ST ALBANS SCHOOL

Hallam Land

PART OF HENRY BOOT

WOOLLAM PARK

North St Albans

TRANSPORT ASSESSMENT

DECEMBER 2024

Hallam Land Management Limited, St Albans School and St Albans School Woollam Trust

Woollam Park, North St Albans

Transport Assessment

December 2024

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Hallam Land Management Limited, St Albans School and St Albans School Woollam Trust

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Introduction

PJA has been commissioned to develop the access and movement vision for Woollam Park, ensuring that the outline masterplan incorporates elements to support low carbon lives, minimising the need to travel and maximises the travel choices available to the new community when they do need to travel. The vision considers the spatial arrangement and land uses within the new community and its relationship to services, facilities, jobs and activities within the existing urban area nearby in order to identify the movement infrastructure and mobility services required to achieve this vision both within and beyond the sites extents.

PJA has prepared this Transport Assessment and a Framework Travel Plan, which will test and embed this vision, to support a hybrid planning application for the proposed development of land at North St Albans, referred to as 'Woollam Park'.

This Transport Assessment provides a detailed evidence base for the proposed transport strategy and includes the assessment of highway impacts. It has been developed through extensive and close engagement with Hertfordshire County Council (HCC), in their role as local highway authority. The strategy has also been developed in accordance with the Draft Local Plan, including the contents of the supporting 'Transport Impact Assessment forming part of the Local Plan Evidence Base.

The Transport Assessment and supporting transport strategy have been prepared to align with key local, regional and national transport related policy. This policy and approach reflects a recent shift with the ultimate aim to reduce net emissions of greenhouse gases. With transport being one of the largest contributors to such emissions, an aspirational 'vision' has been developed along with a package of measures to realise this vision.

The strategy is underpinned by a detailed travel demand model which has used local information to forecast the travel demand generated by the new community within the proposed development, this includes:

- The number of movements generated by the proposed development, remaining within the development, using on-site facilities.
- The number of movements generated by the proposed development, traveling outside the development.
- The mode of travel.
- The origin/destination of the journeys terminating/beginning at the proposed development.
- The routes traversed for these journeys.

Development Proposals

The residential-led development is proposed to comprise up to 1,000 new homes to include a mix of market housing, affordable housing, restricted specialist accommodation (for the elderly and adults with disabilities) along with a care home. These residential uses would be supported by a local centre and two-form entry primary school to meet the daily needs of residents.

Vehicular access is proposed to be taken via the A1081 Harpenden Road via a new traffic signal controlled junction with limited secondary access facilitated via Sandridgebury Lane to the east of the site. A series of active travel connections are proposed with improved linkages to existing communities adjacent to the development as well as the Heartwood Forest and leisure public right of way network. Existing highway connections with Valley Road and Sandridgebury Lane are proposed to be closed to motor vehicles as part of the development to provide good quality active travel corridors. Sandridgebury Lane within the site would become a "green lane" suitable for walking and cycling with vehicular connections between Sandridge and the A1081 provided via the site (subject to monitoring of conditions to ensure traffic flows remain appropriate). Sandridgebury Lane at its western end would be closed to motor vehicles providing a reduced traffic environment fronting the girls school. Valley Road would be modal filtered to remove motor vehicles from this route as it passes through the site boundary.

To embed the vision, detailed consideration has been given to the principles of the on-site movement network design which would be developed and agreed at reserved matters stage should outline planning permission be granted:

- A hierarchy of streets is proposed, ranging from the main entrance street down to tertiary streets, the design of each reflecting the place and movement function.
- Low speeds will be encouraged throughout the development with a maximum 20mph design speed across the whole site.
- Active travel movements will be supported through appropriate levels of infrastructure in line with guidance and standards with priority given to the movement of people over vehicles.
- A bespoke approach to parking has been considered for residential parking in line with the Emerging Local Plan guidance. This has set out a demand based approach to parking with principles set for the provision of a mix of parking (allocated to a specific dwelling and unallocated, allowing use by any resident or their visitors).
- Parking within the local centre will be minimised to reflect the expected use of active travel modes over private car movements with a reduced level of operational car parking, to include disabled provision in line with minimum standards.

Sustainable Travel Strategy

The access and movement vision for Woollam Park has been developed to enable new residents (and the surrounding communities) to adopt more sustainable travel patterns based upon the triple access planning principles which impact upon accessibility, these being:

- Digital Connectivity – the provision of telecommunication systems and homes with work or study space to minimise the number of journeys by providing access to home delivery services, online appointments, entertainment streaming and enabling home working.
- Spatial Proximity – land use planning to reduce the travel distances to services, facilities and transport interchanges, both for the new residents, people working within the site, and for people living and working in the existing communities near Woollam Park. These shorter travel distances are more easily covered on foot or by bike.
- Physical Mobility – the delivery of high-quality infrastructure and transport services within the development site and across the local movement network which is aligned to support the existing and forecast desire lines to and from North St. Albans.

The access and movement vision supports low carbon, car last living which will deliver multifaceted benefits to the new and existing communities including safer journeys, more inclusive travel options, improved health and wellbeing, better access to green space including the Heartwood Forest and reduced living costs.

In terms of physical mobility elements of the Woollam Park proposals, the following is considered:

- A new or improved network of active travel routes enabling more people to travel by active travel modes for a range of journey purposes. Reducing traffic volumes, improving air quality and supporting people in living healthier lives. Routes considered support connectivity to St Albans City Centre and Railway Station in line with the Draft Local Plan. Improvements include provision of separate infrastructure for active travel movements along corridors carrying higher volumes of vehicle movements through to traffic management along corridors where there are lower volumes of vehicle movements. Improvements are also proposed to the Ancient Briton junction (A1081/Beech Road/Batchwood Drive) and the King William IV junction (Beech Road/St Albans Road/Marshalswick Road/Sandridge Road) to better facilitate active travel movements.
- Enhancement of the local bus network including the introduction of new bus stops, a mobility hub and improvements allowing multi-modal journeys with interchange between active and public transport options including rail.
- The provision of on-site car club vehicles within the mobility hub as part of the bespoke parking strategy for the site which seeks to balance sustainable accessibility with car ownership

requirements, and provides EV charging infrastructure to increase the uptake of zero emission vehicles.

Taken together these measures provide the opportunity for more than 50% of the trips to and from Woollam Park to be undertaken by sustainable modes, growing to almost 60% under the most ambitious and desired scenario.

Traffic Impacts

The detailed TDM has been used to forecast the number of vehicle movements likely to be generated by the proposed development, and this is based upon the travel characteristics of people already living, working and learning in comparable areas of St. Albans which have been used as a proxy for the future residents of Woollam Park.

In line with the vision-led approach to the assessment of highway impacts, multiple scenarios have been considered which reflect the potential range of modal splits which might be achieved with the appropriate infrastructure in place. The proposed modal shift scenarios are supported by a strategy to enable these modelled conditions to be realised.

The impacts of additional vehicle movements under each modal scenario have been considered at key junctions to include the site access on Harpenden Road as well as the Ancient Briton junction (A1081/Beech Road/Batchwood Drive) and the King William IV junction (Beech Road/St Albans Road/Marshalswick Road/Sandridge Road). The site access junction is forecast to operate appropriately in terms of capacity, queueing and delays, even in the most robust of traffic scenarios.

The key off-site junctions of the Ancient Briton and King William IV are already known to be congested during peak periods which worsens with the inclusion of background traffic growth and the proposed development traffic. The proposed transport strategy is likely to not only benefit the proposed development but also provide a catalyst for wider behavioural change and modal shift within the existing communities who are already moving around the network. Considering the significant opportunities for behavioural change which are forecast and which align with local and national policy, it is not deemed that the proposed development would result in a severe impact on the surrounding highway network. This conclusion is supported by the wider strategic modelling undertaken independently to support the Draft Local Plan evidence base.

Conclusion

The site is well located to benefit from existing sustainable travel links with a significant package of measures and improvements proposed to enhance connectivity in the wider St Albans area. This would be for the benefit of not only future residents but those already living and working in the area and supporting wider HCC objectives and aspirations.

It has been demonstrated through the transport strategy and proposed offsite measures that the proposed development would not result in a severe residual cumulative impact. An analysis of highway safety data has demonstrated there are generally no inherent safety issues which would mean the development would result in an increase in severity or frequency of collisions. As such, in the terms of the National Planning Policy Framework, there are not deemed to be any reasons for refusal on highways / transport grounds, following mitigation. Furthermore, the strategy aligns well to current and draft policy at a local, regional and national level.

1 Introduction

1.1 Introduction

1.1.1 PJA has been commissioned by Hallam Land Management Limited (HLM), St Albans School and St Albans School Woollam Trust to provide transport planning support for a hybrid planning application for the proposed development of land at North St Albans, referred to as 'Woollam Park'.

1.1.2 Planning permission will be sought for the following development:

1. Relocation and replacement of existing playing fields and erection of pavilion annex; and
2. Construction of up to 1000 new homes (Use Class C3) to include a mix of market housing, affordable housing, age restricted specialist accommodation for the elderly, adult disability service units; a care home (Use Class C2); a local centre (Use Classes E and F); a primary school (Use Class F); the laying out of green infrastructure including habitat creation; drainage infrastructure; earthworks; pedestrian and cycle routes; new means of access and alterations to existing accesses

1.1.3 The application is submitted as a "hybrid" application. Part (1) is submitted as a full application. Part (2) is submitted as an outline application with approval of means of access sought at the present time, and all other reserved matters to be approved at a later date.

1.1.4 PJA has developed an ambitious transport vision for the site which has informed the development of the site's masterplan and the comprehensive access and movement strategy which is presented within this Transport Assessment together with a robust evidence base and detailed assessment and qualification of the transport strategy. The Transport Assessment should be read alongside the accompanying Framework Travel Plan and Transport and Movement chapter of the Environmental Statement.

1.1.5 A separate Technical Note has been prepared and submitted to cover the proposed relocation of the existing playing fields (ref 05920-T-12-A Playing Fields Relocation Transport Technical Note).

1.2 Policy Context and Approach to Transport Strategy

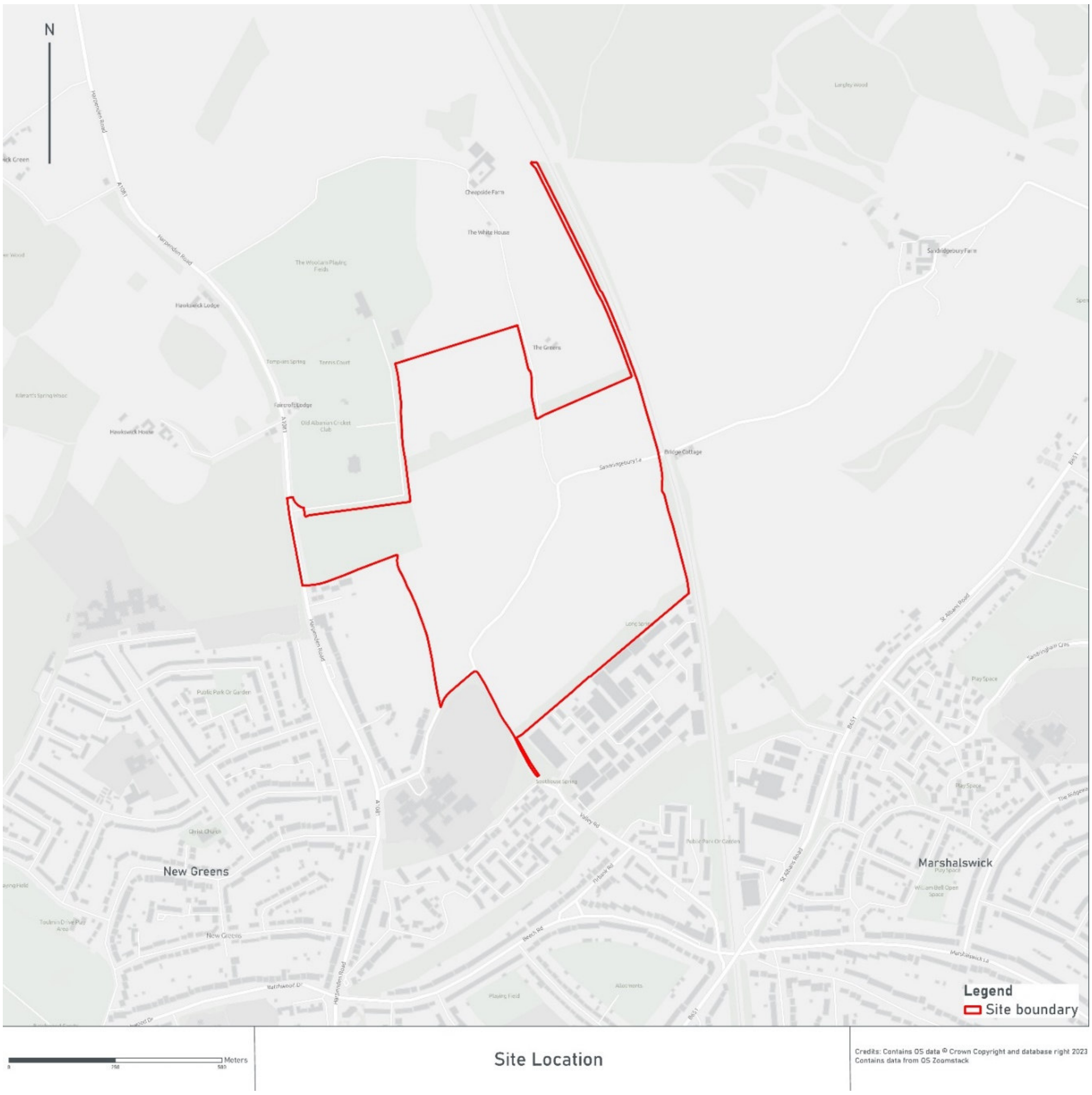
Local Plan Status

1.2.1 The most recent adopted St Albans City and District Council (SACDC) Local Plan dates back to 1994, the previous draft Local Plan was withdrawn in November 2020. The New Local Plan went through the Regulation 18 Consultation Stage between July-September 2023 with the Regulation 19 Pre-submission publication undergoing consultation from September to November 2024. SACDC have stated a target Local Plan submission date of December 2024 and an eventual adoption by March 2026.

1.2.2 Within the Emerging Local Plan, North St Albans is included as a 'Broad Location' for development comprising 1,146 residential dwellings, 2 form-entry (FE) primary school, green infrastructure, transport infrastructure and other community infrastructure. This includes the 150 dwellings recently consented as part of the neighbouring Hunston development now being brought forward by Cala Homes.

1.2.3 The location and extents of the site are shown in Figure 1-1 and the concept masterplan is included in Appendix A.

Figure 1-1: Site Location



Policy Context

1.2.4 Nationally, the UK Government has committed to reducing net emissions of greenhouse gases by 100% relative to 1990 levels by 2050 (to become a "net zero" emitter). Evidence shows that transport is one of the largest contributors to greenhouse gas emissions (28% of total emissions), and therefore at all levels of governance it has become a focus area for reducing emissions:

- **Nationally**:
  - In July 2021, the UK Government launched its **Transport Decarbonisation Strategy**, setting how significant CO_2 reductions will be achieved.
  - This strategy built on what was set out in **Gear Change**, a UK Government strategy prepare in 2020 which sets out their visions for walking and cycling in the UK, with the aim that 50% of journeys in towns and cities are being walked or cycled by 2030. The UK Government have also committed to accelerate carbon reduction with a 78% reduction by 2035, which has subsequently been brought into law.
  - There is a significant amount of uncertainty about how the transport system will evolve in the future, particularly with the potential for emerging trends in behaviour, technology and decarbonisation. The **Transport Analysis Guidance (TAG) Uncertainty Toolkit** sets out the importance of considering future uncertainties and understanding the potential range of outcomes when undertaking scheme appraisal. The **Common Analytical Scenarios** are a set of scenarios which consider potential levels of uncertainty at a national level which can inform the modelling of uncertainty and development of scenarios.
  - National Highways recognises the importance of the delivery of sustainable development. **DfT Circular 01/2022** (Strategic Road Network and the delivery of sustainable development) sets out how NH will engage at plan making and decision taking stages of development and the part they can play in the drive towards zero emission transport through their role as a statutory consultee in the planning system.
- **Locally**:
  - St Albans City & District Council voted unanimously in July 2019 to declare a climate emergency with a pledge that the district would become carbon neutral by the end of the decade (2030). The district has pledged to submit an innovative and comprehensive sustainable travel town Vision to Hertfordshire County Council (HCC) which incorporates a clean air zone in the town centre, and measures to further enable journeys to be undertaken by non-car modes.
  - This includes the preparation of a **Local Cycling and Walking Infrastructure Plan (LCWIP)** as a first step to increasing walking and cycling by planning where to invest in infrastructure to join existing routes and build new ones.

1.2.5 The above policy and strategy documents emphasise the importance of considering a range of scenarios to reflect uncertainty in future travel patterns and behaviours. This approach is often referred to as "*decide and provide*" or "vision and validate". The "*decide and provide*" approach decides on a preferred vision of future mobility in and around a site and then provides the means to achieve this vision. Meanwhile also accommodating the uncertainty of road users, tested through assessment of a range of plausible scenarios based on the characteristics of a development site, existing levels of connectivity, connectivity improvements delivered by the site, and extrapolation of background trends in travel behaviour. The principles of this are reflected in guidance prepared by TRICS entitled "*Guidance Note on the Practice Implementation of the Decide & Provide Approach*".

Approach

1.2.6 It is vital that new developments take account of the latest policy, guidance and strategy documents at all levels. While reflecting significant changes to travel and lifestyle patterns observed in recent years. This will ensure that the development can positively contribute, in a proportionate matter, to net zero goals at a national and local level.

1.2.7 Through recent planning application and scoping discussions with HCC, the existing operation of the local highway network has been noted as constrained and in combination with the declaration of the climate emergency and net zero carbon policy ambitions, it is proposed for the transport strategy for this development to consider the following:

- First and foremost, reduce the need to travel through the enabling and promotion of home based and flexible working, digital connectivity and access to online services, and the provision of a range of land uses on-site to meet daily needs without the need to travel off-site.
- Provision of high-quality infrastructure both on and off-site that can maximise and support the use of active travel modes for trips generated by the proposed development, particularly those over shorter distances, and will offer wider benefits within St. Albans.
- For longer distance journeys, promote and facilitate journeys by shared and low carbon modes of travel, for example public transport and low emission private vehicles.

1.2.8 This approach to the transport strategy would not only benefit the proposed development but also the wider community in St Albans. On this basis, a Low Carbon Transport Strategy (LCTS) has been developed, which considers how the delivery of active travel and public transport infrastructure, within and outside of the site boundary, could change wider travel habits and release capacity for residual development traffic. This is reflected in the proposed methodology for deriving travel demand, assessment methodology for capacity modelling and the active travel and public transport strategy for the site as agreed with HCC.

1.2.9 To quantify the potential impacts of the proposed LCTS whilst also providing comparison to a more standard/historical approach to the transport strategy, a range of scenarios has been considered.

1.3 Scoping Discussions

Local Highway Authority – Hertfordshire County Council

1.3.1 To date a significant amount of engagement has been undertaken with HCC, in their capacity as the Local Highway Authority (LHA). PJA presented an initial Scoping Note and attended a follow up meeting on 19th January 2023 with HCC. It was agreed that a series of topic meetings would be arranged to discuss and agree the detail of the strategy and the intended assessment parameters.

1.3.2 A summary of the meetings held to date and submitted information is set out in Table 1-1 overleaf and a summary of discussions and agreement is set out in full in Appendix B. The submitted information referenced below is also included in Appendix B along with meeting minutes for each meeting, where applicable.

Table 1-1: Transport and Highways Scoping Meetings

Topic and Number of Meeting	Date of Meeting	Technical Note / Presentation Slides Reference
First Phase of Scoping		
3 Initial Scoping Discussion	19/01/23	05920-T-01-C
4 Trip Generation, Mode Share and use of the Travel Demand Model	06/04/23	05920-T-02-A
5 Active Travel Strategy and Interface with Emerging LCWIP	18/04/23	05920-T-03-A
6 Public Transport Strategy	27/04/23	05920-T-04-A
7 Meeting with HCC/BT Active Intelligence Team/PJA to understand the capabilities of mobile network data and for HCC to seek answers to queries from the data providers.	25/05/2023	-
Second Phase of Scoping		
8 Active Travel Strategy – Internal site layout principles, site access and recommendations.	24/11/2023	231124_Active Travel Design Meeting Slides.pdf
9 Mobile Network Data Findings	13/12/2023	231213 MND Findings Slides.pdf
10 Public Transport Strategy Interim Meeting	18/12/2023	-
11 Public Transport Strategy Meeting	09/01/2024	05920-T-04-A Public Transport Topic Note
PPA Phase of Scoping		
12 Presentation of Transport Strategy to SACDC & HCC	07/05/2024	-
13 Sandridgebury Lane Strategy, Preliminary Transport Assessment Capacity Assessment results and presentation of Detailed off-site Active Travel Strategy Drawings	14/06/2024	05920-M-014-P0 Meeting Notes
14 Sandridgebury Lane, Active travel improvements	01/08/2024	05920-M-015-P0 Meeting Notes
15 Sandridgebury Lane Monitoring and Managements, Emergency access, Active travel measures	09/08/2024	05920-M-016-P0 Meeting Notes
16 Active travel updates, Updated Modelling, Sandridgebury Lane	04/09/2024	05920-M-017-P0 Meeting Notes
17 Sandridgebury Lane, Parameters Plan, Local Plan Evidence Base, Modelling outcomes	12/09/2024	05920-M-018-P0 Meeting Notes

National Highways

1.3.3 PJA engaged with National Highways (NH) for initial scoping correspondence on 22nd November 2022, presenting the Transport Assessment Scoping Note, provided in Appendix B. PJA received a detailed scoping response from NH on 19th December 2022, provided in full in Appendix B.

1.3.4 The response received from NH was largely positive with agreements in principle in several areas to the proposed methodology. The additional items required by NH includes the following:

- A sensitivity test for the calculated residential trip rates using TRICS.
- NH accepts the junction assessment study area but if traffic generation and distribution warrants it, they would also like this to be extended to the A1.
- A junction capacity test of the site's opening year plus 10 years (2038) will be required, where junction capacity assessments are deemed to be necessary for strategic network junctions.
- 2020 will not be accepted as suitable year within the Personal Injury Collision data study period, the study period will need to be extended.

1.3.5 The above points have been noted by PJA and will be incorporated within this Transport Assessment, where appropriate.

Network Rail

1.3.6 Network Rail provided a response to the EIA Scoping opinion. The following points were noted:

- Consideration should be given to the environmental impacts of the scheme on the railway infrastructure and upon rail safety.
- Consideration should be given to HGV traffic / haulage routes that may utilise railway assets during construction and operation.
- An assessment of the impact the development would have on passenger numbers and types at nearby railway stations should be undertaken.

1.3.7 These points are addressed, where applicable, within the Transport Assessment and/or Transport and Movement chapter of the Environmental Statement.

1.4 Report Structure

1.4.1 This Transport Assessment identifies the baseline conditions, the travel patterns for the development and examines the transport implications of this and the surrounding area. It has been prepared according to the guidance in 'Travel Plans, Transport Assessments and Statements in Decision Making' (PPG 2014).

1.4.2 This report comprises the following:

- Chapter 2 – Policy Context
- Chapter 3 – Baseline Conditions
- Chapter 4 – Future Baseline Conditions
- Chapter 5 – Development Proposals – Residential-Led Development
- Chapter 6 – Access and Wider Transport/Movement Strategy
- Chapter 7 – Travel Demand Model
- Chapter 8 – Highways Impact Assessment and Modelling
- Chapter 9 – Assessment of the Effects of Active Travel Improvements
- Chapter 10 – Residual Impacts and Mitigation Measures
- Chapter 11 – Summary and Conclusions

2 Planning Policy Review

2.1 National Policy

National Planning Policy Framework (NPPF) (2023)

2.1.1 This document sets out the Government's planning policies for England and how these should be applied, providing a framework within which locally prepared plans for housing and other development can be produced. The NPPF was formally revised on 19th December 2023.

2.1.2 Paragraph 114 states it should be ensured that:

- *"Appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*
- *safe and suitable access to the site can be achieved for all users;*
- *the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code 46; and*
- *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree."*

2.1.3 Paragraph 115 states that:

- *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe."*

2.1.4 Paragraph 116 states that applications for developments should:

- *"give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use.*
- *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
- *create places that are safe, secure, and attractive – which minimise the scope for conflicts between pedestrians, cyclists, and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*

- *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible, and convenient locations."*

2.1.5 Paragraph 117 states "all developments that will generate significant amounts of movement should be required to provide a Travel Plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed."

National Planning Policy Framework Consultation

2.1.6 Consultation on changes to the NPPF ran from 30 July 2024 to 24 September 2024. This proposes for the current paragraph 114 proposed to be replaced with the following (at paragraph 112):

"In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) *A vision led approach to promoting sustainable transport modes is taken, taking account of the type of development and its location;*
b) *safe and suitable access to the site can be achieved for all users;*
c) *the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code; and*
d) *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree through a vision led approach."*

2.1.7 This also proposes for the current paragraph 115 proposed to be replaced with the following (at paragraph 113):

- *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe, in all tested scenarios."*

2.1.8 Whilst not yet adopted and potentially subject to change, this contributes to a change in direction of approach to the assessment of transport impacts which has been evolving for some time. This is considered in the context of the modelling scenarios set out in later chapters.

National Planning Practice Guidance (2014)

2.1.9 The Government's National Planning Practice Guidance (NPPG) was launched on 6th March 2014 by the Department for Communities and Local Government and updated July 2018. NPPG provides 'Travel Plans, Transport Assessments and Statements in Decisions-Taking' guidance, advising on when Transport Assessments and Transport Statements are required, what they are and what they should contain.

2.1.10 Paragraph 6 sets the importance of the Travel Plans, Transport Assessments and Transport Statements saying that they can positively contribute to:

- Encouraging sustainable travel;
- Lessening traffic generation and its detrimental impacts;
- Reducing carbon emissions and climate impacts;
- Creating accessible, connected, inclusive communities;
- Improving health outcomes and quality of life;
- Improving road safety; and
- Reducing the need for new development to increase existing road capacity or provide new roads.

2.2 Regional Policy

Hertfordshire Local Transport Plan (2018-2031)

2.2.1 The Hertfordshire Local Transport Plan (LTP4) sets out the plan for future travel in Hertfordshire for the period 2018-2031. The plan was adopted by Hertfordshire County Council (HCC) in 2018.

2.2.2 The LTP sets out a vision (Figure 2-1), along with objectives (Figure 2-2) to achieve this vision.

Figure 2-1: Hertfordshire Vision (LTP4)

Figure 2-2: Hertfordshire LTP4 Themes, Objectives and Principles

2.2.3 A set of strategic level policies are set out which apply to the county but which the development can also align to and contribute towards. Alignment with key strategic policies is summarised in Table 2-1.

Table 2-1: Relevant Strategic Policy Alignment

Relevant Strategic Policy Area	Proposed Development Alignment
Policy 1 To support the creation of built environments that encourage greater and safer use of sustainable transport modes, the county council will in the design of any scheme and development of any transport strategy consider in the following order: • Opportunities to reduce travel demand and the need to travel • Vulnerable road user needs (such as pedestrians and cyclists) • Passenger transport user needs • Powered two wheeler (mopeds and motorbikes) user needs • Other motor vehicle user needs	• Opportunities to reduce the need to travel through a mix of land uses within the development to meet the daily needs of residents. • A network of on and off-site active travel interventions to enable connectivity for vulnerable road users. • A public transport strategy to serve the development connecting residents to destinations they want to travel at the time they want to travel. • Providing appropriate servicing provision but generally vehicle access will be the lowest priority across the development.

Relevant Strategic Policy Area	Proposed Development Alignment
Policy 2 - Influencing Land Use Planning The county council will encourage the location of new development in areas served by, or with the potential to be served by, high quality passenger transport facilities so they can form a real alternative to the car, and where key services can be accessed by walking and cycling.	The location of the development at the edge of the existing urban extent means there are existing services which can form the basis on which to build the connectivity package.
Policy 3 - Travel Plans and Behaviour Change The county council will encourage the widespread adoption of travel plans through: b) Seeking the development, implementation and monitoring of travel plans as part of the planning process for new developments. c) Supporting school travel plans, and working closely with parents, pupils, teachers and local residents to deliver a network of more sustainable transport links to school. The application of personalised travel planning techniques, marketing and other behavioural change initiatives will be considered when delivering physical transport improvements to maximise the potential to achieve modal shift.	A Framework Travel Plan has been prepared to support and encourage the use of sustainable modes. This will be developed further as the development is built out with specific targets agreed for the various residential elements.
Policy 4: Demand Management The county council considers greater traffic demand management to be essential in the county's urban areas in the next five years to achieve modal shift and improve sustainable travel provision. This can only currently be achieved efficiently and effectively through parking restrictions and charging applied to on-street, off-street and potentially at workplace parking. The county council will work with the district and borough councils and other key stakeholders to develop locally appropriate strategies.	The strategic policy places emphasis on demand management to control and influence vehicle usage. As part of the transport strategy for the proposed development, a variety of methods of managing demand have been set out. This includes reducing the need to travel, providing greater convenience for sustainable travel modes over private car travel and reduced levels of parking compared to typical standards.
Policy 5: Development Management The county council will work with development promoters and the district and borough councils to: a) Ensure the location and design of proposals reflect the LTP Transport User Hierarchy and encourage movement by sustainable transport modes and reduced travel demand. b) Ensure access arrangements are safe, suitable for all people, built to an adequate standard and adhere to the county council's Highway Design Standards. c) Consider the adoption of access roads and internal road layouts where they comply with the appropriate adoption requirements and will offer demonstrable utility to the wider public. Where internal roads are not adopted the county council will expect suitable private management arrangements to be in place. d) Secure developer mitigation measures to limit the impacts of development on the transport network, and resist development where the residual cumulative impact of development is considered to be severe. e) Require a travel plan for developments according to the requirements of 'Hertfordshire's Travel Plan Guidance'.	• The proposed development has been designed to reflect the correct user hierarchy principles with further development of the detail at reserved matters stage. • Safe and suitable access compliant with the GTP and in line with the emerging Local Plan allocation. • Measures to mitigate impacts through managed demand and active travel and public transport interventions. • Preparation of a FTP to support planning and a commitment to develop separate Travel Plans further for specific uses. • Appropriate treatment for Sandridgebury Lane and Valley Road within the application red line boundary.

Relevant Strategic Policy Area	Proposed Development Alignment
f) Only consider new accesses onto primary and main distributor roads where special circumstances can be demonstrated in favour of the proposals. g) Resist development that would either severely affect the rural or residential character of a road or other right of way, or which would severely affect safety on rural roads, local roads and rights of way especially for vulnerable road users. This should include other routes which are important for sustainable transport or leisure.	
Policy 6: Accessibility The county council will seek to increase the ease with which people, particularly disadvantaged groups, can access key services, by: a) Working in partnership with key stakeholders such as bus and rail operators, community transport operators, the voluntary sector and public service providers. b) Supporting transport services which could include providing resource for bus and other transport services. c) Addressing the barriers to accessibility particularly regarding active modes and for people with impaired mobility. d) Promoting travel options and facilitating accessible travel information provision, including open data initiatives. e) Improving travel choices and options, including support for the provision of shared mobility initiatives.	A safe, accessible and equitable multi-modal transport strategy to reduce reliance on private car travel has been developed for the site.
Policy 7: Active Travel - Walking The county council will seek to encourage and promote walking by: a) Implementing measures to increase the priority of pedestrians relative to motor vehicles, especially in town centres, and creating walking friendly town and neighbourhood centres. b) Delivering infrastructure to provide safer access to key services, and pedestrian facilities to enable and encourage walking. c) Identifying and promoting networks of pedestrian priority routes. d) Promoting walking as a mode of travel and for recreational enjoyment. e) Supporting the implementation of the Rights of Way Improvement Plan.	• A development designed around placing active travel users highest in the user hierarchy through provision of high of high quality routes, cycle parking etc. • A network of off-site active travel improvements to enhance connectivity to key facilities. • Creation of new routes to enhance accessibility to the PROW network. • Travel planning measures to support and encourage active travel uptake.
Policy 8. Active Travel - Cycling The county council aims to deliver a step change in cycling, through: a) Infrastructure improvements, especially within major urban areas to enable and encourage more cycling. b) Implementing measures to increase the priority of cyclists relative to motor vehicles. c) Improved safety for users including delivery of formal and informal cycle training schemes. d) Supporting promotion campaigns to inform, educate, reassure and encourage cycling provision and education, such as Bikeability.	

Relevant Strategic Policy Area	Proposed Development Alignment
e) Facilitating provision of secure cycle parking.	
Policy 9: Buses The county council will promote and support bus services to encourage reduced car use by: a) Supporting the delivery of infrastructure including bus priority measures, focussed on a core bus network, and by minimising bus service disruption from road congestion and the effects of roadworks. b) Providing and maintaining all bus stops, and other bus related highway infrastructure, to a consistent quality and standard across the county. d) Reviewing, procuring and supporting cost effective and efficient bus services to improve accessibility and respond to existing and potential passenger needs. Review existing services and take account of enhanced security provision. g) Working with partners to promote bus services as an option for work and school journeys, and promote and publicise the passenger transport network through a variety of media.	• Provision of new bus infrastructure/stops within the development and adjacent to the development on the existing highway. • Funding to support additional bus services to serve the development. • Providing interventions to effect a behavioural change and modal shift in existing movements to reduce background traffic along congested corridors. • Travel planning measures to support and encourage public transport use.
Policy 12: Network Management As part of its Network Management Duty the county council will seek to manage, and where feasible reduce traffic congestion, prioritising strategic routes. Activity will focus on making more efficient use of highway network capacity via: c) Reducing levels of single occupancy car use and encouraging travel by walking, cycling and passenger transport.	The development of a low carbon strategy for the development reducing reliance on private car travel and encouragement for sustainable travel uptake.
Policy 13: New Roads and Junctions The county council will work closely with partners including Highways England, districts and major scheme developers to design new transport infrastructure, following application of the Transport User Hierarchy, to manage existing demand and that of planned development. Future capacity that may be required beyond this could be safeguarded but should not be released until necessary to avoid inducing demand.	Offsite network improvements focussing on and prioritising active travel modes.
Policy 15: Speed Management The county council through its Speed Management Strategy, a joint working strategy with the Police, will seek to manage the network to achieve appropriate speeds in the interests of safety, other road users, and the environment.	The development of a high quality active travel network (on and off site) which: • Is safe, secure and well overlooked encouraging its use. • Includes measures to control vehicle speeds and volumes to a safe level.
Policy 17: Road Safety The county council will seek to continually improve safety on the county's roads, working towards an ultimate vision of zero fatalities and serious injuries, by: a) Working with partners, in particular through the Hertfordshire Road Safety Partnership to deliver targeted, effective and appropriate road safety measures. b) The development of a 'Safe Systems' approach that seeks to co-ordinate a mix of safer roads, safer speeds, safer vehicles, safer road users and post-collision response with	

Relevant Strategic Policy Area	Proposed Development Alignment
a focus on casualty reduction. c) Using latest data analysis and intelligence led techniques to target and evaluate measures.	
Policy 18: Transport Safety and Security The county council will seek to improve the perception of safety and security on Hertfordshire's transport system where this could deter people from travelling, particularly by active modes and passenger transport. This includes ensuring the county's transport system is resilient and prepared for instances of major alert.	
Policy 19: Emissions Reduction The county council will reduce levels of harmful emissions by: a) Promoting a change in people's travel behaviour to encourage a modal shift in journeys from cars to walking, cycling and passenger transport. b) Addressing any barriers to and supporting the uptake of ULEVs in the county, particularly where this can positively affect areas with identified poor air quality.	The development is proposed to support a network of active travel improvements not only benefitting the development but also the wider area which has the ability to effect behavioural change and modal shift. The provision of EV charging facilities throughout the development to support uptake of ULEVs.

2.2.4 The proposed development transport strategy aligns with and supports the strategic policy objectives of LTP4.

Hertfordshire Infrastructure and Funding Prospectus 2018-2031

2.2.5 This prospectus provides an overview of the current and future infrastructure needs of Hertfordshire and how this can be planned to ensure that infrastructure is funding in line with the growth in population. The document identifies the site as a major housing development and outlines several transport projects that will require future funding, one of the proposals includes a new cycleway along the A1081 between Harpenden and Luton; it is proposed the development could look to contribute to the delivery of part of this route.

South Central Hertfordshire Growth and Transport Plan

2.2.6 On behalf of HCC, AECOM has prepared a suite of documents contributing to the South Central Hertfordshire Growth and Transport Plan (GTP), to support LTP4.

2.2.7 The GTP prospectus was published in 2019 and provided a brief summary of how the GTP has been and will continue to be developed, as well as an outline of the proposals (interventions) for each larger town and smaller settlement. The most recent and final publication for the GTP was the South Central Hertfordshire Growth and Transport Plan Stage 3 Interventions Paper in May 2022, which builds on the level of detail given in the previous stages regarding the interventions for each area.

2.2.8 Given the location of the site within St Albans, the interventions likely to have the greatest level of impact on site users will be those within St Albans, as their local area. Though interventions through the rest of Hertfordshire will also be beneficial. Packages 24-29 cover St Albans City and include improvements in St Albans City Centre, at both rail stations and on existing active travel routes, the Green Ring and Alban Way.

2.2.9 Near the site, some key improvements to the St Albans Green Ring are noted in Package 25 under PR148 and PR149. This includes a raised speed table crossing and improved markings between Batchwood Drive and Beech Bottom at the south-west corner of the Ancient Briton crossroads and where the Green Ring crosses Townsend Drive.

2.2.10 SM153 of Package 25 introduces the potential feasibility of new 'spoke' to increase interconnectivity across the Green Ring. These interventions would be developed in conjunction with the St Albans LCWIP.

2.3 Local Policy

City and District of St Albans Local Plan 1994 (Saved and Deleted Policies Version July 2020)

2.3.1 The most recent adopted Local Plan applicable to St Albans is The District Local Plan Review, adopted on 30th November 1994. In 2007, a Saved and Deleted Policies Version of the document was produced to prevent the Local Plan from expiring. The most recent update to the Saved and Deleted Policies Version was in July 2020. The remaining policies within the adopted Local Plan are almost 30 years old and do not take into consideration the ways of modern living and taking steps to address the ongoing climate emergency, formally declared by SACDC in July 2019.

2.3.2 It is noted that in 2018, a new Local Plan was drafted to cover the period 2020-2036. However, this was withdrawn after being submitted to the Secretary of State on 29th March 2019. Most recently an emerging Local Plan was published as part of the Regulation 18 Consultation and is due to be published by the end of 2024.

2.3.3 Much of the policy contained in the adopted document is not in line with the current approach due the age of the document. Guidance is therefore sought from emerging Local Plan and accompanying policy, see Section 2-4.

St Albans City and District Council Local Cycling and Walking Infrastructure Plan

2.3.4 SACDC and HCC have recently adopted a Local Cycling and Walking Infrastructure Plan (LCWIP) for the City and District of St Albans. This is a *"long-term approach aimed at developing cycling and* *walking networks over a 10-year period and form a key part of the Government's strategy to increase the number of trips made on foot or by cycle".*

2.3.5 The adoption follows a consultation, held between 7th February and 20th March 2023. Initial stakeholder engagement for the LCWIP previously began in November 2021, three total rounds of engagement were held, the latest being in June 2022.

2.3.6 The final LCWIP report for adoption was published in July 2023 by WSP on behalf of SACDC and HCC. However, this is an ongoing process and will be revisited periodically and updated as infrastructure is built.

2.3.7 In the latter stages of the LCWIP development, the proposals will be adopted into local planning policies, strategies and delivery plans, and will hold material weight at the planning application stage. Funding or delivery of LCWIP measures can be incorporated into Community Infrastructure Levies (CIL) or Section 106 Agreements. Where LCWIP proposals can assist with mitigating the impact of a proposed development, the Local Authority will seek funding from developers to implement the improvements of the LCWIP.

2.3.8 The LCWIP identifies Woollam Park (North St. Albans) as a potential future development site along with several other sites in the district. The LCWIP identifies A1081 Harpenden Road, Beech Road, Batchwood Drive, Marshalswick Lane and the B651 are listed as existing primary cycle routes.

2.3.9 The LCWIP proposes a range of infrastructure measures across the existing highway network including the introduction of traffic free routes, segregated cycle ways, speed limits, traffic calming and the filtering of streets to deliver suitable conditions for a significant increase in cycling within the city.

2.3.10 The measures along each route have been assessed and prioritised as part of the LCWIP process. This prioritisation assessment has identified the delivery of improved cycle infrastructure along the A1081 between St Albans and Harpenden as one of the top five routes with the district, based on the potential benefits of the link and a range of other factors including deliverability and cost.

2.3.11 The three LCWIP corridors which are considered most beneficial to Woollam Park is along the A1081 towards the City Centre, along Gurney Court Road towards the railway station and along Marshalswick Lane towards the east of the city.

Hertfordshire Bus Service Improvement Plan

2.3.12 The Hertfordshire Bus Service Improvement Plan (BSIP) forms part of the LTP 4 and the future LTP 5 and sets out ambitions and aspirations for the county's bus network. After the publication of LTP4, Hertfordshire County Council formed an Enhanced Partnership between HCC and local rail/bus operators with the following objectives:

1 Prioritising bus services in traffic

18 Improving the image of buses

19 Upgrading bus infrastructure

20 Closer integration of the bus network

21 Smarter use of data and information.

2.3.13 The BSIP focuses on several headline targets surrounding the following themes:

- Reliability;
- Punctuality;
- Passenger Growth;
- Customer Satisfaction; and
- Bus Open Data.

2.3.14 Within the vicinity of the site, the following improvements are specifically mentioned:

- **Hitchin – St Albans Corridor** – enhancing frequencies on this route to deliver minimum 30-minute headways, create transport hubs in major towns such as St Albans and relieve pressure on other routes such as St Albans-Hatfield where there may be overprovision.
- **Corridors for bus priority** – St Albans is identified as a town where bus priority should be of a high priority. 'Quick wins' will include improvements to passenger experience and smaller interventions to help buses in traffic. More complex projects will emerge over time. St Albans have been identified approximately £600k of schemes including bus lanes along London Road.

St. Albans Strategic Sites Design Guidance (SSDG)

2.3.15 This suite of documents was introduced by St Albans and District City Council (SADC) to improve the quality of new planning applications in line with the vision for the district set out in the Draft St Albans City and District Local Plan. Strategic-scale sites are defined as 100+ homes or 10,000m^2 of commercial floorspace (retail, leisure and industrial).

2.3.16 The purpose of the guidance is to provide guidance to applicants and the public about the standard of design expected on Strategic sites projects. The guidance comprises of:

- **Strategic Sites Design Principles** - guidance on the design principles that developments are required to meet for Strategic sites.

• **Strategic Sites Design Toolkit** - guidance on the design process for Strategic Sites.

• **Strategic Sites Masterplanning Toolkit** - guidance on the planning process for Strategic Sites.

• **Strategic Sites Employment Uses Design Toolkit** - guidance on the design principles for employment developments of 10,000m^2 or above.

2.3.17 The SSDG provides non-site-specific guidance on urban and architectural design best practice focusing on design quality set out in the NPPF and helping to deliver the change in design quality sought by the Government.

Hertfordshire's Place & Movement Planning Design Guidance

2.3.18 Hertfordshire's Place & Movement Planning Design Guidance was adopted in March 2024. Chapter 3 provides guidance for the development of schemes through the Development Management process from masterplanning, through the planning process to technical approval and finally to adoption. Chapter 5 provides guidance on the preparation of Transport Assessments and supporting documentation for planning applications. The guidance contained with the Place & Movement Planning Design Guide has been considered in the outline scheme design and within this report.

HCC Travel Plan Guidance

2.3.19 The HCC Travel Plan Guidance is aimed at developers to promote sustainable travel to new developments from the planning and design stage. The guidance recommends the use of clear objectives and targets with liaison between developers (including a dedicated Travel Plan Coordinator), local authorities and future occupants. Specific targets may include plans to:

- Improve accessibility by non-car modes;
- Reduce the need to travel;
- Minimise single occupancy car travel;
- Support commercial viability of public transport;
- Reduce congestion;
- Improve the local environment (including air quality and climate change);
- Reduce the cost of travel;
- Improve health and wellbeing;
- Improve road safety;

2.3.20 Evidence of a site's likely impact provided in a Transport Assessment or Transport Statement should be used to inform the objectives, targets and measures in the Travel Plan, ensuring considerations given to each stage of the application are equivalent.

2.3.21 Strategies for Travel Plans can include:

- Site design including permeability and access points to non-car modes, parking provision/restrictions. For educational establishments, wet weather waiting area for parents, and secure storage area for parents to leave pushchairs for linked journeys can be used.
- Improvements to off-site infrastructure and safer routes to amenities such as schools, including traffic calming, footpath improvements, crossing points, cycle infrastructure, signage and bus infrastructure.
- Active Travel incentives such as cycle hubs, infrastructure for pedestrians/cyclists including cycle parking, provision of cycle/walking maps and provision of on-site facilities within schools/workplaces such as lockers and showers.
- Public transport incentives such as ticket discounts, promotions and information provision.
- Promotion and marketing of events, apps, travel information, awareness sessions, local user groups.
- Promotion of car sharing and parking demand management.

2.3.22 For residential developments, the trigger point for baseline monitoring and Full Travel Plan submission will be agreed based on scheduled build-out and development size.

2.3.23 For workplace and visitor developments the trigger point for baseline monitoring and submission of a Full Travel Plan will typically be within three months of first occupation. Educational establishments will follow similar requirements with the Travel Plan transferred to Modeshift STARS upon first occupation.

Rights of Way Improvement Plan

2.3.24 The Countryside and Rights of Way Act 2000 requires every Highway Authority to prepare a Rights of Way Improvement Plan (ROWIP) and update it every 10 years.

2.3.25 The latest ROWIP for Herts County Council (HCC) was published in 2018. It consists of a high-level policy document covering the years 2017/18 to 2027/28 plus a database of proposals for improvements. The policy stands for ten years but the database with its associated maps is a living document which is updated as new proposals are identified.

2.3.26 Of relevance to the Woollam Park site are suggested improvements to the PRoW network to deliver connections between Sandridgebury Lane and the Hertfordshire Way bridleway.

2.4 Emerging Policy

South West Hertfordshire Joint Strategic Plan (Draft)

2.4.1 This plan is currently in draft and is being developed by the six councils of South West Hertfordshire, including SACDC and HCC.

2.4.2 This document will outline a vision of the future of the area up to 2050. The plan aims to “establish a collective ambition and set a blueprint for the future of the area to 2050. Eventually it will need to address big issues like the scale and location of new growth, the infrastructure needed to deliver it and our response to the challenges of climate change.”

St Albans City and District Council New Local Plan 2041 – Regulation 19 Consultation

2.4.3 Following the decision to withdraw the previous draft Local Plan upon advice from Planning Inspectors and current Local Plan dated 1994, St Albans launched a new Call for Sites in January 2021. A regulation 19 Pre-submission version of the Local Plan has undergone consultation during Autumn 2024. There is a target for Local Plan submission by December 2024 and an eventual adoption by March 2026.

2.4.4 SACDC refers to the New Local Plan as being:

"Like a blueprint for future development so that inevitable change can be managed carefully and thoughtfully."

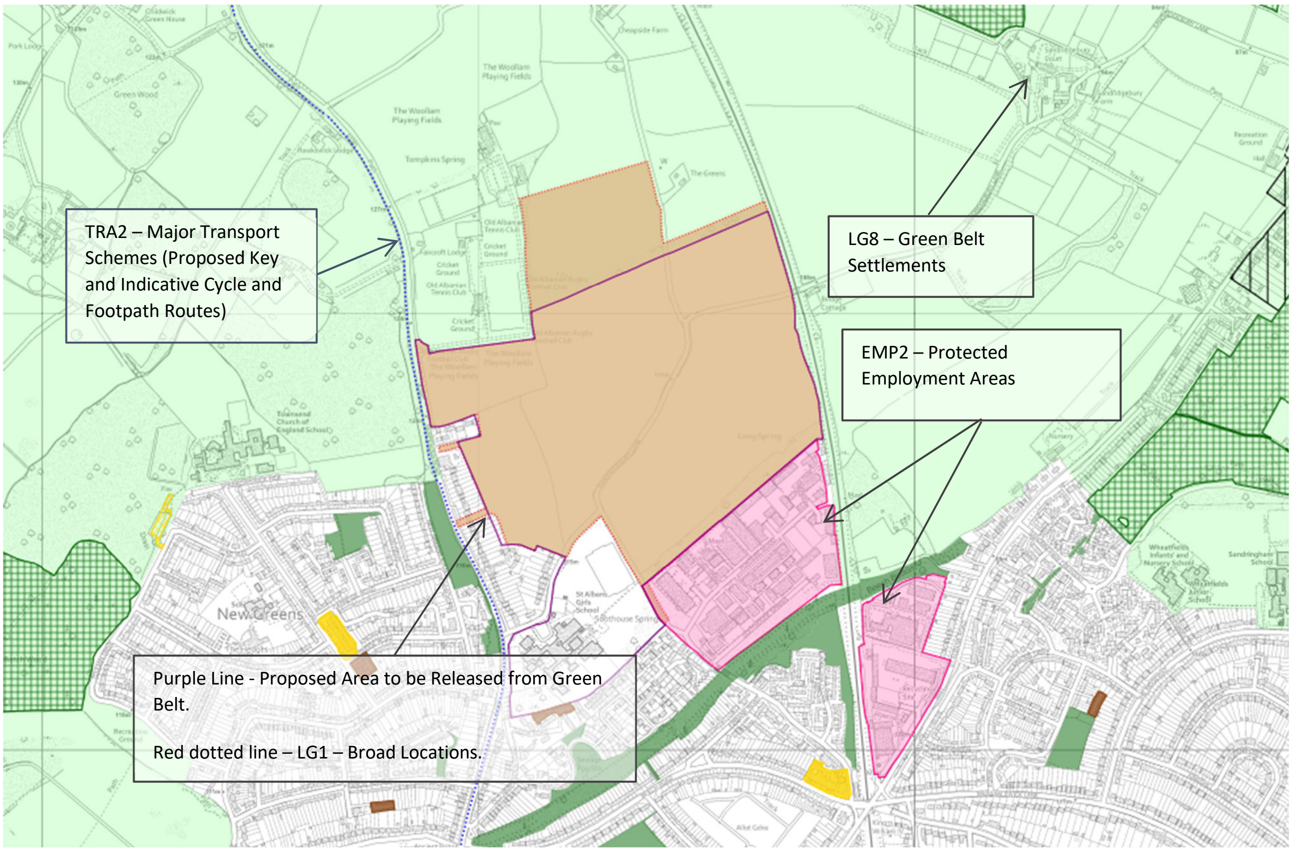
2.4.5 The draft Local Plan would allocate Woollam Park (North St. Albans, B1) as one of the 'Broad Locations' for development upon adoption. The 'Broad Locations' are identified for large urban extensions (250+ dwellings or strategic scale employment), are shown as a red dotted line in Figure 2-3.

2.4.6 The allocation would require the development to be 'primarily residential', providing 1,146 dwellings (inclusive of the consented Hunston Development, 150 dwellings, Ref: 5/2021/0423). The key objectives and issues to address with the allocation are as follows:

- The dwellings figure must include one extra care facility comprising 70-80 self-contained units, one 70-80 bed nursing home and four supported living units for people with disabilities (these units are included in the dwellings total).
- A 2FE primary school, including Early Years provision, to serve the new and wider community.
- A new local centre to provide local services, including medical centre and commercial development opportunities.
- Replacement of the displaced playing fields to an equivalent or better standard in terms of quantity and quality.
- On-site outdoor sports facilities to the meet the additional needs generated by the development. An offsite may be suitable if justified.
- Contributions / enhancements to support relevant schemes in the LCWIP and GTPs as indicated in the accompanying TIA.
- A transport network (including walking and cycling links) and public transport services upgrades / improvements, including off-site improvements to Harpenden Road, Sandridgebury Lane, Valley Road, Ancient Briton and King William IV junctions. Links to St Albans City Centre, station and education, aligned to the GTP, LCWIPs etc.
- Provide pedestrian and cycle links with the part of the site that is delivering 150 homes from planning permission 5/2021/0423.
- Support for the improvement of the PRoW network to enable active travel and recreational use to the Heartwood Forest and Nomansland Common.
- Development proposals must take account of Ancient Woodland, which is also a County Wildlife Site, and a Priority Habitat. There are also Tree Preservation Orders along the south-east boundary. There is also a Priority Habitat close to the eastern boundary, an area of deciduous woodland.

- A noise assessment must be carried out regarding the railway line and appropriate mitigating measures provided, as necessary.

Figure 2-3: SACDC Draft Local Plan 2041 Regulation 19 Consultation – Policies Map



2.4.7 Strategic Policy SP8 sets out the Transport Strategy of the Local Plan which, amongst others, requires all high trip-generating uses to implement Travel Plans to embed sustainable and active travel at an early stage, as well as to work in partnership with key stakeholders such as the LHA and NH. The Transport Strategy will also support a network of local hubs at suitable locations such as railway stations and co-located in city, town and district centres where appropriate. Local hubs are defined as 'supporting sustainable travel' and could include access to a local bus service, car club facilities, bike repair service, e-bike charging, bike share facilities, real-time travel information, Wi-Fi and phone charging and parcel delivery storage lockers.

2.4.8 Policy TRA1 specifically addresses transport considerations for new development, safe and suitable access must be achieved, no undue highway safety problems or impact to the network must be generated and Transport Assessments/Statements must be provided along with other appropriate evidence.

New Local Plan 2041 Parking Standards

2.4.9 The emerging Local Plan incorporates proposed parking standards in Appendix 2, setting out the absolute maximum level of parking. This is applied on a zonal basis and a discount could be applied to the parking standards to account for the characteristics of an area.

2.4.10 For the 'Broad Locations', Policy TRA4 expects that developments would 'prioritise sustainable and active modes of transport such as to require reduced parking provision, as part of a bespoke parking strategy' and as such, prescriptive standards are not set out for these areas.

2.4.11 As the residential element is in outline at this stage and as the parking strategy for the site is developed (as well as the SACDC New Local Plan), the parking proposals will be reviewed in relation to the most recent standards for the New Local Plan.

2.4.12 It is intended that reduced standards will be applied to non-residential land uses within the site as part of the bespoke parking strategy. Opportunities for land uses to share parking provision, particularly where they have different periods of peak demand, will be explored.

2.4.13 Policy TRA4 of the Local Plan includes some additional standards for other modes that would / may require parking on-site. This is inclusive of the following:

- Accessible parking – Accessible parking meeting the needs of people with disabilities and reduced mobility.
- Car Clubs – Suitable on-site car club facilities are required for sites with 100 or more dwellings or 10,000m^2 of non-residential floorspace. Financial contributions will also be sought for car clubs and bike share facilities and schemes.
- EVs - EV charging points or infrastructure for future provision within a development must meet Building Regulations standards.
- Motorcycles - Must be addressed in larger developments.

2.4.14 Whilst a more bespoke approach to calculating a suitable parking provision is set out for the 'Broad Locations' for development in the Local Plan, standards set out in Table 2-2 are referenced below and could be used as a starting point.

Table 2-2: SACDC New Local Plan 2041 – Car and Cycle Parking Standards

Use	Description	Car Parking Standards (Maximum)	Cycle Parking Standards (Minimum)
		Residential Standards	
Residential (C3)	General Housing (inc. retirement and sheltered elderly persons accommodation, and similar non-C2 uses)	1-bed dwellings (inc. studios): 1.5 spaces (either 1.5 unallocated, or 1 allocated and 0.5 unallocated)	1 l/t space per unit if no garage or shed provided. 1 s/t space per 3 units plus 1 l/t space per 5 units
		2-bed dwellings: either 2 spaces (either 2 unallocated or 1 allocated and 1 unallocated or 2.5 spaces (2 allocated and 0.5 unallocated)	
		3+ bed dwellings, 2.5 spaces (2 allocated 0.5 unallocated)	
		Non-Residential Standards	
Retail Food stores within Use Class E (a) or F.2 (a)	a) Shops up to 500m² GFA	1 space per 30m² GFA	1 s/t space per 150m² GFA plus 1 l/t space per 10 staff on-site at any one time
Non-food retail within Use Class E (a)	Non-food retail, including retail warehouses and garden centres		1 s/t space per 350m² GFA plus 1 l/t space per 10 staff on-site at any one time
Restaurants and cafés within Use Class E (b)	a) Restaurants/cafés	1 space per 5m² of dining floorspace	1 s/t space per 350m² GFA plus 1 1/t space per 10 staff on-site at any one time
Residential institutions Within Use Class C2 or C2a	a) Residential home/hostel with care staff working on-premises (includes elderly person homes and nursing homes)	Residents: 1 space per 5 bed spaces Staff living on premises: As C3 (a) Staff living elsewhere: 1 space per 2 staff	1 s/t space per 20 beds plus 1 l/t space per 10 staff on duty at any one time
Non-residential institutions Within Use Class E, Use Class F.1 or Use Class C2	a) Public halls/places of assembly	1 space per 9m² GFA or 1 space per 3 fixed seats plus 3 spaces per 4 staff members	1 s/t space per 200 m² GFA plus 1 l/t space per 10 staff on duty at any one time
	b) Community/family centres	1 space per 9m² GFA plus 1 space per full-time staff member or equivalent	
	c) Day centres	1 space per 2 staff members plus 1 space per 3 persons attending or 1 space per 9m² GFA	
	h) Educational establishments (inc. residential)	(i) 1 space per 2 staff plus 1 space per 15 students (i.e., total number of students attending an educational establishment, rather than full-time equivalent figures)	1 l/t space per 10 f/t staff plus: - primary school: 1 l/t space per 15 students - secondary school: 1 l/t space per 5 students

Use	Description	Car Parking Standards (Maximum)	Cycle Parking Standards (Minimum)
	(i) schools and higher and further education (ii) nursery schools/playgroups Note: overspill parking for community purposes (outside school day) should be catered for by use of dual-purpose surfaces such as school play areas	(ii) 1 space per 4 pupils	- higher and further education: 1 l/t space per 5 students - nursery schools/playgroups: no additional
Public transport facilities	b) Bus stations	To be decided in each case on individual merits	2 l/t spaces per 100 peak period passengers
Car parking for disabled motorists (minimum)	a) Employment generating development (i) up to 200 space car park (ii) more than 200 space car park	Individual spaces for each disabled employee plus 2 spaces or 5% of total capacity, whichever is greater than 6 spaces plus 2% of total capacity	N/A Cycle parking for disabled people not specifically mentioned but cycle parking for non-standard cycles should be considered throughout. Although standards to refer to LTN 1/20 which does consider non-standard cyclists.
	b) Shops/premises to which the public have access/recreation (i) up to 200 space car park (ii) more than 200 space car park	3 spaces or 6% of total capacity, whichever is greater than 4 spaces plus 4% of total capacity	
	c) Residential (i) General (ii) Elderly person dwellings b) Up to 10 spaces c) More than 10 spaces	1 space for every dwelling built to mobility standards 3 spaces 1 space per 4 spaces Consideration for provision of space and charging points for mobility scooters	

l/t = long term (covered and secure, for staff and residents or at transport hub), s/t = short term (visitors)

Local Plan Regulation 19 Submission – Transport Impact Assessment

2.4.15 A 'Transport Impact Assessment' has been prepared as part of the evidence base for the Local Plan.

2.4.16 It considers the impact of the identified sites in transport terms along with mitigation required. It focusses on the core principles of the NPPF:

- The ability to provide safe and suitable access for all users.
- The opportunities for the uptake of sustainable travel modes.
- Whether any impacts in terms of capacity or highway safety can be cost effectively mitigated.

2.4.17 The evidence base on highway impacts is underpinned by a run of the strategic traffic model (COMET) in the Local Plan Year of 2041 for various scenarios, including a modal shift scenario and includes all LP sites.

2.4.18 The TIA is supported by a set of active travel improvements aligning with LCWIP which are deemed to be necessary. The report specifies that the expectation is these key schemes would be delivered by developers.

2.4.19 The transport requirements and strategy set out within the TIA align with that proposed through this Transport Assessment for the Woollam Park development. The TIA deems that the overall impacts are deemed to be acceptable with no "showstoppers". This uses a strategic model which has provided an indication of local network operation but should be supplemented by detailed modelling of the immediate network surrounding developments, as undertaken as part of this Transport Assessment.

2.5 Summary

2.5.1 The development proposals, and this report, have been prepared with specific regard to the policy direction on a national, regional, local, and site-specific level.

2.5.2 On a national level, this document seeks to demonstrate that the proposals comply with the NPPF by exploring opportunities for use of sustainable travel modes, to minimise the requirement for travel by private car.

2.5.3 On a regional level, this document seeks to demonstrate that the proposals comply with the Hertfordshire Local Transport Plan strategic policies and South Central Hertfordshire Growth and Transport Plan.

2.5.4 On a local level, this document seeks to demonstrate the development's position within emerging SACDC New Local Plan 2041.

3 Baseline Conditions

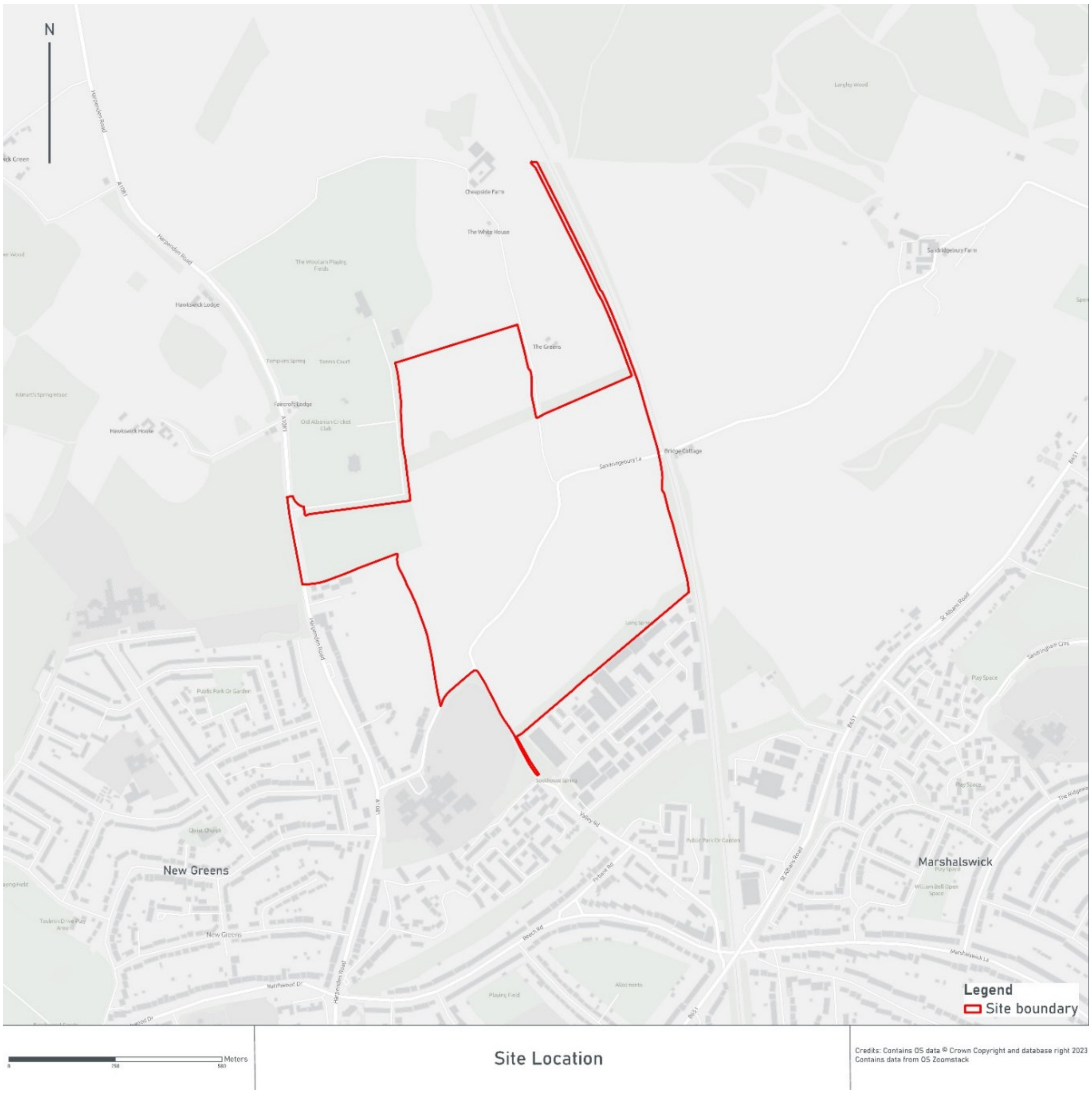
3.1 Site Location

3.1.1 The site is located approximately 2.7km north of St Albans City Centre and 4.7km south of Harpenden. Most of the site is arable land currently in agricultural use, save for three sports pitches. These pitches are the subject of a long-term lease from St. Albans School to the Old Albanians Sports Association which form part of the wider Woollam Playing Fields site.

3.1.2 The Site is bounded to the south by the existing settlement of St Albans, St Albans Girls' School, and Valley Road Industrial Estate, (also known as Porter's Wood). The southern boundary is formed by Longspring Wood which is an ancient woodland and Local Wildlife Site. A public right of way runs through this woodland and a permissive path has been formed along its northern edge. To the north and east there is countryside; to the north west are the Woollam Playing Fields and to the west are residential dwellings fronting Harpenden Road.

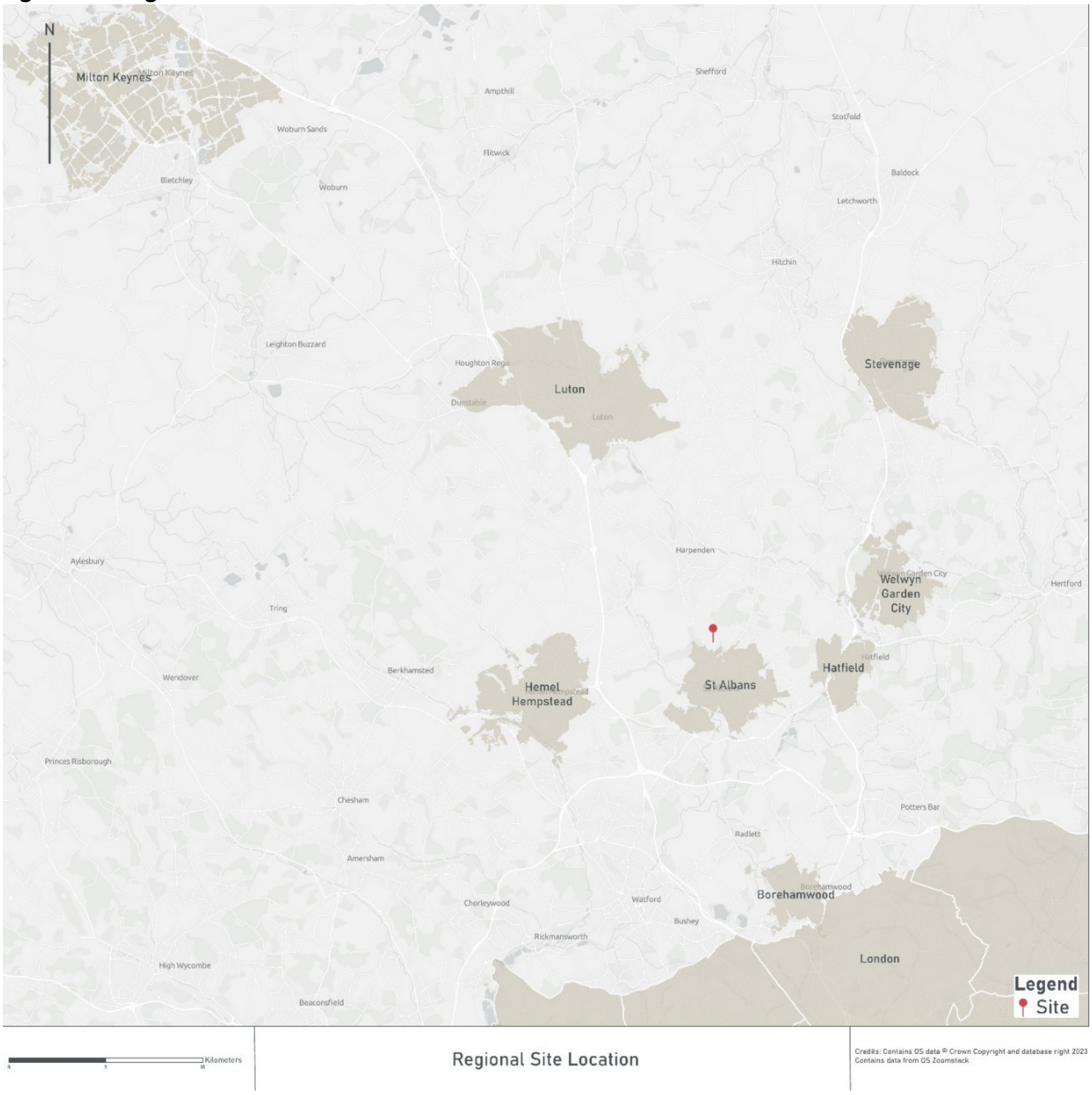
3.1.3 Sandridgebury Lane passes through the site between the east edge of the site and its south-west corner. The location of the site is shown in Figure 3-1 below.

Figure 3-1: Site Location



3.1.4 Figure 3-2 shows the location of the site in relation to other major surrounding urban settlements in the region. To the south of the site is Watford, Borehamwood and Greater London, north is Luton, Stevenage and Milton Keynes. While Hatfield and Welwyn Garden City are located east of the site and Hemel Hempstead is located to the west.

Figure 3-2: Regional Site Context



3.2 Access by Walking

3.2.1 Generally, to the south and west, and within the established urban area of St Albans, there is continuous footway provision along most roads but within the site and in the more rural areas to the north and east, footway provision is more intermittent or absent, albeit augmented by a network of footpaths and bridleways.

3.2.2 Shared use facilities (for pedestrians and cyclists) and/or footways with street lighting feature continuously along the extent of the A1081 Harpenden Road between the Ancient Briton junction and the Hawkswick Bus Stops located just north of the Old Albanians RFC Access. The shared use path on the western side and footway on the eastern side varies in character between being directly adjacent to the carriageway, measuring approx. 2.5m in width near the Ancient Briton Junction and further north, decreasing to between 1.2m-1.9m and becoming segregated from the carriageway by grass verges. To the south of the petrol filling station, this shared use path terminates and the NCN route continues within the New Greens area. To the south of this on the A1081, the facility continues as a footway. Good pedestrian provision along the A1081 Harpenden Road, and Valley Road as a quieter route, will enable future site residents pedestrian access towards St Albans City Centre within an approximate 40-minute walk from the centre of the site.

3.2.3 Informal pedestrian crossings are provided at intervals along this part of the A1081 with dropped kerbs, colour-contrasted tactile paving and pedestrian refuge islands situated within the hatched central reserve of the carriageway. A signalised pedestrian crossing is also provided just south of the A1081 Harpenden Road / Sandridgebury Lane priority junction and St Albans Girls School with pedestrian guard railing on each approach to the crossing.

3.2.4 Further north from the bus stops, the footway provision is decreased to just the western side of the carriageway until the A1081 Harpenden Road reaches Harpenden.

3.2.5 Sandridgebury Lane, within the site extents is a single-track country lane with no pedestrian facilities. As Sandridgebury Lane continues west, lit footway provision is introduced along the north-western side of the carriageway providing access to the residential frontages.

3.2.6 Adjacent to the entrance to the St Albans Girls School (STAGS) Sandridgebury Lane features pedestrian footways on both sides of the carriageway as the route continues west to the A1081 Harpenden Road. It is noted that there are no pedestrian crossings feature between the northern and southern sides of the carriageway until the junction with the A1081 where dropped kerbs but no tactile paving are provided to cater for the north-south desire line across the junction bellmouth.

3.2.7 Valley Road adjacent to the sites southern boundary is a single-track country lane with no pedestrian provision. South of the site, Valley Road features a grade separated footway on the western side, providing access between Darwin Close and rear pedestrian entrance to St Albans Girls School. To the east of Valley Road, a PRoW passes through Longspring Wood. As Valley Road meets Darwin Close, a dropped kerb crossing is provided between the Valley Road footway and footways on the southern side of Darwin Close, with street lighting provided along the route. Further south on Valley Road, footway provision alternates between provision on both sides of the carriageway and just one side. While dropped kerbs are provided at several locations along the route, there is no tactile paving.

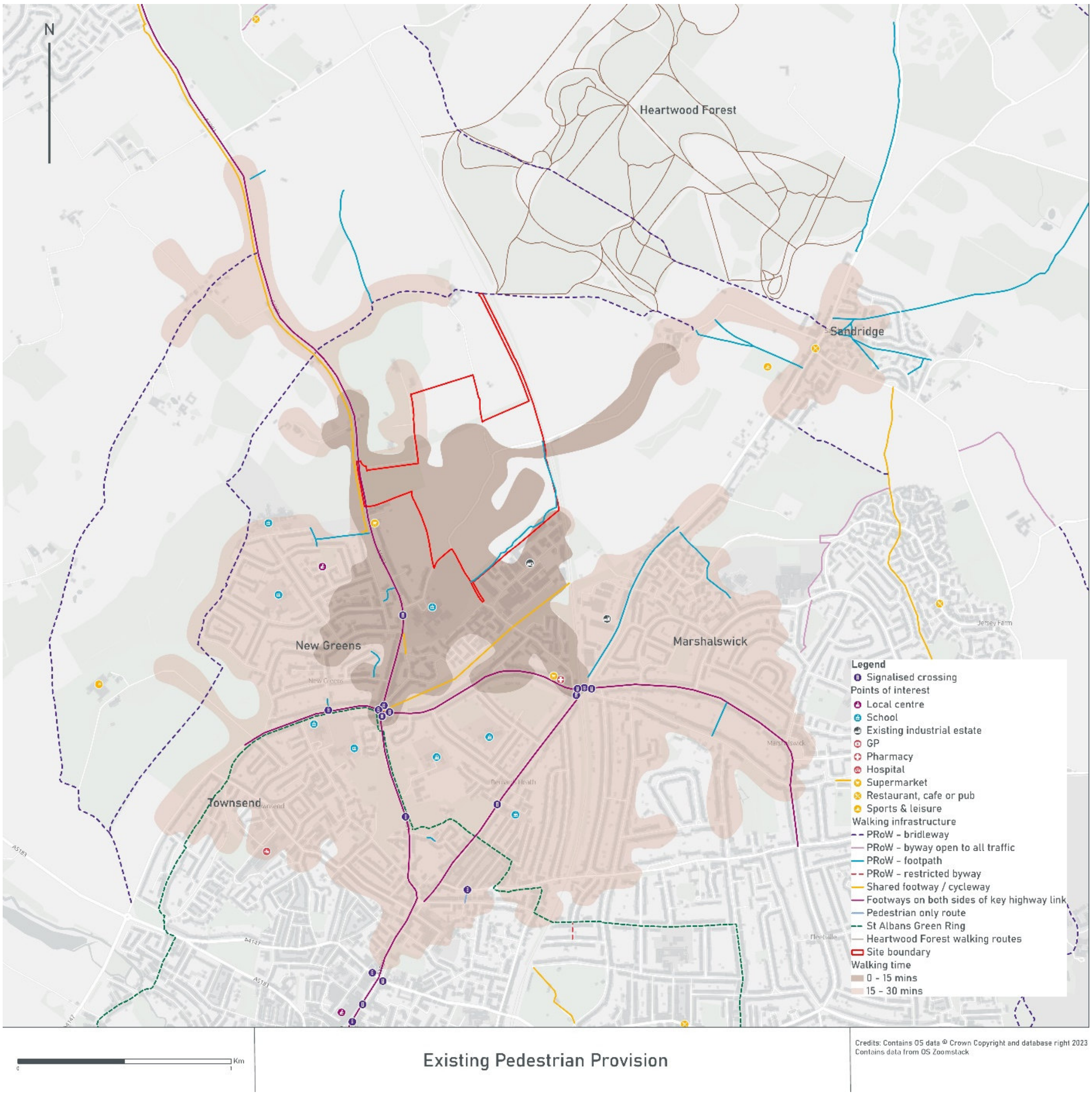
3.2.8 The King William IV junction has signalised pedestrian crossings provided north-south across Beech Road and Marshalswick Lane, and east-west across both sides of the B651. An additional zebra crossing is provided at the north-eastern side of the junction across the left turn slip lane from B651 St Albans Road.

3.2.9 Various Public Rights of Way (PROW) surround the site. As noted previously a PROW Footpath is provided along the south-eastern boundary of the site connecting Sandridgebury Lane and Valley Road via Long Spring Wood and then running parallel to the Midland Main Line Railway. A permissive footpath is also provided along the northern edge of the Longspring Wood.

3.2.10 Two PROW Footpaths also provide connections on the western side of A1081 Harpenden Road to access the New Greens area. The development site is also surrounded to the north and further west by a longer distance bridleway route, part of the Hertfordshire Way, between the village of Sandridge and Batchwood Drive via the Batchwood Golf Course.

3.2.11 Figure 3-3 shows an isochrone with walking times of up to 30-minutes from the centre of the site, with the use of existing infrastructure available to pedestrians as well as existing pedestrian facilities.

Figure 3-3: Pedestrian Provision



3.3 Access by Cycling

3.3.1 There are some existing cycle facilities surrounding the site with a traffic-free portion of National Cycle Route (NCR6) located immediately opposite the site boundary on the western side of the A1081 Harpenden Road, shown in Figure 3-4. NCR6 is a long-distance route spanning the length of England and locally connects St Albans to Harpenden and Luton to the north and Watford and the western extents of Greater London to the south.

Figure 3-4: NCR6 Adjacent to A1081 Harpenden Road

3.3.2 At the western boundary of the site, along A1081 Harpenden Road, the NCR6 is provided as a shared use path for cyclists and pedestrians on the western side of the carriageway. Just south of the St Albans Service Station, NCR6 diverts from A1081 Harpenden Road into the New Greens area via a quieter on-carriageway route. Directional fingerpost signage is provided at turning points along the route to inform cyclists of the NCR direction, as well as shared use path repeater signs along the route.

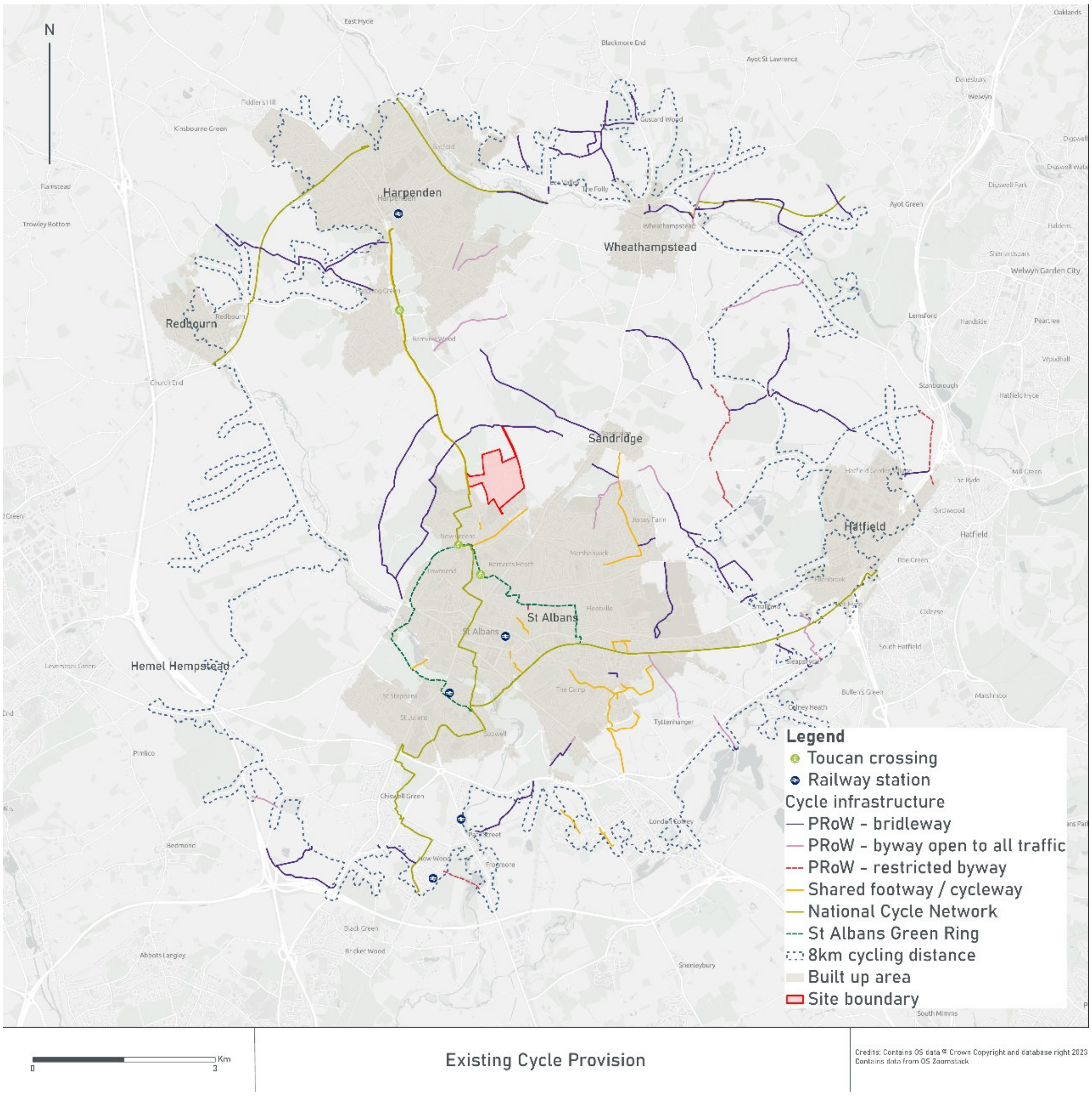
3.3.3 The PROW bridleways in the areas to the north (Hertfordshire Way) and west of the site provide opportunities for leisure routes, including connections to the Heartwood Forest.

3.3.4 The St Albans cycling map published by HCC sets out routes that have been suggested by local cyclists, mostly as quieter roads. This includes Sandridgebury Lane routing through the site boundary, Valley Road, Old Harpenden Road, Ellis Fields and routes through the New Greens area. Although, these suggested routes divert cycle traffic away from the northern approach to the Ancient Briton crossroad junction, instead suggesting Old Harpenden Road as a quieter route.

3.3.5 The circular St Albans Green Ring is accessible in the vicinity of the site, adjacent to the A1081 Harpenden Road south of the Ancient Briton junction. The Green Ring is a continuous walking and cycling route covering 10km around St Albans, providing cycle access to open spaces, heritage sites, schools, workplaces, leisure facilities and both of St Albans Railway Stations. The Green Ring encompasses traffic-free and mixed-traffic cycling provision.

3.3.6 Figure 3-5 shows an isochrone for up to 8km from the centre of the site, using existing infrastructure. This shows that St Albans City Centre is accessible within a suitable cycling distance of the site including both railway stations, as well as wider areas of St Albans, Harpenden and Sandridge. Given this, it is considered that there are genuine opportunities to enable future site users to undertake local trips by cycling.

Figure 3-5: St Albans Cycle Infrastructure



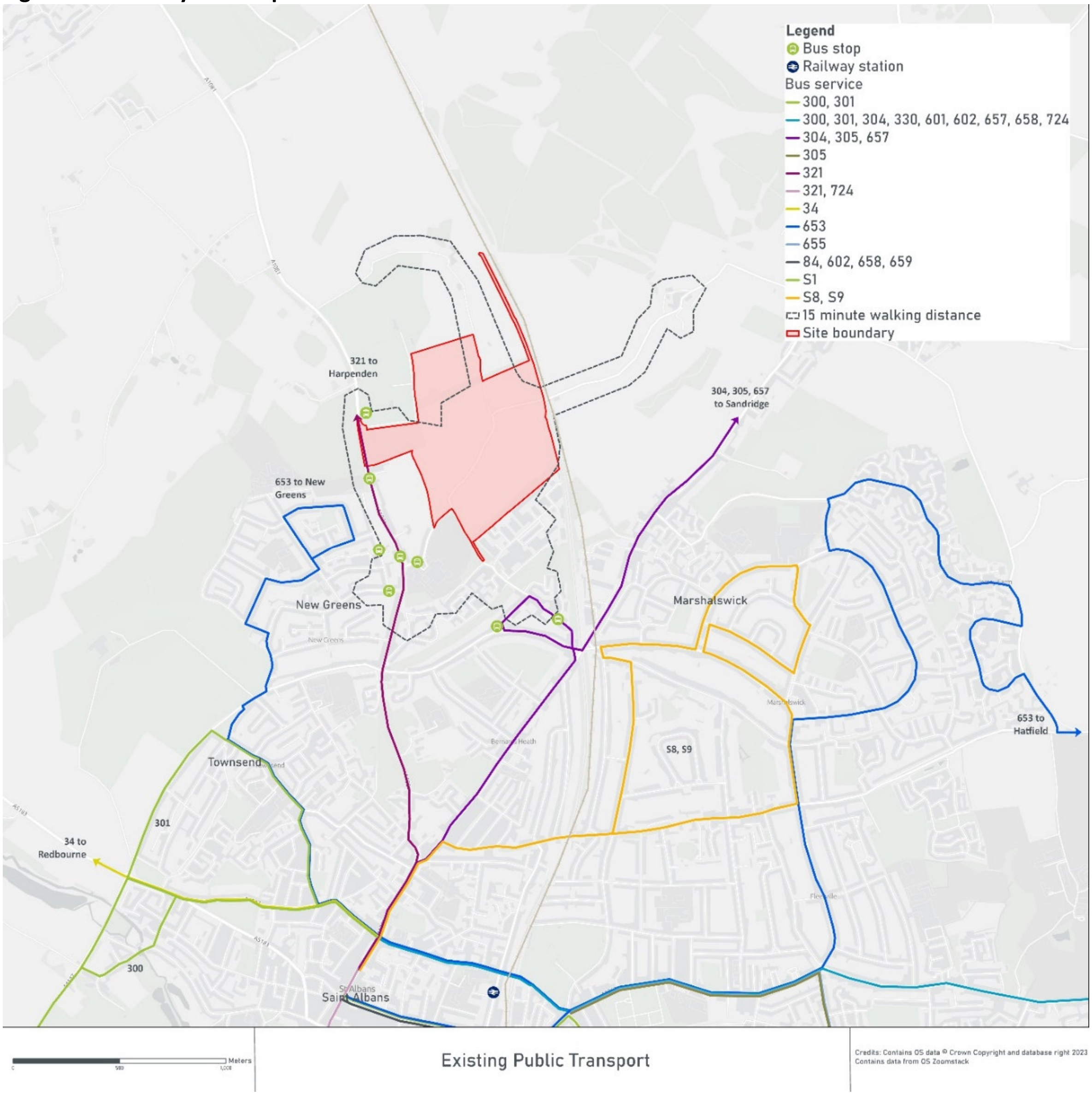
3.4 Access by Public Transport

Bus

3.4.1 There is a good network of existing bus services which operate adjacent to the site. Figure 3-6 shows the bus stops closest to the site and the services that use these stops, including the 321/721 between Luton and Watford/Rickmansworth and the 653 between St Albans and Welwyn Garden City and Hatfield. The 721 service augments the 321 service to raise the frequency of services along this route to 4 per hour and was recently introduced using Bus Service Improvement Plan funding.

3.4.2 Local stops are available along the A1081 Harpenden Road at the western boundary of the site and in the New Greens area to the west of the A1081, further stops are available at the southern boundary of the site along Valley Road and surrounding the King William IV Junction. The bus stops nearest to the site access on A1081 Harpenden Road are identified with a flag and pole with printed timetable information raised kerb, further south on the Harpenden Road bus stops are provided with shelters, seating and live timetable information. In the New Greens area, a combination of bus stop infrastructure is provided with some just accommodating a flag and pole, while some have shelters with seating and live timetable information.

Figure 3-6: Nearby Bus Stops and Services



3.4.3 Table 3-1 outlines the services available at the stops highlighted in Figure 3-6, all are located within a 20-minute walk of the site boundary.

Table 3-1: Bus Services

Service	Route	Mon-Fri Frequency	Sat Frequency	Sun Frequency
84	Potters Bar – St Albans	2 per day (School Departures)	No Service	No Service
	St Albans – Potters Bar	2 per day (School Departures)	No Service	No Service
305	Potters Bar – St Albans – New Greens – Sandridge	1 per day (School Arrivals)	No Service	No Service
	Sandridge – New Greens – St Albans – Potters Bar	1 per day (School Departures)	No Service	No Service
321 Sapphire	Luton – Harpenden – St Albans – Chiswell Green – Watford – Rickmansworth – Maple Cross	20 mins	20 mins	Hourly
	Maple Cross – Rickmansworth – Watford – Chiswell Green – St Albans – Harpenden – Luton	20 mins	20 mins	Hourly
357	Harpenden – Sandridge – St Albans – London Colney – Shenley – Borehamwood	1 per day (School)	No Service	No Service
	Borehamwood – Shenley – London Colney – St Albans – Sandridge – Harpenden	1 per day (School)	No Service	No Service
361	Gorston – Bricket Wood – St Albans – New Greens Estate	1 per day (School Arrivals)	No Service	No Service
	New Greens Estate – St Albans –Bricket Wood – Gorston	1 per day (School Departures)	No Service	No Service
653 Tigermoth	Welwyn Garden City – Hatfield – Smallford – St Albans – New Greens Estate	30 mins	30 mins	Hourly
	New Greens Estate – St Albans – Smallford – Hatfield – Welwyn Garden City	30 mins	30 mins	Hourly
721	Hemel Hempstead – Luton Town Centre	30 mins	No Service	No Service
	Luton Town Centre – Hemel Hempstead	45 mins	No Service	No Service

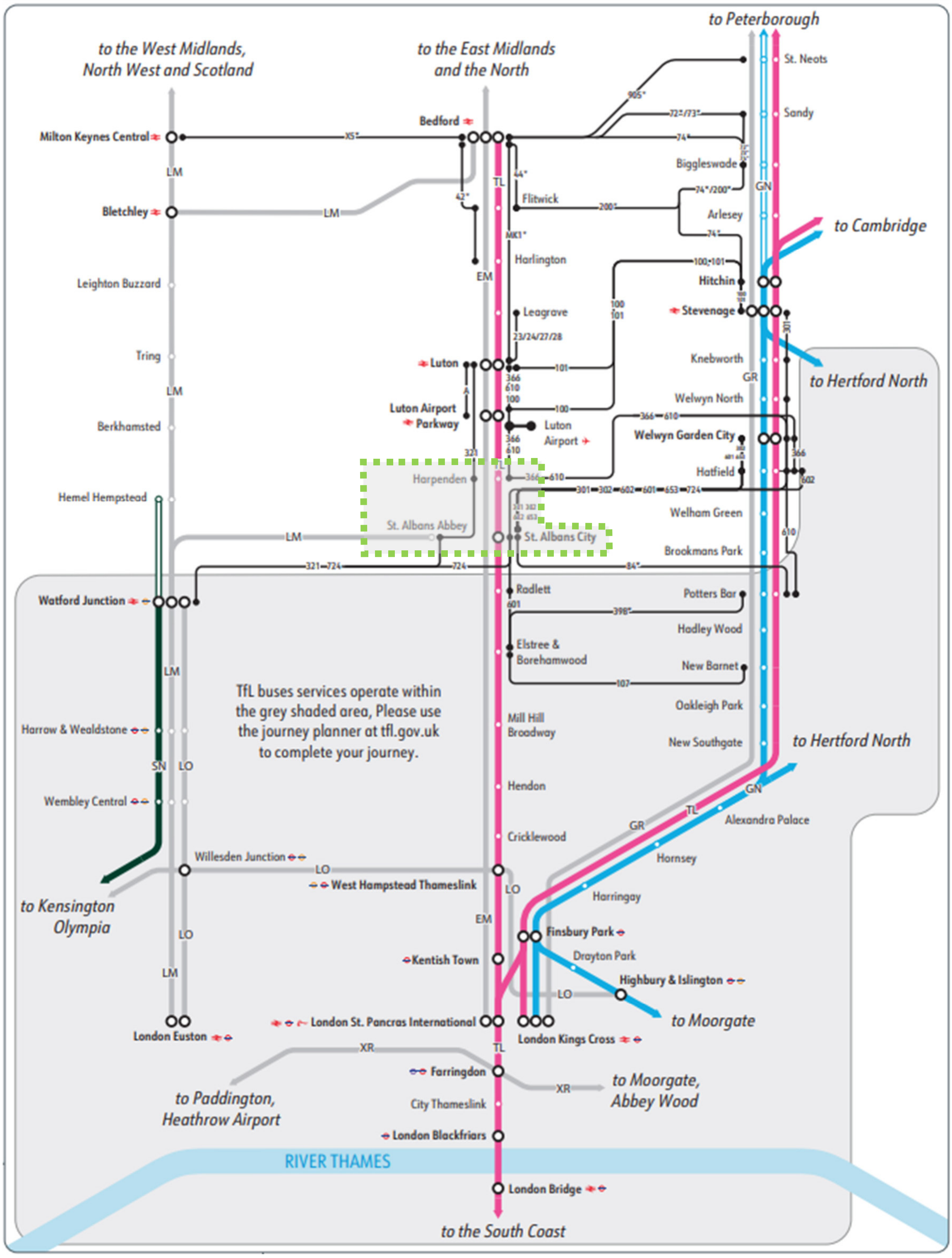
3.4.4 The 321 Sapphire/721 and 653 Tigermoth services are the most frequent and local services offering 15-to-30-minute frequencies, Monday to Saturday and an hourly frequency on Sundays. However, most of the remaining services operating in the vicinity of the site are infrequent, only providing to one or two services per day in each direction for primarily local school access.

Rail

3.4.5 There are three railway stations accessible near the site, shown in Figure 3-7. Two in St Albans (St Albans City and St Albans Abbey) and one north of the site in Harpenden. All stations are part of the 'PlusBus' scheme, where rail users can pay a reduced fare to use the local buses if they have a rail ticket.

3.4.6 St Albans City and Harpenden are both on the same line (Midland Main Line), whereas St Albans Abbey is only on the Abbey Line. The journey between St Albans City and St Albans Abbey is approximately a 22-minute walk and a 10-minute cycle.

Figure 3-7: Railway Network



St Albans City

3.4.7 St Albans City is the closest railway station to Woollam Park and is approximately 3.2km from the centre of the site. The station is accessible in an approximately 40-minute walk, a 12-minute cycle from the edge of the site, or via the 653 Tigermoth.

3.4.8 The station has four platforms and is on the Midlands Main Line and provides a ticket office, 1,150 secure sheltered cycle parking spaces, a taxi rank, bus interchange and multi-storey and surface car parks. Services from St Albans City are mostly operated and managed by Thameslink Railway.

3.4.9 Table 3-2 outlines the timings and frequency of services to key locations from St Albans City and Harpenden Station, discussed below.

Table 3-2: Key Rail Destinations from St Albans City and Harpenden

Key Destination	Average Journey Time		Frequency of trains (tph)
	From St Albans City	From Harpenden	
Luton Airport	11 minutes	5 minutes	6
Luton	15 minutes	9 minutes	6
London St Pancras	21 minutes	36 minutes	10
London Bridge	37 minutes	41 minutes	6
Bedford	40 minutes	34 minutes	4
Gatwick Airport	1hr 8 minutes	1hr 12 minutes	4

3.4.10 St Albans City Station offers a high frequency of rail services to regional destinations in the South East, including Luton, Bedford, Gatwick Airport and several locations within Greater London including St Pancras International, London Bridge and City Thameslink.

Harpenden

3.4.11 Harpenden Station is located 5.4km from the centre of the site, accessible in approximately a 20-minute cycle or via the 321 Sapphire. The station has a ticket office, taxi office and rank, 548 sheltered cycle storage spaces and two surface car parks.

3.4.12 The station has four platforms and is on the Midlands Main Line. The three services that serve Harpenden also serve St Albans City, Table 3-2 outlines frequency of services to key locations and average journey times from Harpenden.

St Albans Abbey

3.4.13 St Albans Abbey is located approximately 3.7km from the centre of the site. The station is accessible in an approximately 45-minute walk, a 15-minute cycle or via the 321 Sapphire.

3.4.14 The station is the smaller of the two in St Albans and has just one platform serving one railway line. The station is unstaffed and consists of a single open-air platform with a ticket machine, 10 covered cycle parking spaces and a surface car park.

3.4.15 The only service at the station is the Abbey Line operated by West Midlands Trains, offering an hourly service between St Albans Abbey and Watford Junction with a 16-minute journey time.

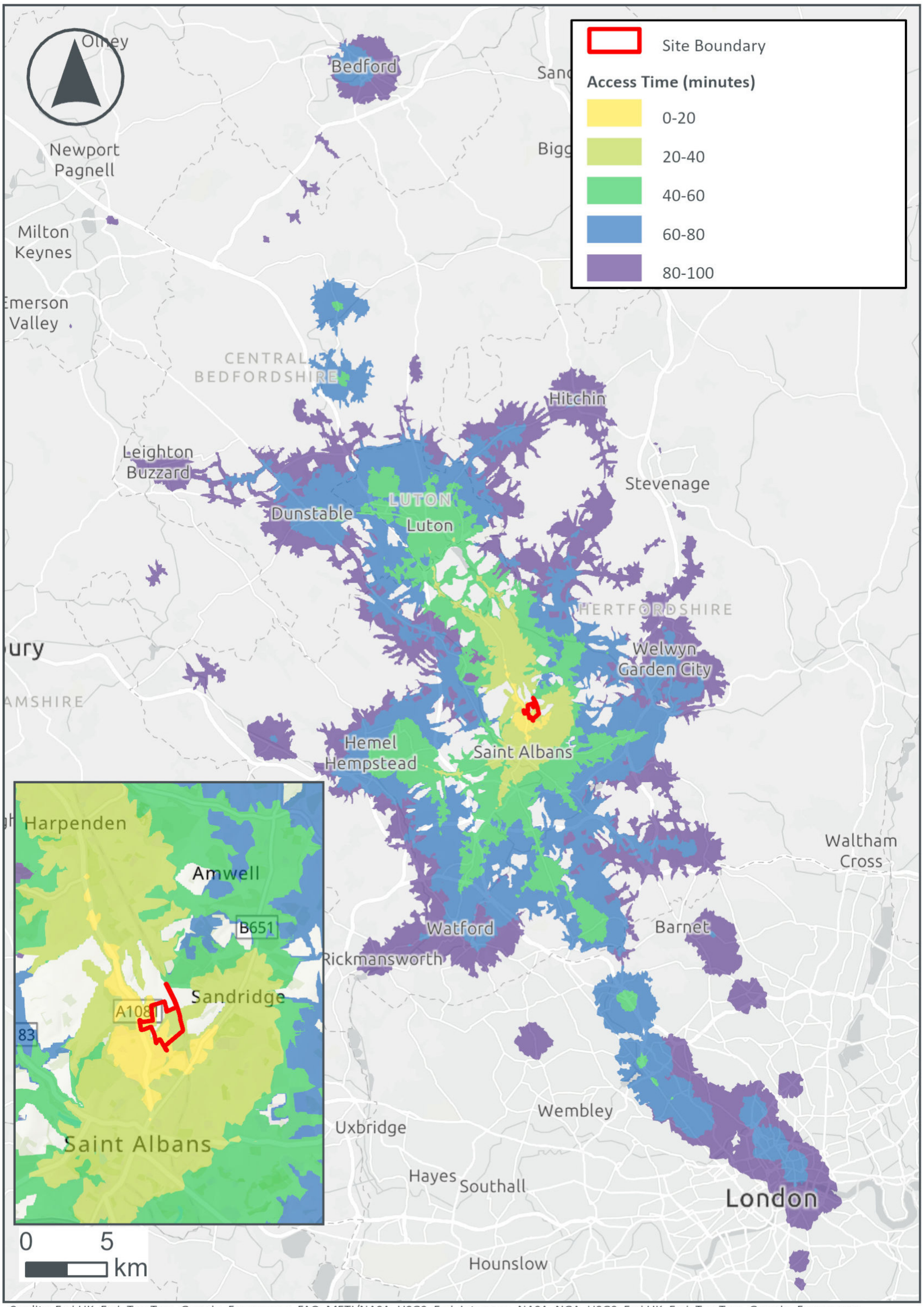
Public Transport Accessibility

3.4.16 An assessment of the accessibility of the site by public transport has been undertaken for the site using Podaris, an online multimodal travel time analysis tool. This analysis assesses travel times from the site based on timetable information on a typical Wednesday, departing at 08:00[1]. This analysis identifies the locations accessible by public transport within 100 minutes of the site.

3.4.17 Figure 3-8 shows that most areas in St Albans are accessible within 20-40 minutes. Residential areas to the north of St Albans are accessible within 20 minutes, and St Albans City Centre is accessible within 20-40 minutes. Surrounding towns of Hatfield, Luton and Hemel Hempstead are accessible in 40-60 minutes. Areas in North London such as Cricklewood and Hampstead are accessible in 60-80 minutes and Central London is accessible within 80-100 minutes.

[1] The assessment calculates accessibility by public transport based on timetabled wait times, with a departure time of 08:00 and a maximum walking distance of 2km. The assessment is based on timetables as of Q2 2024.

Figure 3-8: Public Transport Accessibility



Credits: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, Intermap, NASA, NGA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Datacutter © Copyright Basemap 2024, Open Government Licence, Open Street Map available under the Open Database

3.4.18

Summary

3.4.19 The bus and rail services available from local bus stops and nearby railway stations provide opportunities for future site residents to travel by public transport for journeys to education, employment and leisure, including travel into London within 30 minutes by rail, reducing reliance on private car travel.

3.5 Local Amenities

3.5.1 Table 3-3 outlines the travel times by walking and cycling, based on the Institution of Highways and Transportation (IHT) recommendation of 4.8 km/hr for walking and 16 km/hr for cycling, to key facilities that are accessible to the site, measured from the centre of the site.

Table 3-3: Access to Local Amenities

	Distance (metres)	Approximate walking time (minutes)	Approximate cycling time (minutes)
Education Establishments			
St Albans Girls School	600m	8	2
Margaret Wix Primary School	1.4km	18	5
Batchwood School	1.6km	20	6
Townsend Church of England School	1.6km	20	6
Garden Fields JMI Primary School	1.8km	23	7
Bernards Heath Junior School	1.9km	24	7
Wheatfields Junior School	2.2km	28	8
Sandringham School	2.5km	31	9
Medical Facilities			
High Oaks Dental Practice	1.2km	15	5
Parkbury House Surgery	2.2km	28	8
St Albans City Hospital	2.2km	28	8
Convenience Stores, Leisure and Services			
St Albans Service Station (Texaco)	750m	9	3
Old Albanian RFC	800m	10	3
Porters Wood Industrial Estate	850m	11	3
Beech Road Local Centre (inc. Post Office)	1.2km	15	5
High Oaks Local Centre	1.2km	15	5
Ancient Briton Pub	1.2km	15	5
King William IV Pub	1.2km	15	5
St Albans City Centre	2.8km	35	11
Public Transport Interchanges			
St Albans Girls School Bus Stop	600m-700m	8-9	2-3
Hawkswick Bus Stops	730m	9	3
Valley Road Bus Stops	1.0km	13	4
St Albans City Rail Station	3.2km	40	12
St Albans Abbey Rail Station	3.7km	46	14
Harpenden Rail Station	5.4km	68	20

3.5.2 Guidance provided by the Institution of Highways and Transportation (IHT) in their publication 'Guidelines for Providing for Journeys on Foot' (2000) suggest that in terms of commuting, walking to school and recreational journeys; walk distances of up to 2,000 metres can be considered as a preferred maximum, with 'desirable' and 'acceptable' distances being 500 metres and 1,000 metres respectively. It should be noted that journeys of a longer length are often undertaken. For noncommuter journeys, the Guidance suggests that walk distances of up to 1,200 metres can be considered as a preferred maximum, with the 'desirable' and 'acceptable' distances being 400 metres and 800 metres respectively. Again, it should be noted that journeys of a longer length are often undertaken.

3.5.3 The Walkable Neighbourhood (a concept explained in Manual for Streets) is characterised by having a number of facilities within an 800m walking distance (10 minutes) which can be accessed comfortably on foot. There are however opportunities to reduce the need to travel by car for even greater distances of up to 2,000 metres. This can be achieved through the creation of linkages between new developments and existing facilities.

3.5.4 Table 3-3 demonstrates that a wide range of local facilities can be accessed from the development site by walking and cycling without the need for use of a private car. A variety of amenities and key day to day facilities can also be found locally at the High Oaks and Beech Road Local Centres. St Albans City Centre can also be accessed within an approximate 35-minute walk or 15-minute cycle, providing a variety of amenities and facilities.

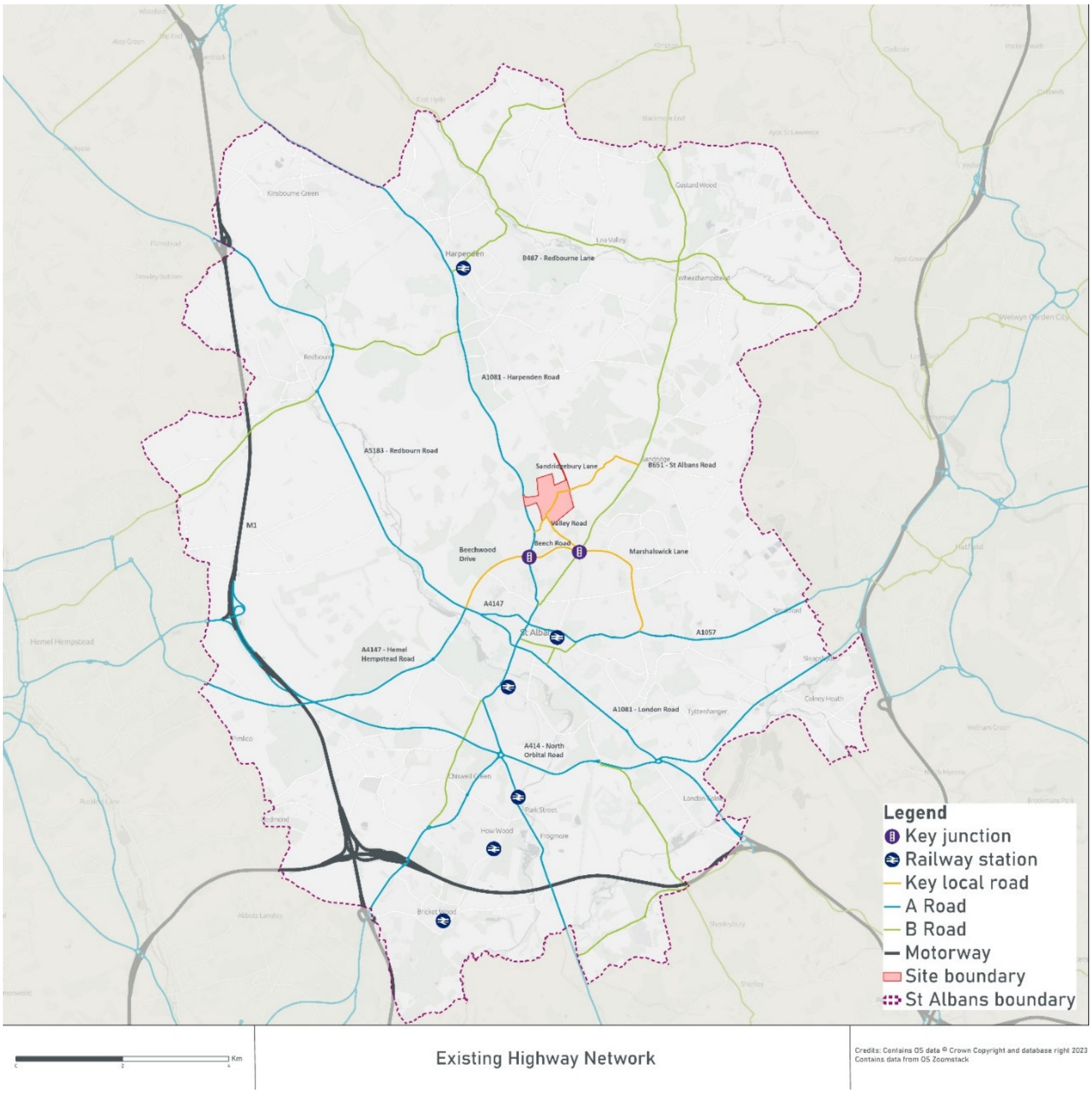
3.5.5 The site is therefore well located to maximise opportunities for trips to local facilities, key services, and transport interchanges (bus and rail) to be undertaken by walking, cycling and public transport.

3.6 Surrounding Highway Network

3.6.1 The local roads surrounding the site vary in character with an A-Road bounding the west of the site, while routes to the south and east are residential or rural in nature.

3.6.2 A number of different speed limits are in place in the local area. The area south of the site is largely subject to a 30mph as the carriageway leads into St Albans City Centre, with A1081 Harpenden Road increasing to 40mph as it leads north out of St Albans. Sandridgebury Lane is subject to the National Speed Limit (max. 60mph as it leads through the site area and the Old Albanians RFC access route is to the north of the site is subject to a private 15mph speed limit in the internal area.

Figure 3-9: Surrounding Highway Network



Local Roads – Within Site Boundary

Sandridgebury Lane and Unnamed Lane providing access to Cheapside Farm

3.6.3 Sandridgebury Lane is a two-way single-track lane with no footways present on either side, with the National Speed Limit in place (60mph). Within the site area, Sandridgebury Lane connects to an unnamed lane serving land and private dwellings, including Cheapside Farm, to the north. Sandridgebury Lane passes through the centre of the site and under the Midland Main Line Railway (Figure 3-10) and continues east past the Sandridgebury Livery Stables to meet the B651 High Street in Sandridge.

3.6.4 Within the site Sandridgebury Lane meets Valley Road at a priority junction with Sandridgebury lane (north) and Valley Road forming the major link. Valley Road is discussed further below.

Figure 3-10: Sandridgebury Lane – Eastern End

3.6.5 To the west of the site Sandridgebury Lanes character changes as it enters the edge of the urban area of St. Albans (Figure 3-11). Here, the speed limit reduces to 30mph, and features including a footway and streetlights are provided on the northern side of the lane where it also provides frontage access to a number of dwellings and St Albans Girls School (STAGS).

Figure 3-11: Character Change on Sandridgebury Lane

3.6.6 Outside STAGS yellow 'School Keep Clear' markings are present on the southern side of the carriageway either side of the school entrance points. On the northern side, single yellow line markings are present, restricting parking between 08:00-18:30, Monday to Friday.

3.6.7 Sandridgebury lane joins A1081 Harpenden Road via a simple priority junction. An informal pedestrian crossing with a dropped kerbs and a pedestrian refuge is also present across the minor arm of this junction.

3.6.8 A 'Keep Clear' area is provided adjacent to the junction to allow space for vehicles turning onto A1081 Harpenden Road.

Valley Road

3.6.9 Valley Road begins within the site boundary and continues south away from the site, ending at Beech Road via a ghost island priority junction, which is integrated within a larger signalised junction known as the King Willian IV junction.

3.6.10 At the northern extent of Valley Road, the carriageway is a narrow, single-track route with passing places and no footways on either side. Here the road is subject to the National Speed Limit (60mph), as shown in Figure 3-12. It is noted that informal signage has been installed asking vehicles to travel at 20mph due to the presence of local wildlife. The route also has a weight restriction in place for vehicles over 7.5 tonnes with no exceptions stated.

Figure 3-12: Valley Road – Southern End

3.6.11 Further south, a 30mph limit is introduced on Valley Road to the north of Darwin Close. At the junction between Valley Road and Darwin Close Valley Road (north) forms the minor arm with priority given to vehicles turning between Darwin Close and Valley Road (south). South of this junction Valley Road becomes more residential in nature, with a footway and streetlights provided. 50m south of Darwin Close, Valley Road meets Porters Wood at a simple priority junction. Porters Wood provides access to a commercial/industrial estate. At the junction Valley Road (north) again forms the minor arm with priority given to traffic turning between Porters Wood and Valley Road (south) reflecting the volumes of traffic and a higher proportion of heavy goods vehicles accessing the estate. From this point south the carriageway along Valley Road widens significantly to between 7.5m-9m in width. Valley Road also provides access to residential estates either side of the road, and via Firbank Road a further connection to Beech Road. Adjacent to the junction of Valley Road with Beech Road there is a small local centre and petrol filling station.

Local Roads – Outside of Site Boundary

3.6.12 Figure 3-9 also shows the wider highway network surrounding the site with a network of several A-roads and B-roads and the M1 west of St Albans, the M25 south and the A1(M) east of St Albans.

3.6.13 The A1081 Harpenden Road routes north-south along the western boundary of the site and this is where the primary vehicle access to the site will be taken from. The route continues north from the site to Harpenden and Luton, terminating at Luton Airport and south towards St Albans City Centre. The area of New Greens can also be accessed to the west of A1081 Harpenden Road via Green Lane, Francis Avenue and Batchwood Drive.

3.6.14 The A1081 Harpenden Road is a two-way carriageway with a hatched central reserve a measuring approximately 9m in width. North of the site the route is subject to a 40mph speed limit, reducing to 30mph just south of the proposed site access location along the A1081 Harpenden Road. South of the potential site access location, the A1081 Harpenden Road continues south for around 1.1km to the Ancient Briton junction formed by the intersection of Harpenden Road with Batchwood Drive and Beech Drive. Areas of congestion along the A1081 corridor were noted as part of peak hour site observations, potentially explaining the 'keep clear' areas marked at the Sandridgebury Lane junction, as noted previously, and also found at the simple priority junctions between the A1081 Harpenden Road and Green Lane, Francis Avenue and Old Harpenden Road south of Sandridgebury Lane.

3.6.15 The Old Harpenden Road runs parallel to Harpenden Road between Green Lane and the Ancient Briton junction. The Old Harpenden Road is a cul-de-sac for motor vehicles which is subject to a 30mph speed limit. Vehicle and active travel access is provided via a simple priority junction near to the Ancient Briton junction and at the northern extent of Old Harpenden Road the former alignment of the road has a modal filter to enable active travel access only, shown in Figure 3-13. Footways are intermittent along Old Harpenden Road.

Figure 3-13: Old Harpenden Road – Modal Filter

3.6.16 The Ancient Briton junction (Figure 3-14) is a four-arm signalised crossroad junction, with no turning restrictions. The Ancient Briton is named after the pub on the south east corner of the intersection. A1081 Harpenden Road and Beech Road each have two lane approaches, with one lane for left and straight-ahead movements and a separate lane for right turning movements. There are signalised pedestrian crossings with a central kerbed refuge on each arm with colour contrasted, tactile paving on the entry / exit to each crossing. The junction operates with an all-red pedestrian phase which is called subject to demand.

Figure 3-14: Ancient Briton Crossroad Junction

3.6.17 Beech Road routes east-west to the south of the site between the Ancient Briton and the King William IV signalised junctions. Beech Road is a two-way carriageway, subject to a 30mph speed limit, with a hatched central reserve. The hatching often makes way for ghost island right turning lanes to side roads north and south of Beech Road, and to provide space for pedestrian refuges at two crossing points. Footways are segregated from the carriageway by a wide grass verge on each side of the road, with breaks to allow vehicular access onto driveways. The soft verges are regularly used for parking vehicles. There is no formal cycling provision on Beech Road.

3.6.18 The King William IV junction (Figure 3-15) (again named after the pub to the south west of the junction is formed as staggered signalised, crossroad junction with priority controlled left turn slip roads on the northern and southern approaches to the junction. Advanced cycle stop lines (ASLs) feature on the B651 St Albans Road to the north, B651 Sandridge Road to the south and Beech Road signalised approaches to the junctions. ASLs are omitted on the Marshalswick Lane approach. Signal controlled pedestrian crossings are provided on all main arms of the junction supplemented by a zebra crossing on the B651 St Albans Road left turning slip lane. The left turn slip from Sandridge Road is subject to both signal control and priority control.

Figure 3-15: King William IV Signalised Junction

3.6.19 West of A1081 Harpenden Road, Green Lane and Francis Avenue provide access into and through the New Greens area. The streets are residential in nature with on-street parking along one or both sides for most of their length. Green Lane is also used by local bus services. These routes are understood to be used as a cut through for traffic travelling between A1081 Harpenden Road and Batchwood Drive avoiding the Ancient Briton junction.

3.7 Baseline Surveys

Manual Classified Counts

3.7.1 MCCs were undertaken on Tuesday 20th September 2022 for the period 07:00-19:00, at the following junctions:

- A1081 Harpenden Road/Sandridgebury Lane.
- A1081 Harpenden Road/Beech Road/Batchwood Drive (Ancient Briton).
- Beech Road/Firbank Road.
- Beech Road/ B651 Sandridge Road/Marshalswick Lane/B651 St Albans Road / Ronsons Way / Valley Road / Gurney Court Road (King William IV).

3.7.2 Table 3-4 provides a summary of the traffic recorded at each junction during the AM and PM peak periods. The typical highway network AM and PM peaks of 08:00-09:00 and 17:00-18:00 are shown below.

Table 3-4: AM and PM Two-Way Traffic for Assessed Junctions (Vehicle Flows)

<table>
<tr><th colspan="2">Junction</th><th>AM Peak (08:00-09:00)</th><th>PM Peak (17:00-18:00)</th></tr>
<tr><td colspan="2">A1081 Harpenden Road / Sandridgebury Lane</td><td>1261</td><td>1452</td></tr>
<tr><td colspan="2">A1081 Harpenden Road / Beech Road / Batchwood Drive (Ancient Briton)</td><td>1925</td><td>2118</td></tr>
<tr><td colspan="2">Beech Road / Firbank Road West</td><td>1118</td><td>1155</td></tr>
<tr><td colspan="2">Beech Road / Firbank Road East</td><td>948</td><td>1059</td></tr>
<tr><td rowspan="4">Beech Road / B651 Sandridge Road/ Marshalswick Lane/ B651 St Albans Road / Ronsons Way / Valley Road / Gurney Court Road (King William IV)</td><td>B651 St Albans Road / Ronsons Way</td><td>974</td><td>889</td></tr>
<tr><td>Beech Road / Valley Road</td><td>1288</td><td>1313</td></tr>
<tr><td>B651 Sandridge Road / B651 St Albans Road / Beech Road</td><td>2098</td><td>2171</td></tr>
<tr><td>Marshalswick Lane / Gurney Court Road</td><td>1410</td><td>1508</td></tr>
</table>

Automatic Traffic Counts

3.7.3 A series of ATCs have been undertaken at a variety of locations around the study area, including the following:

- 20/09/2022 - 26/09/2022 (summarised below in Table 3-5):
  - Harpenden Road
  - Sandridgebury Lane
  - Valley Road
- 08/10/2022 - 14/10/2022 (as donor site surveys for forecasting travel demand at the development and set out in later sections):
  - Toulmin Drive
  - High Oaks
  - New Greens Avenue
  - Villiers Cresent North
  - Villiers Cresent South

3.7.4 Table 3-5 provides a summary of the traffic volume and speeds recorded at each ATC site during the survey period.

Table 3-5: ATC Results

Location	Description	Direction of Traffic		Two-Way
		Southbound	**Northbound**	
Harpenden Road	24 Hour Day (5-day average)	7254	7799	15,053
	24 Hour Day (7-day average)	7083	7441	14,524
	Average Speed (mph)	37	37	-
	85th Percentile Speed (mph)	43	42	-
		Southbound	**Northbound**	
Sandridgebury Lane	24 Hour Day (5-day average)	413	397	809
	24 Hour Day (7-day average)	372	367	739
	Average Speed (mph)	20	22	-
	85th Percentile Speed (mph)	25	28	-
		Southbound	**Northbound**	
Valley Road	24 Hour Day (5-day average)	486	473	958
	24 Hour Day (7-day average)	432	409	841
	Average Speed (mph)	14	14	-
	85th Percentile Speed (mph)	19	19	-

3.7.5 Due to the significant changes in travel and working patterns which have emerged following the Covid-19 Pandemic it should be noted that traffic flows on the network fluctuate significantly across a typical week. On Harpenden Road hourly traffic flows varied above and below the 5-day average significantly with ranges of up to 45% either side of the weekday average.

Table 3-6: A1081 Harpenden Road – ATC Summary Results - Extended Peak Periods

Northbound	Mon	Tue	Wed	Thu	Fri	Average 5-day
07:00	461	523	476	492	471	485
08:00	514	501	563	529	510	523
09:00	448	479	451	489	445	462
16:00	600	623	697	694	726	668
17:00	576	683	737	654	693	669
18:00	810	588	603	623	588	642
Southbound	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Average 5-day**
07:00	584	580	611	621	594	598
08:00	253	306	411	363	388	344
09:00	470	502	494	470	461	479
16:00	464	464	486	495	476	477
17:00	518	589	622	586	510	565
18:00	503	468	538	504	513	505

Table 3-7: A1081 Harpenden Road – Extended Peak Periods – Variability compared to 5-day average

Northbound	Mon	Tue	Wed	Thu	Fri
07:00	-5%	8%	-2%	2%	-3%
08:00	-2%	-4%	8%	1%	-3%
09:00	-3%	4%	-2%	6%	-4%
16:00	-10%	-7%	4%	4%	9%
17:00	-14%	2%	10%	-2%	4%
18:00	26%	-8%	-6%	-3%	-8%
Southbound	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**
07:00	-2%	-3%	2%	4%	-1%
08:00	-26%	-11%	19%	5%	13%
09:00	-2%	5%	3%	-2%	-4%
16:00	-3%	-3%	2%	4%	0%
17:00	-8%	4%	10%	4%	-10%
18:00	0%	-7%	6%	0%	2%

Baseline Multi Modal Counts

3.7.6 Multi-modal surveys were undertaken on 11th October 2022, as follows:

- Pedestrian and Cycle Counts - 12 hour (07:00 to 19:00) to include bi-directional counts at the following locations:
  - Woollam Crescent.

- Toulmin Drive North.
- Toulmin Drive South.

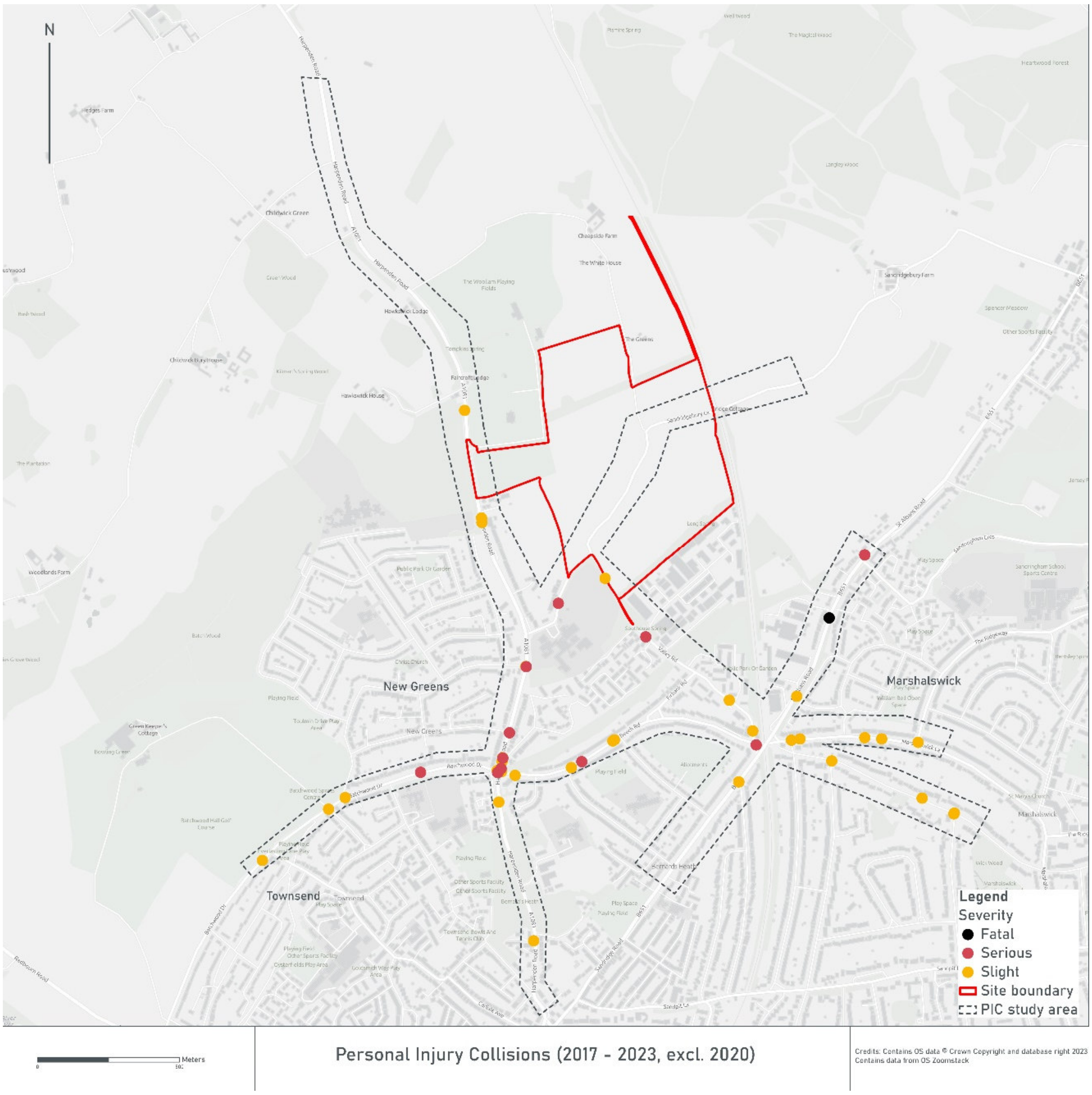
- Bus stop surveys – 12 hour (07:00 to 19:00) including counts of the number of buses at each stop and total number of passengers boarding and alighting each service at four bus stops within New Greens.

3.7.7 The results of these surveys were used for forecasting travel demand for the proposed development, as set out in later chapters and accompanying Technical Notes which have been used as part of scoping discussions with HCC.

3.8 Highway Safety Audit

3.8.1 Personal Injury Collision Data has been obtained from HCC for the latest six-year period (2017 – 2023), covering the study area shown in Figure 3-16. The study area has been agreed with HCC and NH at the scoping stages. The NH scoping response required the 2020 assessment year to be omitted from the analysis due the COVID-19 pandemic. These requirements have been met in the below assessment.

Figure 3-16: Personal Injury Collision Data



3.8.2 A summary of the collisions by road, severity and sensitive user involvement is contained in Table 3-8.

Table 3-8: Personal Injury Collision Overview

	Severity				Sensitive User Involvement			
	Slight	Serious	Fatal	Total	Pedestrian	Cyclist	M / C	Total
A1081 Harpenden Road / Batchwood Drive / Beech Road	2	3	0	5	1	0	2	3
A1081 Harpenden Road (north of Batchwood Drive junction)	4	2	0	6	1	2	2	5
A1081 Harpenden Road (south of Batchwood Drive junction)	2	0	0	2	0	1	0	1
Batchwood Drive	1	2	0	3	0	1	1	2
Beech Road	3	1	0	4	1	0	1	2
Valley Road	2	1	0	3	1	0	1	2
B651 St Albans Road	2	1	1	4	0	2	0	2
Marshalswick Lane	3	0	0	3	0	1	1	2
Sandridgebury Lane	0	1	0	1	0	1	0	1
Marshals Drive	4	0	0	4	0		1	1
Marshalswick Lane / Marshals Drive / B651	3	1	0	4	0	2	1	3
Total	**26**	**12**	**1**	**39**	**4**	**10**	**10**	**24**

3.8.3 Consideration has been given to the number of recorded collisions per year; 2020 has been excluded from the analysis due to the Covid-19 pandemic. From the data analysis, 2019 saw more collisions that any other year with 12 collisions. There were less collisions recorded in recent years than previously, with less than half the number of collisions recorded in any year prior to 2021. There does not appear to have been any changes to the study area highway network which might explain the reduced collision rates, such as changes in speed limits.

A1081 Harpenden Road

A1081 / Batchwood Drive / Beech Road (Ancient Briton)

3.8.4 Five incidents occurred either on or approaching this junction in the five-year study period. Three were recorded as serious in severity, and two as slight. One was recorded in 2019, three in 2021, and one in 2022.

3.8.5 One serious collision involved a pedestrian. A car was travelling southbound on A1081 Harpenden Road and collided with a child crossing the road. No causation factors are stated but it should be noted there are crossing facilities present at the junction. There are however active travel safety enhancements proposed to this junction as part of the off-site strategy as set out in later chapters.

3.8.6 Two collisions involved a car colliding with a motorbike. One collision was recorded as slight and involved a car turning right travelling from A1081 Harpenden Road (south of the junction) onto Beech Road. The motorbike was travelling southbound on A1081 Harpenden Road. The other collision was recorded as serious and involved a car turning right, travelling from A1081 Harpenden Road (north of the junction) onto Batchwood Drive. The motorbike was travelling northbound on A1081 Harpenden Road.

3.8.7 Two further collisions occurred involving cars only. One collision was recorded as slight and involved a car travelling from Batchwood Drive turning left onto A1081 Harpenden Road. The front of this vehicle collided with another travelling northbound on A1081 Harpenden Road. The other collision was recorded as serious and involved one car going ahead from Beech Road onto Batchwood Drive. The front of this vehicle collided to the side of a car turning left from A1081 Harpenden Road (south of the junction) onto Beech Road, as these two movements are not permitted concurrently under the current signal control it is possible this was due to a driver passing a stop line on red.

3.8.8 All collisions had varying circumstances and there are no common movements suggesting an inherent safety issue at the junction.

A1081 Harpenden Road North of Ancient Briton Junction

3.8.9 Six incidents occurred along A1081 Harpenden Road north of the Batchwood Drive / Beech Road junction within the study period. Two were recorded as serious and four as slight. Two were recorded in 2017, two in 2018, one in 2019 and one in 2023.

3.8.10 A slight collision occurred involving a pedestrian, where a child was hit by a driver attempting an overtake. A further slight collision occurred 835m north of the Sandridgebury Lane junction where a cyclist collided with the rear of a car. A further slight collision occurred at the entrance to the Texaco petrol station: a car turning right into the petrol station collided head-on with another that was continuing ahead.

3.8.11 Two collisions involved a car and motorbike at the Green Lane junction. One slight collision occurred in 2017 and involved a car turning right onto Green Lane colliding with a motorcyclist travelling northbound on A1081 Harpenden Road. A serious collision occurring in 2023 also involved a car turning right onto Green Lane and colliding with a motorcyclist.

3.8.12 A further serious collision occurred involving a car turning right onto Francis Avenue, colliding with a cyclist travelling northbound on A1081 Harpenden Road.

3.8.13 There are some common occurrences with collisions involving right turning vehicles from the A1081 Harpenden Road however these collisions are spread across two different junctions and a five-year period suggesting that there are no inherent safety issues. The collision involving a pedestrian occurred as a result of an overtaking manoeuvre and there are existing pedestrian crossing facilities provided. There are also proposed to be enhancements to active travel facilities as part of the off-site strategy for the proposed development and the neighbouring Hunston/Cala Homes development.

A1081 Harpenden Road South of Ancient Briton Junction

3.8.14 Two incidents occurred along A1081 Harpenden Road south of the Ancient Briton junction within the study period. Both incidents were recorded as slight in severity. One was recorded in 2018 and one in 2019.

3.8.15 One collision involved a car turning left onto Edmond Beaufort Drive and colliding with a cyclist travelling southbound. Another occurred 100m south of the Batchwood Drive / Beech Road junction and involved a series of rear shunt collisions involving three vehicles and resulting in two slight casualties.

3.8.16 Only a single collision was recorded resulting in injury to a vulnerable road user. However, as part of the development proposals and off-site strategy, enhancements to active travel connectivity into St Albans City Centre are being explored, as set out in later chapters.

B651 St Albans Road / B651 Sandridge Road

3.8.17 Four incidents occurred on this road within the study area within the study period. Two were recorded as slight in severity, one as serious, and one as fatal. One was recorded in 2018, one in 2019 and two in 2021.

3.8.18 The two slight collisions both involved bicycles. One involved a car turning right on Lancaster Road and colliding with a bicycle also turning right. The other involved a car attempting to overtake a bike 200m north-east of Marshalswick Lane colliding with a bike.

3.8.19 The serious collision involved a car colliding with the rear of a parked car 20m northeast of the junction with Sandringham Crescent.

3.8.20 The fatal collision involved two cars colliding, resulting in one fatality. One of the vehicles was attempting an overtake manoeuvre, and then swerved in an attempt to avoid a head-on collision with an oncoming vehicle, resulting in the two vehicles colliding to the offside of each vehicle.

3.8.21 This road is identified in the LCWIP as a proposed part of the future cycle network in the area. Therefore, it is anticipated in the future that safety improvements could be made along this corridor when cycle schemes are delivered by HCC. The anticipated pedestrian, cycle and vehicle flows generated by the proposed development along this link is likely to be modest and it is not expected that the frequency or severity of collisions would increase as a result of the proposed development.

B651 St Albans Road / Marshalswick Lane / Marshals Drive / Beech Road / Valley Road Junction (King William VI)

3.8.22 Four incidents occurred at this junction during the study period. Three were recorded as slight in severity, and the other as serious. One was recorded in 2017, one in 2019 and two in 2023.

3.8.23 One slight collision involved a head-on collision between a car and light-goods vehicle (LGV) on Marshalswick Lane on the approach to the junction. Another slight collision on Marshalswick Lane involved the side of the car colliding with the back of a bike. The other slight collision involved the front of a car colliding with the side of a motorbike while turning right from Valley Road onto Beech Road.

3.8.24 The serious collision involved a car attempting to overtake a bike on Beech Road following the junction, resulting in a collision with the bike.

3.8.25 The collisions involved different circumstances and there were no common occurrences suggesting an inherent safety issue at the junction. However, as part of the proposed off-site strategy, there are enhancements for active travel users proposed around this junction to help vulnerable road users navigate the junction without being in conflict with vehicular movements.

Marshalswick Lane

3.8.26 Three collisions occurred on Marshalswick Lane during the study period. All three were recorded as slight in severity. One was recorded in 2019 and the other two in 2021.

3.8.27 One collision occurred 130m west of the junction with The Ridgeway and involved a rear shunt. Another collision involved a car colliding with the side of a motorbike, 70m east of the junction with Furse Avenue. Another collision involved a car and bicycle in a head-on collision as the car was turning right onto The Ridgeway.

3.8.28 There are no common occurrences suggesting an inherent safety issue on the link. However, as part of the proposed off-site strategy, there are enhancements for active travel users along the parallel Marshals Drive providing an alternative route to Marshalswick Lane to help active travellers and reduce the potential for conflict with vehicular movements.

Marshals Drive

3.8.29 Four collisions occurred on Marshals Drive during the study period. All were recorded as slight in severity. All were recorded in separate years, one each in 2017, 2018, 2021 and 2022.

3.8.30 One collision involved a head-on collision at the junction with Charmouth Road between two cars, one turning right and the other continuing ahead.

3.8.31 Two collisions occurred at the Homewood Road junction, one in 2017 and one in 2022. One involved a minibus turning right colliding with the side of a motorbike, and the other involved a car colliding with the side of another.

3.8.32 A further collision involved a car reversing and colliding with a six-year-old pedestrian.

3.8.33 There are no common occurrences suggesting an inherent safety issue on the link. It is noted that the LCWIP identifies the introduction of a modal filter at the northern end of Gurney Court Road which should reduce the volumes of traffic on Marshal's Drive and Gurney Court Road.

Beech Road

3.8.34 Four collisions occurred on Beech Road during the study period, all recorded as slight in severity. One collision was from 2017, two were from 2019 and one was from 2022.

3.8.35 One collision involved a rear shunt, resulting in the car at the front colliding with a pedestrian, approximately 20m northeast of the junction with Seymour Road.

3.8.36 Two of the collisions involved cars colliding with the rear of a parked car, and one involved a motorbike colliding with the rear of a parked car. The incidents both involving cars parked approximately 20m and 30m south-west of the Marshall Avenue junction. The incident involving the motorbike occurred approximately 60m north-east of the junction with Seymour Road. There appears to be on-street parking along Beech Road, however there is no clear reason as to why these three incidents have occurred. As there have been only three incidents of this nature in five years, it can be deemed that this is not a frequent occurrence or pattern.

Batchwood Drive

3.8.37 Three collisions occurred on Batchwood Drive during the study period, one recorded as serious and two recorded as slight in severity. One was recorded in 2018 and two were recorded in 2019.

3.8.38 The serious collision involved a bicycle attempting to overtake a car. While attempting the overtake, the bike went into the side of a car, approximately 115m east of the junction with Townsend Drive.

3.8.39 One slight collision involved a car colliding with the side of another at the junction of Becketts Lane, and the other involved a car colliding with the side of a motorbike at the junction with Green Lane.

3.8.40 There are various circumstances between the different collisions suggesting there are considered to be no inherent safety issues on the link.

Valley Road

3.8.41 Three collisions occurred on Valley Road during the study period. Two were recorded as slight and one as serious. One was recorded in 2018 and two in 2019.

3.8.42 The serious collision involved a car colliding with a pedestrian 10m south of the junction with Potters Field.

3.8.43 One slight collision involved a car colliding with a pedestrian approximately 100m south of Sandridgebury Lane. Another involved a motorbike at the junction with Canberra Close. The details of this accident suggest the motorbike lost balance and fell as no other road user was involved.

3.8.44 There are varying circumstances between the collisions, but two of the three collisions involve pedestrians. As part of the LCWIP and the proposed development access strategy, modal filtering and traffic calming is proposed to improve conditions for pedestrians and cyclists, as set out in later chapters.

Sandridgebury Lane

3.8.45 One incident occurred on Sandridgebury Lane during the study period in 2018. The incident was serious in severity and occurred 195m northeast of the A1081 Harpenden Road junction. The collision involved a car attempting to overtake a cyclist resulting in a collision.

3.8.46 There is no evidence to suggest any inherent safety issues on the link. However, as part of the proposed development, modal filtering and or re-routing of the link is proposed which would improve conditions for active travel users, as set out in later chapters.

Summary

3.8.47 Generally, there are varying circumstances involved in the recorded collisions within the study area over the study period suggesting there are generally no inherent safety issues which would suggest that any additional vehicle movements associated with the proposed development would result in an increase in the frequency and/or severity of collisions.

3.8.48 There are however some common occurrences, particularly involving vulnerable road users. In a number of these locations, the proposed off-site strategy would deliver good quality infrastructure for pedestrians and cyclists enhancing the conditions and likely safety for these users.

3.8.49 On St Albans Road, there are wider aspirations for active travel improvements by HCC and SACDC as part of their LCWIP. Proposed development pedestrian, cycle and vehicle numbers on this link are not considered to be of an order which would result in an increase in the frequency or severity of collisions.

3.9 Summary

3.9.1 The site is well located to benefit from a variety of existing sustainable travel links although it is noted that these are lacking in places, particularly on the rural edge of St Albans identifying areas for improvement as part of the proposed development.

3.9.2 The site is well connected to the local and strategic road network but there are existing areas of congestion noted.

3.9.3 There are no inherent highway safety issues identified as part of the analysis of collision data which would be exacerbated by the proposed development.

4 Future Baseline Conditions

4.1 Committed Off-Site Improvements

Land to Rear of 112 to 156b Harpenden Road (Hunston Properties and the Trustees of the Sewell Trust) – (5/2020/3096, 5/2021/0423, 5/2023/1426)

4.1.1 Forming part of the North St Albans Broad Location for development in the emerging Local Plan, the neighbouring Hunston Development/Cala Homes site has planning consent for the delivery of 150 dwellings.

4.1.2 As part of this development, it is proposed to provide a new access junction formed with the A1081 providing for vehicles and active travel modes. The junction is proposed to be a priority ghost island junction. Within the development, active travel linkages into the proposed development via the main site access and via Harpenden Road are proposed to provide permeability, and the consent is subject to planning condition requiring the introduction of active travel connections which will cross the Cala Homes / Woollam Park boundary.

4.1.3 There are also planning obligations to deliver new active travel cycle infrastructure along the A1081 in the vicinity of the development, running to just north of the Ancient Briton junction. The design has been subject to evolution through a reserved matters application since outline planning consent was granted, and it is understood that the developer is working towards technical approval.

4.1.4 The active travel infrastructure is proposed to comprise:

- A uni-directional cycle track along each side of the carriageway segregated from the carriageway and footway. The southbound facility is taken offline along Old Harpenden Road before rejoining the carriageway just north of the Ancient Briton junction.
- A new toucan crossing north of the site's new vehicular access.
- Side road entry treatment to provide continuous route with priority for cyclists and pedestrians.
- Upgrade of existing pedestrian crossing on A1081 Harpenden Road south of STAGS to toucan crossing.
- The facility ends north of the Ancient Briton junction where cyclists need to rejoin the carriageway. To aid cyclists through the junction, there is the provision of two stage right turn facilities proposed at the Ancient Briton junction.
- No junction modelling appears to have been undertaken to understand the changes to the junction's method of control which may be required to enable the two-stage right turn.

Figure 4-1: Hunston Properties Site Access Arrangements

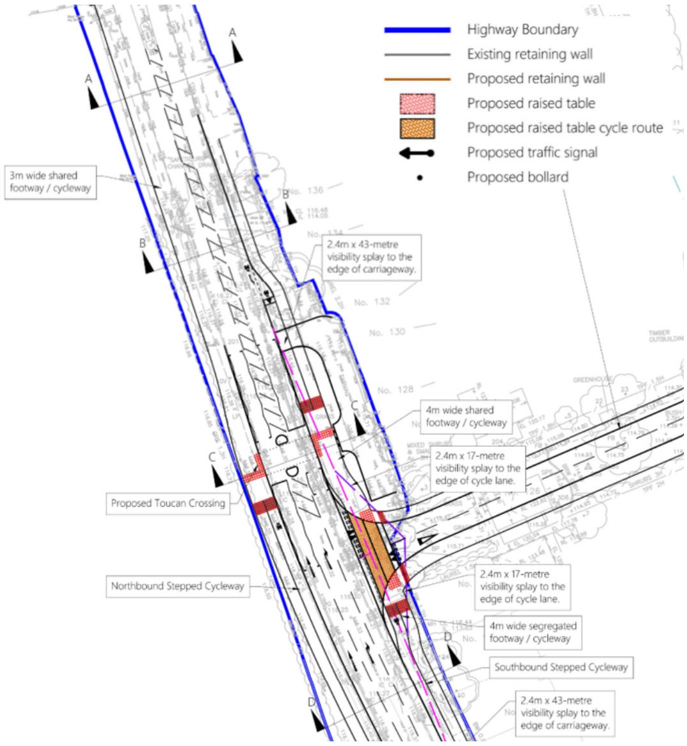


Figure 4-2: Hunston Properties Ancient Briton Crossroads Arrangement

4.1.5 The active travel strategy to support the proposed development at Woollam Park, set out in later chapters, has been designed to tie into these committed improvements.

4.2 Local Walking and Cycling Infrastructure Plan

4.2.1 The LCWIP covers the SACDC jurisdiction (including St Albans and Harpenden) and sets out the combined plans of HCC and SACDC to prioritise and improve the active travel connections within St Albans, Harpenden and between settlements including adjacent towns and cities in other districts.

4.2.2 Improvements for walking are typically focused on urban centres and incorporate improvements on key desire lines or in areas where highway safety concerns are likely to discourage journeys on foot. Measures include improving the frequency of crossing opportunities, the level of priority afforded to pedestrians and measures to improve capacity and to make routes more inclusive. Measures could also include addressing maintenance issues, removal of footway clutter and opportunities to widen footways.

4.2.3 In regard to cycling, the planned improvements include new or improved shared use paths and segregated paths either adjacent to or parallel to the highway network, traffic calming and modal filtering on routes where mixed traffic cycling is envisaged, and the introduction of improved crossing facilities, both formal and informal. Cycle parking is identified as a key element needed to enable greater use of cycles and is included within the plan.

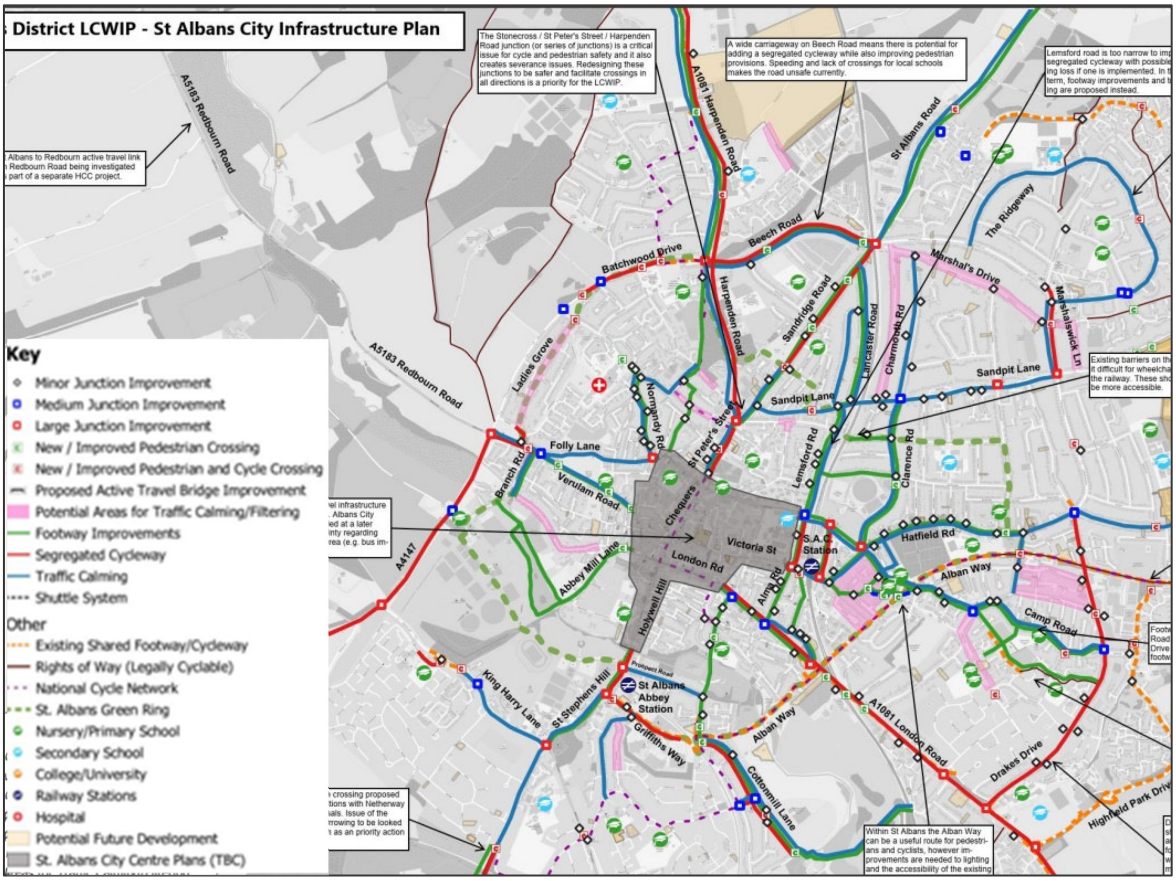
4.2.4 The LCWIP specifically identifies Woollam Park as a potential future development site along with several other potential development sites, of significance to the LCWIP. The roads around the site and through New Greens and Marshalswick form part of the secondary pedestrian network for St. Albans, while A1081 Harpenden Road, Beech Road, Batchwood Drive, Marshalswick Lane and the B651 are listed as primary routes in the cycle network.

4.2.5 It is noted that the LCWIP does not identify potential interventions within the historic core of St. Albans, suggesting that this will be subject to a further comprehensive review of city centre movement.

4.2.6 The LCWIP routes and area improvements are prioritised to gain an understanding of where infrastructure will deliver the greatest benefit in terms of modal shift potential to the St Albans District. The route between St Albans and Harpenden along the A1081 is noted to be one of the top five routes in terms of priority based on a set of criteria, including how easy it would be to deliver and how well it links to other policies and strategies. The main aim for this route would be to make this link a safer and more pleasant route for pedestrians and cyclists (particularly as it is already part of NCR6), by proposing a segregated cycleway from pedestrians and vehicles, traffic calming, junction improvements and new/improved crossings. The St Albans City Infrastructure Plan from the LCWIP is provided in Figure 4-3.

4.2.7 The forecast indicative costs for each route or area improvement within the LCWIP has also been set out in the report. However, these are noted to be very high-level estimates and are not typically based on actual route designs, but rather a route length and an assumed cost per linear metre.

Figure 4-3: St Albans LCWIP



5 Development Proposals – Residential Led Development

5.1 Proposed Development

5.1.1 Planning permission is sought for the following development:

"Relocation and replacement of existing playing fields and erection of pavilion annex; construction of up to 1000 new homes (use class C3) to include a mix of market housing, affordable housing, age restricted specialist accommodation for the elderly, and adult disability service units; an 80-bed care home (use class C2); a local centre (use classes E and F); a two-form entry primary school (use class F;) the laying out of green infrastructure including habitat creation, drainage infrastructure; earthworks; pedestrian and cycle routes; and a new means of access onto Harpenden Road and Sandridgebury Lane."

5.1.2 The application is submitted in outline with all matters reserved for future consideration with the exception of:

- The proposed means of "access" onto Harpenden Road (A1081), Sandridgebury Lane and Valley Road; and
- The proposed "access", "appearance", "landscaping", "layout" and "scale" of the proposed playing fields on land to the east of the existing Woollam Playing Fields.

5.1.3 A parameters plan forms the basis of the application proposals, along with access drawings. An illustrative masterplan has also been prepared. The Parameters Plan and Illustrative Masterplan are provided in **Appendix A** and this chapter provides a summary of the proposals for the wider development (excluding the Relocation of Old Albanians RFC Playing Fields, this is detailed in a separate Technical Note submitted with the planning application).

5.1.4 For the purposes of the traffic impact chapters, the development of 900 standard residential units along with 80 retirement living units and an 80-bed care home have been assessed, in line with the development quantum set out in the Regulation 19 Local Plan site allocation.

5.2 Multi-Modal Access

5.2.1 It is proposed to provide access from various points to aid permeability of the site for active travel movements with public transport and vehicular movements focussed on the A1081:

- Pedestrian/Cycle Access:
  - A1081 Harpenden Road – Active travel corridor to route parallel to the primary link road from the A1081 Harpenden Road.

- Sandridgebury Lane – within the development this will be closed to motor vehicles and dedicated as an active travel route, with Sandridgebury Lane either side of the development re-routed through the development site.
- Valley Road – Reassigned as an active travel route following the introduction of a modal filter to prohibit motor vehicle from accessing the site from the south.
- Hertfordshire Way PROW link – Active travel corridor running parallel to Midland Main Line Railway to link into Hertfordshire Way PROW and to provide an onward traffic free connection to the Heartwood Forest.
- Hunston Properties Site – Active travel connections between Woollam Park and adjacent site adding connections toward A1081 Harpenden Road.
- Comprehensive network of active travel corridors across Woollam Park with connections to external routes. Incorporating and upgrading the footpath through the Long Spring Wood along the southern boundary of the site (north of Porters Wood Industrial Estate).

- **Vehicular Access:**
  - A1081 Harpenden Road – Signal controlled access junction, design shown in Figure 5-1, from A1081 Harpenden Road connecting directly to the main entrance street through western extent of the site. Delivery of this access route is facilitated by relocating the three playing field in this area. This new access road will be the primary street within the development offering onward connection to the proposed school, local centre and secondary streets providing residents vehicular access to their dwellings. The illustrative street typologies are detailed further in Figure 5-7 below.
  - Sandridgebury Lane – The permanent vehicular access arrangements of the eastern end of Sandridgebury Lane are to be determined through a monitor and manage process once the site is in operation, but initially Sandridgebury Lane will be connected to the sites internal road network providing a replacement link between Sandridge and the A1081 Harpenden Road. Further information is provided in proceeding sections.

A1081 Harpenden Road Access

5.2.2 Vehicular access to the site will be taken from the A1081 Harpenden Road, taking the form a three-arm, signal controlled junction designed to provide adequate capacity taking account of forecast development and background traffic flows. An extract of the proposed arrangement is shown in Figure 5-1 with the full drawing included in **Appendix C**.

5.2.3 The proposed access arrangements at A1081 Harpenden Road will feature the following:

- Three-arm signal-controlled junction providing vehicular and active travel access into Woollam Park. 6m two lane approaches each arm (6.50m on site access arm), 18m of storage length (3 PCUs) on right and left turning lanes into site;
- Relocation of existing speed limit change from 30mph to 40mph on A1081 Harpenden Road to north of the proposed site access and north of the Woollam Playing Fields / Old Albanians RFC access, as shown in Figure 5-2;
- Two bus stops with shelters located north and south of signal-controlled junction, dropped kerb crossing with pedestrian refuge on A1081 Harpenden Road to access bus stop on western side;
- A shared footway/cycleway connection between the site access junction and the existing access to the Woollam Playing Fields on the east side of Harpenden Road;
- Two staggered pedestrian crossings, north of signal-controlled junction and across the site access. Linking to minimum 2m footways on both sides of A1081, with minimal localised narrowing to accommodate signal heads; and
- Bi-directional cycleway on western side of A1081, cycle priority crossing on northern arm, connecting directly into bi-directional cycleway north of primary link road. It is proposed to provide segregated LTN 1/20 compliant infrastructure along with controlled crossing facilities to connect into existing and committed infrastructure along this corridor.

Figure 5-1: Proposed A1081 Harpenden Road Access

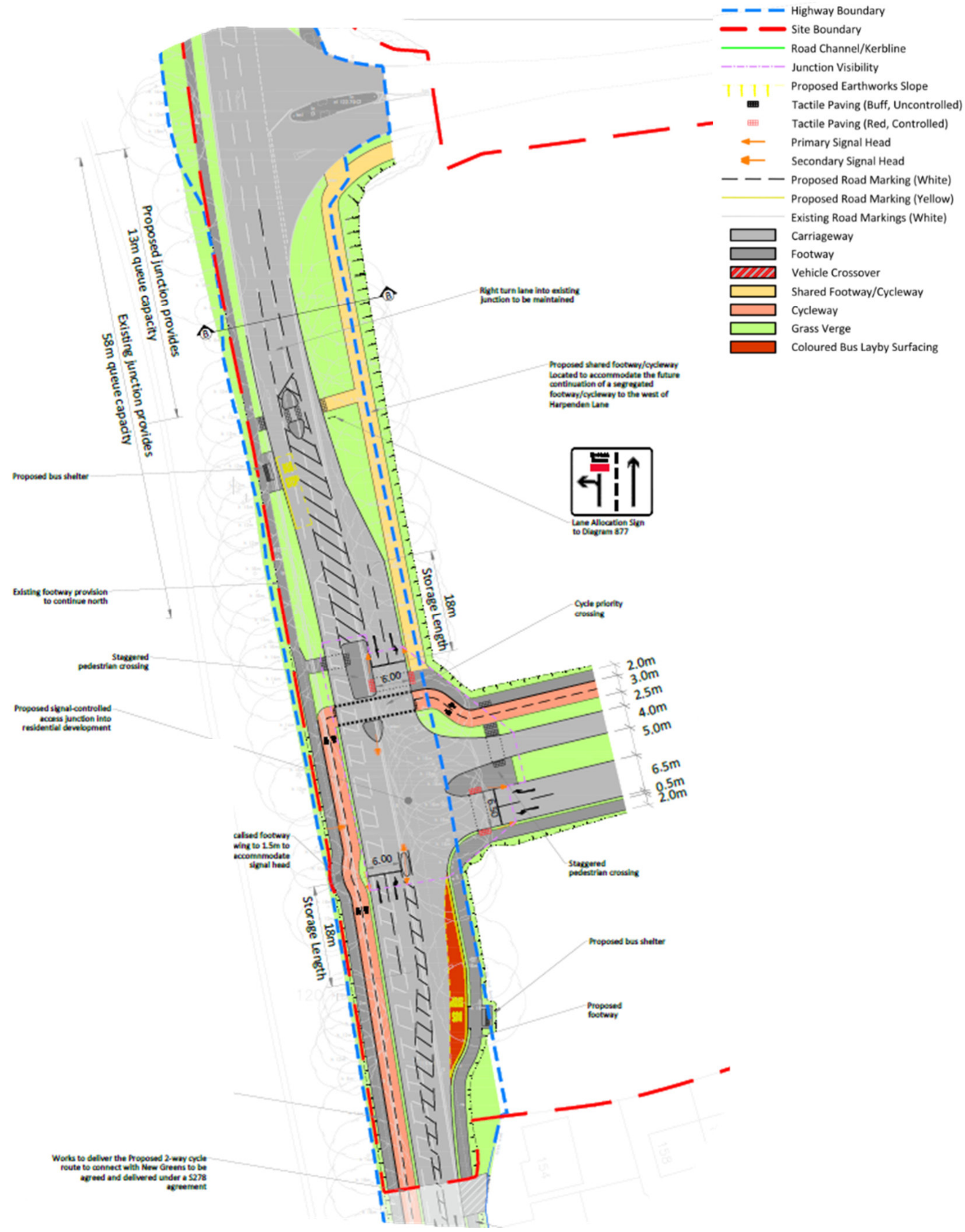
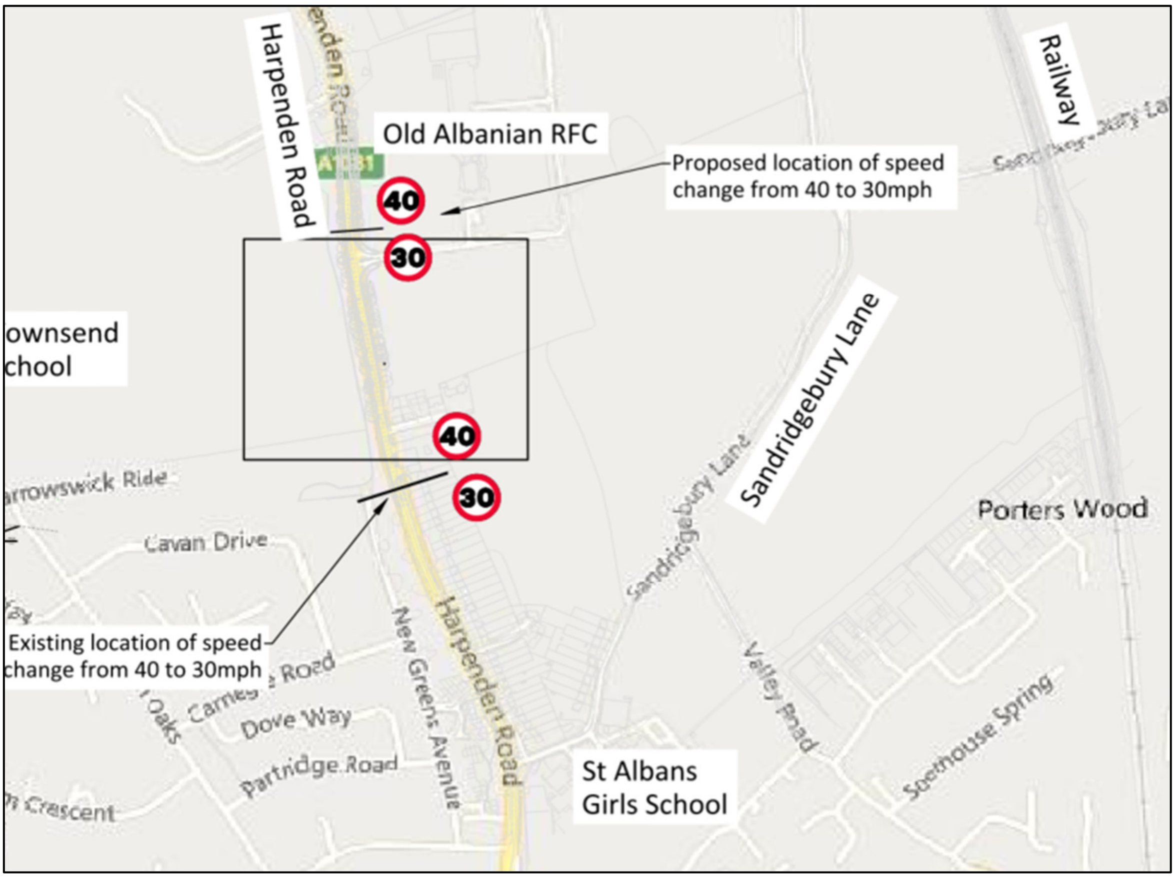


Figure 5-2: Proposed Relocation of Speed Limit Change on A1081 Harpenden Road



Sandridgebury Lane

Existing Conditions

5.2.4 Sandridgebury Lane bisects the application site. It is a narrow single carriageway rural lane absent of footways.

5.2.5 It extends from A1081 Harpenden Road to the village of Sandridge. At its western extent it provides access to 11 residential properties and St Albans Girls School. Immediately east of the railway line it provides access to two residential properties and continues to the commercial operations at Sandridgebury Farm and a small number of surrounding dwellings.

5.2.6 A unnamed lane also joins Sandridgebury Lane and provides access to Cheapside Farm, its associated two dwellings and separate private dwelling (The Greens). Cheapside Farm can also be accessed along a private track from Harpenden Road, which is also the route of the Hertfordshire Way long distance footpath.

5.2.7 Within the application site Sandridgebury Lane forms a junction with Valley Road. Valley Road at this point is extremely narrow with steep verges and limited passing spaces.

5.2.8 Traffic flow data was collected for Sandridgebury Lane in September 2022. The data was collected across a typical week, during school term time, using an automatic traffic counter located halfway between the junction between Sandridgebury Lane and Valley Road and the unnamed lane described above. The data showed that Sandridgebury Lane had an average weekday flow of 809 vehicles, with a broadly even directional split. In the weekday mornings the peak hour was recorded between 08:00 and 09:00 (174 vehicles per hour two-way), and in the weekday afternoons the peak hour was recorded between 15:00 and 16:00 (99 vehicles per hour two-way). The predominant flow in the morning peak hour is north-east to south-west, and in the afternoon peak this is reversed but with a lower volume of traffic. It is understood that this traffic is primarily headed to local destinations including the Valley Road Industrial Estate and the St Albans Girls School but will also include a significant proportion of traffic looking to avoid congestion at the Ancient Briton and King William IV junctions by routing along Sandridgebury Lane and Green Lane to reach destinations on the west of the city.

5.2.9 The road is subject to the national speed limit (60mph), however the survey recorded 85th percentile and mean speeds of 27mph and 22mph respectively.

5.2.10 98% of the traffic using the lane were cars, vans and motorcycles, with only a small number of larger vehicles, which are likely to include some agricultural vehicles.

Proposed Changes

5.2.11 The emerging Local Plan refers to off-site improvements to Sandridgebury Lane and Valley Road as part of the “development objectives/issues to address”. Throughout the collaborative joint masterplanning exercise there has been a shared objective for Sandridgebury Lane to perform the function of a green lane within the proposed development, providing a central walking and cycling corridor connecting the future resident population with active travel routes to the city centre and the countryside to the north. This would require a prohibition of motorised vehicular traffic along a length of Sandridgebury Lane and Valley Road. This is proposed to be achieved through re-routing to allow existing movements along Sandridgebury Lane to route through the development. Movements between Valley Road and Sandridgebury Lane would still need to re-assign across the existing network in the option (**Figure 5-3**).

Figure 5-3: Sandridgebury Lane – Proposed Re-routing through Proposed Development

5.2.12 To retain access to those properties at the western end of the Sandridgebury Lane any prohibition of vehicular movements would need to commence northeast of the property at no.19.

5.2.13 At Valley Road, the prohibition would need to commence north of the junction with Darwin Close (in line with the LCWIP), with the existing T-junction facilitating vehicle manoeuvring.

5.2.14 Turning area and junction arrangements are illustrated in Figure 5-4 to Figure 5-6 with the full drawings included in Appendix D.

Figure 5-4: Proposed Sandridgebury Lane – Western End (Potential Turning Loop Arrangement)

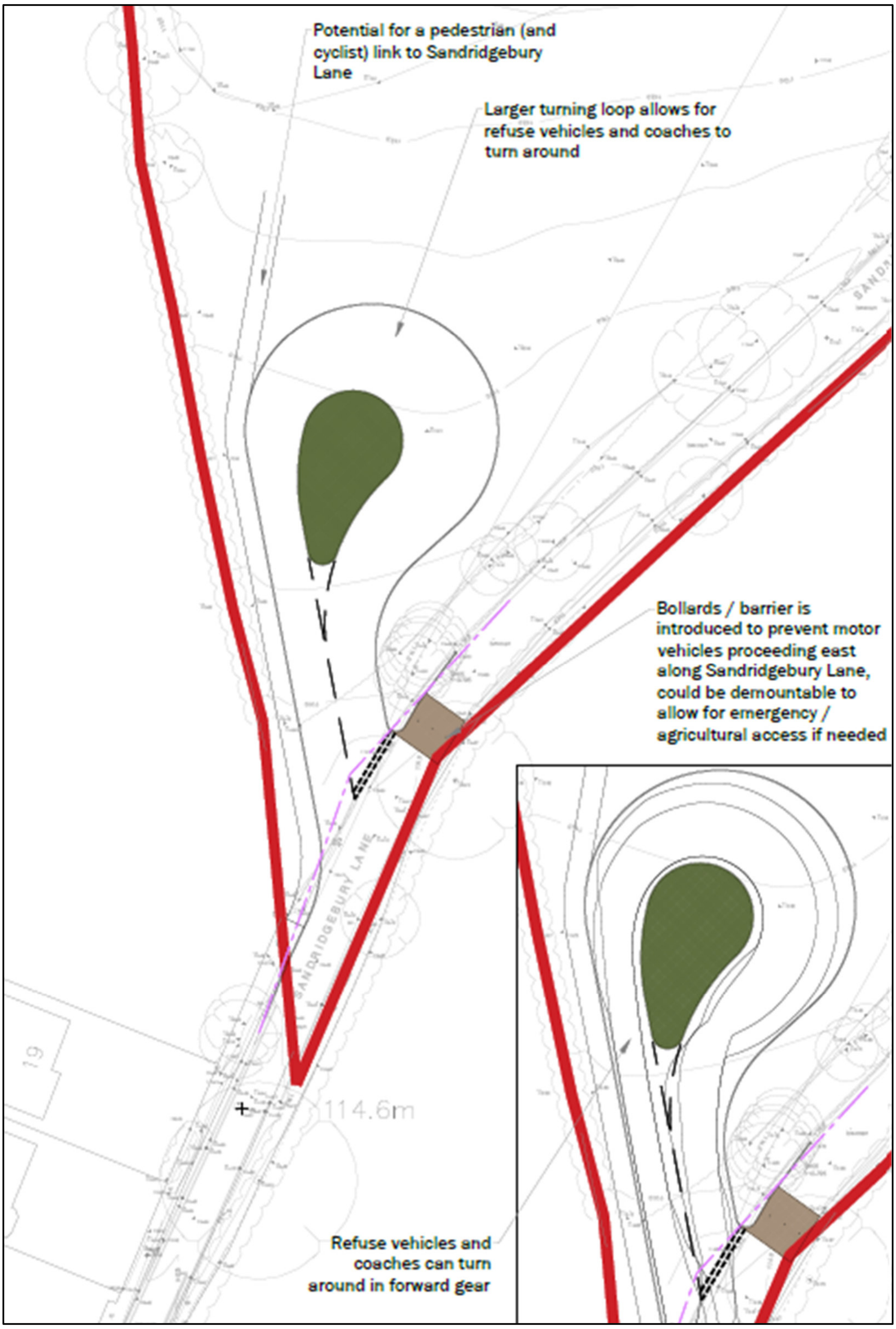


Figure 5-5: Proposed Sandridgebury Lane – Eastern End (Potential Arrangement)

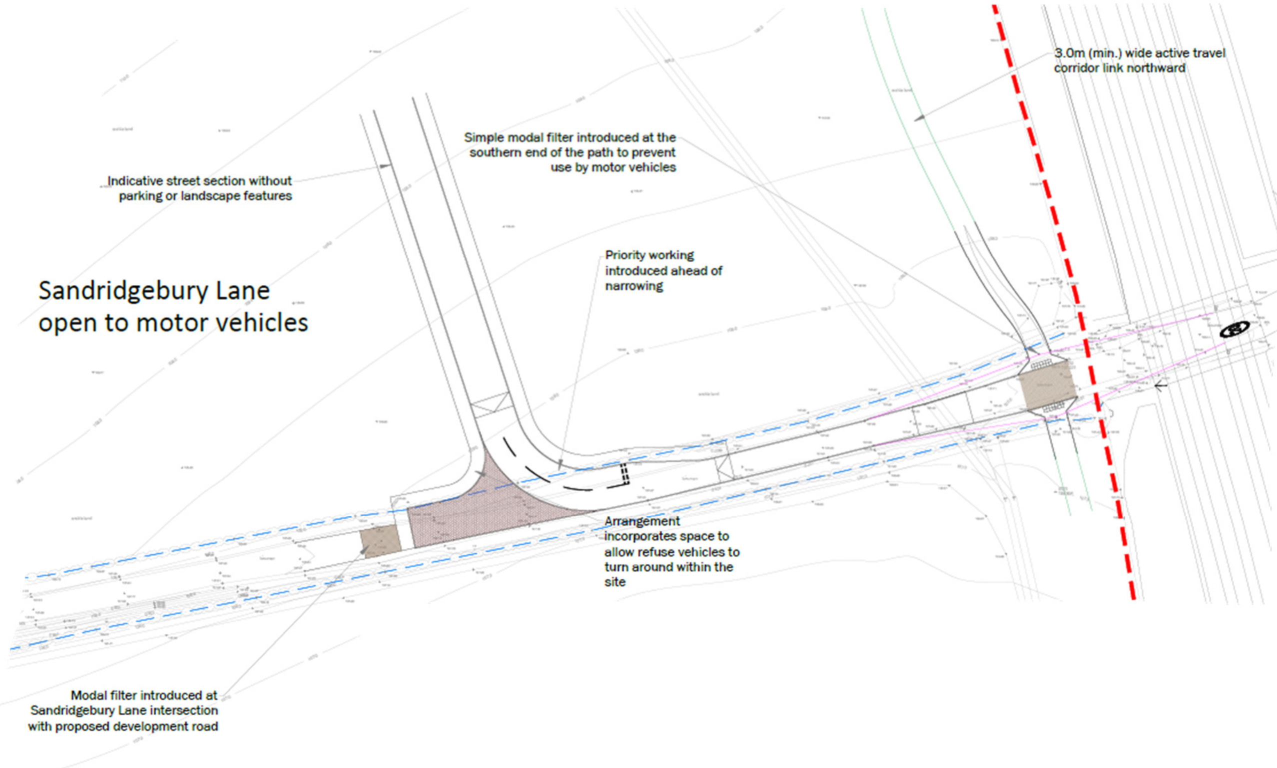
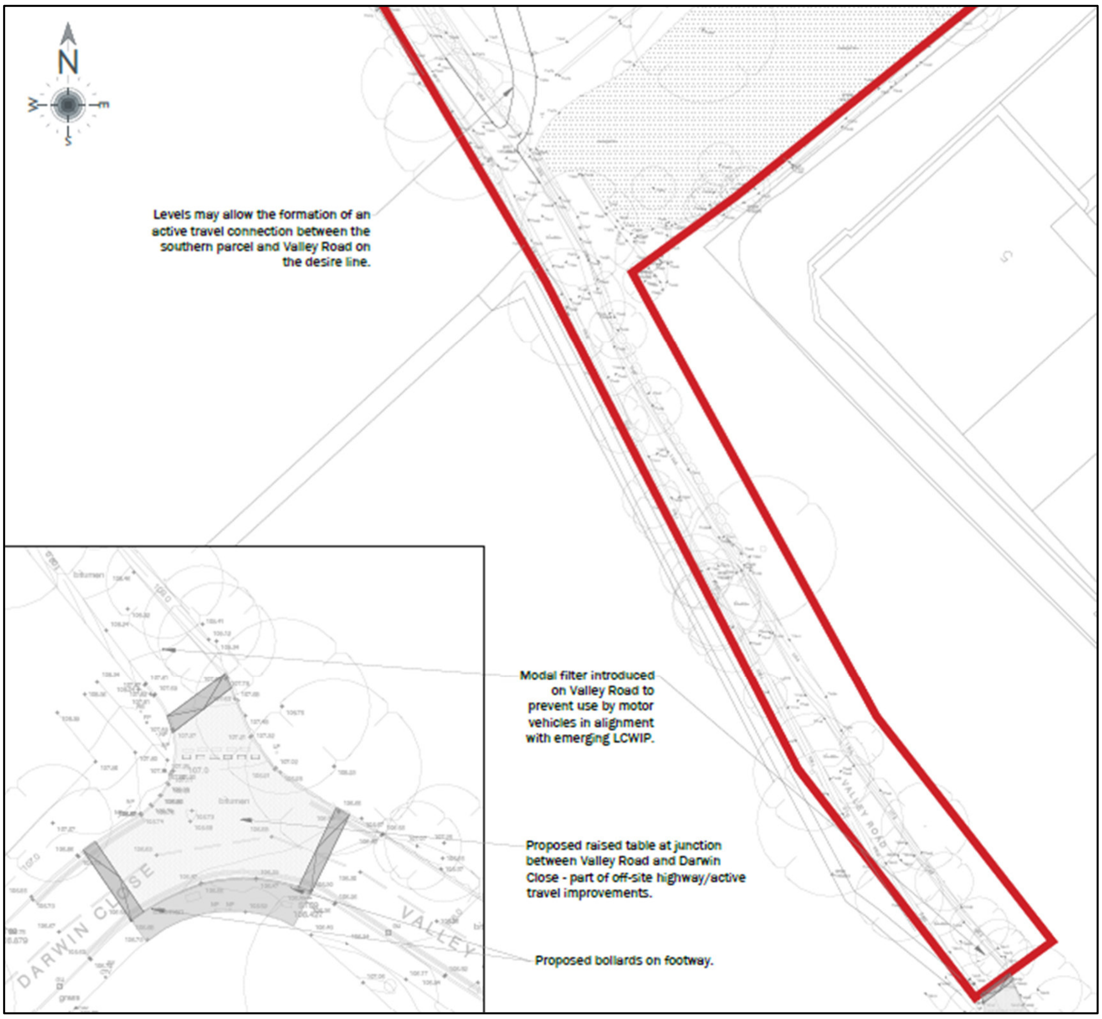


Figure 5-6: Proposed Valley Road Arrangement



5.2.15 Through traffic movements would be discouraged through the arrangement of internal roads offering a circuitous route incorporating traffic calming measures to reduce vehicle speeds and maximise journey times. The above principles have been discussed and agreed with HCC.

5.2.16 The impacts of the potential re-routing of Sandridgebury Lane has been tested from a highway impact perspective and the results are reported in later chapters.

5.2.17 The proposed re-routing of Sandridgebury Lane would be supported by a monitoring strategy to ensure the route does not become overly attractive as an east-west cut through inducing further vehicle demands through the development. This monitoring would be secured via planning condition/s106 obligation. Set out below is a series of potential planning conditions relating to the monitoring which may be needed in order to support the approach described above. The details of any conditions/obligations will be agreed during post submission discussions and prior to determination:

d) Prior to first occupation of the ***XXXth*** dwelling , an application will be made by HCC to progress a Traffic Regulation Order prohibiting the use of Valley Road by motor vehicles between its junction with Sandridgebury Lane and a point north of Darwin Close, as proposed within the adopted LCWIP. Physical measures will be completed in accordance with a Section 278 agreement with the Highway Authority once the order is made.

e) Prior to the opening of any highway connection between Sandridgebury Lane (east) and the internal highway network across which motorised vehicles can freely pass, a permanent automatic traffic counter of a type and specification agreed by HCC must be installed and commissioned in order to provide a daily record of traffic flows, broken down by hour, by direction and by vehicle classification, passing through the development site. This forms the basis of a monitor and manage approach to addressing the potential use of Sandridgebury Lane by inappropriate levels of traffic. The monitoring period commences at the opening of the highway connection, through to a point in time five years after the first occupation of the ***XXX***th dwelling.

f) Upon the opening of a highway connection between Sandridgebury Lane (east) and the internal road network, and completion of an appropriate turning facility on Sandridgebury Lane north of 19 Sandridgebury Lane, St. Albans, AL3 6DD, an application will be made by HCC to progress a Traffic Regulation Order prohibiting the use of Sandridgebury Lane (west) by motor vehicles. Physical measures will be completed in accordance with a Section 278 agreement with the Highway Authority once the order is made.

g) Prior to the occupation of the ***XXXth*** dwelling (assumed to be the first dwelling in Phase 4) evidence that monitoring and annual reporting has been undertaken since the opening of the connection between Sandridgebury Lane and the development site shall be provided to HCC.

h) Should the monitoring of traffic flows identify a sustained growth in traffic flow past the monitoring point during the monitoring period, with average daily flows exceeding ***xxx*** vpd, HCC will draw on funding secured through planning obligation to deliver a scheme of measures to remove the impact of motor vehicles while maintaining essential access to all properties along Sandridgebury Lane (east) and those within the development.

Emergency Access

5.2.18 Emergency access to the site will be taken from the northern end of Valley Road and the western end of Sandridgebury Lane.

5.2.19 It is proposed that both of these sections of the existing public highway are subject to Traffic Regulation Orders prohibiting their use by motor vehicles except for in emergencies and for the purpose of maintenance.

5.2.20 Subject to the status of Sandridgebury Lane to the east of the site, a further emergency access would be provided here if the through traffic route was closed to motor vehicles.

5.3 Internal Design Principles

On-site Street Hierarchy

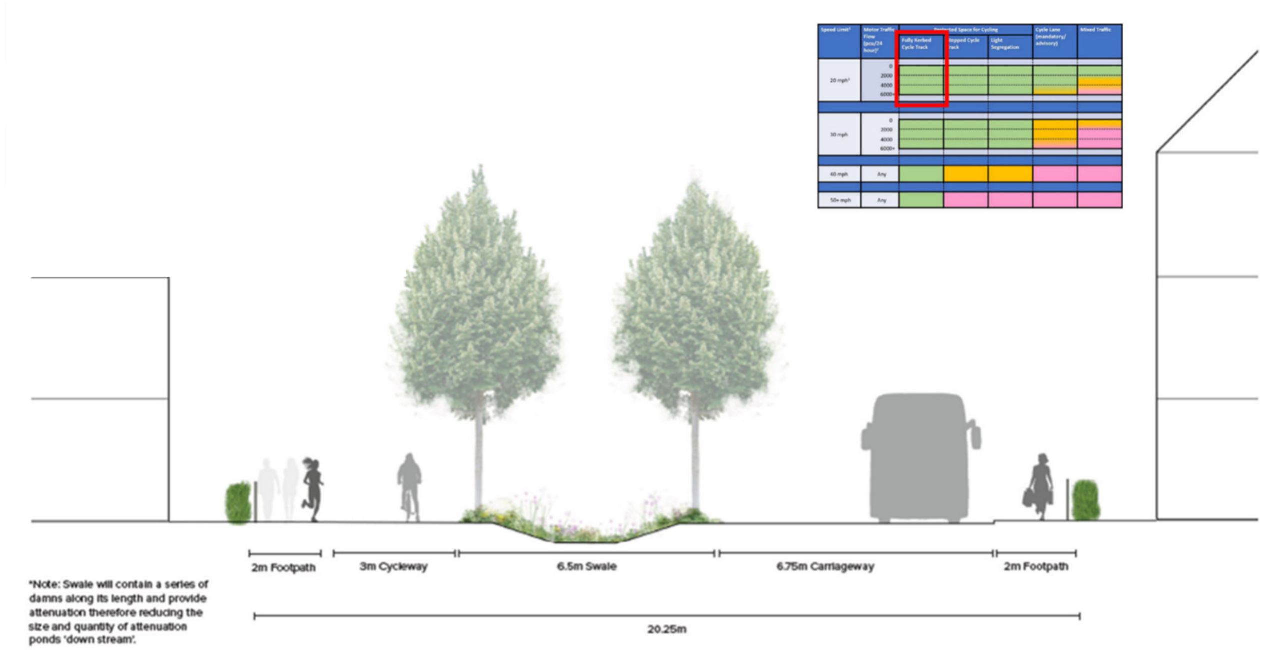
5.3.1 A hierarchy of street types will be introduced within the site area consisting at least of a main entrance street; primary street; secondary streets and tertiary streets. A 20mph speed limit will be applied to all street types. Buses will be permitted on the main entrance and primary streets, but not on secondary streets.

5.3.2 It is anticipated that only the streets forming part of the internal bus service route and the streets forming the through route to Sandridgebury Lane will be formally adopted by HCC, although many more of the roads within the development will be designed and delivered to adoptable standards to be certain that accessing and servicing requirements can be met.

5.3.3 Typical sections of the street types proposed are set out in Figure 5-7 and in full in **Appendix E** and provide detail on the widths, the forecast average daily traffic volumes and the resultant active travel provisions required as a result.

Figure 5-7: Indicative Street Typologies

On-site Active Travel Principles



5.3.4 Within the site Sandridgebury Lane is proposed to be closed to motor vehicles for the most part and will form the backbone of the site's active travel network (the re-routing of traffic through the central spine road of the development is proposed as set out in later chapters). Parallel crossings will be provided at intersections with the sites road network to facilitate road crossings with priority for pedestrians and cyclists. There may be an exception for emergency and maintenance vehicles in some areas with demountable modal filters installed to enable specialist access.

5.3.5 The Sandridgebury Lane corridor will be supported by a network of additional active travel routes running through the development. These will be fully lit and well overlooked to support use during hours of darkness.

5.3.6 Sandridgebury Lane will be re-routed through the development, but suitable turning areas will be provided near beyond no.19 to allow for vehicles to manoeuvre and exit Sandridgebury Lane back to Harpenden Road.

5.3.7 A new bridleway will be provided parallel to the railway link linking the Woollam Park to the existing bridleway (Hertfordshire Way) into the Heartwood Forest.

5.3.8 Several traffic free active travel connections will be provided between Woollam Park and the Hunston Properties development for use by pedestrians and cyclists, creating permeability between the two sites and increased permeability to the A1081 Harpenden Road, including access to new and existing bus stops.

Pedestrians

5.3.9 Pedestrian connectivity within the site will be prioritised by a low speed, low traffic street network complimented with traffic free routes to reduce walking distances within the site. The site boundary will be permeable for pedestrians allowing the new and existing communities more direct access to new and existing services, facilities and public transport interchanges in the area. Pedestrians will be accommodated alongside all vehicle connections into the site on dedicated footways segregated from cyclists and motor vehicles. It is proposed that existing highways through the site will be closed to motor vehicles providing pleasant traffic free walking routes through the development connecting with existing PRoWs. To accommodate existing vehicle movements, it is proposed to allow traffic to re-route through the development.

5.3.10 Accessible and inclusive pedestrian connections to and through high-quality public open spaces will be formed and a new PRoW link north to the bridleway will be provided enabling traffic-free access to the Heartwood Forest, Hertfordshire Way and the existing PRoW network leading north to Harpenden.

5.3.11 To the west, links through the adjacent Hunston Properties development will increase pedestrian permeability towards the New Greens area, including the schools, playing pitches and community facilities here, with east-west movements over Harpenden Road facilitated by new and committed controlled crossings offering pedestrian priority over vehicle movements.

Cyclists

5.3.12 Within the site, cycle provision will be delivered in accordance with LTN 1/20 standards providing the appropriate level of infrastructure to enable most people to feel comfortable undertaking journeys within the site by cycling. It is proposed that all roads within the site are subject to a 20mph speed limit and will be designed accordingly.

5.3.13 Along the main entrance street between the proposed site access junction on the A1081 and the local centre and the other primary streets, segregated bi-directional paths will be provided along one side of the new streets.

5.3.14 Away from the primary streets, traffic volumes and vehicle speeds within the development are expected to be low enough to enable most people to be comfortable cycling on trafficked streets or parallel traffic free routes.

5.3.15 The development will provide high quality cycle parking meeting the LTN 1/20 standards (above local plan standard) within or near new homes. Secure cycle parking will also be available within the local centre to enable cyclists to interchange with public transport services, a car club vehicle or to shop without concerns of bike theft. Cycle parking will incorporate spaces for non-standard cycles in line with LTN1/20 guidance. The provision of cycle parking for homes will be far more aspirational than the emerging local plan standards, with the aim of providing at least one cycle parking space per bedroom.

On-site Mobility Hub

5.3.16 The mobility hub will be a key part of the local centre in the development, bringing together facilities to support all sustainable modes in a central area of the site. Figure 5-8 identifies some of the elements that could form part of a typical mobility hub, but this does not represent the proposed design or layout of the hub proposed as this will be established through later design stages.

5.3.17 The elements of the mobility hub are shown below. It is envisaged that the mobility hub would provide the following:

- Modal integration – Bus Stops with shelters and real time information, secure cycle parking including for cargo bikes and non-standard cycles, cycle repair facilities, car club vehicle hub, future proofed for eScooter parking.
- Electric Vehicle Facilities – EV charging, potentially rapid charging facility, including e-bike charging.
- Opportunity for bus layover and PT EV charging, as well as driver facilities (incorporated within the wider local centre provision) to provide comfort when changing over/layover.
- Active travel network linkage – links to proposed active travel links within the site and external connecting to off-site routes.
- High-quality public realm linked to community facilities and potentially a café.
- Parcel collection/postage lockers to minimise the number of delivery vehicles accessing deep into the development.

5.3.18 The requirements set out in the new Local Plan[2] align with the proposals for the mobility hub at the development, including connections to a local bus service, car club facilities, bike repair facilities, e-

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- [2] Strategic Policy SP8 of the new Local Plan (Reg. 19) being developed by SACDC sets out the 'Transport Strategy' for the Local Plan period, primarily to prioritise the use of sustainable modes and deliver bike charging, real-time travel information, digital connectivity and delivery facilities. The proposed mobility hub could incorporate the site into the proposed wider network at city, town and district centre levels to promote the site as a key sustainable transport interchange.

accessible improvements to the local network. One of the objectives listed discusses SACDC providing support to the development of:

- "Mobility hubs at suitable locations such as railway stations and co-located in city, town and district centres where appropriate. The scale and nature of proposals must be appropriate to the size and function of the centre or station and proposals should contribute towards the vitality of a centre."

Figure 5-8: Mobility Hub Concept Illustration

5.4 Parking Strategy

5.4.1 The Emerging Local Plan sets out updated parking standards, it is deemed that these provide a more suitable guide for determining an appropriate parking strategy than those contained in the adopted Local Plan.

5.4.2 For the 'Broad Locations' which includes 'North St Albans', Policy TRA4 of the Emerging Local Plan expects that the developments would '*prioritise sustainable and active modes of transport such as to require reduced parking provision, as part of a bespoke parking strategy*' and as such, prescriptive standards are not set out for these areas.

5.4.3 A bespoke approach to parking which complements the low carbon transport strategy for the proposed development is therefore set out defining the principles for parking at the development with the precise detail to be agreed at Reserved Matters stage.

5.4.4 Initial engagement with HCC has demonstrated their support for a provision of car parking which is lower than typical for other development in St Albans as well as a higher than minimum standards provision of cycle parking to support the low carbon transport strategy for the development. For the local centre, HCC has confirmed their in principle support for zero/very low provision of car parking, with the exception of parking for disabled users which would be ensured.

5.5 Cycle Parking

5.5.1 It is proposed to provide cycle parking in excess of the Draft Parking Standards in the Emerging Local Plan, with an aspiration for cycle parking for at least one cycle space per bedroom for the residential uses. This will be provided for in a safe and suitable location within the curtilage of individual properties and in a prominent, secure and covered location within public/shared areas.

5.5.2 This principle is also proposed for the local centre and education uses to be in exceedance of the minimum standards set out in the Emerging Local Plan. Shared cycle parking would again be provided in a secure, convenient, accessible and well-lit location.

5.5.3 Cycle parking will be designed to ensure that access to cycles at the start of any journey is no less convenient than access to a vehicle.

5.6 Vehicle Parking

Standard Residential

Approach

5.6.1 Local car ownership data has been extracted from a combination of the 2001 and 2021 Censuses. To understand existing car availability trends within St Albans at a detailed level by dwelling type and size, cross tabulated datasets from the 2011 Census for St Albans has been extracted. This level of data has not yet been published for the 2021 Census but to ensure the calculations reflect the latest trends, overarching trends for wider St Albans in terms of car availability has been extracted and applied to the 2011 dataset.

5.6.2 The method set out in the DCLG Residential Car Parking Research report has been adopted. This utilises car availability data from a proxy area to forecast the demand for parking at new development.

5.6.3 The method gives consideration to the provision of allocated car parking and unallocated/visitor car parking. Generally, the more allocated parking which is provided, the more parking that is required overall due to inefficiencies in how the parking is used; for example, those properties which do not require a parking space are still allocated one but then there may be dwellings which still require more parking than they're allocated leading to the need for further provision. However, there is a balance between the marketability of properties having an element of allocated/guaranteed parking and providing an efficient car parking arrangement.

5.6.4 The Residential Car Parking Research report method has been adopted to consider the forecast demand for parking for different sizes and types of property allowing for different levels of allocated parking.

5.6.5 The calculations are based on an indicative housing schedule and current car availability trends within wider St Albans. As part of the proposed development strategy, there is the potential that behaviour and attitudes around car ownership may be more aspirational than amongst existing residents meaning lower levels of car parking demand. The ratios and calculations within this note however provide a starting point.

Proposed Car Parking Ratios

5.6.6 The calculated car parking ratios and demand based on the 2011/2021 census data for car availability in St Albans are set out in Table 5-1.

Table 5-1: Residential Car Parking Demand Calculations

	Quantum	Allocated Parking	Unmet Demand	Visitor Parking	Total Parking	Allocated	Unallocated	Total Parking
Houses								
		0	1.1	0	1.1	0.0	1.1	48
1 bed	45	1	0.2	0.2	1.4	1.0	0.4	65
		0	1.2	0	1.2	0.0	1.2	305
		1	0.3	0.2	1.5	1.0	0.5	395
2 bed	260	2	0.1	0.2	2.3	2.0	0.3	585
		0	1.5	0	1.5	0.0	1.5	524
		1	0.5	0.2	1.7	1.0	0.7	625
3 bed	357	2	0.1	0.2	2.3	2.0	0.3	826
		0	1.8	0	1.8	0.0	1.8	236
		1	0.8	0.2	2.0	1.0	1.0	267
4 bed	134	2	0.2	0.2	2.4	2.0	0.4	321
		0	2.0	0.0	2.0	0.0	2.0	49
		1	1.1	0.2	2.3	1.0	1.3	54
5 bed	24	2	0.3	0.2	2.5	2.0	0.5	60
Apartments								
		0	0.9	0	0.9	0	0.9	68
1 bed	77	1	0.1	0.2	1.3	1	0.3	103
		0	1.1	0	1.1	0	1.1	21
2 bed	19	1	0.3	0.2	1.5	1	0.5	28

5.6.7 As can be seen from Table 5-1, the more allocated parking which is provided, the greater the unmet demand, leading to the provision of more parking overall. Considering a balance between marketability whilst maximising efficiency of car parking, a mix of allocated and unallocated parking is suggested as follows:

- Apartments: Car parking would be provided within a communal area for the apartment blocks. This would be offered on a lease arrangement whereby residents have to pay for the use of a parking space. This would be clearly promoted through the sales process. The quantum of parking proposed for this element therefore reflects the calculated overall demand where spaces are not specifically allocated. This would equate to 79 car parking spaces for the 96 apartments. A ratio of **0.92 spaces per dwelling.**
- Houses (1/2/3 bed): The provision of one allocated parking space per dwelling with adequate unallocated parking to meet unmet demand forecast along with the provision of visitor parking. This equates to:
    a. 662 allocated parking spaces; and
    b. 422 unallocated/visitor parking spaces.
    c. A total of 1,085 spaces for 662 dwellings. A ratio of **1.64 spaces per dwelling**.
- Houses (4/5 bed): The provision of two allocated parking spaces per dwelling with adequate unallocated parking to meet unmet demand forecast along with visitor parking. This equates to:
    d. 316 allocated parking spaces; and
    e. 65 unallocated/visitor parking spaces.
    – A total of 381 spaces for 158 dwellings. A ratio of **2.41 spaces per dwelling**.

5.6.8 An overall provision of 978 allocated parking spaces and 576 unallocated parking spaces is therefore suggested. This is a total of 1,554 spaces for 916 dwellings, equating to an **overall ratio of 1.70 spaces per dwelling** across the standard residential elements of the development as a whole.

Specialist Residential

5.6.9 For the retirement and adult social care accommodation, it is proposed to provide parking in line with demands forecast and set out in Table 5-1. Since the data is not provided by population demographic, the numbers contained in Table 5-1 are adopted and are deemed to be robust.

5.6.10 It is proposed to provide a communal car parking area where parking is not specifically allocated to a specific dwelling. A total of 80 parking spaces are proposed for 84 dwellings, a ratio of **0.95 spaces per dwelling.**

5.6.11 Again this provision is below that typically required within St Albans. Albeit this has been based on evidence as well as being supported by the low carbon transport strategy for the development.

Local Centre

5.6.12 The local centre will be provided primarily to meet local need from within the development. It will be well served by active travel routes and public transport routes linking to all areas of the development as well as to neighbouring areas, to support non-motorised journeys. As such, it is intended that there will be a very low provision of standard car parking which is supported by HCC.

Whatever parking is provided would be shared between the various uses reflecting that different land uses often attract peaks in parking demand at different times of the day. Provision will be made for disabled parking to meet demand and local/national standards.

5.6.13 Precise details will be determined at reserved matters stage once the composition of local centre uses is known.

Primary School

5.6.14 Parking for the primary school is proposed to be provided in line with the draft Parking Standards within the Emerging Local Plan to meet the likely demands from staff and visitors who are likely to still travel from off-site.

5.6.15 The school will be well connected to the development and surrounding areas via active travel routes. As such, it is not intended to provide dedicated drop off and pick up facilities for pupils as this could encourage a higher number of vehicle trips for pupil movements. This will be subject to further discussion at Reserved Matters stage.

5.7 Parking Provision Summary

5.7.1 In line with the Emerging Local Plan Parking Standards, a more bespoke approach to parking has been considered.

5.7.2 This includes the principles of:

i) The provision of a higher than minimum standard of cycle parking.

j) The provision of car parking below the emerging standards for smaller development within St Albans. This is supported by the proposed low carbon transport strategy offering real alternatives to private car use and ownership.

k) The residential parking ratios are based on evidence of car availability within wider St Albans and the provision of a balance between allocated and unallocated parking to strike a balance between marketability of properties and efficiency of car parking usage. The aspirations and travel behaviour may be different within the proposed development which could encourage lower levels of demand. The overall standard residential parking ratio equates to a provision of **1.7 spaces per dwelling** within specialist accommodation a ratio of **0.95 spaces per dwelling**.

l) The precise details are proposed to be agreed at Reserved Matters stage but it is intended that the ratios and approach set out provide a sensible starting point.

5.8 Servicing Arrangements

5.8.1 The internal network will be designed to accommodate service, delivery, refuse and emergency vehicles. It will however be ensured that the requirements for these vehicles will not dominate the street design.

5.8.2 There will also be appropriate servicing arrangements for the local centre which could be supported by a management strategy to control service vehicle movements in this area so as not to dominate the environment.

5.8.3 Digital connectivity will offer the new community access to a wide range of services which will help to reduce the need to travel such as supermarket deliveries, online shopping, fast food delivery and online medical consultations and prescription deliveries. It is proposed that parcel lockers are introduced in the local centre area to minimise the need for all deliveries to go deep into the development's tertiary street network.

6 Wider Transport/Movement Strategy

6.1.1 The Travel Demand Model (see proceeding chapters) has been used to inform and validate the wider transport and movement strategy along with offsite active travel enhancements and public transport strategy.

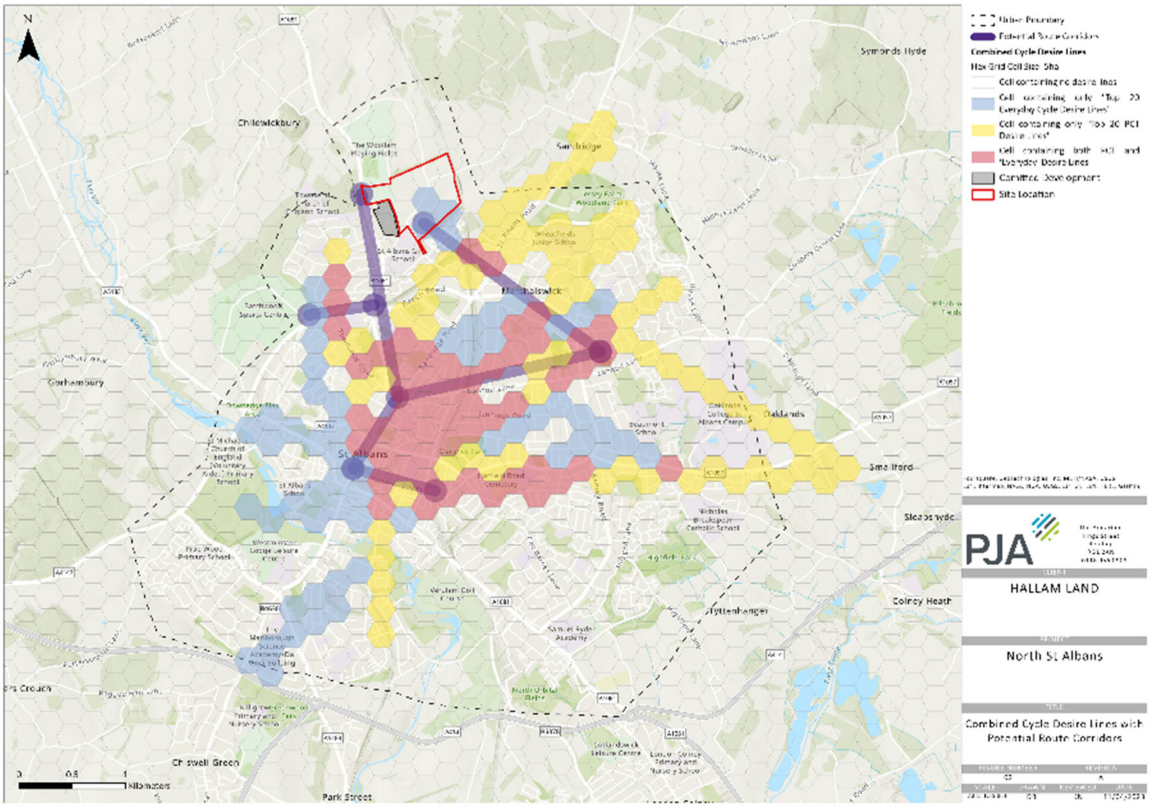
6.2 Active Travel Strategy

6.2.1 The active travel strategy has been determined using an evidence-based approach. The potential desire lines for active travel movements have been determined through analysis of various datasets within GIS software. This comprises:

- Propensity to Cycle Tool[3] (PCT) data analysis which provides an approximation of commuting trips which could be undertaken by bicycle.
- Everyday trip analysis which considers potential desire lines of other purposes of trips including leisure, recreation and amenity.

6.2.2 The full methodology of this assessment process is set out in Technical Note 05920-T-03-A included at **Appendix B**. The key desire lines have been determined as shown in **Figure 6-1**.

Figure 6-1: Proposed Active Travel Desire Lines

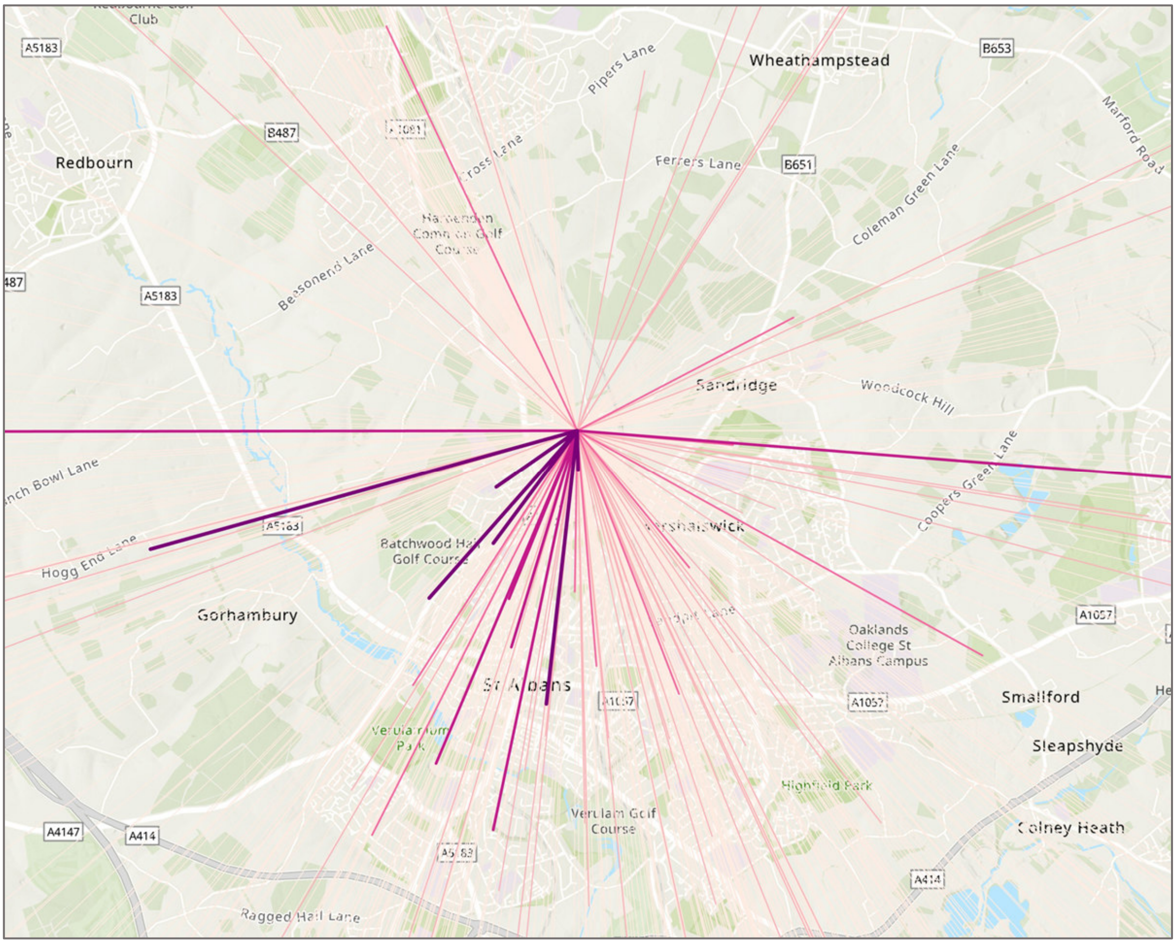


[3] [Welcome to the Propensity to Cycle Tool (PCT)]

6.2.3 Following analysis of the mobile network data, journeys to/from residential elements of the New Greens area (as a proxy for the development) have also been examined. This has established a significant pull to / from various destinations / origins within short walkable or cyclable distances of the site which are known to be undertaken by vehicle modes. This represents an opportunity to encourage these shorter distance journeys to be undertaken by active travel models.

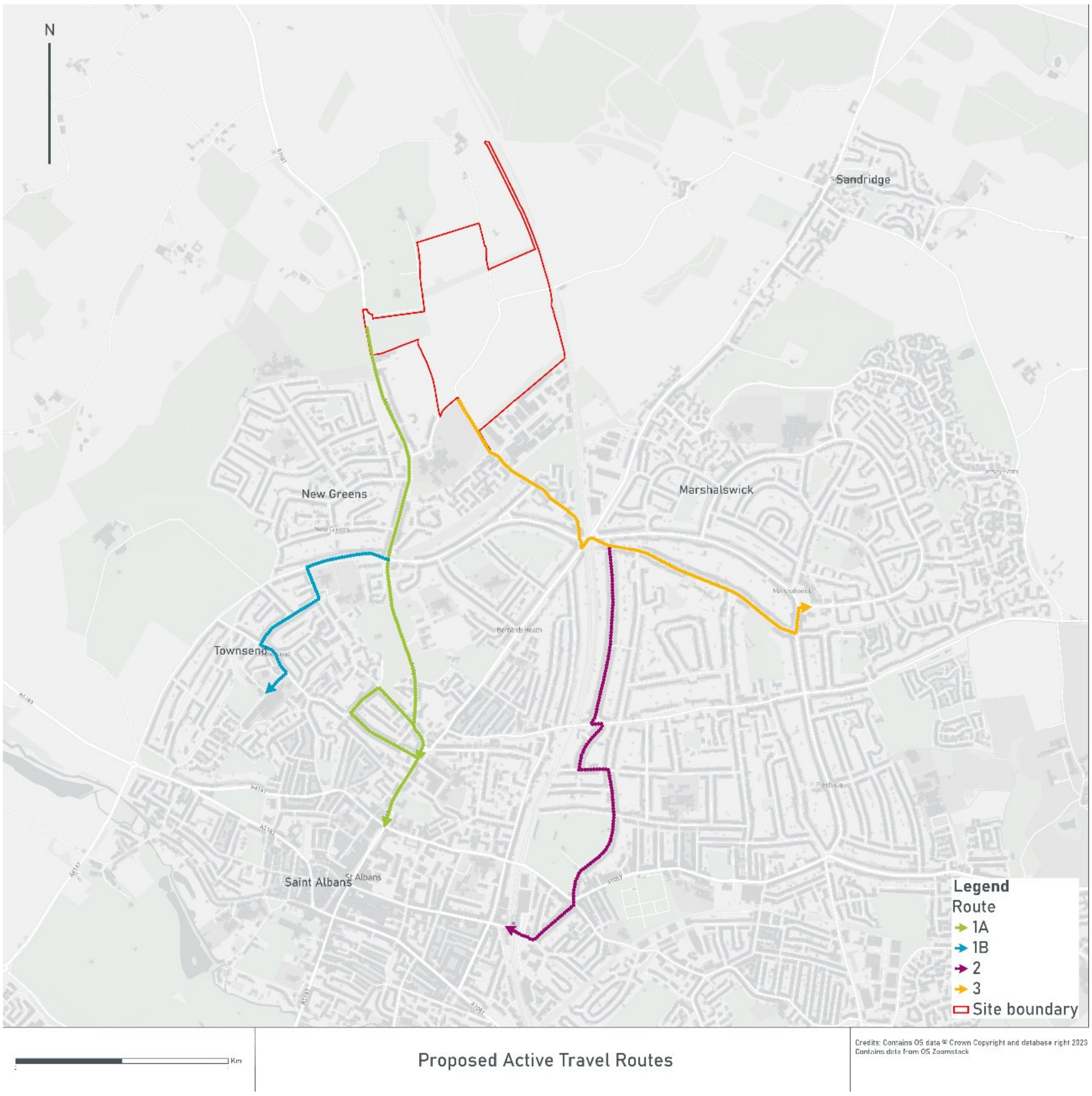
6.2.4 This is demonstrated in **Figure 6-2** and is line with the findings shown in **Figure 6-1** which further validates the routes/corridors which have been identified for improvement.

Figure 6-2: Mobile Network Data – Forecast Vehicle Desire Lines



6.2.5 From the identified desire lines, a series of routes for active travel enhancements have been established. These are set out in **Figure 6-3**. The desire lines and identified corridors resulting from these, align with some of the key corridors identified through the LCWIP, as set out in further detail in Appendix A.

Figure 6-3: Proposed Active Travel Routes



Preliminary Design

6.2.6 The corridors defined as part of the initial route assessment have been taken forward to concept design to provide greater certainty on the level of infrastructure that could be delivered either by the developer under a Section 278 agreement or via contribution to enable the Highway Authority to design and deliver where measures become more strategic in nature, such as the requirement to introduce one-way working, remove parking and reconfigure junctions some distance from the site. Additionally, the Highway Authority would need to implement any traffic regulation orders required for the prohibition of motor vehicles, parking restrictions, banned turns and one-way working required as any part of the proposals.

6.2.7 The split of infrastructure which might reasonably be delivered by development or via contribution is to be agreed, but it is suggested that the measures falling to the south of a virtual line running along Waverley Road and Sandpit Lane should be considered strategic in nature and fundamental to the wider transport strategy aspirations for the district and county as a whole.

6.2.8 The design of the active travel infrastructure has been undertaken in accordance with LTN 1/20 with consideration given to traffic speeds and flows along links as well as taking account of land constraints.

6.2.9 These improvements form three broad routes/corridors with detailed drawings showing the improvements to the Ancient Briton and King William IV junctions included in Appendix F.

- **Route 1A - A1081 Site to St Albans City Centre:**
  - Improvements to the Ancient Briton junction and scheme to tie into the Hunston Development off-site improvements to the north of the junction.
  - Side road entry treatment including continuous footway along the A1081 Harpenden Road.
  - Constrained widths between the Ancient Britton Junction and Townsend Drive mean it is not possible to accommodate segregated cycling infrastructure along this section. Vehicle flows are of sufficient volume that it would not be appropriate for cyclists to cycle within the carriageway in this location.
  - Enhance the quality of the path surface along the national cycle route through the woods at Bernards Heath to provide a parallel route to the A1081 which is suitable for use during all seasons.
  - Carlisle Avenue and Townsend Avenue Cycle Street have been traffic calmed with raised tables and visual narrowing to provide a quieter alternative route for the constrained sections of Harpenden Road.
  - A combination of shared use and segregated facilities on the A1081 south of Townsend Avenue to fit with highway boundary constraints.
  - Reconfiguration of the A1081/A4147 junction to accommodate separate north/south cycle facilities.
  - Use of the service road alongside the A1081 south of the A4147 leading to segregated cycle facilities terminating at Market Place where it is proposed a mobility hub would be provided to include cycle parking. This would allow those travelling into St Albans by bicycle to park and then complete the remainder of their journey on foot.
- **Route 1B - Batchwood Drive/Hospital:**
  - Segregated cycle facilities along the southern side of Batchwood Drive. This requires land outside the adopted the highway boundary, but the land required is within the control of SACDC. The land also forms part of the Beech Bottom Dyke Scheduled Ancient Monument – delivery of these improvements would be subject to discussion, agreement and the securing of appropriate consents.

  - Shared use facility along Townsend Drive linking to Batchwood View, including the potential introduction of a modal filter between Langley Cresent and Batchwood View.
  - Traffic calming measures along Batchwood View/Margaret Avenue/Eleanor Avenue/Alban Avenue to provide a quiet route for cyclists within the carriageway, connecting to Waverley Road.
  - Shared use facility on Waverley Road with parallel crossing linking to hospital site active travel access.
- **Route 2 – Valley Road, King William IV junction, Gurney Court Road, Sandpit Lane, Clarence Road to St Albans City Railway Station:**
  - Modal filter of Valley Road (as per LCWIP) to reduce vehicle flows and traffic calming to reduce speeds to allow mixed traffic cycling. Traffic calming features to include side road entry treatment and priority features.
  - Provision of shared use facility at the southern end of Valley Road leading to a segregated cycle crossing through the King William IV junction. Provision of toucan crossings through the King William IV junction and shared use facilities connecting into these.
  - Modal filtering of Gurney Court Road (as per LCWIP) and traffic calming to provide suitable conditions for mixed traffic cycling. Traffic calming features to include raised tables at junctions and priority features.
  - Rationalisation of the Gurney Court Road/Sandpit Lane junction to provide separate route through for cyclists towards Blenheim Road which is a lightly trafficked road suitable for mixed traffic cycling.
  - Junction treatment at the Jennings Road/Blenheim Road junction to reduce vehicle speeds with route towards the restricted byway to Gainsborough Avenue.
  - Shared use facility along Clarence Road.
  - Reconfiguration of the A41057/B691 junction including introduction of one-way traffic on Stanhope Road to allow contraflow cycling.
  - Continuation of contraflow cycle lane on Stanhope Road.
  - Reconfiguration of Stanhope Road/Victoria Street junction to provide traffic free access to the railway station and the Alban Way to the south.
- **Route 3 – Marshals Drive and Marshalswick Lane:**
  - Traffic calming on Marshals Drive to reduce vehicles speeds and to provide suitable conditions for mixed traffic cycling.
  - Provision of shared use facility at the Marshals Drive/Marshalswick Lane junction leading to a parallel crossing over Marshalswick Lane with continuation of shared use facility along Marshalswick Lane linking to the Marshalswick Local Centre via a parallel crossing over The Ridgeway.

6.2.10 The reconfiguration of the A1081/A4147 junction and A41057/B691 junction could impact on the capacity and operation of these junctions. Junction capacity models have therefore been created to test the proposed interventions using baseline traffic flows.

6.2.11 The precise mechanism for funding and/or delivery of Active Travel Infrastructure measures will be discussed and agreed post submission.

6.3 Public Transport Strategy

6.3.1 The proposed public transport strategy looks to:

- Meet the demands of future residents in terms of where and when they want to travel.
- Ensure there is a viable public transport service in operation for early occupation of the site. The operation of future services would reflect the development phasing with further service provision implemented at a time when it is beneficial.
- Be viable and self-sustaining in the long term. It is likely that there will be a requirement for some pump priming of services earlier on (funding arrangements to be discussed and agreed) but the intention is that any service enhancements would become broadly self-sustaining through revenue from fares. A high-level calculation of revenue and costs is included in Appendix G.

Development Phasing

6.3.2 The development would be built out in phases starting in the area nearest the vehicular site access on the A1081 Harpenden Road and working eastwards. The public transport strategy would reflect this. During early occupation of the site, it is intended that the necessary infrastructure would be put in place to allow the existing services to be used by residents.

6.3.3 As the site is built out further, service enhancements would be introduced to serve the development with a bus entering and directly serving the site. In terms of vehicular access, it is intended that public transport access would be provided via the A1081 Harpenden Road only and therefore services would need to route in and back via this point. This is due to the unsuitability of Valley Road and Sandridgebury Lane as public transport routes due to their constrained widths, rural nature and potential impacts on patronage.

6.3.4 Guidance specifies an acceptable walking distance of 400m to a bus stop, with a good proportion of the development within 400m of the existing bus services on the A1081 Harpenden Road. In reality, greater distances are still acceptable for access to good quality bus services. Therefore, whilst the phasing of the strategy will look to align to ensure convenient access to buses within the guideline distance of 400m, there will be some flexibility in the precise timings for the delivery of the extended service into the site to serve those units deeper in the development.

Bus Strategy – Early Phases

6.3.5 There are existing bus stops on the A1081 Harpenden Road serving Arriva service 321 and recently introduced 721 service, which combined offer a 15-minute frequency service to key destinations which could cater for the needs of residents occupying the site during early phases of the development.

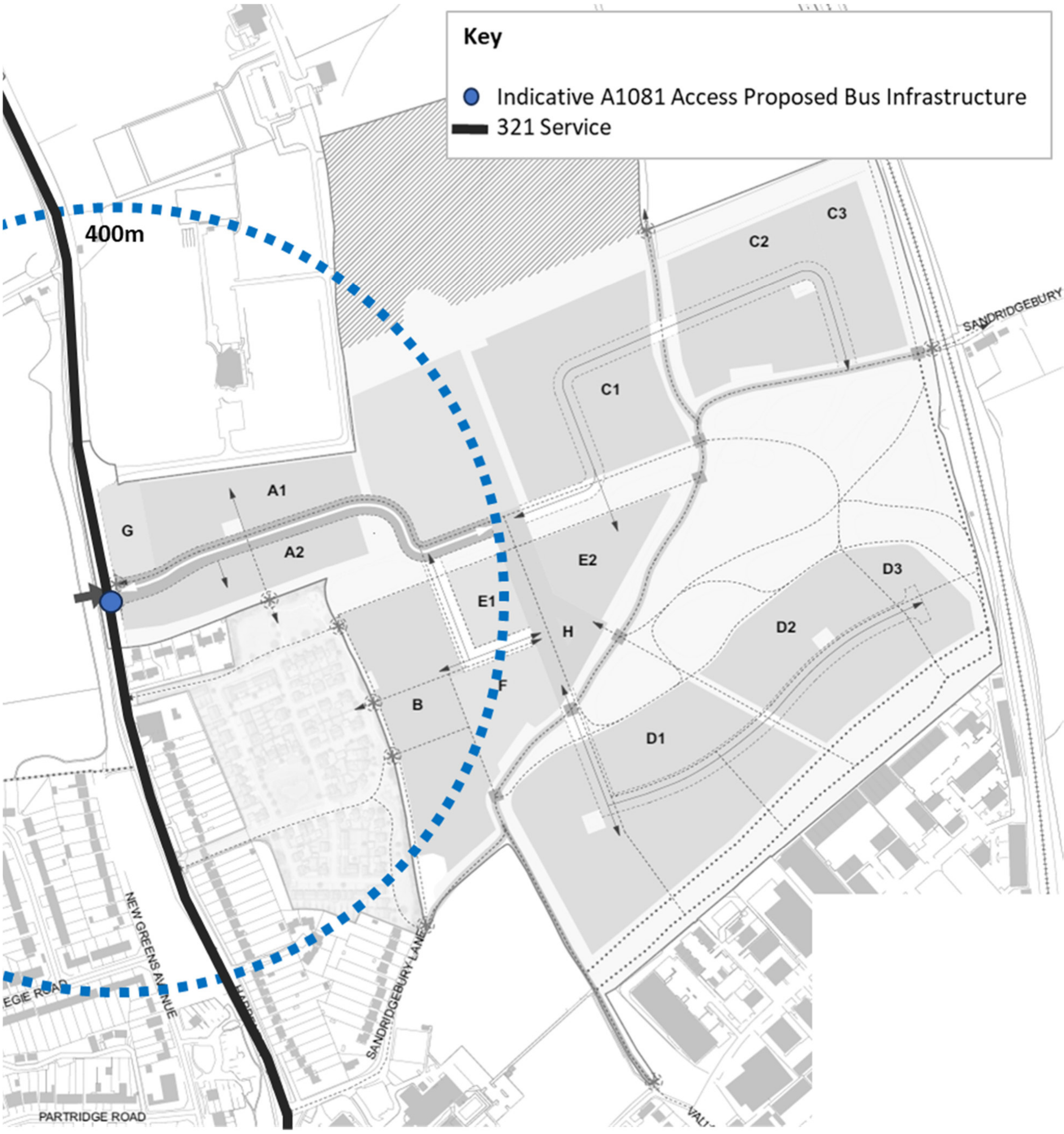
6.3.6 As part of the initial public transport strategy, it is proposed that additional good quality bus stops with shelter provision are provided close to the sites vehicular access point. This would be on the mainline with the southbound stop provided within a layby facility. In addition, good quality routes for pedestrians between the residential areas and these bus stops would be provided on-site.

6.3.7 This would provide residents with convenient access to a frequent service operating from early morning until night, 7 days per week.

6.3.8 Other existing services could also be accessed from the development, including the 653 service which serves stops approximately 750m from the proposed development.

6.3.9 The applicant would commit to early delivery of suitable bus stops / bus hub adjacent to the site access and suitable pedestrian infrastructure to connect residential properties and the bus infrastructure, secured via planning condition. Furthermore, travel plan measures would be pursued to encourage public transport use including free taster tickets and timetabling information.

Figure 6-4: Indicative Public Transport Strategy (Early Phases)



Bus Strategy – Later Phases

6.3.10 As part of later development phases, it is intended that the 321/721 service would continue operating serving stops adjacent to the site access and along Harpenden Road. This would allow residents to access a frequent and direct service to key destinations via the main access road and via routes through the adjacent consented development.

6.3.11 It is unlikely to be viable or attractive for operators to re-route the 321/721 further into the development due to increases in journey times on this direct inter-settlement route. It is also unlikely to be viable to provide a wholly new route to St Albans as this would likely only attract patronage from the development as there would be duplication with other services along most of the route to / from St Albans.

6.3.12 It is therefore proposed to provide enhancements to a key local route. The 653 service terminates in the New Greens estate circa 750m from the development site with a turnaround via the existing residential street network. This route could be extended to the proposed development. Since the layover time at New Greens is limited, it would likely require an additional bus to be deployed to allow for the increase in route length.

6.3.13 The service would then route through the vehicular access from the A1081 Harpenden Road and serve the local centre area where a central mobility hub would be provided with space for vehicle layover. The bus would then turn in this area and exit the site to the Harpenden Road.

6.3.14 The applicants would commit to proportionate funding to support an additional bus service to be agreed with HCC in line with revenue and cost estimates and secured via s106. The provision of on-site infrastructure to serve buses including local bus stops, central mobility hub and layover area, would be secured via planning condition.

Figure 6-5: Indicative Public Transport Strategy (Later Phases)

Rail Access

6.3.15 Rail provides significant opportunities for longer distance journeys particularly towards London. The proposed bus strategy for the site facilitates movements between the site and railway stations:

- St Albans City Railway Station – Served by 653 service.
- Harpenden Railway Station – Served by 321 services (200m walk).
- St Albans Abbey Station (rail services to Watford) – Served by 321 service.

6.3.16 The proposed active travel strategy will also help to facilitate links towards St Albans.

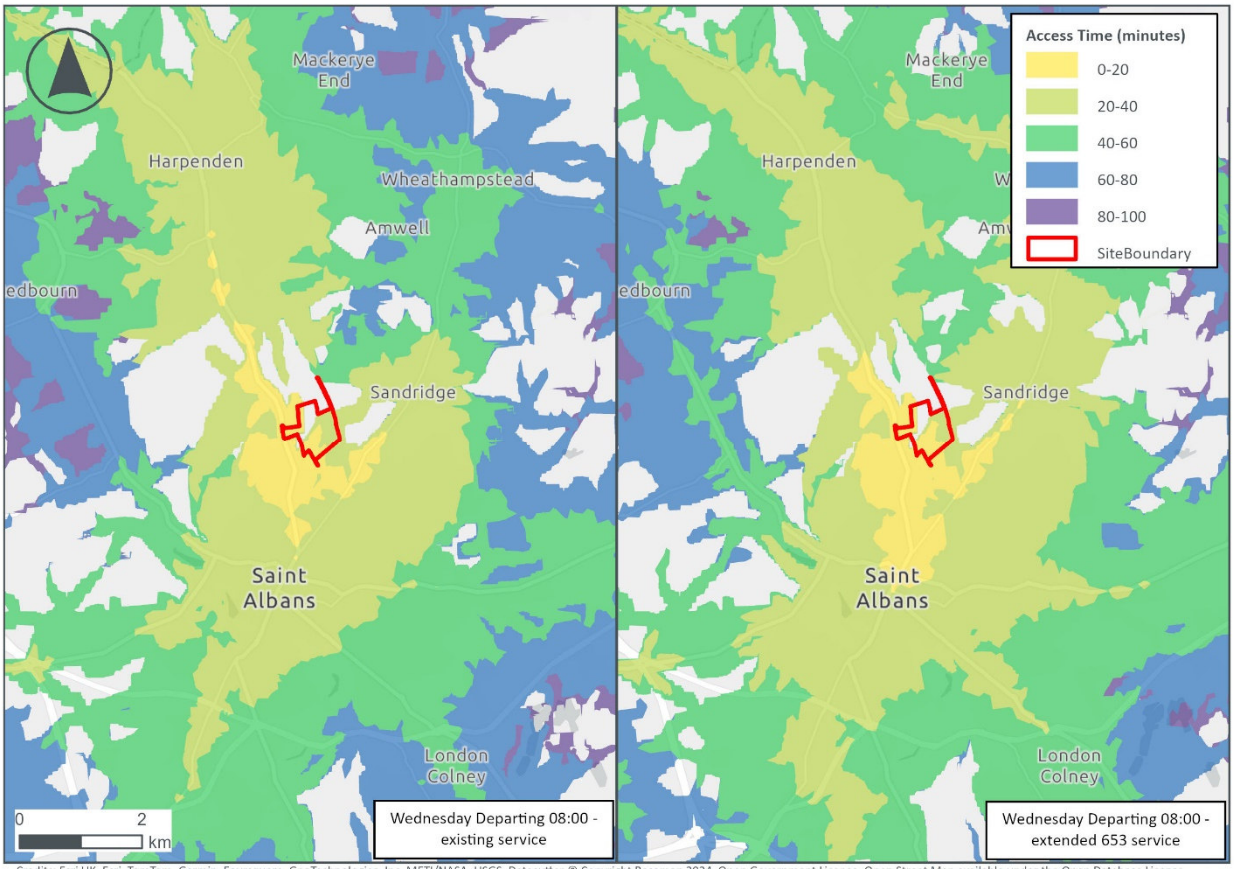
Changes to Transport Accessibility

6.3.17 Podaris has been used to visualise the above improvements to public transport using the same parameters outlined in Section 3.4. Within the software, bus route 653 has been extended to the proposed mobility hub within the site using an indicative site layout. For the assessment, the route has been simplified to operate the following service patterns:

- Monday – Saturday: 06:00-22:00 every 30 minutes; and
- Sunday: 07:00-19:00 every hour.

6.3.18 Figure 6-6 shows the changes to travel times within the St Albans Area compared to that presented in Section 3.4. The provision of the extended 653 service reduces travel times to St Albans City Centre to 20 minutes or under. There are also improvements to travel times to areas such as Sandridge and Harpenden.

Figure 6-6: Podaris Travel Time Comparison – local context



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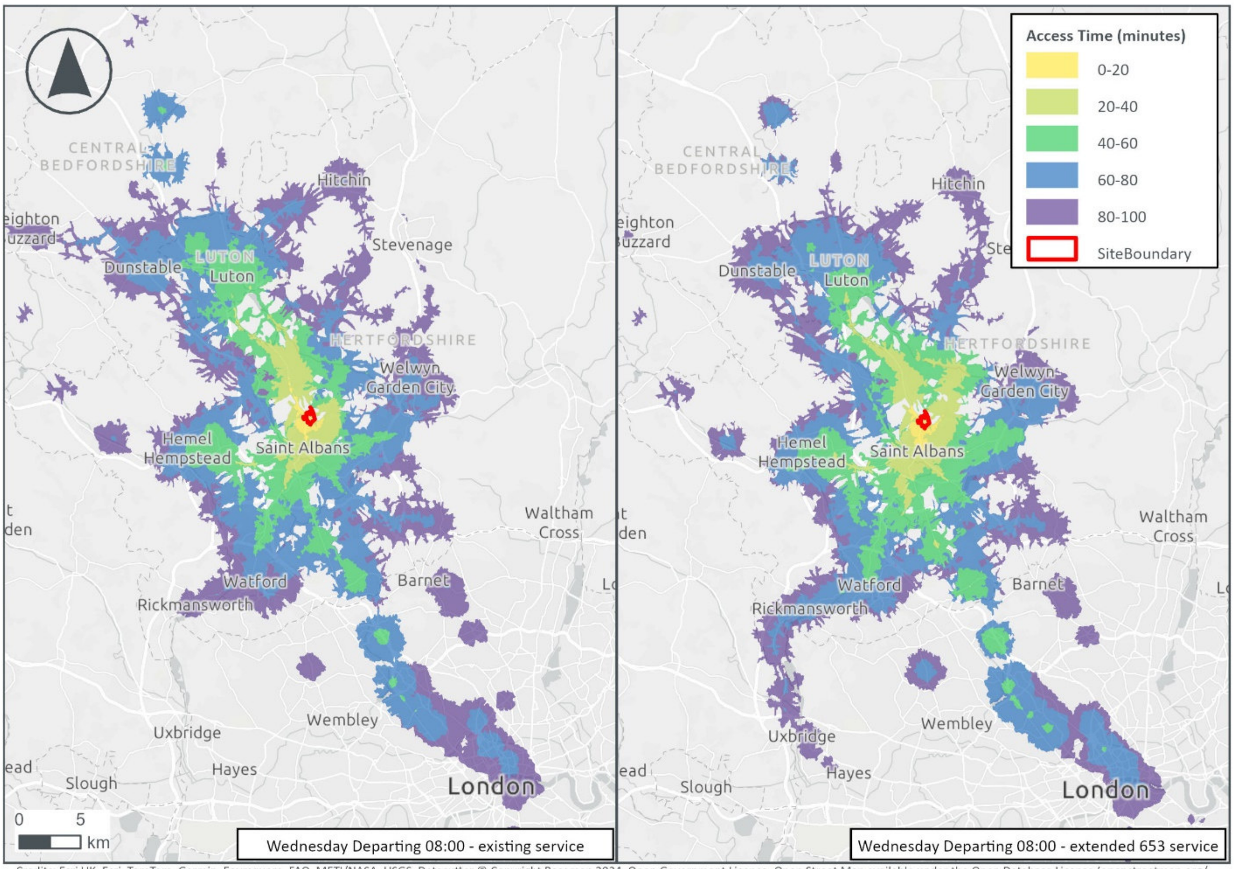
6.3.19 Figure 6-7 shows the changes to travel times on a regional scale Area compared to that presented in Section 3.4. The provision of the extended 653 service reduces travel times to local destinations such as Luton, Hertford and Watford. Areas around West London such as Uxbridge and Hayes would be newly accessible within 80-100 minutes. There are also some improvements to travel times to North and Central London.

Figure 6-7: Podaris Travel Time Comparison – regional context



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7 Travel Demand Model

7.1 Introduction

7.1.1 It has been agreed in scoping discussions with HCC that a comprehensive Travel Demand Model (TDM) will be used to understand baseline and future trip making patterns at the proposed development and within existing nearby communities.

7.1.2 Further details regarding the specifics of the TDM are set out in this chapter, and a more detailed technical note has been included in **Appendix H**.

7.2 Development Quantum

Assessed Development Quantum

7.2.1 The development quantum assessed within the TDM is as follows::

- Up to 900 residential dwellings plus;
- Up to 80 retirement living units;
- An ExtraCare facility with up to 80 beds; and
- A 2 Form Entry (2fE) primary school, with capacity for up to 420 pupils.

7.2.2 For this assessment, no allowance has been made for the local centre uses. Whilst it is recognised that the local centre may generate trips, the facilities are intended to be small scale and meet the daily needs of future residents on-site. Therefore, it is anticipated that these trips are likely to be made by residents on-site and an internal only trip primarily undertaken by sustainable travel modes.

7.2.3 Given that the donor site from which residential trip rates have been calculated contains no local centre and no primary school, it is reasonable to assume that trips associated with these journey purposes will be included for within this assessment, albeit this is likely to result in an overestimation of off-site trips.

7.2.4 As set out in the separate Technical Note, the proposed pitch relocation is not forecast to generate any additional movements over and above the current operation and so this has not been considered further in the proceeding chapters.

Comparison to the Proposed Development Quantum

7.2.5 The calculation of the trip generation estimates and associated modelling of highway impacts, was undertaken some months ago, to inform ongoing discussions with the local highway authority and to shape the evolving transport strategy, in advance of the drafting of this Transport Assessment. Since this time, the masterplan has progressed following pre-application discussions with the local authorities and subsequent design iterations incorporated. As such, there are some minor differences between the development quantum assessed and that for which planning permission is sought.

7.2.6 A comparison of the development quantum assessed to the development quantum for which planning permission is sought is given in Table 7-1.

Table 7-1: Comparison of Assessed and Proposed Residential Development Quantum

Housing Type	Dwellings Included within Assessment	Dwellings Proposed
Standard Housing (Sewell Park)	150[4]	123[5]
Standard Housing (Woollam Park)	900	916
Elderly Specialist Accommodation	Retirement Units – 80 Care Home Beds – 80 *Total - 160*	Retirement Units – 80 Care Home Beds – 80 *Total - 160*
Adult Disability Units	-	4
Total	**Standard Housing – 1,050** **Specialist Accommodation – 160** **Total – 1,210**	**Standard Housing – 1,039** **Specialist Accommodation – 164** **Total – 1,203**

7.2.7 The combined development quantum assessed allowing for both Sewell Park **and** Woollam Park is marginally above the proposed development quantum for which planning permission is sought. In particular, a higher quantum of standard housing, which generates a greater volume of traffic per dwelling than the specialist residential accommodation, has been assessed. As such, the overall assessment is deemed to be suitably robust.

7.2.8 Considering the allowance made for Woollam Park alone, there is an additional 20 homes proposed than what has been assessed (16 standard residential units and 4 adult disability units). The 20 additional homes represents an increase in development of around 2% in the residential quantum and this would result in a maximum of 10-12 additional vehicle movements (two-way) before any reductions are applied for modal shift.

7.2.9 It is therefore considered that the assessment of highway impacts within this TA and based on the assessed quantum is robust. Furthermore, this small difference in vehicle trips is well within the daily fluctuation of traffic that might be expected within the site and on the local highway network.

7.3 Travel Demand Model Principles

Introduction

7.3.1 The TDM is a four-stage model that considers trip generation, trip distribution, assignment and mode share with a summary shown in Figure 7-1. The TDM is broken down into two elements:

[4] Allowed for as "Committed Development"
[5] Reserved Matters Application

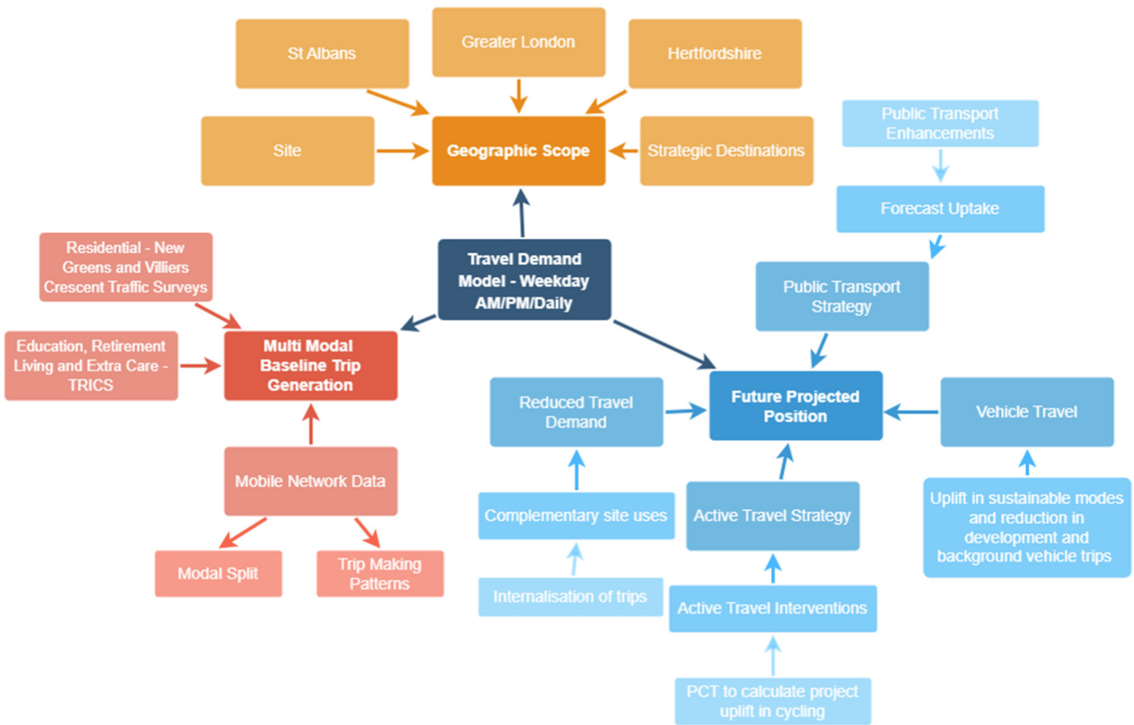
- **Development** – This captures trips to and from the proposed development as well as those internal to the development.
- **Background** – This captures trips along adjacent networks but which do not enter/exit the development.

7.3.2 There are two broad scenarios considered within the TDM:

- **Core/Baseline** – This is based on current travel patterns, i.e., a 'business as usual' scenario which assumes car use continues historic trends.
- **Aspirational** – This is based on more aspirational travel patterns, i.e., resulting from sustainable travel interventions. It is based on data and evidence to understand the potential modal shift which could occur for those journeys which would be directly affected by the interventions (i.e., not a blanket application of modal shift but a targeted one). '*Low*' and '*high*' modal shift scenarios are considered as set out in later chapters.

7.3.3 The model considers typical weekday morning, evening peak and daily periods.

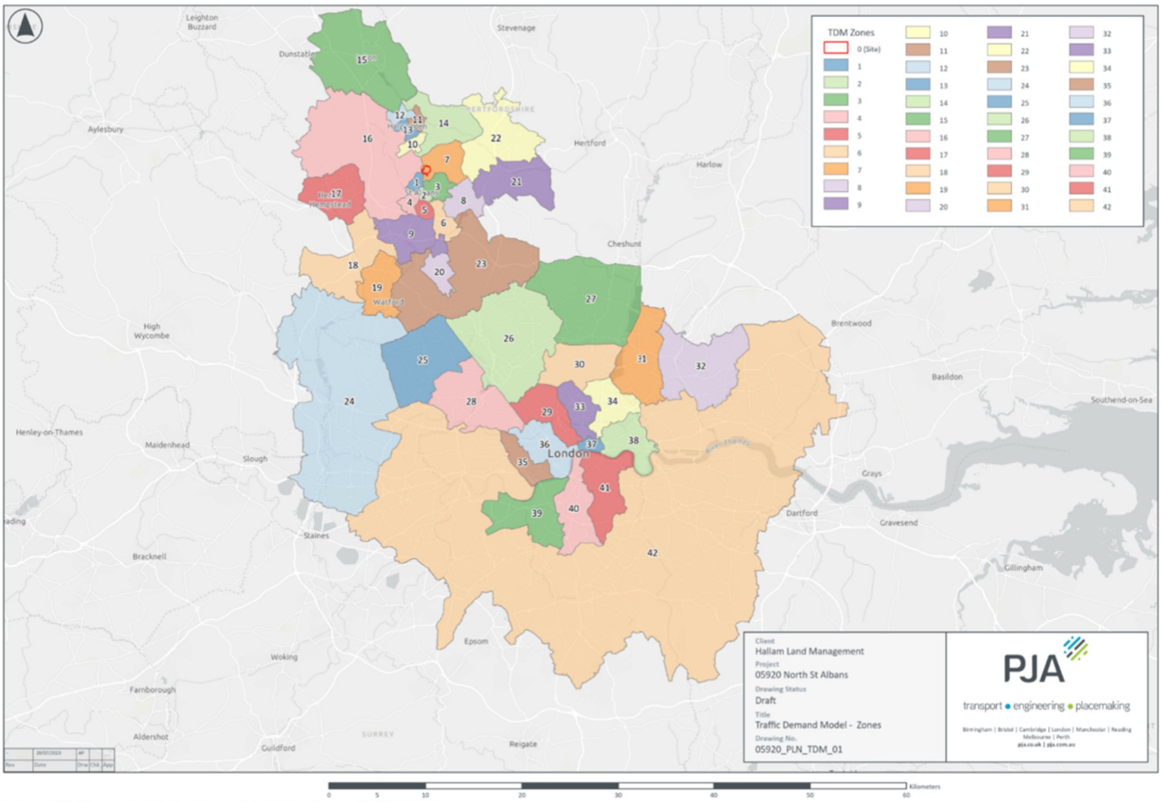
Figure 7-1: Travel Demand Model Principles



Geographic Scope

7.3.4 The geographic scope of the TDM is illustrated in Figure 7-2. The geographic scope has been determined to understand travel behaviours on a small scale (i.e., within proximity of the site) and a wider level (i.e., St Albans and the surrounding counties and region). The coverage/zoning is shown in Figure 7-2 and has been agreed with HCC.

Figure 7-2: Travel Demand Model Zone Coverage



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Data Inputs and Outline Approach

7.3.5 The TDM calculations have been informed by various datasets. A summary of the approach to each element of the four stage TDM and the data inputs is provided in Table 7-2. Further details are provided in proceeding sections and the Technical Note in Appendix H (including a mobile network data integrity note).

Table 7-2: TDM Approach and Data Inputs

TDM Element / Scenario	Core/Baseline	Aspirational
Development	• **Trip Generation:** Donor site surveys, TRICS • **Trip Distribution:** Mobile network data for proxy area. • **Modal Split:** Mobile network data / HCC Travel Survey. • **Vehicle Trip Assignment:** Traffic congestion data to inform routing of trip distribution of vehicle trips.	• **Person trip generation and distribution:** Fixed from Core/Baseline • **Modal Split:** PCT Data applied to journeys where proposed interventions are to understand modal shift from baseline. • **Vehicle Trip Assignment:** Traffic congestion data to inform routing of trip distribution of revised vehicle trips.
Background	• **Trip generation, distribution, modal split:** Mobile network data for journeys within defined zones. • **Vehicle Trip Assignment**: Traffic congestion data to inform routing of trip distribution.	• **Person trip generation and distribution:** Fixed from Core/Baseline. • **Modal Split:** PCT Data applied to journeys where proposed interventions are to understand modal shift from baseline. • **Vehicle Trip Assignment:** Traffic congestion data to inform routing of trip distribution of revised vehicle trips.

7.4 Development Trip Generation

Residential

7.4.1 As agreed with HCC, residential person trip rates and the resultant trip generation has been calculated using multi-modal surveys undertaken for residential areas near the site, as a proxy for the proposed development. The following areas have been used as a suitable proxy for the development:

- Villiers Crescent – An ATC survey was undertaken in to understand vehicle trip generation associated with a wholly residential area; and
- New Greens (Woollam Crescent, Toulmin Drive and Maple Avenue) – multi-modal surveys were undertaken to understand the pedestrian, cycle and public transport trip generation.

7.4.2 The resultant person and vehicle trip rates and trip generation is summarised in Table 7-3 below, and further details are provided in **Appendix B.**

Table 7-3: Residential Person Trip Rate and Generation per Dwelling (900 dwellings)

Time Period	Person Trip Rate			Person Trip Generation		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
07:00-08:00	0.202	0.546	0.748	182	492	673
08:00-09:00	0.707	1.336	2.042	636	1202	1838
09:00-10:00	0.294	0.395	0.689	265	355	620
10:00-11:00	0.333	0.377	0.710	300	339	639
11:00-12:00	0.343	0.440	0.783	309	396	705
12:00-13:00	0.394	0.356	0.750	355	320	675
13:00-14:00	0.428	0.417	0.845	385	375	760
14:00-15:00	0.347	0.402	0.748	312	362	674
15:00-16:00	1.163	0.677	1.840	1047	609	1656
16:00-17:00	0.593	0.438	1.031	534	394	928
17:00-18:00	0.599	0.461	1.061	539	415	955
18:00-19:00	0.666	0.459	1.125	599	413	1012
12h Daily	**6.069**	**6.302**	**12.372**	**5462**	**5672**	**11135**

Table 7-4: Residential Vehicle Trip Rate and Generation per Dwelling (900 dwellings)

Time Period	Vehicle Trip Rate			Vehicle Trip Generation		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
07:00-08:00	0.066	0.277	0.343	59	249	308
08:00-09:00	0.191	0.394	0.586	172	355	527
09:00-10:00	0.159	0.191	0.350	143	172	315
10:00-11:00	0.145	0.182	0.327	130	164	294
11:00-12:00	0.161	0.177	0.338	145	160	304
12:00-13:00	0.182	0.179	0.362	164	161	326
13:00-14:00	0.173	0.155	0.328	156	140	296
14:00-15:00	0.168	0.201	0.370	151	181	333
15:00-16:00	0.284	0.226	0.511	256	204	460
16:00-17:00	0.264	0.207	0.471	237	186	424
17:00-18:00	0.313	0.221	0.533	281	199	480
18:00-19:00	0.257	0.174	0.432	232	157	389
12h Daily	**2.364**	**2.587**	**4.950**	**2127**	**2328**	**4455**

7.4.3 The above residential trip generation and rates reflects all trips (external and internal). Due to the facilities proposed to be provide on-site at the development, further consideration is given later to the number of trips which would remain internal to the site; this has been included for the primary school but to provide a robust view, no account has been given to the potential internalisation of residential trips due to the presence of the on-site local centre.

7.4.4 A comparison of the resulting vehicle trip rates has been undertaken to more traditional methods, this includes a TRICS analysis and comparison to the Local Plan Transportation Study work undertaken in 2016. The TRICS analysis has utilised the following parameters:

- Category: 03 – Houses, A – Privately Owned
- Regions: Excluding Greater London, Wales, Scotland, Northern Ireland
- Dwellings: 500 – 1500
- Location: Edge of Town

7.4.5 A summary of the TRICS trip rates, Local Plan 2016 Transportation Study trip rate and the donor site trip rates are presented for comparison in Table 7-5.

Table 7-5: Vehicle Trip Rate Comparison

Time Period	AM Peak Hour			PM Peak Hour			Daily 12h		
	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total
Donor Site Survey	0.191	0.394	0.586	0.313	0.221	0.533	2.364	2.587	4.950
TRICS	0.169	0.398	0.567	0.357	0.165	0.522	2.150	2.143	4.293
Local Plan 2016 TS	0.152	0.391	0.543	0.333	0.216	0.549			

7.4.6 The donor site survey vehicle trip rates which are adopted in this assessment are comparable to the alternative trip rates extracted from TRICS and from the 2016 Local Plan Transportation Study. They are also based on local data captured recently. Therefore, these are deemed to be an appropriate assessment parameter for use in the modelling of highway impacts.

Retirement Living and ExtraCare

7.4.7 The use of the TRICS database for the combined extra care and retirement living land uses was discussed and agreed with HCC at the scoping stages, the full methodology is set out in Technical Note 05920-T-02 in **Appendix B**. Table 7-6 summarises the person trip rates and generation.

Table 7-6: Person Trip Generation – Retirement Flats (160 units - 80 bed care home and 80 retirement living units)

Time Period	Person Trip Rate			Person Trip Generation		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
07:00-08:00	0.082	0.143	0.225	13	23	36
08:00-09:00	0.126	0.159	0.285	20	25	46
09:00-10:00	0.209	0.258	0.467	33	41	75
10:00-11:00	0.225	0.275	0.500	36	44	80
11:00-12:00	0.203	0.187	0.390	32	30	62
12:00-13:00	0.253	0.154	0.407	40	25	65
13:00-14:00	0.209	0.198	0.407	33	32	65
14:00-15:00	0.231	0.242	0.473	37	39	76
15:00-16:00	0.198	0.165	0.363	32	26	58
16:00-17:00	0.269	0.187	0.456	43	30	73
17:00-18:00	0.170	0.110	0.280	27	18	45
18:00-19:00	0.088	0.176	0.264	14	28	42
12h (Daily)	**2.263**	**2.254**	**4.517**	**362**	**361**	**723**

Education – Primary School

7.4.8 The use of the TRICS database for the education (primary school) land use was discussed and agreed with HCC at the scoping stages, the full methodology is set out in Technical Note 05920-T-02 in **Appendix B**. Table 7-7 summarises the resultant person trip rates and trip generation.

Table 7-7: Person Trip Generation – Primary School (420 pupils)

	Person Trip Rate			Person Trip Generation		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
07:00-08:00	0.124	0.039	0.163	52	16	68
08:00-09:00	1.296	0.293	1.589	544	123	667
09:00-10:00	0.089	0.122	0.211	37	51	89
10:00-11:00	0.024	0.048	0.072	10	20	30
11:00-12:00	0.038	0.025	0.063	16	11	26
12:00-13:00	0.034	0.051	0.085	14	21	36
13:00-14:00	0.032	0.058	0.090	13	24	38
14:00-15:00	0.140	0.063	0.203	59	26	85
15:00-16:00	0.340	1.044	1.384	143	438	581
16:00-17:00	0.103	0.366	0.469	43	154	197
17:00-18:00	0.028	0.090	0.118	12	38	50
18:00-19:00	0.019	0.027	0.046	8	11	19
12h (Daily)	**2.267**	**2.226**	**4.493**	**952**	**935**	**1887**

7.4.9 It is recognised that a proportion of pupils attending the on-site primary school will also reside on-site, thus representing an internal trip and would not impact the offsite network. As such, the proportion of pupils both residing on site and attending the on-site primary school has been estimated, and applied to the trip generation to understand the internal and external trips related to the school separately so that appropriate discounts can be applied. This has been determined through a gravity model approach considering the weighting for education trips based on proximity to facility. Full details on how this has been calculated are provided in the technical note in **Appendix H. Table 7-8** below summarises the resultant internal and external trips.

Table 7-8: Person Trip Generation – Primary School (420 pupils) – Internal / External Split

Time Period	Total Trips			Internal			External		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals	Arrivals	Departures	Totals
07:00-08:00	52	16	68	27	8	35	25	8	33
08:00-09:00	544	123	667	282	64	345	263	59	322
09:00-10:00	37	51	89	19	27	46	18	25	43
10:00-11:00	10	20	30	5	10	16	5	10	15
11:00-12:00	16	11	26	8	5	14	8	5	13
12:00-13:00	14	21	36	7	11	18	7	10	17
13:00-14:00	13	24	38	7	13	20	6	12	18
14:00-15:00	59	26	85	30	14	44	28	13	41
15:00-16:00	143	438	581	74	227	301	69	212	281
16:00-17:00	43	154	197	22	80	102	21	74	95
17:00-18:00	12	38	50	6	20	26	6	18	24
18:00-19:00	8	11	19	4	6	10	4	5	9
12h (Daily)	**952**	**935**	**1887**	**493**	**484**	**976**	**460**	**451**	**911**

Local Centre and GP Surgery

7.4.10 For this assessment, no allowance has been made for external vehicle trips associated with the local centre uses. Whilst it is recognised that the local centre may generate trips, the facilities are generally intended to be small scale and will primarily meet the daily needs of future residents on-site. Therefore, it is anticipated that these trips are likely to be made by residents on-site and an internal only trip primarily undertaken by sustainable travel modes.

7.4.11 In recent discussions with the local planning authority, a requirement for the provision of health facilities in the form of a GP surgery of approximately 480sqm has been identified. This has not been included within the assessment as it is again likely to serve the needs of residents on-site but there could be a small element of external demand. A TRICS analysis has been undertaken to consider the potential vehicle trip generation of the facility and to justify the approach to the assessment.

7.4.12 The TRICS analysis has utilised the following parameters:

- Category: 05 – Health, G – GP Surgeries
- Regions: Excluding Greater London, Scotland, Northern Ireland, Republic of Ireland
- Size: 200-800sqm
- Location: Edge of Town, Neighbourhood Centre, Suburban

7.4.13 The vehicle trip rates per 100sqm and resulting vehicle trip generation of the proposed facility are summarised in Table 7-9.

Table 7-9: GP Surgery Vehicle Trip Rates and Trip Generation (480sqm)

	Vehicle Trip Rate (per 100sqm)			Vehicle Trip Generation (480sqm)		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
07:00-08:00	1.162	0.145	1.307	6	1	6
08:00-09:00	4.031	2.288	6.319	19	11	30
09:00-10:00	3.486	3.268	6.754	17	16	32
10:00-11:00	3.958	3.776	7.734	19	18	37
11:00-12:00	3.232	3.776	7.008	16	18	34
12:00-13:00	1.997	2.796	4.793	10	13	23
13:00-14:00	1.707	1.561	3.268	8	7	16
14:00-15:00	3.922	3.595	7.517	19	17	36
15:00-16:00	2.687	3.05	5.737	13	15	28
16:00-17:00	2.215	2.505	4.72	11	12	23
17:00-18:00	1.38	1.888	3.268	7	9	16
18:00-19:00	0.808	1.473	2.281	4	7	11
12h (Daily)	**30.585**	**30.121**	**60.706**	**147**	**145**	**291**

7.4.14 In the peak hours, the proposed facility is forecast to generate up to approximately 30 vehicle trips. It is likely that a large proportion of the demand would be from within the development, thus resulting in no vehicle trips on the external network and opportunities for a greater proportion of these trips to instead be undertaken by sustainable modes. There may be a proportion of trips which are generated from the surrounding existing residential areas which could generate an external vehicular demand.

7.4.15 However, this external vehicular demand is likely to be limited in the volume of movements. Furthermore, no discounts for the proposed on-site local centre have been applied within the residential trip generation forecasts to allow for the likely internalisation of such movements. As such, this over allowance is expected to at least offset the proposed external vehicle demands of the medical facilities proposed. As such, no further consideration is given within the assessment to the proposed GP surgery.

Total Person Trip Generation

7.4.16 The total external person trip generation (internal and external) associated with the proposed development is summarised in Table 7-10, below.

Table 7-10: Total Person Trip Generation (Residential and Primary School)

Time Period	Total Person Trips		
	Arrivals	Departures	Total
07:00-08:00	247	531	778
08:00-09:00	1201	1351	2551
09:00-10:00	336	448	783
10:00-11:00	346	403	749
11:00-12:00	357	436	793
12:00-13:00	409	366	776
13:00-14:00	432	431	863
14:00-15:00	408	427	834
15:00-16:00	1221	1074	2296
16:00-17:00	620	578	1198
17:00-18:00	578	471	1049
18:00-19:00	621	453	1074
12h (Daily)	**6777**	**6968**	**13744**

7.5 Development Trip Distribution

Residential

7.5.1 This mobile network data has been utilised to understand existing travel patterns within the New Greens residential area. This local proxy has been used to understand the pull of proposed development trips undertaken by all modes broken down by the time periods provided.

7.5.2 The mobile network data has been provided by:

- **Journey Purpose** – Home, Work and Other, with journeys defined as Home to Home, Home to Work, Home to Other, Work to Home, Work to Other, Work to Work, Other to Home, Other to Other.
- **Mode** – Road (all road modes, including private car, bus, bicycle etc.), Rail and Walking.
- **Time Period** – Extended AM peak, Extended PM peak, Weekday.

7.5.3 For the purposes of the residential distribution, origin / destination pairs for the following have been extracted for the New Greens residential area:

- **Home Based** – residential trips ***departing*** from the New Greens residential area (Home to Work, Home to Other, Home to Home).
- **Home Bound** – residential trips ***arriving*** at the New Greens residential area (Work to Home, Other to Home and Home to Home).

7.5.4 The corresponding destinations of Home Based and origins of Home Bound trips have been used to determine the future distribution of the proposed residential development.

7.5.5 Within the distribution of trips, there would be an internal pull for trips for daily convenience retail and primary school education since these facilities are proposed to be provided on-site. The process for determining this internal pull of trips is as follows:

- **Primary School** – as set out in proceeding sections, a gravity model approach has been undertaken to distribute primary school trips. The relative pull of trips from the on-site community has been determined as part of this gravity model. This number of trips has been treated as internal for the purposes of the residential trip generation and deducted from the person trip generation to determine the external residential trip generation.
- **Local Centre** – the provision of facilities within the proposed development will reduce the need to travel off-site. The donor site area did not contain any other land uses and therefore the donor trip rate will include a proportion of trips associated with short trips to the nearby local centre which is located around 10 minutes' walk away. The provision of local centre facilities within the site would in turn reduce the external trip generation of the development. For robustness, no reductions have been made to the proposed residential development traffic.

Retirement Living & Extra Care

7.5.6 A similar process has been followed as for the standard residential to understand the distribution of retirement living and extra care trips with mobile network data extracted for the same parameters as above but with the further selection of those in an older age demographic of 65+ years.

Primary School

7.5.7 A gravity model based approach has been undertaken for distributing primary school trips. This has utilised a population / distance^2 relationship where the population is the number of people residing living within the TDM zone and the distance is that from the proposed facility to the centre of the TDM zone. This provides a relative weighting for the pull to each TDM (as well as the on-site residential population) which has been used to calculate a percentage distribution.

7.6 Baseline Mode Share

7.6.1 This section sets out the baseline modal share based on current travel behaviours to provide a proxy for the development in the Core/Baseline scenario ('business as usual'). It also forms the basis from which to calculate the projected modal shift in the Aspirational scenarios.

Residential

7.6.2 The same mobile network dataset and parameters used in the trip distribution exercise has been used to understand the zone-to-zone modal split of external trips generated by the residential development.

7.6.3 Since the mobile network data only provides Road, Rail and Walking modes, the Road modes have been disaggregated further using the HCC Travel Survey. The resulting baseline modal split is set out in Table 7-11.

Table 7-11: Baseline Residential External Trips Modal Splits (Mobile Network Data and HCC Travel Survey)

Main Mode	AM Peak	PM Peak	Daily
Road	80%	81%	79%
Road - Cycle	*3%*	*3%*	*3%*
Road - MC/Moped	*0%*	*0%*	*0%*
Road - Scooter/E-Scooter	*1%*	*1%*	*1%*
Road - Bus	*3%*	*3%*	*3%*
Road - Car/Van Driver	*48%*	*49%*	*47%*
Road - Car/Van Passenger	*24%*	*24%*	*24%*
Road - Taxi	*1%*	*1%*	*1%*
Walking	16%	16%	18%
Rail	4%	3%	3%

Retirement Living & Extra Care

7.6.4 Again, the same mobile network dataset and parameters used in the trip distribution has been used to understand the zone-to-zone modal split of trips generated by the specialist elements of the residential development. Again, the HCC travel survey has been used to disaggregate the Road modes further. The resulting baseline modal split is set out in Table 7-12.

Table 7-12: Baseline Elderly/Specialist Residential External Trips Modal Splits (Mobile Network Data and HCC Travel Survey)

Main Mode	AM Peak	PM Peak	Daily
Road	78%	68%	76%
Road – Cycle	*3%*	*3%*	*3%*
Road - MC/Moped	*0%*	*0%*	*0%*
Road - Scooter/E-Scooter	*1%*	*1%*	*1%*
Road – Bus	*3%*	*2%*	*3%*
Road - Car/Van Driver	*47%*	*41%*	*46%*
Road - Car/Van Passenger	*24%*	*21%*	*23%*
Road – Taxi	*1%*	*0%*	*1%*
Walking	19%	31%	23%
Rail	2%	0%	1%

Primary School

7.6.5 To inform the mode share of primary school trips, data on the main mode of travel to school by age was extracted from the HCC Travel Survey (2022). The mode share from the HCC travel survey is summarised in Table 7-13 below.

Table 7-13: Primary School External Trips Modal Splits (HCC Travel Survey)

Main Mode	Pupil Age		
	5-10	11-15	16-17
Road	50%	54%	56%
Road - Cycle	4%	3%	1%
Road - MC/Moped	0%	0%	0%
Road - Scooter/E-Scooter	1%	0%	0%
Road - Bus	2%	14%	17%
Road - Car/Van Driver	0%	0%	4%
Road - Car/Van Passenger	44%	35%	34%
Road - Taxi	0%	1%	0%
Walking	50%	43%	35%
Rail	0%	3%	7%
Other	0%	0%	3%
Total	**100%**	**100%**	**100%**

7.6.6 Given that the HCC travel survey records pupil travel modes, it does not account for car drivers (i.e., parents picking up/dropping off pupils), instead purely classifying pupils as a car/van passenger. As such, the mode shares were adjusted for peak periods using the TRICS trip rates for a Primary School. To adjust the mode share, a ratio of car passengers to vehicles was identified from the TRICS trip rates and applied to the 'Car/Van Passenger' mode shares from the HCC travel survey. The resultant mode shares are summarised in **Table 7-14** below.

Table 7-14: Primary School External Trips Modal Splits Disaggregated to Account for Car Driver Trips

Main Mode	Modal Split (All Time Periods)
Road	50%
Road - Cycle	*4%*
Road - MC/Moped	*0%*
Road - Scooter/E-Scooter	*1%*
Road - Bus	*2%*
Road - Car/Van Driver	*18%*
Road - Car/Van Passenger	*26%*
Road - Taxi	*0%*
Walking	50%
Rail	0%
Other	0%
Total	**100%**

7.7 Total External Development Trip Summary

7.7.1 The resultant total external trips associated with the proposed development, by zone, and mode for the morning and evening peak periods and daily are summarised in Table 7-15.

Table 7-15: Total External Development Trip Summary – By Mode and Time Period

Mode	AM Peak		PM Peak		Daily (12h)	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Road	453	660	523	396	4364	4693
Road - Cycle	*22*	*26*	*21*	*17*	*179*	*193*
Road - MC/Moped	*1*	*1*	*1*	*1*	*8*	*8*
Road - Scooter/E-Scooter	*5*	*5*	*4*	*3*	*33*	*36*
Road - Bus	*16*	*26*	*20*	*15*	*166*	*177*
Road - Car/Van Driver	*241*	*403*	*313*	*228*	*2589*	*2787*
Road - Car/Van Passenger	*166*	*194*	*160*	*130*	*1358*	*1460*
Road - Taxi	*2*	*5*	*4*	*3*	*30*	*33*
Walking	223	130	122	119	1171	1300
Rail	1	50	24	8	159	191
Total	**677**	**840**	**669**	**523**	**5693**	**6184**

7.7.2 The zone-to-zone multi-modal movements (distribution) by each proposed development element are provided in **Appendix H**.

7.8 Development Vehicle Trip Assignment

7.8.1 To identify the impact on the highway network, the subsequent vehicle trips associated with the proposed development have been assigned onto the local highway, using ArcGIS route assignment software.

7.8.2 Route assignment has been undertaken based on the following assumptions:

- Origin Points – the centroid of the site; and
- Destination Points – the central point of each TDM zone, as identified within GIS software.

7.8.3 It should be noted that the ArcGIS route assignment represents an all or nothing approach whereby all trips to/from the same origin/destination will use the same route. The route assignment is underpinned by traffic/congestion data, so routes take account of current congestion conditions on the network. The GIS route assignment has been manually sense checked, and the following adjustments made:

- Trips towards Sandridge / Welwyn / Hatfield were originally routed north along Harpenden Road and used rural lanes to north. A more suitable and robust route for all trips determined to travel south on Harpenden Road and north along St Albans Road;
- 50% of trips to St Stephens area in the south split between Batchwood Drive to the west, and Harpenden Road to the south at the Ancient Briton crossroads, to account for route choice;
- Trips to TDM Zone 3 (north-east St Albans) split with 25% using Sandridge Road south, 25% using Marshalswick Lane and the remaining share using Harpenden Road south, to account for route choice; and
- Trip to TDM Zone 1 (north-west St Albans) split either side of Batchwood Drive based on LSOA workplace population, with 16% reassigned to the New Greens area via Green Lane, 25% routed along Harpenden Road south and the remaining share along Batchwood Drive to the west, all these trips are then assumed to distribute across local roads.

7.8.4 Whilst the percentage of trips on each route varies between the assessment periods, the resultant routes remain the same. Traffic flow diagrams illustrating the resultant assignment are provided in Appendix I.

7.9 Proposed Sandridgebury Lane Re-routing

7.9.1 As noted in Chapter 5, there is a shared objective to restrict vehicle movements on Sandridgebury Lane which it is proposed would comprise re-routing Sandridgebury Lane through the development site. This would close the existing Sandridgebury Lane/Valley Road junction and result in the reassignment of existing traffic.

7.9.2 Traffic surveys have been used to identify the number of vehicles during the morning and evening peak periods that may be impacted by the proposals, and an exercise undertaken to identify the alternative routing associated with these vehicles through the network. This reassignment of traffic has been modelled to understand the potential impacts of this change to the highway network.

7.9.1 It should be noted that some of this traffic would re-route as a result of the closure of Valley Road to motor vehicles proposed as an LCWIP measure.

7.9.2 Traffic flow diagrams demonstrating the reassignment of background flows are provided in Appendix I. A summary of the total change in flow at the key junctions considered on the network for is given in Table 7-16.

Table 7-16: Sandridgebury Lane Re-Routing – Change in Background Traffic Flows

Junction		AM	PM
1	Site Access/A1081 Harpenden Road	137	41
2	A1081 Harpenden Road/Sandridgebury Lane	-81	-119
3	A1081 Harpenden Road/Batchwood Drive/Beech Road	53	74
4	Firbank Road/Beech Road	107	89
5	Firbank Road/Beech Road	23	69
6	Beech Road/Valley Road	79	103
7	B651 St Albans Road/Beech Road/Marshalswick Lane	56	34
8	Marshalswick Lane/Gurney Court Road	0	0
9	B651 St Albans Road/Ronsons Way	54	34

8 Highways Impact Assessment and Modelling

8.1 Introduction

8.1.1 Through scoping discussions, it has been agreed that the following junctions will be assessed using standalone modelling software, LINSIG and Junctions 10. Traffic surveys were undertaken in 2022 for each of these locations for use in the modelling exercise:

- Site Access/A1081 Harpenden Road
- A1081 Harpenden Road/Sandridgebury Lane
- A1081 Harpenden Road/Beech Road/Batchwood Drive (Ancient Briton)
- Beech Road/Firbank Road
- Beech Road / B651 Sandridge Road / Marshalswick Lane / B651 St Albans Road / Ronsons Way / Valley Road / Gurney Court Road (King William IV)

8.1.2 In addition to the assessment of the above junctions, consideration has also been given to the number of vehicle movements that the development would generate on the strategic highway network. The nearest points of the strategic road network to the development are M1 J6, M1 J8, M1 J9, M25 J21A, M25 J22, A1(M) J1 and A1(M) J3.

8.2 Data Collection

8.2.1 Traffic surveys were undertaken in 2022 for each of these locations for use in the modelling exercise and to prepare calibrated models of the current operation of key junctions:

- A1081 Harpenden Road – ATC
- A1081 Harpenden Road/Sandridgebury Lane – MCC and Queue Surveys
- A1081 Harpenden Road/Beech Road/Batchwood Drive (Ancient Briton) – MCC and Queue Surveys
- Beech Road/Firbank Road – MCC and Queue Surveys
- Beech Road / B651 Sandridge Road / Marshalswick Lane / B651 St Albans Road / Ronsons Way / Valley Road / Gurney Court Road (King William IV) – MCC

8.3 Assessment Scenarios

8.3.1 The following assessment scenarios have been considered:

- 2022 Base – Based on surveyed flows to ensure the models validate appropriately to observed conditions.
- 2028 Base + Committed Development (Assumed Opening Year) – Based on uplifted surveyed flows using TEMPro factors and the further addition of traffic associated with pertinent committed development to provide a robust future position.

- 2033 Base + Committed Development (Assumed Opening Year + 5 Years) - Based on uplifted surveyed flows using TEMPro factors and the further addition of traffic associated with pertinent committed development to provide a robust future position.
- 2033 Base + Committed Development + Proposed Development.

8.3.2 In line with the Decide and Provide approach, multiple scenarios to reflect the potential uncertainties on the background network through different growth scenarios have been considered. A table illustrating the elements included in each scenario has been included in **Table 8-3**, and the traffic flow diagrams for the core scenarios are provided in **Appendix I.**

8.3.3 Various vision-based scenarios have also been considered in terms of potential modal shift resulting from the proposed active travel interventions. The modelling of these scenarios is set out in later chapters.

8.4 Future Year Assessment and Committed Development

Background Growth

8.4.1 This modelling considers two traffic growth scenarios; one being a more standard approach to growth adopted in the past and a second being a more aspirational but potentially more balanced view on likely growth in traffic, particularly on an already constrained local highway network.

8.4.2 TEMPro has been used in both instances with forecasts of local growth obtained from the National Trip End Model (NTEM) adjusted by the relevant National Transport Model 8.0 forecasts published as part of the National Road Traffic Projections, 2022 (NRTP) to account for wider factors such as fuel cost, values on time and changes in journey length/composition.

8.4.3 TEMPro v8.1 includes several NTEM scenarios, including:

- **Behavioural Change** – considers increased flexibility of working and online shopping, a reduction of license holdings amongst the younger population cohort and changes in trip rates.
- **Technology** – considers a high uptake of connected and autonomous vehicles and low-cost electric vehicles. Increase trip making for the elderly cohort among other assumptions.
- **Low** - considers low rates of population, employment and GDP growth.
- **Core** - considers central rates of population, employment and GDP growth.
- **Regional** – considers higher relative growth of population, employment and GDP growth outside London, the South East and East of England. Households and dwelling are also re-distributed in line with the population.
- **High** – considers high rates of population, employment, and GDP growth.

8.4.4 The various NRTP scenarios which are used to adjust the NTEM factors are shown in Figure 8-1.

Figure 8-1: National Road Traffic Projections (2022), Billion Vehicle Miles

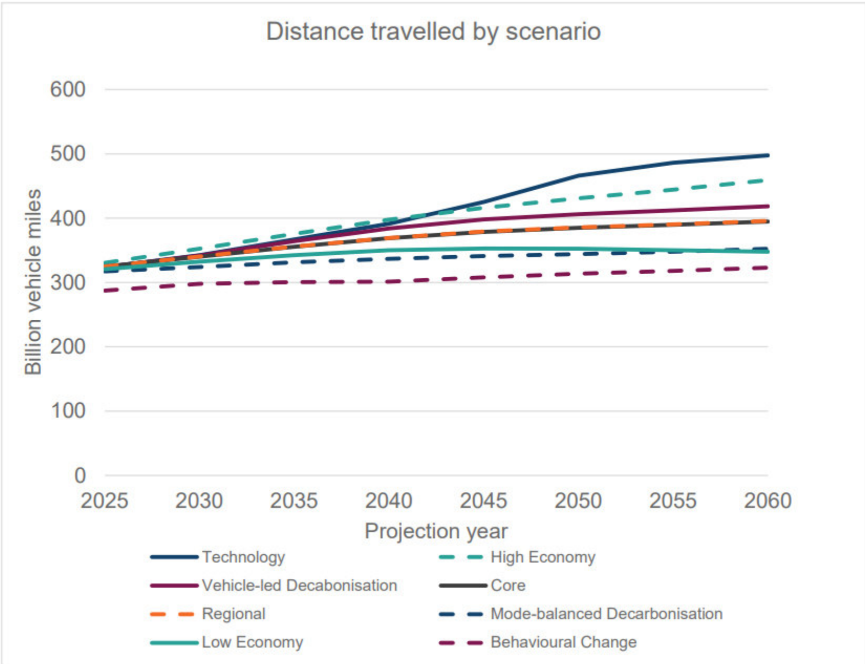


Figure 9 Projected total vehicle miles by scenario and year

8.4.5 Background growth has been calculated for the AM and PM periods to uplift 2022 data to 2028 and 2033 as follows:

- Core Scenario (Typical Growth based on historical trends):
  - Utilisation of TEMPro Core scenario for St Albans.
  - Adjust NTEM local growth by NRTP Core scenario.
- Aspirational Scenario (Managed growth reflecting already constrained network):
  - Utilisation of TEMPro Behavioural scenario for St Albans.
  - Adjust NTEM local growth by NRTP Behavioural scenario.

8.4.6 The resultant traffic growth factors applied are summarised in Table 8-1 below.

Table 8-1: TEMPro Growth Factors

Year	Core Scenario		Aspirational Scenario	
	AM	PM	AM	PM
2022 – 2028	1.0652	1.0627	0.9903	0.9884
2022 – 2033	1.1117	1.1088	0.9819	0.9800

Committed Development

8.4.7 The following committed developments have been accounted for separately and are based on our understanding of the Emerging Local Plan allocations at the point of undertaking the assessments.

The trip generation estimates along with distribution have been taken from published information for these developments prepared by other consultants, as follows:

- North St Albans Broad Location (Hunston Properties / 'Sewell Park') - 150 dwellings
- North East Harpenden Broad Location (Crest Nicholson and Bloor) – 680 dwellings
- North West Harpenden Broad Location (Legal and General) – 580 dwellings

8.4.8 Traffic flows diagrams demonstrating the committed developments are included in Appendix I.

8.5 Strategic Highway Network Impact Assessment

8.5.1 As part of the scoping discussions with NH, it has been requested that consideration is given to the potential impacts on the strategic highway network. This has taken the form of quantification of the number of additional vehicle movements at key points on the strategic highway network. This has been considered for:

- A1(M) J3.
- M25 J22.
- M25 J21A.
- M1 J8.

Table 8-2: Total Forecast Development Vehicle Trips on the Strategic Highway Network

Junction	AM Peak Hour	PM Peak Hour
M25 J22	29	18
M1 J9	15	0
M1 J10	15	0
M25 J21A	6*	10*
M25 J23 / A1(M) J1	5	0
M25 J24	10	12
M25 J25	9	0
M25 J27	6	6

*trips at junction, not joining SRN

8.5.2 The number of trips at key strategic network junctions is relatively modest. The trips presented are those passing through the junction as well as joining the strategic network. As such, it is not deemed that there is a need to undertake further detailed modelling of these junctions.

8.6 Local Highway Network Junction Capacity Modelling

8.6.1 The agreed off-site junctions have been modelled using standalone modelling software (Junctions 10, LinSig). Geometries have been measured from Ordnance Survey mapping. The baseline junction models have been verified through the comparison of model outputs to queue length surveys, site visit observations and discussions with HCC officers to ensure they provide a suitable basis for testing the impacts of development. The results are summarised in the tables below and full outputs provided in Appendix J. Table 8-3 below summarises each of the junctions and scenarios that have been modelled.

Table 8-3: Model Scenarios

Junction	Form	2022 Base	2028 FY Base	2033 FY Base (Core)	2033 FY Base (Beh)	2033 Core + Dev (Core)	2033 Beh + Dev (Core)	2033 Beh + Dev + Background (High Modal Shift)	2033 Beh + Dev + Background (Low Modal Shift)
Site Access/A1081 Harpenden Road	Existing	N	N	N	N	Y	N	N	N
Ancient Briton (A1081 Harpenden Road/Beech Road/Batchwood Drive)	Existing	Y	Y	Y	Y	N	N	N	N
	Committed	N	Y	Y	Y	N	N	N	N
	Proposed - Active Travel Improvements	N	N	N	N	Y	Y	Y	Y
King William (Beech Road / B651 Sandridge Road / Marshalswick Lane / B651 St Albans Road / Ronsons Way / Valley Road / Gurney Court Road)	Existing	Y	Y	Y	Y	N	N	N	N
	Proposed - Active Travel Improvements	N	N	N	N	Y	Y	Y	Y
A1081 Harpenden Road/Sandridgebury Lane	Existing	Y	Y	Y	Y	Y	Y	N	N
Firbank/Beech Road	Existing	Y	Y	Y	Y	Y	Y	N	N

8.6.2 These scenarios represent the potential outcomes in the future without benefits realised through modal shift achieved from the proposed active travel route interventions. These are set out in later chapters. All 'with development' scenarios allow for the reassignment of traffic following on from the re-routing of Sandridgebury Lane which would be required to facilitate the development.

8.7 Baseline Model Validation

A1081 Harpenden Road/Beech Road/Batchwood Drive (Ancient Briton) Junction

8.7.1 The Ancient Briton Crossroads has been modelled using LinSig (v3) software. The operation is based on the signal specification information provided by HCC and from observations of staging and cycle times during a site visit with a cycle time of 106 seconds observed. In discussion with officers at the HCC, the pedestrian crossings have been assumed to operate every cycle. In addition, adjustments to traffic flows have been applied to increase vehicle demands to reflect residual queueing at the end of the modelled period.

8.7.2 The results for the 2022 baseline scenario are presented in Table 8-4 below, alongside a summary of the recorded queues from the traffic surveys in Table 8-5.

Table 8-4: A1081 Harpenden Road/Beech Road/Batchwood Drive (Ancient Briton) Base Year Signalised Junction Capacity Results

Arm	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	DoS	Queue (PCU)	Delay (s/PCU)	DoS	Queue (PCU)	Delay (s/PCU)
2022 Base						
Harpenden Road North	114.8%	68	314	104.1%	37	164
Beech Road	112.8%	62	280	112.1%	60	270
Harpenden Road South	73.6%	10	56	112.1%	44	289
Batchwood Drive	113.2%	44	302	112.4%	46	288
PRC (Cycle Time)	*-27.6% (106s)*			*-24.9% (106s)*		

Table 8-5: A1081 Harpenden Road/Beech Road/Batchwood Drive (Ancient Briton) – Comparison of Observed and Modelled Queues

Arm	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Observed Queue	Modelled Queue	Observed Queue	Modelled Queue
Harpenden Road North	45	68	27	37
Beech Road	34	62	33	60
Harpenden Road South	20	10	16	44
Batchwood Drive	29	44	21	46

8.7.3 Whilst the queuing recorded within the queue surveys is lower than the modelled queues, it is understood from officers that queueing can exceed the surveyed levels and therefore the modelled queues are deemed by HCC to better align to observed conditions. Therefore, it is deemed that the model provides a suitable basis for testing. In terms of the current operation, the junction is operating over acceptable capacity thresholds with high levels of queuing and delays already experienced at the junction. This should be borne in mind in the assessment of future year scenarios and development impacts.

Beech Road / B651 Sandridge Road / Marshalswick Lane / B651 St Albans Road / Ronsons Way / Valley Road / Gurney Court Road (King William IV)

8.7.4 The King William IV Crossroads has been modelled using LinSig (v3) software. The operation is based on the signal specification information provided by HCC and from observations of staging and cycle times during a site visit. A cycle time of approximately 100 seconds was observed with pedestrian crossings called regularly, sometimes each cycle.

8.7.5 The results for the 2022 baseline scenario are presented in Table 8-6 below, alongside a summary of the recorded queues from the traffic surveys in Table 8-7.

Table 8-6: Beech Road / B651 Sandridge Road / Marshalswick Lane / B651 St Albans Road / Ronsons Way / Valley Road (King William IV) Signalised Junction Capacity Results

Arm	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	DoS	Queue (PCU)	Delay (s/PCU)	DoS	Queue (PCU)	Delay (s/PCU)
2022 Base						
St Albans Road Sb Right Ahead	93.2%	12.6	100.2	102.4%	17.9	93.8
St Albans Road Left Slip Left	27.2%	0.2	4.2	27.1%	0.2	4.2
Marshalswick Lane Right Ahead Left	93.8 : 93.8%	23.8	62.1	102.7 : 102.7%	30.2	52.7
Beech Road Left Ahead Right	77.9 : 77.9%	15.5	38.4	81.4 : 81.4%	17.7	32.6
Beech Road Ahead Right	27.7%	0.2	1.2	13.1%	0.1	0.5
Sandridge Road Ahead Right	95.7%	14.7	109.5	98.0%	16.4	82.4
Sandridge Rd Left Ahead	6.9%	0.5	2.3	4.9%	0.4	1.7
Marshalswick Lane Ahead Right	50.8%	0.5	2.5	48.0%	0.5	2.2
Valley Road Left Right	24.8%	0.2	4.0	21.7%	0.1	3.9
Gurney Court Rd Left Right	33.7%	0.3	5.5	24.5%	0.2	4.8
Sandridge Rd Left Ahead Right	22.1%	0.6	4.3	15.8%	0.3	4.0
PRC / Cycle Time	-6.3% / 100s			-14.2% / 100s		

Table 8-7: Beech Road / B651 Sandridge Road / Marshalswick Lane / B651 St Albans Road / Ronsons Way / Valley Road (King William IV) Signalised Junction – Comparison of Observed and Modelled Queues

Arm	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Observed Queue	Modelled Queue	Observed Queue	Modelled Queue
St Albans Road	15	13	20	18
Marshalswick Lane	19	24	20	30
Gurney Court Road	10	<1	3	<1
Sandridge Road	19	15	21	17
Beech Road	19	16	37	18
Valley Road	6	<1	8	<1

8.7.6 In terms of the current operation, the junction is operating over acceptable capacity thresholds with queuing and delays already experienced at the junction. This should be borne in mind in the assessment of future year scenarios and development impacts.

8.7.7 The modelled operation generally calibrates to observed conditions. The Gurney Court Road and Valley Road approaches have lower levels of queuing in the model than observed. This is due to conditions on Beech Road and Marshalswick Lane restricting vehicles turning out of these minor arms. The model is deemed to provide a suitable basis for comparative testing of future year scenarios and development impacts.

A1081 Harpenden Road/Sandridgebury Lane

8.7.8 The A1081 Harpenden Road/Sandridgebury Lane junction has been modelled using Junctions 10 software. The results are presented in Table 8-8 below and compared to queue surveys in Table 8-9.

Table 8-8: A1081 Harpenden Road/Sandridgebury Lane Baseline Junction Capacity Results

Turning	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	RFC	Queue (PCU)	Delay (s/PCU)	RFC	Queue (PCU)	Delay (s/PCU)
2022 Base						
Sandridgebury Lane (left)	0.36	1	10	0.11	<1	7
Sandridgebury Lane (right)	0.12	<1	13	0.24	<1	18
Harpenden Road (right, ahead)	0.52	2	9	0.42	2	6

Table 8-9: A1081 Harpenden Road/Sandridgebury Lane – Comparison of Observed and Modelled Queues

Arm	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Observed Queue	Modelled Queue	Observed Queue	Modelled Queue
Sandridgebury Lane	11	1	3	1
A1081 Harpenden Road (S)	11	2	6	2

8.7.9 The junction is modelled to currently be operating within acceptable thresholds of capacity with minimal queueing and delays. The observed conditions are however worse with more marked queuing on the Sandridgebury Lane and A1081 Harpenden Road approach. The southbound queuing and slow-moving vehicles along the Harpenden Road on the approach to the Ancient Briton junction span back as far as and beyond the Sandridgebury Lane junction at peak times. This is therefore likely to impact the operation of the Harpenden Road/Sandridgebury Lane junction and would not be able to be fully demonstrated through the standalone junction capacity modelling undertaken.

8.7.10 That being said, the model is deemed to be a suitable comparative tool for which to model future year scenarios and development impacts but should be read in conjunction with the results of the modelling for the Ancient Briton junction.

Beech Road/Firbank Road

8.7.11 The Beech Road/Firbank Road priority junction has been modelled in Junctions 10 software and due to the configuration of the junction, has been modelled using the lane based module. The results of the modelling of the 2022 baseline scenario are presented in Table 8-10 below, alongside a summary of the recorded queues from the traffic surveys in Table 8-11. When using the lane based module, the reported RFCs should be treated with some caution and therefore the reported Level of Service (LoS) is presented in the table below.

Table 8-10: Beech Road/Firbank Road Base Year Junction Capacity Results

Junction	Arm	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
		LOS	Queue (PCU)	Delay (s/PCU)	LOS	Queue (PCU)	Delay (s/PCU)
2022 Base							
1	Beech Road West	A	0	0	A	0	0
	Firbank Road	C	0.4	15.4	C	1	22.56
	Beech Road East	A	0	0.04	A	0	0.03
2	Beech Road West	A	0	0	A	0	0
	Firbank Road	A	0.2	7.13	A	0.3	8.39
	Beech Road East	A	0.1	0.46	A	0	0.23
3	Firbank Road North	A	0	0	A	0	0.14
	Firbank Road East	A	0.1	7.51	A	0	7.45

	Firbank Road West	A	0	0	A	0	0

Table 8-11: Beech Road/Firbank Road Junction – Comparison of Observed and Modelled Queues

Arm	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Observed Queue	Modelled Queue	Observed Queue	Modelled Queue
Firbank Road (W Side)	4	<1	5	1
Firbank Road (E Side)	1	<1	2	<1
Beech Road (E)	1	<1	0	0

8.7.12 The junction is currently operating acceptably with negligible queues and delays reported. The observed queuing is higher than the modelled queuing. This is likely due to conditions at the adjacent King William VI junction with queueing and slow-moving vehicles spanning back towards the Firbank Road junction. The model is however deemed to be a suitable basis for testing future year scenarios and development testing within.

8.8 Future Year Modelling

8.8.1 The results are summarised in the tables below and full outputs provided in Appendix K.

Site Access/A1081 Harpenden Road

8.8.2 The proposed Site Access/A1081 Harpenden Road junction has been modelling using LinSig (v3) software. Measurements are taken from the preliminary site access drawings to inform the calculation of saturation flows. The assessment has been undertaken for the Core scenario which provides a more robust assessment of the junction. It also allows for Sandridgebury Lane re-routing with additional flows passing through the site access junction as a result.

8.8.3 The staging assumes the pedestrian stages are called every other cycle, with a cycle time of 90s.

Table 8-12: Site Access/A1081 Harpenden Road Signalised Junction Capacity Results

Arm	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	DoS	Queue (PCU)	Delay (s/PCU)	DoS	Queue (PCU)	Delay (s/PCU)
2033 Future Year (Core) + Development (Core) + Sandridgebury Lane Re-routing						
Harpenden Road North	82.2%	19	29	85.2%	30	23
Site Access Left	81.4%	13	48	85.1%	8	80
Site Access Right	13.1%	2	30	13%	1	47
Harpenden Road South	59.2%	11	26	64.8%	17	18
PRC / Cycle Time	9.4% / 180s			5.6% / 180s		

8.8.4 The site access junction has been modelled with a robust set of flows and is forecast to operate within acceptable capacity thresholds. Average delays per vehicle on the Harpenden Road approaches are less than 30 seconds which would not unduly impact vehicles which are currently using this corridor unconstrained.

A1081 Harpenden Road/Beech Road/Batchwood Drive (Ancient Briton)

Existing Layout

8.8.5 The results for the future year baseline scenarios are presented in Table 8-13 assuming the existing layout of the junction.

Table 8-13: Ancient Briton – Future Year Modelling (Existing Layout)

		2028 Future Year	2033 Future Year (Core)	2033 Future Year (Behavioural)
AM Peak (08:00 to 09:00)				
PRC		**-48.1%**	**-54.0%**	**-38.5%**
DoS (%)	A – Harpenden Road N	133.3%	137.9%	124.7%
	B – Beech Road	132.8%	138.6%	122.2%
	C – Harpenden Road S	70.6%	73.8%	65.4%
	D - Batchwood Drive	129.1%	134.5%	119.4%
Queue (pcu)	A – Harpenden Road N	142	159	112
	B – Beech Road	121	141	87
	C – Harpenden Road S	10	11	9
	D - Batchwood Drive	73	84	54
Delay (s/pcu)	A – Harpenden Road N	540	590	440
	B – Beech Road	536	599	407
	C – Harpenden Road S	49	51	47
	D - Batchwood Drive	500	559	384
PM Peak (17:00 to 18:00)				
PRC		**-47.0%**	**-52.2%**	**-36.6%**
DoS (%)	A – Harpenden Road N	118.7%	123.3%	110.2%
	B – Beech Road	132.3%	137.0%	123.0%
	C – Harpenden Road S	126.4%	131.5%	117.7%
	D - Batchwood Drive	127.6%	132.8%	118.1%
Queue (pcu)	A – Harpenden Road N	83	98	57
	B – Beech Road	126	143	93
	C – Harpenden Road S	79	91	59
	D - Batchwood Drive	79	91	58
Delay (s/pcu)	A – Harpenden Road N	368	423	249
	B – Beech Road	525	577	312
	C – Harpenden Road S	475	534	364
	D - Batchwood Drive	480	538	363

8.8.6 In the future year modelling, the operation of the junction is forecast to worsen with increasing levels of queueing and delays experienced.

Committed Layout

8.8.7 As part of the Hunston / Cala Homes development, it is proposed to implement an active travel improvement along the A1081 Harpenden Road / Old Harpenden Road. To allow cyclists to rejoin the Harpenden Road to the south of the Old Harpenden Road, a revised signal arrangement is proposed. Beyond this, it is proposed to introduce a 2-stage right turn arrangements at the Ancient Briton junction for cyclists.

Figure 8-2: Hunston Properties Ancient Briton Crossroads Arrangement

8.8.8 The calibrated base LinSig model has been utilised as a starting point for the model for testing future year scenarios and development impacts with the above scheme in place.

Table 8-14: Ancient Briton – Future Year Modelling (Committed Layout)

		2028 Future Year	2033 Future Year (Core)	2033 Future Year (Behavioural)
AM Peak (08:00 to 09:00)				
PRC		**-120.7%**	**-130.0%**	**-104.1%**
DoS (%)	A – Harpenden Road N	214.7%	222.2%	201.0%
	B – Beech Road	187.1%	195.4%	171.8%
	C – Harpenden Road S	130.1%	135.8%	120.5%
	D - Batchwood Drive	198.7%	207.0%	183.7%
Queue (pcu)	A – Harpenden Road N	276	294	244
	B – Beech Road	213	232	178
	C – Harpenden Road S	57	65	43
	D - Batchwood Drive	144	155	123
Delay (s/pcu)	A – Harpenden Road N	1110	1141	1047
	B – Beech Road	976	1022	881
	C – Harpenden Road S	529	591	416
	D - Batchwood Drive	1040	1081	958
PM Peak (17:00 to 18:00)				
PRC		**-133.0%**	**-142.4%**	**-116.1%**
DoS (%)	A – Harpenden Road N	225.3%	233.9%	162.8%
	B – Beech Road	208.9%	216.2%	194.5%
	C – Harpenden Road S	198.7%	206.7%	184.9%
	D - Batchwood Drive	209.7%	218.2%	194.0%
Queue (pcu)	A – Harpenden Road N	238	253	157
	B – Beech Road	247	263	215
	C – Harpenden Road S	163	176	142
	D - Batchwood Drive	169	181	145
Delay (s/pcu)	A – Harpenden Road N	1159	1191	817
	B – Beech Road	1072	1101	1012
	C – Harpenden Road S	1044	1082	970
	D - Batchwood Drive	1094	1132	1016

* On the approach to the stop line where cyclists re-join the A1081 at old Harpenden Road. The model has been manually optimised to ensure the queuing on the Harpenden Road N approach to the Ancient Briton does not exceed the stacking capacity between this stop line and the Old Harpenden Road to ensure re-joining cyclists are able to enter the reservoir to pass through the junction.

8.8.9 The committed scheme on the northern approach to and at the Ancient Briton junction is forecast to significantly worsen the operation of the junction in the Future Year scenarios with all approaches forecast to operate over capacity across all the scenarios, when comparing to the existing layout operation.

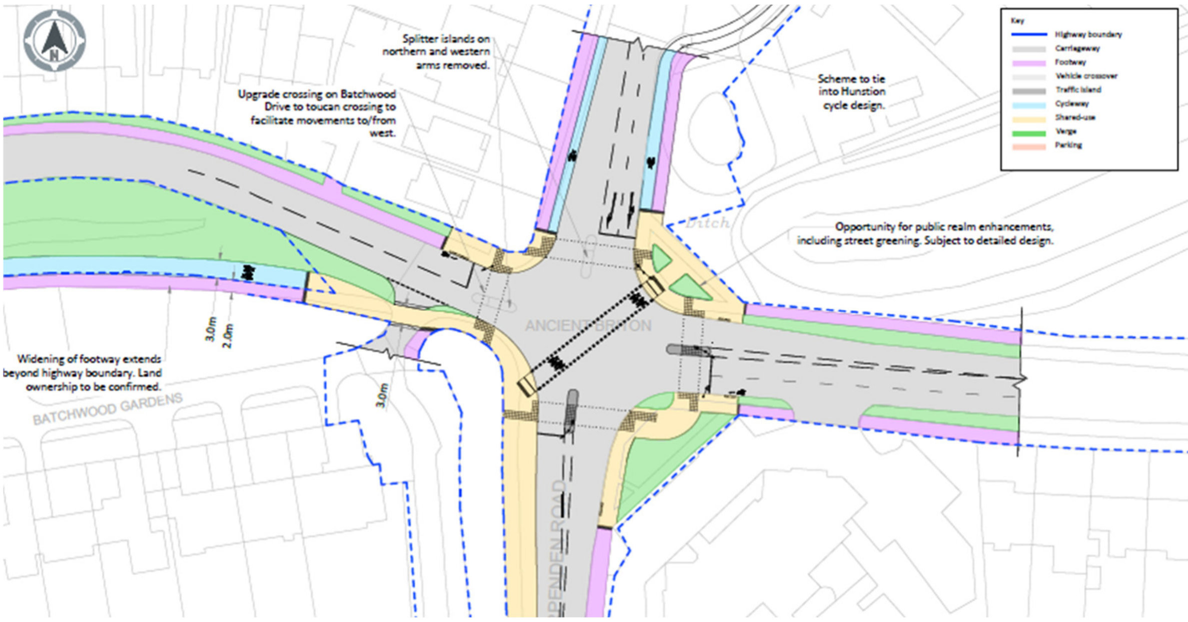
8.8.10 The 2033 Future Year Behavioural scenario shows better operation but relies on behavioural change, this would require, at least in part, investment in infrastructure and more meaningful measures to encourage modal shift. It is unlikely with the limited scale infrastructure committed as part of the Sewell Park development that the full extent of the behavioural change envisaged through this scenario would be realised. Therefore, a more appropriate scenario to compare against would be the 2033 Future Year (Core) scenario.

8.8.11 Whilst HCC has requested the impact of the proposed scheme at the Ancient Briton along with the proposed development traffic is assessed against the operation of the existing layout in the Future Year scenarios, a comparison to the operation under the committed scheme is also important as it provides a benchmark for what has already been agreed in principle by HCC.

Proposed Scheme

8.8.12 As part of the proposed Woollam Park development, a scheme to better accommodate cyclists through the Ancient Briton junction has been developed which ties into the southern extent of the Sewell Park scheme.

Figure 8-3: Proposed Ancient Briton Active Travel Improvement



8.8.13 The base LinSig model has again been used as a basis for developing a model for the proposed improvement scheme and testing the development impacts. It is expected that the proposed network of improvements would have the potential to deliver modal shift at the development and within the background network. This is assessed in proceeding chapters and the results presented in this chapter relate to the 2033 Future Year (Core) + Development (Core) scenario and 2033 Future Year (Behavioural) + Development (Core). These are deemed to be robust scenarios, particularly the former, but are presented for comparison. This also assumes the reassignment of traffic following the re-routing of Sandridgebury Lane through the development site.

Table 8-15: Ancient Briton – Future Year With Proposed Development Modelling (Proposed Layout)

		2033 Future Year (Core) + Dev (Core)	2033 Future Year (Beh) + Dev (Core)
AM Peak Hour (08:00 to 09:00)			
PRC		**-117.9%**	**-97.4%**
DoS (%)	A – Harpenden Road N	196.1%	176.0%
	B – Beech Road	193.3%	170.0%
	C – Harpenden Road S	109.4%	95.8%
	D - Batchwood Drive	185.4%	177.7%
Queue (pcu)	A – Harpenden Road N	349	288
	B – Beech Road	240	184
	C – Harpenden Road S	40	19
	D - Batchwood Drive	151	129
Delay (s/pcu)	A – Harpenden Road N	1014	898
	B – Beech Road	1006	863
	C – Harpenden Road S	251	99
	D - Batchwood Drive	960	913
PM Peak Hour (17:00 to 18:00)			
PRC		**-129.4%**	**-107.3%**
DoS (%)	A – Harpenden Road N	167.2%	152.7%
	B – Beech Road	201.1%	181.4%
	C – Harpenden Road S	202.6%	185.1%
	D - Batchwood Drive	206.4%	186.5%
Queue (pcu)	A – Harpenden Road N	222	178
	B – Beech Road	279	224
	C – Harpenden Road S	211	177
	D - Batchwood Drive	193	158
Delay (s/pcu)	A – Harpenden Road N	844	733
	B – Beech Road	1043	934
	C – Harpenden Road S	1058	967
	D - Batchwood Drive	1070	964

8.8.14 When comparing to the Future Year operation with the existing layout, the proposed development and associated active travel scheme is forecast to have a material impact on the operation of the junction with a significant worsening forecast in terms of queues and delays across all approaches.

8.8.15 However, HCC has already approved in principle the provision of the committed scheme at the junction which is forecast to worsen the operation as demonstrated in Table 8-14. This is therefore deemed as the most sensible basis for comparison. When using the operation of the committed scheme in the future year scenarios as a basis for comparison to determine proposed development impacts, it has been demonstrated that the proposed development is not forecast to have a material impact.

8.8.16 Furthermore, the benefits to active travel users in terms of safety, convenience and wellbeing should be noted. Active Travel improvements to this junction form part of SACDC's LCWIP.

8.8.17 These scenarios are deemed to be robust with high levels of growth (Core scenario) and no modal shift (both scenarios) allowed for despite the proposed network of active travel improvements. The benefits that could be realised and improvements to junction operation are assessed in proceeding chapters.

Beech Road / B651 Sandridge Road / Marshalswick Lane / B651 St Albans Road / Ronsons Way / Valley Road (King William IV)

8.8.18 The King William IV junction has been modelling using the calibrated LinSig model as presented in Table 8-16.

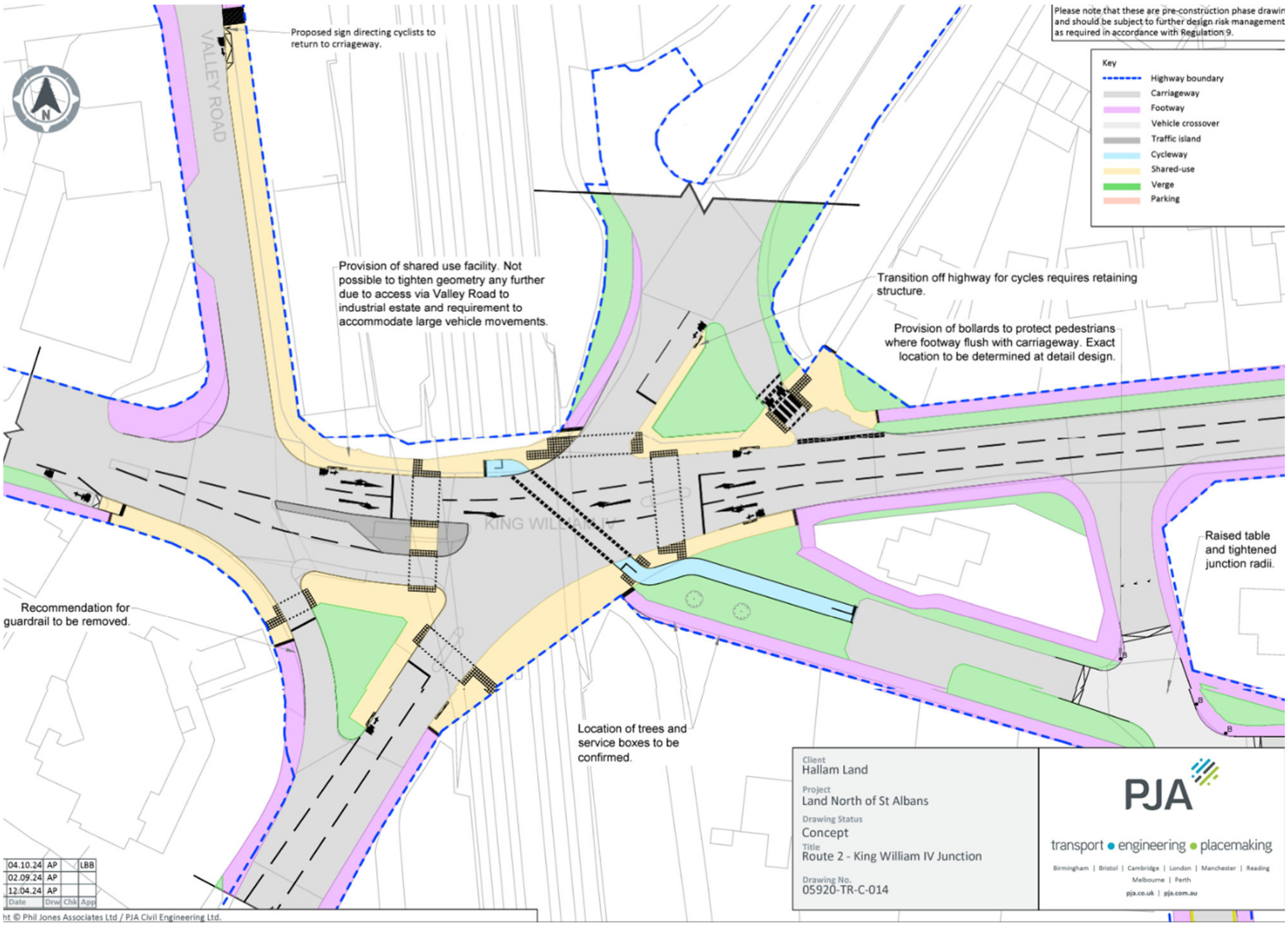
Table 8-16: King William IV – Future Year Modelling (Existing Layout)

		2028 Future Year	2033 Future Year (Core)	2033 Future Year (Behavioural)
AM Peak Hour (08:00 to 09:00)				
PRC		**-27.9%**	**-34.3%**	**-14.0%**
DoS (%)	A – St Albans Road	108.4%	120.9%	93.5%
	B – Marshalswick Lane	115.1%	115.0%	102.6%
	C – Beech Road	86.8%	86.2%	84.7%
	D – Sandridge Road	108.1%	120.8%	93.6%
	E – Valley Road	26.9%	28.4%	24.5%
	F – Gurney Court Road	37.6%	40.1%	33.4%
Queue (pcu)	A – St Albans Road	27	43	13
	B – Marshalswick Lane	44	46	27
	C – Beech Road	21	21	19
	D – Sandridge Road	240	45	14
	E – Valley Road	<1	<1	<1
	F – Gurney Court Road	<1	<1	<1
Delay (s/pcu)	A – St Albans Road	251	418	102
	B – Marshalswick Lane	150	148	82
	C – Beech Road	44	42	44
	D – Sandridge Road	240	403	99
	E – Valley Road	4	4	4
	F – Gurney Court Road	6	7	6
PM Peak Hour (17:00 to 18:00)				
PRC		**-37.2%**	**-45.7%**	**-18.2%**
DoS (%)	A – St Albans Road	115.0%	128.6%	99.4%
	B – Marshalswick Lane	123.5%	125.2%	106.4%
	C – Beech Road	86.0%	85.6%	83.3%
	D – Sandridge Road	118.0%	131.2%	101.9%
	E – Valley Road	23.7%	24.8%	21.5%
	F – Gurney Court Road	27.8%	29.3%	24.7%
Queue (pcu)	A – St Albans Road	34	51	16
	B – Marshalswick Lane	84	91	39
	C – Beech Road	21	21	19
	D – Sandridge Road	40	57	20
	E – Valley Road	<1	<1	<!
	F – Gurney Court Road	<1	<1	<1
Delay (s/pcu)	A – St Albans Road	342	513	143
	B – Marshalswick Lane	395	413	178
	C – Beech Road	41	39	40
	D – Sandridge Road	369	524	164
	E – Valley Road	4	4	4
	F – Gurney Court Road	5	5	5

8.8.19 The junction is forecast to operate over capacity in all future year scenarios modelled. The 2033 Future Year (Behavioural) scenario however shows better operation but relies on behavioural change. This would require, at least in part, investment in infrastructure and more meaningful measures to encourage modal shift. There are no committed improvements at this stage which could deliver this level of behavioural change. Therefore, a more appropriate scenario to compare against would be the 2033 Future Year (Core) scenario.

8.8.20 As part of the proposed development, a scheme to better accommodate cyclists through the King William IV junction and routes beyond this have been developed.

Figure 8-4: Proposed King William IV Active Travel Improvement



8.8.21 The base LinSig model has again been used as a basis for testing the proposed improvement scheme and the proposed development impacts. It is likely that the proposed network of improvements would have the potential to encourage modal shift at the development and within the background network. This is assessed in proceeding chapters and the results presented in this chapter relate to the 2033 Future Year (Core) + Development (Core) scenario and 2033 Future Year (Behavioural) + Development (Core). These are deemed to be robust scenarios, particularly the former, but are presented for comparison. This also assumes the reassignment of traffic following the re-routing of Sandridgebury Lane.

Table 8-17: King William IV – Revised Future Year Modelling (Proposed Layout)

		2033 Core	2033 Core + Dev (Core)	2033 Beh + Dev (Core)
AM Peak Hour (08:00 to 09:00)				
PRC		**-54.9%**	**-83.1%**	**-37.9%**
DoS (%)	A – St Albans Road	130.2%	153.7%	124.1%
	B – Marshalswick Lane	132.2%	164.8%	116.8%
	C – Beech Road	90.0%	93.6%	88.5%
	D – Sandridge Road	139.4%	153.6%	122.4%
	E – Valley Road	28.4%	35.4%	30.1%
	F – Gurney Court Road	39.7%	41.1%	33.6%
Queue (pcu)	A – St Albans Road	53	81	48
	B – Marshalswick Lane	41	56	27
	C – Beech Road	23	27	21
	D – Sandridge Road	65	79	42
	E – Valley Road	<1	<1	<1
	F – Gurney Court Road	<1	<1	<1
Delay (s/pcu)	A – St Albans Road	530	758	458
	B – Marshalswick Lane	154	214	101
	C – Beech Road	47	54	45
	D – Sandridge Road	609	739	428
	E – Valley Road	4	5	5
	F – Gurney Court Road	6	7	6
PM Peak Hour (17:00 to 18:00)				
PRC		**-68.9%**	**-86.0%**	**-39.0%**
DoS (%)	A – St Albans Road	152.0%	153.4%	125.1%
	B – Marshalswick Lane	142.3%	164.1%	115.0%
	C – Beech Road	89.3%	91.8%	87.0%
	D – Sandridge Road	141.3%	167.4%	125.0%
	E – Valley Road	24.8%	44.9%	39.1%
	F – Gurney Court Road	29.1%	29.2%	24.7%
Queue (pcu)	A – St Albans Road	72	73	43
	B – Marshalswick Lane	43	52	23
	C – Beech Road	23	25	21
	D – Sandridge Road	67	89	45
	E – Valley Road	<1	<1	<1
	F – Gurney Court Road	<1	<1	<1
Delay (s/pcu)	A – St Albans Road	746	757	475
	B – Marshalswick Lane	199	243	105
	C – Beech Road	43	47	41
	D – Sandridge Road	626	847	458

		2033 Core	2033 Core + Dev (Core)	2033 Beh + Dev (Core)
AM Peak Hour (08:00 to 09:00)				
	E – Valley Road	4	6	5
	F – Gurney Court Road	5	5	5

8.8.22 Considering the operation of the proposed improvement scheme prior to the addition of proposed development traffic, it can be seen that there are forecast to be some impacts on operation, queues and delays. This is as a result of some movement of stop lines and intergreens changing as a result, as well as the addition of the provision of a cycle crossing over the junction which (based on the Traffic Signs Manual, Ch 6), requires a longer minimum green time than the current pedestrian crossings (which operate presently with a 5 second minimum green time).

8.8.23 The impacts do however appear more marked due to the junction already operating over capacity and the benefits to active travel users should be a material consideration.

8.8.24 The proposed development is forecast to have an impact on the operation of the junction with a significant worsening forecast in terms of queues and delays across all approaches. These scenarios are however deemed to be robust with high levels of growth (Core scenario) and no modal shift (both scenarios) allowed for despite the proposed network of active travel improvements. The benefits that could be realised are assessed in proceeding chapters.

Beech Road/Firbank Road

8.8.25 The A1081 Harpenden Road/Sandridgebury Lane junction has been modelled using the calibrated Junctions 10 model.

Table 8-18: Beech Road/Firbank Road Junction – Future Year Capacity Results

Junction	Arm	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
		RFC	Queue (PCU)	Delay (s/PCU)	RFC	Queue (PCU)	Delay (s/PCU)
2028 Opening Year							
1	Beech Road West	A	0	0	A	0	0
	Firbank Road	C	<1	20	C	1	29
	Beech Road East	A	0	0	A	0	0
2	Beech Road West	A	0	0	A	0	0
	Firbank Road	A	<1	8	A	<1	9
	Beech Road East	A	<1	0	A	0	0
3	Firbank Road North	A	0	0	A	0	1
	Firbank Road East	A	<1	8	A	0	8
	Firbank Road West	A	0	0	A	0	0
2033 Future Year (Core)							
1	Beech Road West	A	0	0	A	0	0

Junction	Arm	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
		RFC	Queue (PCU)	Delay (s/PCU)	RFC	Queue (PCU)	Delay (s/PCU)
	Firbank Road	C	<1	20	D	2	30
	Beech Road East	A	0	0	A	0	0
2	Beech Road West	A	0	0	A	0	0
	Firbank Road	A	<1	8	A	<1	9
	Beech Road East	A	<1	0	A	<1	0
3	Firbank Road North	A	0	0	A	<1	1
	Firbank Road East	A	<1	8	A	<1	8
	Firbank Road West	A	0	0	A	0	0
2033 Future Year (Behavioural)							
1	Beech Road West	A	0	0	A	0	0
	Firbank Road	C	<1	16	C	1	22
	Beech Road East	A	0	0	A	0	0
2	Beech Road West	A	0	0	A	0	0
	Firbank Road	A	<1	7	A	<1	8
	Beech Road East	A	<1	0	A	<1	0
3	Firbank Road North	A	0	0	A	<1	1
	Firbank Road East	A	<1	7	A	<1	8
	Firbank Road West	A	0	0	A	0	0
2033 Future Year (Core) + Development (Core)							
1	Beech Road West	A	0	0	A	0	0
	Firbank Road	D	1	26	E	2	38
	Beech Road East	A	0	0	A	0	0
2	Beech Road West	A	0	0	A	0	0
	Firbank Road	A	<1	9	A	<1	10
	Beech Road East	A	<1	0	A	<1	0
3	Firbank Road North	A	0	0	A	<1	4
	Firbank Road East	A	<1	8	A	<1	8
	Firbank Road West	A	0	0	A	0	0

8.8.26 The proposed development, even in the Core scenario without any modal shift or behavioural change, is not forecast to have a severe impact at the Firbank Road/Beech Road junction.

A1081 Harpenden Road/Sandridgebury Lane

8.8.27 The A1081 Harpenden Road/Sandridgebury Lane junction has been modelled using Junctions 10 software using the calibrated model.

Table 8-19: A1081 Harpenden Road/Sandridgebury Lane Junction – Future Year Capacity Results

Turning	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	RFC	Queue (PCU)	Delay (s/PCU)	RFC	Queue (PCU)	Delay (s/PCU)
2028 Opening Year						
Sandridgebury Lane (left)	0.43	1	12	0.12	<1	8
Sandridgebury Lane (right)	0.17	<1	19	0.33	1	27
Harpenden Road (right, ahead)	0.66	4	13	0.56	3	8
2033 Future Year (Core)						
Sandridgebury Lane (left)	0.46	1	13	0.14	<1	8
Sandridgebury Lane (right)	0.19	<1	21	0.37	1	31
Harpenden Road (right, ahead)	0.71	5	15	0.63	4	10
2033 Future Year (Behavioural)						
Sandridgebury Lane (left)	0.39	1	11	0.11	<1	7
Sandridgebury Lane (right)	0.15	<1	17	0.28	<1	22
Harpenden Road (right, ahead)	0.57	3	11	0.47	2	7
2033 Future Year (Core) + Development (Core) – Sandridgebury Lane Re-routing						
Sandridgebury Lane (left)	0.31	1	15	0.03	0	8
Sandridgebury Lane (right)	0.37	1	57	0.33	1	54
Harpenden Road (right, ahead)	0.58	5	11	0.75	11	15

8.8.28 As part of the proposed development, it will be necessary to allow for Sandridgebury Lane traffic to re-route via the proposed development. The traffic turning into / out of Sandridgebury Lane would reduce in this case. This is represented in the 2033 Future Year (Core) + Development (Core) – Sandridgebury Lane Re-routing scenario. Even with no modal shift forecast for the development or in background trips, the proposed highway changes that would be required to facilitate the development, would result in the Harpenden Road/Sandridgebury Lane junction operating within acceptable capacity thresholds, albeit there are some delays to movements turning out of Sandridgebury Lane.

8.9 Summary

8.9.1 To summarise:

- A1081 Harpenden Road / Site Access junction – the proposed junction is forecast to operate within acceptable capacity thresholds even using a robust set of traffic flows. The delays introduced to the A1081 Harpenden Road approaches are acceptable and less than 30 seconds so as not to unduly affect these through movements which are currently unconstrained.
- A1081 Harpenden Road / Sandridgebury Lane junction – with the addition of development traffic and the re-routing of Sandridgebury Lane traffic which would be required to facilitate the

development transport strategy, the junction is forecast to operate within acceptable capacity thresholds.

- Ancient Briton Junction – the junction already operates over capacity which is worsened further in the future years modelled. Whilst the development is shown to have a material impact on the operation of the junction in its current layout, through a reduction in capacity following the implementation of the Sewell Park active travel scheme at the junction, the proposed scheme with development traffic is forecast to result in an improved operation compared to the committed scheme. Further benefits that could be achieved through modal shift resulting from the proposed active travel schemes are tested in Chapter 11.
- King William IV Junction – the junction already operates over capacity which is worsened further in the future years modelled. The development traffic worsens the operation of the junction further in the Core scenario tested. However, the Core scenario is deemed to be overly robust since there is likely to be modal shift and behavioural change following the introduction of the proposed active travel network improvements. The benefits are tested in Chapter 11.
- Firbank Road/Beech Road – The junction currently operates within capacity and the operation is not meaningfully impacted by the introduction of development traffic along Beech Road.

9 Assessment of the Effects of Proposed Active Travel Enhancements

9.1 Introduction

9.1.1 The Travel Demand Model has been used to determine the potential effects of the proposed active travel enhancements in terms of the potential reduction in background and development vehicle movements.

9.1.2 The approach comprises two elements:

- Reduction in **development** vehicle trips from the Core/Baseline scenario, following a shift to active travel modes; and
- Reduction in **background** vehicle trips on the local network from the Core/Baseline scenario, following a shift to active travel modes.

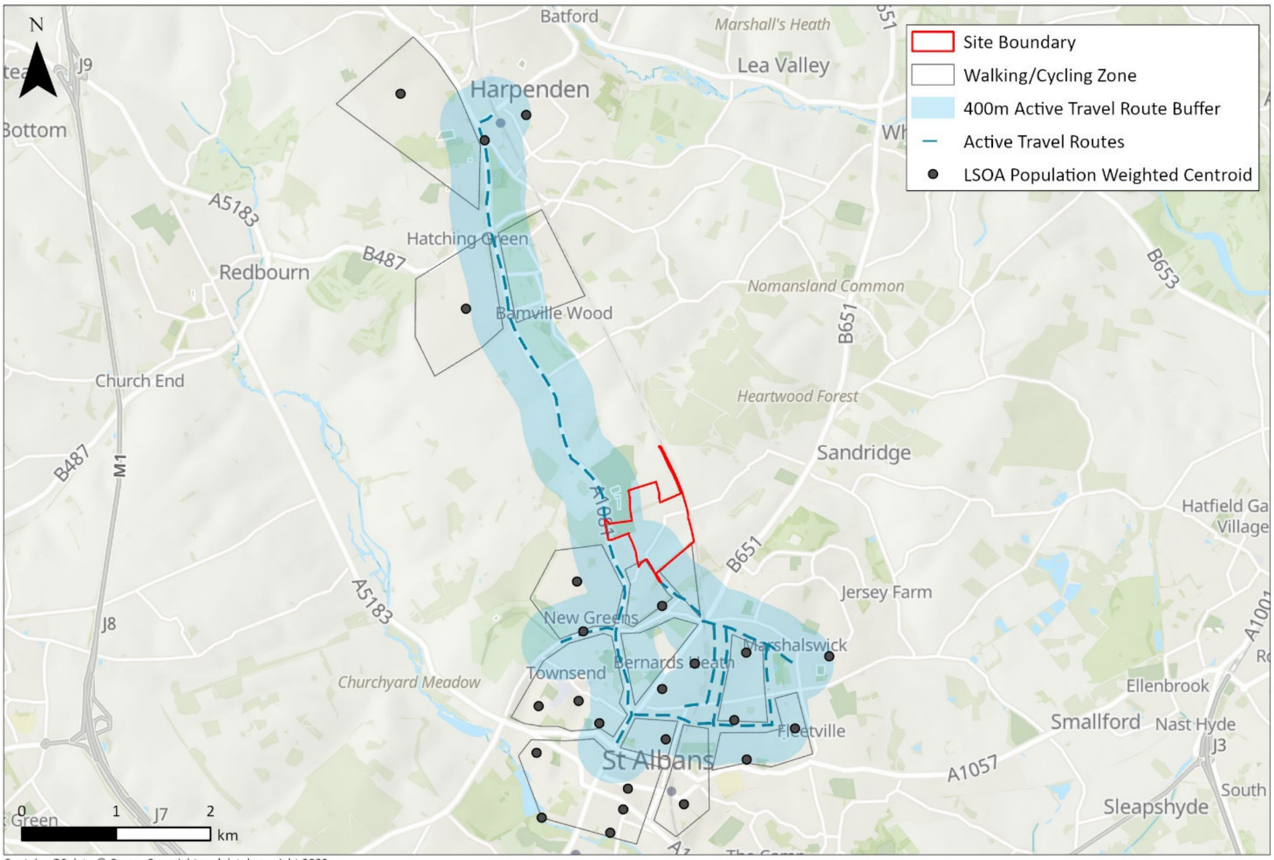
9.1.3 Both scenarios are instigated as a result of local improvements to active travel facilities proposed to be delivered offsite by the developer or through contribution where changes are more strategic in nature, as set out in Chapter 7.

9.2 Development Trips

9.2.1 The trip generation and distribution determined within the TDM for the Core/Baseline scenario calculates the expected trips to local destinations assuming historical travel behaviour using a local proxy.

9.2.2 Using the proposed active travel route network, a 400m catchment has been identified to determine zonal locations where forecast development vehicle journeys could instead be undertaken using active travel modes using the proposed active travel infrastructure, thus being subject to modal shift. Walking and cycling zones were also identified as part of the catchment, where the proposed routes would lead to a cohesive and connected environment for pedestrians and cyclists. The catchment is demonstrated in Figure 9-1.

Figure 9-1: Active Travel Catchment Zones

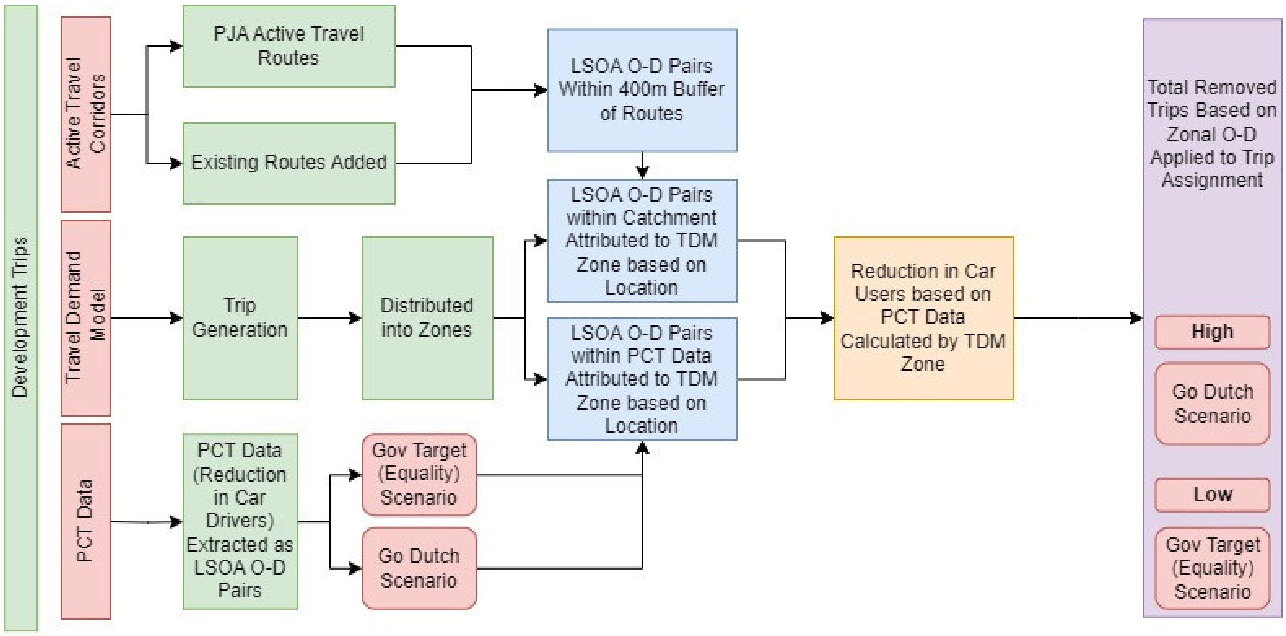


9.2.3 Origin-destination trips between the site and local zones within a 400m catchment of active travel routes have been applied to varying scenarios within the Propensity to Cycle Tool (PCT) to generate a potential modal shift across the network. These scenarios are as follows:

- **Low Modal Shift** - a modest level of modal shift assuming that existing relatively low cycle uptake is doubled, based on Government Target forecast in the PCT.
- **High Modal Shift** - a more aspirational level of modal shift, mirroring modal patterns with the provision of high-quality Dutch level (LTN 1/20 compliant) infrastructure, based on the Go Dutch forecast in the PCT.

9.2.4 The process is summarised in Figure 9-2.

Figure 9-2: Quantification of Modal Shift Methodology – Development Trips

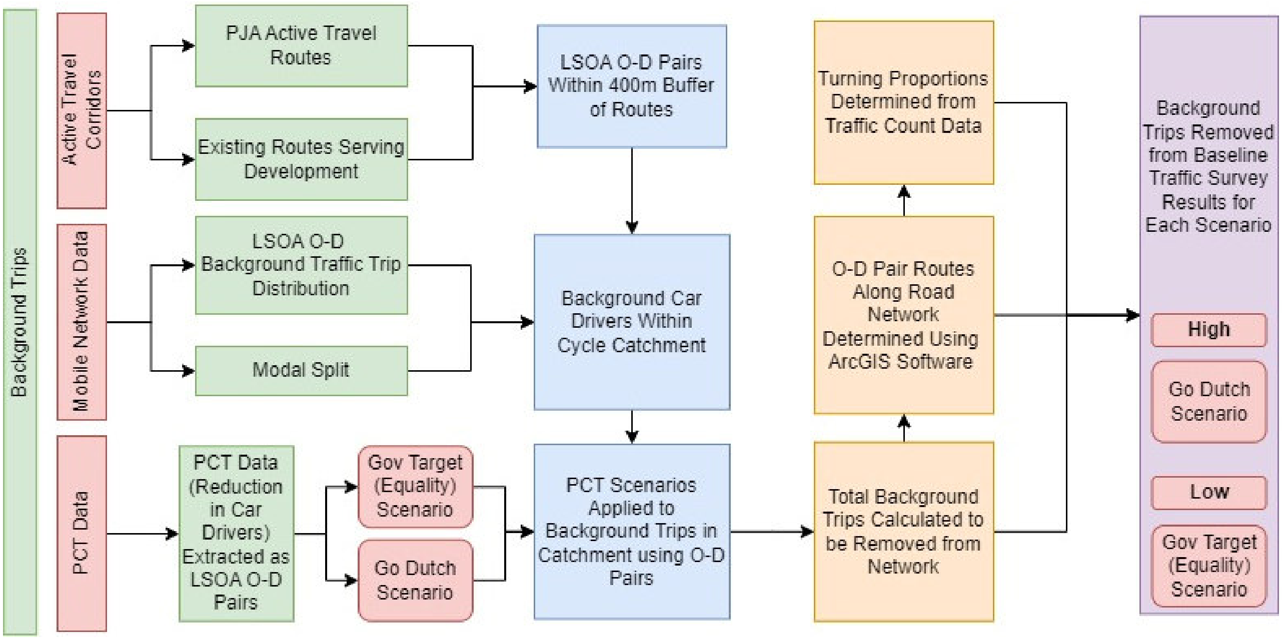


9.3 Background Trips

9.3.1 The process for quantifying a modal shift in background vehicle movements has utilised mobile network data, the proposed active travel corridors and PCT data.

9.3.2 Mobile network data has been utilised to establish existing off-site LSOA origin-destination pairs within a 400m catchment of the proposed active travel routes which could be subject to modal shift from vehicle to active travel modes. The PCT forecasts outlined above for the **Low** and **High** Modal Shift scenarios have then been applied to the existing mobile network vehicle trips to generate a potential reduction in vehicle trips across the network with modal shift to active travel modes. The process is summarised in Figure 9-3 below.

Figure 9-3: Trip Banking Methodology – Background Trips



9.3.3 A summary of the overall reduction in vehicular trips across the network in the various scenarios for both the development and background elements is provided in Table 9-1 and Table 9-2, respectively.

9.3.4 Traffic flow diagrams demonstrating the vehicle movement reductions across the network by junction and turning movement is provided in Appendix I.

Table 9-1: Forecast Reduction in Vehicle Trips by TDM Element and Scenario (Development Trips)

TDM Element/Scenario	AM	PM	Daily (12h)
Development Vehicle Trips (**Core**)	643	541	5178
Development Vehicle Trips (**Low Modal Shift**)	631	531	5084
Reduction in Development Vehicle Trips (Low Modal Shift)	*2%*	*2%*	*2%*
Development Vehicle Trips (**High Modal Shift**)	555	470	4502
Reduction in Development Vehicle Trips (High Modal Shift)	*14%*	*13%*	*13%*
Development Vehicle Trips (**Core**) – within St Albans City Cycle Route Improvement Catchment	380	307	2952
Development Vehicle Trips (**Low Modal Shift**) – within St Albans City Cycle Route Improvement Catchment	367	297	2858
Reduction in Development Vehicle Trips for Local Trips (Low Modal Shift)	*3%*	*3%*	*3%*
Development Vehicle Trips (**High Modal Shift**) – within St Albans City Cycle Route Improvement Catchment	291	236	2276
Reduction in Development Vehicle Trips for Local Trips (High Modal Shift)	*23%*	*23%*	*23%*

Table 9-2: Forecast Reduction in Vehicle Trips by TDM Element and Scenario (Background Trips)

TDM Element/Scenario	AM	PM	Daily (12h)
Background Vehicle Trips (**Core**) – within St Albans City Cycle Route Improvement Catchment	794	646	10055
Background Vehicle Trips (**Low Modal Shift**) – within St Albans City Cycle Route Improvement Catchment	773	629	9809
Reduction in Background Vehicle Trips Shift for Local Trips (Low Modal Shift)	*3%*	*3%*	*2%*
Background Vehicle Trips (**High Modal Shift**) – within St Albans City Cycle Route Improvement Catchment	567	466	7244
Reduction in Background Vehicle Trips Shift for Local Trips (High Modal Shift)	*29%*	*28%*	*28%*

9.3.5 The top rows in Table 9-1 (white background) present the total number of vehicle trips forecast to be generated by the development in the baseline (core) scenario and then under the two modal shift scenarios considered within this assessment.

9.3.6 The figures in the rows shaded green are a subset of the development traffic flows. These represent journeys to and from destinations served by the proposed active travel network, where a greater level of modal shift is considered likely.

9.3.7 In Table 9-2, the rows shaded blue set out the forecast background vehicle trips on the highway network with origins and destinations within the catchment of the proposed active travel network, and the potential reduction in trips between these OD pairs which could be achieved through the introduction of improved infrastructure above overarching modal shifts achieved through wider national and local policy and associated interventions.

9.3.8 The vehicle reductions have been applied to the baseline splits to calculate the forecast modal shift and resulting modal split for sustainable travel modes for both the low and high modal shift scenarios.

Table 9-3: Forecast Development Modal Shift

	High Modal Shift			Low Modal Shift		
	AM	PM	Daily	AM	PM	Daily
Baseline Development Vehicle Driver Modal Split	42%	45%	46%	42%	45%	46%
Development Vehicle Trip Reduction	14%	13%	13%	2%	2%	2%
Percentage Modal Shift	6%	6%	6%	1%	1%	1%
Aspirational Development Vehicle Driver Modal Split	37%	39%	40%	42%	45%	45%

9.3.9 Up to a 14% reduction is forecast across all development vehicle trips in the high modal shift scenario, which constitutes an approximate 6%-point modal shift giving approximately a 60% modal split by sustainable travel modes. This reduction in development vehicle trips increases to 23% when considering the most local vehicle trips within the active travel route improvement catchment.

9.3.10 A similar reduction in background vehicle trips is also forecast when considering those trips within the local area in the active travel route improvement catchment.

9.3.11 These forecast vehicular reductions and their impact is tested within the standalone junction capacity models set out in Chapter 10.

10 Active Travel Enhancements – Highway Impact Assessment

10.1 Introduction

10.1.1 In line with Decide and Provide guidance and the emerging changes to the NPPF, a variety of scenarios have been considered to reflect not only a historical approach to transport planning with typical levels of car uptake and continual upward projection of vehicular traffic volumes, but also a set of Vision Based scenarios to reflect modal shift which could occur as a result of investment in sustainable travel measures and infrastructure on the local movement network.

10.1.2 This has included the implementation of an active travel strategy which would benefit not only those travelling to/from the site but also those travelling through the area surrounding the site. As set out in Chapter 9, the potential modal shift / vehicular reductions have been quantified. This chapter sets out the highway impact assessment assuming these more aspirational scenarios.

10.2 Assessment Scenarios

10.2.1 The reduction in trips as a result of trip banking associated with the proposed development and background traffic have been assessed at each of the agreed off-site junctions, for the following scenarios:

- 2033 Future Year (Behavioural) + Proposed Development (Low) +Background Modal Shift (Low) – Based on a Low level of modal shift (Government Target) associated with the proposed development and background trips; and
- 2033 Future Year (Behavioural) + Proposed Development (High) +Background Modal Shift (High) – Based on a High level of modal shift (Go Dutch) associated with the proposed development and background trips.

10.2.2 For the proposed development scenarios, the Site Access, A1081 Harpenden Road/Sandridgebury Lane junction and Firbank Road/Beech Road junction operate within capacity under that classic traffic growth scenarios and therefore have not been modelled further. Under these behaviour change/mode shift scenarios, the operation of these junctions would only improve as traffic volumes would reduce.

10.3 Local Modelling Results

10.3.1 The results are summarised in the tables below and full outputs provided in Appendix L.

A1081 Harpenden Road/Beech Road/Batchwood Drive (Ancient Briton)

10.3.2 The A1081 Harpenden Road/Beech Road/Batchwood Drive junction has been modelled using the proposed scheme layout LinSig model to understand the effects of modal shift.

Table 10-1: Revised Future Year With Proposed Development Modelling (Proposed Layout)

		2033 Beh + Dev + Modal Shift (High)	2033 Beh + Dev + Modal Shift (Low)
AM Peak Hour (08:00 to 09:00)			
PRC		**-90.9%**	**-97.0%**
DoS (%)	A – Harpenden Road N	168.1%	174.9%
	B – Beech Road	168.7%	169.6%
	C – Harpenden Road S	90.5%	94.9%
	D - Batchwood Drive	171.9%	177.3%
Queue (pcu)	A – Harpenden Road N	261	284
	B – Beech Road	179	182
	C – Harpenden Road S	16	19
	D - Batchwood Drive	120	129
Delay (s/pcu)	A – Harpenden Road N	846	891
	B – Beech Road	853	858
	C – Harpenden Road S	79	95
	D - Batchwood Drive	875	911
PM Peak Hour (17:00 to 18:00)			
PRC		**-103.0%**	**-106.6%**
DoS (%)	A – Harpenden Road N	146.4%	148.8%
	B – Beech Road	178.8%	186.0%
	C – Harpenden Road S	177.2%	184.2%
	D - Batchwood Drive	182.7%	185.9%
Queue (pcu)	A – Harpenden Road N	159	167
	B – Beech Road	218	234
	C – Harpenden Road S	161	175
	D - Batchwood Drive	152	157
Delay (s/pcu)	A – Harpenden Road N	678	699
	B – Beech Road	917	961
	C – Harpenden Road S	919	962
	D - Batchwood Drive	941	960

10.3.3 The Ancient Briton junction in its proposed layout with the addition of development traffic and modal shift of varying levels, is forecast to operate outside of acceptable capacity thresholds. However, the junction already operates over capacity, and this is forecast to worsen even without development traffic in future years.

10.3.4 The committed improvement scheme at the junction to be delivered by Sewell Park is deemed to provide the most suitable basis for comparison. The proposed scheme reduces capacity yet provides limited betterment for active travel users. It is therefore unlikely to achieve a wider behavioural change due to the limited nature of these improvements. The scheme put forward as part of the Woollam Park development, along with the wider proposed active travel network improvements are however forecast to have a beneficial impact and contribute towards wider behavioural change.

10.3.5 When using the operation of the committed scheme in the future year scenarios as a basis for comparison to determine proposed development impacts:

- When compared to the operation in the 2033 Future Year core scenarios, the proposed development, allowing for modal shift and wider behavioural change, is not forecast to have an impact. Indeed, there is forecast to be an improvement in operation with a more efficient arrangement proposed compared with the committed scheme of improvement.
- The improvements include some potentially significant reductions in queuing and delay on the Harpenden Road N, a key public transport corridor into St. Albans.

Beech Road/B651 Sandridge Road/Marshalswick Lane, B651 St Albans Road/Ronsons Way/Valley Road (King William IV) Junction

10.3.6 A summary of the operation of the 2033 Future Year (Core) scenario for the committed scheme layout is provided against the operation of the 2033 Future Year (Behavioural) + Development + Beech Road / B651 Sandridge Road / Marshalswick Lane / B651 St Albans Road / Ronsons Way / Valley Road / Gurney Court Road (King William IV)

10.3.7 The King William IV junction has been modelled using the proposed scheme layout LinSig model to understand the effects of modal shift.

Table 10-2: King William IV – Revised Future Year Modelling (Proposed Layout)

		2033 Beh + Dev + Modal Shift (High)	2033 Beh + Dev + Modal Shift (Low)
AM Peak Hour (08:00 to 09:00)			
PRC		**-36.9%**	**-37.9%**
DoS (%)	A – St Albans Road	118.5%	124.1%
	B – Marshalswick Lane	107.7%	116.8%
	C – Beech Road	88.0%	88.2%
	D – Sandridge Road	123.2%	122.4%
	E – Valley Road	30.2%	30.1%
	F – Gurney Court Road	33.8%	33.6%
Queue (pcu)	A – St Albans Road	39	48
	B – Marshalswick Lane	21	27
	C – Beech Road	21	21
	D – Sandridge Road	43	41
	E – Valley Road	<1	<1
	F – Gurney Court Road	<1	<1
Delay (s/pcu)	A – St Albans Road	388	458
	B – Marshalswick Lane	70	101
	C – Beech Road	45	45
	D – Sandridge Road	436	428
	E – Valley Road	5	5
	F – Gurney Court Road	6	6
PM Peak Hour (17:00 to 18:00)			
PRC		**-39.0%**	**-39.0%**
DoS (%)	A – St Albans Road	125.1%	125.1%
	B – Marshalswick Lane	115.0%	115.0%
	C – Beech Road	87.0%	87.0%
	D – Sandridge Road	125.0%	125.0%
	E – Valley Road	39.1%	39.1%
	F – Gurney Court Road	24.7%	24.7%
Queue (pcu)	A – St Albans Road	43	43
	B – Marshalswick Lane	23	23
	C – Beech Road	21	21
	D – Sandridge Road	45	45
	E – Valley Road	<1	<1
	F – Gurney Court Road	<1	<1
Delay (s/pcu)	A – St Albans Road	475	475
	B – Marshalswick Lane	105	105
	C – Beech Road	41	41
	D – Sandridge Road	458	458
	E – Valley Road	5	5
	F – Gurney Court Road	5	5

10.3.8 When compared to the operation of the existing layout in the 2033 Future Year core scenarios, the proposed development, allowing for modal shift, is not forecast to have an unacceptable impact on the improved junction with generally comparable level of operation with some improvements in the PM peak hour.

10.3.9 The proposed development impacts with the proposed improvement scheme and extensive off-site active travel network are therefore adequately mitigated. Furthermore, the benefits to active travel users in terms of safety, convenience and wellbeing should be noted.

10.4 Summary

10.4.1 To summarise:

- The proposed development impacts when testing using robust assumptions around growth with no modal shift were deemed to be severe at the Ancient Briton and King Willian IV junctions when considering the existing layout. At the Ancient Briton junction, the impact of the proposed development is not deemed to be severe when compared to the operation under the committed improvement scheme to be delivered by the Sewell Park development.
- The 2033 Future Year Core scenario, which assumes upward trends in traffic growth, is likely to be realised without meaningful interventions on the network to affect a modal shift. The proposed investment in active travel improvements which are comprehensive and wide ranging have the potential to cause a behavioural change.
- This potential behavioural change has been assessed using the junction capacity models with more aspirational forecasts for vehicle reductions and reduced levels of background growth.
- The modelling has demonstrated that the forecast travel behaviour which could be realised through the proposed strategy has the potential to offset a material amount of the development impact identified resulting in the development not having a severe impact on the operation of the highway network.
- Furthermore, the principle of not providing further highway capacity has been agreed with HCC and the increased congestion could in itself be a catalyst for behavioural change encouraging drivers to re-time, re-mode and re-route their journeys.
- Within the modelling no account has been taken for the wider implications of significant traffic growth on congested road networks such as peak spreading or drivers considering alternative travel options (route/mode/time) where origins and destinations are outside the locally improved active travel network.
- The aforementioned effects of the congested network have been accounted for within the strategic modelling presented as part of the TIA to support the Regulation 19 Local Plan. This has identified there are no “showstoppers” from a highway operational perspective.

- Therefore it is deemed that the proposed strategy adequately mitigates the proposed development and therefore there would not be a severe residual cumulative impact on the operation of the highway network.

11 Summary and Conclusions

11.1 Summary

11.1.1 PJA has been commissioned by Hallam Land Management Limited (HLM),St Albans School and St Albans School Woollam Trust to lead the development of a movement vision for the proposed development of land at North St Albans, referred to as 'Woollam Park' and to provide transport planning and placemaking advice in relation to the masterplanning of the site and the preparation of transport related inputs to a planning application. This Transport Assessment supports a hybrid application seeking outline consent for residential-led development with detailed consent for access and the relocation of sports pitches at the Old Albanians RFC which will need to be delivered ahead of the commencement of residential development here.

11.1.2 North St Albans is listed as a 'Broad Location' for development in the Emerging SACDC Local Plan for up to 1,146 dwellings with supporting facilities. The site forms part of this draft allocation along with the consented Hunston Properties/Cala Homes development (150 dwellings).

11.1.3 With the locally and nationally declared climate emergency, an ambitious transport strategy has been developed for the site seeking to reduce reliance on car travel and encouraging the uptake of sustainable travel modes. The strategy founded in core transport planning principles, is evidence based and is underpinned by robust data.

11.1.4 PJA has engaged in a significant number of discussions to agree the scope and content of this Transport Assessment. This has included engagement with HCC and NH.

11.1.5 A review of local, regional and national transport related policy has been undertaken and the development proposals have been prepared to accord with these ensuring safe and suitable access is provided and genuine sustainable travel choices are available.

11.1.6 The site is well located to benefit from a variety of existing sustainable travel links although it is noted that these are lacking in places, particularly on the rural edge of St Albans identifying areas for improvement as part of the proposed development. The site is well connected to the local and strategic road network but there are well understood existing areas of congestion which again need to be considered in the context of the development.

11.1.7 There are no highway safety issues identified as part of the analysis of collision data which would be exacerbated by the proposed development.

11.1.8 There are various committed and aspirational improvements on the adjacent network to include a package of active travel measures along the A1081 corridor to be delivered as part of the Hunston Properties development and which the proposed development infrastructure would tie into. There are also various aspirations for network improvements through the LCWIP which sets out a plan for delivery over the next 10 years.

11.1.9 The development is proposed to be residential led with key facilities provided to minimise the need to travel to include a primary school and small local centre, meeting daily needs of residents. Multi-modal access is proposed to be provided with more active travel access points providing connectivity on multiple boundaries of the site. Vehicular access is proposed to be taken via the A1081 Harpenden Road. There will also be a need to reconfigure existing highways running within the development red line to include Sandridgebury Lane and Valley Road.

11.1.10 The principles of the internal layout have been set out placing active travel users at the top of the hierarchy and ensuring the requirement for vehicular access do not dominate the street design. A network of LTN 1/20 compliant routes will be provided throughout the development. This will be supported by the provision of a mobility hub facilitating multi-modal journeys.

11.1.11 The principles of car parking have also been set out and in line with the Emerging Local Plan policy, a bespoke approach is proposed. This will look to minimise parking where possible to ensure sustainable travel modes are prioritised but so as not to cause inappropriate / overspill parking.

11.1.12 The precise details of the internal layout, parking and servicing would be subject to agreement at reserved matters stage.

11.1.13 Part of the hybrid application will be seeking full/detailed consent for the relocation of existing pitches. This will form a like for like replacement for those which will be replaced by the residential-led development. The operation is proposed to remain as at present thus generating no more movements than the current provision. The proposals comprise a reconfigured car parking area formalising an area currently used for parking. Data has been collected to demonstrate the reconfigured area is suitable for accommodating the projected demands in this area.

11.1.14 To support the development, an ambitious sustainable travel strategy has been detailed to include a network of active travel improvements and public transport enhancements. The improvements have been based on data to determine key desire lines. These improvements will be delivered in part by the development with wider measures delivery through a contribution to HCC.

11.1.15 The assessment in this report is underpinned by a comprehensive Travel Demand Model using various robust datasets providing local insights into travel patterns. This has been used to provide a forecast of the development travel demand as well as identifying opportunities for trip banking through the provision of good quality active travel infrastructure.

11.1.16 This in turn has fed into an assessment of highway impacts which demonstrates there are already areas of congestion on the network with the Ancient Briton and King William IV junction operating over capacity at present. The future year growth and proposed development are forecast to contribute towards a worsening in operation with the development impact deemed to be severe in NPPF terms.

11.1.17 The site access is forecast to operate acceptably, and the proposed development is not forecast to have a severe impact on the Firbank Road/Beech Road and A1081 Harpenden Road/Sandridgebury Lane junctions.

11.1.18 Modal shift scenarios have been modelled and demonstrate that with the provision of a comprehensive active travel network, as proposed, behavioural change is likely to be realised. This modal shift / vehicular reduction across the network is forecast to go a long way to offsetting the development impacts. Furthermore, the benefits to active travel users are likely to be far reaching. In the context of the existing operation, the residual impacts are not deemed to be severe. This aligns with the modelling undertaken as part of the TIA to support the emerging Local Plan which considered various scenarios (including ones with modal shift), which concluded there were no "showstoppers".

11.2 Conclusion

11.2.1 The site is well located to benefit from existing sustainable travel links with a significant package of measures and improvements proposed to enhance connectivity in the wider St Albans area. This would be for the benefit not only future residents but those already living and working in the area and supporting wider HCC objectives and aspirations.

11.2.2 NPPF Paragraph 115 states that:

- *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe."*

11.2.3 It has been demonstrated through the development transport strategy and proposed offsite measures that the proposed development would not result in a severe residual cumulative impact.

11.2.4 Therefore, it is deemed that from a highway capacity perspective, there are no highways/transport related reasons why the development should be refused based on the range of scenarios modelled and reported.

11.2.5 It should also be noted that changes to the NPPF are currently being consulted on. This sees the current paragraph 115 proposed to be replaced with the following (at paragraph 113):

- *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe, in all tested scenarios."*

11.2.6 Whilst not adopted and potentially subject to change, this contributes to a change in direction of approach to the assessment of transport impacts which has been evolving for some time. Whilst there are scenarios modelled and reported in this note which demonstrate the potential for severe impacts resulting from the proposed development, these are deemed to be overly robust and unlikely to be realised.

11.2.7 In addition, the analysis of highway safety data has demonstrated there are generally no inherent safety issues which would mean the development would result in an increase in severity or frequency of collisions. There are some areas with collisions involving active travel users where there are proposals put forward for improvements to the active travel network which should improve conditions.

11.2.8 Therefore it is deemed, based on current and draft policy, that there are no highways/transport related reasons why the development should be refused.

Appendix A Parameters Plan and Indicative Masterplan

LAND USE PARAMETER PLAN

LEGEND

- Planning application site boundary
- **Residential** — Including housing, apartments, streets, access, open space, allotments and grow zones, play areas, drainage, landscaping, parking, pedestrian / cycle links, and associated infrastructure
- **Primary School** — Including primary school building, access, parking, landscaping, open space, sports pitches and associated infrastructure
- **Local Centre** — Including housing, apartments, commercial and retail, nursery / creche, medical, community use, adult disability service units, parking, access, landscaping, and associated infrastructure
- **Age restricted specialist accommodation for the elderly** — Including apartements, access, parking, landscaping, open space, and associated infrastructure
- **Care home** — Including residential units, access, parking, landscaping, open space, and associated infrastructure
- **Key civic space** — Including mobility hub / community-use pavilion, bus stop, pedestrian / cycle links, landscaping, and parking
- **Green infrastructure** — Including streets, access, play areas, drainage, natural and semi-natural green spaces, amenity green space, parks and gardens, landscaping, drainage, pedestrian / cycle links, allotments and food growing zones, landscaping, and associated infrastructure
- Longspring Wood
- Buffer planting
- Indicative location for neighbourhood greens and open spaces
- Area reserved for relocation of Old Albanian Sports Pitches and associated facilities as per drawing DE_565_81
- Alignment of primary streets

Notes:

1. All features and areas are subject to a lateral tolerance of +/- 10m within application boundary, subject to site constraints;

2. All the road widths and alignments are indicative and subject to detailed design.

Define.

Scale	1:2,500@A1	Hallam Land Management Limited	Client
Date	31/10/2024	Woollam Park, North St Albans	Project
Drawn By	TA	Parameter Plan - Land Use	Title
Revision	B	DE_565_72	Ref.

ACCESS AND MOVEMENT PARAMETER PLAN

LEGEND

- Planning application site boundary
- Public Rights of Way (PRoW) - footpath
- Public Rights of Way (PRoW) - bridleway including Hertfordshire Way
- Sandridgebury Lane and Valley Road
- Permissive footpath
- Private access road
- Primary link street
- Primary access street
- Primary active travel route with fully segregated cycle lane
- Primary active travel route - Sandridgebury Lane and Valley Road closed to vehicular traffic
- One way street
- Vehicular turning point for coaches, refuse vehicles, and similar. Potential to reduce scale at later date
- Indicative network of proposed pedestrian / cycle links
- Key civic space Including mobility hub / community-use pavilion, bus stop, pedestrian / cycle links, landscaping, parking, and all neccessary infrastructure
- Location for modal filters
- Vehicular primary access point
- Vehicular secondary access point

Notes:

1. All features and areas are subject to a lateral tolerance of +/- 10m within application boundary, subject to site constraints;

2. All the road widths and alignments are indicative and subject to detailed design.

Define.

Scale	1:2,500@A1	Hallam Land Management Limited	Client
Date	31/10/2024	**Woollam Park, North St Albans**	Project
Drawn By	TA	Parameter Plan - Access and Movement	Title
Revision	B	DE_565_73	Ref.

BUILDING HEIGHTS PARAMETER PLAN

LEGEND

- Planning application site boundary
- Up to 4m high (1 storey)
- Up to 9.3m* high to ridge (2 storeys)
- Up to 10.9m* high to ridge (2.5 storeys)
- Up to 12m** high to ridge (primary school)
- Up to 12.8m* high to ridge (3 storeys)
- Up to 16m* high to ridge (3 - 4 storeys)

Notes:

1. All built environment may exceed the existing / proposed ground level by up to +/- 2m;
2. Incidential elements, such as chimneys / flues / photovoltaic panels / AOV's / ACU's / etc., may exceed the building height parameter by up to 2m;
3. All features and areas are subject to a lateral tolerance of +/- 10m within application boundary, subject to site constraints;
4. All the road widths and alignments are indicative and subject to detailed design.

Define.

Scale	1:2,500@A1	Hallam Land Management Limited	**Client**
Date	31/10/2024	**Woollam Park, North St Albans**	**Project**
Drawn By	TA	Parameter Plan - Building Heights	**Title**
Revision	B	DE_565_75	**Ref.**

GREEN AND BLUE INFRASTRUCTURE PARAMETER PLAN

LEGEND

- Planning application site boundary
- Green infrastructure
  Including streets, access, play areas, drainage, natural and semi-natural green spaces, amenity green space, parks and gardens, landscaping, drainage, pedestrian/cycle links, allotments and food growing zones, landscaping, and associated infrastructure
- Longspring Wood
- Buffer planting
- Indicative location for neighbourhood greens and open spaces

Indicative location for play areas:

- NEAP
- LEAP
- LAP
- Teenage area

- Indicative zone for drainage infrastructure
  Including attenuation basins, infiltration basin, and swales
- Indicative location for allotments and grow zones.
  Addiditional food growing and production opportunities will be provided within open space and residential areas
- Alignment protected for surface water drainage
- Area reserved for relocation of Old Albanian Sports Pitches and associated facilities as per drawing DE_565_81
- Alignment of primary streets

Notes:

1. All features and areas are subject to a lateral tolerance of +/- 10m within application boundary, subject to site constraints;

2. All the road widths and alignments are indicative and subject to detailed design.

Define.

Scale	1:2,500@A1	Hallam Land Management Limited	Client
Date	31/10/2024	**Woollam Park, North St Albans**	Project
Drawn By	TA	Parameter Plan - Green and Blue Infrastructure	Title
Revision	B	DE_565_74	Ref.

Appendix B Scoping Correspondence and Technical Notes

Technical Note

Project: North St Albans

Subject: Transport Assessment Methodology

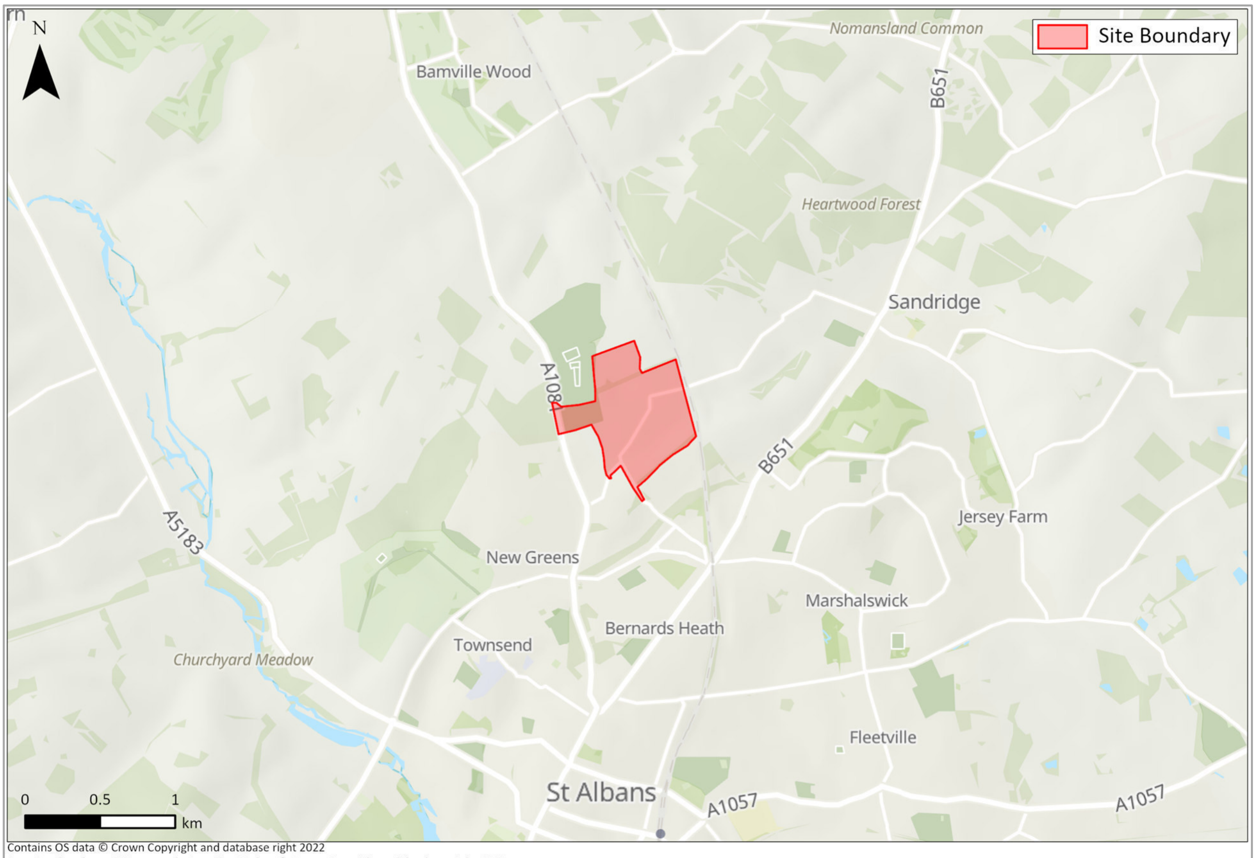
Client:	Hallam Land Management Ltd	**Version:**	3
Project No:	05920	**Author:**	KN
Date:	06/10/2022	**Approved:**	MM

1 Introduction

1.1 Background

1.1.1 PJA has been commissioned to provide transport planning support for the proposed development of Land North of St Albans. The location of the site is shown in Figure 1.

Figure 1: Site Location



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1.1.2 Specifically, PJA has been commissioned to help develop a robust access and movement strategy to be presented in a Transport Assessment and Travel Plan/Travel Demand Management Strategy which can be used to support a planning application for development following the withdrawal of the previous draft Local Plan for St Albans City and District in November 2020.

1.1.3 Hallam Land Management Limited (HLM) was previously supported by WSP who undertook various discussions with the local highway authority, Hertfordshire County Council (HCC). Since this time however there has been a step-change in policy surrounding climate change and the role of transport in meeting national and local targets for Net Zero Carbon and it is therefore proposed to consider a different approach to that considered previously.

1.2 Policy Context

1.2.1 Nationally, the UK Government has committed to reducing net emissions of greenhouse gases by 100% relative to 1990 levels by 2050 (to become a 'net zero' emitter). Transport is now the largest contributor to UK greenhouse gas emissions (28%), and this is likely to make it one of the focus areas for reducing emissions. In July 2021, the Government launched its transportation decarbonisation strategy, which sets out how they propose to achieve significant CO_2 reductions in this area. The strategy builds upon the "gear change" strategy which was launched in Summer 2020. Ahead of the release of the decarbonisation strategy the Government have committed to accelerate carbon reductions with a 78% reduction by 2035, which has subsequently been brought into law.

1.2.2 Locally, St. Albans City & District Council voted unanimously in July 2019 to declare a climate emergency with a pledge that the district would become carbon neutral by the end of the decade (2030). The district has pledged to submit an innovative and comprehensive sustainable travel town Vision to HCC which incorporates a clean air zone in the town centre, and measures to further enable journeys to be undertaken by non-car modes.

1.2.3 Additionally, our collective experience of the Covid-19 Pandemic is also likely to lead to significant changes in travel habits, particularly around commuting trips. Many people have discovered (or rediscovered) the joy of walking and cycling for leisure on quieter streets, and around 42% of people in employment planned to continue working from home most of the time, with an element of hybrid working and sometimes visiting their usual place of work[1]. Data recently collected has demonstrated that people typically travel less and previously elevated traffic levels during the traditional peak hours are smoothed. These trends will be explored further through the assessment undertaken.

[1] Is hybrid working here to stay? - Office for National Statistics (ons.gov.uk)

1.3 Strategy Context

1.3.1 There is now a need for development to integrate potential for new ways of living, working, and moving in the post-pandemic period, by creating places and housing products in locations that enable lifestyles which align with achieving net zero goals.

1.3.2 Due to the existing operation of the St Albans highway network, the declared climate emergency and significant shift in policy, our proposed approach to developing a transport strategy for the development of Land North of St Albans will consider:

- How the transport strategy and the quality of provision can be bolstered to maximise the number of trips which can be undertaken by non-car modes.
- How the mix of uses onsite can contribute to reducing the need to travel offsite.
- How additional measures can be delivered which will extend this opportunity to the existing communities around the North St. Albans site, helping to offset residual car borne trips generated by the development.

1.3.3 It is therefore proposed that a low carbon transport strategy for the development is developed which considers how the delivery of active travel and public transport infrastructure outside of the development red line could change travel habits within the establish neighbouring settlement effectively freeing up capacity for any residual development traffic.

1.4 Approach

1.4.1 To develop such a strategy requires analysis of data to understand travel patterns of those living and working in the area already and understand the potential to influence the mode choice of such journeys.

1.4.2 The strategy is likely to identify and rely upon the creation of new active travel infrastructure including new high-quality routes which lie outside of the red line boundary. We therefore seek the buy in of the local highway authority to the vision. This will be achieved by involving the LHA in early engagement through this scoping process and then continued beyond through the application process.

1.4.3 The process for developing the low carbon transport strategy is iterative, taking information about existing travel patterns to identify key trip generators and attractors in order to identify where the common travel corridors are, along with new active travel and public transport infrastructure that can deliver the greatest changes in car use.

1.4.4 In addition to considering connectivity outside of the red line, it is important that the masterplan is developed to align with a low carbon, car-last environment. This means a network of high-quality active travel routes which pass close to all homes, access to a variety of public transport services, and consideration of how land use planning within the development site can help to reduce car-borne trips. We will also undertake a review of how the car is accommodated including the use of reduced parking standards, off-plot remote parking within centralised mobility hubs, car free streets and modal filtering to further influence travel behaviour.

1.5 Technical Note Purpose

1.5.1 The purpose of this Technical Note is to set out the approach proposed to develop an aspirational low carbon transport strategy for the site. It also sets out the methodology for developing a sound evidence base to underpin the assessment of the strategy.

1.5.2 The success of the strategy will require buy in from the City and District Council's and a wide range of stakeholders, as delivery of the strategy will likely require the implementation of elements beyond the red line. A detailed explanation of the proposed approach is set out within this scoping note as the beginning of a conversation which will lead to the development of an acceptable and deliverable transport strategy supporting development here.

2 Development Proposals

2.1.1 The masterplan for the site is emerging but the development will be residential-led with complementary facilities to support residents and reduce the need to travel offsite. Indicatively, the following development is currently considered:

- In the region of 1,000 residential dwellings including c. 60 retirement living units;
- Care home facility
- 2FE Primary School (420 pupils)
- Local Centre

2.1.2 It is proposed to provide access from various points, with the following currently being considered:

- Pedestrian/Cycle Access:
  - Harpenden Road.
  - Sandridgebury Lane.
  - Valley Road.
- Vehicular Access:
  - Harpenden Road.
- Bus Access:
  - Potential bus link via Valley Road and/or Sandridgebury Lane (s).

3 Data Collection

3.1.1 It is proposed to collect data to assist in the understanding of existing conditions as well as understanding how the development may operate in the future.

3.2 Highway Safety Review

3.2.1 To assist in the analysis of the condition of highway safety on the local network surrounding the development, we will look to obtain Personal Injury Collision (PIC) data for the latest 5 year period from HCC, inclusive of the full STATS-19 dataset including locations, timings and causation.

3.2.2 The study area which will be utilised to obtain PIC data is shown in Figure 2 and encapsulates the highways routing through and immediately surrounding the development site, as well as junctions and their approaches which we will look to assess through junction capacity assessments and other significant carriageways in the vicinity.

Figure 2: Personal Injury Collision Data – Study Area

3.3 2011 Census Data and Other Datasets

3.3.1 Data would be extracted from the 2011 census to include:

- Journey to work data by mode for OD pairs within St Albans.
- Population statistics to inform the TDM.
- Car ownership data.

3.3.2 Data would be extracted for relevant output areas to fit with the zones considered. In particular, to provide a proxy for the development, data relating to St Albans 009 will be used; this is the output area covering the adjacent New Greens area.

3.3.3 Data from the National Travel Survey, TEMPRO, TRICS will also be drawn together to develop or test the development trip generation assumptions.

3.3.4 Data would also be extracted from TRACC[2] relating to public transport accessibility levels to understand key trends around accessibility.

3.3.5 Propensity to Cycle Tool (PCT)[3] data will also be used in the analysis, further details of how the data is proposed to be used is included in proceeding sections.

3.3.6 Data collected as part of the 2021 census is not yet available at lower levels of geography. Whilst there are data releases planned later during 2022, transport and travel statistics are likely to be limited in their use due to the snapshot being recorded during the Covid pandemic. It is therefore proposed to use mobile network data which provides travel insights both prior to the Covid pandemic and emerging patterns moving forward. The data includes the following and would be extracted for the surrounding areas:

- Journey purpose.
- Mode split (road, active travel, bus).
- Time of day.

[2] TRACC Travel Time analysis - Basemap – TRACC software is used to undertake public transport analysis using data to run multi-modal journey time calculations.

[3] The Propensity to Cycle Tool (www.pct.bike) is a nationwide model that identifies where increases in the rates of cycling can be expected through the provision of better infrastructure. It uses census travel to work data and school travel data and looks at trip distances to see where there may be scope for more short journeys to be undertaken by cycling. The data is used regularly in Local Cycling and Walking Infrastructure Plans (LCWIP) prepared and adopted by local authorities across the country.

3.4 Surveys

3.4.1 It is proposed to commission surveys during a neutral period in September/October 2022 to understand existing conditions. This would include the following:

- Manual Classified Counts (MCC) at key junctions to assist in the assessment of highway capacity.
- Multi-modal surveys for a part of the New Greens area of St Albans to provide a baseline picture of local travel demand which is considered to be a good proxy for the potential characteristics of trips generated by the proposed development without the implementation of an aspirational transport strategy.
- Automatic traffic counts to understand existing conditions and to compare to previous counts to understand trends in traffic patterns in the local area prior to and following the Covid pandemic and the growing understanding of climate change impacts.

Manual Classified Counts

3.4.2 Manual Classified Counts and queue surveys would be undertaken on a neutral weekday during w/c 19th September 2022 from 07:00 to 10:00 and 16:00 to 19:00, at the following locations:

- A1081 Harpenden Road/Sandridgebury Lane.
- A1081 Harpenden Road/Beech Road/Batchwood Drive.
- Beech Road/Firbank Road.
- Beech Road/Sandridge Road/Marshalswick Lane/St Albans Road.

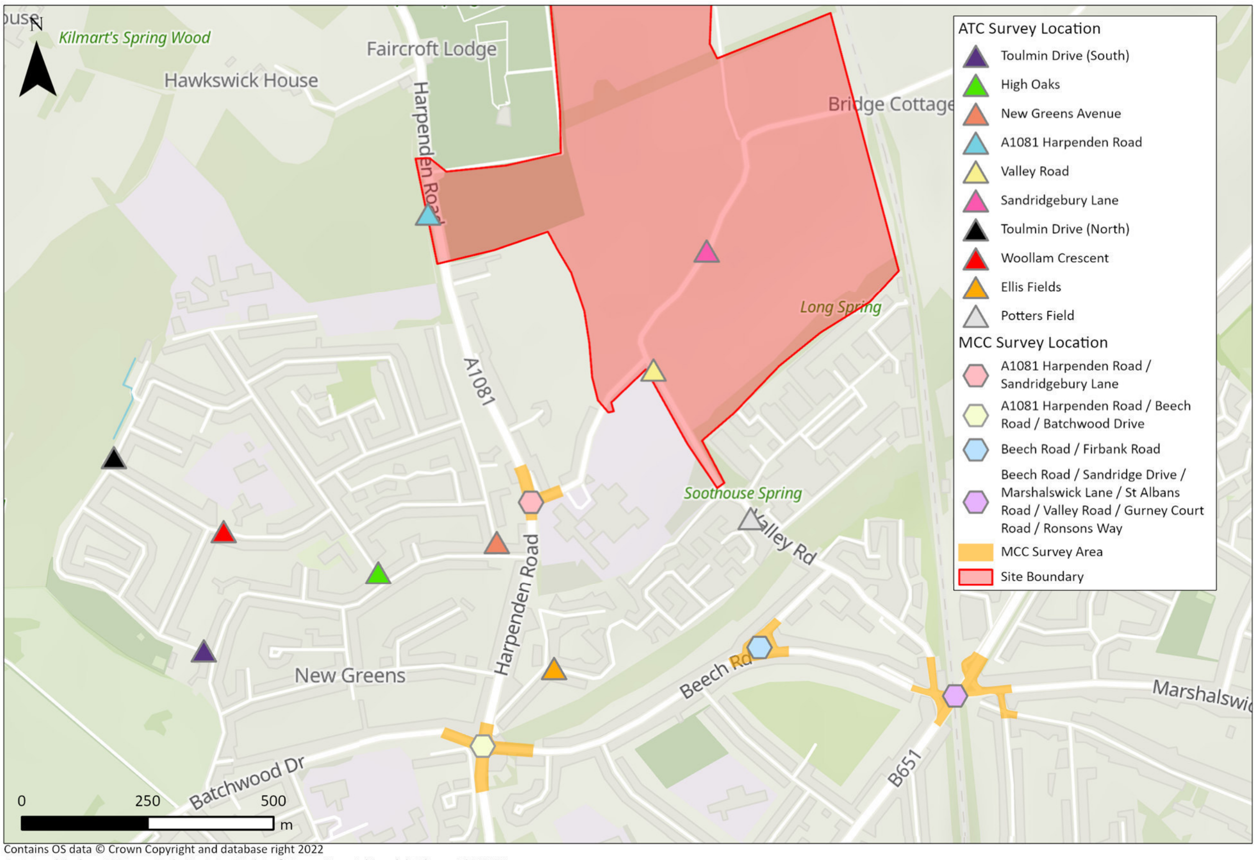
Automatic Traffic Counts

3.4.3 It is proposed to commission a series of automatic traffic counts to understand local conditions as well as to compare to historical counts to understand how traffic conditions have changed since the Covid pandemic began. These would be undertaken for a 7-day period during w/c 19th September 2022, as follows:

- A1081 Harpenden Road.
- Sandridgebury Lane.
- Valley Road.

3.4.4 The location of the Manual Classified Counts and Automatic Traffic Counts are shown in Figure 3, including the Automatic Traffic Counts undertaken as part of the donor site surveys.

Figure 3: Traffic Survey Locations



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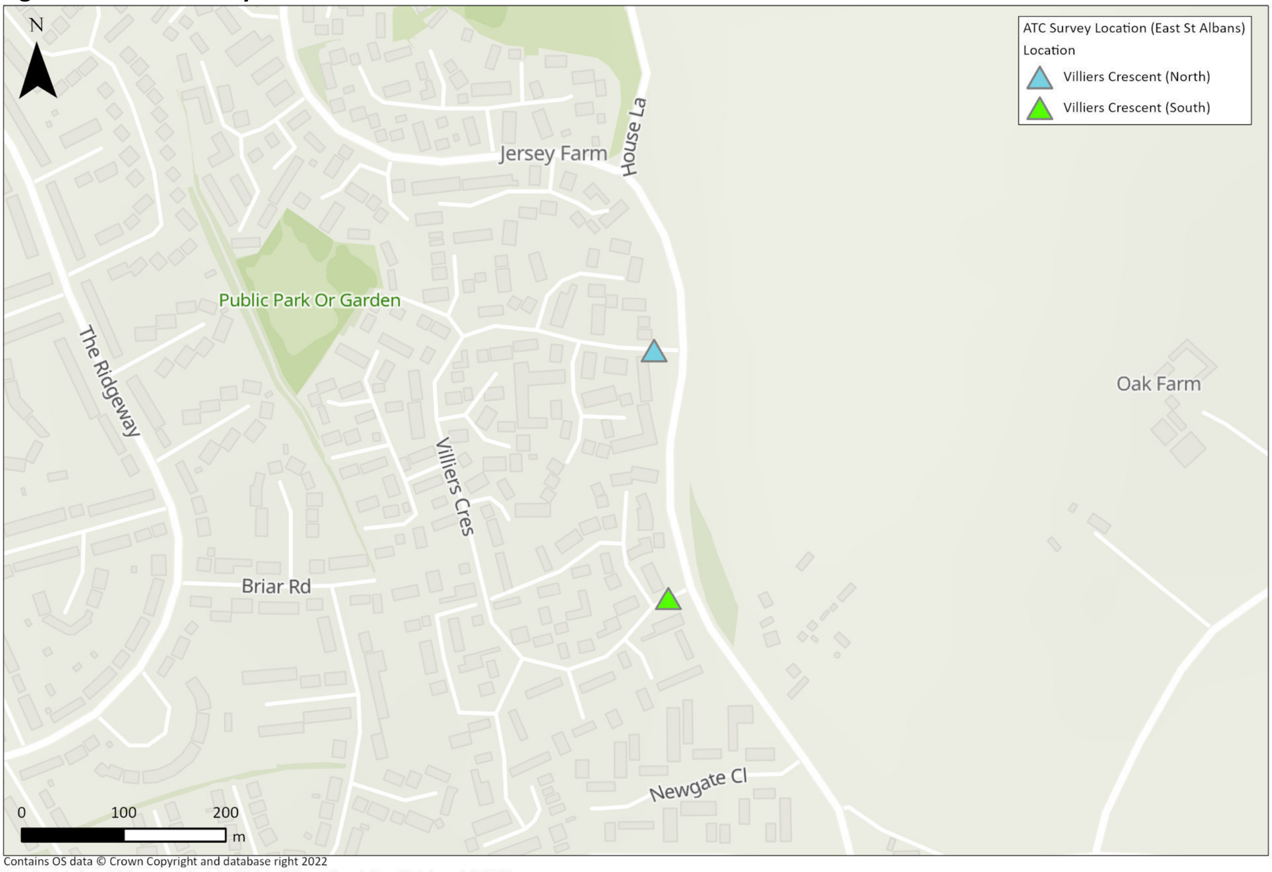
Automatic Traffic Counts – Reference Sites

3.4.5 Four automatic traffic counts will be undertaken in additional areas surrounding the development site to provide reference sites to enable benchmarking against similar residential areas within St Albans. Figure 3 shows two of the locations at Potters Field (Orange Triangle) and Ellis Fields (Grey Triangle), located just south of the development site.

3.4.6 Two further automatic traffic count locations are shown in Figure 4 in east St Albans at Villiers Crescent (North, Blue Triangle) and Villiers Crescent (South, Green Triangle). These would be undertaken for a 7-day period during w/c 3rd October 2022.

Figure 4: Traffic Survey Locations



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Multi-Modal Surveys – Donor Site

3.4.7 To understand the baseline multi-modal travel characteristics of the local area which could form a baseline for the proposed development, the following surveys are proposed:

- Automatic Traffic Counts – for a 7-day period during October 2022 (w/c 3rd October 2022 onwards):
  - Woollam Crescent.
  - Toulmin Drive North
  - Toulmin Drive South.
  - High Oaks.
  - New Greens Avenue.
- Pedestrian and Cycle Counts - **12 hour (07:00 to 19:00)** for a neutral weekday during October 2022 (w/c 3rd October 2022) to include bi-directional counts at the following locations, shown in Figure 5:

– Woollam Crescent.

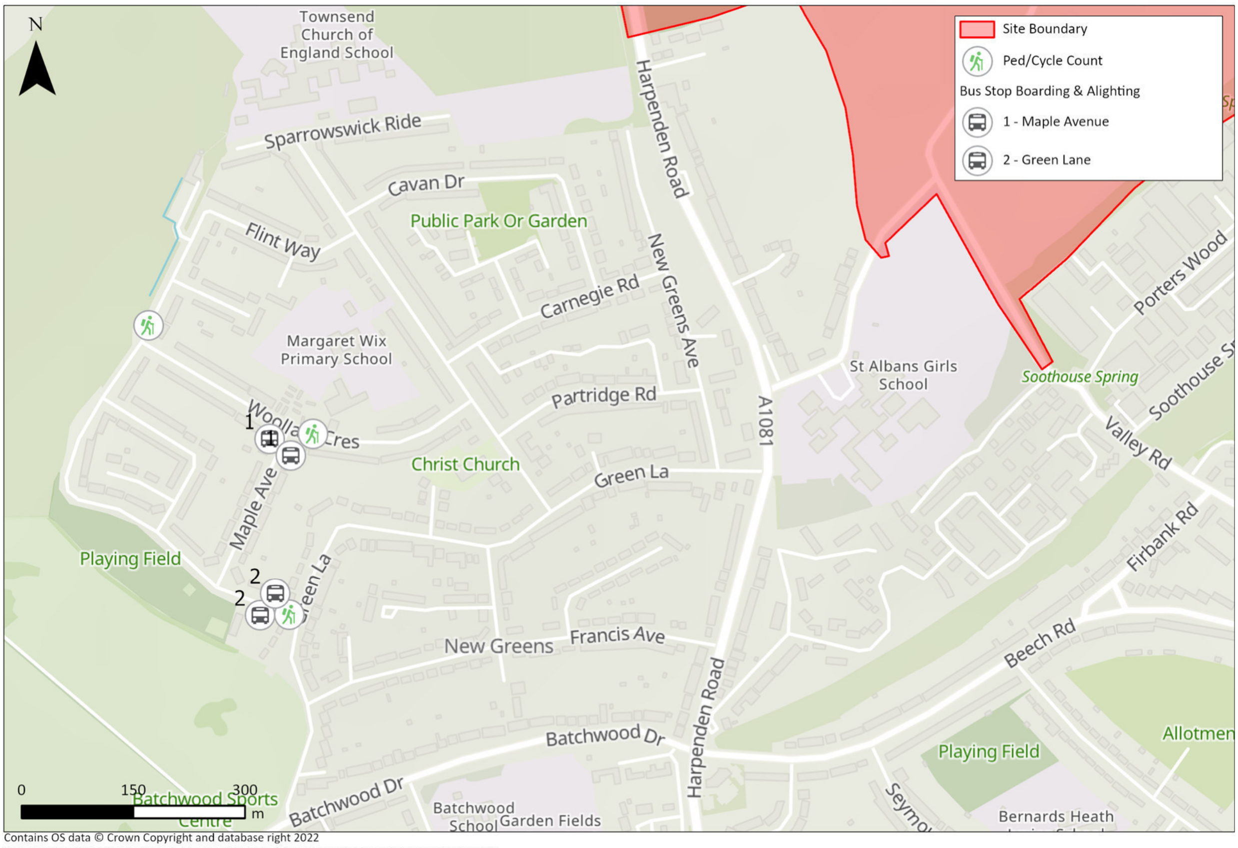
– Toulmin Drive North.

– Toulmin Drive South.

- Bus stop surveys – **12 hour (07:00 to 19:00)** for a neutral weekday in October 2022 (w/c 3rd October 2022) to include counts of the number of buses at each stop and total number of passengers boarding and alighting each service at:

– 4 bus stop locations highlighted on in Figure 5.

Figure 5: Pedestrian/Cycle and Bus Stop Count Locations



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4 Proposed Assessment Methodology

4.1 Introduction

4.1.1 It is proposed to develop a comprehensive Travel Demand Model (TDM) to understand baseline and future trip making patterns within existing communities and the proposed development.

4.1.2 The TDM would consider a range of journey purposes including employment, education, leisure and retail which are the predominant trip purposes which occur during the peak hours.

4.1.3 The TDM will be developed with the use of a range of data from the Census, TRICs database, the National Travel Survey 2019, the propensity to cycle tool, geospatial information and mobile network data.

4.1.4 The TDM will consider a weekday morning and afternoon period and a daily period and the key principles of this will be as follows:

- A broader geographic scope covering not only the development but also neighbouring communities in wider St Albans.
- The baseline trip generation position will be informed by data collected for the New Greens area of St Albans providing a baseline multi-modal trip generation. This would be supported by mobile network data to understand current trip making patterns and validated against Census and TEMPro data to understand trip making patterns by other modes for a variety of purposes.
- Develop a future projected position through consideration of other datasets:
  - Reduced travel demand – based on the masterplan for the site and the complementary land uses which reduce the need to travel offsite.
  - Active travel – considering the strategy for the site and surrounding area and using PCT data to understand the projected uplift in cycling at the development and locally which could be achieved from active travel interventions.
  - Public transport – considering the strategy for the site and determining a donor area for which data can be extracted to forecast uptake of public transport modes at the development and locally resulting from public transport enhancements.
  - Vehicle travel – consider the projected uplift in sustainable modes and determine the resultant reduction in vehicle trips.

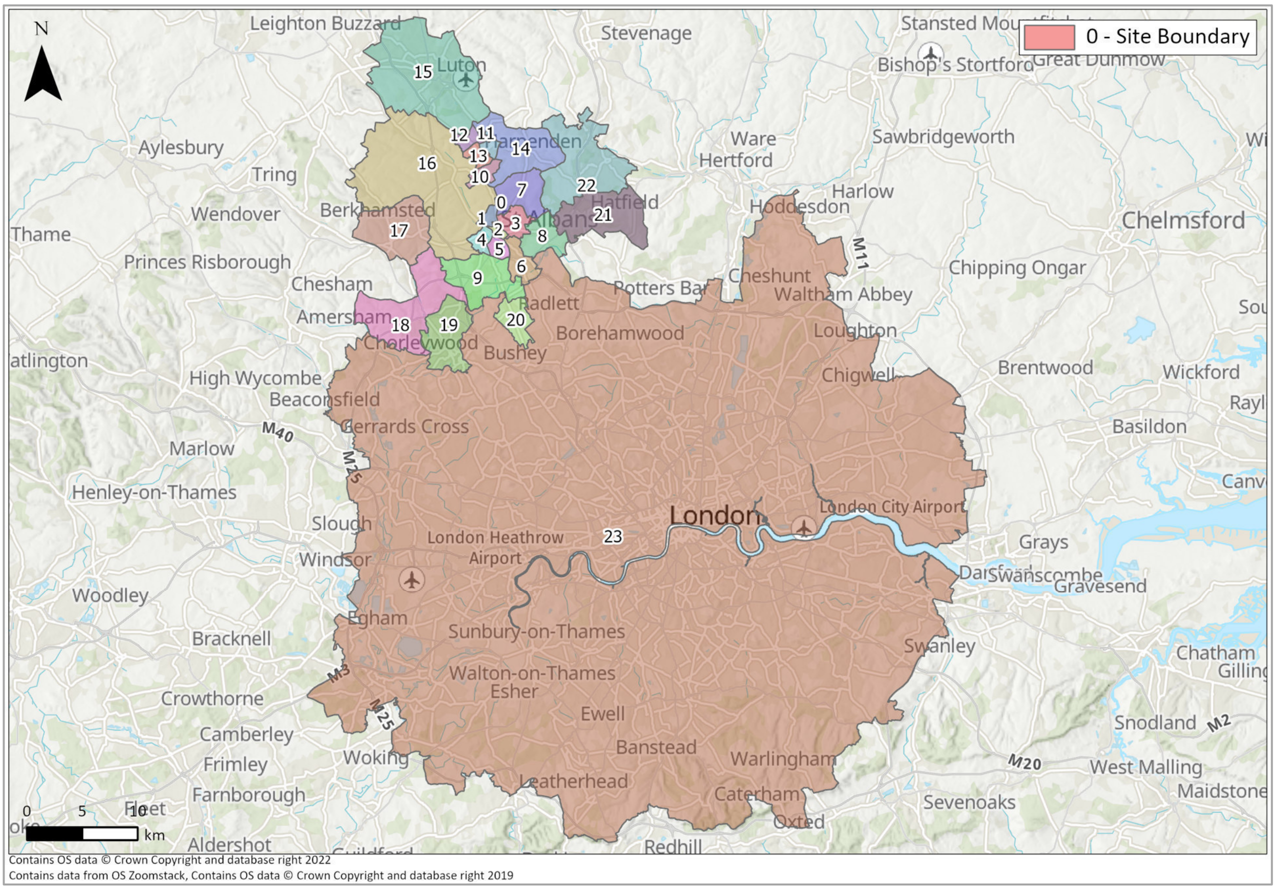
4.2 Travel Demand Model Coverage

4.2.1 The TDM will cover a large area which will encompass the proposed development, the area surrounding the development, wider St Albans and key origins/destinations further afield for journeys terminating/beginning in St Albans.

4.2.2 The zones to be covered within the TDM are set out in Figure 6. These zones have been determined using 2011 Census Journey to Work data for St Albans 009, journeys to/from these zones cover 89% of the total journeys to work for those residing in St Albans 009, as the donor site for the purpose of this assessment. Thus, providing a suitable sample size and a suitable coverage for the TDM.

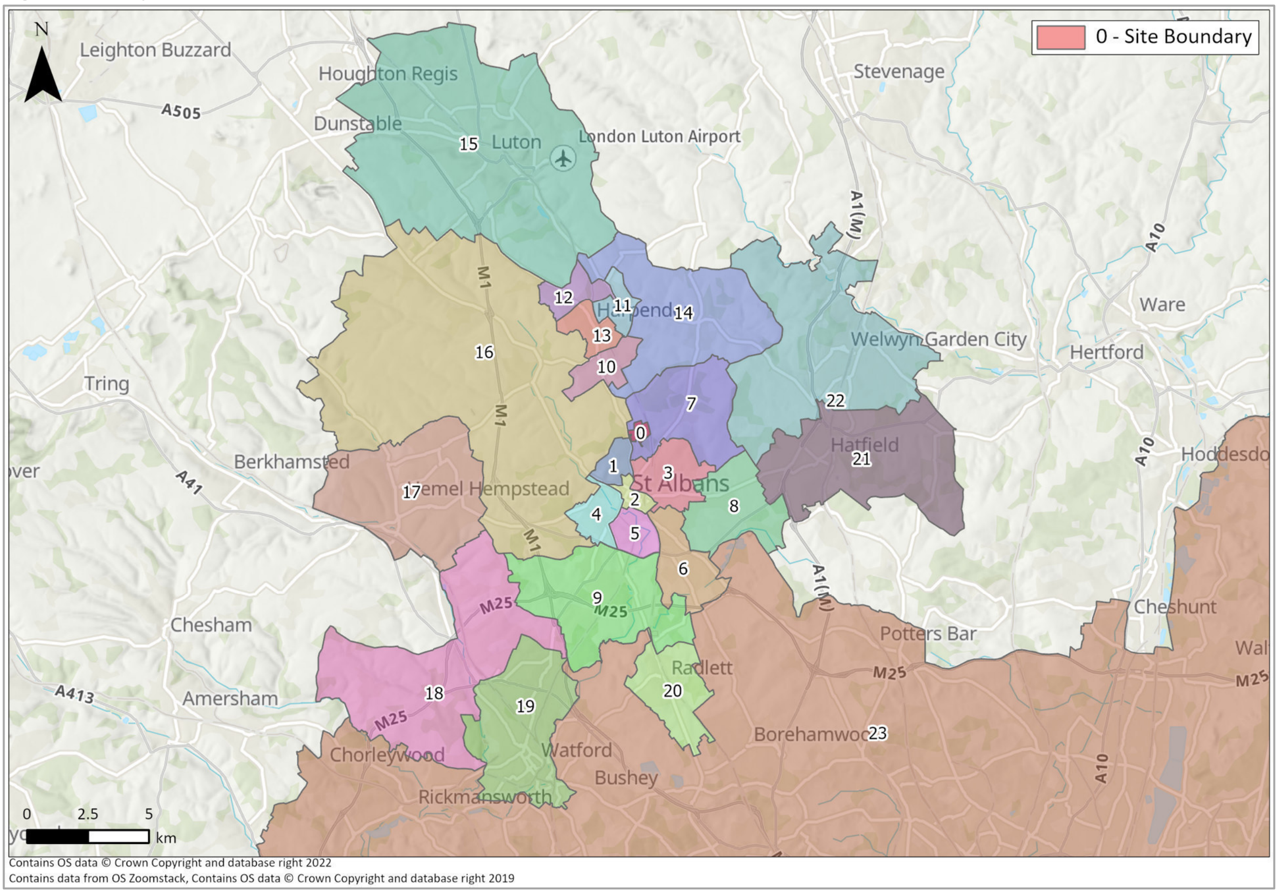
4.2.3 Typical daily journeys for other purposes, such as education, retail and leisure would likely be over a shorter distance and so the zoning determined through consideration of the Journey to Work data would be adequate to cover other journey purposes.

Figure 6: Proposed TDM Zones



4.2.4 Figure 7 provides a local extract of the proposed zones of the TDM.

Figure 7: Proposed TDM Zones (Local Extract)



4.3 Total Person Trip Rates and Generation

Residential Trip Rates and Trip Generation

4.3.1 As we move on from the COVID pandemic, there is a long lasting impact on travel patterns particularly those trips to/from home; including a reduction in overall travel demand with greater levels of home working, changes in modal split following an increased uptake of walking/cycling modes and a change in the times of day which people travel. With only a limited number of surveys undertaken recently in the TRICS database, it is not deemed suitable to use the TRICS database in the calculation of appropriate trip rates or as the basis for factoring daily flow profiles.

4.3.2 The total person trip rates of the site will therefore be determined by surveying the nearby New Greens area. These multi-modal surveys will be used to determine a trip rate for the residential element of the development.

4.3.3 The area suggested and set out in earlier sections is deemed to be representative of the proposed development with a mix of housing, in close proximity to a local centre and schools, that it is expected would be representative of the proposed development.

4.3.4 It is also proposed that there would be a retirement living complex which would provide an onsite community for residents reducing the need to travel. As such, the travel demand associated is likely to be minimal, particularly during the network peak hours. A TRICS assessment will be undertaken to determine appropriate trip rates.

4.3.5 The proposed care home would also likely generate only a modest amount of travel demand. A TRICS assessment will again be undertaken to determine appropriate trip rates.

Education Trip Rates and Trip Generation

4.3.6 Whilst travel patterns of journeys to/from home have changed since the COVID pandemic, the nature of journeys to school have not changed in the same way. It is therefore deemed appropriate to adopt trip rates extracted from the TRICS database from the 04 – Education, A – Primary category as follows. The location of sites have been reviewed to ensure similarities between the sites and the development site.

- Greater London and Ireland removed;
- Only weekday surveys selected; and
- 92 to 449 pupil range selected.

4.3.7 The 12-hour profile of the total person trip generation is presented as follows with full TRICs outputs provided in Appendix A.

Table 1: Total Person Trip Rates and Trip Generation (420 pupils)

Time Period	Arrivals		Departures		Total	
	Trip Rate	Trip Gen	Trip Rate	Trip Gen	Trip Rate	Trip Gen
07:00-08:00	0.124	52	0.039	16	0.163	68
08:00-09:00	**1.296**	**544**	**0.293**	**123**	**1.589**	**667**
09:00-10:00	0.089	37	0.122	51	0.211	89
10:00-11:00	0.024	10	0.048	20	0.072	30
11:00-12:00	0.038	16	0.025	11	0.063	26
12:00-13:00	0.034	14	0.051	21	0.085	36
13:00-14:00	0.032	13	0.058	24	0.09	38
14:00-15:00	0.14	59	0.063	26	0.203	85
15:00-16:00	**0.34**	**143**	**1.044**	**438**	**1.384**	**581**
16:00-17:00	0.103	43	0.366	154	0.469	197
17:00-18:00	0.028	12	0.09	38	0.118	50
18:00-19:00	0.019	8	0.027	11	0.046	19
Daily Trip Rates:	2.267	952	2.226	935	4.493	1887

Local Centre Trip Rates and Trip Generation

4.3.8 It is deemed that the local centre would primarily fulfil onsite demand for facilities and therefore the external trip generation is likely to be minimal.

4.3.9 The trips to the local centre from the proposed residential development are included within the residential trip rates and trip generation, and a proportion of internalisation would be calculated across the site.

4.4 Trip Distribution

4.4.1 The residential person trip generation will be split by journey purpose using TEMPro data. Trips for each journey purpose will be distributed in the following way to provide zone to zone person trips based on the previously defined zoning system:

- Residential:
  - Employment trips – Distribute based on the proportion of trips by MSOA using 2011 Census Journey to Work data for St Albans 009.
  - Education trips – Estimating the number of pupils of primary, secondary and further education age using 2011 Census data for St Albans 009. Distribute trips using a gravity model based on number of pupils in the school weighted against the distance to the facility squared. The majority of primary school trips are distributed to the on-site primary school.
  - Retail and other trips – Distribute trips using a gravity model based on the number of retail workers from the 2011 Census in each MSOA within 11.9km (National Travel Survey 2019, Table NTS0409b) weighted against the distance to the area squared. A proportion of retail trips are distributed to the on-site local centre.
- Education:
  - Internal trips – The internal trips from the onsite population are included above so as not to double count.
  - External trips – The residual school places (not taken by those onsite), have been distributed across local MSOAs within 2.9km for primary schools (National Travel Survey 2019, Table NTS0613) based on the population of the MSOA weighted against the distance to the MSOA squared.

4.4.2 Mobile data network information would be used to refine the assumptions around trip distribution.

4.5 Baseline Modal Split

4.5.1 It is assumed that existing local travel patterns could provide an adequate proxy for the baseline modal split. This represents the likely travel characteristics that would be expected for a development where particular focus is not given to encourage a high uptake of sustainable travel modes. This baseline will be used to forecast the potential shifts away from car reliance to sustainable modes of travel that could be expected with the right level of infrastructure to support this shift, as set out in proceeding sections.

4.5.2 The baseline modal split of the calculated zone to zone person trips will be considered using 2011 Census Journey to Work modal split data for corresponding O/D pairs based on St Albans 009. Whilst this is based on commuting journeys, there is a limited availability of zone to zone data by mode for other journey purposes. It is therefore proposed to calibrate the calculated overall baseline modal split against the multi-modal donor surveys.

4.5.3 The initial baseline modal splits have been calculated as follows. This will be compared to the surveys undertaken at the donor site and calibrated accordingly.

Table 2: Interim Forecast Baseline Modal Split

Travel Mode	Interim Modal Split (AM Peak: 08:00-09:00)	Interim Modal Split (PM Peak: 17:00-18:00)	Interim Modal Split (12 Hour)
Underground	1%	0%	0%
Train	11%	6%	7%
Bus	5%	5%	5%
Car Driver	59%	55%	53%
Car Passenger	5%	4%	4%
Cycle	3%	3%	3%
Walk	18%	27%	28%
Total	100%	100%	100%

4.5.4 The modal splits shown in Table 2 consider the trips generated to and from the site from external destinations and excludes all movements made within the site (Zone 0), to assist in the avoidance of double counting trips generated by the development. For the purpose of this assessment, it is considered that all trips made within the site area will be undertaken by active travel modes only.

4.6 Future Modal Split

4.6.1 The above baseline modal split provides an indication of travel patterns assuming historic attitudes to travel and methods for forecasting demand remain. It is proposed to provide an aspirational transport strategy for the site to influence future travel patterns. This strategy will influence modal choice amongst future residents encouraging a higher uptake of sustainable travel modes and reduced usage of vehicle modes, as well as reducing the need to travel offsite.

4.6.2 The projected future modal splits will be determined as follows:

- Active travel modes: PCT
  - Key corridors will be determined where improvements could be implemented for cyclists. The resultant PCT levels for the 'Go Dutch' scenario would be applied to journeys to/from the development which begin/end within 400m of an improved corridor (further details are provided in the proceeding section).
- Public transport modes: Donor corridors.
  - Key PT corridors will be determined with donor levels of bus uptake applied to journeys to/from the development which begin/end within 400m of a PT corridor.
- Vehicle modes: A corresponding downturn relating to the projected uplift in sustainable travel modes will be applied.

5 Wider Travel Patterns

5.1 Introduction

5.1.1 This aspirational strategy will not only influence travel patterns at the proposed development but will also look to affect how those in the local community travel, particularly for shorter distance journeys.

5.1.2 It is proposed to use data to understand current travel patterns. This would take the form of mobile network data for all origin and destination pairs within the defined zones, this will establish the following:

- The key OD pairs locally and straight line routes between these.
- GIS software will be used to understand the highway corridors which are used in routes for completing these journeys. Of particular interest would be those journeys using the Harpenden Road corridor and intersecting corridors.
- OD pairs which have the potential to be shifted to sustainable modes based on distance.

5.1.3 The other element of this is the analysis of:

- PCT data to understand key corridors where active travel uptake could increase. Analysis of everyday trips between key origins and destinations which could be undertaken by active travel modes. This would be undertaken for both background and development trips. Further details of this methodology are provided below.

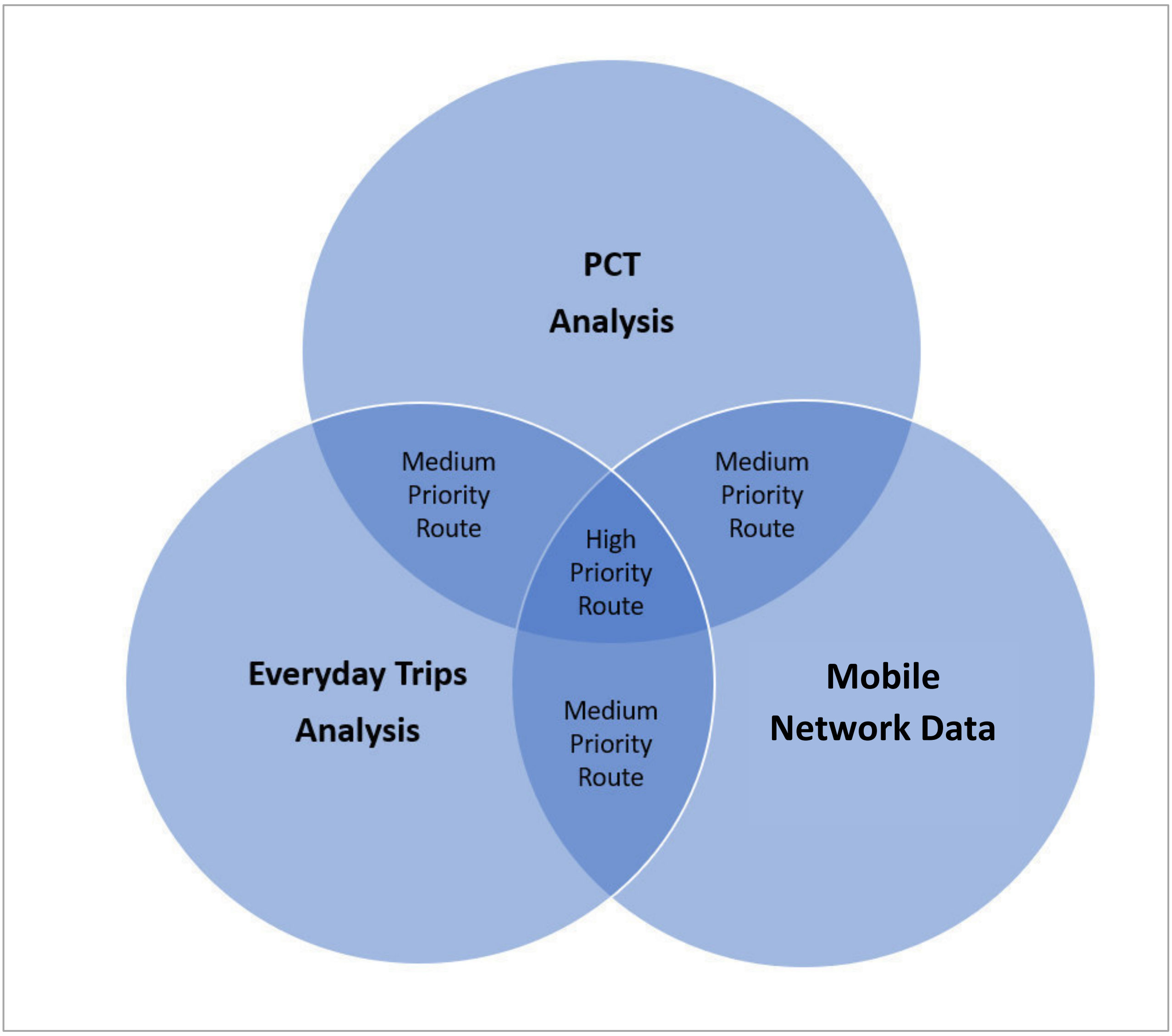
5.2 Potential Active Travel Desire Lines

5.2.1 Potential Active Travel desire lines have been determined through analysis of various datasets within GIS software. This comprises:

- Propensity to Cycle Tool (PCT) data analysis which provides an approximation of commuting trips which could be undertaken by bicycle.
- Everyday trip analysis which considers potential desire lines of other purposes of trips including leisure, recreation and amenity.
- Mobile network data to inform current car-borne travel patterns.

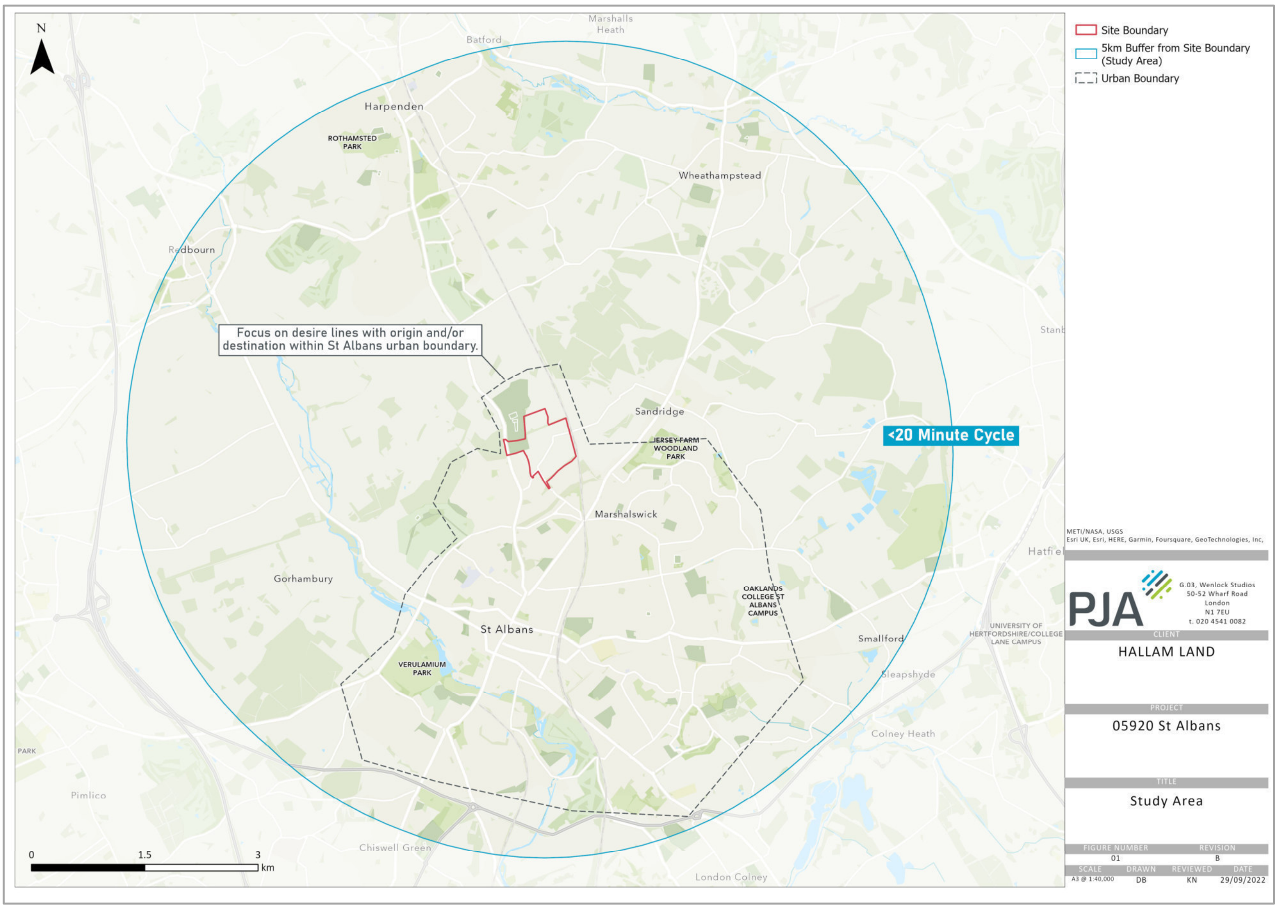
5.2.2 The overlap between these different desire lines is used to prioritise the routes for further study. That is, those desire lines from the different exercises which overlap with one another have the greatest potential to encourage the highest uptake of active travel modes and to reduce corresponding vehicle trips, as illustrated in Figure 8. This is the broad process followed by many local authorities when development their Local Walking and Cycling Infrastructure Plans (LCWIP).

Figure 8: Desire Lines Data Analysis and Relative Route Priority



5.2.3 The study area is presented overleaf (Figure 9) and comprises a 5km buffer around the site. Within the study area, consideration is given to all active travel desire lines within the buffer but with a particular focus on desire lines with a start and/or end point on Harpenden Road as these are the routes which are likely to have the biggest impact in terms of providing the 'headroom' on the road network to enable development North of St Albans through modal shift to active travel modes.

Figure 9: GIS Study Area



5.3 Propensity to Cycle

Overview

5.3.1 The PCT provides seven scenarios for forecasting future levels of cycling which range in ambition from the 'Government Target' (assumes a national average of 6% of commuting trips by bicycle) up to the 'E-Bike' scenario (assumes a national average of 22% of commuting trips by bicycle and improved access to e-bikes). The PCT provides two sets of mapping outputs:

- Straight line networks – these plans show direct paths between LSOA Origin-Destination points which gives an overview of key desire lines for cycling flows.
- Applied Networks – applies the straight desire lines to the existing road network and provides a more detailed summary of where increased cycle flows would take place on the local network.

Methodology and Outputs

5.3.2 The PCT analysis uses the 'E-Bike' scenario, which models the same mode share for cycling as in the Netherlands, adjusting for demographics, trip distance and topography and includes improved access to E-bikes. Using the E-bike scenario is a more ambitious and longer-term outlook for cycling flows, which is advantageous in network planning as it ensures that the proposed routes will provide for assumed future advances in St Albans' cycle network. In terms of the proposed development, this would be complemented by the provision of high-quality infrastructure onsite to include mobility hubs and bike/E-bike hire.

5.3.3 To accommodate for future commuting demand from proposed developments, the population forecasts for each of the proposed sites in the recent draft Local Plan (which has not been adopted) have been incorporated into the PCT forecasts to provide a more accurate representation of potential future flows.

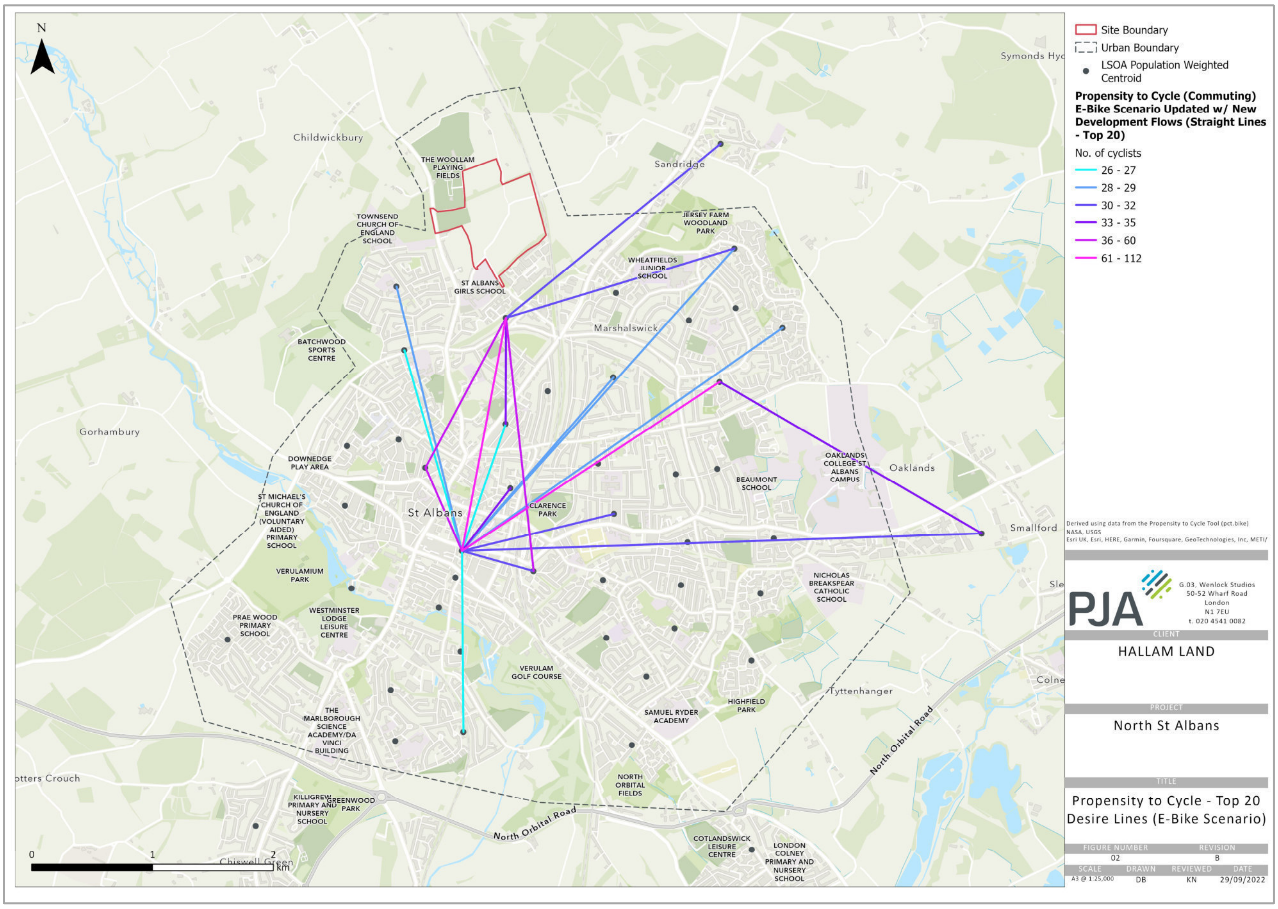
5.3.4 The draft Local Plan site centroids were plotted, and the associated population growth calculated by assuming an average of 2.4 people per new dwelling, which is in accordance with the average household size in 2020 calculated by the Office for National Statistics[4]. The resulting forecast populations were assigned to the nearest LSOA to each potential development site.

5.3.5 The top 20 desire lines, with an origin or destination in St Albans were identified based on the number of cyclists in the E-bike scenario, uplifted to take account of new population as per the above.

5.3.6 The top 20 desire lines with origins and/or destinations, based on the uplifted E-Bike Scenario flows are presented in Figure 10, below.

[4] Families and households in the UK - Office for National Statistics (ons.gov.uk)

Figure 10: PCT E-Bike Scenario – Top 20 Desire Lines



5.3.7 As would be expected when looking at desire lines based on commuting trips, the majority of the top 20 desire lines have a start/end point in the centre of St Albans.

5.3.8 The strongest desire lines are indicated by pink and then purple, showing a pull towards St Albans from the north eastern quadrant and also, to a lesser extent, from the New Greens area.

5.4 'Everyday' Trip Analysis

Overview

5.4.1 The PCT outputs provide an overview of desire lines based on commuting trips. Therefore, a second type of analysis has been undertaken to help understand desire lines associated with 'everyday' trips. For instance, trips to leisure and recreation, trips to local centres and amenity trips.

Methodology and Outputs

5.4.2 Developing the desire lines required the identification of all origins and destinations within the study area. The catchment area has been divided into a hexagon grid using 0.25sqkm hexagons.

5.4.3 For the purposes of the analysis, all hexagons which currently contain an output area centroid and/or are anticipated could include more than 100 residential dwellings in the future were included as origins.

5.4.4 Having identified the origins, destinations were identified based on the following:

- Class 1: Town, Village and Local Centres; Key Employment Sites.
- Class 2: Existing and Proposed Schools, Railway and Bus Stations, Medical Facilities, Supermarkets, Leisure Facilities, Job Centres and Community Facilities.

5.4.5 The origin grids and destinations used in the analysis are presented below.

Figure 11: Assumed Origin Clusters

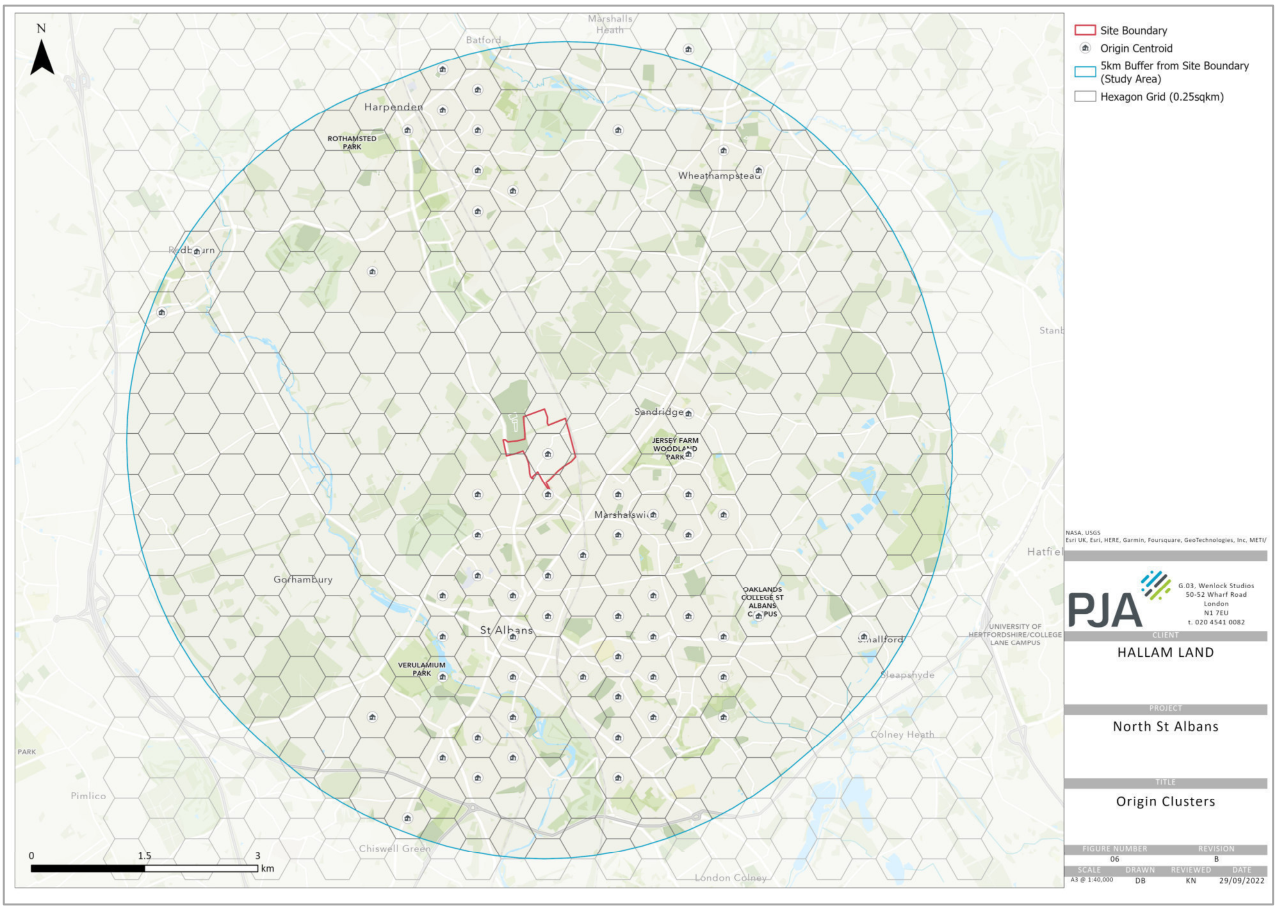
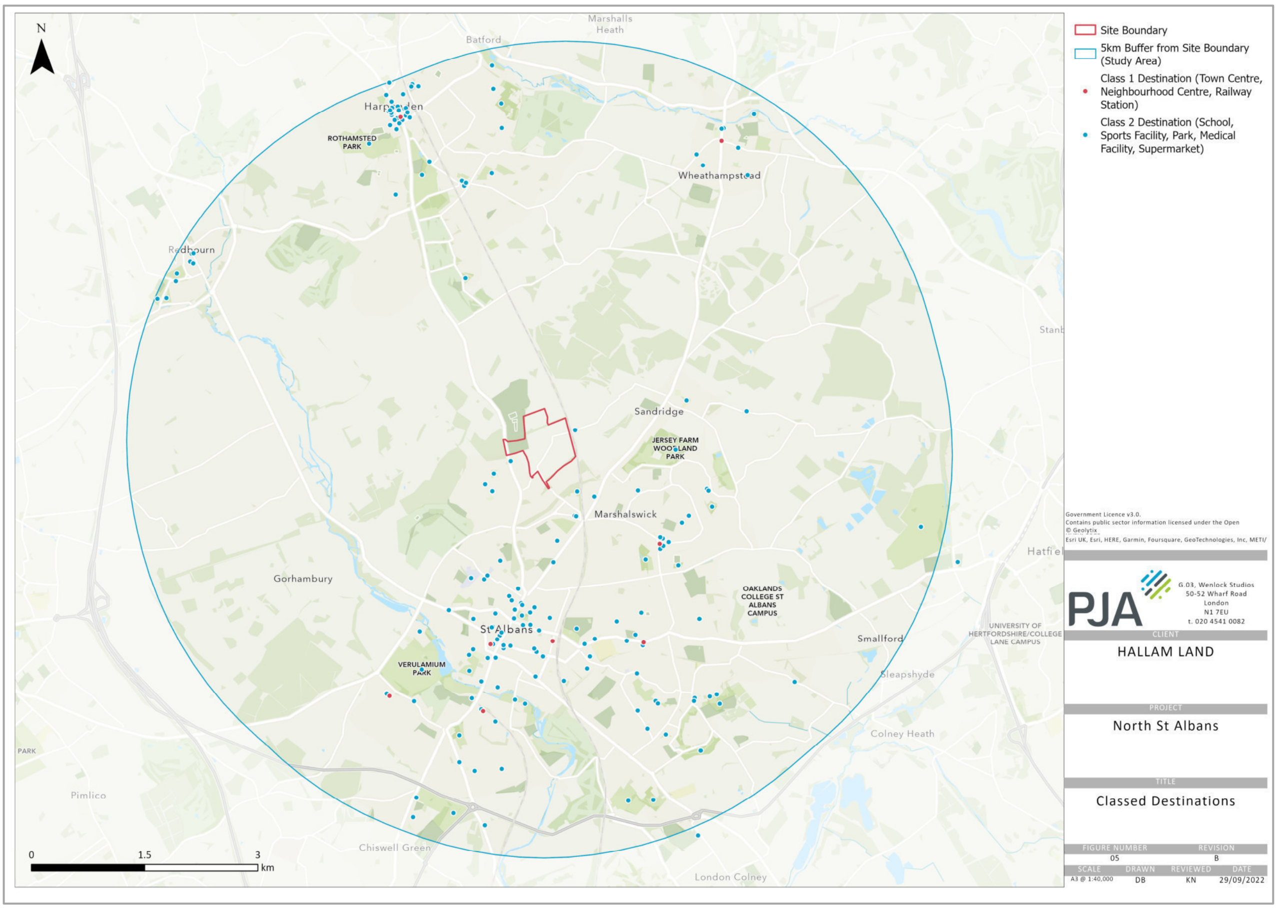


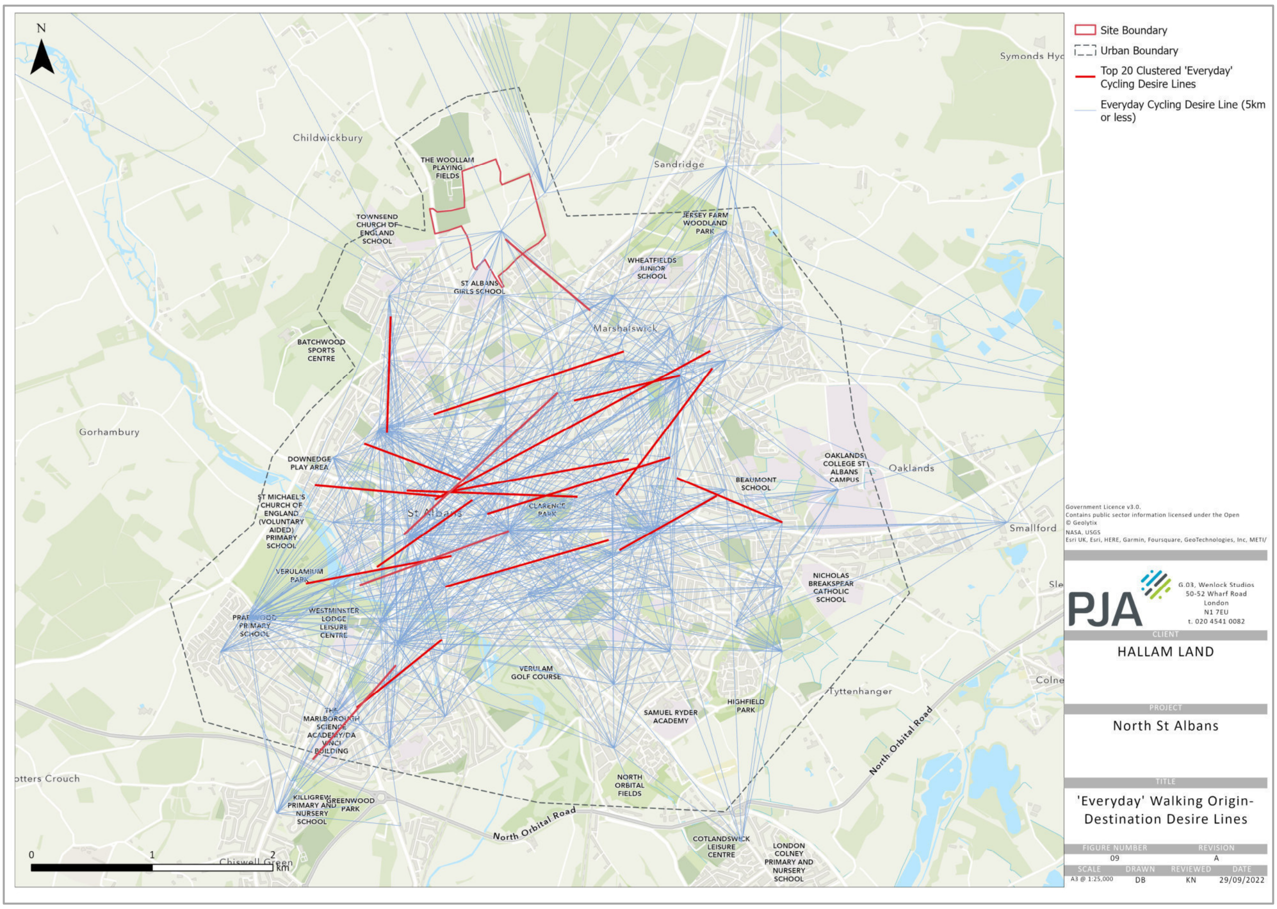
Figure 12: Key Destinations within Study Area



5.4.6 To determine the key 'everyday' desire lines, the spatial relationship between origin and destinations has been analysed. Desire lines have been created from each origin centroid to its nearest Class 2 destination, and then also to all Class 1 destinations in the study area. This assumed that the Class 1 destinations would generate a higher number of trips and that they are also likely to have a larger catchment of trips from across the study area, compared to Class 2 destinations which are more likely to generate locally based trips. Walking trips were defined as desire lines less than 2km in length, and cycling trips were defined as being between 2-8km in length.

5.4.7 Having identified all available desire lines, analysis has been undertaken to cluster the desire lines into a more refined plan which identifies the top 10 walking and cycling desire line clusters. The methodology identifies individual desire lines which are within close proximity to each other and combines these into grouped desire lines. The general alignment of each desire line cluster was then identified to represent the desire lines which represent the highest number of everyday trips.

Figure 13: Top 20 Everyday Cycling Desire Lines



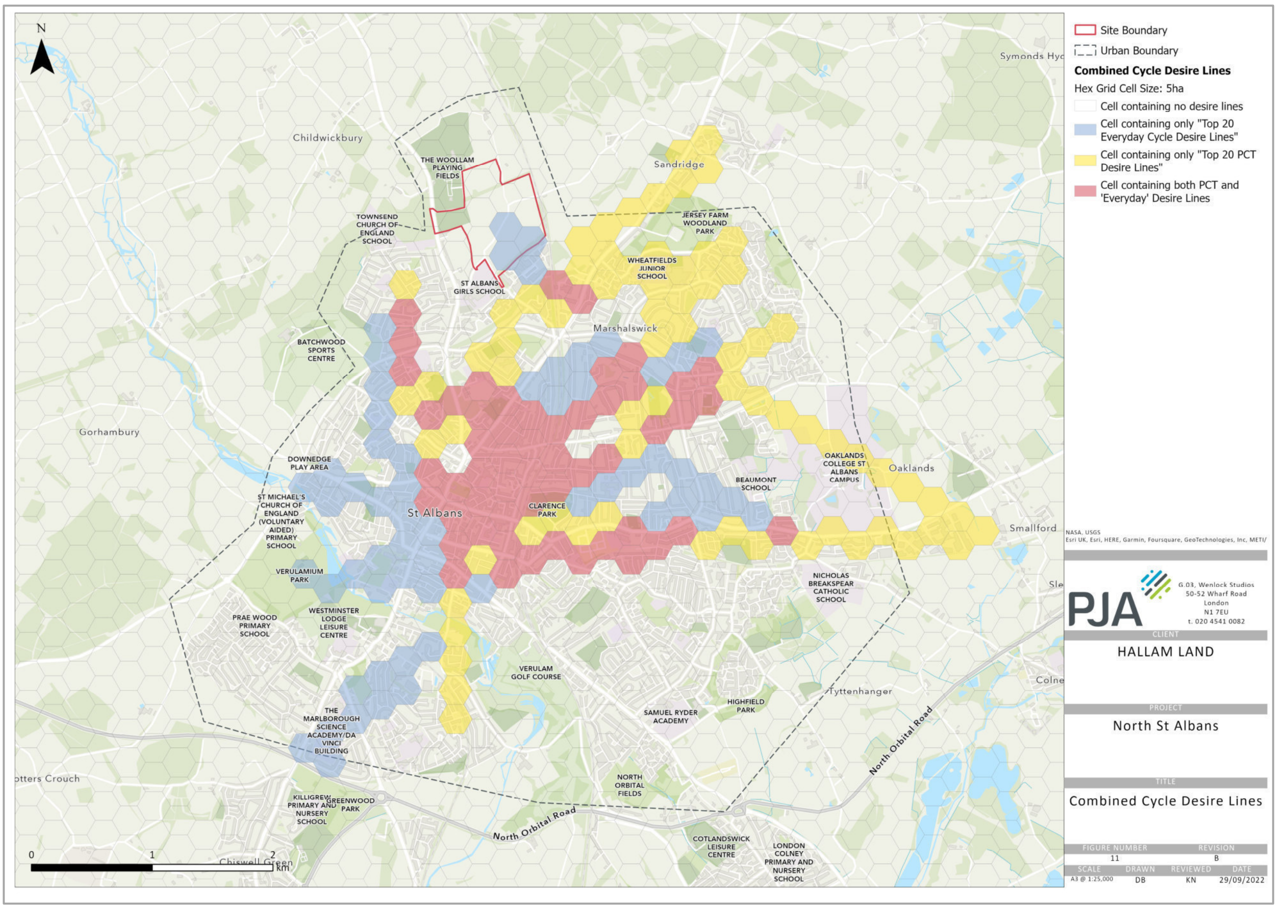
5.5 Desire Line Identification

Combined Desire Lines

5.5.1 In order to identify priority desire lines from the two sets of analysis, the top 20 desire lines for each method were combined to identify areas where they overlapped. The study area was again divided into a hexagonal grid (5ha) and each hexagon which contained a desire line was included in the analysis. Where a hexagon contained a desire line of more than one type, it was classified in a different colour.

5.5.2 The resulting plan for cycling is presented in Figure 14.

Figure 14: Combined Cycling Desire Lines



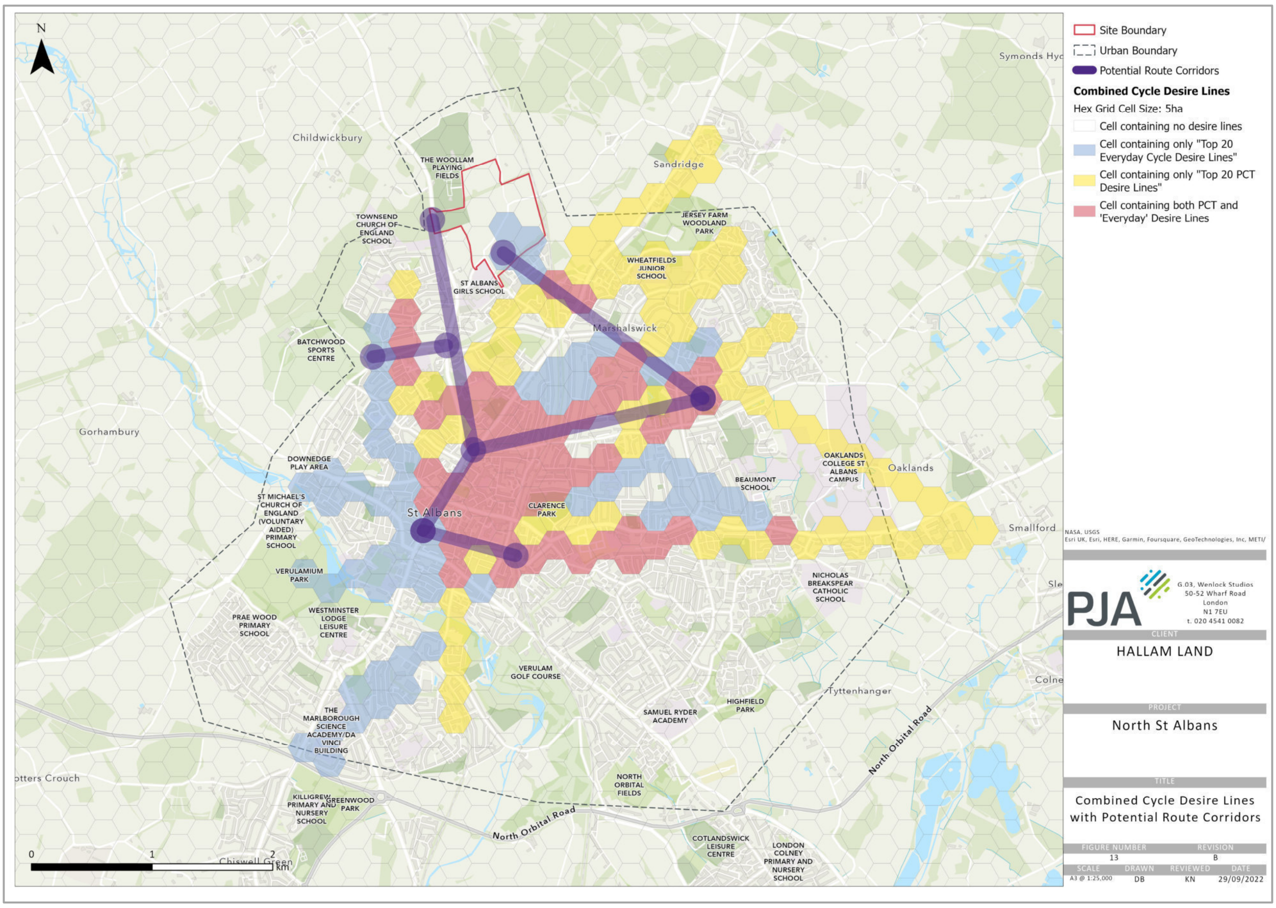
5.5.3 Areas in shades of yellow contain a PCT desire line, areas of blue contain an everyday trips desire line and areas of red contain both types of desire line. Prioritising routes shaded in red would therefore ensure more types of cycling journey are catered for than routes shaded yellow or blue, which is likely to result in a higher rate of modal shift.

5.6 Proposed Cycle Route Audits

5.6.1 Based on the overlap between the predicted desire lines for commuting and everyday trips, it is proposed to audit the following routes to determine feasible interventions to bring the corridors to LTN 1/20[5] standard. The broad corridors where it is proposed audits would focus are shown in Figure 15.

[5] Local Transport Note 1/20: Cycle Infrastructure Design

Figure 15: Proposed Broad Routes for Audit



5.6.2 The broad corridors where improvements could be focussed as follows:

- A north-south route to broadly to follow the Harpenden Road towards St Albans.
- A route connecting the broad development area and Marshalswick.
- An east-west route connecting New Greens and residential areas to the west of Harpenden Road and the development.
- An east-west route to broadly follow Sandpit Lane.

5.6.3 Once these broad corridors are agreed, a more focussed consideration would be given to the potential routes for audit. This would be undertaken by first doing a desktop analysis of opportunities and constraints to inform a site visit to audit specific route options. The audits will then inform potential interventions to ensure the routes become LTN 1/20 compliant.

5.6.4 The next step is to then consider the potential modal shift from vehicle to active travel modes using the PCT modal split targets for the 'Go Dutch' scenario following implementation of the improvements. This assumes the level of cycling seen in the Netherlands adjusting for population demographics, trip distance and topography. This is not as aspirational in terms of its projections at the 'E-bike' scenario but provides a more conservative yet ambitious target for future cycling levels providing a quality level of infrastructure is provided, compliant with LTN 1/20.

5.6.5 Whilst it is noted that the developer would look to fund some of these routes, the precise level of funding would be determined through ongoing engagement with the local authority.

5.7 Comparison to Vehicle Desire Lines

5.7.1 Following initial meetings with HCC officers, PJA has been advised that the COMET model would not be appropriate for use in understanding local car-borne trip making patterns. It is therefore proposed to use mobile network data to better understand these patterns. This data will demonstrate key OD pairs which use constrained highway corridors. These will then be compared to the proposed cycle desire lines.

5.7.2 The projected uplift in cycle movements for key OD pairs will be used to calculate a resulting reduction in vehicle trips between these OD pairs and corresponding amendments made to vehicle movements.

6 Assessment of Highway Impacts

6.1 Traffic Assignment

6.1.1 The distribution of vehicle trips within the proposed zoning system will be assigned to the local highway network. It is proposed to use GIS software which draws on historical traffic/congestion data[6] to reflect real life route choice. This will be undertaken for a typical Wednesday at 08:30 to reflect peak network conditions.

6.1.2 This provides an "all or nothing" assignment and therefore the outputs will be verified and manually adjusted to reflect route choice where there are alternative routes which would have a comparable journey time.

6.2 Geographic Scope and Data Collection

6.2.1 It is proposed that the following junctions will be assessed using standalone modelling software:

- Site access junctions.
- A1081 Harpenden Road/Sandridgebury Lane.
- A1081 Harpenden Road/Beech Road/Batchwood Drive.
- Beech Road/Firbank Road.
- Beech Road/Sandridge Road/Marshalswick Lane/St Albans Road.

6.3 Assessment Scenarios

6.3.1 It is proposed that the following assessment scenarios would be considered:

- 2022 Base – Based on surveyed flows to ensure models validate to observed conditions.
- 2030 Base (Assumed Opening Year + 5 Years) - Based on uplifted surveyed flows using TEMPro factors and the further addition of traffic associated with pertinent committed development to provide a robust future position.
- 2030 Base + Committed Development + Proposed Development.
- 2030 Revised Base + Committed Development + Proposed Development (Aspirational Modal Split applied to background traffic).

[6] The historical, live, and predictive traffic feeds come directly from HERE (www.HERE.com). HERE collects billions of GPS and mobile phone probe records per month and, where available, uses sensor and toll-tag data to augment the probe data collected. An advanced algorithm compiles the data and computes accurate speeds. The real-time and predictive traffic data is updated every five minutes through traffic feeds. https://www.arcgis.com/home/item.html?id=b7a893e8e1e04311bd925ea25cb8d7c7

6.4 Future Year Assessment and Committed Development

Background Growth

6.4.1 It is proposed to consider two traffic growth scenarios; one being a more standard approach to growth adopted in the past and a second being a more aspirational view on likely growth in traffic.

6.4.2 TEMPro will be used in both instance with forecasts from the National Trip End Model (NTEM) adjusted by the relevant National Transport Model forecasts published as part of the Road Traffic Forecasts (RTF).

6.4.3 TEMPro v8 has recently been released with further updates planned in November 2022 and includes a number of NTEM scenarios:

- Behavioural Change – considers increased flexibility of working and online shopping, a reduction of license holdings amongst the younger population cohort and changes in trip rates.
- Technology – considers a high uptake of connected and autonomous vehicles and low cost electric vehicles. Increase trip making for the elderly cohort among other assumptions.
- Low - considers low rates of population, employment and GDP growth.
- Core - considers central rates of population, employment and GDP growth.
- Regional – considers higher relative growth of population, employment and GDP growth outside London, the South East and East of England. Households and dwelling are also re-distributed in line with the population.
- High – considers high rates of population, employment and GDP growth.

6.4.4 There are also a range of RTF scenarios which will soon be encompassed into TEMPro v8. These projections are shown in Figure 16.

Figure 16: TEMPro v8 RTF Vehicle Miles Forecasts

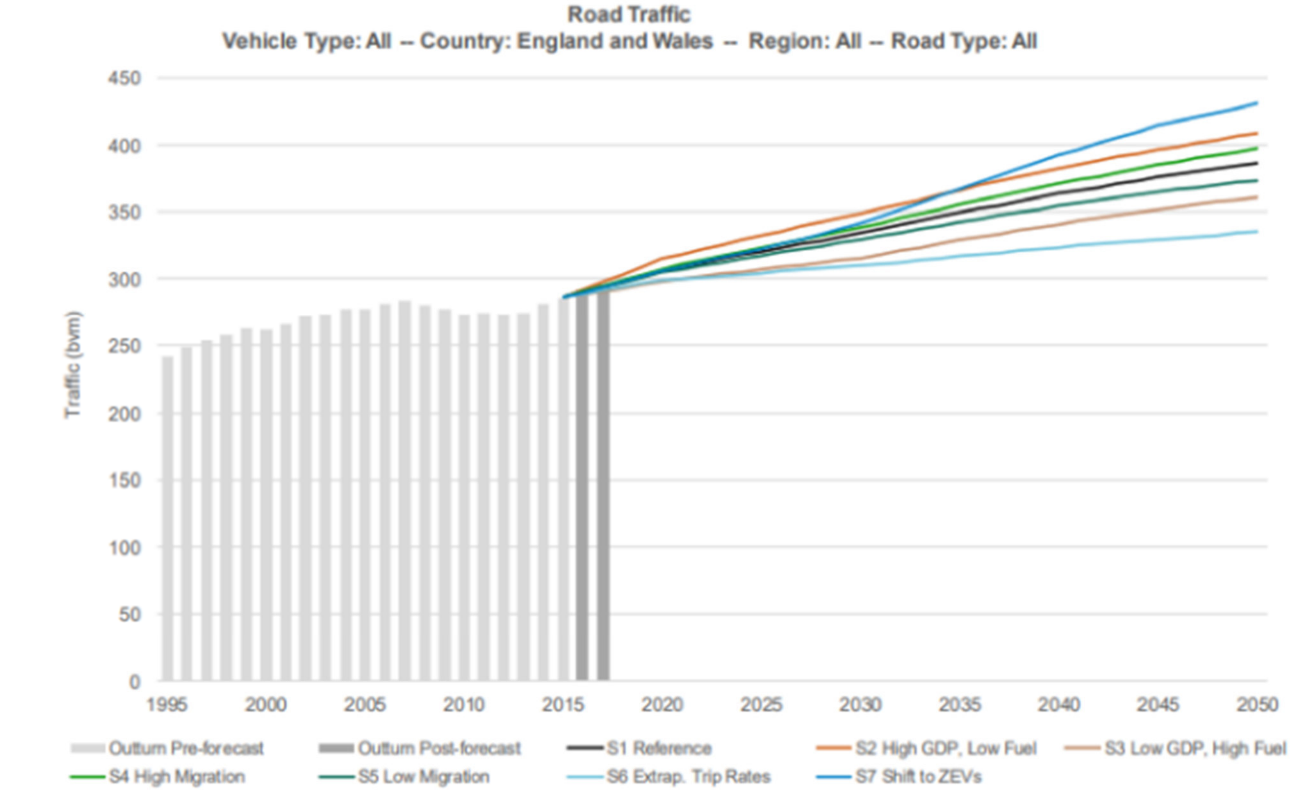


Figure 25: Vehicle miles forecasts for England & Wales

Reproduced from: DfT RTF18 (July 2018)

6.4.5 The following traffic growth scenarios will be considered within the assessment of Land North of St Albans:

- Core Scenario (Typical Growth based on historical trends):
  - Alternative development assumptions to remove projected housing growth from committed (see below) and proposed development.
  - Utilisation of TEMPro core scenario for St Albans.
  - Adjust NTEM growth by RTF Scenario 1 (Reference).
- Aspirational Scenario (Managed growth reflecting behavioural change) – sensitivity scenario:
  - Alternative development assumptions to remove projected housing growth from committed and proposed development.
  - Utilisation of TEMPro behavioural scenario for St Albans.
  - Adjust NTEM growth by RTF Scenario 6 (Extrapolated trip rates).

Committed Development

6.4.6 The TEMPro factors will be adjusted to take account of revised development assumptions removing pertinent committed development and the proposed development. The following committed developments will be accounted for separately and are based on the withdrawn Local Plan site allocations, as follows:

- North St Albans Broad Location (Hunston Properties) - 150 dwellings
- North East Harpenden Broad Location (Crest Nicholson and Bloor) – 680 dwellings
- North West Harpenden Broad Location (Legal and General) – 580 dwellings

6.5 Offsite Highway Improvements

6.5.1 The requirement for any offsite highway improvements to mitigate any residual impacts which are identified to be unacceptable in NPPF terms will be identified through the modelling exercise. This could be delivered through traditional highway improvement works but, more likely, implementation of the off-site sustainable travel measures considered will be used at least in part to mitigate highway impacts.

6.5.2 It is also proposed that the developer would commit to a comprehensive programme of monitoring to respond to actual demands and impacts.

7 On-Site Principles

7.1.1 A strategy for the site would be developed in close liaison with the local highway authority and presented in the Transport Assessment. This would include the following:

- Principles of active travel routes on the site.
- Provision of cycle docks and potential provision of e-bikes.
- Provision of a series of mobility hubs to provide a highly accessible space for public, shared and active travel modes. To include multiple local hubs and a central hub covering the whole development.
- Travel planning to support and encourage uptake of active and public transport modes and Mobility as a Service to ensure a seamless journey for future residents.
- Local connections to provide priority to active travel and public transport users.
- Public transport strategy meeting the needs of future residents providing local connections at the time they wish to travel whilst responding to reduced patronage levels since the Covid pandemic. This would include services to St Albans and other key destinations determined through the TDM with the aim of ensuring any services become commercially viable and self-sustaining.
- Monitoring strategy – a commitment to monitor travel patterns and traffic generation at the site to understand any residual impacts which may require addressing.

8 Summary

8.1.1 PJA has been commissioned to provide transport planning support for the proposed development of Land North of St Albans. This includes the development of a robust access and movement strategy to be presented in a Transport Assessment and Travel Plan/Travel Demand Management Strategy which can be used to support a planning application for development following the withdrawal of the previous draft Local Plan for St Albans City and District in November 2020.

8.1.2 Since previous discussions with HCC undertaken by WSP, policy context and direction has changed in response to the commitment to reduce net emissions. Furthermore, St Albans City and District Council has declared a climate emergency and pledged the area will become carbon neutral by the end of the decade. Changes during the Covid pandemic has demonstrated new attitudes towards active travel and reducing the need to travel.

8.1.3 There is therefore a need for development to integrate potential new ways of living, working and moving in the post pandemic period by creating places and housing products in locations that enable lifestyles which align with achieving the carbon zero goals.

8.1.4 It is therefore proposed that a low carbon transport strategy for the development is developed which considers how the delivery of active travel and public transport infrastructure outside of the development red line could change travel habits within the establish neighbouring settlement effectively freeing up capacity for any residual development traffic.

8.1.5 This note sets out the proposed principles of the strategy as well as the methodology for evidencing the strategy and its impacts on the surrounding network.

8.1.6 It is proposed to use various data sources, as follows:

- 2011 census data.
- National Travel Survey 2019
- TERMPRO
- Public transport accessibility levels from TRACC.
- Propensity to Cycle Tool data.
- Mobile network data.
- Surveys to be undertaken in September 2022.

8.1.7 It is proposed to develop a TDM encompassing the development and the surrounding area. The TDM will be formulated using a comprehensive dataset which considers existing and future travel patterns. The following has been set out:

- Proposed zone structure encompassing wider St Albans and the surrounding area.
- Proposed person trip generation – initially informed by TRICs outputs and will be compared to surveys undertaken for the New Greens area adjacent to the site.
- Trips will be distributed based on journey purpose utilising census data or population/distance weighted gravity models for key trip attractors.
- The baseline modal split will be considered based on census data and calculated using donor site surveys.
- The future modal split will be calculated using forecast for uptake in sustainable travel modes following infrastructure improvements. This will be considered against the potential reduction in vehicle trips based on car-based travel patterns established from mobile network data.
- Similar changes in travel patterns resulting from sustainable travel improvements will be quantified across the wider area and in particular along the Harpenden Road corridor adjacent to the site.
- A methodology is set out which details the corridors which are likely to have the greatest influence and routes which are to be audited to enable active travel interventions to be considered and put forward.
- The off-site highway impacts are proposed to be considered at the site access junction(s) and four offsite junctions:
  - Traffic will be assigned to the network using typical conditions and route choice for a weekday peak period.
  - Assessment will be conducted for a base year of 2022 to validate the outputs of the model against observed conditions.
  - A future year of 2030 will be considered along with key committed development.
  - Two scenarios will be considered to understand the impacts of the baseline travel patterns across the wider network and assuming a greater uptake in sustainable travel modes with a reduction in vehicle trips resulting across the wider network.

8.1.8 The strategy will be underpinned by onsite infrastructure principles and measures to ensure appropriate travel choices are made by future residents. Consideration will be given to:

- Principles of active travel routes on the site.
- Provision of cycle docks and potential provision of e-bikes.
- Provision of a series of mobility hubs to provide a highly accessible space for public, shared and active travel modes. To include multiple local hubs and a central hub covering the whole development.

- Travel planning to support and encourage uptake of active and public transport modes and Mobility as a Service to ensure a seamless journey for future residents.
- Local connections to provide priority to active travel and public transport users:
- Public transport strategy meeting the needs of future residents providing local connections at the time they wish to travel whilst responding to reduced patronage levels since the Covid pandemic. This would include services to St Albans and other key destinations determined through the TDM with the aim of ensuring any services become commercially viable and self-sustaining.
- Monitoring strategy – a commitment to monitor travel patterns and traffic generation at the site to understand any residual impacts which may require addressing.

Meeting Minutes and Matters Arising		Action
	AC says there will be another document in late summer with more information on LCWIP. AC says HCC are keen to work with us, happy to find transport solutions in how we decide to progress the site. MM suggests planning in another meeting, PJA need to go away and do some work, progress mobile data. Suggests meeting topic by topic in more detail, JD happy to do that and can bring specialist along on each topic. (See Action 1)	
7 – AOB	MM says PJA will send a note from the meeting for agreement by attendees. (See Action 1).	1. PJA will distribute meeting minutes to meeting attendees for comment and approval.

Distribution:	MM – Matt McFeat (PJA) LB – Lucy Briggs (PJA) IM – Iain Macsween (Hallam Land) JMK – Jack Martin-King (Hallam Land) JD – James Dale (HCC) AC – Anthony Collier (HCC) ES – Ed Saunders (St Albans School) Mike Edwards (PJA) Kay Nicholls (PJA)

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

MULTI-MODAL LGVS

Calculation factor: 1 PUPILS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	432	0.003	3	432	0.002	3	432	0.005
08:00 - 09:00	3	432	0.007	**3**	**432**	**0.006**	**3**	**432**	**0.013**
09:00 - 10:00	3	432	0.003	3	432	0.004	3	432	0.007
10:00 - 11:00	3	432	0.002	3	432	0.002	3	432	0.004
11:00 - 12:00	3	432	0.003	3	432	0.004	3	432	0.007
12:00 - 13:00	3	432	0.002	3	432	0.002	3	432	0.004
13:00 - 14:00	**3**	**432**	**0.008**	3	432	0.004	3	432	0.012
14:00 - 15:00	3	432	0.002	3	432	0.005	3	432	0.007
15:00 - 16:00	3	432	0.003	3	432	0.002	3	432	0.005
16:00 - 17:00	3	432	0.003	3	432	0.002	3	432	0.005
17:00 - 18:00	3	432	0.000	3	432	0.002	3	432	0.002
18:00 - 19:00	3	432	0.000	3	432	0.000	3	432	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.036			0.035			0.071

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Meeting Note

Meeting Details			
Project Title:	North St Albans	**Date:**	11/04/2023
Project No.:	05920	**Time:**	10:30
Subject:	Scoping - Trip Generation, Mode Share, Travel Demand Model	**Venue:**	Microsoft Teams
Present:	Kay Nicholls (KN) – PJA Lucy Briggs (LB) – PJA Anthony Collier (AC) – Hertfordshire County Council (HCC) James Dale (JD) – HCC Ania Jakacka (AJ) – HCC Dan Tan (DT) – HCC Gary Beaumont (GB) - HCC Jack Martin-King (JMK) – Hallam Land Management (HLM)		
Apologies:	Matt McFeat (MM) – PJA Mike Edwards (ME) – PJA Owen Jones (OJ) – LRM Planning Iain Macsween (IM) – HLM		

Matters Discussed		Action
1 – Introductions, Background and Agendas	KN thanked all for attendance and agreement to schedule of meetings to come. JD queried purpose of meetings and what was sought from these. KN confirmed engagement to ensure everyone was comfortable with the assessment and strategy to work towards a planning submission. JD confirms that HCC has reviewed the Technical Note issued in advance, potentially in varying levels of detail. Also asks for clarification on different sections. HCC can provide summary of agreement, additional points and feedback (1.) (2.). DT asks about MND (Mobile Network Data), explains that it is unusual for HCC to use to support planning application, typically incorporated with strategic modelling and asks for detail on MND. KN summarised the agenda to cover the travel demand model principles (Travel Demand Model), trip generation, baseline modal splits and use of MND and outcomes of the meeting.	1. HCC to provide summary of feedback and any queries following meeting (w/c 17th April). 2. KN to share slides from meeting with minutes.
2 - TDM	KN discussed TDM principles which will help gain understanding of the development and also other journeys happening surrounding site to/from all zones and between zones. This includes people movements, distribution of movements, baseline modal split and assignment of trips across the network. There is also a future element of the TDM which will forecast the change in the way people travel following interventions on the network (future topic notes) for both development and background trips.	1. PJA to update TDM London Zones to breakdown North London, Central and Rest to account for differing modes.

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Matters Discussed		Action
	AC raised point about TDM and that there are a number of people undertaking short car trips to North London and also those that will use rail into Central London, this is in the context of granularity of large London zone (23). The possibility of breaking down London zone into North, Central and rest is discussed and LB/KN state that this can be updated. KN explains that MND will help with this, particularly picking up rail data. (1.) DT asked about areas covered by TDM and zones in particular. KN/LB explain 2011 census data was used to define geographic scope of zones. The zones cover 89% of commuting trips made and therefore when considering all purposes (often shorter trips), the zoning would pick up the majority of movements; 100% of development trips will be distributed using the proportions of movements between the defined zones. DT queried sample size of MND. KN explains the BT provided MND utilises EE network which has 33% market share across the UK - this is scaled using population data applied to market share in the given area.	
3 – Traffic Survey Locations	KN discussed data collection has been carried out in line with the locations set out in the initial scoping note. The surveys in the New Greens area were observed to be picking up external factors particularly inflating vehicle trips relating to other uses i.e. local schools. KN mentioned Villiers Crescent was also surveyed and discussed the benefits of using this as a proxy for forecasting vehicular trips to/ from the development. HCC raised no issues with the data collection.	
4 – Survey Results, Trip Rates and Modal Split	KN discussed survey results and resultant trip rates and modal split from Villiers Crescent. AC asked for clarification on modal splits due to a difference in modal splits in Topic Note. KN/LB explain that this is related to differences between time periods across the day i.e. AM, PM and 12 hour modal splits and differing modal splits used in different tables. KN offered to provide updated tables with more clarity (1.) JD asked for clarification on not using TRICS to assess residential development, is supportive of more representative travel habits of local area and how this could be used in a positive manner going forward for HCC. JD also questioned housing mix comparison to local area. KN states the development mix of the areas have been reviewed and is considered to be appropriate to represent local area and proposed development. KN confirmed the trip rates are comparable to those used in the Local Plan testing undertaken previously. JD happy that comparisons are being made against the proposed methods. Discussion on TRICS as an industry standard and comparison of local trips route. HCC to consider this internally as an approach. AJ questioned use of interpeak, uncomfortable with use of interpeak to assess development. LB explains in some cases interpeak could be used instead of AM/PM peak ('the peak problem'), as using the peak creates an issue with infrastructure being designed to suit a small portion of the day. GB supports this point and that local	1. KN to provide updated modal split tables to clarify on time period point with differing modal splits. 2. Data in HCC report (2023) provided by GB will be reviewed by KN/LB to ensure consistency in PJA works.

Matters Discussed		Action
	characteristics of St Albans would support the use of the interpeak given higher levels of movement during the interpeak compared to other locations. GB suggested that the Transport work for North St Albans should be properly documented and could be used as an exemplar case going forward when considering other developments. DT questioned modal split and combination of car passenger and driver totalling 60%. Questions how modal split can vary across the daily period and queries number of resultant trips generated by proposed development. KN explains that modal split varies due to different modes used for different travel habits and destinations travelled to throughout the day. JD questioned if resultant data has just been calculated using Manual Counts and Automatic Traffic Counts, supportive that data used is more locally representative but caveated that this needs to be discussed internally to ensure all are satisfied. GB referred to recent report and survey of residents in HCC and suggested making reference to this in our work. Done in early 2022 (2.)	
5 – Other Site Land Uses	KN discussed other key uses on-site (retirement uses and primary school) and associated trip generation using TRICS, due to minimal change with COVID (when compared to residential). Travel to/from these land uses less likely to be impacted by the location, as is the case with residential. AJ questioned absent TRICS site specifics from Topic Note appendix and asked for updated TRICS data with full site specifics (1.). AC supported the continued recording of trip generation and modal split separately by land use rather than providing combined figures. AC asked for PJA to consider different travel characteristics of the proposed non-residential uses when calculating trip generation as factors such as car parking (or lack of) would likely have a significant impact to trip generation. KN understands minimal operational parking would be provided. This could also be picked up through the parking strategy topic (2.). JMK added context of proposed site uses, primary school linking to local centre, small convenience store, food retail, community building, small scale office space, nursery, mobility hub, apartments above non-residential uses. AJ asked for detail of where local centre will be positioned in site. JMK stated that local centre will be more central to site that was previously shown in old masterplan submitted previously. JMK asked for agenda on local centre discussion point, could incorporate into parking meeting. Local centre unlikely to have significant car parking. AC suggest limited parking for local centre, to prevent higher use of cars to access local centre and school.	1. LB to re-provide TRICS output for retirement uses with site specifics. 2. Agenda for Parking Meeting to be updated to include discussion on local centre proposals, as with Active Travel. Specific site proposals need to be included to aid discussion and more specific feedback to be provided. **Post meeting note:** Active travel topic meeting - it is suggested that this would include discussions on the on-site layout with concept plans provided to inform this discussion.

Matters Discussed		Action
	Discussed the principle that people will use quickest mode, if there is parking then people will likely drive, if no/limited parking then walking or cycling becomes quickest mode. KN agreed the quantum of parking can influence travel choices. KN also mentioned site design to make it most convenient to travel to on-site facilities using active travel modes. AC mentioned that they would likely be looking to severely limit drop-off/pick-up facilities for on-site school but this may be at odds with what the LA education team would require. DT asked question on external trip generation for primary school, and level of trips generated by site for school and numbers coming from off site to school. KN clarified that this is addressed in the TDM by considering the on-site population which would fill most on-site school places, but some external trips have been accounted for by considering staff trips and the pull from external communities for school places.	
6	KN discussed the use of MND; benefits of picking up trips of all purposes and not just commuting. Previous examples of MND used in positive way, WCC, TfGM, DfT, NH, NR. KN suggested putting HCC in touch with WCC to discuss use of MND (1.) and arranging for BT to present to HCC. AC welcomed this but would also suggest including St Albans City and District Council (2.). DT discussed COMET using MND, and 33% market share is good number. DT queried temporal coverage of data. KN discussed flexibility in time periods with data available from mid 2022 onwards. JD asked the purpose of using the MND. KN explained that data would provide OD pairs, modes of OD pairs and gives us comparison for baseline. JD asks will data provide us with all trips, where and why they are travelling and how this differs from traditional use of census data and TRICS. KN explained it would provide similar outputs in terms of OD pairs to understand distribution, but the data is more up-to-date, covers all purposes and flexible in terms of the time periods, days of the week etc that can be considered to understand the profile across a typical day, week etc. JD asked about the use of MND in other planning applications, KN explains WCC demands use of MND for planning, and TfGM use it too. JD wondered how the result could be validated. DT suggested the COMET model could be used. KN cautioned this as we do not want to double up efforts and previously concerns were flagged with the use of the COMET model by HCC. AC discussed planning application and that it might be challenged, need information to be understood fully by HCC so that they are able to defend it. Need to look at it in terms of St Albans Members and explaining to them.	1. KN to arrange contact between WCC and HCC for MND discussion 2. KN to enquire with BT to see if they can provide presentation to HCC/SACDC.
7	KN discussed distribution using MND OD pairs. This would be completed by using a suitable proxy area by considering demographics / housing mix across key areas in St Albans (New Greens/Villiers Crescent areas are likely to be suitable proxy subject to analysis). This would be presented back to HCC for agreement.	

Matters Discussed		Action
	KN set out suggested approach to assignment of trips using GIS and integral traffic data to understand journey times for typical conditions on the network at a given time of day. KN also discussed a manual exercise to consider alternative routing as the GIS analysis provides an 'all or nothing' assignment. KN also flagged the potential for the MND to understand this alternative routing. AC asks question on different groups and how you group movements, i.e. secondary school trips disrupts network a lot. KN confirmed this could be looked at but may be difficult to disaggregate these based on the available journey purposes in the MND. DT asks question on journey purposes generated by MND, KN explains that they are categorised as work, home and other.	
8	KN discussed next steps, agreeing use of MND and commission this data once agreement is reached. JD offered week after next for feedback (w/c 17th April). Formal response to note and clarification from 6th April meeting (1.) JD and KN thanked everyone for the time in the meeting. KN mentioned the next meeting scheduled will cover the active travel strategy. HCC requested further information to support this in terms of indicative layout of development, access points, internal layout and principles; the more specific the information that can be provided, the more specific feedback that can be provided (2.).	1. JD to arrange for HCC to provide feedback on Topic Note and points raised in 6th April Meeting during w/c 17th April. 2. JMK and PJA to provide additional site details for proposals to inform active travel meeting to enable more specific feedback.

Distribution:	
	Kay Nicholls (KN) – PJA Lucy Briggs (LB) – PJA Anthony Collier (AC) – Hertfordshire County Council (HCC) James Dale (JD) – HCC Ania Jakacka (AJ) – HCC Dan Tan (DT) – HCC Gary Beaumont (GB) - HCC Jack Martin-King (JMK) – Hallam Land Management (HLM) Matt McFeat (MM) – PJA Mike Edwards (ME) – PJA Owen Jones (OJ) – LRM Planning Iain Macsween (IM) – HLM

Topic Note

Project: North St Albans

Subject: Active Travel Strategy and LCWIP Topic Note

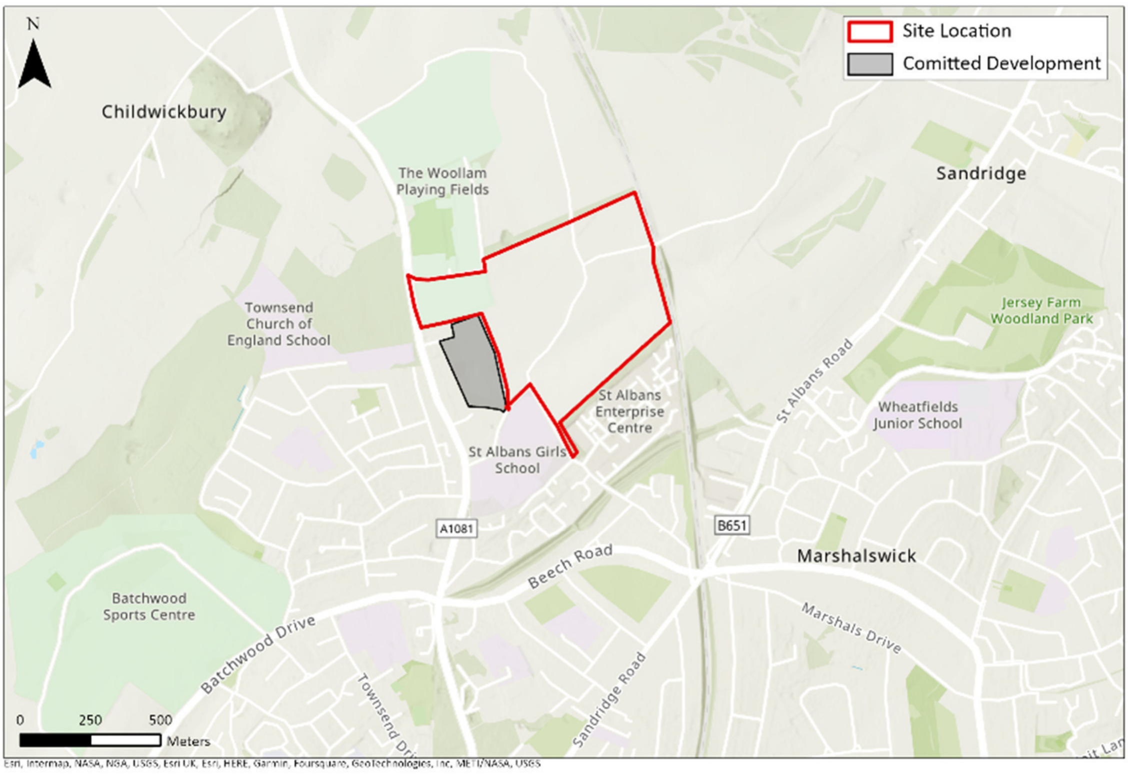
Client:	Hallam Land Management	**Version:**	02
Project No:	05920	**Author:**	KN
Date:	20/04/2023	**Approved:**	MM

1 Introduction

1.1 Background

1.1.1 PJA has been commissioned by Hallam Land Management to provide transport planning support for the proposed development of North St Albans. The location of the site is shown in Figure 1.1.

Figure 1.1: Site Location



1.1.2 Specifically, PJA has been commissioned to help develop a robust access and movement strategy to be presented in a Transport Assessment and Travel Plan/Travel Demand Management Strategy which can be used to support a planning application for development following the withdrawal of the previous draft Local Plan for St Albans City and District in November 2020.

1.2 Progress to Date and Technical Note Purpose

1.2.1 PJA presented an initial Scoping Note and attended a follow up meeting on 19th January 2023 with the Local Highway Authority, Hertfordshire County Council (HCC), to discuss the intended assessment parameters and approach to the transport strategy. It was agreed that a series of topic notes would be prepared and follow up meetings arranged to discuss, as follows:

- Initial trip generation, mode share and use of the TDM;
- Trip distribution, assignment and use of mobile network data;
- Active travel strategy and interface with emerging Local Cycling and Walking Infrastructure Plan (LCWIP);
- Public transport strategy;
- On-site design principles and approach to parking and parking standards; and
- Coordination of transport strategy (feeding from previous topics), TDM forecasts of modal shift and trip banking and residual impacts of development.

1.2.2 This Technical Note sets out the principles of the proposed active travel strategy and the interface with the emerging LCWIP.

1.2.3 The note provides a summary of the analysis undertaken to date to establish key routes and corridors relating to pertinent active travel connections for North St Albans along with the audit of these routes and potential interventions. It also considers the interface with the draft LCWIP and the on-site active travel strategy principles.

1.2.4 Following this introduction, the note comprises the following sections:

- Section 2 Data Analysis to determination of key desire lines.
- Section 3 Route audits and potential route interventions.
- Section 4 Interface with the LCWIP.
- Section 5 On-site design principles.
- Section 6 Summary and next steps.

1.2.5 It is intended that this note will set out the principles of key active travel routes and suggested interventions to ensure they are compliant with guidance contained in Local Transport Note 1/20[1]: Cycle Infrastructure Design. This would provide the necessary connectivity for the development as well as effecting a modal shift across the highway network surrounding the site to create additional 'headroom' on the highway network to accommodate the development.

1.2.6 These routes provide a wider benefit beyond the that to the residents and visitors to the development and it is important that a suitable delivery mechanism is agreed, with a proportional approach to funding, which reflects the benefits to the development, the wider City, and which meets the tests relating to the appropriateness of planning obligations. This will need to be discussed and agreed with the local authority at the appropriate time. Delivering enhanced active travel facilities in the vicinity of North St Albans will likely involve a combination of developer (potentially pooled and not limited to North St Albans) and public funds to deliver the wider aspirations of the LCWIP in this area.

1.3 Policy Context

1.3.1 Nationally, the UK Government has committed to reducing net emissions of greenhouse gases by 100% relative to 1990 levels by 2050 (to become a 'net zero' emitter). Transport is now the largest contributor to UK greenhouse gas emissions (28%), and this is likely to make it one of the focus areas for reducing emissions. In July 2021 the Government launched its transportation decarbonisation strategy, which sets out how they propose to achieve significant CO_2 reductions in this area. The strategy builds upon the "gear change" strategy which was launched in Summer 2020. Ahead of the release of the decarbonisation strategy the Government have committed to accelerate carbon reductions with a 78% reduction by 2035, which has subsequently been brought into law.

1.3.2 Locally, St. Albans City & District Council voted unanimously in July 2019 to declare a climate emergency with a pledge that the district would become carbon neutral by the end of the decade (2030). The district has pledged to submit an innovative and comprehensive sustainable travel town Vision to HCC which incorporates a clean air zone in the town centre, and measures to further enable journeys to be undertaken by non-car modes.

1.3.3 HCC has published for consultation, its draft LCWIP, which sets out an exercise in considering key routes, potential interventions and a prioritisation exercise around delivering active travel

[1] Cycle Infrastructure Design (publishing.service.gov.uk)

facilities to encourage modal shift. This is supported by the aspirations for the proposed development and also those set out in Gear Change[2].

[2] Gear change: a bold vision for cycling and walking (publishing.service.gov.uk)

2 Data Analysis and Determination of Key Desire Lines

2.1.1 As set out in the initial Scoping Note submitted to HCC, a process similar to that undertaken for the development of the LCWIP, has been undertaken to determine key desire lines for active travel movements which would in turn inform routes and corridors which could form the basis of the off-site active travel network for the site.

2.1.2 The principles of this analysis was agreed as part of the initial scoping meeting. For details of the full analysis process, please consult the initial Scoping Note and a summary of key points is provided below.

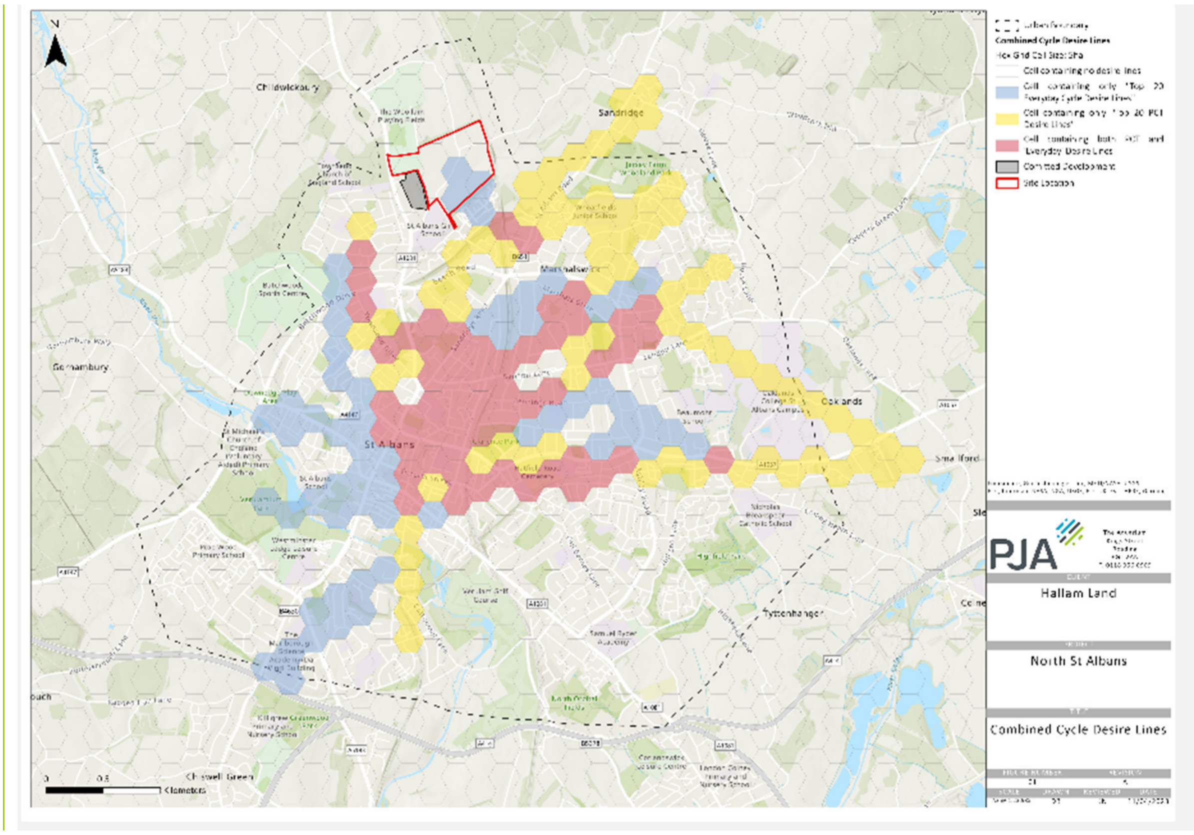
2.1.3 The potential Active Travel desire lines have been determined through analysis of various datasets within GIS software. This comprises:

- Propensity to Cycle Tool[3] (PCT) data analysis which provides an approximation of commuting trips which could be undertaken by bicycle.
- Everyday trip analysis which considers potential desire lines of other purposes of trips including leisure, recreation and amenity.

2.1.4 By considering the overlap between desire lines for journeys of different purposes has helped to establish the priority routes in our analysis. The study area considered comprised a 5km buffer around the site. Within the study area, consideration is given to all active travel desire lines within the buffer but with a particular focus on desire lines with a start and/or end point on Harpenden Road / Valley Road as these are the routes which are likely to have the biggest impact in terms of serving the site and also providing the 'headroom' on the road network to enable development of North of St Albans through modal shift to active travel modes. They key desire lines for cycling are presented in Figure 2.1.

[3] Welcome to the Propensity to Cycle Tool (PCT)

Figure 2.1: Key Cycling Desire Lines (PCT and Everyday trip analysis combined)

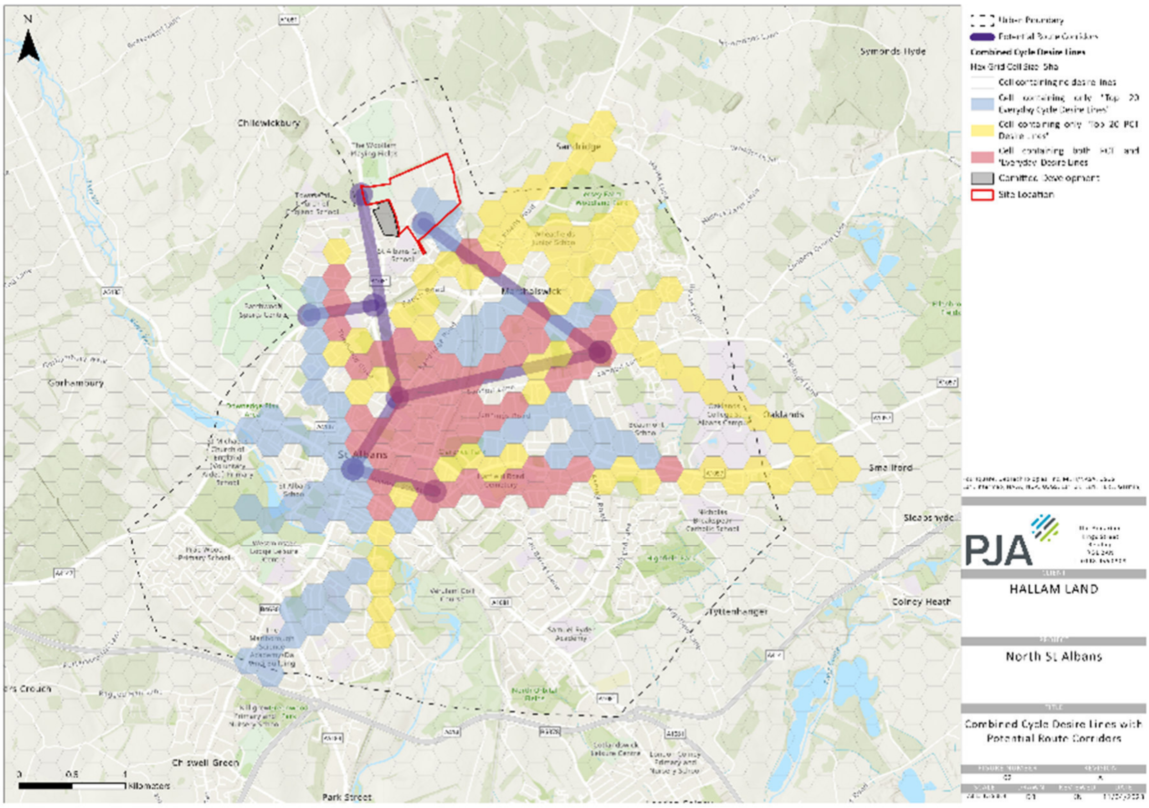


2.1.5 Areas in shades of yellow contain a PCT (commuting) desire line, areas of blue contain an everyday trips desire line and areas of red contain both types of desire line. Prioritising routes shaded in red would therefore ensure more types of cycling journey are catered for than routes shaded yellow or blue, which is likely to result in a higher rate of modal shift.

2.1.6 Based on the overlap between the key desire lines for commuting and everyday trips, the following broad corridors have been considered in terms of feasibility for implementing interventions to bring the corridors to LTN 1/20[4] standard. The broad corridors where it is proposed audits would focus are shown in Figure 2.2.

[4] Local Transport Note 1/20: Cycle Infrastructure Design

Figure 2.2: Proposed Broad Corridors for Audit



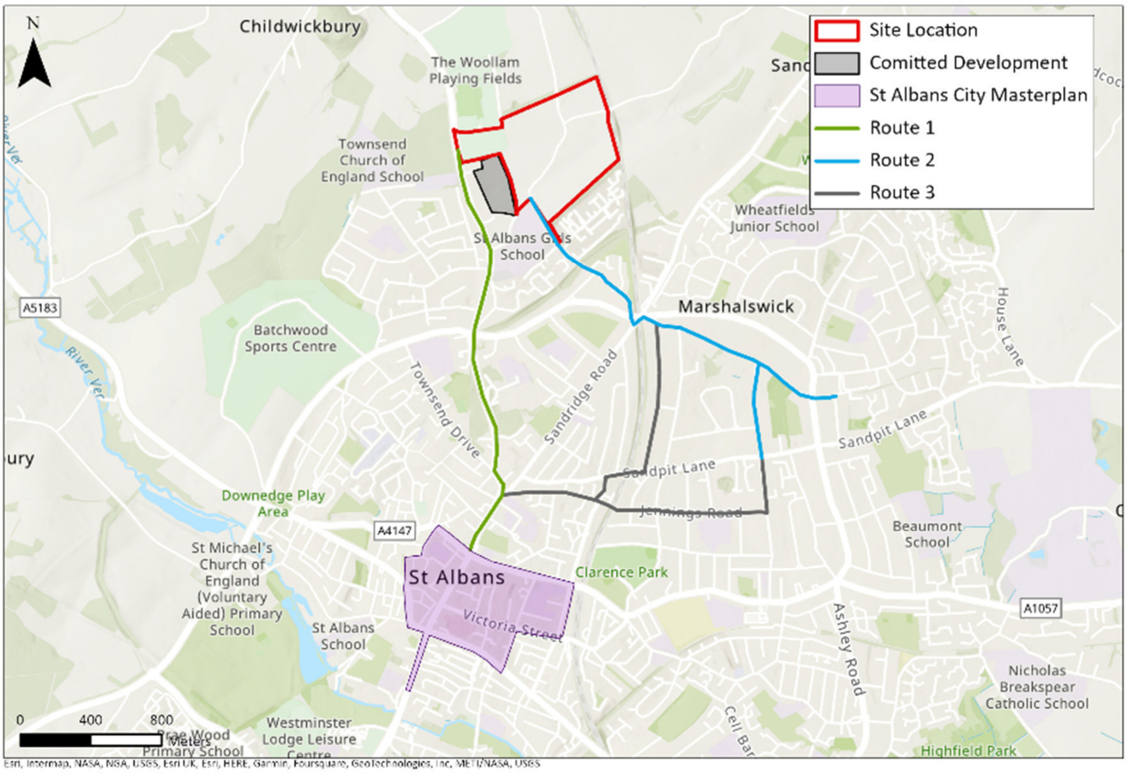
3 Route Audits and Proposed Interventions

3.1.1 From the broad corridors set out in Figure 2.2, precise routes and alternative routes to fulfil the identified desire lines, have been established.

3.1.2 These routes as shown in Figure 3.1 and are as follows:

- **Route 1** – A1081 Harpenden Road between development and St Albans. It is assumed that the immediate city centre area facilities would be addressed at a more strategic level by the local authority. Some alternative parallel routes to the A1081 corridor have been considered where there are known network constraints and a branch along Batchwood Drive has also been considered to provide connectivity towards the hospital.
- **Route 2** – Development to Marshalswick Local Centre via Valley Road and Marshal's Drive. This also includes a connecting section along Homewood Road towards Route 3.
- **Route 3** – An East-West Connection linking Routes 1 and 2 along Avenue Road and Jennings Road. This also includes connecting sections along Blenheim Road, Gurney Court Road and Woodstock Road North towards Route 2.

Figure 3.1: Routes Audited



3.1.3 A site visit was undertaken in March 2023 to audit these routes. This was undertaken by bicycle to understand conditions for cyclists and to better understand the opportunities and challenges. A summary of the findings of the audit and the proposed interventions are provided in the proceeding sections.

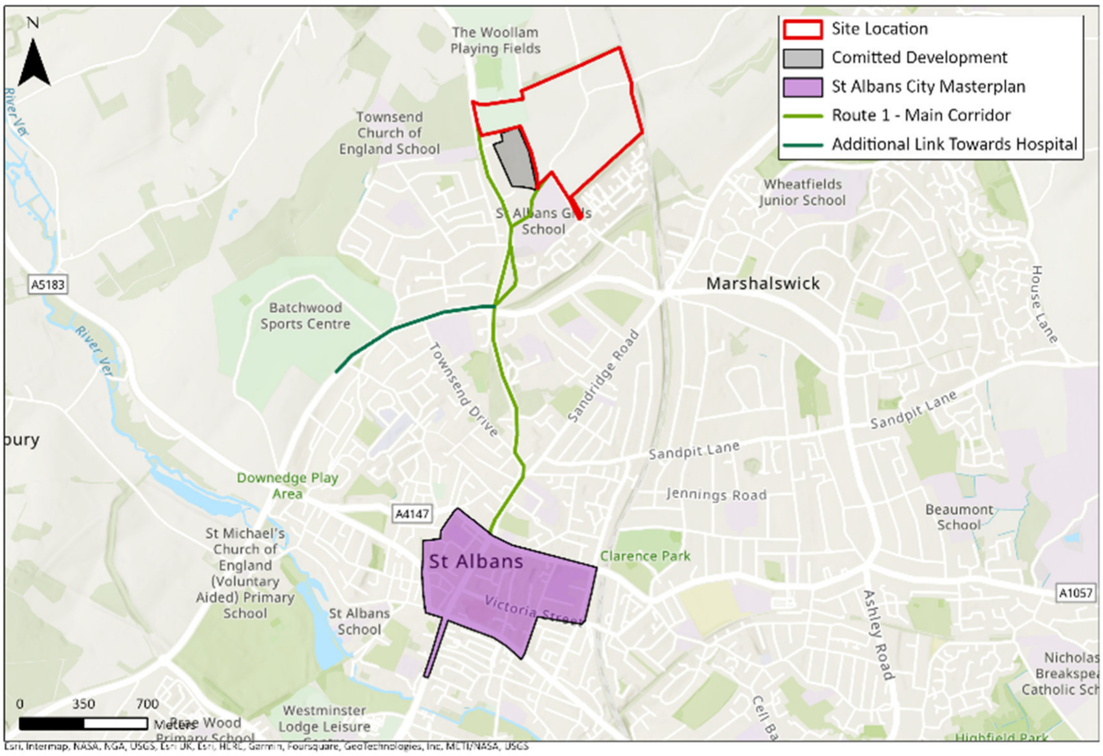
3.2 Route 1

3.2.1 Route 1 provides a link from the development, along Harpenden Road, towards St Albans City Centre. The route is illustrated in Figure 3.2.

3.2.2 Alternative routes have been considered parallel to the A1081; along the Old Harpenden Road and via an existing path through a woodland area parallel to the A1081. A branch along Batchwood Drive has also been considered to provide connections towards the St Albans City Hospital.

3.2.3 The A1081 corridor is characterised by a c.7.0 – 7.5 metre carriageway with footways on either side. The extent of highway adjacent to the carriageway varies by section with some sections being more constrained than others. DfT counts indicate that two way vehicle movements on the link (in the vicinity of Beech Road) are approximately 8,000 per day. With reference to Table 4.1 in LTN 1/20, these traffic conditions would require a segregated facility to be suitable for all users or use of a parallel route with lower vehicle volumes and speeds.

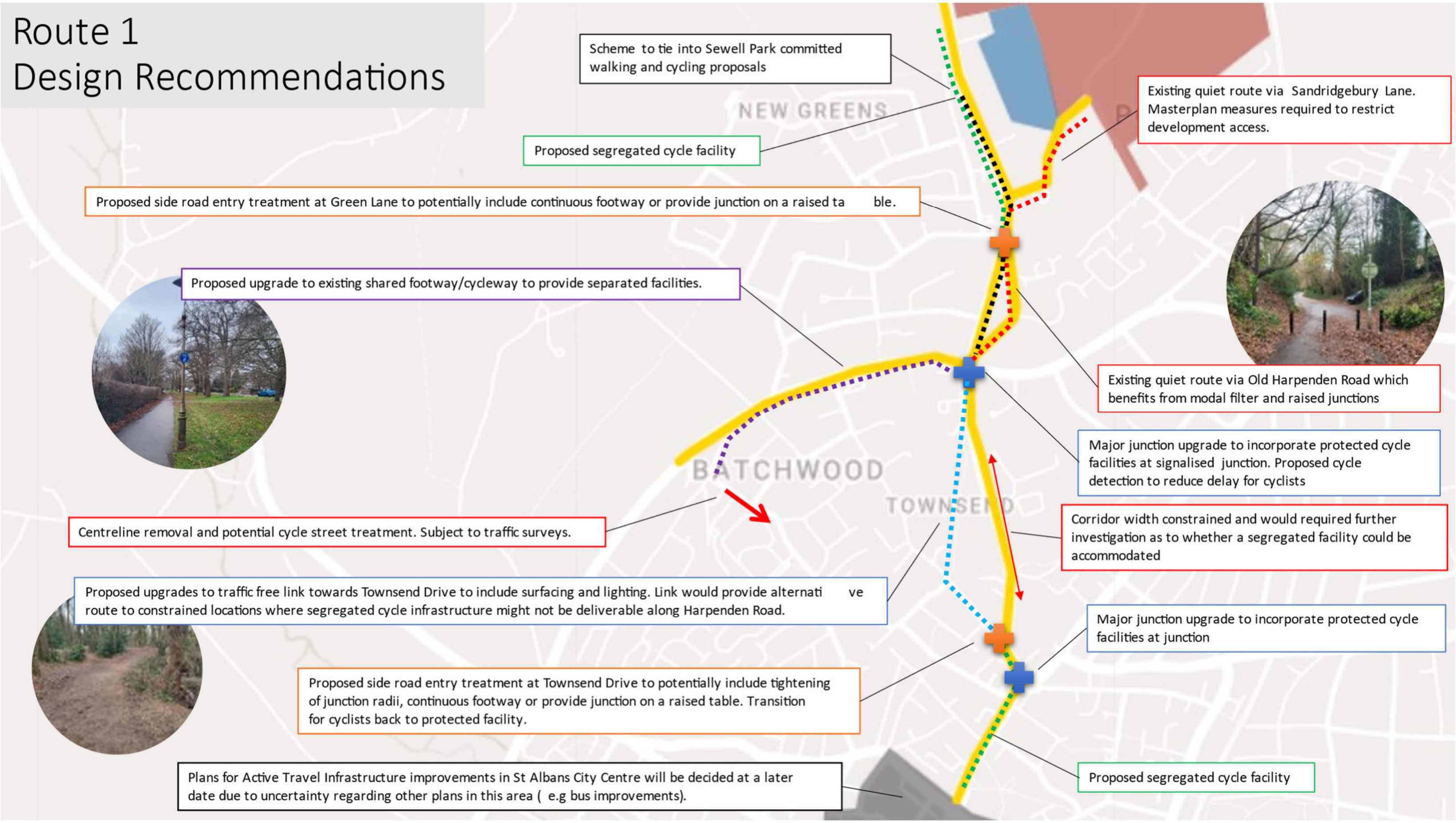
Figure 3.2: Route 1- Audit Alignment



3.2.4 A summary of the proposed design interventions to ensure the route is LTN 1/20 compliant is set out in Figure 3.3. The key features suggested are as follows:

- Delivery of a segregated pedestrian and cycle facility alongside the A1081 Harpenden Road on key sections where there is available width within the highway boundary to accommodate this. This would also include major junction improvements/rationalisation at the Batchwood Drive and Sandridge Road junction and side road treatments at other junctions along the link to ensure priority for active travel movements.
- It is proposed that the existing Old Harpenden Road link which is already modal filtered is utilised as the active travel route in place of the parallel section of the A1081 in this location which would require more significant upgrades.
- The section of the A1081 between the junctions formed with Batchwood Drive and Townsend Drive is constrained in width and the deliverability of active travel facilities would need to be considered in more detail. A potential alternative is the parallel path through woodland route linking Harpenden Road and Townsend Drive which is traffic free but this would require upgrades in terms of surfacing and lighting.

Figure 3.3: Route 1 – Suggested Design Interventions

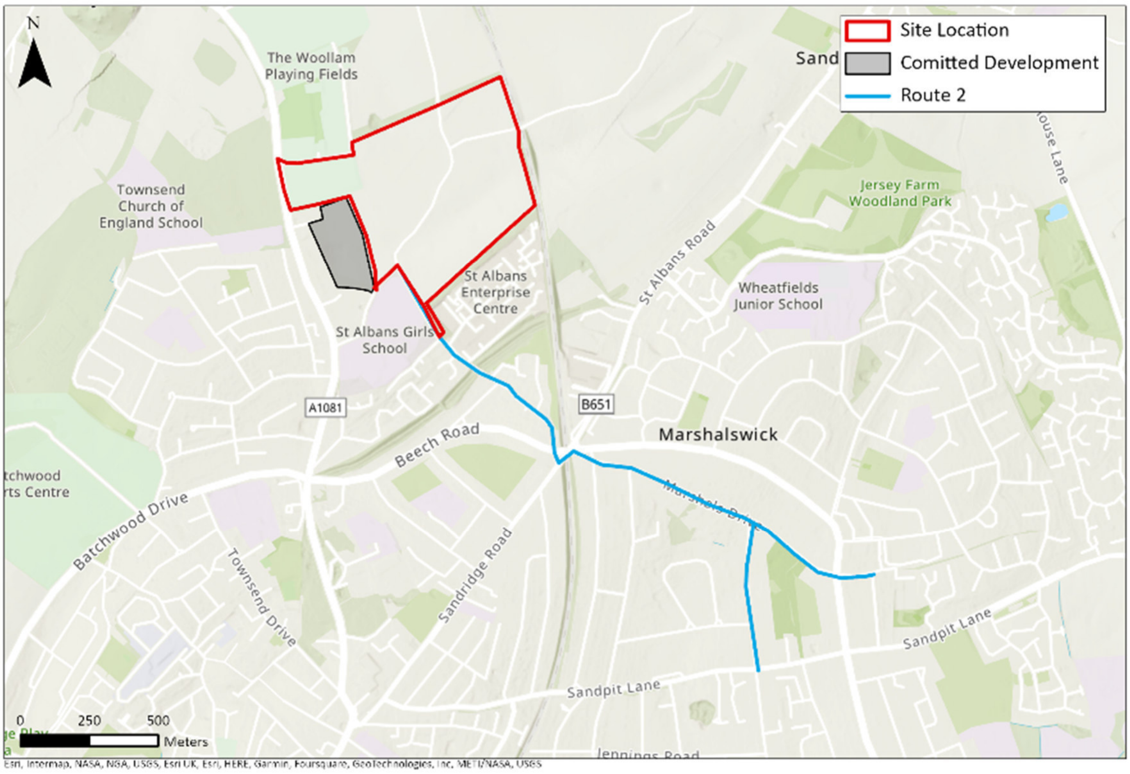


3.3 Route 2

3.3.1 Route 2 provides a link from the development site to the south east of the city via Valley Road and Marshall Drive. This route also provides a connection to the Marshalswick Local Centre which has a selection of shops, cafes, restaurants and a pharmacy. The route is shown in Figure 3.4. A barrier to cycling along this route includes the Beech Road/Marshalswick Lane/Sandridge Road signalised junction which would require further consideration.

3.3.2 The northern extent of Valley Road is lightly trafficked, with DfT traffic counts indicating a daily two-way flow of c.3,400 vehicles. The posted speed limit on Valley Road is 30mph. With reference to Table 4.1 in LTN 1/20, these traffic conditions would allow for consideration of mixed carriageway cycling providing vehicular speeds are minimised to a suitable level. On links to the south of Marshalswick Drive, it is envisaged that flows would be similarly low or controlled as such using modal filtering and again with the introduction of appropriate features lower speeds could be ensured and therefore mixed cycling on the carriageway would be appropriate in line with Table 4.1 of LTN 1/20.

Figure 3.4: Route 2- Audit Alignment

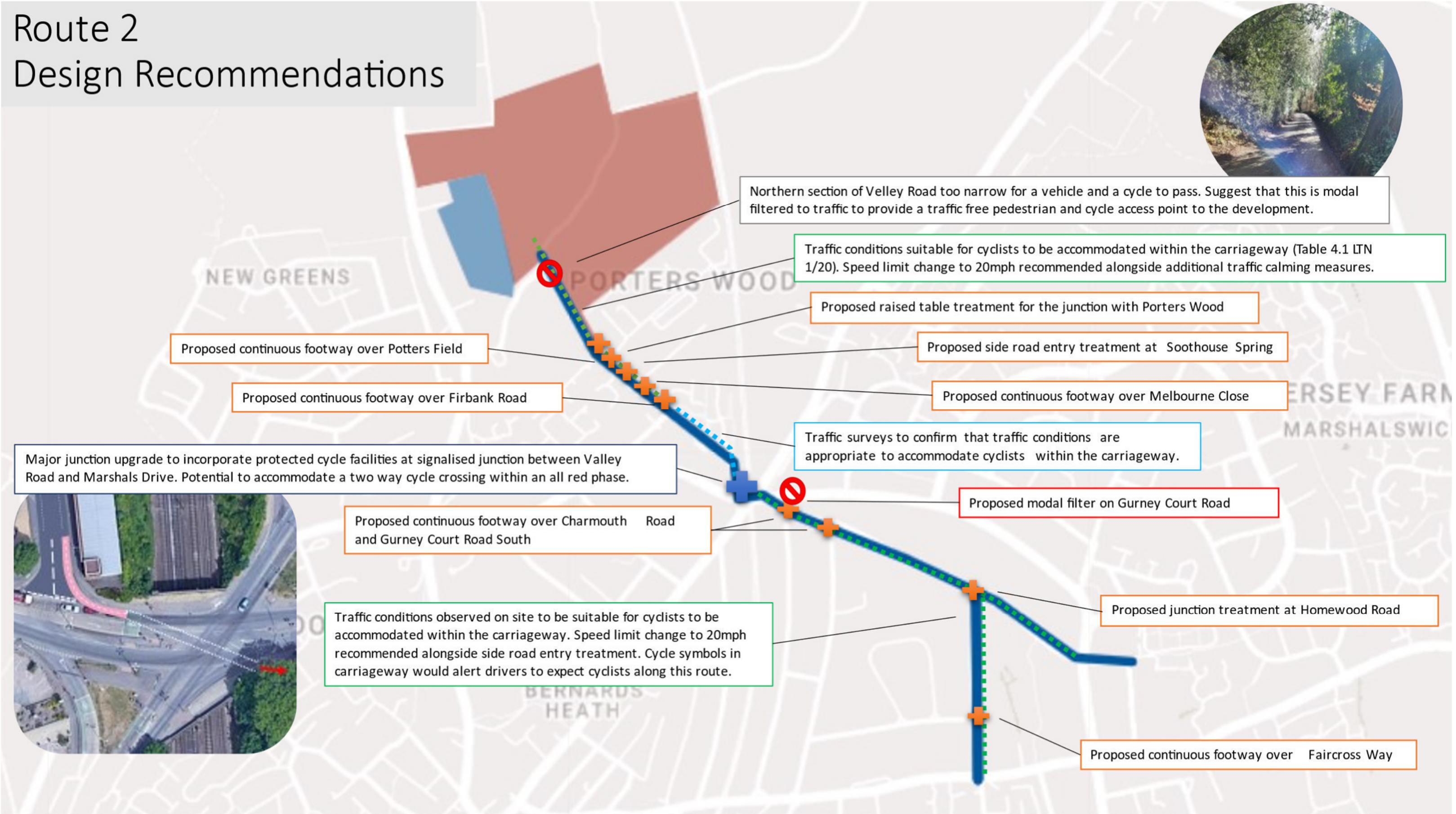


3.3.3 A summary of the proposed design interventions to ensure the route is LTN 1/20 compliant is set out in Figure 3.5. The key features suggested are as follows:

- The northern end of Valley Road is too narrow to allow a vehicle to comfortably pass a bicycle and therefore it is suggested that modal filtering is introduced to provide an active travel and emergency access only link to the site.
- Beyond this initial stretch, Valley Road and also Marshal's Drive experience relatively light traffic conditions that are suitable for cycling in the carriageway, as per Table 4.1 of LTN 1/20. This is proposed to be accompanied by a speed limit reduction and traffic calming to ensure vehicle speeds are appropriate for cycling in the carriageway.
- Minor works would be required to accommodate suitable side road treatments.
- Major improvements works would be required at the Marshalswick Lane/Valley Road/Sandridge Road junction to accommodate crossing movements. This would need to be considered in balance with the wider operation of the junction and strategic level decisions made by HCC.

- It is suggested that connections could be made via Gurney Court Road and Homewood Road to Route 3 (see proceeding sections). It is recommended that appropriate junction treatments would be put in place at the junction between Marshal's Drive and Homewood Road and modal filtering introduced at the northern end of Gurney Court Road to reduce vehicular flows and make conditions suitable for cycling on carriageway.

Figure 3.5: Route 2 – Suggested Design Interventions



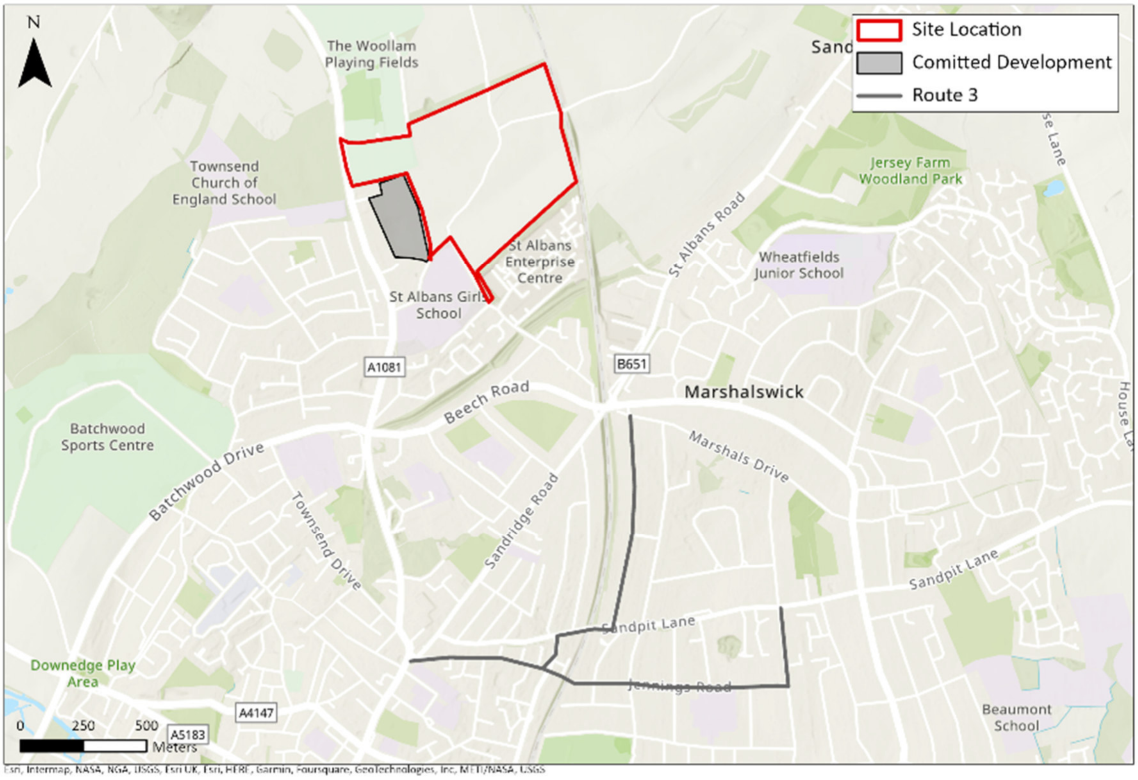
3.4 Route 3

3.4.1 Route 3 is formed by a selection of quiet routes which provide a connection between Route 1 and Route 2 and provides an east-west connection from St Albans City Centre. The route is shown in Figure 3.6.

3.4.2 Route 3 comprises Avenue Road, Jennings Road, Gurney Court Road and Woodstock Road North which are predominantly characterised as being residential streets subject to a 30mph speed limit.

3.4.3 Traffic volumes are likely to be of an appropriate order to accommodate cycling on the carriageway. Some measures would be required to ensure vehicle speeds are minimised accordingly to support on-carriageway cycling. This is in line with Table 4.1 of LTN 1/20.

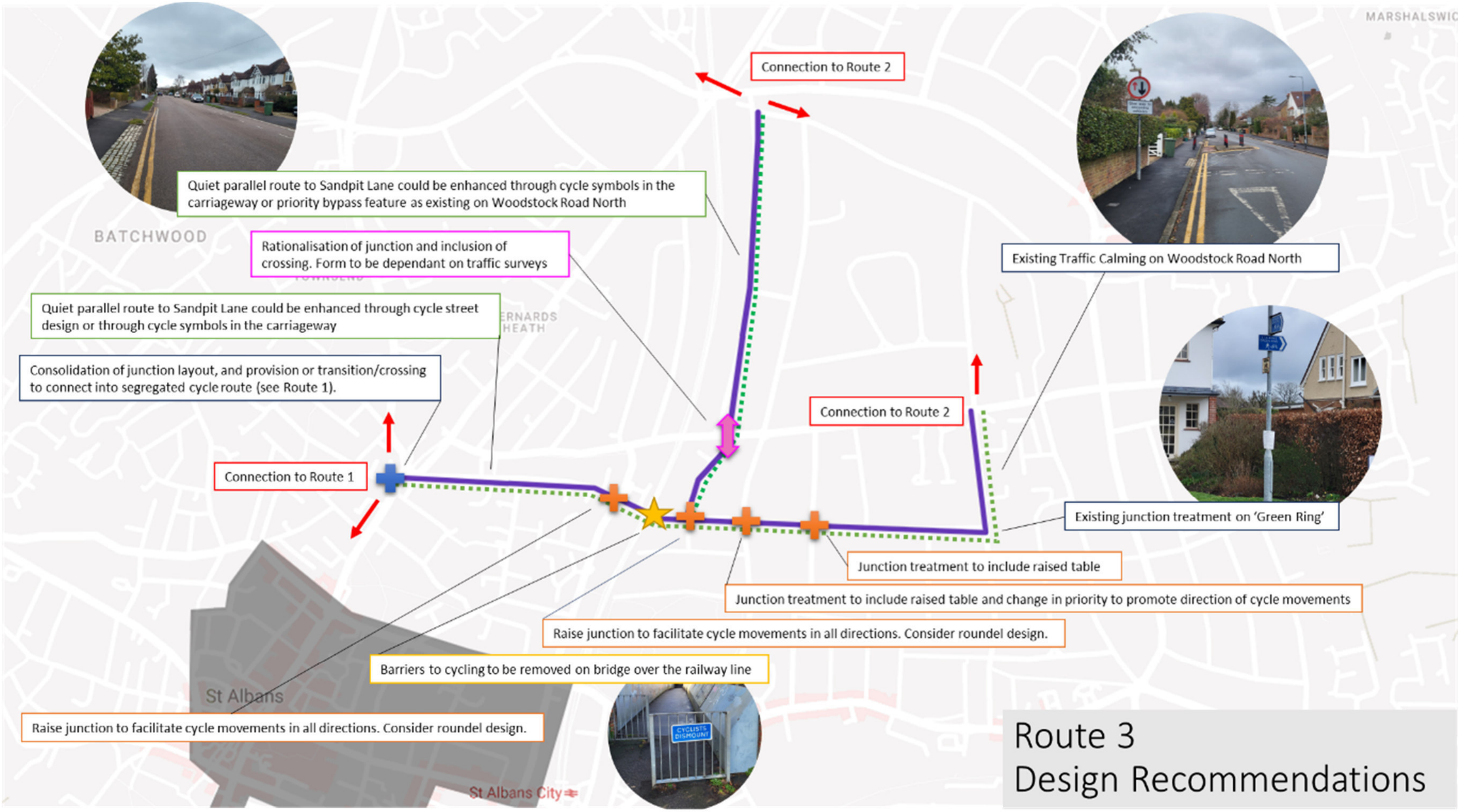
Figure 3.6: Route 3 - Audit Alignment



3.4.4 A summary of the proposed design interventions to ensure the route is LTN 1/20 compliant is set out in Figure 3.7. The key features suggested are as follows:

- This route provides a connection between Routes 1 and 2. The connection to Route 1 would be via Avenue Road which is lightly trafficked as it is severed for traffic at the railway line and therefore suitable for mixed cycling. The connection to Route 2 would be via Woodstock Road North/Homewood Road or Blenheim Road/Gurney Court Road. These are also relatively lightly trafficked to support mixed cycling, subject to additional traffic calming features, where required, and modal filtering of Gurney Court Road.
- Junction treatments to be considered along Avenue Road and Jennens Road to ensure vehicular speeds are minimised.
- Removal of barriers over railway bridge which currently means cyclist must dismount to traverse it.

Figure 3.7: Route 3 – Suggested Design Interventions



3.5 Funding and Delivery

3.5.1 The precise delivery and funding arrangements for local active travel interventions would need to be considered in discussion with HCC and their wider aspirations.

3.5.2 National Planning Policy Guidance is clear on the use of planning obligations in mitigating impacts and making development acceptable in planning terms. They may only constitute a reason for granting planning permission if they meet the following tests:

- Necessary to make the development acceptable in planning terms.
- Directly related to the development; and
- Fairly and reasonably related in scale and kind to the development.

3.5.3 The delivery and funding of any off-site active travel improvements would need to be considered in the above context but due to the wider benefits, it is suggested that the routes would likely be funded through a combination of developer and public funds.

3.6 Summary

3.6.1 A series of potential design interventions have been suggested to Routes 1, 2 and 3. This has been based on an audit of existing conditions and consideration of the principles and guidance contained with LTN 1/20.

3.6.2 These improvements would provide a network of cycle routes between the site and key parts of St Albans city. They would be for the benefit of future residents as well as existing communities helping to effect a modal shift away from private car travel. A suitable, proportional mechanism for funding and delivery would need to be considered and agreed.

4 Interface with Draft LCWIP

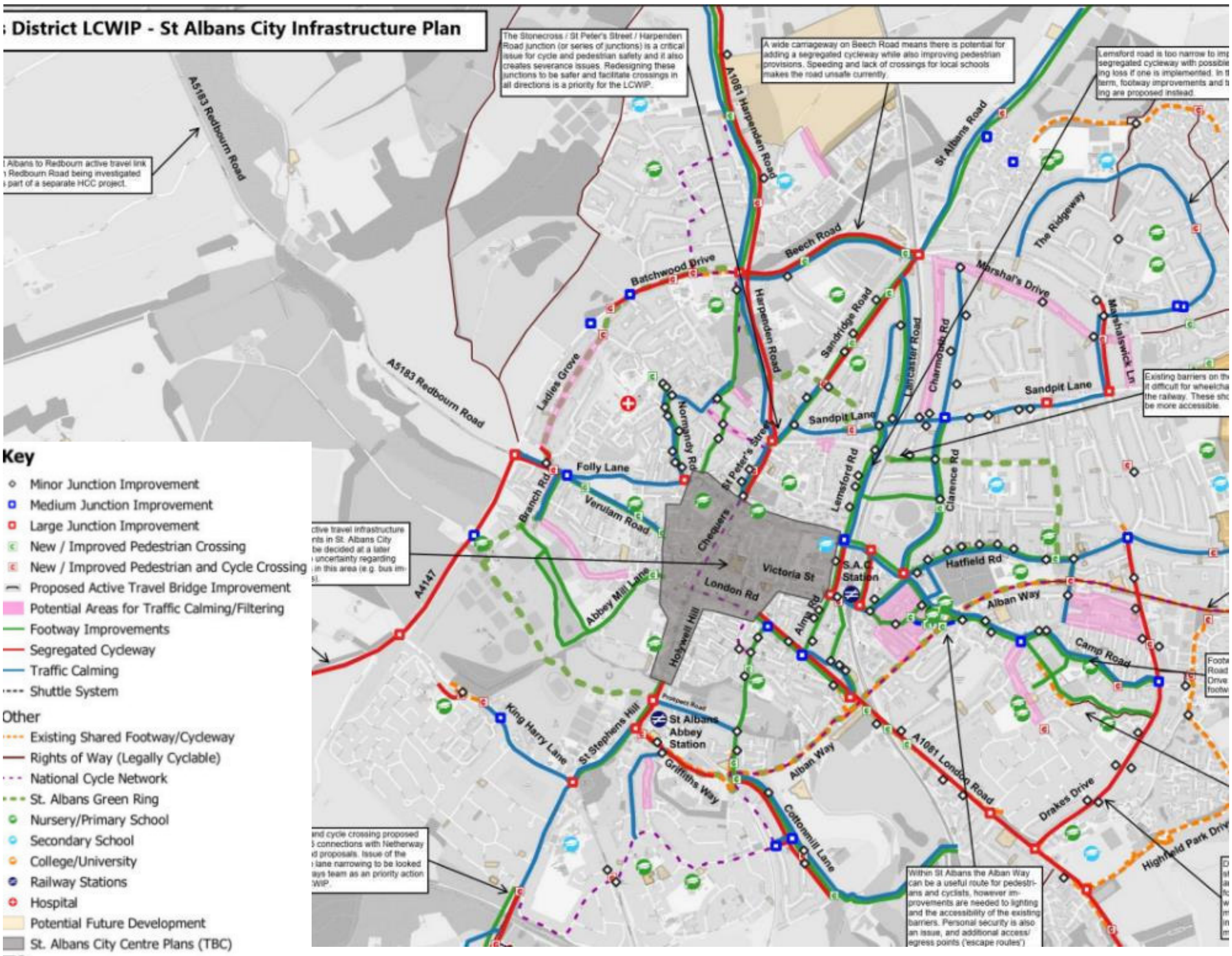
4.1 Draft LCWIP Principles and Approach

4.1.1 The LCWIP covers the St Albans City and District Council areas (including St Albans and Harpenden) and sets out the combined plans of HCC and St Albans City and District Council (SACDC) to prioritise and improve the active travel connections within St Albans, Harpenden and between settlements including adjacent towns and cities in other districts.

4.1.2 The LCWIP was recently consulted on, with consultation starting on 7th February 2023 and concluding on 20th March 2023.

4.1.3 The LCWIP presents the local authorities' aspirational active travel network, alongside a prioritised list for scheme delivery. The LCWIP is built around the desire lines to local schools and places of work, informed through the use of the Propensity to Cycle Tool (PCT). A further origin/destination model was created to inform desire lines associated with everyday trips. This method is very similar to that used by PJA in the development of the North St. Albans active travel strategy. An extract of the resulting draft network plan for cycling is provided in Figure 4.1.

Figure 4.1: Draft St Albans District Network Plan for Cycling (extract)



4.2 Comparison to the PJA identified Cycling Network and the LCWIP Network Plan

4.2.1 Following a review of the recently published LCWIP consultation document, it is evident that there is some clear overlap in terms of the emerging active travel strategy for the site and the LCWIP.

4.2.2 A summary of this review relating to the key routes is provided at Table 4.1 below.

Table 4.1: Comparison of Cycle Network Strategy

Route ID (PJA strategy)	Route Description	LCWIP Feature
Route 1	Route along A1081 Harpenden Road between the site boundary and St Albans Town Centre/Rail Station	This route was identified within the LCWIP for a segregated cycle way. The area of St Albans City Centre would be decided at a later date due to uncertainty surrounding other plans in the area (e.g., bus improvements). This route came out within the top 6 schemes within the prioritisation exercise. A cost of £10.1m was forecast for this route between Harpenden and the centre of St. Albans.
Route 2	Route between the site and the east of St Albans, via Valley Road and Marshalswick Lane.	Both the northern extent of Valley Road and Marshal's Drive have been identified for potential areas for traffic calming and filtering which would create a more walking and cycling friendly environment. The King William IV Junction has been identified for a large-scale junction improvement scheme. It is pertinent to note that the Marshal's Drive traffic calming scheme came out within the top 20 schemes within the prioritisation exercise.
Route 3	Sandpit Lane between A1081 Harpenden Road and Woodstock Road North. An alternative parallel route has also been identified along Avenue Road and Jennings Road.	Sandpit Lane was identified for a series of traffic calming measures along its length. A medium junction improvement was identified at Charmouth Road/Sandpit Lane, and a large-scale junction improvement was identified for both junctions of Sandpit Lane with Woodstock Road and Marshalswick Lane.

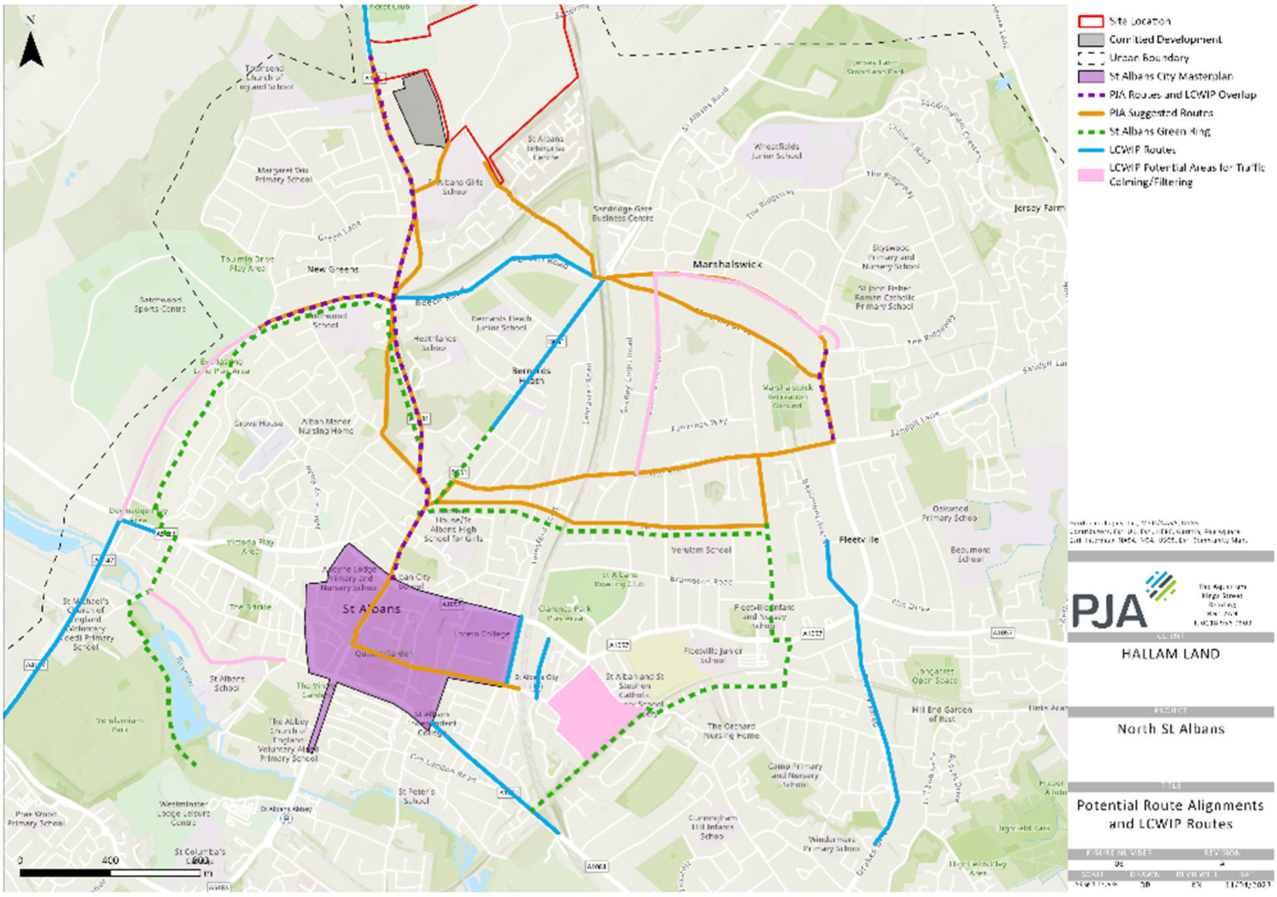
4.2.3 In addition to the measures proposed along the routes previously identified by PJA, there are a number of proposals within the LCWIP which will strengthen the active travel network in the vicinity of the North St. Albans site. These include:

- Pedestrian crossing improvement over A1081 Harpenden Road at northern end of New Green Avenue, on Beech Road and at the King Willian IV Junction;
- Pedestrian and cycle crossing over A1081 Harpenden Road at junction with Green Lane, south of St Albans Girls School;
- Traffic filter on Valley Road north of Darwin Close;
- Segregated cycle route along A1081 Harpenden Road, Beech Road, Batchwood Drive and along Sandridge Road;
- Segregated cycle routes in the vicinity of the railway station;

- Junction improvements at Ancient Briton and King William IV Junctions and minor junction improvements to the Old Albanians Access and the A1081 Harpenden Road/Sandridgebury Lane junction; and
- Pedestrian crossing over St. Albans Road at the eastern end of Sandridgebury Lane.

4.2.4 Figure 4-1 shows how the LCWIP proposals overlap and/or compliment the routes identified by PJA.

Figure 4.1: Audited Network and LCWIP Network Comparison



4.2.5 Figure 4.1 shows where there is overlap, and where high-quality facilities are proposed within the LCWIP which will complement or could potentially replace parts of the initial routes identified.

4.2.6 The primary differences between the audited network and interventions suggested by PJA with respect to North St Albans and those contained in the LCWIP are as follows:

- Constrained sections along the A1081 Harpenden Road have not been identified where there may be issues delivering a segregated facility within the existing highway.
- Sandpit Lane has been identified in the LCWIP as a potential east-west route whereas the audit undertaken by PJA has considered the opportunities along the parallel Avenue Road and Jennings Road which already carry less vehicle movements and speeds are likely to be lower providing better conditions for cycling on the carriageway.

4.2.7 Broadly speaking, the LCWIP strengthens the case that development at North St. Albans is in a sustainable location and that the sustainability of the site can be enhanced through the delivery of infrastructure which will have benefits to existing communities as well as future residents

4.2.8 There is a clear overlap between the emerging active travel network for the development and the LCWIP which is unsurprising given that similar data sets would have been used to identify potential routes. The local authority aspiration closely aligns with the strategy being put forward and therefore it is clear any proposals to fund or deliver these measures or complementary measures should be supported by the local planning and local highway authorities. It does however demonstrate the part the development can play in helping to realise the aspirations of the LCWIP. In the north of the city there is a significant overlap between the LCWIP proposals and the initial routes identified within our emerging active travel strategy,

4.2.9 The lack of clarity around the more complicated areas of the city (St Albans City Centre) are unlikely to impact on the effectiveness of the measures being proposed by both the LCWIP and PJA regarding travel demand to and from the development site and areas in the north of the city. The LCWIP makes it clear that the intention here is to deliver improvements in coordination with the delivery other elements such as the bus strategy, and therefore some assumptions can be made as to the ease of access to this area by active travel modes.

5 On-site Design Principles

5.1.1 A strategy for the site will be developed in close liaison with HCC as part of the Reserved Matter stage, since it is intended to submit an outline application for development at North St Albans.

5.1.2 In terms of the site access points, it is proposed to have more pedestrian / cycle access points than vehicular access points to aid connectivity by and increase convenience for active travel modes over private car travel. As such, the following access points are proposed for pedestrians and cyclists:

- Harpenden Road.
- Sandridgebury Lane.

- Valley Road.

5.1.3 In terms of the on-site design principles, the following is proposed for active travel modes:

- Principles of active travel routes on the site:
  - To provide more convenient and shorter routes than the corresponding vehicular route.
  - To be of a suitable design and compliant with LTN 1/20 considering any vehicular movements alongside the routes.
  - To provide access closer to facilities than corresponding vehicle routes.
- Provision of cycle facilities, docks, hire and parking:
  - Provision of cycle parking compliant with standards in LTN 1/20 allowing for adapted and cargo cycles as well as standard cycles. This would be at the residential units but also for the complementary facilities with cycle parking located closer to the "front door" than vehicular parking.
  - Consideration of provision of cycle docks as part of a wider cycle hire scheme to include the potential for a fleet of e-bikes to be used by residents and site users.
  - Provision of showering/changing facilities at the local centre, school and retirement living complex to allow staff to travel by bicycle.
- Provision of a network of mobility hubs to provide a highly accessible space for public, shared and active travel modes. To include multiple local hubs and a central hub covering the whole development.
- Travel planning to support and encourage uptake of active travel modes and Mobility as a Service to ensure a seamless journey for future residents.

6 Summary and Next Steps

6.1.1 This Technical Note forms the second topic note setting out the proposed active travel strategy for the development of North St Albans. It sets out the key desire lines, identification of routes along these desire line and potential interventions. It also sets out the alignment of these routes and interventions with the emerging LCWIP.

6.1.2 A selection of interventions across three key routes have been determined and in principle agreement to this is sought from HCC. This would be supported by a comprehensive package of onsite measures and facilities to encourage and support active travel modes for daily journeys.

6.1.3 It is suggested the developer would look to assist in the delivery of the suggested off-site interventions, if agreed with HCC, through an agreed mechanism and proportionate funding which meets the statutory test for planning obligations. It is suggested that some initial design is considered for these improvements allowing indicative costings to be produced to inform further discussions around delivery and funding.

6.1.4 The next step is to then consider the potential modal shift from private vehicle to active travel modes using the PCT modal split targets for the 'Go Dutch' scenario following implementation of the improvements. This assumes the level of cycling seen in the Netherlands adjusting for population demographics, trip distance and topography. This is not as aspirational in terms of its projections at the 'E-bike' scenario but provides a more conservative yet ambitious target for future cycling levels providing a quality level of infrastructure is provided, compliant with LTN 1/20. This would be completed as follows:

- Utilise development distribution (determined from mobile network data) to understand those journeys which could be undertaken by active travel modes in place of private car travel. This would be focussed on OD pairs which could utilise the proposed active travel network and within a suitable buffer (say 400m).
- Utilise existing OD pairs (again determined from mobile network data) to understand those journeys which could be undertaken by active travel modes in place of private car travel. Again focussing on OD pairs which could utilise the proposed active travel network and within a suitable buffer of this.
- Calculate the corresponding vehicular assignment of those existing journeys which would no longer be undertaken by private car to understand the potential reduction in vehicle movements across the surrounding highway network.

6.1.5 This analysis would be presented in detail in a Technical Note for review by HCC to agree the approach and outcomes.

Meeting Note

Meeting Details			
Project Title:	North St Albans	**Date:**	18/04/2023
Project No.:	05920	**Time:**	09:30-11:00
Subject:	RE: Active Travel Strategy and LCWIP	**Venue:**	Microsoft Teams
Present:	Matt McFeat (MM) – PJA Kay Nicholls (KN) – PJA Lucy Briggs (LB) – PJA Anthony Collier (AC) - HCC Jack Martin-King (JMK) – HLM Owen Jones (OJ) – LRM Planning (LRM) Ania Jakacka (AJ) – HCC Emma Turner (ET) – HCC LCWIP Toby – HCC		
Apologies:	James Dale (JD) - HCC		

Matters Arising		Action
1	Introductions AC confirms AJ will be Development Management lead on this scheme.	
2	OJ gives scheme background: SACDC first identified North St Albans area in Local Plan process in 2014. In 2018, it was one of the broad locations identified for future development for up to 1,100 homes. In 2019, HLM, St Albans School and Hunston Properties entered into a planning performance agreement with SACDC for development of a masterplan for future development and outline planning application, working collaboratively. A Draft Masterplan for North St Albans was presented to Planning Policy Committee in July 2020. This confirmed: • The proposed means of access from Harpenden Road was the subject of STIB approval in 2020. • Active travel measures were consistent with LTP4 and should be a priority. Long-term use of Sandridgebury Lane was an issue that needed to be resolved. However, in November 2020 the Local Plan was withdrawn. Since then, Hunston have secured planning permission for 150 homes on part of the site. This includes conditions requiring improvements to walking and cycling infrastructure along Harpenden Road and links to the adjoining (Hallam) land. HLM has continued to assemble its development proposals, noting the difference of scale to Hunston, have not as yet submitted an application.	

Matters Arising		Action
	Active travel considered as part of the masterplan, required as part of policy. Some circumstances have now changed with LTP and these will be refreshed through the latest work. In broad terms, what is now proposed is indiscernible from what was proposed in LP context (up to 1000 homes, local centre to meet scale and need generated by the development, retirement living/extra care, primary school and open space). Concept of walkable neighbourhood and internalisation of trips is embedded in the proposals. AC mentions ET involved in detailed design of A1081 scheme, plans adapting to real world environment and local constraints.	
3	OJ discusses highway proposals broadly and internal road layout. Access subject to STIB approval, strategic transport infrastructure board (treat it as you would a departure from standards due to access from road of a strategic nature), application of policy which sought to prevent new accesses being formed on key A roads. AC supported the principle of access from A1081 due to local context based on previous work. OJ confirmed the approval is subject to application of key LTP principles to provide active travel connections. AC flagged LTP4 being reviewed but principles likely to be similar. OJ explains masterplan provides potential to close Sandridgebury Lane under railway access from site, if there is a strategic decision made to do so, or provide a circuitous route through the site. AC asks who has authority to close Sandridgebury Lane, HLM looked into Town and Country Planning Act option and does not appear possible. Will need to go down the traffic regulation order route instead led by HCC. AC noted that this would be difficult to condition, and therefore flexible approach appropriate. OJ explains proposal are largely in alignment with proposals previously discussed. Except for Valley Road vehicle access closure.	
4	MM runs through high level masterplan. Primary route from Harpenden Road would be main vehicle access and also provide bus access. This primary route would have fully segregated cycle / pedestrian infrastructure alongside linking to the local centre and beyond to Sandridgebury Lane active travel spine. The proposals would envisage the inclusion of SUDs, Landscaping and parking along this route also. Main access junction would incorporate active travel infrastructure and will be different to previous proposals. Through the site Sandridgebury Lane would form a traffic free walking and cycling route through the site from SW to NE, with modal filters introduced. None of the development proposals take vehicular access from Sandridgebury Lane within the main masterplan area. On the south west extent of the site Sandridgebury Lane would be modal filtered and a turning loop provided to serve vehicles accessing the school or residential properties here at the south western end. At the north eastern end, the masterplan allows for this	HCC to provide contact at SACDC to discuss parking strategy with.

Matters Arising		Action
	could be closed to traffic west of the railway bridge and the masterplan shows a turning head to the east of a potential modal filter to support this. Many internal roads likely to be quiet enough for mixed traffic cycling supported with some shared use facilities in places. Sandridgebury Lane and Valley Road walking and cycling route connect to spine through site. MM explains new active travel route next to railway, continuation of PROW connecting to bridleway to north, providing a connection into the Heartwood Forest, likely to primarily be a leisure route. MM discussed the local centre transport proposals. Bus route drop off facility at local centre with space potentially for layover / EV bus charging capabilities. Car club/mobility hub in local centre, good quality cycle parking, opportunity to travel without private car, and measures to reduce car ownership. Active travel routes would incorporate controlled and uncontrolled crossing points throughout. Parallel crossing on main route. Parking provided on south east side of local centre. MM shared example of primary road cross sections incorporating bi-directional cycle routes, footways, Landscaping and some parking. AC asks about local centre, what is seen as realistically deliverable for commercial use. OJ explains retail food and non-food, community space, office space (work hub style rather than a formal office provision), nursery, mobility hub, apartments, retirement living (extra care). AC suggested that similar schemes have encountered issues surrounding the deliverability of commercial uses and that deliverability should be factored into the emerging proposals. MM later noted that the provision of facilities on the site could be guided by looking at what is available locally to help inform demand using 10/15 minute city principles. AC noted that the local centre plans incorporated a significant amount of parking spaces, and noted that this might not align with rhetoric suggesting that this was easily accessed by sustainable modes primarily for the residents of the site. AC questioned whether provision of parking spaces to support community centre for off-site users. AC noted challenging position regarding current St. Albans car parking standards and stated that he would be happy to support arguments for lower standards in discussion with SACDC to try and bring in new approach regarding parking provision and the link between car ownership, parking provision and volumes of traffic. Cycle parking LTN1/20 compliant for local centre. OJ states difficulty in finding appropriate contact at SACDC having raised the question with Chris Briggs recently. Could HCC suggest an appropriate contact at SACDC? OJ asks AC about residential parking provision on other sites where lower provision has been agreed in principle. AC emphasises the importance of using land for development and not significant amounts of parking – lower levels of parking should be holistic to the wider strategy to support alternative modes. Particularly true when the argument is for the release of green belt land for housing provision. AC also supports car club provision and centralised delivery hub/locker storage. It was recommended that parking facilities for parcel delivery vehicles should be considered.	

Matters Arising		Action
	AC queries if team have spoken to HCC about need for primary school. AC noted that primary schools typically incorporate car park at the front of the site. MM explained that vehicle access to the school had been moved west to separate vehicle movements from key pedestrian and cycle desire lines. Suggest arrows on plan for vehicle and pedestrian/cycle access which can be taken through to further design to try to cement approach to access. AC emphasises the need for suitable walking and cycling links to the primary school. Wants to establish the principles of safe routes which encourage children to walk. MM noted that priority crossings of the primary road network were proposed such as parallel crossings.	
5	AC discusses buses, routing bus into site could delay existing services. Bus provider may say that there is not enough development to support a delay to existing services. AC and MM discuss feasibility of using Valley Road, MM explains why discounted. Valley Road forms a key active travel route which would be compromised by the introduction of bus services and it brings out bus to wrong place on Beech Road, which is again unlikely to be attractive to bus operators. Given proximity of the site to the city centre active travel likely to offer a good option for a lot of journeys, PT needs to be considered second in the hierarchy. AC suggest some form of bus prioritisation at site access, using land within ownership to demonstrate that buses entering and exiting the site would not be held up could support proposed arrangement. ET queries whether there will be secure cycle parking within the local centre. MM explains Outline Application but will include the principle of secure cycle parking (e.g. accessible by fob), where you would be happy to leave for day, particularly with expensive eBike, potentially as part of multimodal journey. PJA/HLM LCWIP response discusses cycle parking at key destinations being an important element of the strategy to enable more people to cycle. ET asks whether Sandridgebury Lane active travel route is dependent on modal filter/TRO. MM confirms on site it will be, but eastern access is subject to further discussion. MM notes that Sandridgebury Lane is currently used by very low volumes of traffic, which might be appropriate for shared use.	
6	MM provides a summary of active travel strategy note focussing on the process of analysis to determine routes, route audits and proposed interventions. See separate Technical Note. MM explains LCWIP aligned analysis of active travel off-site connections, considering all trips not just work. The work shows key broad routes identified and routes snapped to roads. MM explains audit work done to assess feasibility of delivering improvements along routes to bring them up to an appropriate standard, guided by LTN 1/20. Hunston site delivering A1081 route, not focusing on this section. HCC noted that more detailed work had been undertaken on the Hunston proposals and they had a better understanding of the technical challenges of delivery. Route incorporates dual provision where constrained in the vicinity of the Old Harpenden Road loop.	MM to issue active travel note. HCC to provide considered response to note, possible follow up meeting if needed.

Matters Arising		Action
	MM discusses Route 1 highlighting the issues of delivery along the constrained section of A1081 in Townsend, and noted that this may need parallel route option to change/go around this. Proposals also notes the benefit of improving Batchwood Drive, towards hospital, through the use of traffic calming etc, reduce speeds better for cycle. MM discusses constrained locations south of Beech Road junction and potential alternatives. ET raised concerns with the potential requirement for surfacing and lighting for Townsend Drive route. MM aware and understood the need to consider wider ecological and urbanising issues of upgrading path through a woodland. Potentially a dual provision in this location could provide suitable route at different times of the day. MM explains that city centre not considered as part of current analysis, as PJA need a better understanding of wider aspirations here to provide a holistic solution. AC comments nobody wants to take this on and it is likely it will need to be dealt with by HCC in time. AC noted importance of routes connecting to key destinations (and cycle parking in those locations) and also connecting with existing and proposed routes on the other side of the city centre. Connections need to be considered. Route 2 on Valley Road to Marshalswick Drive, potential for two-way desire line not just for proposed residents but also for linking people across town to the schools and towards station. MM explained audit suggesting that mixed traffic cycling likely appropriate on Valley Road to make compliant with LTN 1/20, with traffic calming and pedestrian improvements identified for Valley Road. Major junction improvement required at King William junction for active travel across junction. LCWIP proposes LTN with modal filter at northern end of Gurney Court Road, allows onward streets to be quieter and suitable for cycling in the carriageway. This proposal provides significant benefit to the provision of route two and will largely provide appropriate conditions with some remedial measures. Route 3, closer to city centre, east west route, which links route 1 and 2 and is also likely to provide greater wider benefit to existing population of St. Albans. Route leaves route 2 and passes along GCR, to Sandpit Lane and Jennens Road St. Albans Green Ring). Connecting onto railway station and back into the town centre. Audit resultant in modal filter needed on GCR and, junctions improved. MM discusses next steps, detailed understanding of people journeys. Mobile Network Data (MND) will help a lot with this, understanding short journeys. MM shows audited network and LCWIP network comparison plan, how they aligned. Produces dense network of routes suitable for cycling. Crossing on Harpenden Road, to access New Greens also important AC discusses compromises can be made to deliver new infrastructure in line with LTN 1/20 but only where other possibilities have been exhausted, does not support rush to minimums. KN queries if there are geometries which would be acceptable and AC notes that there is new design guidance being consulted on which he would share and offers discussions with engineering team to agree suitable cross sections at appropriate time. HCC require meaningful interventions and improvements. For example, they will	

Matters Arising		Action
	not support any quiet way routes where signs are just put up unless it can be demonstrated that a road is actually quiet. Measures to ensure quiet way will be needed to support. AC discusses some critical junctions and confirms that it is widely understood that no further highway capacity can be achieved (and capacity is likely to diminish as a result of AT and PT measures) but safety is still an important consideration. Focus should be on active travel connectivity through these. AC queried the connection between on-site and off-site facilities. The residents will be spoilt for choice around how they access and exit the site by active travel modes.MM explains suitable provision would be made at all the access points to ensure smooth integration between on and offsite routes with active travel access points on all boundaries to ensure desire lines are met. AC confirms the approach taken is positive and robust and can only be strengthened by analysis of mobile network data. AC emphasises where routes are going to key destinations, ensure secure cycle parking at these destinations. This is critical for the railway station and understand demand for parking compared to capacity as they would require previously for car based assessments. AC also emphasises importance of wayfinding to key destinations like the station but also to other key connecting routes.	
7	MM queries used of MND and whether it might be acceptable and what HCC need to help this decision. AJ asks for minutes (issued after meeting concluded). AC states HCC like MND approach and pushing for others to accept. HCC already use MND. Meeting with data team this afternoon. AJ confirms formal response to last meeting will be provided next week to include confirmation of use of MND.	
8	OJ asks ET about LCWIP to understand next steps and process with the LCWIP and what would be required for a planning application in terms of delivery of off-site active travel routes. ET confirms currently reviewing responses from LCWIP consultation and plan to go to committees with adoption by the end of 2023 ideally. ET does not foresee any significant changes to routes being considered in this part of St Albans. Following adoption, they would look to work towards feasibility and design as funding opportunities came forward. AC sets expectation that in a congested city for the scale of development proposed, the developer would need to look towards delivery of key active travel routes. For planning, this would likely comprise preliminary sketches and Stage 1 RSA for routes where there is reliance upon them as part of a strategy to reduce car use and therefore capacity impact. JMK asks question to HCC on SACDC Local Plan, how site will meet policy criteria. No draft policy issued to members on transport at the moment. AC confirms this has been disrupted by HCC reviewing LTP but that the transport policy is largely consistent with what was contained in the Withdrawn Local Plan.	

Matters Arising		Action
	AC suggests HCC (South West Hertfordshire Growth and Transport Plan Prospectus) scheme linking north to Harpenden along the A1081 is considered. AC says there may or may not be a need to deliver this and analysis of MND would help to understand if there is a strong desire line from the development.	
9	AC states that decision on MND will come back as matter of urgency.	AC to come back on MND ASAP.
10	AJ offers to take away questions, reliant on JD as still getting up to speed with the site.	

Distribution:	All at meeting and apologies.

Topic Note

Project: North St Albans

Subject: Public Transport Strategy Topic Note

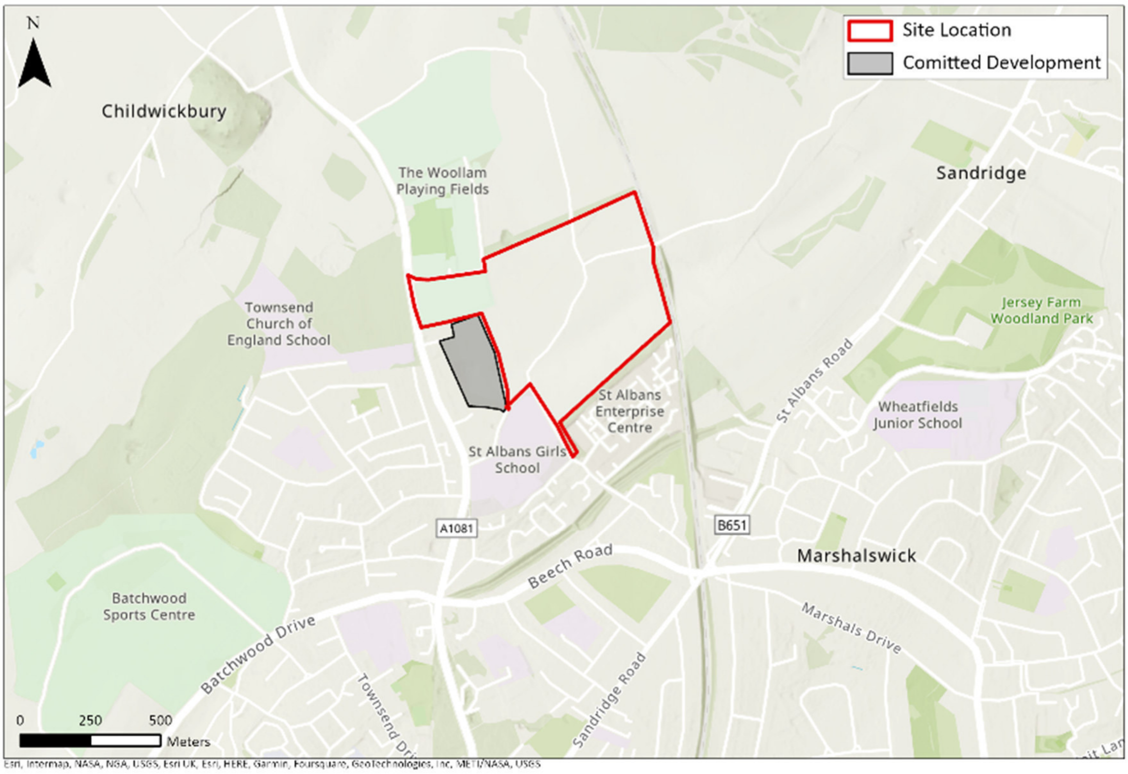
Client:	Hallam Land Management	**Version:**	01
Project No:	05920	**Author:**	KN
Date:	24/04/2023	**Approved:**	MM

1 Introduction

1.1 Background

1.1.1 PJA has been commissioned by Hallam Land Management to provide transport planning support for the proposed development of North St Albans. The location of the site is shown in Figure 1.1.

Figure 1.1: Site Location



1.1.2 Specifically, PJA has been commissioned to help develop a robust access and movement strategy to be presented in a Transport Assessment and Travel Plan/Travel Demand Management

Strategy which can be used to support a planning application for development following the withdrawal of the previous draft Local Plan for St Albans City and District in November 2020.

1.2 Progress to Date and Technical Note Purpose

1.2.1 PJA presented an initial Scoping Note and attended a follow up meeting on 19th January 2023 with the Local Highway Authority, Hertfordshire County Council (HCC), to discuss the intended assessment parameters and approach to the transport strategy. It was agreed that a series of topic notes would be prepared and follow up meetings arranged to discuss, as follows:

- Initial trip generation, mode share and use of the TDM;
- Trip distribution, assignment and use of mobile network data;
- Active travel strategy and interface with emerging Local Cycling and Walking Infrastructure Plan (LCWIP);
- Public transport strategy;
- On-site design principles and approach to parking and parking standards; and
- Coordination of transport strategy (feeding from previous topics), TDM forecasts of modal shift and trip banking and residual impacts of development.

1.2.2 This Technical Note sets out the principles of the proposed public transport strategy.

1.2.3 Following this introduction, the note comprises the following sections:

- Section 2 Current bus services in the vicinity of the site.
- Section 3 Proposed bus strategy and potential phasing.
- Section 4 On-site design principles.
- Section 5 Summary and next steps.

1.3 Policy Context

1.3.1 Nationally, the UK Government has committed to reducing net emissions of greenhouse gases by 100% relative to 1990 levels by 2050 (to become a 'net zero' emitter). Transport is now the largest contributor to UK greenhouse gas emissions (28%), and this is likely to make it one of the focus areas for reducing emissions. In July 2021 the Government launched its transportation decarbonisation strategy, which sets out how they propose to achieve significant CO_2 reductions in this area. Ahead of the release of the decarbonisation strategy the Government have committed to accelerate carbon reductions with a 78% reduction by 2035, which has subsequently been brought into law.

1.3.2 Locally, St. Albans City & District Council voted unanimously in July 2019 to declare a climate emergency with a pledge that the district would become carbon neutral by the end of the decade (2030). The district has pledged to submit an innovative and comprehensive sustainable travel town Vision to HCC which incorporates a clean air zone in the town centre, and measures to further enable journeys to be undertaken by non-car modes.

1.4 The National Bus Strategy and Bus Service Improvement Plans

1.4.1 The National Bus Strategy (Bus Back Better) set out an ambitious vision to improve bus services across England (and outside of London) through local leadership and partnerships with operators to reverse the shift in journeys away from public transport, particularly seen through the Covid-19 pandemic.

1.4.2 As a result of this, there was an expectation that all Local Transport Authorities would prepare a Bus Service Improvement Plan (BSIP) and form Enhanced Partnerships with operators.

1.4.3 HCC setup the first Enhanced Partnership in England back in 1999; known as Intalink. This has evolved over time and recently, HCC used powers under the 2017 Bus Services Act to formally setup an Enhanced Partnership based on the previous partnership.

1.4.4 The Enhanced Partnership will be in place for 10 years from adoption (1 April 2020 to 21 March 2030) and covers the wider Hertfordshire area which encompasses St Albans and Harpenden.

1.4.5 HCC prepared a BSIP and submitted this to the Department for Transport. HCC were successful in obtaining funding of approximately £29.7 million to deliver passenger transport schemes and initiatives through the Intalink Enhanced Partnership.

1.4.6 To date, the Intalink Enhanced Partnership has made significant progress on fares, ticketing and marketing and the BSIP is looking at St Albans as an investment location for bus priority measures. It is therefore deemed that there are good opportunities working in collaboration with HCC and the Enhanced Partnership to deliver public transport services which meet the needs of future residents.

1.5 Future Funding and Delivery of Service Improvements

1.5.1 The precise delivery and funding arrangements for any identified service improvements would need to be considered in discussion with HCC and the wider aspirations of the Enhanced Partnership.

1.5.2 National Planning Policy Guidance is clear on the use of planning obligations in mitigating impacts and making development acceptable in planning terms. They may only constitute a reason for granting planning permission if they meet the following tests:

- Necessary to make the development acceptable in planning terms.
- Directly related to the development; and
- Fairly and reasonably related in scale and kind to the development.

1.5.3 The delivery and funding of any public transport improvements would therefore need to be considered in the above context and in line with the BSIP. It is suggested that the improvements would be funded through a combination of developer and public funds. Developer funds would be likely secured via s106 agreement.

2 Existing Bus Services

1.5.4 The current bus network has developed on historic lines with St Albans city centre as a focus for both the local network and interurban services.

1.5.5 The development site is located immediately adjacent to the A1081 road linking St Albans to Luton. The current local bus routes are provided on three key axis:

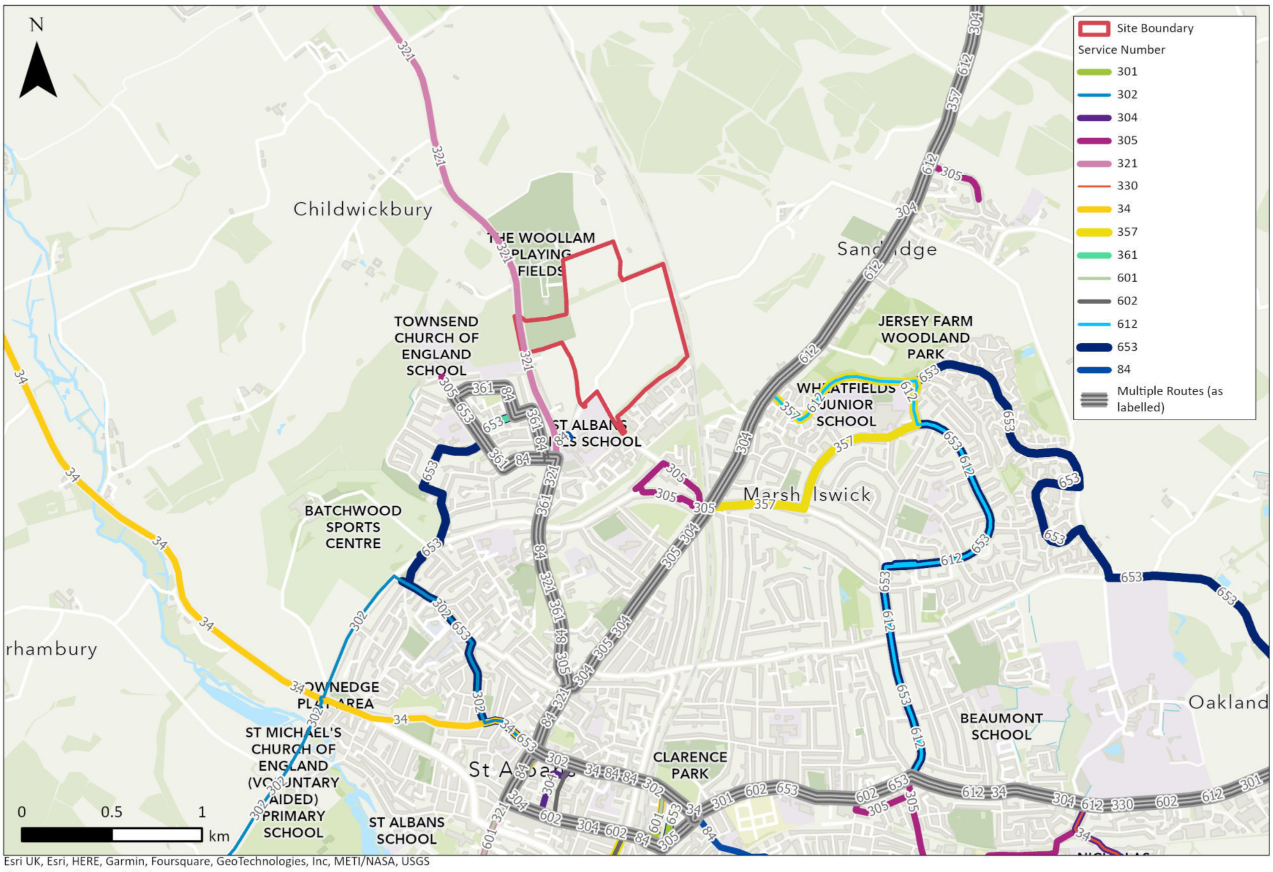
- A1081 Harpenden Road.
- B651 Sandridge Road.
- Local roads into the New Greens Estate.

1.5.6 A summary of existing services and frequency is set out in Table 2-1.

Table 1: Existing Bus Services and Frequency

Service	Route	Corridor	Weekday			Saurday			Sunday			Operator
			Freq	First (near to site)	Last (near to site)	Freq	First (near to site)	Last (near to site)	Freq	First (near to site)	Last (near to site)	
304	Hitchin to St Albans	B651	120	0722	1721	120	0852	1719	180	1108	1656	Arriva
305	Sandridge to Potters Bar	B651	180	0922	1412	180	0922	1707	n/a	n/a	n/a	Metroline
321	Luton to Maple Cross	A1081	20	0535	2339	20	0651	2339	60	0813	2339	Arriva
357	Borehamwood - Harpenden	B651	60	0740	1929	60	0741	1814	90	0933	1906	Red Rose
361	New Green - Garston	New Green	Schools	0824	1539	n/a	n/a	n/a	n/a	n/a	n/a	Red Eagle
653	New Green - Welwyn	New Green	30	0548	2145	30	0604	2145	60	0856	1846	Uno

Figure 2: Existing Bus Services



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3 Proposed Bus Service Options and Potential Phasing

1.5.7 The proposed public transport strategy will look to:

- Meet the demands of future residents in terms of where and when they want to travel.
- Ensure there is a viable public transport service in operation for early occupation of the site. The operation of future services would reflect the development phasing with further service provision implemented at a time when it is beneficial.
- Be viable and self-sustaining in the long term. It is likely that there will be a requirement for some pump priming of services earlier on (funding arrangements to be discussed and agreed) but the intention is that any service enhancements would become broadly self-sustaining through revenue from fares.

1.6 Development Phasing

1.6.1 The development would be built out in phases likely starting in the area nearest the vehicular site access on the A1081 Harpenden Road and the public transport strategy would reflect this. During early occupation of the site, it is intended that the necessary infrastructure would be put in place to allow the existing services to be used by residents.

1.6.2 As the site is built out further, service enhancements would be introduced to serve the development with a bus directly serving the site. In terms of vehicular access, it is intended that public transport access would be provided via the A1081 Harpenden Road only and therefore services would need to route in and back via this point. This is due to the unsuitability of Valley Road and Sandridgebury Lane as public transport routes.

1.6.3 It is considered that 30 – 40% of the residential element of the current masterplan layout is within 400m of the A1081 Harpenden Road, as the crow flies, and therefore approximately 330 - 440 dwellings plus the retirement living is deemed an appropriate quantum for which the existing arrangements would be suitable. These arrangements could also serve access to the primary school. Beyond 400 dwellings it is expected that some or all of the local centre would be delivered incorporating bus interchange facilities.

1.7 Public Transport Strategy – Early Phases (Up to 440 dwellings)

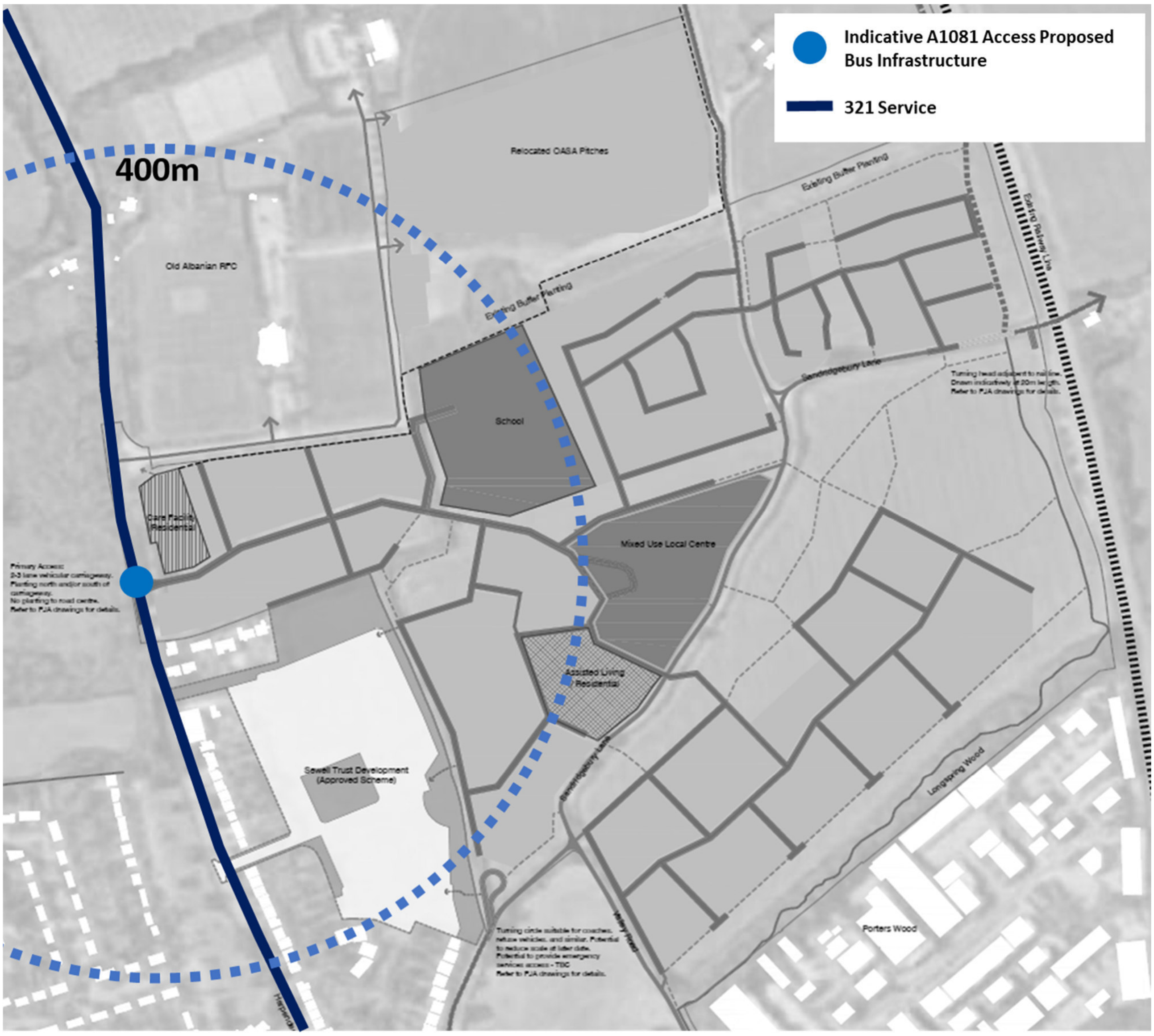
1.7.1 There are existing bus stops on the A1081 Harpenden Road serving Arriva service 321 at a 20 minute frequency which could cater for the needs of residents occupying the site during early phases of the development. Although it is understood that this frequency may be reviewed as part of the BSIP discussions which are ongoing between HCC and local operators.

1.7.2 As part of the initial public transport strategy, it is proposed that additional good quality bus stops with shelter provision are provided close to the sites vehicular access point. This would be on the mainline or in a bus hub immediately within the site which would require buses to deviate from the A1081 for a short time. In addition, good quality routes for pedestrians between the residential areas and these bus stops would be provided on-site.

1.7.3 This would provide residents with convenient access to a frequent service operating from early morning until night, 7 days per week.

1.7.4 Other existing services could also be accessed from the development, including the 653 service which serves stops approximately 750m from the proposed development.

Figure 3: Indicative Public Transport Strategy (Early Phases)



Suggested Obligation: Prior to first occupation, provision of suitable bus stops / bus hub adjacent to the site access and suitable pedestrian infrastructure to connect residential properties and the bus infrastructure, secured via planning condition.

1.8 Public Transport Strategy – Later Phases (450 dwellings+)

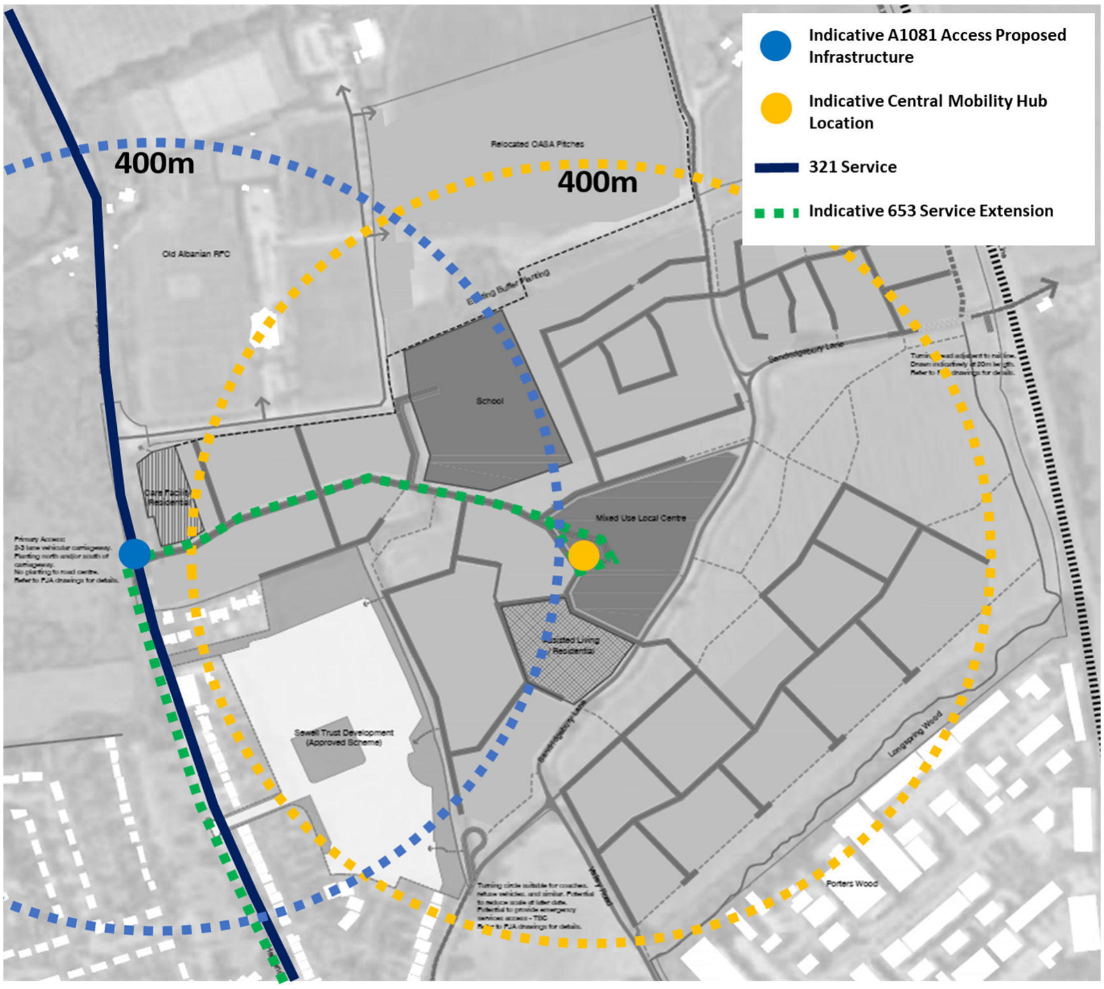
1.8.1 As part of later development phases, it is intended that the 321 service would continue operating serving stops adjacent to the site access and along Harpenden Road. This would allow residents to access a frequent and direct service to key destinations via the main access road and via routes through the adjacent Sewell Trust Development.

1.8.2 It is unlikely to be viable or attractive for operators to re-route the 321 further into the development due to increase in journey times on this direct inter-settlement route. It is also unlikely to be viable to provide a wholly new route to St Albans as this would likely only attract patronage from the development as there would be duplication with other services along the majority of the route to / from St Albans.

1.8.3 It is therefore proposed to provide enhancements to a key local route. The 653 service terminates in the New Greens estate circa 750m from the development site. This route could be extended to the proposed development. Since the layover time at New Greens is limited it would likely require an additional bus to be deployed to allow for the increase in route length.

1.8.4 The service would then route through the vehicular access from the A1081 Harpenden Road and serve the local centre area where a central mobility hub would be provided with space for vehicle layover. The bus would then turn in this area and exit the site to the Harpenden Road.

Figure 4: Indicative Public Transport Strategy (Later Phases)



Suggested Obligation: Prior to occupation of 450 dwellings:

- Proportionate funding to support an additional bus service to be agreed with HCC in line with revenue and cost estimates, secured via s106.
- Provision of on-site infrastructure to serve buses including local bus stops, central mobility hub and layover area, secured via planning condition.

1.9 Rail Access

1.9.1 Rail provides significant opportunities for longer distance journeys particularly towards London. The proposed bus strategy for the site facilitates movements between the site and railway stations:

- St Albans City Railway Station – Served by 653 service
- Harpenden Railway Station – Served by 321 services (200m walk).
- St Albans Abbey Station (rail services to Watford) – Served by 321 service.

1.9.2 The proposed active travel strategy will also help to facilitate links towards St Albans City Railway Station.

4 On-site Design Principles

1.9.3 A strategy for the site will be developed in close liaison with HCC as part of the Reserved Matters stage, since it is intended at this point to submit an outline application for development at North St Albans.

1.9.4 In terms of the site access points, the vehicular site access point with the A1081 Harpenden Road will be designed accordingly to accommodate bus movements and provide priority to these movements, where required and where possible.

1.9.5 In terms of the on-site design principles, the following is proposed for public transport modes:

- A clear carriageway width of at least 6.2m to be consistently available along routes traversed by buses.
- Localised widening should be assumed on bends, in line with results of a realistic tracking exercise; specifically where there are more significant vehicular movements and where there is the greatest likelihood of other vehicles passing a bus.
- Good quality bus stops and shelter facilities which are lit and appropriately overlooked, and suitably prominent within the street scene, without being intrusive. These would be provided

in normal circumstances approximately 300m apart, to maximise the number of dwellings within easy walking distance of stops.

- Provision of a centralised mobility hub to accommodate bus boarding and alighting. Facilities to allow bus layover and future electric bus charging facilities to meet wider aspirations.
- Travel planning to support and encourage uptake of public transport modes and Mobility as a Service to ensure a seamless journey for future residents.

5 Summary and Next Steps

1.9.6 This Technical Note forms the third topic note setting out the proposed public transport strategy for the development of North St Albans. It sets out the existing service patterns, potential bus routing options and design of the internal site layout to support public transport access.

1.9.7 An outline phased strategy has been suggested to ensure the site is adequately served by public transport. This assumes early phases are served by the existing 321 service on the A1081 Harpenden Road with some infrastructure adjacent to the vehicular site access to support this. As part of later phases, it is proposed to extend the local 653 service into the development serving the central mobility hub. The precise funding arrangements and mechanism would need to be discussed with HCC and the Enhanced Partnership along with a cost / revenue exercise to determine the value of a proportionate contribution towards these enhancements which could be collected via s106.

1.9.8 Principles of the internal site design have been set out to ensure convenient access for buses and between residential properties and the proposed bus infrastructure.

1.9.9 The next step is to then consider the potential modal split at the development for bus movements using mobile network and census data to understand public transport uptake for journeys where regular bus services provide a choice of travel. This would be completed as follows:

- Utilise development distribution (determined from mobile network data) to understand those journeys which could be undertaken by public transport in place of private car travel. This would be focussed on OD pairs which could utilise the proposed bus network (allow for interchange).
- Apply an appropriate modal split for bus for these journeys based on a suitable donor corridor.

1.9.10 This analysis would be presented in detail in a Technical Note for review by HCC to agree the approach and outcomes.

Meeting Note

Meeting Details			
Project Title:	North St Albans	**Date:**	27/04/2023
Project No.:	05920	**Time:**	10:30-11:30
Subject:	RE: Public Transport Strategy	**Venue:**	Microsoft Teams
Present:	Matt McFeat (MM) – PJA Lucy Briggs (LB) – PJA Anthony Collier (AC) – HCC James Dale (JD) – HCC Robert Handbury (RH) – HCC Daniel Tancock (DT) – HCC Jack Martin-King (JMK) – HLM		
Apologies:	Kay Nicholls (KN) – PJA Ania Jakacka (AJ) – HCC		

Matters Arising		Action
1	Introductions and MM discusses agenda. RH introduces as Network Planner in ITU. MM recaps previous active travel meeting, and provides a little background for JD who missed the last meeting and RH who has not been involved in the North St Albans discussions to date. MM discusses the site location, and the emerging masterplan and access arrangements. Key elements are that public transport access is proposed to be taken along the main access road from Harpenden Road. Services will terminate at a mobility hub within the proposed local centre. This will provide bus interchange facilities and driver facilities, alongside a range of other features such as secure cycle parking, e-car club vehicles and parcel delivery lockers. Proposals are based on modal filter to Valley Road (aligned with LCWIP proposal) as this is considered to be unsuitable to run a bus service along. Additionally, Sandridgebury Lane is proposed to be filtered where it passes through the development site. Masterplan provides opportunity to connect eastern end of Sandridgebury Lane to internal road network or not. However, the existing railway bridge prevents high sided vehicles from travelling along this route. To mitigate closure of Sandridgebury Lane a turning loop is proposed in the south western corner of the site. RH queries whether the mobility hub turning area and the turning loop on site will be connected by through route for vehicles. MM confirms no through route. JD queries distances of mobility hub and 400m from bus stops. MM explains that most of site will be covered in 400m of the mobility hub.	

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Jacob Street
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Bristol
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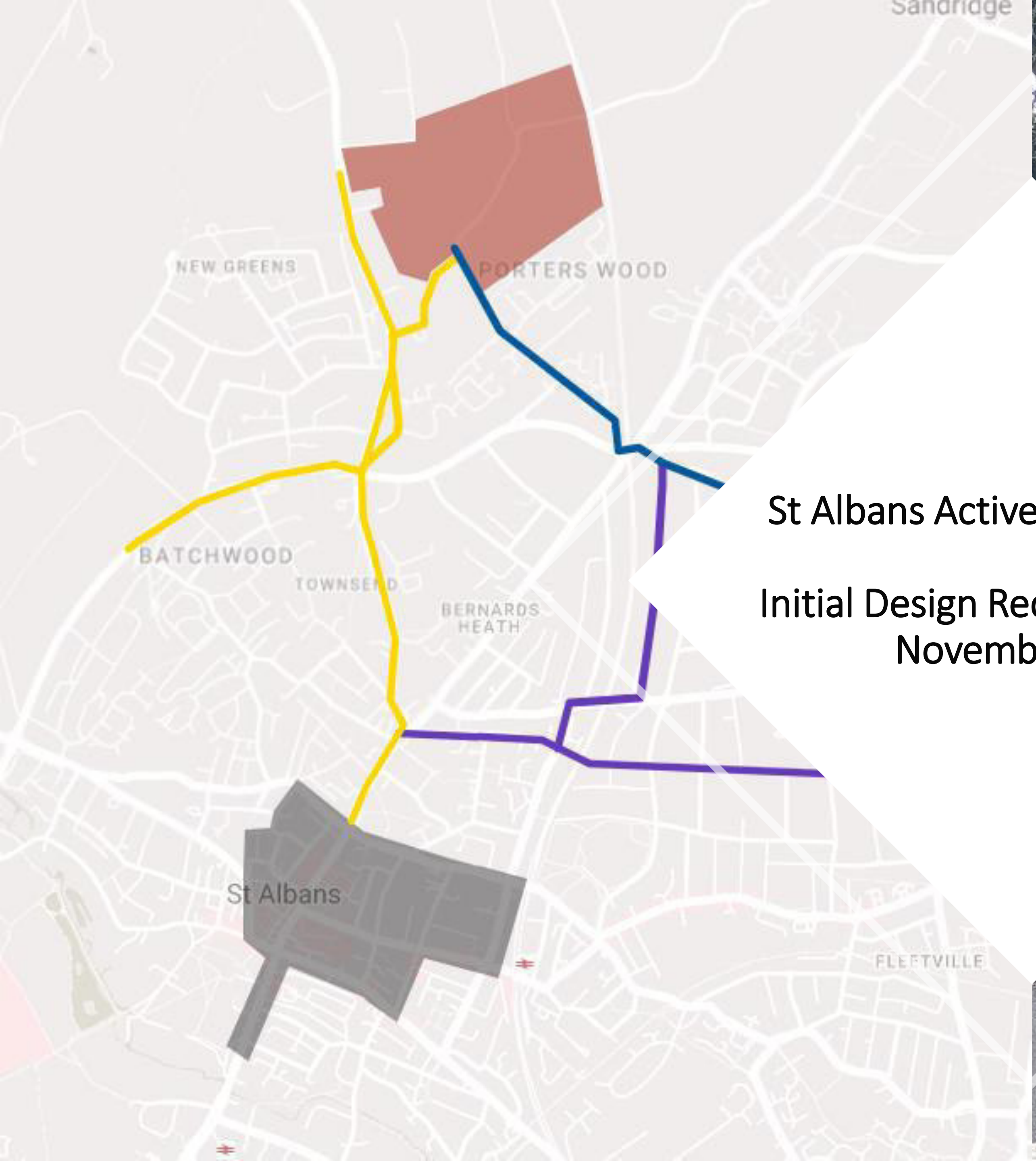
WEBSITE pja.co.uk

Matters Arising		Action
2	MM provided an overview of the existing bus network in the vicinity of the site. 6 services currently serve the streets near the site. With a mix of services and providers operating them.	
3	In providing PT access for the development it is considered that there are three main opportunities at present. MM set these out as: 1) new route to St Albans – which could potentially run with a single vehicle, however it would follow the same corridor as the 321 and therefore limited opportunity for new patronage 2) diversion of 321 into site – 3) extension of 653 into site – extending the existing service from New Greens terminus could offer improved driver facilities. It would require an additional vehicle on the route These proposals could be complimented by a possible bus interchange on the Harpenden Road near the site entrance. Bus proposals could be phased in line with the phasing of the development.	
4	Review of bus options. MM discusses that PJA initial assessment of patronage (based on development population and target mode share) suggests that a development of this size could require 1 additional bus either as a new route or by increasing the vehicles running existing services. MM comments that the benefits of a new route running between the site and the town centre would be limited largely to the resident population of the development. Patronage along the route is likely to be served by the 321 and therefore a new service would only be able to capture some of this. On the diversion of 321 into site it was noted that the existing service operates with a 20 minute frequency. However, the diversion would add a 3 – 4 minute increase in journey times between Harpenden and St. Albans. HCC noted that the service is currently on a very tight timetable. The extension of 653 service is likely to be the least challenging option albeit this would require a fairly significant extension of the existing route, which would again require additional buses to run the service at the current frequency. MM discusses that suitable space in site for turning infrastructure will be provided.	
5	Questions on Proposals: RH agrees with summary discussed by MM. But doesn't think Arriva would go for diversion of 321 into site, on a primary trunk route. DT agrees with points raised by RH. If bus is running late, there is a potential scenario where they don't serve/miss site altogether to catch up. A stop on the Harpenden Road would be the best way to access this service.	

Matters Arising		Action
	RH thought that 653 extension would be better option for serving the site. This could provide much improved terminus within the development compared to existing situation in New Greens. DT in discussion with Uno and others for bus service improvement plan (BSIP). St Albans to Watford key corridor a key route to improve, St Albans-Luton, Watford-Luton, Hemel Hempsted-St Albans also key corridors. DT discusses that one bus an hour on the Hemel Hempstead to St Albans route was cut but thinking about bringing it back. Notes that ongoing discussions around BSIP could potentially lead to a reduction in frequency of 321 services to the north of St. Albans as suggested bv Arriva, although this is not necessarily supported by HCC. Within next month, BSIP will be more solidified. This has funding, Arriva thinking more operationally and HCC thinking more of opportunities, need to come to an agreement in between. JD queried whether the development should be providing more than one additional bus service to the existing network. JD also requested a review of east/west connections from the site. MM explains calculation currently based on commercial viability and patronage development can generate. MM notes that further work on the TDM, particularly with the addition of mobile phone data is likely to yield a better understanding of how new/improved routes could support existing travel patterns and shift mode away from car. DT queries S106 toolkit and likely contribution of a development for this size. JD confirmed that a development of this nature would require £6,000 per unit to support local infrastructure. This could generate an infrastructure fund of £6m to deliver significant PT improvements. RH asks about potential rail station on existing rail line. MM confirms this is not being considered. AC asks about journey times into St Albans, and prioritisation of bus routes into St Albans. RH suggests with 321 being a long distance route, it is not attractive to other bus users on long distance route to go around a residential development, slowing down journey time. Suggest that the service would need to be a route that finishes in development, 321 could finish in development, half hourly service could support 1 PVR increase. Facilities at mobility hub could be more attractive for bus to finish in the site rather than in New Greens with potentially no facilities for driver.	
6	MM discusses next steps of pushing button on mobile data purchase and the TDM and this will help solidify proposals for mobility hub.	
7	DT discusses frequencies of the various services within the New Greens area (84,305,361,653), noting that many of the services are school services. Could some of	

Matters Arising		Action
	these also be extended to site to broaden PT catchment, even if just limited services per day?	
8	AC queries junction design at Ancient Briton and level of use of this junction with active travel, adding bus, traffic etc. Also discusses housing type locations in site and certain types of dwellings being closer to services for access to station/(mobility hub?) and local journeys further into the site. MM notes that emerging parameter plans propose greater density toward the western side of the development and around the mobility hub, maximising the number of residents within close proximity to bus services. AC queries operational times and off-peak. MM notes that both the 321 and 653 run throughout the week and across most of each day.	
9	JMK queries AJ email on MND and if there is any further information on use of MND. LB suggests that BT have offer to present to HCC and can answer any detailed questions on data.	PJA (KN) to help arrange BT presenting to HCC.

Distribution:	Matt McFeat – PJA Lucy Briggs – PJA Kay Nicholls – PJA Anthony Collier- HCC Jack Martin-King – HLM Iain Macsween – HLM Owen Jones – LRM Ania Jakacka – HCC Robert Handbury – HCC



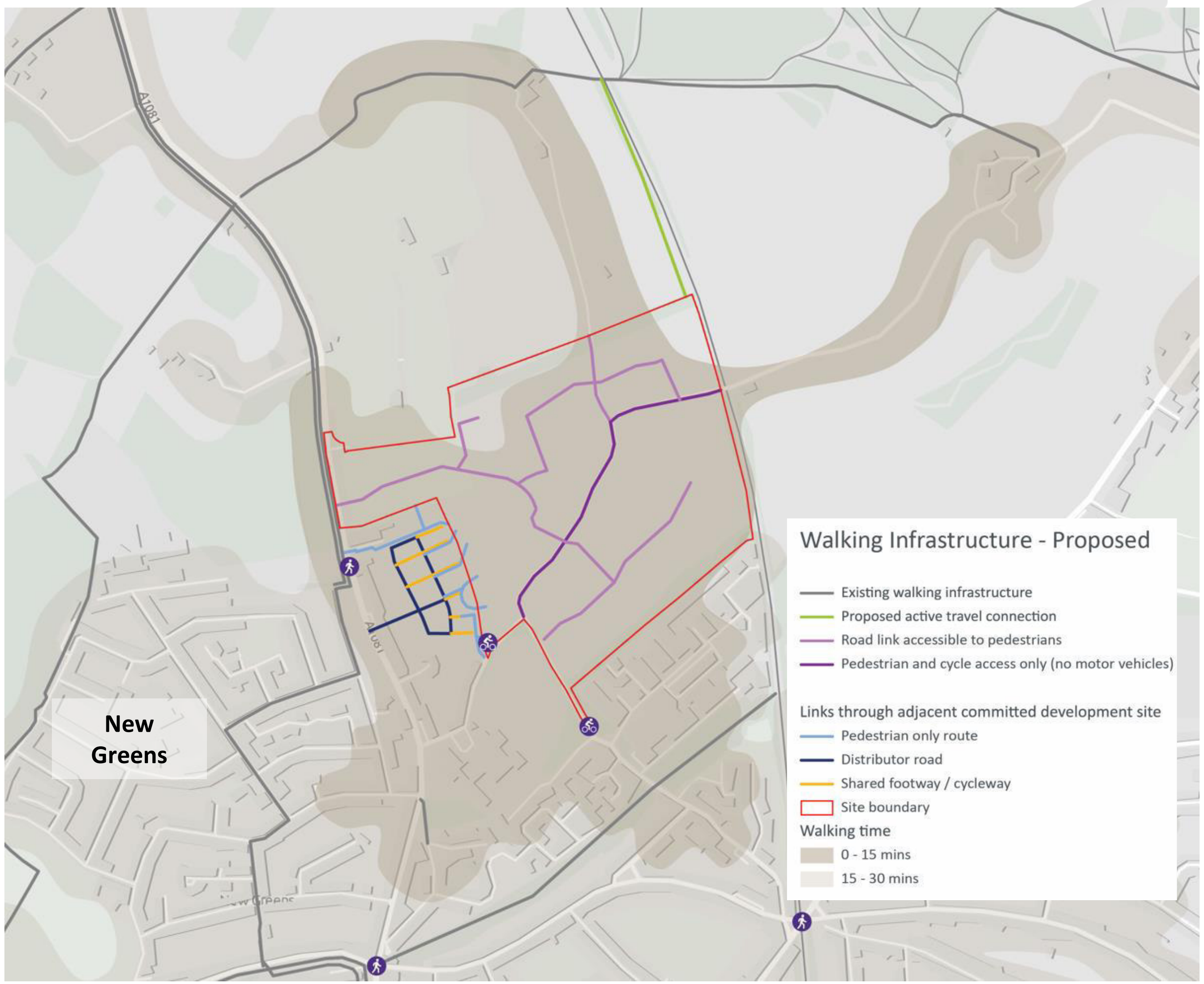
St Albans Active Travel Strategy

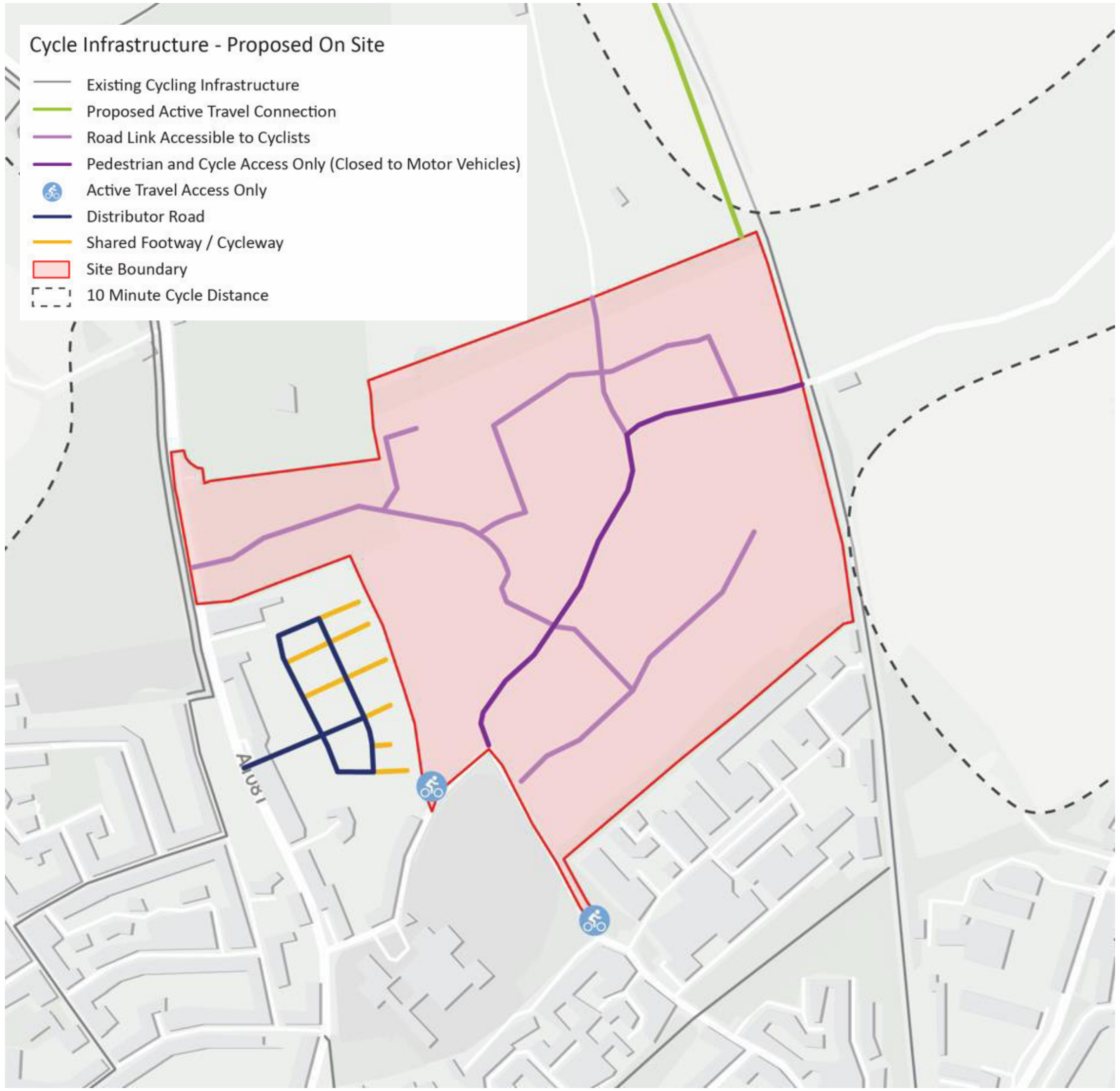
Initial Design Recommendations
November 2023

Agenda

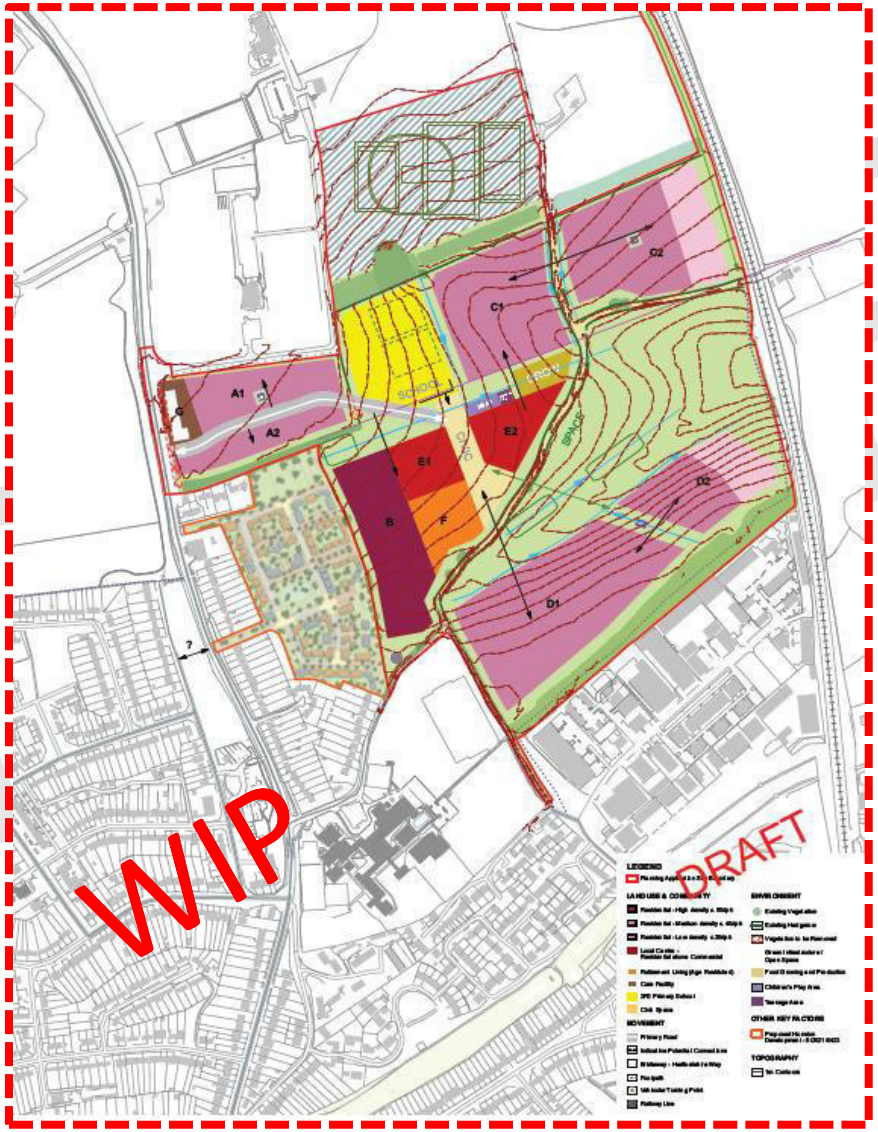
- Internal site layout principles.
- Site access connections to existing and committed infrastructure.
- Offsite Overview and Key Points:
  - Batchwood Drive Junction – initial considerations
  - Harpenden Road Constraints and proposed end point - Additional options review
  - Valley Road Junction – Initial considerations
  - Onward connections to Railway Station
- AOB

Internal Site Principles – Proposed Connectivity

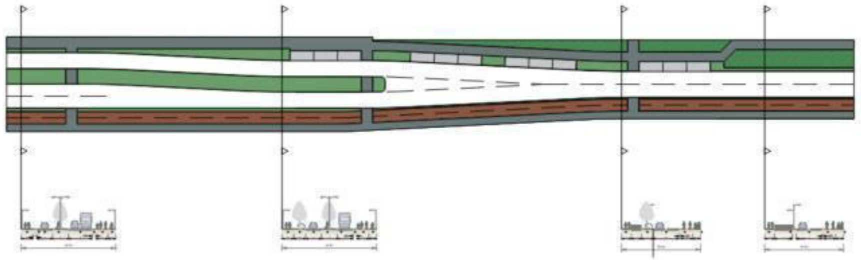




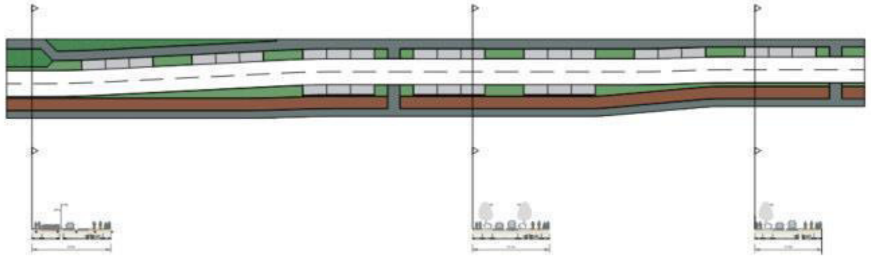
Internal Site Principles – Indicative Layout and Cross Sections



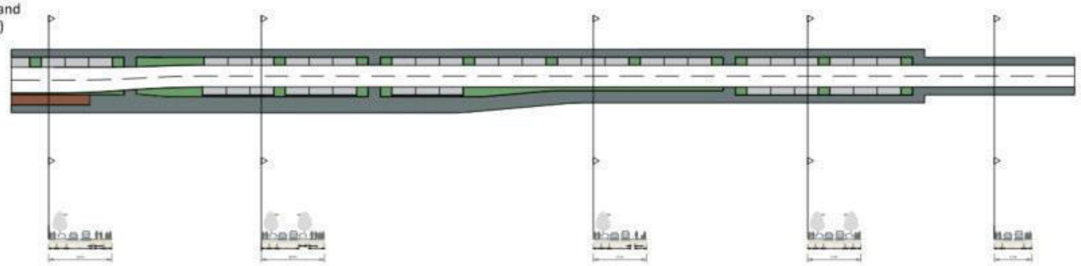
Main Entrance Street
Section width: 20 - 24m
Speed limit: 20 - 30mph
Traffic volumes: 6,000+
Cycle provision: Separate and protected
Bus route: yes



Primary Street
Section width: 17 - 20m
Speed limit: 20 - 30mph
Traffic volumes: 4,000+
Cycle provision: Separate and protected
Bus route: yes

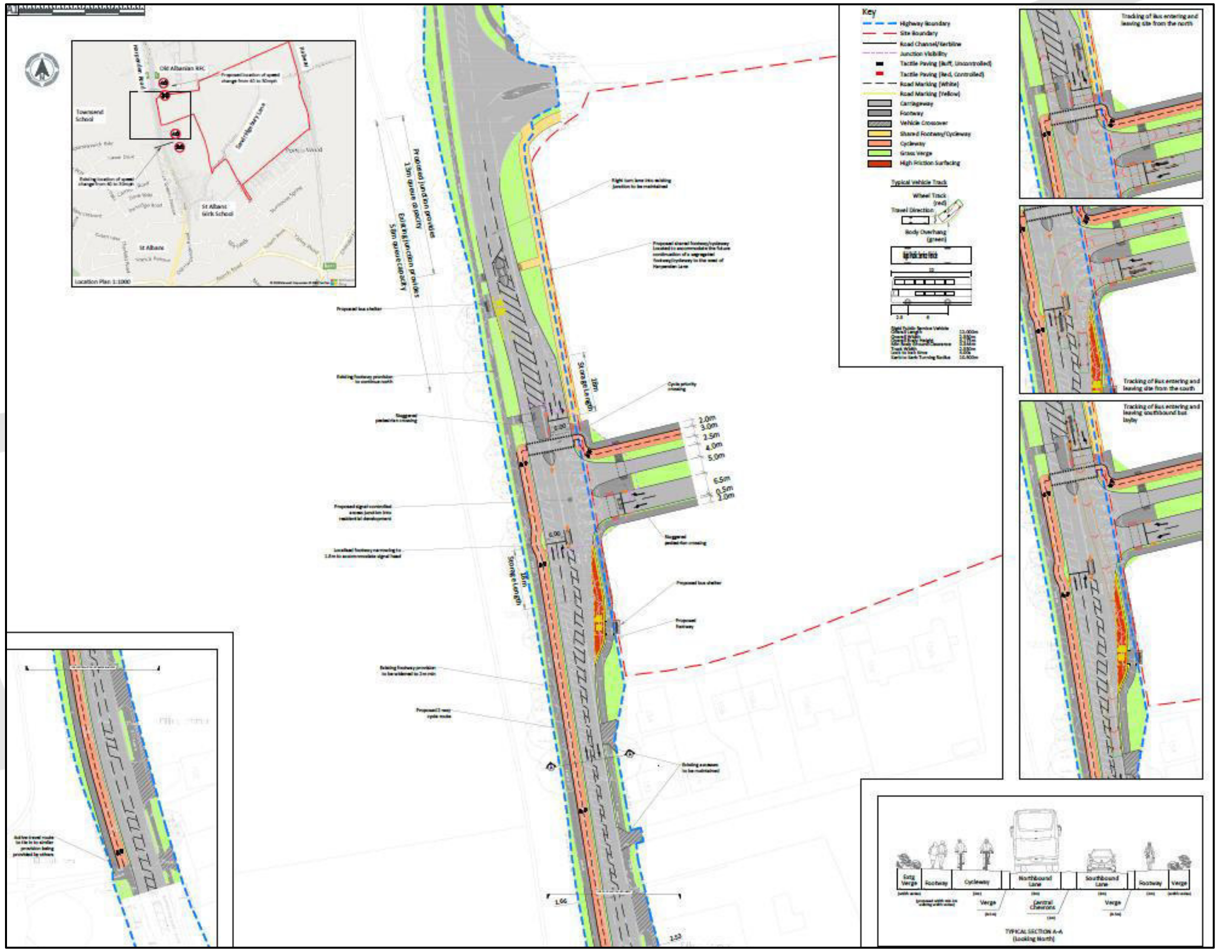


Secondary Street
Section width: 9 - 16m
Speed limit: 20 - 30mph
Traffic volumes: 2,000 - 4,000 per day
Cycle provision: Separate or shared and protected (where flows above 2,000)
Bus route: no

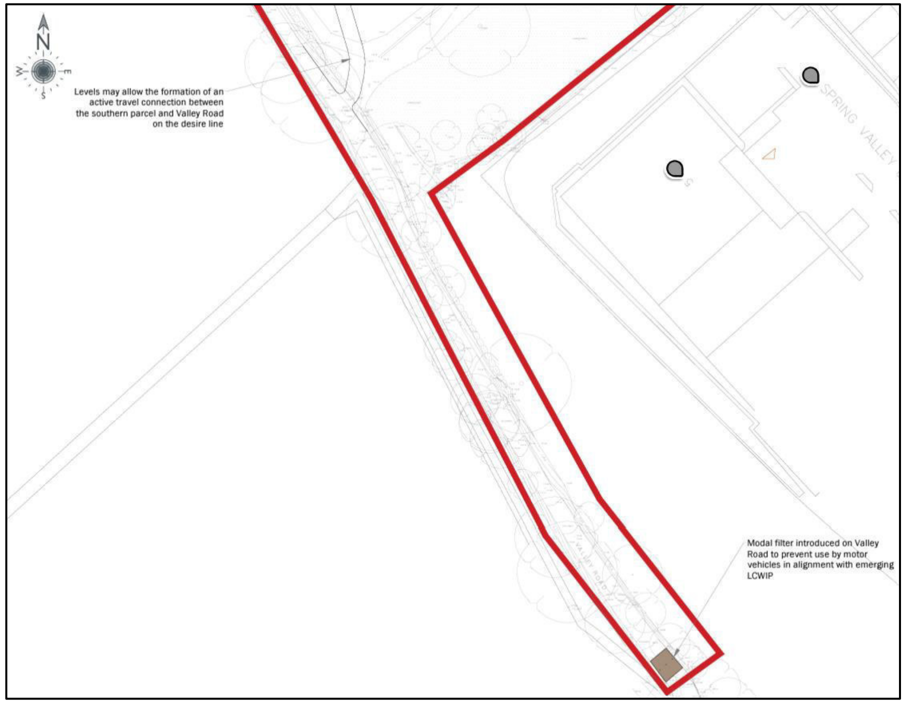


Site Access Points

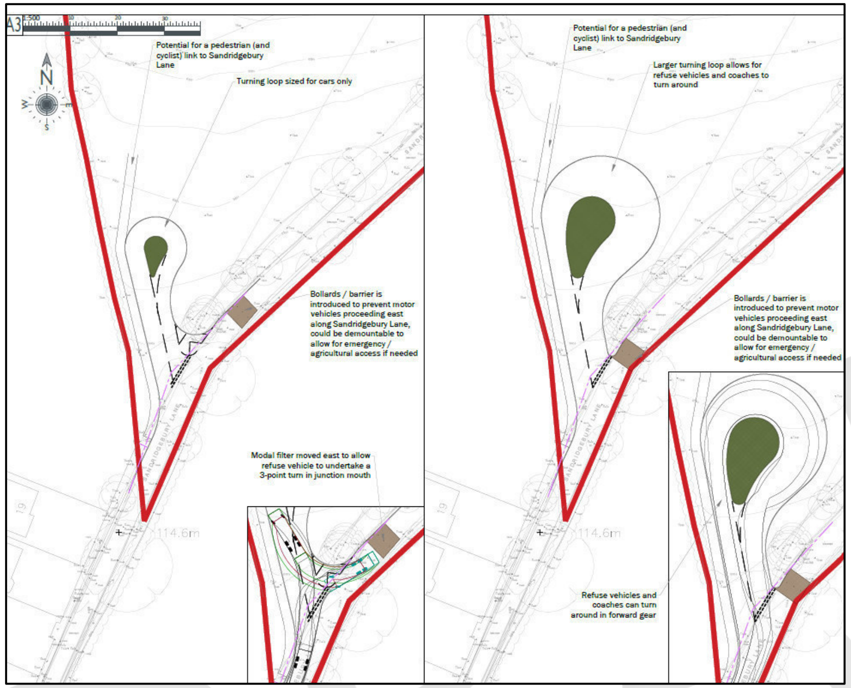
Harpenden Road

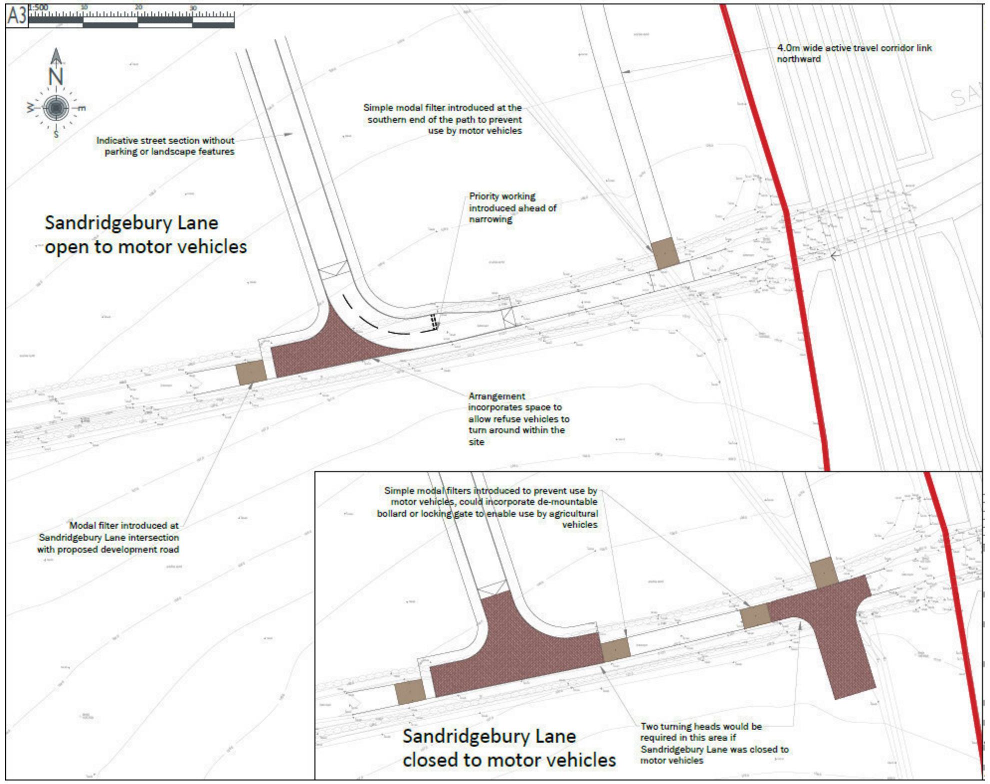


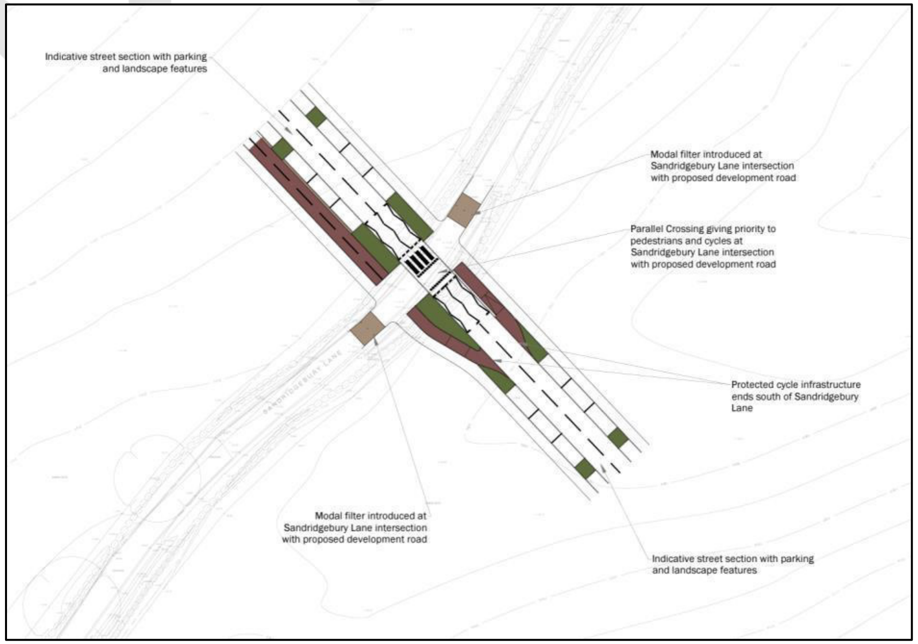
Valley Road



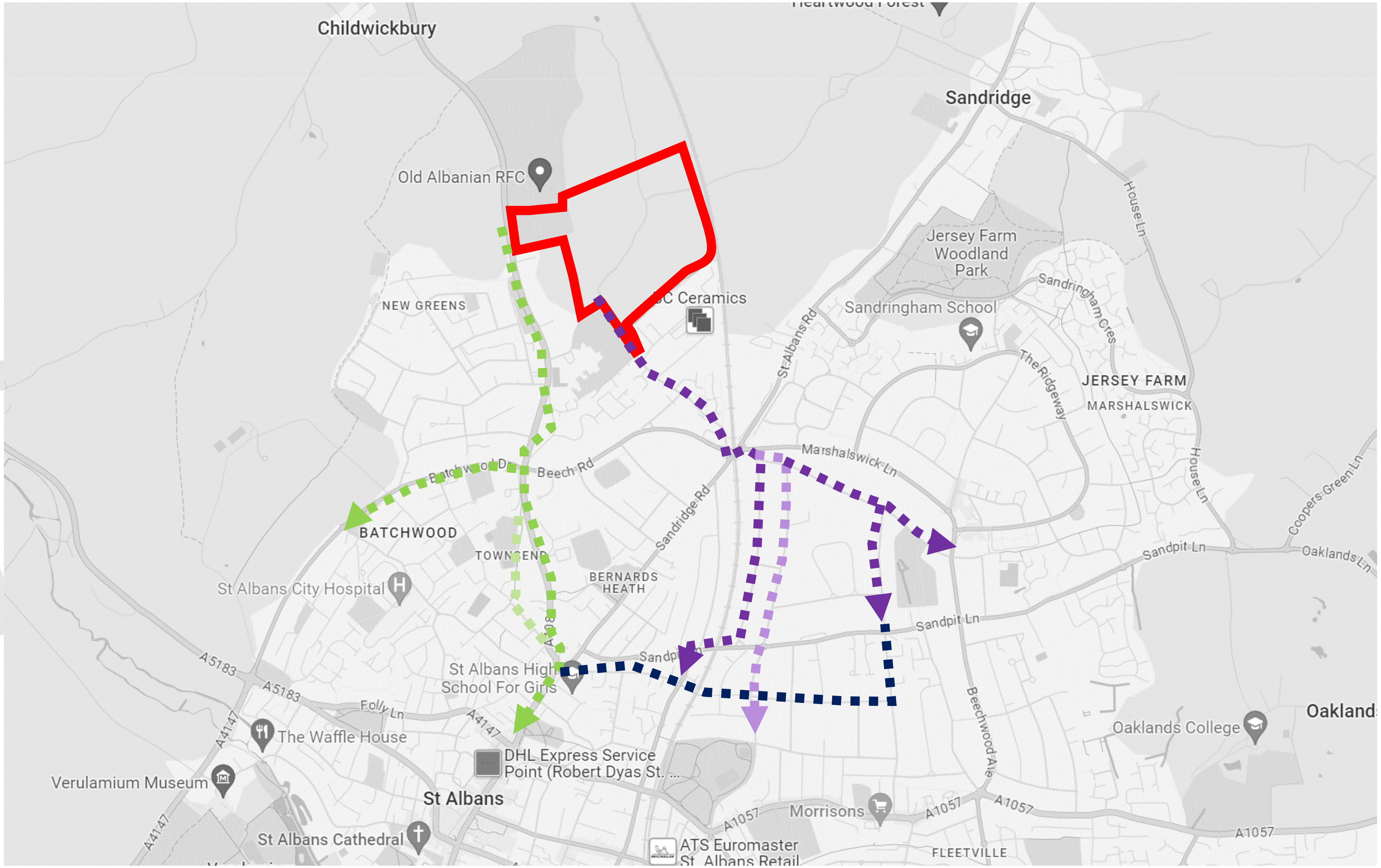
Sandridgebury Lane







Proposed Off-site Active Travel Connectivity



R#1

Harpenden/Batchwood Dr/Beech Rd junction

Scheme to tie into committed uni-directional tracks

Proposed upgrading to provide segregation subject to land ownership. Nonetheless, the existing path would benefit from additional width to achieve a uniform 3m-min width.

Incorporate surfacing, lighting, and wayfinding improvements. Potential to link with sport facilities on western side and enhance the route's function by investigating potential to provide benches, PE equipment, parklets, etc in 'pouches' along the trail. Small interventions like those will increase activity levels and natural surveillance.

Opportunities to introduce traffic calming measures such as sinusoidal speed humps and traffic chicanes w/cycle bypass to support on-road cycling.

Subject to vehicle tracking, remove chevron markings and widen footway to provide a 3m-wide shared use facilities on south side (tbc)

Harpenden/Stonecross/St Peters junction

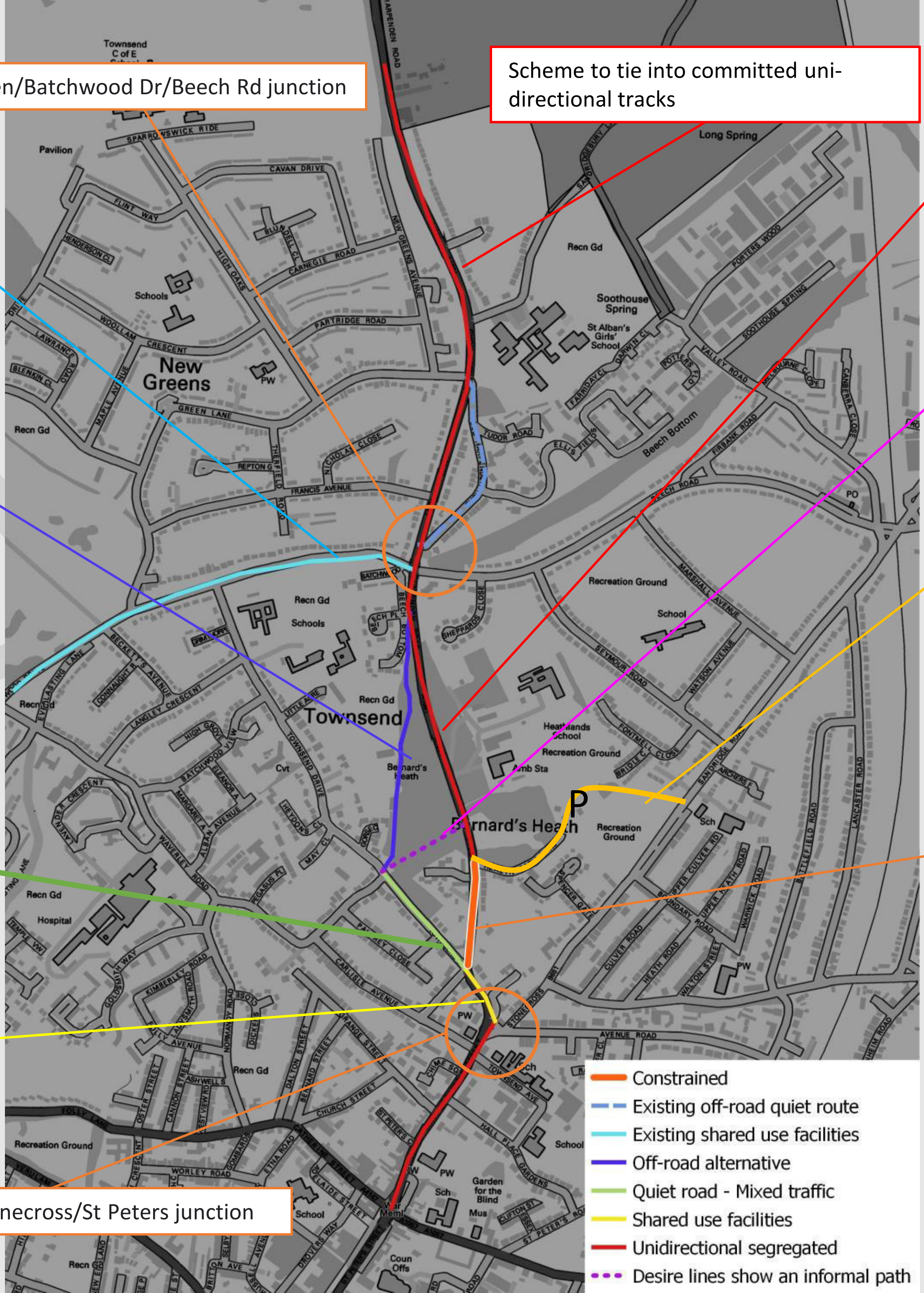
Corridor very constrained – Unlikely that Unidirectional track south of Beech Rd and north of Heath Farm Ln could be accommodated. Cross sections to follow.

Investigate feasibility to formalise a shared use facilities and provide a cut-through to avoid off-road section

Potential to Investigate further feasibility to link route to Green Ring via Heath Farm Lane

South of Heath Farm Lane constrained. Little scope to provide segregation in the form of shared use facilties. Cycling in mixed traffic not feasible (A-road with AADT~8500)

Segregated cycle infrastructure not possible without fundamental traffic management measures.



R#1

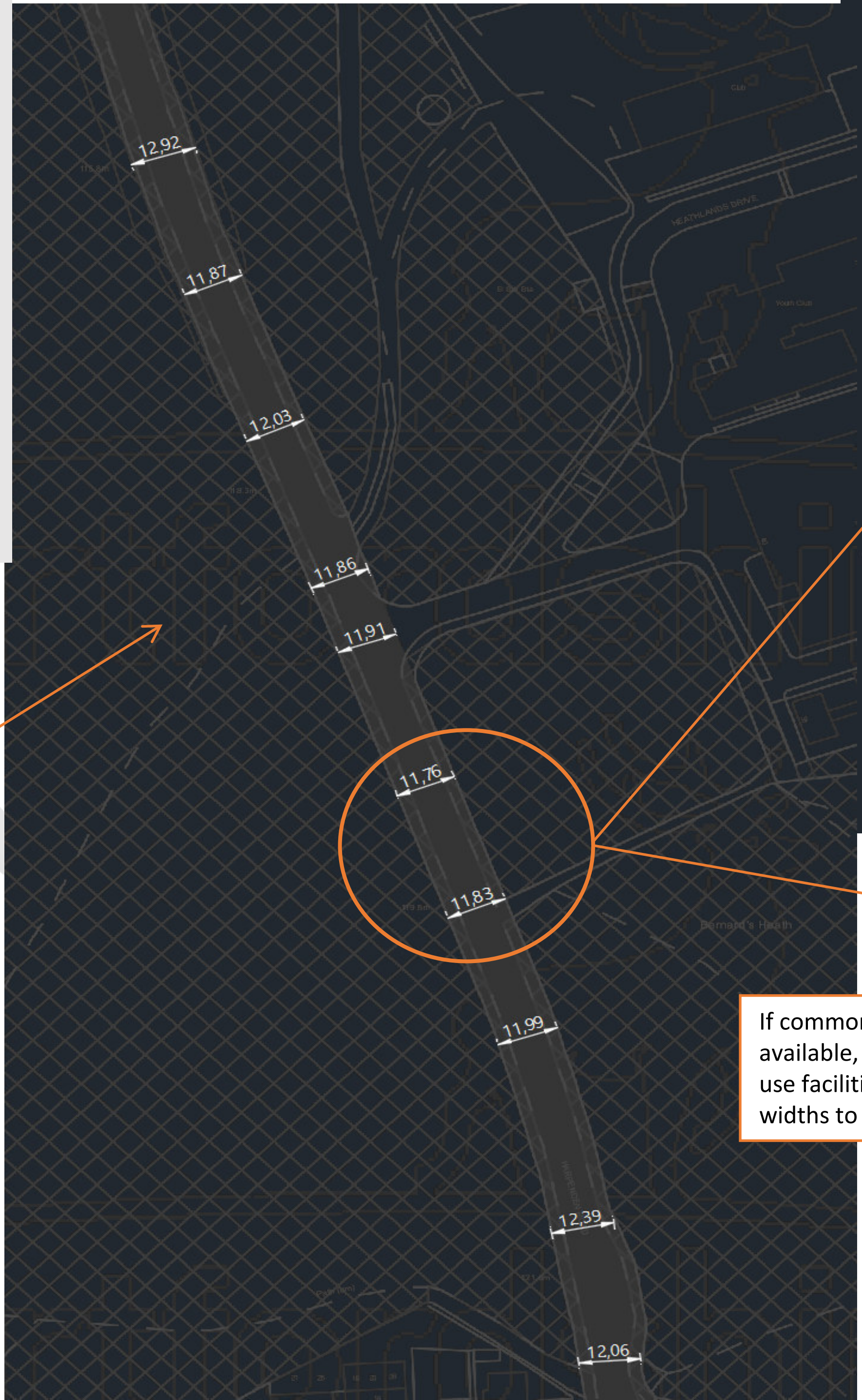
- Constrained Section

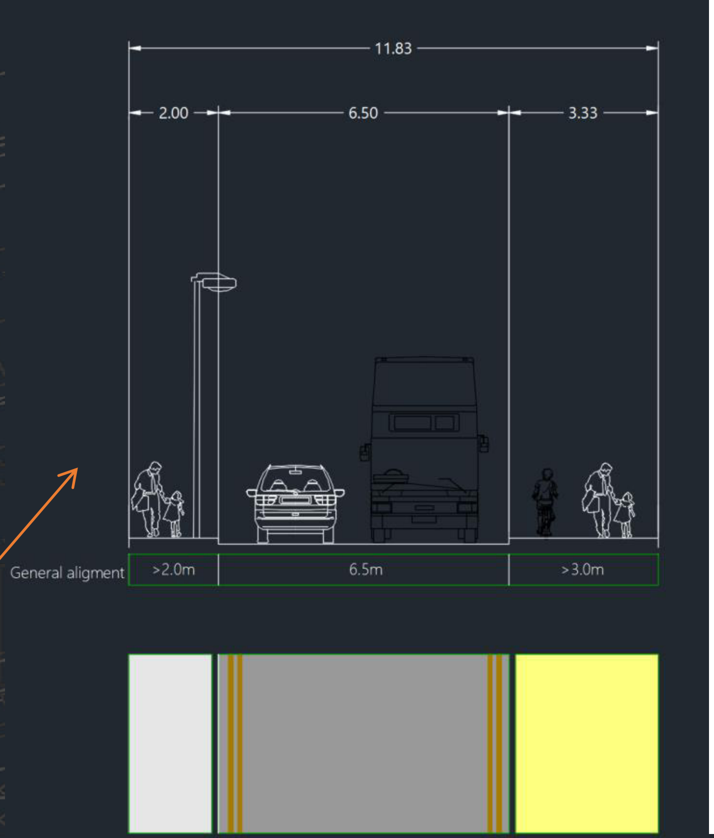
Batchwood Dr/Beech Rd - Heath Farm Lane (North of)

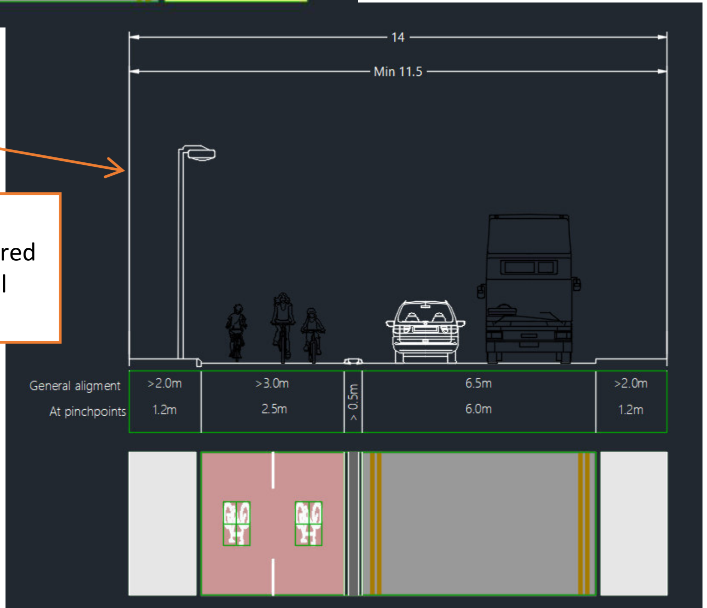
- Cross-section

Harpenden Rd

Corridor very constrained – Unlikely that Unidirectional track south of Beech Rd and north of Heath Farm Ln could be accommodated unless common land (cross-hatched area) is used







If common land (cross-hatched area) not available, it will be only possible to fit shared use facilities or two-way track reducing all widths to absolute minimums.

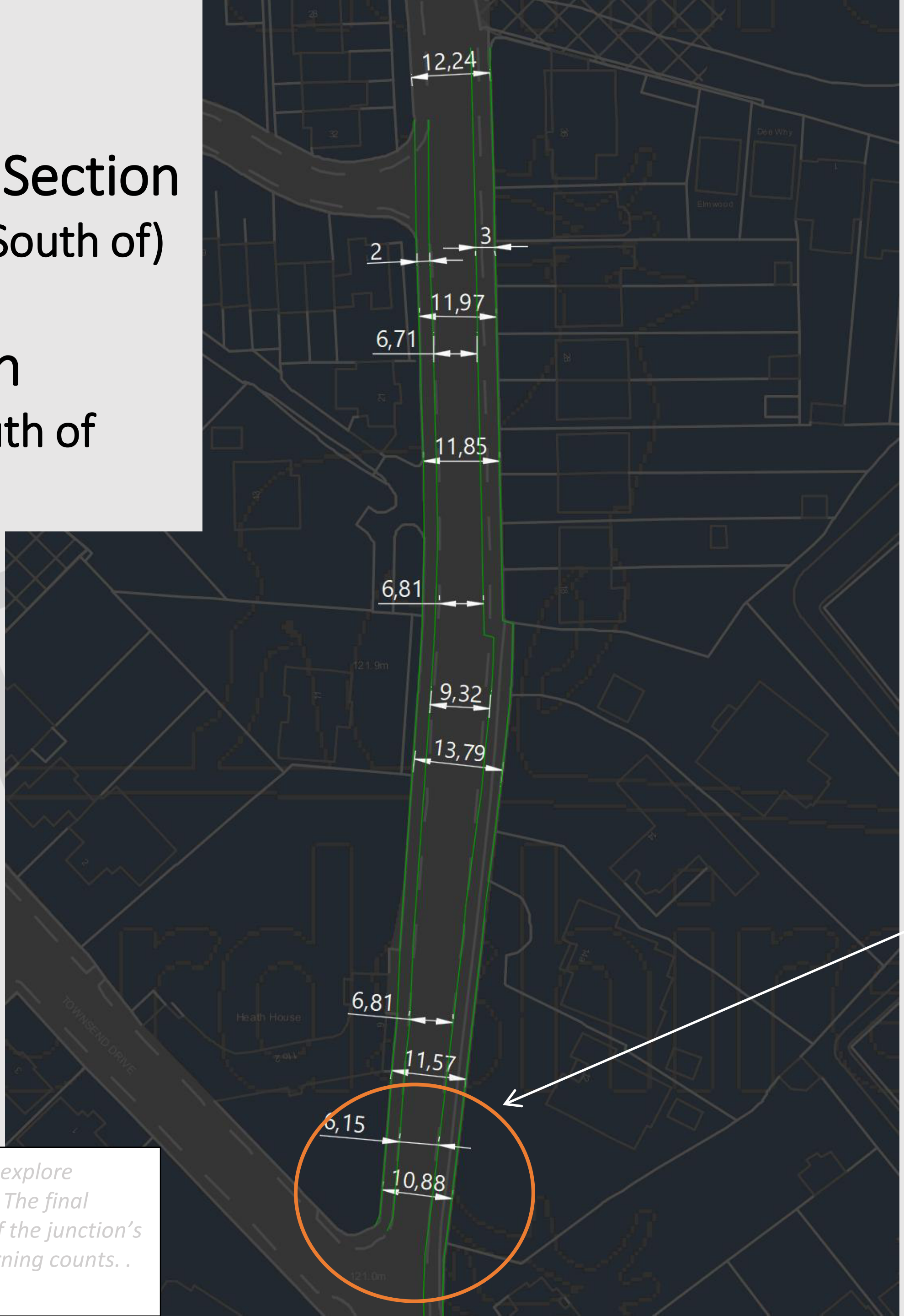
R#1

- **Constrained Section**

Heath Farm Lane (South of) – Townsend Drive

- **Cross-section**

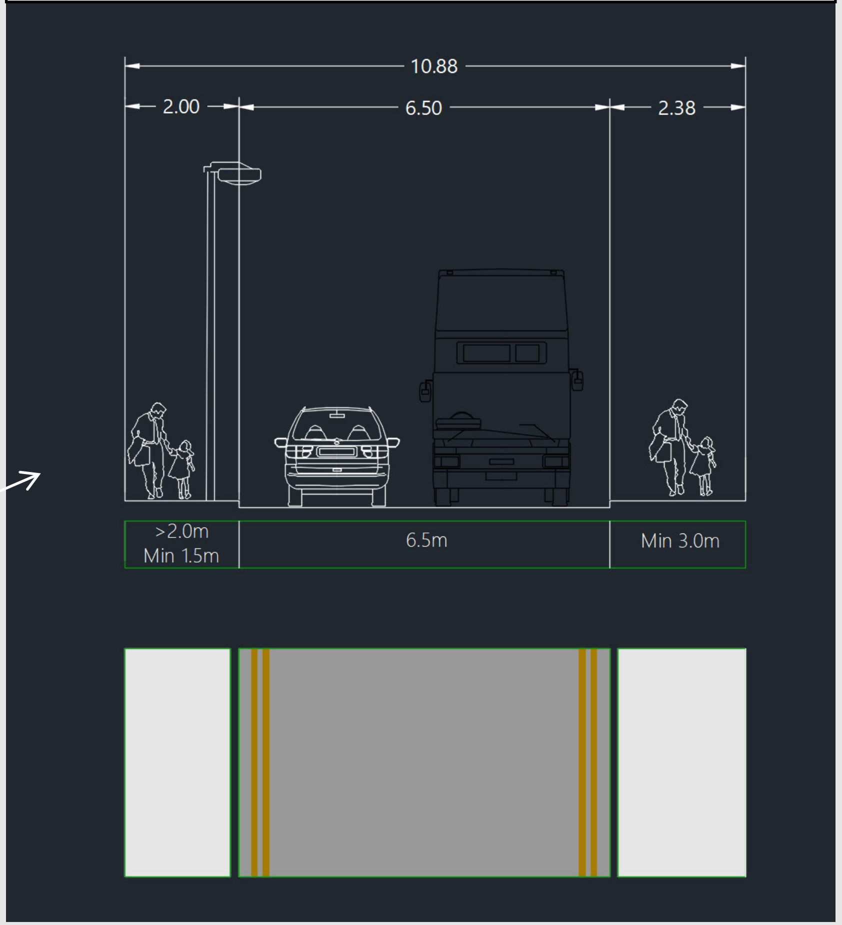
Harpenden Rd, south of Heath Farm Lane



Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. . All options need further refinement.

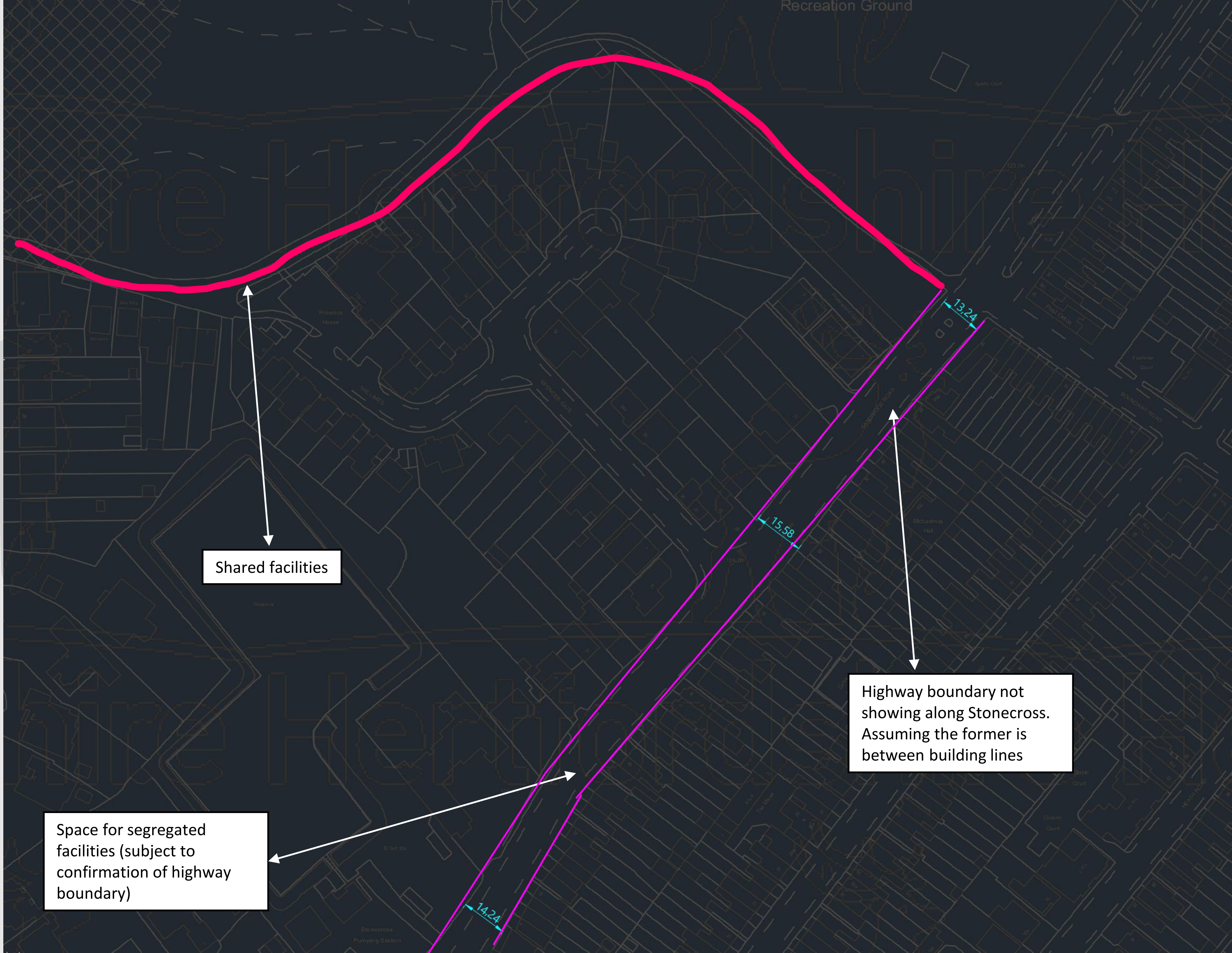
South of Heath Farm Lane constrained. Little scope to provide segregation in the form of minimum shared use facilities → substandard infra.
Towards Townsend Dr, the road narrows with no space to provide cycle facilities along link nor at junction, where road danger is more pertinent. Lack of protected infra at junction is key to provide coherence and continuity to the route.
Cycling in mixed traffic not feasible (A-road with buses and AADT~8500)

Cycle provision on the approach to the junction not feasible even if footways are reduced to pinch point widths (1.5m)
Cycling in mixed traffic not feasible (A-road with buses and AADT~8500)



R#1

- Alternative alignment via Heath Farm Lane and Stonecross Rd



Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. . All options need further refinement.

R#1

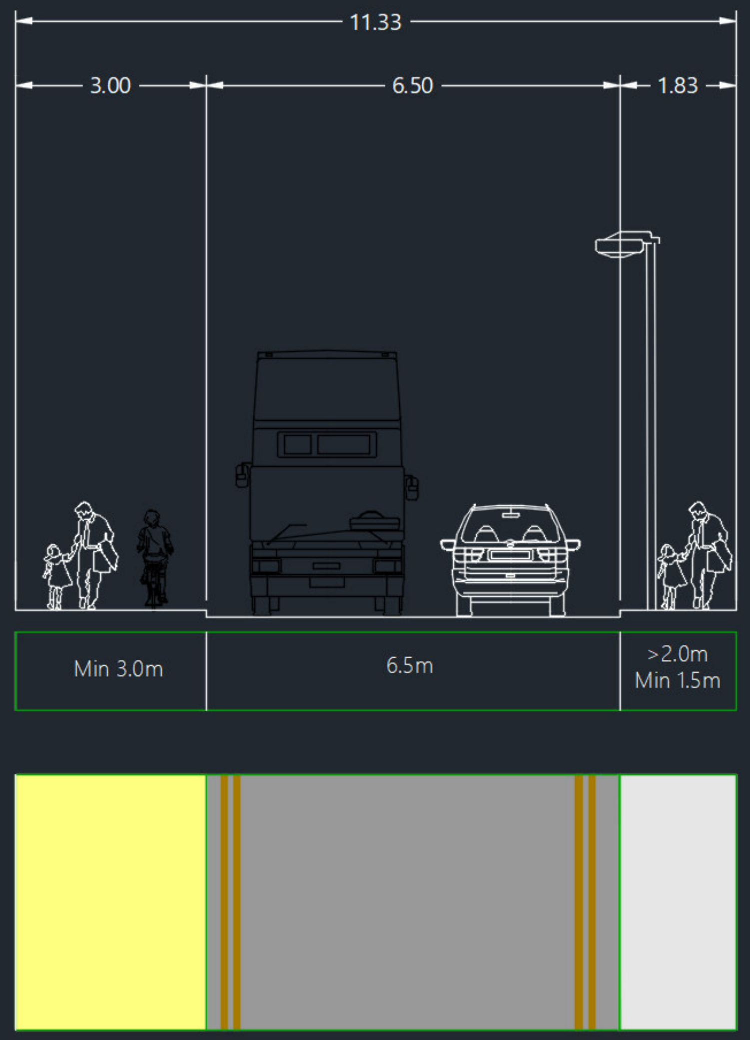
- Shared use facilities

Harpenden/Stonecross/St Peters Junction

- Cross-section

Harpenden Rd, north of Harpenden/Stonecross/St Peters Junction

Remove chevron markings and widen footway to provide a 3m-wide shared use shared use faculties.
If shared use facilities located on south side, will facilitate link with infra on St Peter's + would link with Townsend quiet road → TBC.
Introduce traffic calming measures to reduce speeds of motorised vehicles along bend.

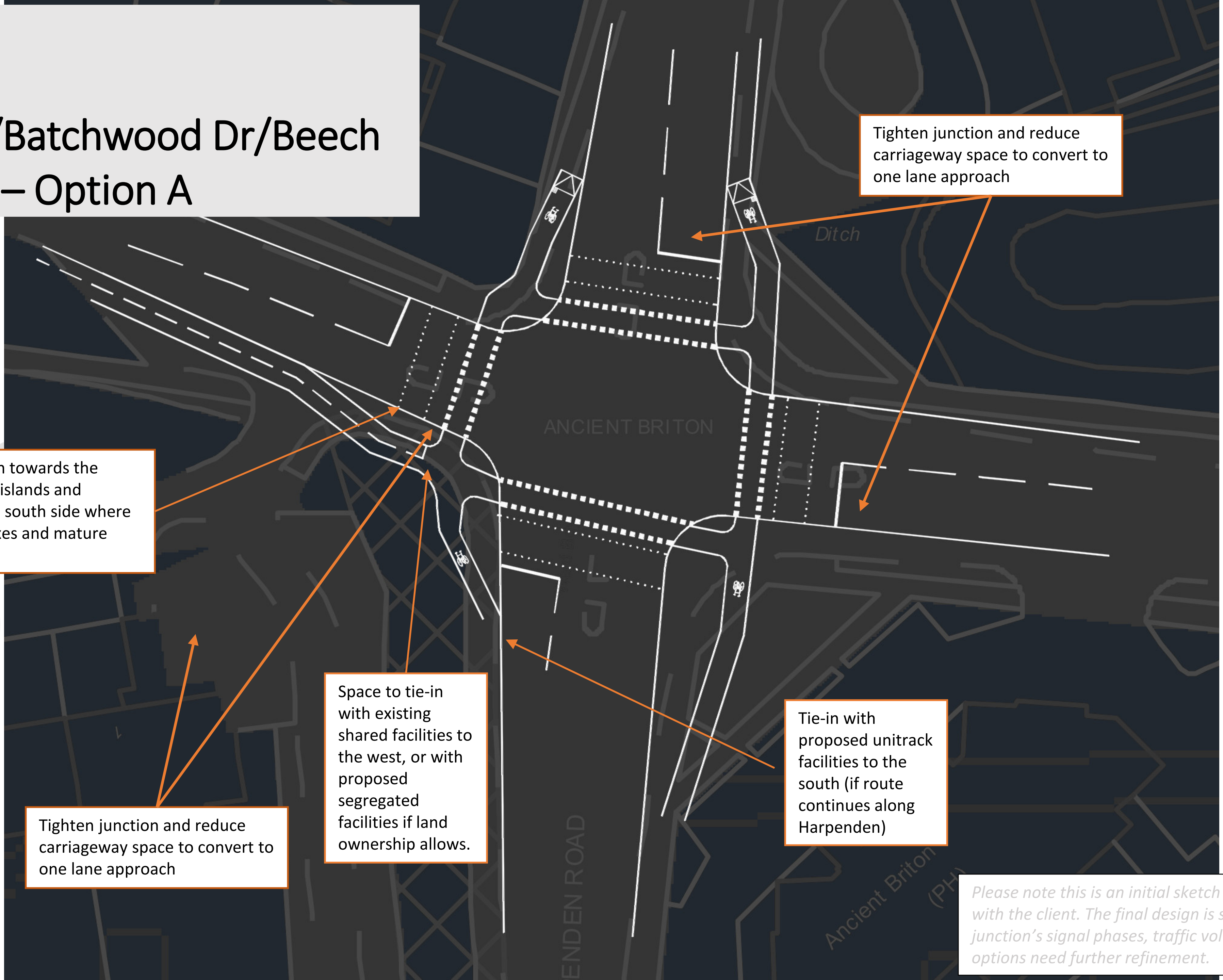


Shared space

Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. . All options need further refinement.

R#1

Harpenden/Batchwood Dr/Beech Rd Junction – Option A



Tighten junction and reduce carriageway space to convert to one lane approach

Potential to shift junction towards the North, removing central islands and providing more space on south side where currently are control boxes and mature trees

Space to tie-in with existing shared facilities to the west, or with proposed segregated facilities if land ownership allows.

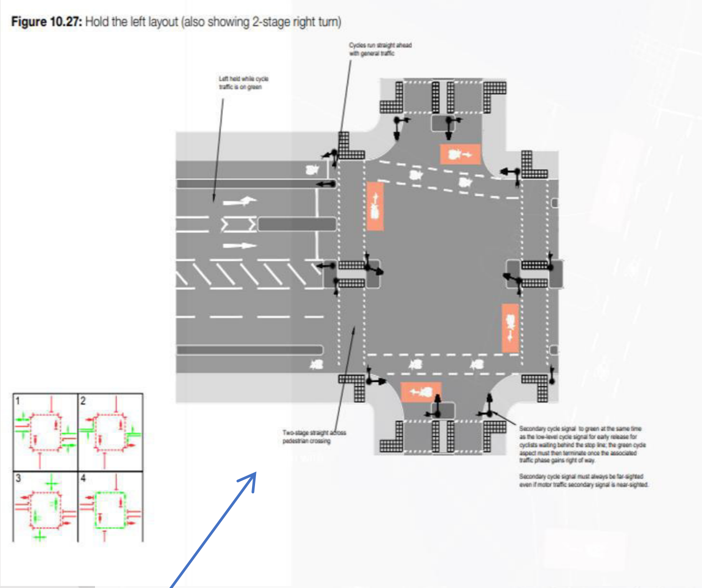
Tie-in with proposed unitrack facilities to the south (if route continues along Harpenden)

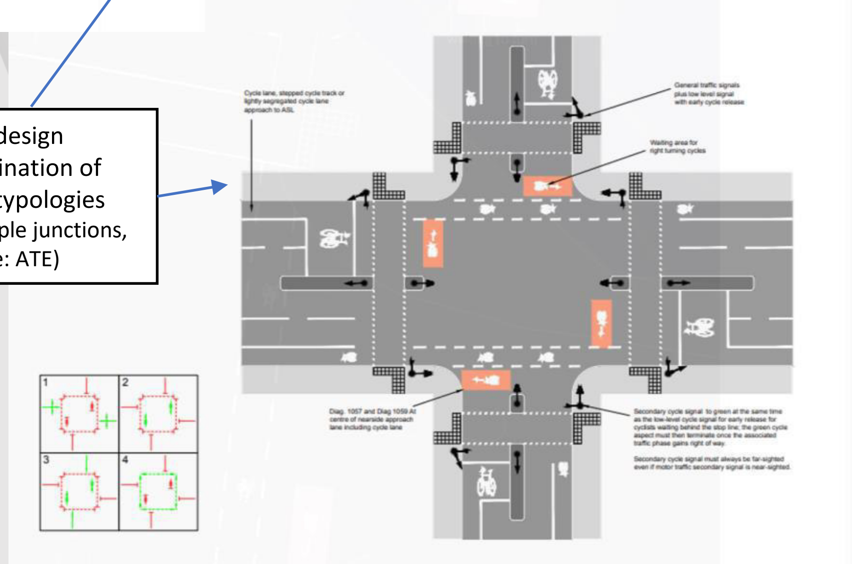
Tighten junction and reduce carriageway space to convert to one lane approach

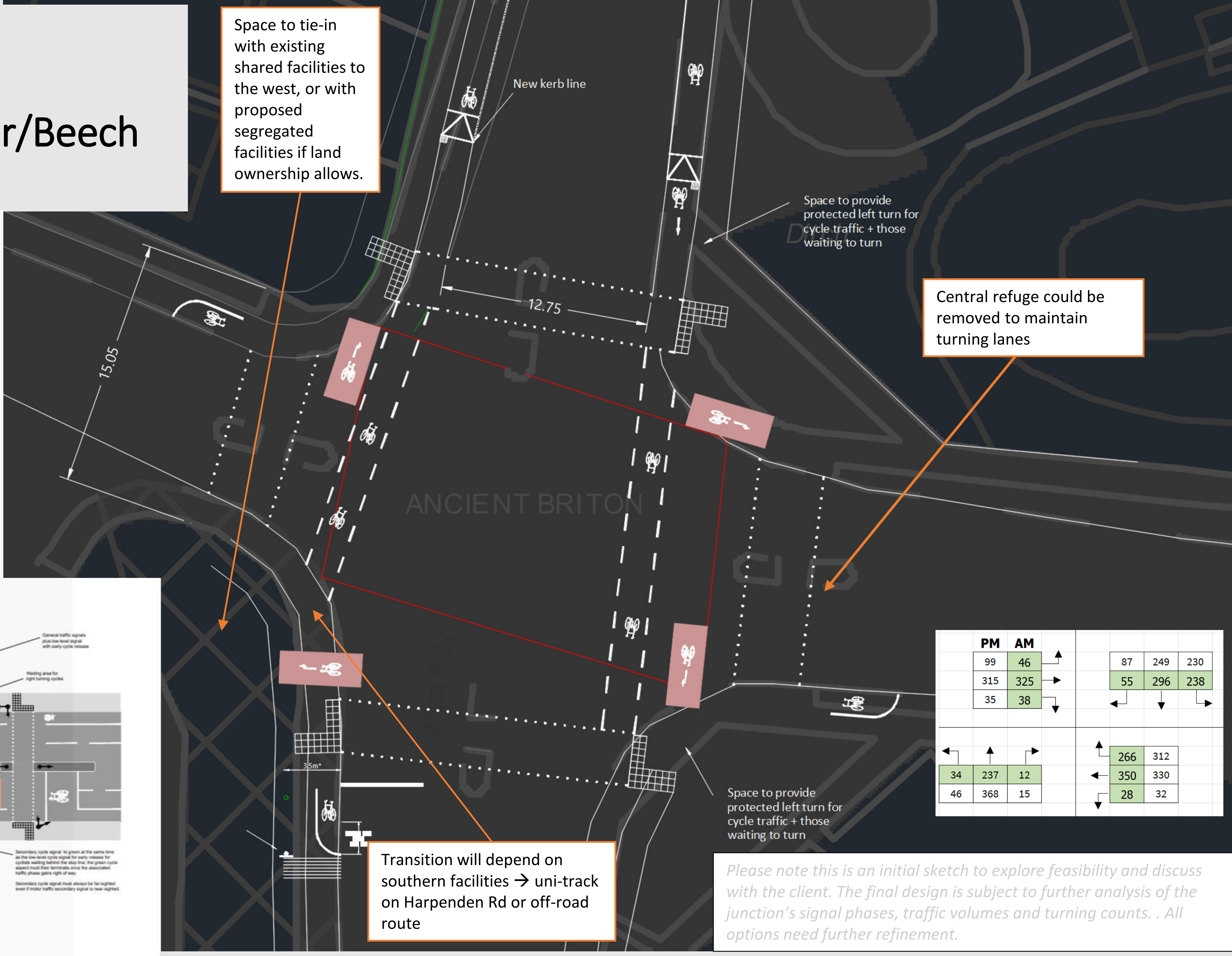
Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. All options need further refinement.

R#1

Harpenden/Batchwood Dr/Beech Rd Junction – Option B







Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. . All options need further refinement.

R#1

Harpenden/Stonecross/St Peters Junction

Shared use facilities

Unidirectional track on St Peter's Road

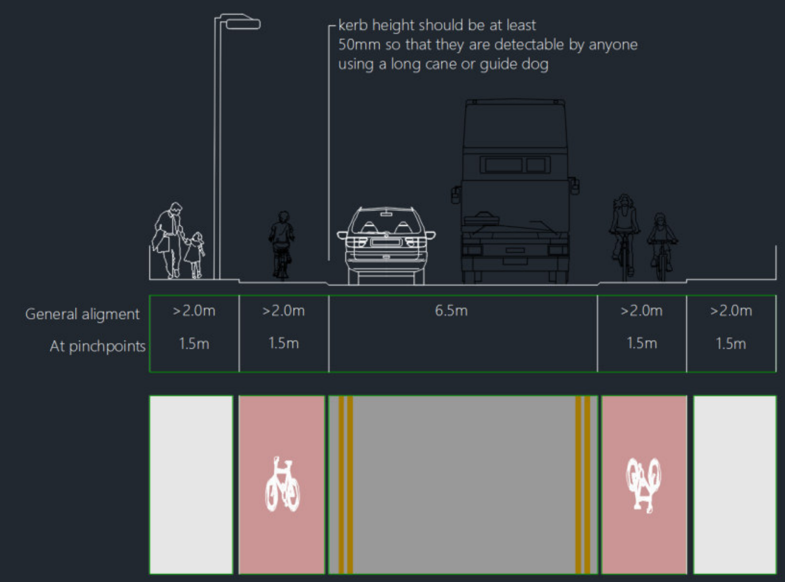
Relocate crossing and upgrade to toucan

Shared use facilities to link with unidirectional cycle track

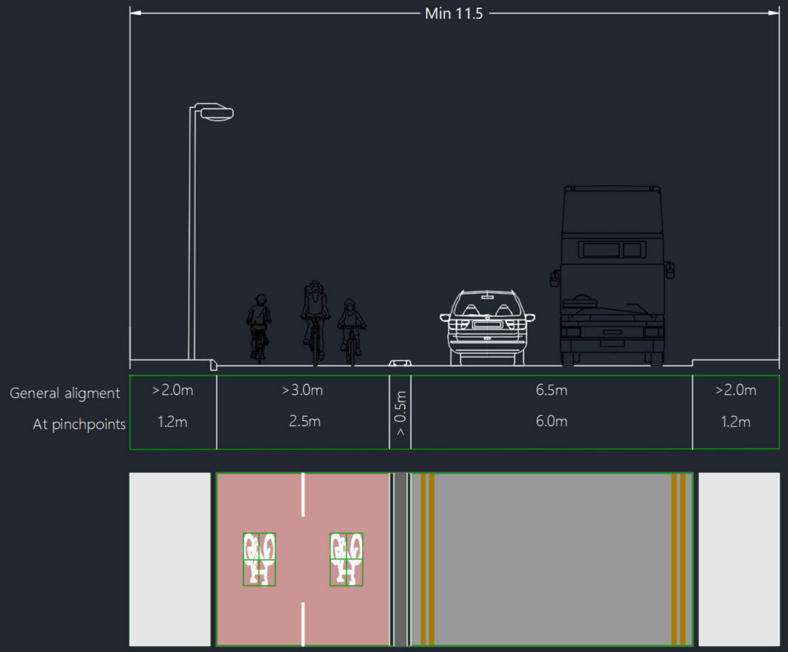
Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. . All options need further refinement.

R#1

St Peters Street

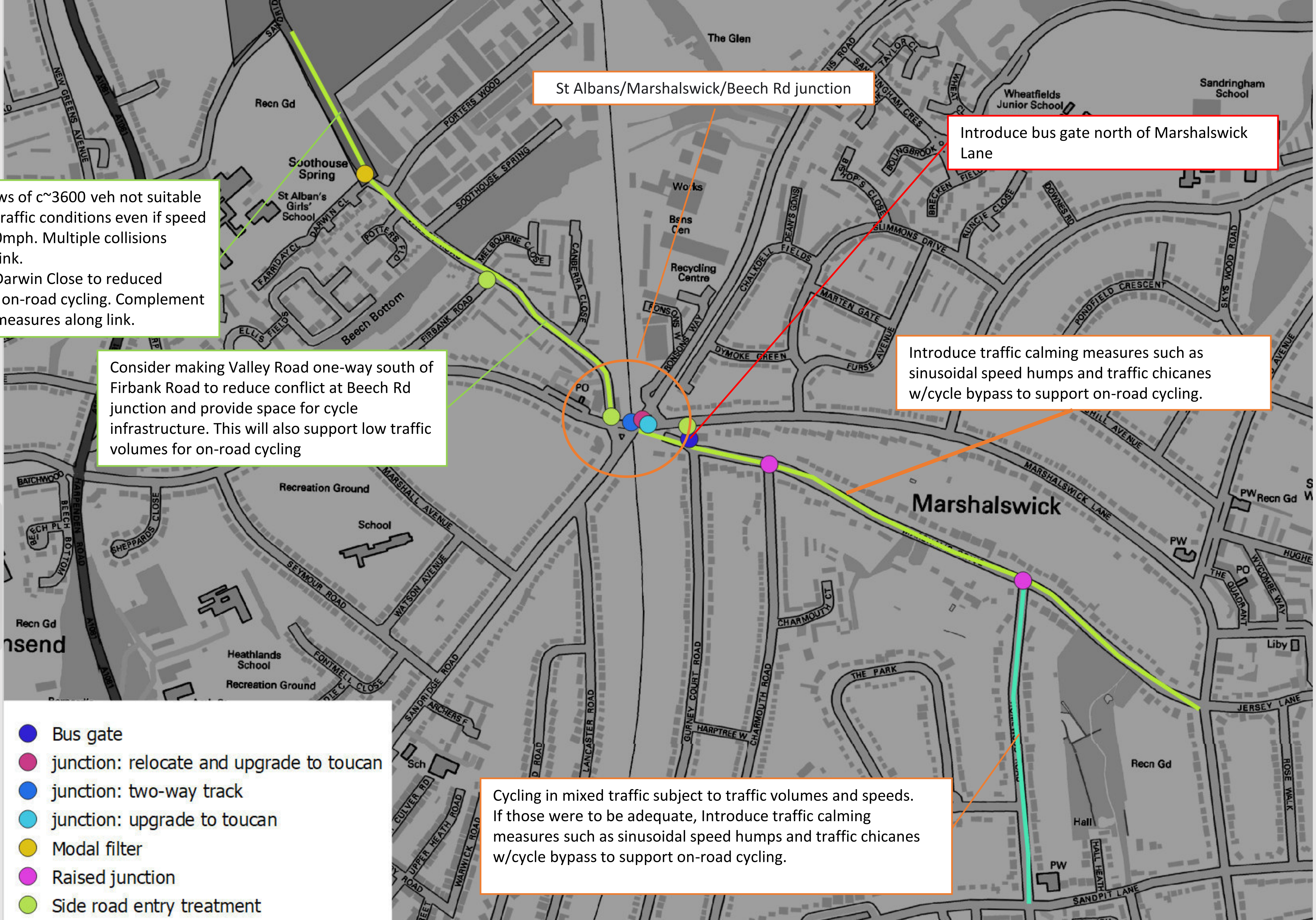


Stepped cycle track



Two-way segregated cycle track

R#2



St Albans/Marshalswick/Beech Rd junction

Introduce bus gate north of Marshalswick Lane

Valley Road daily flows of c~3600 veh not suitable for cycling in mixed traffic conditions even if speed limit is lowered to 20mph. Multiple collisions recorded along this link.
Filter road south of Darwin Close to reduced traffic flows to allow on-road cycling. Complement with traffic calming measures along link.

Consider making Valley Road one-way south of Firbank Road to reduce conflict at Beech Rd junction and provide space for cycle infrastructure. This will also support low traffic volumes for on-road cycling

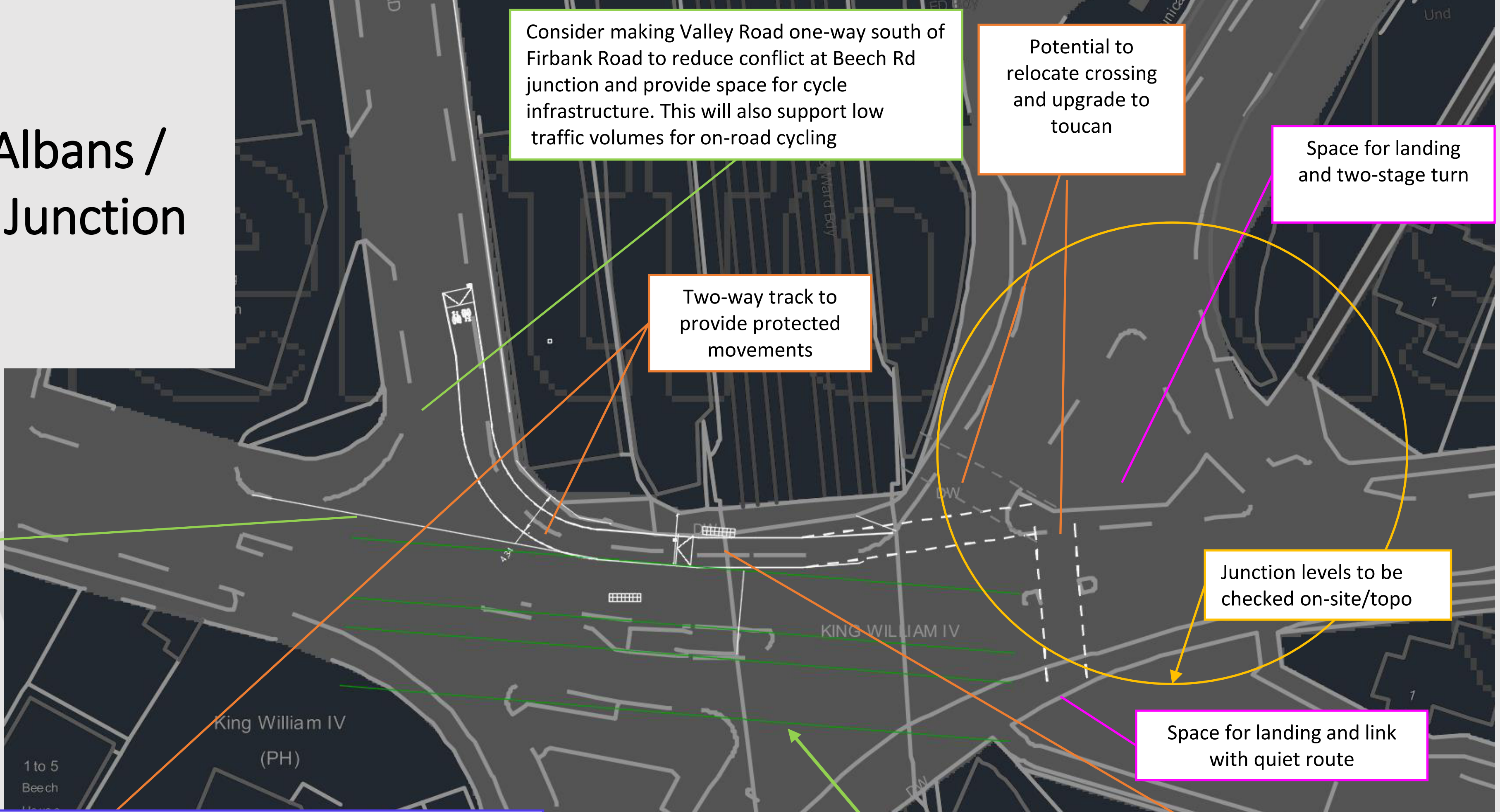
Introduce traffic calming measures such as sinusoidal speed humps and traffic chicanes w/cycle bypass to support on-road cycling.

Cycling in mixed traffic subject to traffic volumes and speeds. If those were to be adequate, Introduce traffic calming measures such as sinusoidal speed humps and traffic chicanes w/cycle bypass to support on-road cycling.

- Bus gate
- junction: relocate and upgrade to toucan
- junction: two-way track
- junction: upgrade to toucan
- Modal filter
- Raised junction
- Side road entry treatment

R#2

Beech Rd/ St Albans / Marshalswick Junction Option A



Example Ideal Cross-Section with Two-Way Cycle Track (Kerb Protected)

Source: ATE cross-section check. Visualisations prepared by Mott MacDonald Group

Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. . All options need further refinement.

R#2

Beech Rd/ St Albans / Marshalswick Junction Option B

Consider making Valley Road one-way south of Firbank Road to reduce conflict at Beech Rd junction and provide space for cycle infrastructure. This will also support low traffic volumes for on-road cycling

Two-way track to provide protected movements

Large distance for pedestrians to cross in a single stage. Ped crossing will have to be relocated

Side road entry treatment on Valley Rd to reduce speeds of turning vehicles

Space for landing and link with quiet route

Ped crossing to be relocated and ped island removed

Kerb lines to be reconfigured to provide space for two-way track and to allow retaining existing traffic lane widths. If ped crossing relocated, island width could be reduced.

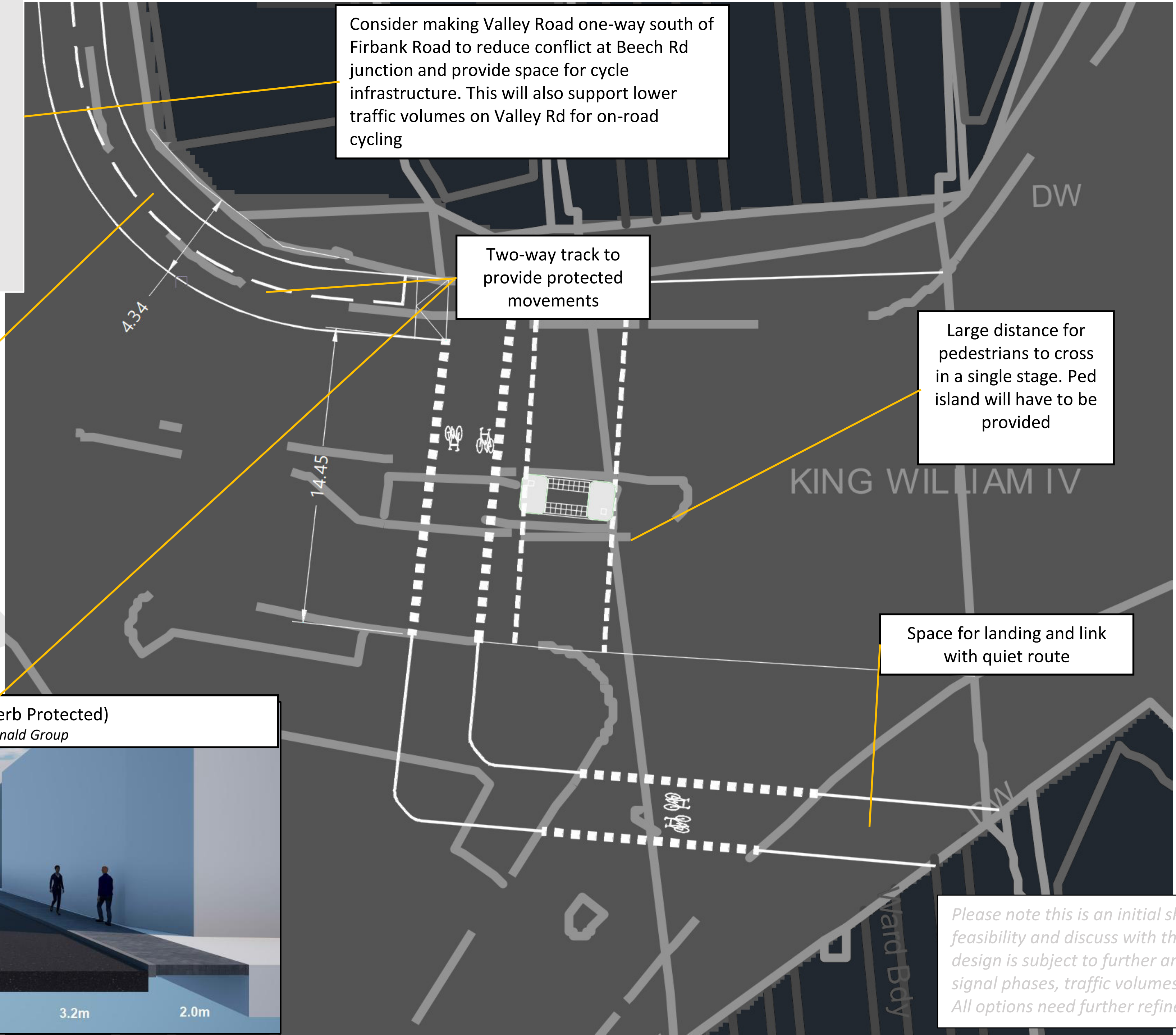
Example Ideal Cross-Section with Two-Way Cycle Track (Kerb Protected)

Source: ATE cross-section check. Visualisations prepared by Mott MacDonald Group

Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. . All options need further refinement.

R#2

Beech Rd/ St Albans / Marshalswick Junction Option C

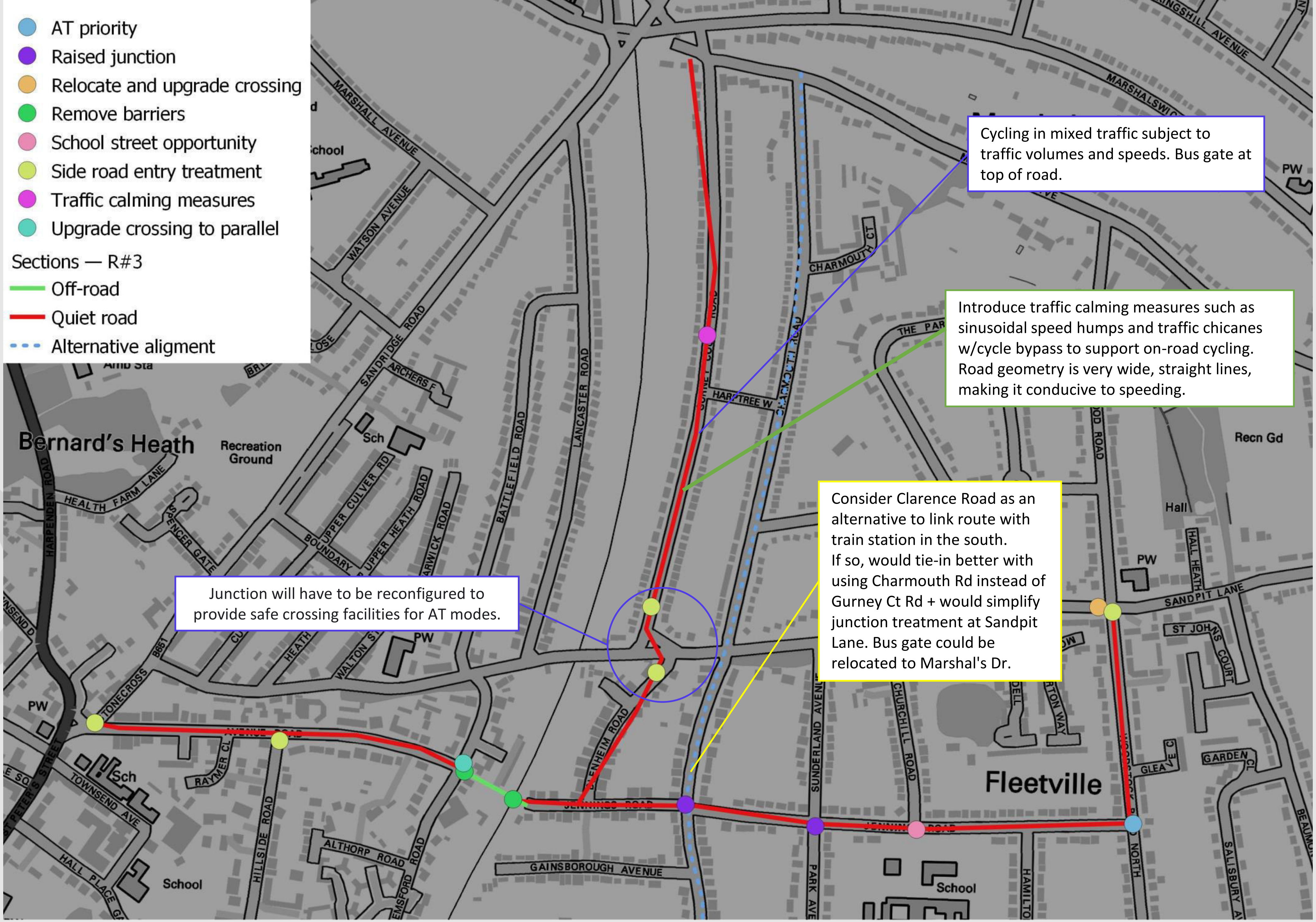


Example Ideal Cross-Section with Two-Way Cycle Track (Kerb Protected)

Source: ATE cross-section check. Visualisations prepared by Mott MacDonald Group

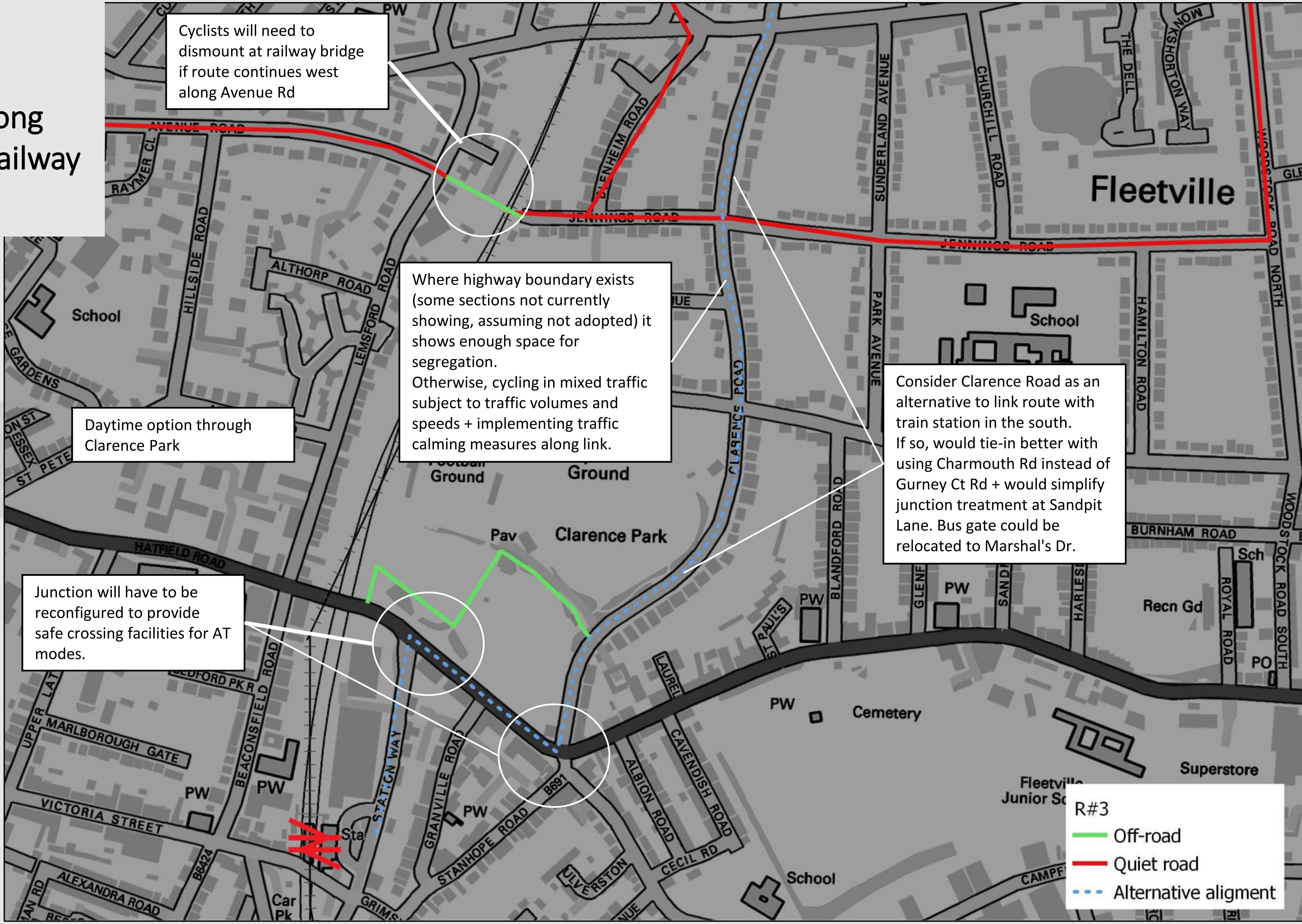
Please note this is an initial sketch to explore feasibility and discuss with the client. The final design is subject to further analysis of the junction's signal phases, traffic volumes and turning counts. . All options need further refinement.

R#3


AT priority
Raised junction
Relocate and upgrade crossing
Remove barriers
School street opportunity
Side road entry treatment
Traffic calming measures
Upgrade crossing to parallel
Sections — R#3
Off-road
Quiet road
Alternative aligment
Cycling in mixed traffic subject to traffic volumes and speeds. Bus gate at top of road.
Introduce traffic calming measures such as sinusoidal speed humps and traffic chicanes w/cycle bypass to support on-road cycling. Road geometry is very wide, straight lines, making it conducive to speeding.
Consider Clarence Road as an alternative to link route with train station in the south.
If so, would tie-in better with using Charmouth Rd instead of Gurney Ct Rd + would simplify junction treatment at Sandpit Lane. Bus gate could be relocated to Marshal's Dr.
Junction will have to be reconfigured to provide safe crossing facilities for AT modes.
Bernard's Heath
Recreation Ground
Fleetville
Recn Gd
Hall
School
Sch
PW
MARSHALL AVENUE
WATSON AVENUE
SANDRIDGE ROAD
CHARMOUTH CT
SANDPIT LANE
ST JOHNS COURT
BATTLEFIELD ROAD
LANCASTER ROAD
UPPER CULVER RD
UPPER HEATH ROAD
HEALTH FARM LANE
SPENCER GATE
BOUNDARY
HARPENDEN ROAD
TOWNSEND AVE
RAYMER CL
HILLSIDE ROAD
ALTHORP ROAD
GAINSBOROUGH AVENUE
SUNDERLAND AVENUE
CHURCHILL ROAD
PARK AVE
GARDEN CL
SALISBURY AV
HALL HEATH
MARSHALSWICK
KINGSHILL AVENUE
ARCHERS
HARPTREE W
THE PAR

R#3

Alternative alignment along Clarence Rd, linking to Railway Station



Meeting Note

Meeting Details			
Project Title:	Woollam Park, North St Albans	**Date:**	24/11/2023
Project No.:	05920	**Time:**	11:30
Subject:	Active Travel Design	**Venue:**	MS Teams
Present:	Matt McFeat, PJA (MM) Lianne Baker-Brook, PJA (LBB) Lucy Briggs, PJA (LB) Lucia Perez-Ezquerro, PJA (LPE) Jack Martin-King, HLM (JMK) Abi Hawke, LRM (AH) James Bavin, Define (JB) Ania Jakacka, HCC (AJ) Anthony Collier, HCC (AC) Emma Turner, HCC (ET) James Dale, HCC (JD) Martyn Crawford, HCC (MC)		
Apologies:	Kay Nicholls, PJA (KN)		

Matters Arising		Action
1	MM discusses agenda items for internal site principles, including primary multi-modal access to Harpenden Road and numerous external active travel connections. Outlines the primary on-site route from Harpenden Road towards the local centre and then links to Sandridgebury Lane and Valley Road. Modal filters are proposed to restrict vehicular traffic to the external highway network on Valley Road in line with LCWIP and potentially also at two location on Sandridgebury Lane to minimise or eliminate rat-running. A new traffic-free link will route north, parallel to the railway, linking into the existing bridleway and towards the Heartwood Forest. Active travel connections will also link Woollam Park with the consented Hunston Properties site, allowing for east-west permeability across the site and onwards towards facilities and services in the New Greens area. Within the site, facilities will be LTN1/20 compliant and MM shared the initial designs for the main entrance junction on Harpenden Road, and the emerging primary and secondary street types for the site which demonstrate how active travel provision will respond to the differing levels of traffic on the streets within the site.	
2	MM talks through the site access proposals onto Harpenden Road, via a signalised T-junction, which incorporates a segregated active travel route on the western side of Harpenden Road which will connect down to the Hunston Proposals. He went on to share	

Matters Arising		Action
	additional proposals associated with the external highway interfaces around the site including: a turning loop as Sandridgebury Lane (for STAGS traffic and local residents) is proposed to be stopped up to through vehicular traffic; the potential introduction of a modal filter on Sandridgebury Lane west of the railway bridge at the eastern site extent; and the form of the modal filter for Valley Road. MM states that the applicant would prefer to close the route between Harpenden Road and Sandridgebury Lane to through traffic at some point through the development, but this would be reliant on a TRO which might be outside the developers control. MM Suggests that this could remain open at first, monitored during the site's operational phase and closed to through traffic in future if signs of rat-running are seen.	
3	LBB discusses off-site overview and key points related to the agenda item. She begins by recapping work completed to date to establish new active travel routes from Woollam Park.	
4	LBB talks through the challenges associated with the constrained corridor width along A1081 Harpenden Road and how at specific sections, including an area with a pinch point of 10.8m, it would not be feasible to deliver compliant active travel provision. LBB explained that due to these constraints it may be necessary to consider alternative routes along some sections of Harpenden Road, and we are currently exploring how we can resolve. LPE noted that value of the entire route could be compromised by missing sections or sections with very poor quality provision.	
5	Alternative routes to Harpenden Road were discussed, including the use of an improved route wooded trail nr Townsend Drive and connecting to St Albans Green Ring/locally created desired routes. LBB suggests that wooded trail currently has challenges with natural surveillance, but that improvements could be made to this with parklets, connection to nearby sports facilities and increasing natural surveillance through increased walkability and improved environment for all to use. On the issue of natural surveillance it is important to recognise that the constrained section of Harpenden Road is also through a wooded area with very little natural surveillance so we should not overstate the impact of slightly less direct route in this regards. Also considered whether Sandridge Road and the link to the north of Heath Farm Lane might allow the most constrained sections of the route to be avoided. Sandridge Road is considered challenging due to residential parking demand on-street.	

Matters Arising		Action
6	Looking at the stretch of Harpenden Road south east of Townsend Drive LPE suggests that the central hatch markings could be removed and reallocated to active travel but caveats this by noting the curvature in Harpenden Road and the need to accommodate swept paths of larger vehicles.	
7	LBB and LPE discussed initial options for Batchwood Drive/Beech Road junction (Ancient Briton). Option A – protected segregated provision for cyclists across all arms. LPE notes traffic flows showing a high level of right turners on some arms, and that the introduction of a fully protected layout would have capacity reduction implications. This layout may require use of common land which sits to the south west of the junction. Option B – cyclists accommodated on carriageway with two-stage right turns introduced with right turn pockets for cyclists, broadly aligned with Hunston development proposals. MC asks how many turning lanes there will be at Ancient Briton Junction, LPE explains that as shown in the concept plans one lane in all directions in Option A and broadly the same as the existing approach lanes in Option B. MC questioned how many lanes are needed on the north- and south-bound approaches on Harpenden Road and the width of those lanes. LPE explains lane numbers remain the same in Option B, but would be reduced to a single lane entry on all approaches in Option A. MC comments that removing the splitter islands to create space for both pedestrians and cyclists should be considered as the current initial option A does not show space for pedestrians on the north west corner, and the active travel provision is being squeezed too much by trying to stick to existing lanes widths. Needs an understanding of swept path requirements to understand opportunities to squeeze the road space. MC would prefer if existing lanes were altered to create more space for active travel, even if this reduces highway space. LBB noted that the initial concepts had been developed with a view to maintaining existing kerb lines where possible as this can significantly improve buildability. MM notes that the junction is already at capacity, and it is therefore not really a question of how many lanes are needed on each approach, as the answer is likely to be more than there already are. There is going to have to be a trade-off between vehicular capacity and active travel provision, and that it is important to remember that this junction also accommodates public transport services so impacts on capacity and delay need to be balanced so that buses aren't held up too much in general traffic. MC is happy with the form of the junction design as an inverted cyclops.	

Matters Arising		Action
8	AC discusses mitigation and has previously found success in other options with moving just one kerb line to reduce cost/risk. AC notes proposals at top end of Harpenden Road, wants to ensure infrastructure is extended to Old Albanians sports ground. MM mentions that there will be a shared route connecting from the site access providing access to the wider network via a crossing over Harpenden Road on the north side of the junction. Access junction allows for onward provision of active travel infrastructure to Harpenden by HCC as per LCWIP. AC/MC discusses wanting to keep modes separated where we can. But if not sufficient space, go for shared use. HCC happy to be flexible with regard to widths at pinch points. AC raises widths shown in Hunston proposals for Harpenden Road, look at constraints imposed by trees as this has led to significant design issues when getting into the detail. LBB discusses that proposals are draft and agrees on point about absolute minimums. AC mentions going below 6.5m in some areas but still need space for vehicles to pass. LBB asks for HCC to confirm the absolute minimums they may be willing to accept in certain situations 6.25m, 6.0, less? What is impact of being a bus route?	AC (HCC) to provide absolute minimums for design elements.
9	Harpenden Road/Stonecross/St Peters Junction options discussed, which are likely to incorporate shared provision on the west side of the A1081 which could then transition to either a uni-directional or bi-directional segregated facility to the south. It was noted that there is a significant amount of space at this junction which could allow for a more holistic improvement to the public realm and simplification of the junction, but this was outside of our remit. Side road entry treatment on Avenue Road if this remains part of the quiet street route to the station. LBB discusses St Peters Street, pinch point 11.25m. Western side of carriageway, space to put in minimum separated use path, and not too many access or parking constraints. Absolute minimum for the uni-directional track – pushing footways down to 1.5m footway (ideally 2m) with 1.5m track on each side of the road (=3m), +6m carriageway. Bi-directional path could be narrower (2.5m) than two uni-directional paths. LBB discusses the extent of our work which concludes to the north of Catherine Street currently and notes that there would need to be cycle parking at the end of the route, until extension of route comes forward, on the understanding that the LCWIP proposes that this route continues through the town centre ET asks for clarity on end of route, LBB would prefer to transition from segregated facility onto quiet route within the town centre and asks for recommendation on locations or routes. Any clarity on direction of travel within the LCWIP grey zone would be appreciated.	ET provide comment / options on ending of route preference.

Matters Arising		Action
	ET asks for clarity on switching between bi/unidirectional routes, due to constraints on widths. LBB notes that it is not the intention to switch back and forth, but the provision which can be accommodated at pinch points might need to guide the type of provision elsewhere on the route. AC mentions that where routes stop there needs to be a planning story on this, link up to town centre and stations and how people can park their bike to proceed on foot. AC recognises that the current LCWIP is not particularly helpful in this regards as the City Centre is greyed out. AC says works are really positive and raises need to address things early in discussions to avoid issues later.	
10	LBB discusses Route 2 from Valley Road including modal filter and inclusion of bus gate on northern end of Gurney Court Road as per LCWIP. At the King William Junction, high-level sketches have been produced showing what space is available and how we can work with signal staging to get cyclists across Beech Road from Valley Road. Cyclists can travel further than pedestrians in the same amount of time so proposals are likely to include separate provision. Again we need to balance the junction capacity against pedestrian and cyclist amenity, and we have been looking at scramble type options which would allow cyclists to be brought across in a more direct movement, possibly within an all red stage to go straight across? ET questions whether any proposals negatively effect other routes proposed in LCWIP. LBB explains as proposals develop, will consider how adjacent routes might be tied in.	
15	LBB discusses Route 3 for onward connections to the station and that PJA are looking at getting some more data to inform design requirements i.e. ATCs to see what the appropriate level of provision might be. Roads north of Sandpits Lane in this area, which might be used by riders heading south towards the station, are generally quieter than Harpenden Road and will be an attractive choice . MM notes that these roads are assumed to benefit from the LCWIP proposals for a northern modal filter at Gurney Court Road, which would help minimise infrastructure requirements for routes through this area. LPE asks whether there is potential for a cycling route through Clarence Park, even if this is only available while the park is open	

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Matters Arising		Action
16	MM asks for any details available for other active travel improvements going on in St Albans, so everything can be coordinated. MM notes that just seeing HCC standard plans in other parts of St. Albans or the authority area would be useful in understanding HCC design style and the approach to constraints. ET says nothing too close to routes proposed or site, but offers to provide designs for reference. Early stages of designs on Victoria Street for public transport, active travel improvements. These are primarily driven by bus improvement plan and the need to identify infrastructure within the greyed out areas of LCWIP.	ET to provide design drawings for all town centre proposals, at any stages.
17	Design criteria and flexibility discussed overall across proposals. Specifically around minimum design widths.	HCC to provide design criteria and level of flexibility across design requirements.
18	JD asks about the administration on pre-application engagement staging. JMK notes that Hallam are looking to start engagement with HCC on other areas, i.e. drainage etc. JD advises that a PPA best way to do this and is happy to speak to HCC colleagues higher up to get involved in discussions. JD recommends a PPA with SACDC as well. JMK is aware of their issues with capacity and notes that they are only providing written advice at present. JMK and JD to discuss and sort engagement.	JD to discuss with higher ups within HCC to open up further engagement for site and a PPA. JMK and JD to discuss separately on engagement.
19	JD asks about provision of information and on hatched common land. HCC looked at many times unsuccessfully. Thinking about Plan B to avoid land would be the best approach.	LBB to provide information on current thinking on proposals.

Distribution:	All at meeting and apologies.

Meeting Note

Meeting Details			
Project Title:	North St Albans	**Date:**	13/12/2023
Project No.:	05920	**Time:**	10:00
Subject:	Mobile Network Data Findings	**Venue:**	MS Teams
Present:	Matt McFeat (MM), PJA Kay Nicholls (KN), PJA Lucy Briggs (LB), PJA Jack Martin-King (JMK), HLM Abi Hawke (AH), LRM James Bavin (JB), Define Dan Tan (DT), HCC Gary Beaumont (GB), HCC James Dale (JD), HCC		
Apologies:	Anthony Collier (AC), HCC Beth Street (BS), PJA		

Matters Arising		Action
1	KN goes through the presentation prepared on the following; - Background - Use of BT Data – Discusses BT and PJA undertaking validation of data (against NTS and HCC data) and that BT has detailed the suppression rates. - Disaggregated zones from the previous iteration to provide more detail in London. - Time periods used. - MND findings to date.	PJA to provide presentation slides alongside minutes for reference.
2	GB mentions the availability of 2023 HCC data, including information about shorter trips.	
3	DT discusses the time periods used. KN states that data for all time periods has been used in the data presented. KN also mentioned that BT did their assessments to validate data before release to PJA.	
4	DT asks for information on the percentage of trips removed, rather than integers as HCC can use this more clearly to translate across other information they have. KN states that BT uplifted the data from their market share of the population to represent the general population. This is based on their detailed market share data which PJA do not have access to at the time of writing/cannot be provided due to privacy of data.	PJA to provide details of removed trips as percentages.
5	JD asks about the use of PCT data and if further detail can be provided on the suitability of PCT data. JD is directed to the PCT website in the meeting where full detail is provided on this.	
6	GB discusses how he thinks the methodology being used is a novel approach and would like to understand what PJA have done in complete detail. The other relevant schemes in the area are mentioned and MM mentions that AC has already said he would provide this information. JD adds that he thinks this is not a novel approach and is an established approach.	AC to provide other relevant scheme information.

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Matters Arising		Action
7	A1081 Harpenden Road is discussed as being a priority route for active travel towards the city centre, and expanding the active travel catchment is discussed.	
8	JD expresses concerns about overestimating the benefits realised from improved active travel routes. JD discusses that HCC can provide information on the amount of modal shift generated by improved active travel infrastructure by HCC, from studies they have undertaken. GB/DT mentions that HCC are working on similar schemes/methodologies and can provide data from these. MM states that this will include an element of future gazing in all areas but need to be understood. KN emphasised a range of scenarios would be considered, which can include data from local uptake of similar schemes.	JD/GB/DT to provide information on modal split changes from AT improvements and data from similar methodologies.
9	GB asks if PJA are considering how to monitor and manage the scheme. Permanent ATC/Counts and measures to understand future benefits are mentioned. Detail to be agreed and secured through S106.	
10	MM discusses the PCT tool and that there are other scenarios, as well as the Go Dutch Scenario. These do account for not everyone taking up cycling. KN emphasises the data accounts for local characteristics, demographics and topography. MM discusses that the MND is more advanced and would pick up more data events and information which can be derived from the data, including looking at gender equality and different scenarios. In addition to looking at how government targets can be met.	
11	JD asks about 'bread & butter' methods and information. KN mentions that modal splits will be validated to the MND. HCC reinforced that they are happy with using trip rates from donor surveys and that they will need to be compared to trip rates from TRICS. KN confirmed this had already been done and presented in previous scoping notes.	
12	GB/DT discuss validation against traditional approaches, which was already discussed and agreed to be incorporated in the work PJA are completing. KN confirms this will be included in the Transport Assessment.	
13	DT asks what the development trip rates are, KN states that Villiers Crescent surveyed trip rates were previously agreed to being used for the vehicle development trip rates. Villiers Crescent is also discussed as representing a business-as-usual approach (Do Nothing). Scenario testing was discussed which will be included in the TA. KN states a range of vehicular trip rates to reflect varying levels of intervention from standard historical car-centric approach to a more aspirational strategy with lower vehicle uptake.	KN/LB to resend Villiers Cresent survey data and trip rates.
14	Next Steps are discussed; - Standard process – just using different datasets - Scenario testing considering a range of possible scenarios, in line with Decide and Provide guidance.	

Matters Arising		Action
	- Links to AT Strategy and benefits quantified and assessed within scenarios, to be discussed in the new year. - PT Strategy and benefits quantified and assessed within scenarios – Meetings to be held.	
15	JD asks for more detail on access strategy (primarily vehicular). MM provides more detail on the vehicular access strategy; - The principle of accessing the site via a new signalised junction is well established via detailed engagement under the previous PPA for the development back in 2019 - PJA early assessment shows junction sufficient to accommodate development scale. - Discusses vehicular links through the site. - States that WSP had proposed slightly more vehicle permeability. - Valley Road will be permeable for AT only. - Sandridgebury Lane (Eastern Extent) – Potentially to be closed to through traffic, though evidence is needed to justify closure, MM suggests a monitor and manage approach. Initially, MM suggests that the vehicular route could be made unattractive to drivers to discourage through movements and significantly traffic calmed. The closure could be implemented if required, subject to necessary processes. KN adds to the discussion of vehicular access strategy and mentions that there will be a step down in the road category into the site.	PJA to send up-to-date access drawings in full.
16	JD asks for an update on the planning application timetable. JMK states that he has been in touch with Charlie Thompson (HCC) about a PPA and that they will be meeting to agree on a programme. JMK also refers to wanting to engage with SACDC and that they would want to aim for a Design Review in Spring 2024 JMK added that further pre-application engagement is required before a decision is made on a planning application.	
17	GB asks about complementary strategic modelling (COMET Model) for the development and asks why it has not been used to date. MM states that it was established through early discussions on the scheme that the COMET model would not be granular enough for these proposals and would not provide sufficient information for the distribution of all trip types/journey purposes, hence the agreement to use MND to understand traffic distribution across the network.	
18	GB and JD discuss the benefits/disbenefits of using the COMET model, at the level of individual development. MM adds that strategic modelling is better used for testing wider strategic development aspirations rather than a single development scale.MM also notes that the use of COMET modelling as part of the assessment for this development had previously been discussed and subsequently dismissed. This is captured in scoping discussions/documents to date. JD agrees that there is a role for strategic modelling at LP level to test allocation/scenarios and interactions between multiple sites.GB confirms that they are currently scoping a modelling exercise considering the emerging allocations in St. Albans. (N.B North St Albans being one of these).	HCC to provide an update on this conversation.

Matters Arising		Action
	DT adds that the COMET model would show rat runs in the site area. MM notes that the network in the vicinity of the development does not offer significant route choices. GB suggested that as the site is included as a major allocation in the emerging LP it would form part of wider modelling work and that a single run of the model could just be completed to provide supporting information. This would result in lower costs to the developer and would enable them to get ahead of Member comments. Discussion is concluded that HCC needs to discuss this further between themselves.	

Distribution:	All attendees and apologies.

Meeting Note

Meeting Details			
Project Title:	Woollam Park - Land at North St Albans	**Date:**	01/08/2024
Project No.:	05920	**Time:**	10:00
Subject:	North St Albans - Transport PPA Meeting (Signals and AT)	**Venue:**	Teams
Present:	James Dale, HCC Martyn Crawford, HCC Anthony Matfield, HCC Chirs Gladwyn, HCC Emma Turner, HCC Matt McFeat, PJA Abi Hawke, LRM Planning Jack Martin-King, HLM Ed Saunders, St Albans School		
Apologies:	Kay Nichols, PJA Lianne Baker-Brook, PJA Owen Jones, LRM Planning Iain McSween, HLM		

Matters Arising		Action
1	**<u>Ancient Briton (AB) Junction</u>** Baseline modelling • HCC queried the baseline junction model for the AB, stating it needs to be updated to more accurately reflect levels of queuing experienced 'locally', particularly on the southbound approach. • In modifying the junction models, it would be beneficial to consider the implications of running the ped crossings every cycle rather than the 2 in 3 approach currently taken. Again, this is based on HCC signals teams' 'local' knowledge (they have a colleague who lives near the junction). • A question was raised around the signal timings. MM suggested that these had come from the controller spec. HCC confirmed the junction incorporates MOVA so will optimise on street. • HCC suggested that if the above changes do not produce results which more closely reflect 'local experiences', a more detailed review of approach flows may be needed to accurately consider demand rather than just the volume of traffic which can cross the stop line. Committed Development • MM asked whether modelling had been undertaken in association with the proposed improvements to this junction related to Sewell Park (Cala Homes scheme), as this would technically form the committed future arrangement at the junction.	

Matters Arising		Action
	• JD suggested that we should not focus on this as HCC is primarily interested in the change between the existing situation on the ground and the changes with the introduction of the Woollam Park proposals for the junction. Proposed scheme • MM confirmed that the proposed changes to the junction assume the banning of the right turn from Harpenden Road (south) to Beech Road. • MC ran through some suggested changes to the proposed layout that HCC would like to see changes made and then modelled. • Changes primarily involved the introduction of toucan crossings over all arms with associated areas of shared use paths and appropriate transitions to and from the carriageway. • On the southern approach it was suggested that the segregated cycleway section was replaced with a shared path in order to enable the toucan crossings to work. • MM confirmed that these updates will be considered and any impacts on the operation reported back.	
2	**King William Junction** Baseline modelling • HCC are broadly satisfied with the baseline modelling of the junction. Proposed Scheme • Concern was raised that despite the relatively modest changes to the junction arrangement the modelling showed a significant change in the summary PRC. This should be reviewed and the reasons better understood • HCC would expect the proposed changes not to result in a significant worsening of PRC. As an example, the Future core scenario modelling goes from -39% PRC to - 67% PRC with the introduction of the AT scheme. • It was noted that the modelling does not reflect the extension of the two lane approach from the east along Marshalswick Lane, as the 2nd lane length is 25m in both the existing and future model. This needs to be reviewed in future models. • On the proposed arrangements, MC has asked that consideration is given to all potential cycle movements through the junction rather than focus on those related to the development. MC referenced use of the JAT to demonstrate proposals make suitable provision. • MC shared a sketch diagram showing potential enhancements of the improvement scheme. Again, this includes the introduction of toucans on all crossings and the introduction of shared path areas at landing points with appropriate transitions to/from the carriageway	

Matters Arising		Action
	• MC discussed potential improvements which could be made on the St. Albans Road approach from the north. This change would require the alignment of the road on the approach to the junction to be moved eastwards to enable improvements to the footway width on the west side of the road which is currently constrained. MM confirmed this would be considered, but noted that the topography in this location may prevent a significant shift away from the present alignment. • MC requested that the diagonal route proposed across the junction was converted to a toucan crossing. MM explained that this was likely to have significant implications on the junction operation as the green time required for pedestrians to cross would be significantly greater than that required for cycles to make the crossing.	
3	Wider Active Travel Measures • Limited time was available to discuss the wider AT network, but a few points were mentioned in relation to routes 1 and 2. MC had also provided a more detailed commentary on the proposal in advance of the meeting. • On the Harpenden Road where it passes through an S-bend north of the Stonecross junction it was explained that swept path assessments had been undertaken and the opportunities to widen the existing footway had been maximised. JD/MC noted that the available width was not sufficient for shared use. It was agreed that this should not form part of the wider AT proposals. • MC asked that traffic volumes and speeds were provided on Waverley Road and Carlisle Ave to demonstrate that it was suitable for mixed traffic cycling. ET noted that the LCWIP identifies that filtering would be required in this area. • A few more general points were discussed related to the prior comments received. • MC noted in a number of locations that table top junctions and blended footways were proposed, but he had concerns about pedestrian safety in these locations as this might make spaces difficult to navigate for people who have a visual impairment and then may allow vehicles to over-run the footway. MM noted that these treatments at junctions followed best practice and has been widely implemented across the UK. MM asked whether MC could provide any examples of location in Hertfordshire where similar measures to slow traffic and improve pedestrian amenity had been delivered successfully so that we could draw on local best practice. • MC suggested that the measures to control traffic should be on the links away from the crossing points. • It was suggested that the best way to push forward discussions on the wider network was to cycle the routes with HCC. [This has now been arranged for the 12th August]	

Distribution:	As per attendee list

Meeting Note

Meeting Details			
Project Title:	Woollam Park - Land at North St Albans	**Date:**	01/08/2024
Project No.:	05920	**Time:**	13:00
Subject:	North St Albans - Transport PPA Meeting 2	**Venue:**	Teams
Present:	James Dale, HCC Russell Monck, HCC George Burgess, SACDC Matt McFeat, PJA Abi Hawke, LRM Planning Jack Martin-King, HLM Ed Saunders, St Albans School		
Apologies:	Anthony Collier, HCC Kay Nichols, PJA Owen Jones, LRM Planning Ruth Ambrose, SACDC Iain McSween, HLM		

Matters Arising		Action
1	**<u>Sandridgebury Lane</u>** • MM began the discussion on Sandridgebury Lane with reference to the email issued by AC in the week prior to the meeting which set out HCCs position in relation to the current and future operation of Sandridgebury Lane. Unfortunately, AC was unable to join the call. • MM suggested that this could be used as the basis for a monitor and manage approach to the future operation of Sandridgebury Lane which might include its closure to motor vehicles as part of a through route. • JD queried closure and asked whether additional measures could be adopted to discourage inappropriate use. • MM noted that there still appeared to be some confusion around how the masterplan interacted with Sandridgebury Lane and the sections of it, which were proposed for closure. It was agreed that the latest parameter plans would be shared with HCC prior to the next meeting. • It was also noted that the phasing of development needed to be incorporated into discussions around the operation of Sandridgebury Lane, potential mitigation measures and triggers. • MM highlighted that it was proposed that a vehicular connection was made between the development sites internal road network which would enable the western end of Sandridgebury Lane and the northern end of Valley Road to be closed to motor vehicles. This section of Sandridgebury Lane within the development is intended to function as a green lane allowing for pedestrian, cycle and equestrian movements.	

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Matters Arising		Action
	• The key challenge with rerouting Sandridgebury Lane traffic through the north of the development is around ensuring the quality of the public realm and highway safety particularly in the vicinity of the proposed school and local centre. • JD suggested that this was a matter of highway design and traffic calming to ensure that the route did not become more attractive as a rat-run to avoid wider network congestion. • MM noted that there were limits to what could be achieved through alignment and highway design approaches, and that in the age of sat-nav it was very hard to make the argument that people would not be tempted to use the route if an algorithm suggested it was a quicker way to their destination. • MM explained how the masterplan could be brought forward in a way which incorporated infrastructure or reserved land which would enable a closure to be introduced at a point in the future as part of the monitoring mechanism attached to a planning application. • JD noted that if closure remained an option, it would be important to understand where this displaced traffic would go, and junction models would need to reflect this scenario. • It was agreed that previous notes discussing Sandridgebury Lane would be updated to reflect HCCs position and suggested list of outcomes, and that this would provide additional information around any potential monitor and manage approach.	
2	**<u>Traffic Signal junction improvements</u>** • MM provided a summary of the discussions which took place during the workshop session as a number of attendees at this meeting did not join the earlier call. • Modelling and junction proposals would be updated to reflect discussions and will be re-issued for further comment.	
3	**<u>Wider Active Travel Measures</u>** • Limited time was available to discuss the wider AT network, but a few points from the earlier discussion were repeated • It was agreed that a review of proposal on site should be arranged to bottom out concerns. • JMK raised a point around funding / delivery mechanisms for the wider active travel network. MM noted that during previous discussions it had been noted that it was considered unreasonable to expect that a single development would fund and deliver the wider network improvements proposed.	

Matters Arising		Action
	• MM also noted that intrinsically linking delivery of active travel measures to a single development site risked objections being raised against the introduction of AT measures as a way of blocking development. • MM also noted that when considering strategic improvements away from the development site it was not possible to capture wider aspirations for improvement to walking, cycling and public transport networks. The proposal put forward primarily align with active travel movements to and from the north of the city. • JD noted that the scale of the improvements being delivered by the Cala Homes scheme could offer an indication of the expected level of intervention, noting the significant difference in scale between the two developments would need to be taken into account. • It was suggested that in the first instance a plan was prepared showing the extent of the works which might reasonably be expected to be delivered by the development, and the works where a contribution towards more comprehensive local authority scheme might be more appropriate.	
4	**<u>HCC Update</u>** • MM asked whether there was any further update on the wider local plan modelling work which had been commissioned. GB suggested that there were no results available. • MM noted that it would be useful to understand preliminary findings, particularly around Sandridgebury Lane. HCC position statement references an understanding of future demand. • MM asked JD whether he had found any further information on a study looking and the propensity for modal shift to cycling within St. Albans. JD confirmed that he had found more details on the study and that this had used the propensity to cycle tool in forming assumptions. • JD noted that he did not think that the modal shares produced in the various scenarios within the tool were applicable to calculating changes in potential demand along routes where infrastructure was to be improved. • JD reiterated a challenge from previous conversations that he hasn't seen any evidence that improvements to active travel corridors lift modal share. JD would welcome examples. • MM noted that the consultation draft of the NPPF now referred to the use of 'vision-based' approaches to transport planning, and that assumptions around achieving modal shift through the introduction or improvement of active travel and public transport services was intrinsic to this approach. • JD suggested that the focus of assessment needed to be around the core scenario in order to understand the worst case.	

Distribution:	As per attendee list

Meeting Note

Meeting Details			
Project Title:	Woollam Park - Land at North St Albans	**Date:**	09/08/2024
Project No.:	05920	**Time:**	13:00
Subject:	North St Albans - Transport PPA Meeting 2	**Venue:**	Teams
Present:	Russell Monck, HCC Roger Flowerday, HCC Charle Thompson, HCC George Burgess, SACDC Matt McFeat, PJA Abi Hawke, LRM Planning Jack Martin-King, HLM Anthony Collier, HCC Owen Jones, LRM Planning		
Apologies:	Kay Nichols, PJA James Dale, HCC Ed Saunders, St Albans School Ruth Ambrose, SACDC Iain McSween, HLM		

Matters Arising		Action
1	**<u>Parameter Plans</u>** • JMK provided an overview of the draft parameter plans for the development site. • Key points of interest on the parameter plans were discussed including the spatial distribution of different land uses across the site with a local centre serving the development sitting at the heart of the scheme adjacent to the primary school site and key areas of public realm within the development. • JMK noted that the land for the school site would be provided to HCC. HCC would then deliver the school as need is established. • MM talked through the access and movement parameter plan noting the sites primary access location on Harpenden Road, the potential route for buses entering into the site and turning at the local centre and the potential highway connection east to Sandridgebury Lane • The role of Sandridgebury Lane through the central section of the site as a green lane for active travel was highlighted along with the potential points of closure to motor vehicles on Sandridgebury Lane west and Valley Road. • CT asked whether consideration had been given to the use of Valley Road to provide a public transport route through the site. MM noted that this had been considered previously and AC supported noting that this would only have served as a potential bypass of Harpenden Road for the key inter settlement routes along the A1081, and this would result in a	

Matters Arising			Action

		significant diversion of routes away from this corridor. MM noted that it was not considered possible for Valley Road to be a high-quality AT route if it was also used by buses due to the constrained width of the road.
		• RF noted that HCC will require all homes to be within 400m walk of a bus stop, and that this needs to be confirmed. MM noted that the site is only 800m wide at its widest point and that this should be possible to achieve by bringing the Tigermoth bus into the centre of the site. RF reiterated that the requirement was not a crow fly distance, MM considered this was achievable, but noted that as this is an outline application it would not be possible to check exact walking routes.
		• RF asked whether it would be possible to form an internal loop road that would link development parcel C with parcel D. MM noted that due to topography and the requirements of the drainage strategy it would be challenging to form a connecting route on the east side of the site for vehicles. MM shared details of the green / blue parameter plan.
		• JMK then talked through the phasing strategy for development:
		  ○ Phase 1 – relocation of sports pitches
		  ○ Phase 2 – Harpenden Road site access delivery and progression east including the school site and part of the local centre.
		  ○ Phase 3 – Continuation of development on the north west side of Sandridgebury Lane including completion of the local centre and highway connections to points of intersection with Sandridgebury Lane
		  ○ Phase 4 – development to the south east of Sandridgebury Lane
		• JMK noted that phase 2 required some development activity to the east of Sandridgebury Lane associated with drainage strategy. This would require a crossing of Sandridgebury Lane. AC asked whether this presented an opportunity to temporarily close Sandridgebury Lane to through traffic and for the monitoring of impacts. JMK noted that further refinement of this approach is needed, and that there may be a need ~~to~~ for open space delivery prior to Phase 4. MM commented that AC suggestion around closure then monitoring before deciding if a route needed to be provided was the opposite approach to what we had considered, but worthy of further thought.
		• It was noted that the phasing plan did not provide clarity of the status of Sandridgebury Lane and when changes to the operation might be desirable or necessary.
		• GB noted that he would be supportive of an earlier closure of Valley Road and the western end of the lane.
		• RM asked whether it was possible for the road through the site which potentially links Harpenden Road with Sandridgebury Lane could be moved elsewhere in the site. HCC have had issues on other sites where key roads within developments were proposed in the vicinity of school sites resulting in delivery challenges and conflict between traffic volumes and safe movement of children to school. MM noted that there limited flexibility in the location of this road given the sites constraints. MM noted that the monitor and manage approach would seek to prevent traffic conditions in the vicinity of the school becoming a significant issue.	

Matters Arising		Action
	Nonetheless, it was agreed that the applicant would review this matter further.	
2	**<u>Sandridgebury Lane – Monitor and Manage</u>** • MM noted that a significant amount of time in the past couple of discussions had been given over to the role of Sandridgebury Lane within the development and how existing and future traffic volumes on the lane were accommodated or diverted away from the site. The discussion had become a little circular and therefore a proposed approach to monitor and manage had been developed. • MM shared a number of slides which provided the context for the discussion and provided some answers around the current level of usage of Sandridgebury Lane. The presentation referred to Sandridgebury Lane west (SLW) and Sandridgebury Lane E (SLE) for clarity. • MM shared the HCC position statement and asked whether any further clarity could be given around the inappropriate use statements. AC noted that this related to current understanding and emerging results of modelling which showed that the primary road network was at capacity and as a result less suitable routes were being used by through traffic including Sandridgebury Lane and Green Lane. • MM noted that a technical note will be circulated setting out the proposed approach. • In summary it is proposed that the masterplan comes forward with the incorporation of a bypass route for the section of SLW where it is considered essential for a prohibition of motor vehicles to be introduced in order for the lane to serve active travel requirements. • The bypass route would connect SLE at a point west of the railway line to Harpenden Road through the development site. As noted earlier in the discussion this route is currently proposed to pass adjacent to the local centre and primary school site. • Monitoring is proposed from the point at which a through traffic connection is made, with reporting undertaken as part of the travel plan monitoring. • Current estimates suggest that 2-way flow in the vicinity of the school will be around 2,000 vpd once the development is complete, but this would not be the flow on SLE as much of this would be development traffic travelling to and from the west. • It is proposed that a trigger in the order of 3,000 vehicles per day is used as this aligns with guidance in LTN 1/20 around the conditions where mixed traffic cycling is considered appropriate. • Once a sustained exceedance of this trigger level had been reported, HCC would take action to limit the volumes of traffic flowing along SLE via the introduction of a TRO and associated works. • AC commented that funding would need to be provided and secured during the monitoring period. • AC welcomed the approach and considered that subject to a detailed review this approach addressed concerns around Sandridgebury Lane.	

Matters Arising		Action
	• RF noted that the proposal did little to improve conditions on Sandridgebury Lane to the east of the railway line where the lane was subject to the national speed limit. MM commented that there was little that could be done due to third land ownership and carriageway widths, and that it was unlikely that an approach which sought to modify conditions on the lane, such as the introduction of a 20mph limit were feasible. This point was agreed. • AC noted that the junction in Sandridge with High Street had a central green area and that a scheme to reduce the junction size might be beneficial.	
3	**<u>Emergency Access</u>** • MM presented a number of slides setting out proposals for emergency access which would be taken along SLW. • Emergency access would be achieved through the modal filters by means of a demountable bollard or similar feature. This would also allow for maintenance access along Sandridgebury Lane. • The phasing plan needs to consider how earlier phases might be provided with an emergency access, again likely from Sandridgebury Lane. This could require some of the internal highway connections to be brought forward earlier. • There was broad agreement from HCC to the emergency access proposals.	
4	**<u>Wider Active Travel Measures</u>** • Discussion focused on the extent of the network where it might be appropriate for the development to delivery and where a contribution towards HCC delivery might be appropriate. • RF discussed the two-strand approach to planning obligations within Hertfordshire, with strand 1 obligations addressing the immediate impacts of new developments and strand 2 obligations addressing the cumulative impacts. Some of the wider active travel network would be likely to fall into the second strand. • OJ noted that in the absence of an IDP it was challenging to understand how off-site measures considered as part of this development might also be needed to support other allocation sites in the LP. • GB noted that he had not seen the IDP either although it is expected that this will be published September 2024 ~~.~~ • AC commented that HCC have seen the emerging IDP in relation to the LP transport assessment work which is ongoing. AC would explore whether it was possible to share any details of this. • GB asked whether there was any understanding around the costs to deliver of the network currently being considered. OJ pointed to the LCWIP which had considered high level costs for key routes as part of the prioritisation process. But costing can only be reviewed once agreement had been reached on each corridor.	

Matters Arising		Action
	• AC noted that HCC needed certainty around the delivery of routes if they were being relied upon to achieve certain levels of modal shift assumed in the TA. MM noted that James Dales focus appears to be on core scenarios where there were no assumptions around modal shift, and it therefore did not feel that the assessment was benefiting from off-site investment proposed. • AC reiterated that off-site routes needed to go somewhere in order to be considered as delivering benefit. MM noted that the Sewell Park development infrastructure did not seem to meet this test. AC suggested that this should be thought of as this development delivering some of Woollam Park AT requirements. • RF suggested that an alternative measure could be that the applicant delivers one AT corridor and then funding is provided for the other corridors. It was agreed that the applicant would review this further once agreement with HCC had been established for design of each corridor.	
5	**HCC Update** • MM asked whether there was any further update on the wider local plan modelling work which had been commissioned. GB suggested that there were no results available. • RM asked whether it would be possible to draft a document which could record points agreed through this engagement process as has been the case with the other specialisms discussed. JMK agreed and confirmed that this would be pulled together to reflect recent discussions.	

Distribution:	As per attendee list

Meeting Note

Meeting Details			
Project Title:	Woollam Park, North St Albans	**Date:**	12/09/2024
Project No.:	5920	**Time:**	14:30
Subject:	HCC Highways Meeting	**Venue:**	Teams
Present:	Anthony Collier (HCC) Russell Monck (HCC) James Dale (HCC) Jack Martin-King (HLM) Ed Saunders (St Albans School) Abi Hawke (LRM) Matt McFeat (PJA) Kay Nicholls (PJA)		
Apologies:	Owen Jones (LRM)		

Matters Arising		Action
1	**Sandridgebury Lane** - MM confirmed response from HCC on Sandridgebury Lane note had been received. - MM set out our understanding is the principle is agreed and cannot be taken further at this stage. Details around triggers/phasing/obligations can be fine tuned post submission. - AC agreed this to be the case.	-
2	**School Layout and Emerging Parameters Plan** - MM confirmed further detail being worked up and will be shared soon. Parameter plans being considered to better show intention around the environment that will be created near the school. - JMK confirmed that the open space and road are being "flipped" to provide setback between the road and school. Technical details of this are being checked currently. - MM also emphasised the importance of the link to Sandridgebury Lane and keeping traffic volumes to an appropriate level.	Further information to be presented by PJA/HLM in due course.
3	**Local Plan Evidence Base** - KN/MM provided brief overview of TIA and IDP which generally align well with the proposed strategy being developed/agreed for Woollam Park. - MM queried some differences between the COMET model outputs and the local junction modelling PJA has undertaken. KN explained differences. MM requested confirmation of how this has been modelled (particularly around the Ancient Briton) and how to address any differences within the TA so as not to undermine either set of modelling. - AC advised the COMET model has a variable demand element which can peak spread, re-mode etc. This could explain some differences. AC to follow up with colleagues. **[Post meeting note: KN provided summary to AC].** - MM queried level of input from HCC on preparation of evidence base. AC confirmed some input but currently reviewing the evidence base documents.	AC to discuss COMET model with colleagues. All to discuss appropriate and proportionate delivery/funding of infrastructure to support development/wider settlement aspirations.

Matters Arising		Action
	- MM queried how the pooling suggested would work. There appears some overlap between delivery of the infrastructure requested by HCC and contributions towards the same infrastructure schemes via Settlement Strategy contribution. AC confirmed that the contribution is based on the HCC Toolkit. - RM said there is currently a process to work through to draw this together. Delivery of what is needed for the development and then funds towards wider/settlement scale infrastructure. - MM queried e-bike contribution. AC confirmed this would be for an e-bike hire scheme. - RM confirmed car hire scheme is district wide possibly building on current Enterprise Car Club scheme. - JMK queried station links and what the intention was with this scheme. HCC unable to provide detail.	
4	**Position Statement/Engagement Summary** - MM requested feedback on engagement summary/position note provided by PJA. - AC stated only real point for discussion is Section 2.4 and the funding/delivery of off-site active travel schemes. - RM states that HCC can possibly agree points of principle but await full package of information/any comments now would not prejudice view on application when submitted. - JMK requested agreement to less "contentious" items. RM requested items are split down into what can be agreed/requires agreement now and what can wait.	PJA to provide Position Statement note in word format along with summary table splitting down items for agreement.
5	**Modelling and Updated Active Travel Scheme Drawings** - AC provided some feedback on Ancient Briton and King William IV scheme drawings by email. - AC confirmed signals team content with schemes/toucan crossing provision. - AC confirmed signal team review of modelling is awaited and will be provided in due course. Some discussion around accompanying note and the outcomes of assessment being not yet agreed. - MM stated confirmation of base models needed as it is understood these address all comments raised by HCC. Scenario/future year modelling to also be agreed.	HCC to provide signals team feedback and review of technical note/outcomes as a priority.
6	**AOB** - MM confirmed key items and order of importance: 1) Signals/modelling review. 2) Position Statement including points we need to be agreed before and what can wait until the application is submitted. - RM queried whether HoT schedule would be included in planning submission. - JMK confirmed this was being developed and would be submitted via GB in advance of planning submission.	-

Distribution:	All in attendance and apologies.

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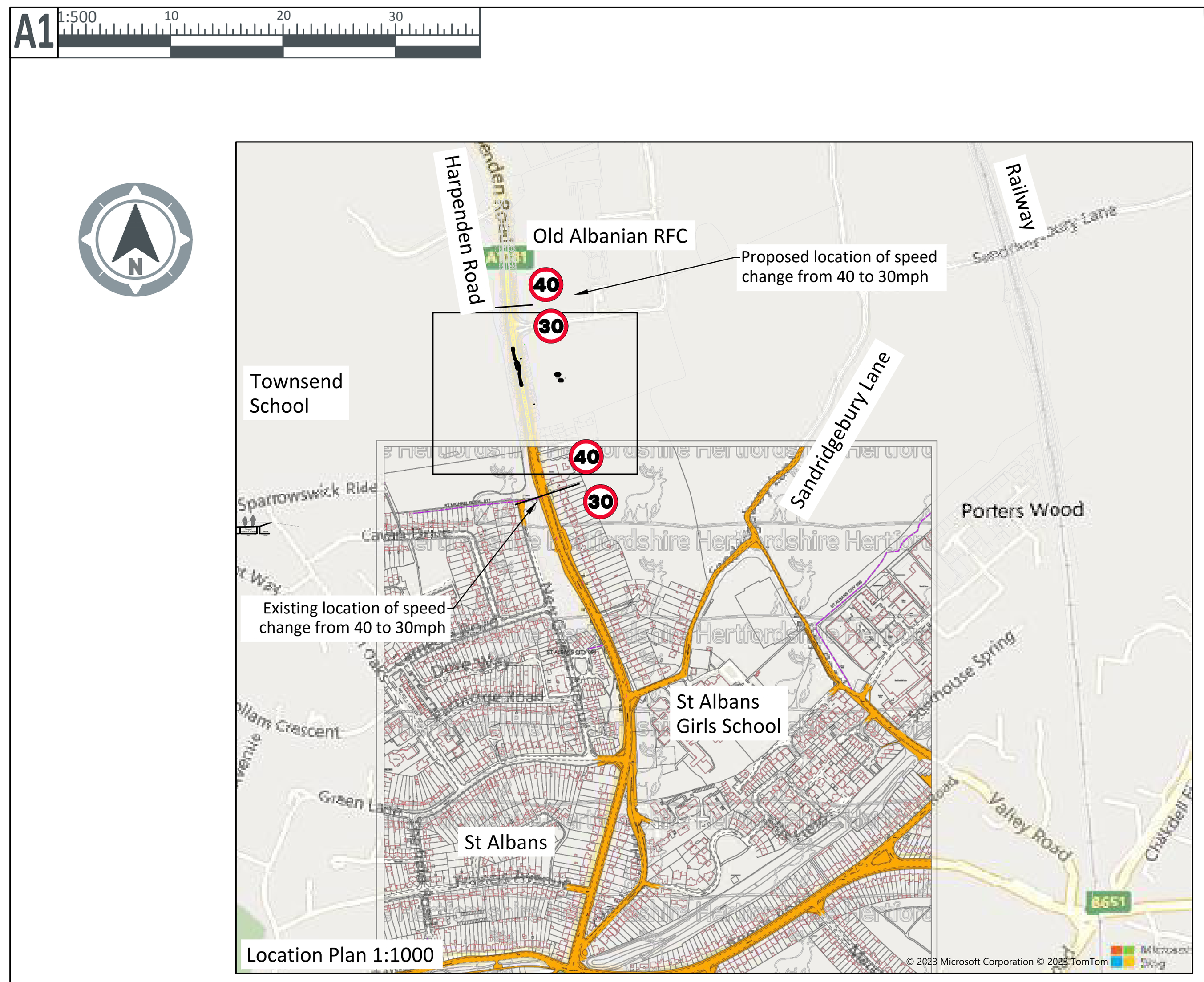
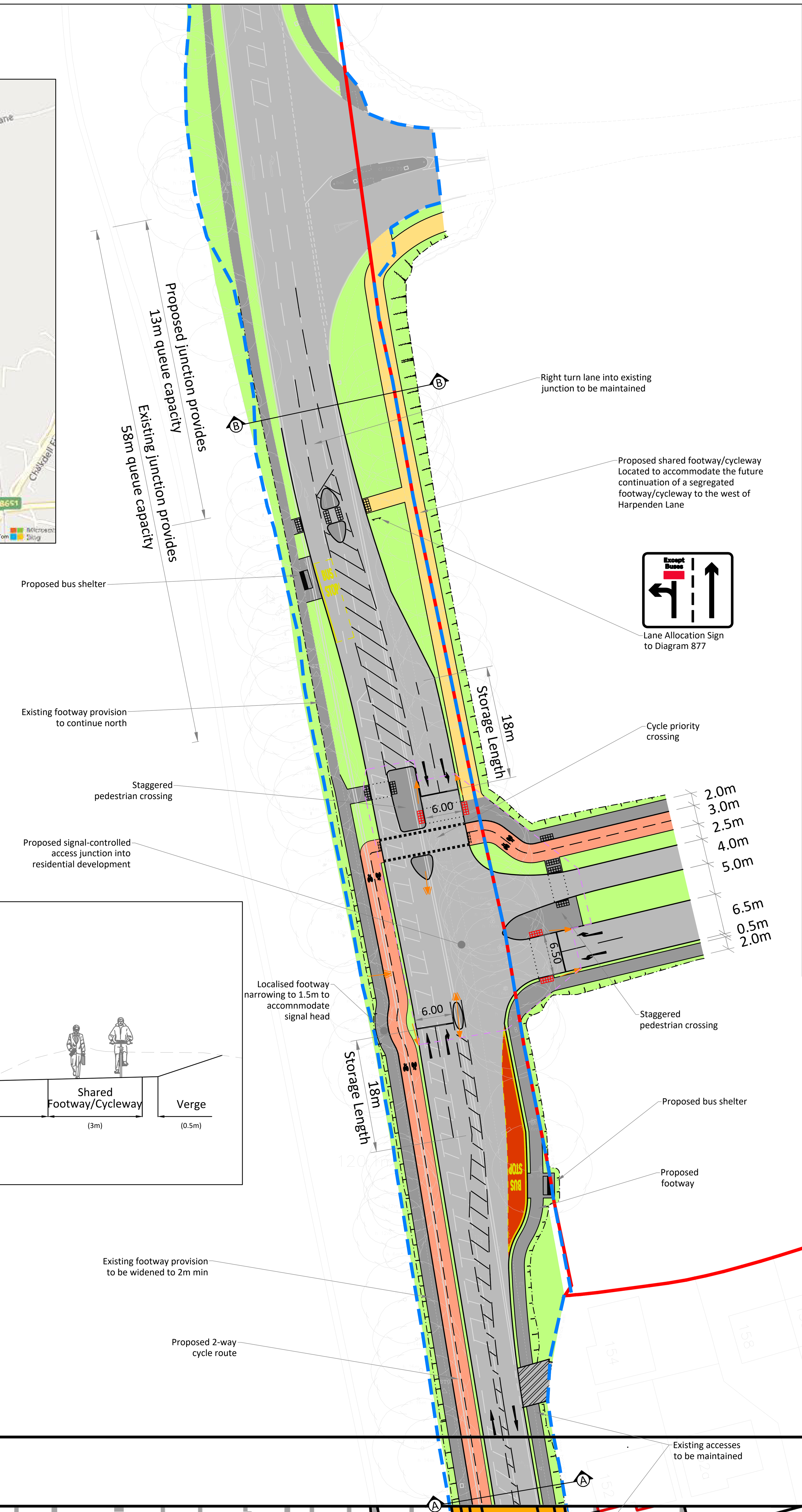
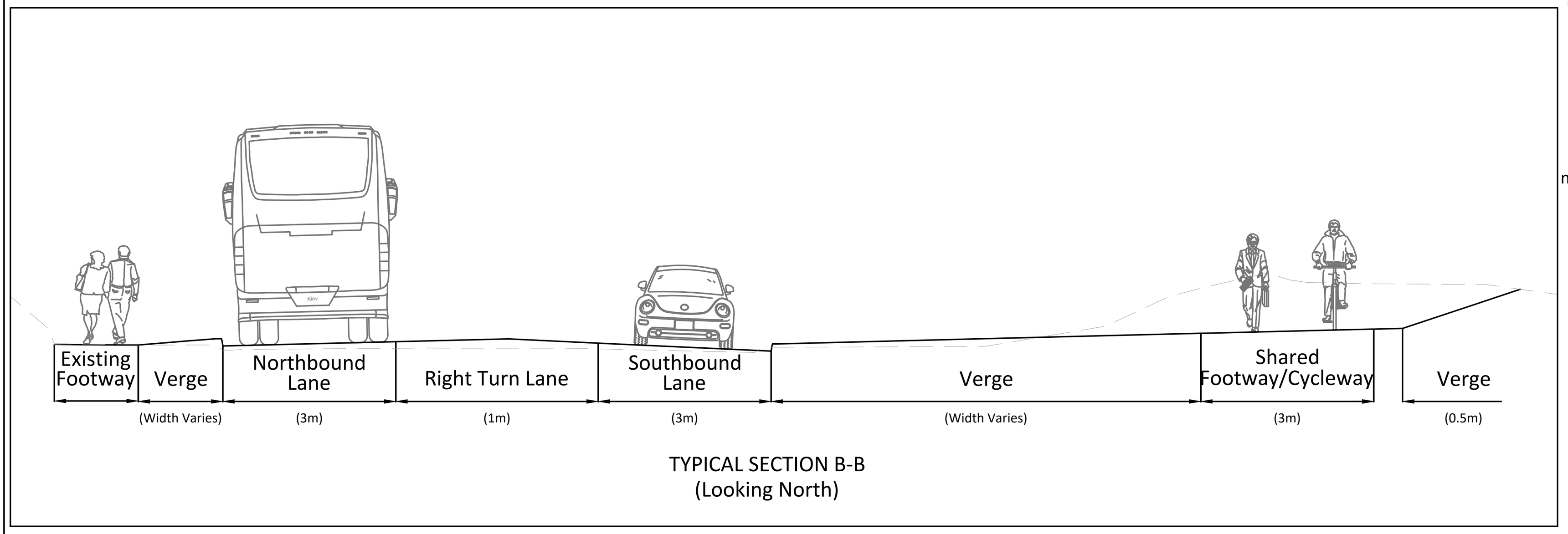
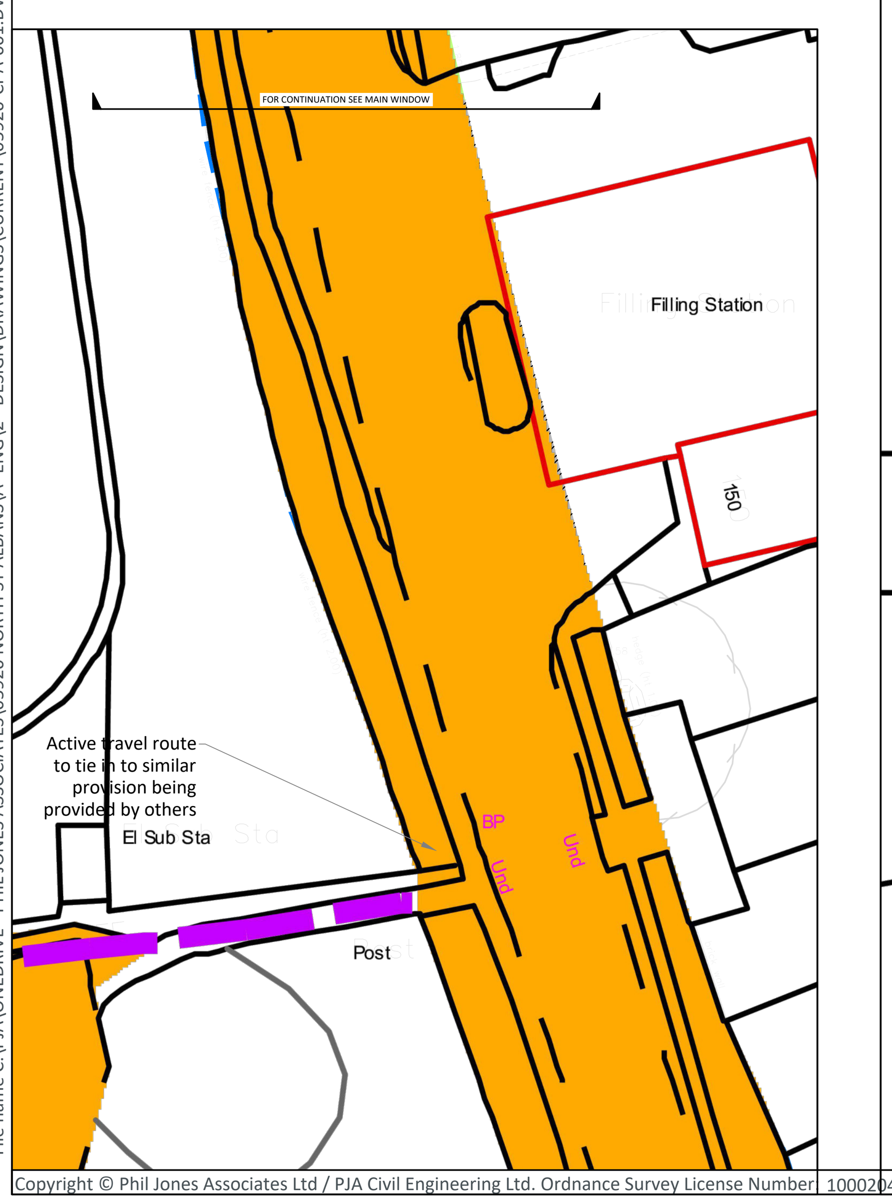
Appendix C A1081 Harpenden Road Access Arrangements Drawing







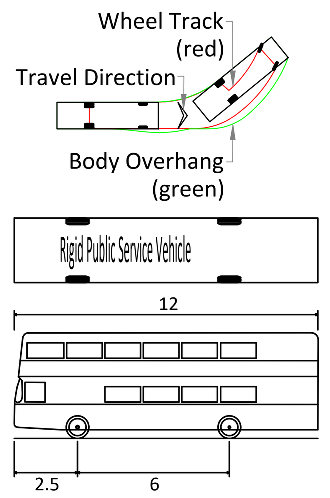
TYPICAL SECTION B-B
(Looking North)



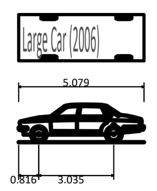
Key

- Highway Boundary
- Site Boundary
- Road Channel/Kerbline
- Junction Visibility
- Proposed Earthworks Slope
- Tactile Paving (Buff, Uncontrolled)
- Tactile Paving (Red, Controlled)
- Primary Signal Head
- Secondary Signal Head
- Proposed Road Marking (White)
- Proposed Road Marking (Yellow)
- Existing Road Markings (White)
- Carriageway
- Footway
- Vehicle Crossover
- Shared Footway/Cycleway
- Cycleway
- Grass Verge
- Coloured Bus Layby Surfacing

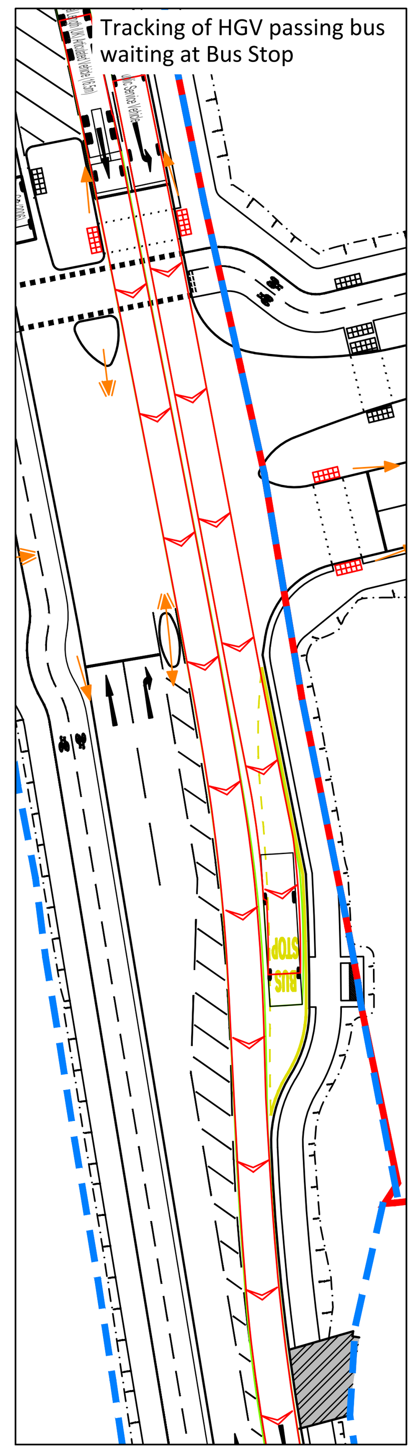
Typical Vehicle Track

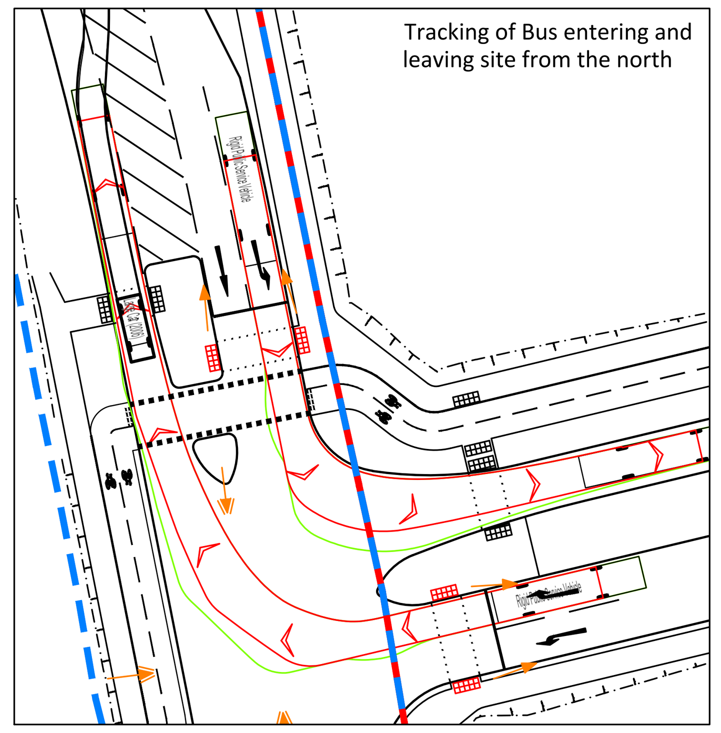


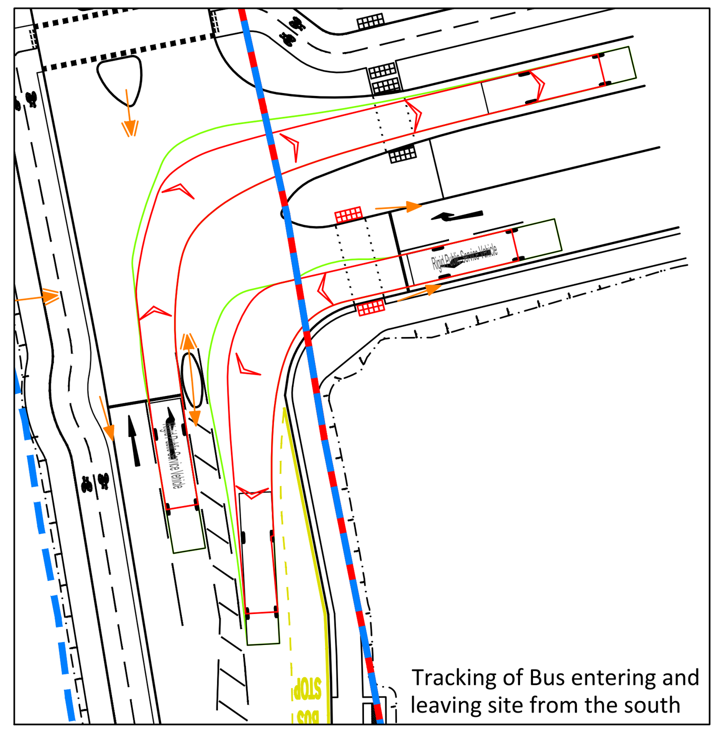
Rigid Public Service Vehicle	
Overall Length	12.000m
Overall Width	2.550m
Overall Body Height	4.173m
Min Body Ground Clearance	0.344m
Track Width	2.550m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	10.500m

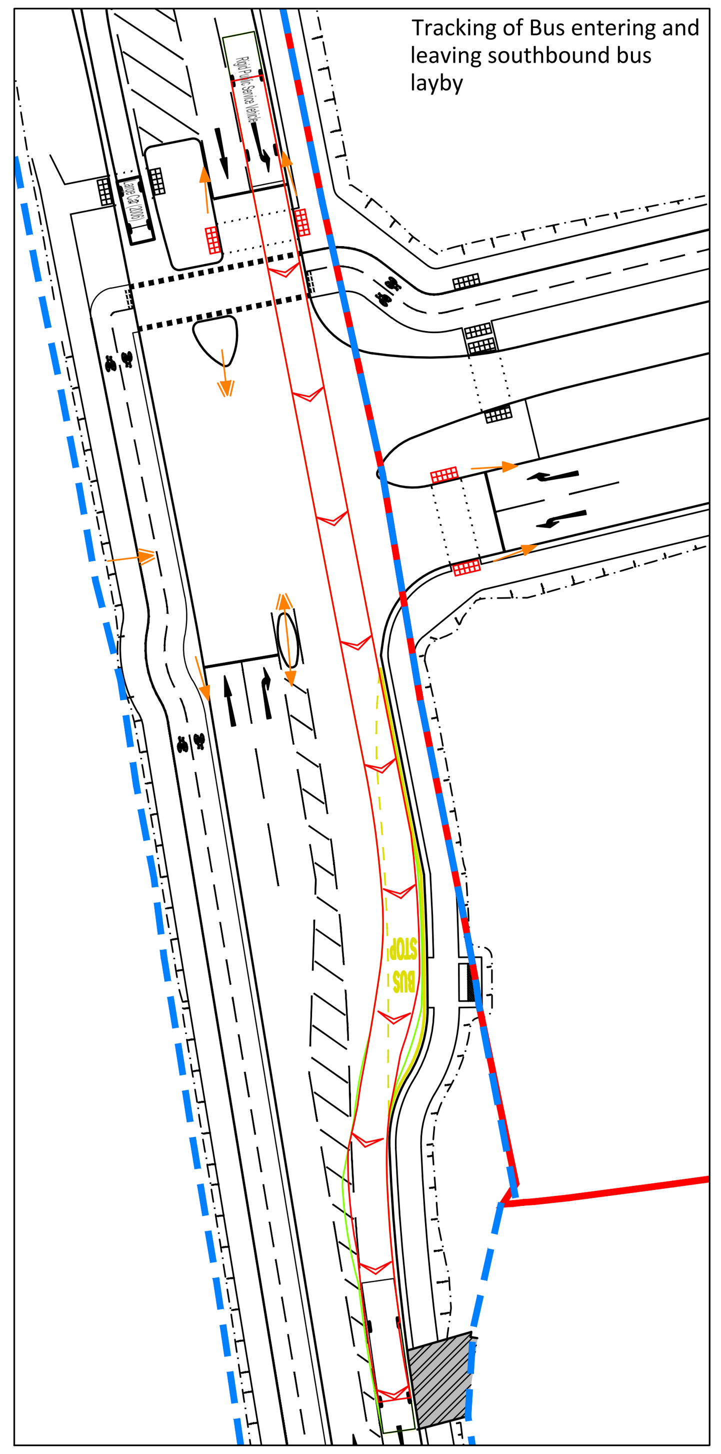


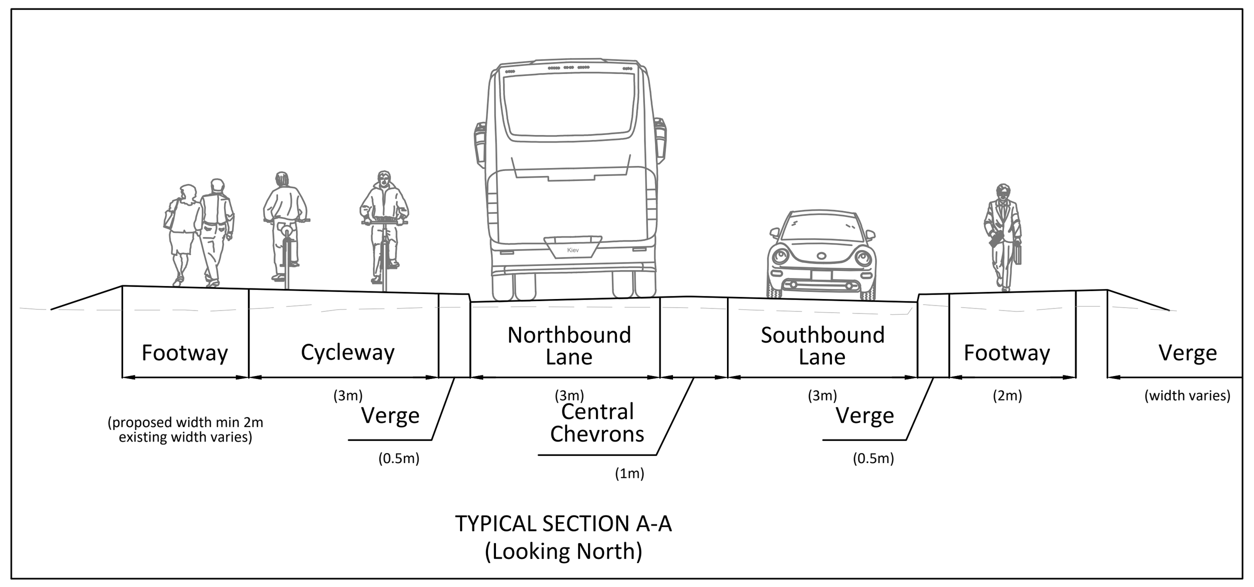
Large Car (2006)	
Overall Length	5.079m
Overall Width	1.872m
Overall Body Height	1.525m
Min Body Ground Clearance	0.310m
Max Track Width	1.831m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.900m











TYPICAL SECTION A-A
(Looking North)

CDM Note

These drawings have been produced with reference to the CDM Regulations 2015.
Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9.

Notes

1. Do not scale from this drawing.
2. All dimensions in metres unless stated otherwise.
3. This drawing is based on OS mapping.
4. This drawing is not to be reproduced in any part or form without consent of PJA Civil Engineering Ltd. All copyright reserved.
5. The design details presented must be reviewed in conjunction with the wider site information and site constraints.
6. No liability will be accepted by PJA for inaccuracies or otherwise in relation to the accuracy of the OS mapping which has been received from third parties and it's contents.
7. Reproduction from the Ordnance Survey map with permission of the controller of His Majesty's Stationary Office.
8. The purpose of this drawing is to show the location and form of a new signal-controlled junction to form the access into a new residential development.

   The drawing has been produced to support an outline planning application.

   From a planning perspective, the purpose is to show where access is to be formed and indicate an engineering solution for the road / cycle / pedestrian link arrangements. The alignment and technical details of those arrangements are not fixed at this stage and will be resolved via condition.
9. The design is Preliminary and subject to discussions with the local planning and highway authorities. The drawing should not be used for tendering or construction purposes and requires further development as part of the pre-planning application and understanding of highway authority preferences, which vary between authority.
10. All works are proposed to be within the highway boundary or Developer owned land. It is assumed that the highway and site boundary abut each other.
11. Site specific detailed surveys need to be carried out to confirm design information, which may impact the outline design proposals. These include, but are not limited to, ground conditions, groundwater levels, utilities, ecology, tree protection etc. Impacts related to other civils features have not been detailed and are subject to detailed design.
12. Any existing details which are shown on this drawing are for guidance only and are to be checked on site.
13. The existing road widths are based upon OS mapping data.
14. The proposals outlined are subject to Road Safety Audits.
15. The junction has been designed in accordance with Design Manual for Roads and Bridges as listed below:
    - CD 109 Highway Link Design (revision 1)
    - CD 123 Geometric Design of At Grade Priority and Signal Controlled Junctions (revision 2.1.0)
    - LTN 1/20 Cycle Infrastructure Design (July 2020)
16. The design criteria and philosophy is subject to local authority agreement.

Rev	Date	Revision Note	Drw	Chk	App
P04	25.09.24	Lane allocation sign added to amend use of southbound left lane, tracking amended	RH	RH	AN
P03	01.11.23	Layout amended, earthworks added	RH	RH	AN
P02	09.10.23	Site and Highway Boundaries amended	RH	RH	AN
P01	04.10.23	FIRST ISSUE	RH	RH	AN

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Client
Hallam Land Management

Project
Land at North St Albans

Title
Proposed Junction Access General Arrangement

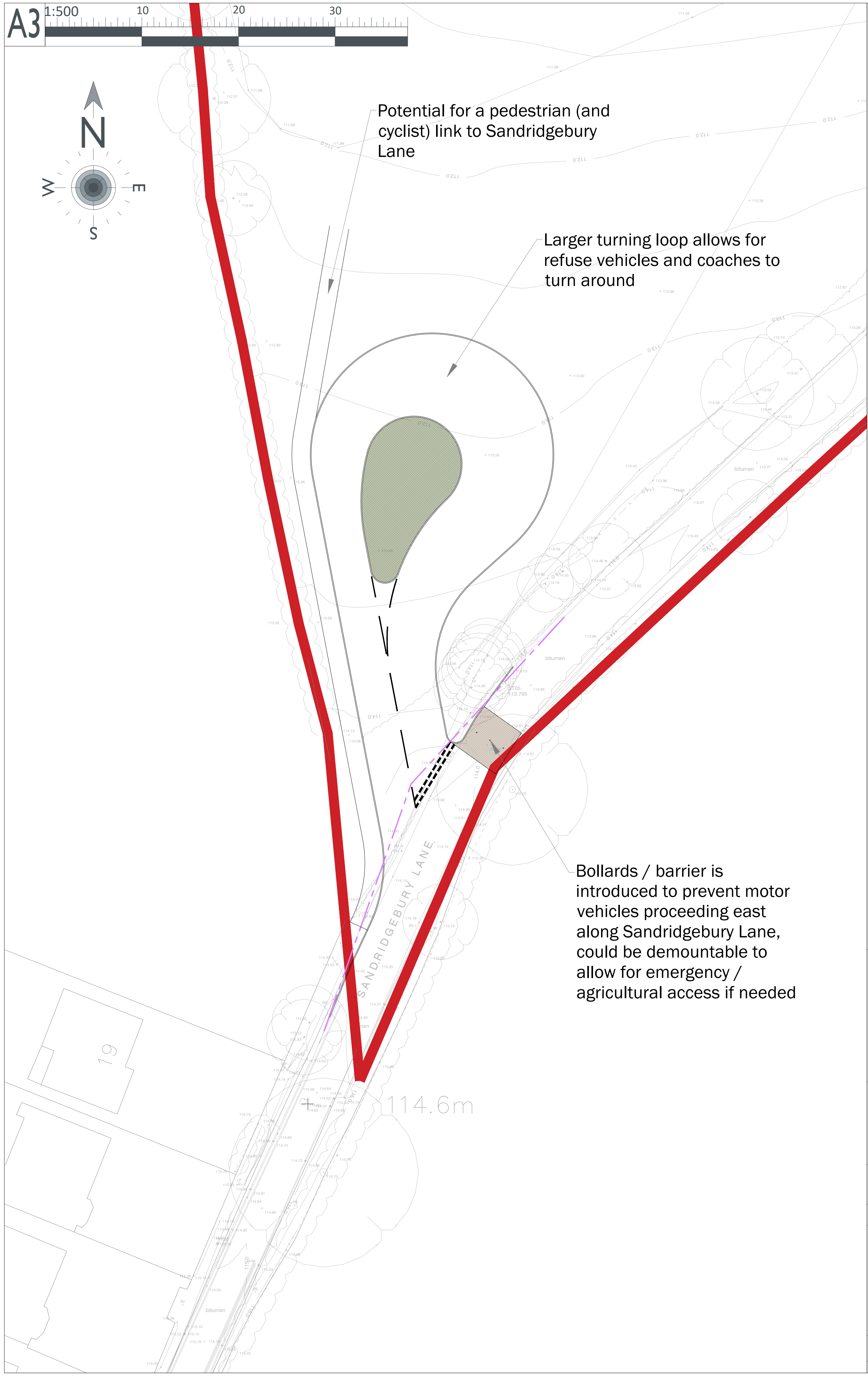
Drawing Issue Status
For Information

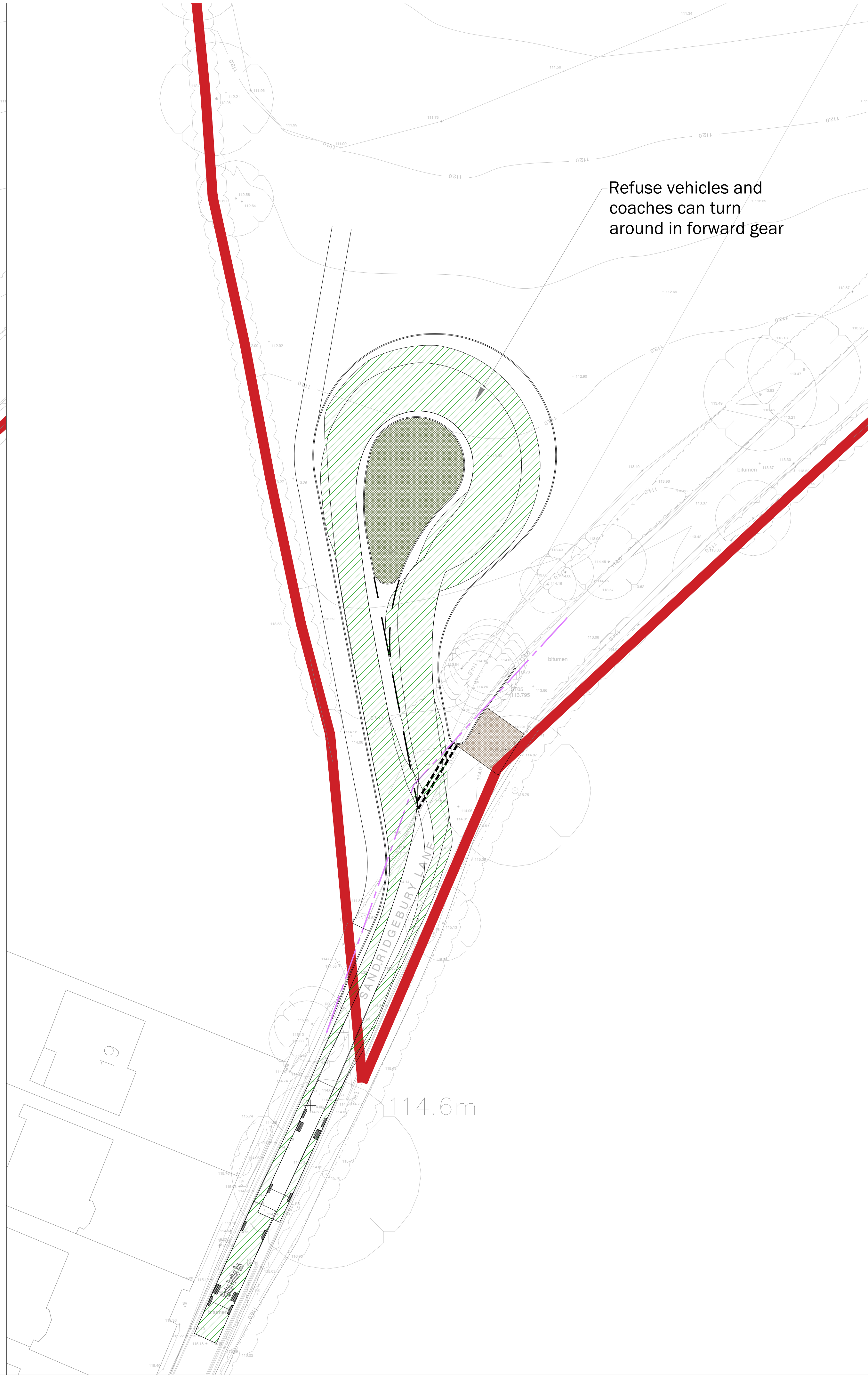
PJA Ref	Scale @ A1	Date
05920	1:500	September 24

Drawing No.	Revision
05920-CI-A-001	P04

Primary Contact
Andrew.Nixon@pja.co.uk

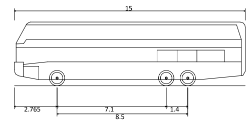
Appendix D Sandridgebury Lane Access Arrangements Drawing





NOTES

These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9



Plaxton Panther Bus	
Overall Length	15.000m
Overall Width	2.500m
Overall Body Height	4.157m
Min Body Ground Clearance	0.397m
Track Width	2.500m
Lock to lock time	5.00s
Wall to Wall Turning Radius	12.500m

REV	DATE	REVISION NOTE	BY
P1	26/9/24	Alternative option removed	AP

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CLIENT
Hallam Land Management

PROJECT
Land North of St. Albans

DRAWING TITLE
Potential turning loop arrangements off Sandridgebury Lane

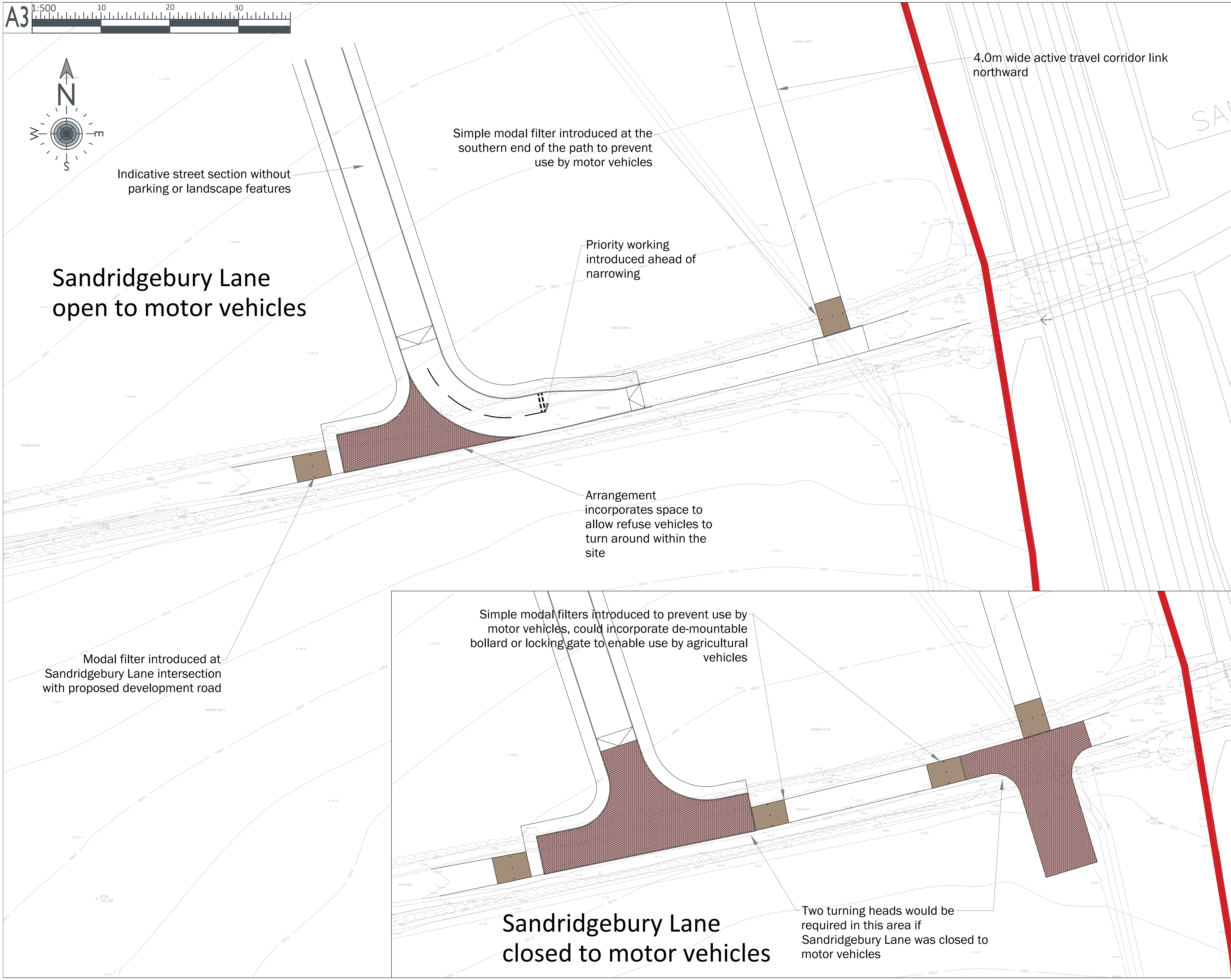
DRAWING ISSUE STATUS
INFORMATION

PJA JOB No.	SUB-CODE	DRAWING NO.	REVISION
05920 -	SK -	006	- P1

Revision Letter : P - Prelim / A - Approval / T - Tender / C - Construction

BIM DRAWING REFERENCE

SCALE	DRAWN	REVIEWED	DATE
A3 @ 1:500	CT	MM	02/2023



NOTES

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REV	DATE	REVISION NOTE	BY

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CLIENT
Hallam Land Management

PROJECT
Land North of St. Albans

DRAWING TITLE
Potential arrangement of Sandridgebury Lane to the west of the railway bridge

DRAWING ISSUE STATUS
INFORMATION

PJA JOB No.	SUB-CODE	DRAWING NO.	REVISION
05920 -	SK -	008 -	P0

Revision Letter : P - Prelim / A - Approval / T - Tender / C - Construction

BIM DRAWING REFERENCE

SCALE	DRAWN	REVIEWED	DATE
A3 @ 1:500	CT	MM	02/2023

NOTES

These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9

REV	DATE	REVISION NOTE	BY
P1	26/9/24	Incorporate off-site improvements	AP

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CLIENT
Hallam Land Management

PROJECT
Land North of St. Albans

DRAWING TITLE
Potential modal filter location along Valley Road north of Darwin Close

DRAWING ISSUE STATUS
INFORMATION

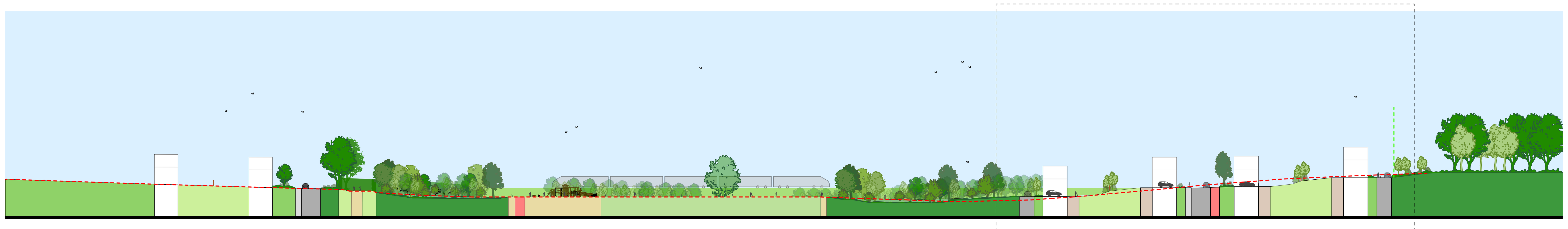
PJA JOB No.	SUB-CODE	DRAWING NO.	REVISION
05920 -	SK -	010	- P1

Revision Letter : P - Prelim / A - Approval / T - Tender / C - Construction

BIM DRAWING REFERENCE

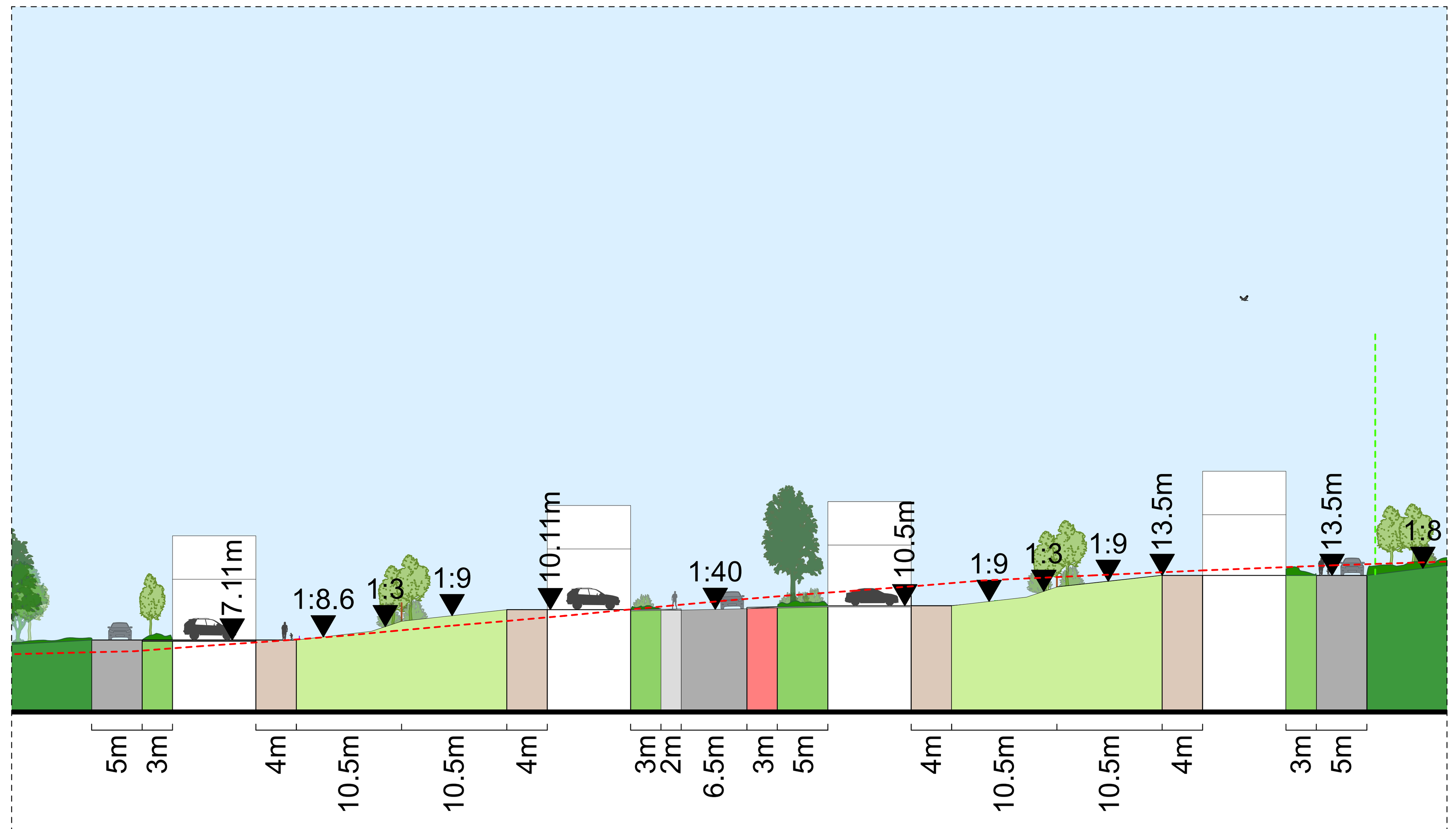
SCALE	DRAWN	REVIEWED	DATE
A3 @ 1:500	CT	MM	02/2023

Appendix E Street Sections

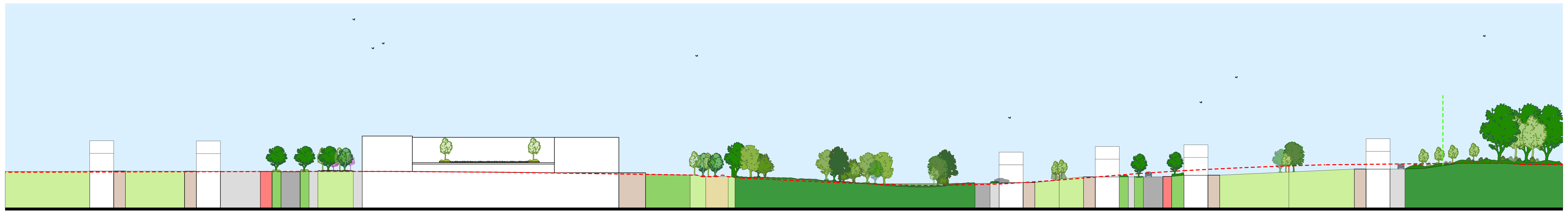


Section A

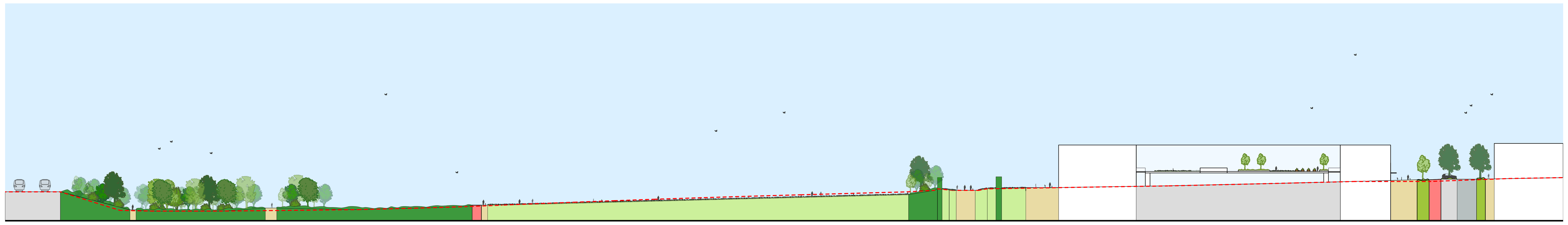
A1 - Insert



A1 - Insert



Section B



Section C

Section D

Section Location Plan

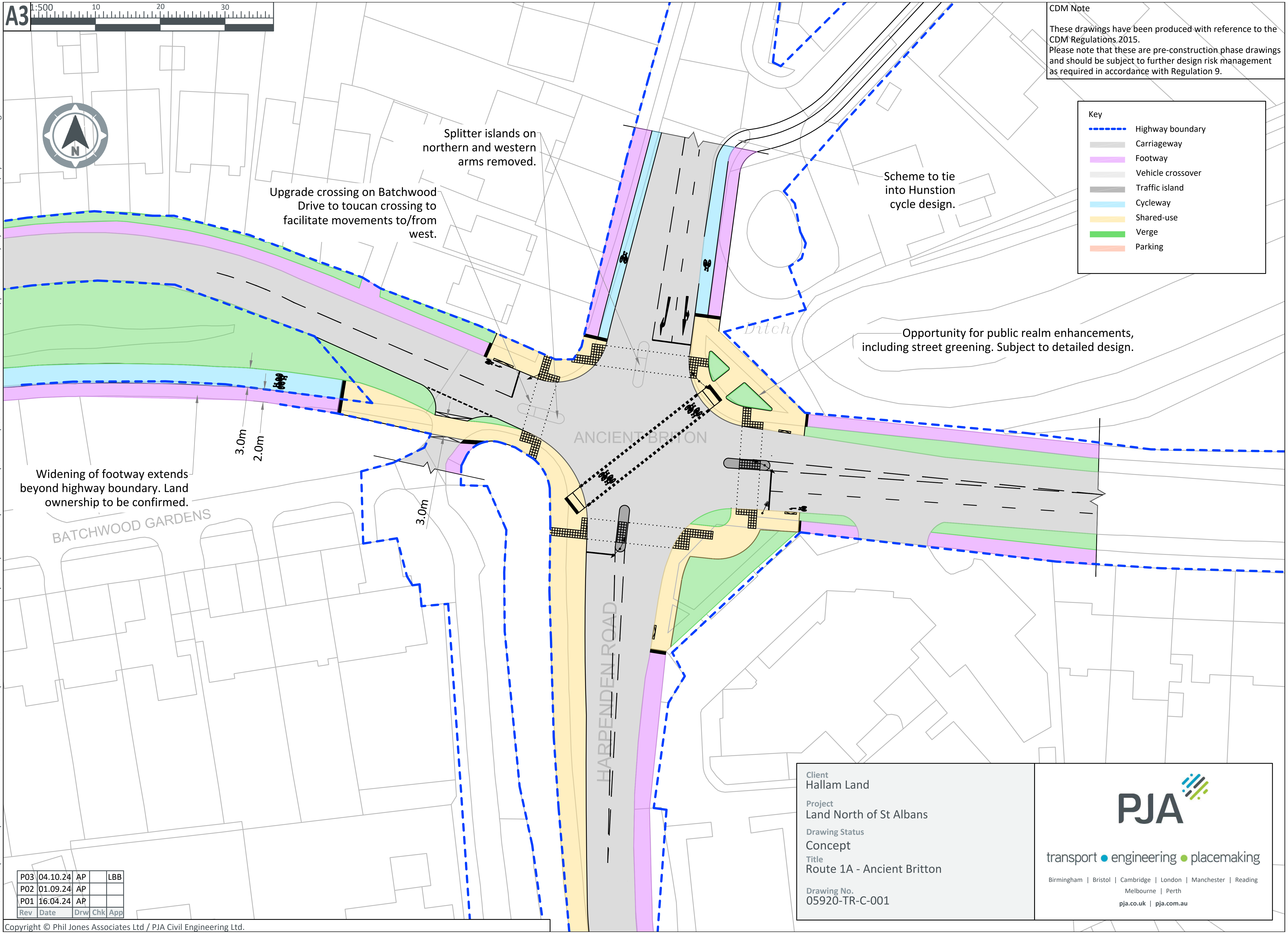
Define.

WORK IN PROGRESS

Scale	Various
Date	28/05/2024
Drawn By	KE
Revision	-

Hallam	Client
North St Albans Project	
Landscape Cross Sections	Title
DE565-NSA-107	Ref.

Appendix F Ancient Briton and King William IV Active Travel Improvements



A3 1:500
10
20
30
CDM Note
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Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9.
Key
Highway boundary
Carriageway
Footway
Vehicle crossover
Traffic island
Cycleway
Shared-use
Verge
Parking
N
Splitter islands on northern and western arms removed.
Upgrade crossing on Batchwood Drive to toucan crossing to facilitate movements to/from west.
Scheme to tie into Hunstion cycle design.
Opportunity for public realm enhancements, including street greening. Subject to detailed design.
Ditch
ANCIENT BRITON
3.0m
2.0m
3.0m
Widening of footway extends beyond highway boundary. Land ownership to be confirmed.
BATCHWOOD GARDENS
HARPENDEN ROAD
File name C:\PJA NEW\ONEDRIVE - PHIL JONES ASSOCIATES\05920 NORTH ST ALBANS\A- ENG\2 - DESIGN\DRAWINGS\CURRENT\05920-TR-C-006 - MARK UP.DWG, printed on 04/10/2024 11:48:23, by Alex Painting
P03 04.10.24 AP LBB
P02 01.09.24 AP
P01 16.04.24 AP
Rev Date Drw Chk App
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Client
Hallam Land
Project
Land North of St Albans
Drawing Status
Concept
Title
Route 1A - Ancient Britton
Drawing No.
05920-TR-C-001
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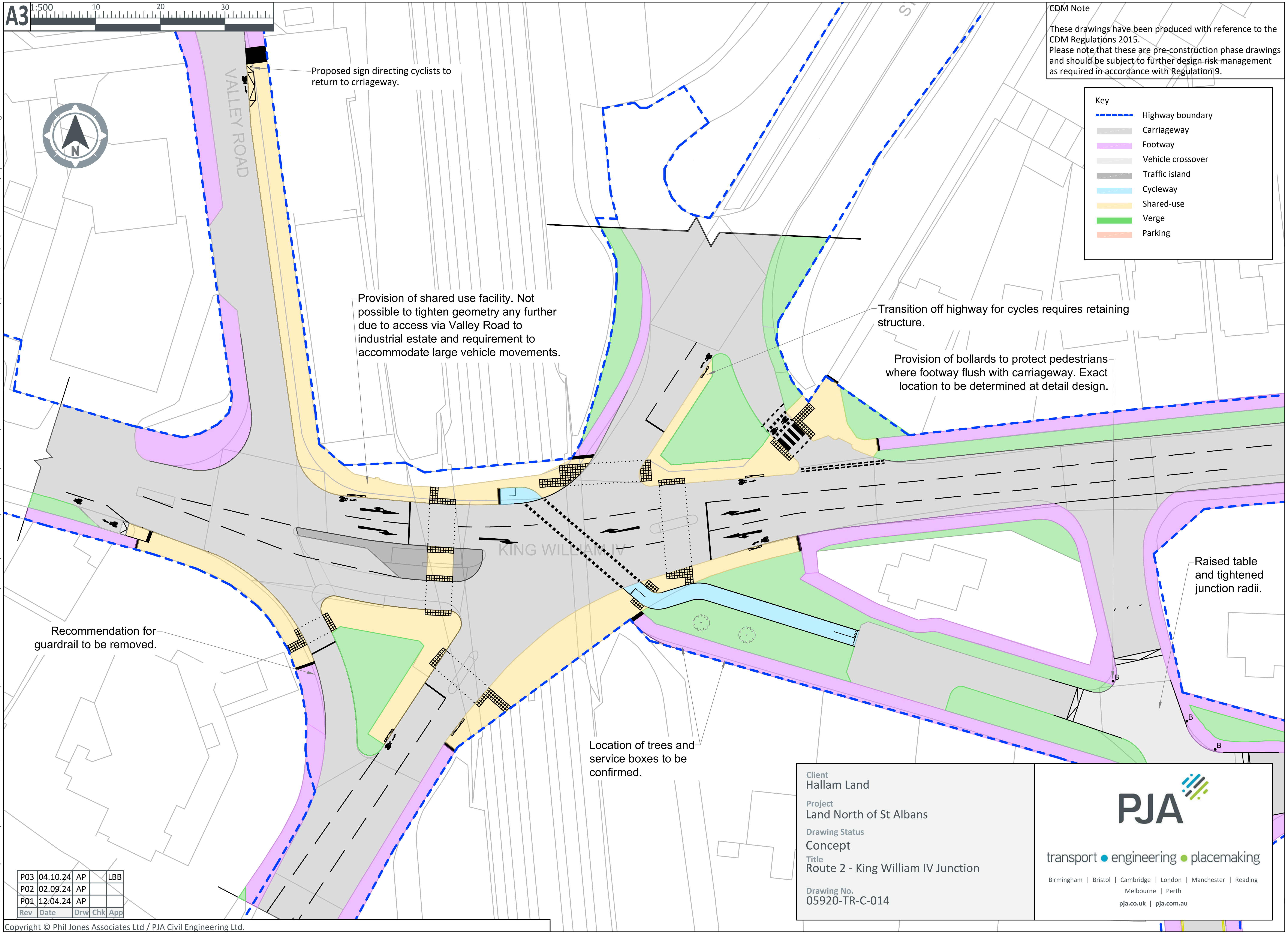

CDM Note

These drawings have been produced with reference to the CDM Regulations 2015.
Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9.

Key

- Highway boundary
- Carriageway
- Footway
- Vehicle crossover
- Traffic island
- Cycleway
- Shared-use
- Verge
- Parking

File name C:\PJA NEW\ONEDRIVE - PHIL JONES ASSOCIATES\05920 NORTH ST ALBANS\A- ENG\2 - DESIGN\DRAWINGS\CURRENT\05920-TR-C-006 - MARK UP.DWG, printed on 04/10/2024 12:41:08, by Alex Painting

Rev	Date	Drw	Chk	App
P03	04.10.24	AP		LBB
P02	02.09.24	AP		
P01	12.04.24	AP		

Client
Hallam Land

Project
Land North of St Albans

Drawing Status
Concept

Title
Route 2 - King William IV Junction

Drawing No.
05920-TR-C-014

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Appendix G Public Transport Cost / Revenue Calculations

Year			1	2	3	4	5	6	7	8	9	10
Years real	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Housing units delivered			100	100	100	100	100	100	100	100	100	100
Housing units cummulative			100	200	300	400	500	600	700	800	900	1000
Mode share bus current			1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%
Mode Share target			10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Inflation general (OBR)	10.0%	3.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Inflation bus opex (CPT)	15.0%	5.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

Age			Pop	%	Corrected
0-5			8,555	5.8%	0.0%
5 to 16			23,397	15.7%	16.7%
16 to 65			90,992	61.2%	64.8%
65 +			25,697	17.3%	18.4%
Total			148,641	100.0%	100.0%

Trip Rate / dwelling / day			8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Internalisation			50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Net trip rate / dwelling day			4	4	4	4	4	4	4	4	4	4

Journeys / day												
5 to 16			6	13	19	25	31	38	44	50	57	63
16 to 65			24	49	73	98	122	147	171	196	220	245
65 +			7	14	21	28	35	41	48	55	62	69

Annualiser			
5 to 16			190
16 to 65			252
65 +			305

Journeys / annum												
5 to 16			1196	2393	3589	4785	5981	7178	8374	9570	10767	11963
16 to 65			6171	12341	18512	24682	30853	37023	43194	49365	55535	61706
65 +			2109	4218	6327	8437	10546	12655	14764	16873	18982	21091

Adult Fare Yield to Bus Op (not what the passenger sees)	£2.50	£2.75	£2.83	£2.89	£2.95	£3.01	£3.07	£3.13	£3.19	£3.25	£3.32	£3.39
Fares - proportion of adult fare												
U16	50.0%											
Concessions	60.0%											

Annual Revenue												
5 to 16 (half fare)			£1,694.24	£3,456.25	£5,288.06	£7,191.77	£9,169.50	£11,223.47	£13,355.93	£15,569.20	£17,865.66	£20,247.74
16 to 65			£17,478.13	£35,655.39	£54,552.75	£74,191.74	£94,594.47	£115,783.63	£137,782.52	£160,615.05	£184,305.77	£208,879.87
65 + 60% reimbursement)			£3,584.47	£7,312.32	£11,187.84	£15,215.47	£19,399.72	£23,745.26	£28,256.86	£32,939.42	£37,797.99	£42,837.72
Total income			£22,756.84	£46,423.96	£71,028.66	£96,598.97	£123,163.69	£150,752.36	£179,395.31	£209,123.67	£239,969.41	£271,965.33

Estimated Opex Costs												
1 bus	£170,000.00	£178,500.00	£183,855.00	£189,370.65	£195,051.77	£200,903.32	£206,930.42	£213,138.33	£219,532.48	£226,118.46	£232,902.01	£239,889.07
2 buses	£340,000.00	£357,000.00	£367,710.00	£378,741.30	£390,103.54	£401,806.65	£413,860.84	£426,276.67	£439,064.97	£452,236.92	£465,804.03	£479,778.15
Nett Position by Year			£161,098.16	£142,946.69	£124,023.11	£104,304.35	£83,766.73	£62,385.98	£40,137.18	£16,994.79	-£7,067.40	-£32,076.26

Outcomes												
Year			1	2	3	4	5	6	7	8	9	10
Years real	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Units			100	100	100	100	100	100	100	100	100	100
Units cummulative			100	200	300	400	500	600	700	800	900	1000
Mode share bus current			1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%
Mode Share target			10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Journeys / annum												
5 to 16			1196	2393	3589	4785	5981	7178	8374	9570	10767	11963
16 to 65			6171	12341	18512	24682	30853	37023	43194	49365	55535	61706
65 +			2109	4218	6327	8437	10546	12655	14764	16873	18982	21091
Adult Fare Equivalent	£2.50	£2.75	£2.83	£2.89	£2.95	£3.01	£3.07	£3.13	£3.19	£3.25	£3.32	£3.39
5 to 16 (half fare)			£1,694.24	£3,456.25	£5,288.06	£7,191.77	£9,169.50	£11,223.47	£13,355.93	£15,569.20	£17,865.66	£20,247.74
16 to 65			£17,478.13	£35,655.39	£54,552.75	£74,191.74	£94,594.47	£115,783.63	£137,782.52	£160,615.05	£184,305.77	£208,879.87
65 + 60% reimbursement)			£3,584.47	£7,312.32	£11,187.84	£15,215.47	£19,399.72	£23,745.26	£28,256.86	£32,939.42	£37,797.99	£42,837.72
Total income			£22,756.84	£46,423.96	£71,028.66	£96,598.97	£123,163.69	£150,752.36	£179,395.31	£209,123.67	£239,969.41	£271,965.33
Costs												
1 bus	£170,000.00	£178,500.00	£183,855.00	£189,370.65	£195,051.77	£200,903.32	£206,930.42	£213,138.33	£219,532.48	£226,118.46	£232,902.01	£239,889.07
Nett Position by Year			£161,098.16	£142,946.69	£124,023.11	£104,304.35	£83,766.73	£62,385.98	£40,137.18	£16,994.79	-£7,067.40	-£32,076.26

Appendix H Travel Demand Model and Mobile Network Data Technical Note

Technical Note

Project: Woollam Park, North St Albans

Subject: Travel Demand Model and Mobile Network Data Technical Note

Client:	Hallam Land Management Limited, St Albans School and St Albans School Woollam Trust		
Project No:	05920	**Version:**	1
Document Ref:	05920-T-13-A	**Author:**	KN
Date:	28/11/2024	**Approved:**	MM

1 Introduction

1.1.1 This Technical Note provides further details on the development and outputs of the multi-modal Travel Demand Model (TDM) and the specification and use of the mobile network data (MND). This supplements the overview provided within the Transport Assessment.

2 Travel Demand Model

2.1 Introduction

2.1.1 It has been agreed in scoping discussions with HCC that a comprehensive TDM will be used to understand baseline and future trip making patterns at the proposed development and within existing nearby communities.

2.1.2 This provides a more granular approach than a strategic model would provide (such as the existing strategic traffic model "COMET"). It allows for the detailed consideration of likely future journeys and has informed the development of the transport strategy, to best accommodate these movements.

2.1.3 It draws on local data to provide a more accurate representation of how future residents at Woollam Park will travel. It also considers wider movements which could be influenced by the proposed transport strategy.

2.2 Travel Demand Model Principles

2.2.1 The TDM is a four-stage model that considers trip generation, trip distribution, assignment and mode share with a summary shown in Figure 1. The TDM is broken down into two elements:

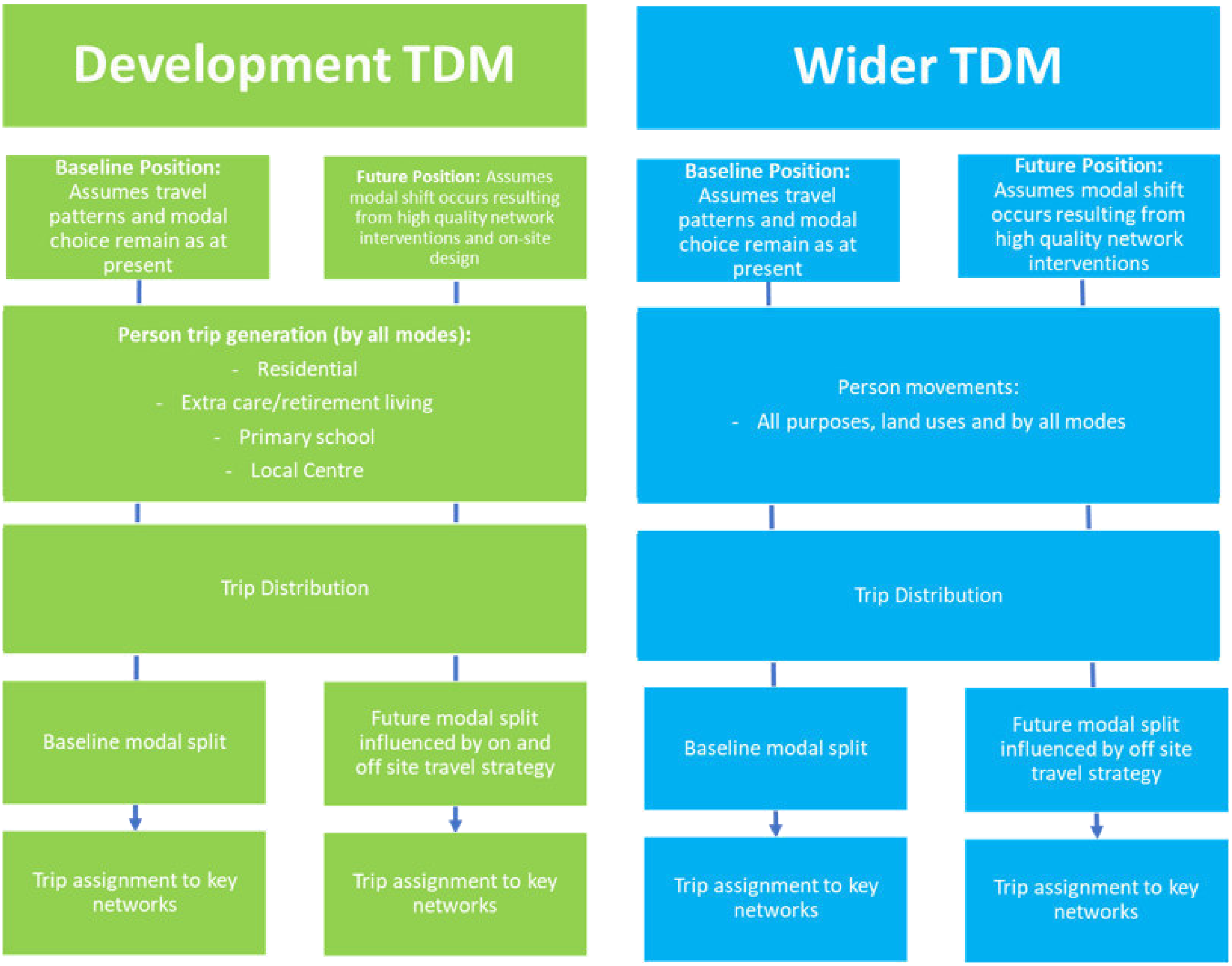
- **Development** – This captures trips to and from the proposed development as well as those internal to the development.
- **Background** – This captures trips along adjacent networks but which do not enter/exit the development.

2.2.2 There are two broad scenarios considered within the TDM:

- **Core/Baseline** – This is based on current travel patterns, i.e., a 'business as usual' scenario which assumes car use continues with historic trends. It draws on data from the existing neighbouring area of New Greens and the travel patterns in place there. This provides a good proxy for the proposed development in terms of its proximity to St Albans, access to facilities and demographics.
- **Modal Shift** – This is based on more aspirational travel patterns, i.e., resulting from sustainable travel interventions. It is based on data and evidence to understand the potential modal shift which could occur for those journeys which would be directly affected by the proposed transport strategy interventions (i.e., not a blanket application of modal shift but a targeted one). '*Low*' and '*high*' modal shift scenarios are considered.

2.2.3 The TDM considers typical weekday morning, evening peak and daily periods.

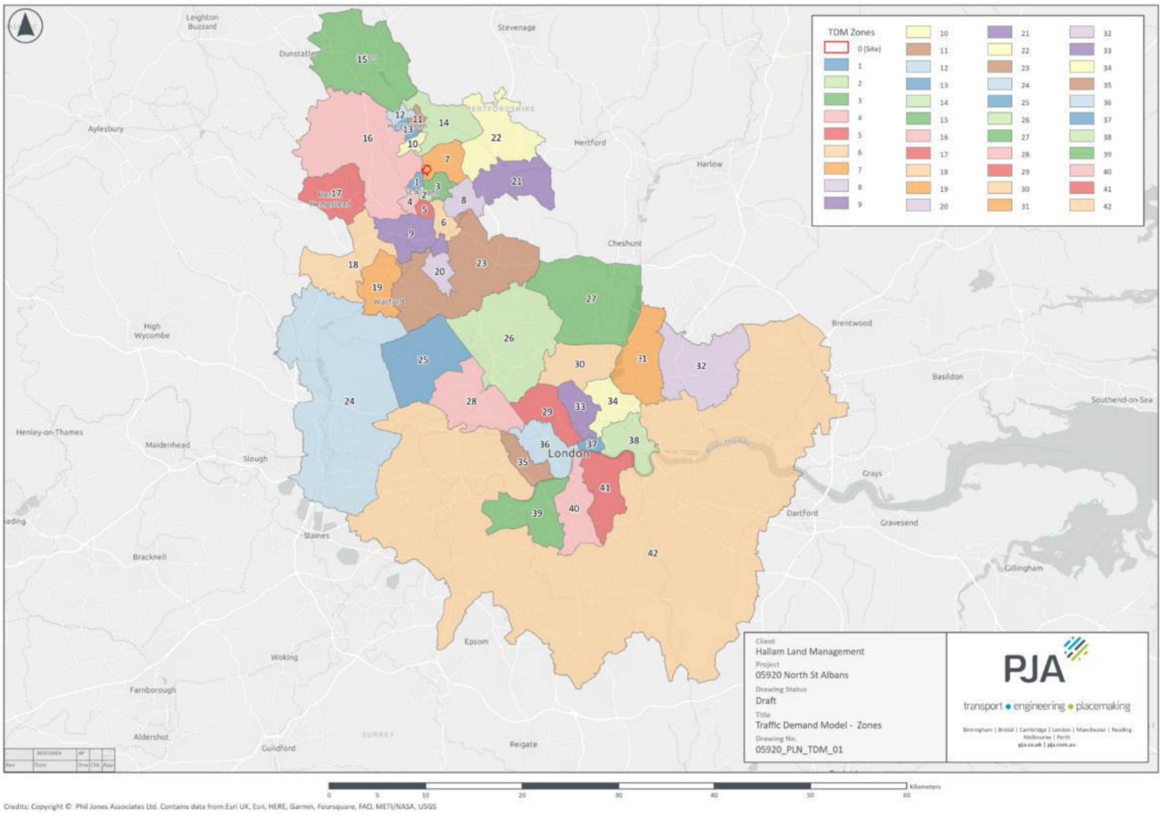
Figure 1: Travel Demand Model Principles



Geographic Scope

2.2.4 The geographic scope of the TDM is illustrated in Figure 2. The geographic scope has been determined to understand travel behaviours on a small scale (i.e., within proximity of the site) and a wider level (i.e., St Albans and the surrounding counties and region). The coverage/zoning is shown in Figure 2 and has been agreed with HCC. This zoning also allows an understanding of background trips which could be influenced by the proposed transport strategy.

Figure 2: Travel Demand Model Zone Coverage



Data Inputs and Outline Approach

The TDM calculations have been informed by various datasets. A summary of the approach to each element of the four stage TDM and the data inputs is provided in Table 1-1.

Table 1: TDM Data Inputs

TDM Element / Scenario	Core/Baseline	Aspirational
Development	• **Trip Generation:** Donor site surveys, TRICS • **Trip Distribution:** Mobile network data for proxy area. • **Modal Split:** Mobile network data / HCC Travel Survey. • **Vehicle Trip Assignment:** Traffic congestion data to inform routing of trip distribution of vehicle trips.	• **Person trip generation and distribution:** Fixed from Core/Baseline • **Modal Split:** PCT Data applied to journeys where proposed interventions are to understand modal shift from baseline. • **Vehicle Trip Assignment:** Traffic congestion data to inform routing of trip distribution of revised vehicle trips.
Background	• **Trip generation, distribution, modal split:** Mobile network data for journeys within defined zones. • **Vehicle Trip Assignment**: Traffic congestion data to inform routing of trip distribution.	• **Person trip generation and distribution:** Fixed from Core/Baseline. • **Modal Split:** PCT Data applied to journeys where proposed interventions are to understand modal shift from baseline. • **Vehicle Trip Assignment:** Traffic congestion data to inform routing of trip distribution of revised vehicle trips.

2.2.5 A detailed summary of the approach is provided in Table 2.

Table 2: TDM Detailed Approach

Element	Dataset/Method	Data Coverage
	Development TDM (Development Only Trips)	
Trip Generation		
Residential trip generation	Local surveys to inform multi-modal trip generation. A comparison to standard TRICS assessment also included in the TA.	-
Local Centre trip generation	The purpose of the local centre is to facilitate daily needs of residents with limited off-site pull and therefore no additional external trip generation has been allowed for. No discounts have been applied to the potential for trips to local centre to remain internal to the development.	-
Primary School trip generation	TRICS Person Trip Rates – Primary School - Person trip generation utilised to forecast total number of trips generated by all modes.	-
Retirement accommodation trip generation	TRICS Person Trip Rates – Specialist Retirement - Person trip generation utilised to forecast total number of trips generated by all modes.	-
Trip Distribution - Residential Land Use (including retirement specialist accommodation)		
Journey Purpose	Trip distribution has been taken from O/D pairs within the mobile network data and presented by journey purpose for information and to help shape the transport strategy. 'Other' trips have been broken down further by: - TEMPro splits for leisure/recreation, retail, education, personal business, visit, holiday. - MND locations/GIS analysis to look at destinations of these journeys to categorise purpose.	From MND: Area: St Albans 009 MSOA (or St Albans 009C LSOA for internalisation %) Purposes: **Home**-Work, **Home**-Other, Other-**Home**, Work-**Home**, **Home**-**Home**. Date Range: w/c 08/09/2022, 10/10/2022, 06/03/2023, 12/06/2023. Time Periods: Weekday AM Peak (06-10), PM Peak (15-18), Daily (07-19). For retirement living – age segmented data has been used for age 60+.
Distribution of Employment (Commuting and Business) Trips		
Distribution of Education Trips		
Distribution of Retail/Leisure and Other Trips		

		For standard residential – all age segments utilised.
Trip Distribution – School (On-site)		
Trip Distribution	National Travel Survey NTS0613 – Trips to and from school by main mode - To determine average distance and mode of travel for education trips to primary school (2.9km) School places distributed to development (forecast population) and local MSOAs within 2.9km with the distribution calculated using a population / distance^2 relationship gravity model.	UK dataset, cut down to MSOAs within 2.9km
Modal Share - Baseline		
Residential	Extracted from MND and disaggregated 'Road' modes using HCC Travel Survey.	From MND: Area: St Albans 009 MSOA (or St Albans 009C LSOA) Purposes: Home-Work, Home-Other, Other-Home, Work-Home, Home-Home. Date Range: Full week start date: [08/09/2022, 10/10/2022, 06/03/2023, 12/06/2023] Time Periods: AM Peak (06-10) PM Peak (15-18) Daily (07-19) For retirement living – age segmented data has been used for age 60+ For standard residential – all age segments utilised.
School	HCC Travel Surveys have informed baseline modal split for education journeys.	County level dataset for education journeys. Main mode to school by age (primary, aged 5-10 years).

Modal Share – Future/Aspirational		
Active Travel Modal Share	Considered proposed active travel strategy and forecast uplift in cycling trips where O/D of journeys originating from / terminating at the site - utilising Propensity to Cycle Tool data (Go Dutch scenario and Government Target) to forecast the 'high' and 'low' modal split.	Applied to journeys to/from the development within a 400m buffer of proposed active travel network improvements.
Public Transport Modal Share	No additional modal shift assumed. Proposed service coverage is comparable to existing service within New Greens area.	-
Vehicle Modal Share	Resulting uplift in active travel has been deducted from vehicle mode share.	In line with active travel geographic influence.
Background TDM (Existing Trips on the Network)		
Distribution of Travel Movements		
Current/Proposed	MND for existing O/D pairs utilised to understand current travel patterns across the network by mode and journey purpose.	MND: Area: All Zones Purposes: Home-Work, Home-Other, Other-Home, Work-Home, Work-Other, Other-Work, Home-Home, Work-Work, Other-Other Date Range: w/c 08/09/2022, 10/10/2022, 06/03/2023, 12/06/2023. Time Periods: Weekday AM Peak (06-10), PM Peak (15-18), Daily (07-19). Age segments: all
Modal Share		
Current	Utilised MND to calculate the proportion of trips by mode: Road. Rail. Walking. Underground.	MND: Area: All Zones

	Disaggregated further using Hertfordshire Travel Survey.	Purposes: Home-Work, Home-Other, Other-Home, Work-Home, Work-Other, Other-Work, Home-Home, Work-Work, Other-Other Date Range: w/c 08/09/2022, 10/10/2022, 06/03/2023, 12/06/2023. Time Periods: Weekday AM Peak (06-10), PM Peak (15-18), Daily (07-19). Age segments: all
Proposed	Active Travel - Consider proposed active travel strategy and forecast uplift in cycling trips where O/D of journeys both sit influence of active travel strategy - utilising Propensity to Cycle Tool data (Go Dutch and Government Target) to forecast the 'high' and 'low' modal split. Public Transport – It is unlikely the proposed public transport strategy will increase public transport modal share across existing journeys. Vehicle - Resulting uplift in active travel to be deducted from baseline vehicle mode share.	Applied to journeys to/from the development within a 400m buffer of proposed active travel network improvements.

2.3 TDM Outputs

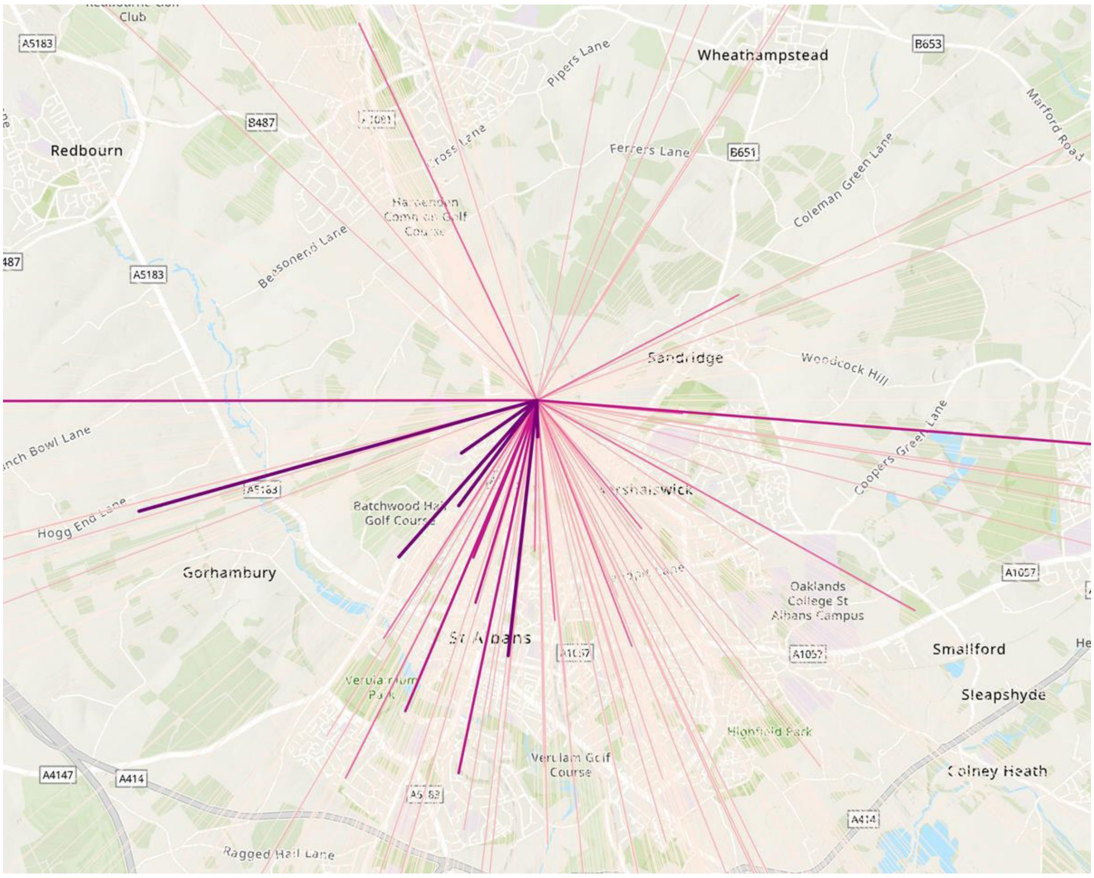
2.3.1 The resulting distribution of development trips by mode (expressed as origin/destination pairs), is provided in Appendix A of this Technical Note.

2.4 TDM Insights

2.4.1 Some key insights are included below to demonstrate the strategy developed and the use of the MND and TDM. The forecast distribution of vehicle based trips generated by the proposed development are illustrated in Figure 3. The darker the colour, the more trips there are going to an area.

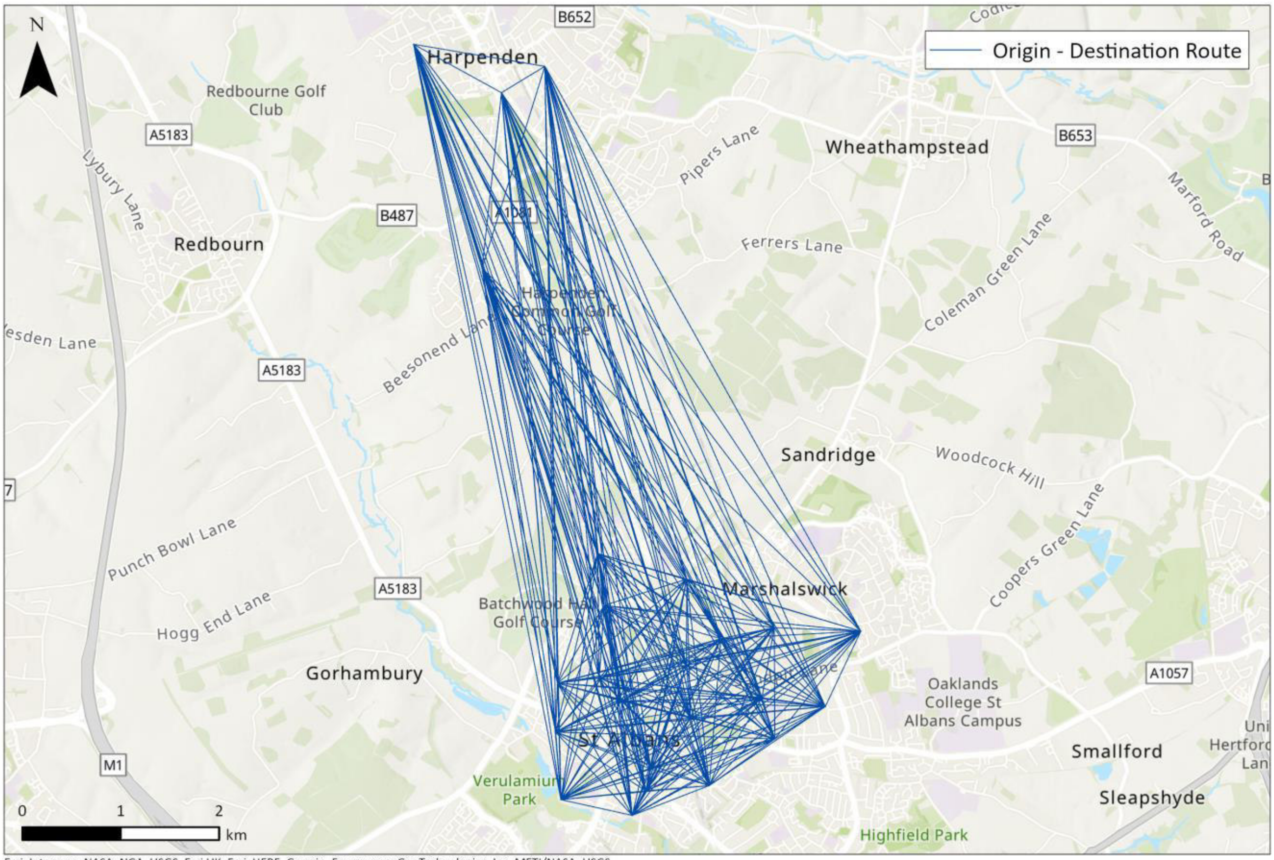
2.4.2 This figure demonstrates a proportion of trips travelling longer distances to North London, Hemel Hempstead, Luton but a sizeable pull of vehicle trips to areas within St Albans, less than 5km. These shorter distance trips are a good target for influencing travel behaviour and uptake of sustainable modes. In this respect, it has helped to steer the active travel strategy and where improvements could be implemented with interventions proposed to improve connectivity to New Greens, area around the hospital, St Albans City Centre, City railway station and Marshalswick.

Figure 3: Proposed Development Vehicle Trip Distribution



2.4.3 For wider/background trips, consideration has been given to trips within Harpenden/St Albans which could be influenced by the proposed active travel strategy. Figure 4 demonstrates a large number of desire lines, representing tens of thousands of vehicle trips daily, which could be undertaken by active travel modes with the implementation of the proposed active travel improvements.

Figure 4: Existing Background Vehicle Trips O/D Pairs



Esri, Intermap, NASA, NGA, USGS, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

3 Mobile Network Data

3.1 Introduction

3.1.1 Mobile network data (MND) has been obtained from BT who hold data captured by mobile phones operating on the EE network. This dataset therefore provides a good sample size, representing approximately one third of the UK population. It provides real life insights into daily journeys capturing:

- How people travel (mode choice).
- Where people travel (trip distribution).
- The time and days they travel (temporal distribution).

3.1.2 This recorded mobile phone information is overlaid by BT, with land use and other information. BT then utilise this with algorithms to categorise the journeys by purpose and to add in extra information relating to demographics. All data is anonymised but its power is in the sheer number of data points collected providing reliable insights to travel behaviour.

3.2 Data Granularity

3.2.1 The MND provided by BT is sophisticated and granular, providing local level insights. The dataset used (GeoMND) is a much improved dataset compared to traditional MND dataset. As demonstrated in the example in Figures 5 and 6, traditional MND provides information at a higher geographic level ('cell' based). Due to investment in the EE network and improved detection, the data utilised in this assessment is captured at a much more detailed level allowing for better insights, particularly for shorter distance journeys.

Figure 5: Data Granularity

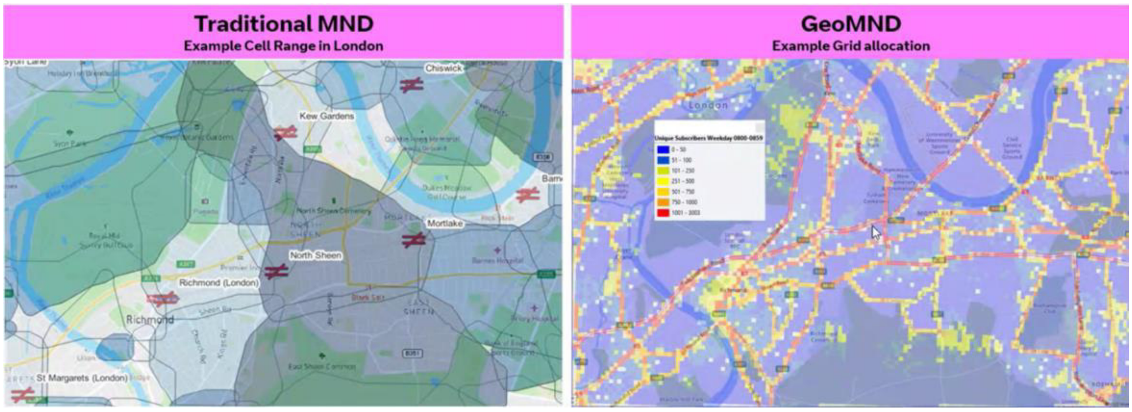


Figure 6: MND Accuracy Levels

	Traditional MND	BT's GeoMND
Location Accuracy	Cell radius: 300m to 15km. Mean size: $4km^2$	50x50m grid squares Mean size: $0.0025km^2$
Average number of data points per day	58 per device	332 per device
Average number of data points per hour of travel (road, rail, walking)	6 per device	54 per device

3.3 Data Extracted

3.3.1 The specification of the MND provided by BT for use in the assessment is summarised in Table 2.

Table 3: Data Specification

Data	Specification
Journey Purpose	Home-Home Home-Work Home-Other Work-Home Work-Other Work-Work Other-Home Other-Work Other-Other
Mode of Travel	Road Rail Walk Other
Date Ranges	Data has been averaged over four 'neutral' weeks during 2022/2023: w/c 8th September 2022 w/c 10th October 2022 w/c 6th March 2023 w/c 1st June 2023
Time Periods	Weekday: AM Peak (06:00 to 10:00) Interpeak (10:00 to 15:00) PM Peak (15:00 to 19:00) Weekend: All day

3.4 Data Validation and Integrity

3.4.1 Various checks have been undertaken to consider the data integrity to include:

- Consideration of suppression (data points which have been removed from the dataset to retain anonymity of mobile phone users).
- Comparisons to other datasets to validate the MND.

Data Suppression

3.4.2 A summary of the suppression is shown in Table 4. The 'records' represent a mobile phone device and the 'trips' represent the journeys that a mobile phone is taken on.

3.4.3 Whilst just over three quarters of 'records' are suppressed, only just over a quarter of trips are suppressed. This therefore is predominantly picking up devices/people undertaking regular journeys in the modelled area. Additionally, the records suppressed are across those origin/destination pairs within the zones where fewer journeys are happening, outside of the core St Albans area so does not unduly affect the analysis. As such, the level of suppression is deemed to be acceptable.

Table 4: Data Suppression

Dataset	Total Records	Suppressed Records (values of <10)	% of Records	Total Trips	Suppressed Trips	% Trips Suppressed
MND	7,105,440	5,425,312	76.4%	94,498,825	26,045,493	27.6%

Data Validation

3.4.4 BT has undertaken validation checks against national datasets to ensure the MND is appropriate. This includes a comparison of the following to the National Travel Survey for the East of England. PJA has also considered the HCC Travel Survey statistics as a basis for comparison. This has been considered for proportion of journeys covered by distance/length and the modal share.

Trip length

3.4.5 A summary of the BT comparison to the NTS is provided in Table 5 and a comparison to the HCC travel survey is provided in Table 6 (noting differing trip length bands from HCC travel survey).

Table 5: MND Comparison to NTS – Trip Length (Source: BT)

Length	Total Trips	%	NTS EE 2021	EE 2021 %	NTS EE 2019	NTS EE 2019 %
<1mile	26,041,315	**19%**	211	**25%**	223	**22%**
1-2miles	16,924,618	**13%**	184	**22%**	173	**17%**
2-5miles	26,667,383	**20%**	195	**23%**	245	**25%**
5-10miles	17,321,183	**13%**	112	**13%**	145	**15%**
10-25miles	20,035,345	**15%**	92	**11%**	146	**15%**
25-50miles	10,943,052	**8%**	27	**3%**	45	**4%**
50-100miles	7,786,592	**6%**	7	**1%**	16	**2%**
>100miles	7,919,510	**6%**	5	**1%**	7	**1%**
Total	133,638,998		834		998	

3.4.6 There are fewer shorter distance trips but the proportions of trip by length are broadly comparable. The NTS is for the whole region and so differences are not unexpected.

Table 6: MND Comparison to HCC Travel Survey – Trip Length

Trip Length	MND 2022/23 %	HCC 2022/23 % (All weekday)
Less than 1 mile	26%	21.9%
1-3 miles	35%	30.1%
3-5 miles	12%	12%
5-10 miles	14%	14.3%
10-15 miles	5%	6.9%
15-20 miles	2%	4.8%
20-30 miles	6%	4.6%
30-40 miles	1%	3.0%
40-50 miles	0%	0.8%
50+ miles	1%	1.6%
Total	**100%**	**100%**

3.4.7 The MND and HCC travel survey datasets are comparable and follow a similar split of trip lengths across the varying distances. Therefore, it has been demonstrated that the MND dataset validates appropriately for the proportion of journeys by length/distance.

Modal Split

3.4.8 A summary of the modal splits from the MND along with the comparison to the NTS and HCC travel survey is provided in Table 7.

Table 7: MND Comparison to NTS and HCC Travel Survey

Mode	MND %	NTS 2021 EE%	NTS 2019 EE%	HCC Travel Survey %
Road	77%	69%	73%	67%
Rail	8%	1%	3%	6%
Walking	15%	30%	24%	27%
Other	0%	0%	0%	0%

3.4.9 Comparing the modal splits from the different datasets:

- There are fewer walking and more road trips in the MND than in the NTS and HCC datasets. The differences are however likely to be due to the large zonal coverage in the MND; comparing the MND dataset for St Albans 009 alone, the proportions are more comparable to the HCC travel survey.
- Rail trips are higher in the MND dataset compared to the NTS, this is likely due to the NTS representing regional behaviour and the potential for lesser coverage by rail across the region. However, the MND and HCC datasets are comparable for rail trips.

3.4.10 As such, it is deemed that the MND validates appropriately to the other datasets considered.

Appendix A TDM Outputs – Multi-modal Trip Distribution (O/D Pairs)

RESIDENTIAL - MULTI-MODAL TRIP DISTRIBUTION

	AM		PM		Daily	
Road	Arrival	Departure	Arrival	Departure	Arrival	Departure
0- Site	0	0	0	0	0	0
1	51	41	35	36	333	423
2	49	53	53	44	422	520
3	29	82	57	42	397	489
4	27	46	34	30	273	347
5	15	15	18	19	177	218
6	8	22	19	12	134	145
7	27	34	28	20	250	239
8	6	22	14	9	110	111
9	3	12	11	6	80	69
10	0	3	2	1	11	8
11	1	7	3	1	17	15
12	1	1	2	1	14	15
13	2	9	8	4	59	51
14	2	13	11	6	72	69
15	4	19	15	9	92	106
16	31	35	30	24	259	278
17	8	24	20	10	130	114
18	2	12	9	4	54	49
19	1	12	10	6	58	70
20	0	1	0	0	6	6
21	4	18	16	11	112	132
22	2	20	12	6	82	72
23	3	25	18	6	106	71
24	2	15	9	4	66	51
25	0	1	1	1	7	14
26	0	6	4	2	28	19
27	3	12	7	3	49	33
28	0	2	2	2	16	21
29	0	2	1	1	7	10
30	0	1	0	1	5	12
31	2	8	6	3	38	33
32	2	7	6	3	36	31
33	0	0	0	0	4	2
34	0	1	1	0	4	0
35	0	1	0	0	3	4
36	0	2	2	1	12	15
37	0	0	0	0	2	2
38	0	0	0	0	2	2
39	0	0	0	0	1	0
40	0	0	0	0	1	0
41	0	0	0	0	1	0
42	0	0	0	0	0	0
	287	588	466	330	3529	3867

	AM		PM		Daily	
Road - Cycle	Arrival	Departure	Arrival	Departure	Arrival	Departure
0- Site	0	0	0	0	0	0
1	2	2	1	2	14	18
2	2	2	2	2	18	22
3	1	3	2	2	17	21
4	1	2	1	1	12	15
5	1	1	1	1	7	9
6	0	1	1	0	5	6
7	1	1	1	1	11	10
8	0	1	1	0	4	4
9	0	0	0	0	3	3
10	0	0	0	0	0	0
11	0	0	0	0	1	1
12	0	0	0	0	1	1
13	0	0	0	0	3	2
14	0	1	0	0	3	3
15	0	1	0	0	3	3
16	1	1	1	1	10	11
17	0	1	1	0	4	4
18	0	0	0	0	2	2
19	0	0	0	0	2	2
20	0	0	0	0	0	0
21	0	1	1	0	4	4
22	0	1	0	0	3	2
23	0	1	1	0	3	2
24	0	0	0	0	2	2
25	0	0	0	0	0	0
26	0	0	0	0	1	1
27	0	0	0	0	2	1
28	0	0	0	0	1	1
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	0	0	1	1
32	0	0	0	0	1	1
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
	12	23	18	13	138	153

AM

Road - MC/Moped	Arrival	Departure
0- Site	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
	1	1

Road - Scooter/E-Scooter	Arrival	Departure
0- Site	0	0
1	0	0
2	0	0
3	0	1
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
	2	4

PM

Road - MC/Moped	Arrival	Departure
0- Site	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
	1	1

Road - Scooter/E-Scooter	Arrival	Departure
0- Site	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
	3	2

Daily

Road - MC/Moped	Arrival	Departure
0- Site	0	0
1	1	1
2	1	1
3	1	1
4	1	1
5	0	0
6	0	0
7	1	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
	6	7

Road - Scooter/E-Scooter	Arrival	Departure
0- Site	0	0
1	3	3
2	3	4
3	3	4
4	2	3
5	1	2
6	1	1
7	2	2
8	1	1
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	1	1
17	1	1
18	0	0
19	0	0
20	0	0
21	1	1
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
	23	26

	AM		PM		Daily	
Road - Bus	Arrival	Departure	Arrival	Departure	Arrival	Departure
0- Site	0	0	0	0	0	0
1	2	1	1	1	11	14
2	2	2	2	1	14	17
3	1	3	2	1	13	16
4	1	1	1	1	9	11
5	0	0	1	1	6	7
6	0	1	1	1	6	6
7	1	1	1	1	8	8
8	0	1	1	0	5	5
9	0	1	0	0	3	3
10	0	0	0	0	0	0
11	0	0	0	0	1	1
12	0	0	0	0	1	1
13	0	0	0	0	2	2
14	0	1	0	0	3	3
15	0	1	1	0	4	5
16	1	2	1	1	11	12
17	0	1	1	0	6	5
18	0	1	0	0	3	2
19	0	1	0	0	3	3
20	0	0	0	0	0	0
21	0	1	1	1	5	6
22	0	1	1	0	4	3
23	0	1	1	0	5	3
24	0	1	0	0	3	2
25	0	0	0	0	0	1
26	0	0	0	0	1	1
27	0	1	0	0	2	2
28	0	0	0	0	1	1
29	0	0	0	0	0	0
30	0	0	0	0	0	1
31	0	0	0	0	2	2
32	0	0	0	0	2	1
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	1	1
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
	10	23	18	12	136	146

Road - Car/Van Driver	Arrival	Departure	Arrival	Departure	Arrival	Departure
0- Site	0	0	0	0	0	0
1	31	25	21	21	198	252
2	29	32	32	26	252	310
3	17	49	34	25	236	291
4	16	28	20	18	163	207
5	9	9	11	11	106	130
6	5	13	12	8	81	88
7	16	20	17	12	149	142
8	4	13	9	6	67	67
9	2	8	6	4	49	42
10	0	2	1	0	6	5
11	1	5	2	1	10	9
12	1	0	1	1	8	9
13	1	5	5	3	35	31
14	1	8	7	4	43	42
15	3	12	9	6	57	65
16	19	22	18	14	157	169
17	5	14	12	6	79	70
18	1	7	5	3	33	30
19	1	7	6	4	36	43
20	0	1	0	0	4	4
21	2	11	10	7	69	81
22	1	12	7	4	50	44
23	2	15	11	4	65	43
24	1	10	6	3	41	31
25	0	1	1	1	4	9
26	0	4	2	1	17	12
27	2	7	4	2	30	21
28	0	1	1	1	10	13
29	0	1	1	1	4	6
30	0	0	0	1	3	7
31	1	5	4	2	23	21
32	1	5	4	2	22	20
33	0	0	0	0	2	1
34	0	1	1	0	2	0
35	0	1	0	0	2	2
36	0	1	1	1	7	10
37	0	0	0	0	1	1
38	0	0	0	0	1	1
39	0	0	0	0	1	0
40	0	0	0	0	1	0
41	0	0	0	0	1	0
42	0	0	0	0	0	0
	172	355	281	199	2127	2328

AM			PM			Daily		
Road - Car/Van Passenger	Arrival	Departure	**Road - Car/Van Passenger**	Arrival	Departure	**Road - Car/Van Passenger**	Arrival	Departure
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	16	13	**1**	11	11	**1**	104	133
2	15	17	**2**	17	14	**2**	133	163
3	9	26	**3**	18	13	**3**	125	153
4	9	15	**4**	11	9	**4**	86	109
5	5	5	**5**	6	6	**5**	56	68
6	2	6	**6**	6	4	**6**	39	43
7	9	11	**7**	9	6	**7**	79	75
8	2	6	**8**	4	3	**8**	32	33
9	1	4	**9**	3	2	**9**	24	20
10	0	1	**10**	1	0	**10**	3	2
11	0	2	**11**	1	0	**11**	5	5
12	0	0	**12**	1	0	**12**	4	5
13	1	3	**13**	2	1	**13**	19	16
14	1	4	**14**	3	2	**14**	21	20
15	1	6	**15**	4	3	**15**	27	31
16	9	10	**16**	9	7	**16**	76	82
17	2	7	**17**	6	3	**17**	38	33
18	1	4	**18**	3	1	**18**	16	14
19	0	3	**19**	3	2	**19**	17	20
20	0	0	**20**	0	0	**20**	2	2
21	1	5	**21**	5	3	**21**	33	38
22	1	6	**22**	3	2	**22**	24	21
23	1	7	**23**	5	2	**23**	31	21
24	1	4	**24**	3	1	**24**	19	14
25	0	0	**25**	0	0	**25**	2	4
26	0	2	**26**	1	0	**26**	8	6
27	1	3	**27**	2	1	**27**	14	10
28	0	0	**28**	0	1	**28**	5	6
29	0	0	**29**	0	0	**29**	2	3
30	0	0	**30**	0	0	**30**	1	3
31	1	2	**31**	2	1	**31**	11	9
32	0	2	**32**	2	1	**32**	10	9
33	0	0	**33**	0	0	**33**	1	1
34	0	0	**34**	0	0	**34**	1	0
35	0	0	**35**	0	0	**35**	1	1
36	0	1	**36**	1	0	**36**	3	4
37	0	0	**37**	0	0	**37**	1	1
38	0	0	**38**	0	0	**38**	1	1
39	0	0	**39**	0	0	**39**	0	0
40	0	0	**40**	0	0	**40**	0	0
41	0	0	**41**	0	0	**41**	0	0
42	0	0	**42**	0	0	**42**	0	0
	88	177		141	101		1072	1179

Road - Taxi	Arrival	Departure	**Road - Taxi**	Arrival	Departure	**Road - Taxi**	Arrival	Departure
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	0	0	**1**	0	0	**1**	2	3
2	0	0	**2**	0	0	**2**	3	3
3	0	0	**3**	0	0	**3**	2	3
4	0	0	**4**	0	0	**4**	2	2
5	0	0	**5**	0	0	**5**	1	1
6	0	0	**6**	0	0	**6**	1	1
7	0	0	**7**	0	0	**7**	2	1
8	0	0	**8**	0	0	**8**	1	1
9	0	0	**9**	0	0	**9**	1	1
10	0	0	**10**	0	0	**10**	0	0
11	0	0	**11**	0	0	**11**	0	0
12	0	0	**12**	0	0	**12**	0	0
13	0	0	**13**	0	0	**13**	0	0
14	0	0	**14**	0	0	**14**	1	1
15	0	0	**15**	0	0	**15**	1	1
16	0	0	**16**	0	0	**16**	2	2
17	0	0	**17**	0	0	**17**	1	1
18	0	0	**18**	0	0	**18**	0	0
19	0	0	**19**	0	0	**19**	1	1
20	0	0	**20**	0	0	**20**	0	0
21	0	0	**21**	0	0	**21**	1	1
22	0	0	**22**	0	0	**22**	1	1
23	0	0	**23**	0	0	**23**	1	1
24	0	0	**24**	0	0	**24**	1	1
25	0	0	**25**	0	0	**25**	0	0
26	0	0	**26**	0	0	**26**	0	0
27	0	0	**27**	0	0	**27**	0	0
28	0	0	**28**	0	0	**28**	0	0
29	0	0	**29**	0	0	**29**	0	0
30	0	0	**30**	0	0	**30**	0	0
31	0	0	**31**	0	0	**31**	0	0
32	0	0	**32**	0	0	**32**	0	0
33	0	0	**33**	0	0	**33**	0	0
34	0	0	**34**	0	0	**34**	0	0
35	0	0	**35**	0	0	**35**	0	0
36	0	0	**36**	0	0	**36**	0	0
37	0	0	**37**	0	0	**37**	0	0
38	0	0	**38**	0	0	**38**	0	0
39	0	0	**39**	0	0	**39**	0	0
40	0	0	**40**	0	0	**40**	0	0
41	0	0	**41**	0	0	**41**	0	0
42	0	0	**42**	0	0	**42**	0	0
	2	5		4	2		26	28

Walking	AM		PM		Daily	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
0- Site	0	0	0	0	0	0
1	57	44	38	43	417	549
2	9	15	19	15	135	163
3	3	10	8	4	46	50
4	3	5	6	4	36	43
5	0	0	2	1	7	7
6	0	0	0	0	0	0
7	5	12	9	4	64	65
8	0	0	0	0	2	1
9	0	0	0	0	0	1
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	1	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	5	3	3	3	37	35
17	0	0	0	0	1	1
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	0	0
24	0	0	0	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	0
28	0	0	0	0	0	0
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	0	0	0	0
32	0	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
	83	91	85	74	746	916

Rail	AM		PM		Daily	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
0- Site	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	0	2
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	1
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	1	0	0	1	2
10	0	0	0	0	0	0
11	0	0	0	0	1	0
12	0	0	0	0	0	0
13	0	0	0	0	1	1
14	0	0	0	0	0	1
15	0	1	0	0	3	4
16	0	0	0	0	0	0
17	0	0	0	0	1	1
18	0	0	0	0	1	1
19	0	1	1	0	2	6
20	0	0	0	0	2	0
21	0	0	0	0	1	1
22	0	0	0	0	1	1
23	0	1	1	0	4	1
24	0	1	0	0	2	2
25	0	0	0	0	1	0
26	0	1	0	0	1	3
27	0	0	0	0	1	1
28	0	0	0	0	1	4
29	0	11	5	1	35	45
30	0	0	0	0	0	1
31	0	0	0	0	2	2
32	0	0	0	0	1	1
33	0	2	2	1	12	24
34	0	1	0	0	2	0
35	0	1	0	0	3	2
36	0	10	3	1	27	46
37	0	8	4	1	24	14
38	0	3	2	0	8	6
39	0	0	0	0	2	0
40	0	1	0	0	3	0
41	0	3	1	0	6	0
42	0	0	0	0	0	0
	1	49	24	7	154	174

RETIREMENT RESIDENTIAL - MULTI-MODAL TRIP DISTRIBUTION

AM			PM			Daily		
Road	Arrival	Departure	**Road**	Arrival	Departure	**Road**	Arrival	Departure
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	7	6	**1**	25	6	**1**	151	114
2	5	5	**2**	7	3	**2**	86	60
3	3	4	**3**	2	3	**3**	44	58
4	3	2	**4**	4	2	**4**	61	42
5	3	1	**5**	3	2	**5**	29	34
6	0	1	**6**	1	1	**6**	8	16
7	2	1	**7**	2	1	**7**	36	24
8	0	1	**8**	0	1	**8**	10	17
9	0	1	**9**	0	1	**9**	4	13
10	0	0	**10**	0	0	**10**	4	3
11	0	0	**11**	0	0	**11**	0	0
12	0	0	**12**	0	0	**12**	0	0
13	0	0	**13**	0	0	**13**	8	11
14	0	1	**14**	0	1	**14**	8	12
15	0	1	**15**	0	0	**15**	6	9
16	3	4	**16**	1	3	**16**	51	45
17	1	1	**17**	0	1	**17**	8	15
18	0	1	**18**	0	0	**18**	7	11
19	0	0	**19**	0	0	**19**	4	5
20	0	0	**20**	0	0	**20**	0	1
21	2	3	**21**	0	2	**21**	20	28
22	1	1	**22**	0	1	**22**	10	15
23	0	2	**23**	0	1	**23**	8	14
24	0	1	**24**	0	0	**24**	9	9
25	0	0	**25**	0	0	**25**	1	0
26	1	0	**26**	0	0	**26**	5	6
27	1	1	**27**	0	0	**27**	8	12
28	0	0	**28**	0	0	**28**	0	1
29	0	0	**29**	0	0	**29**	0	1
30	0	0	**30**	0	0	**30**	0	0
31	0	1	**31**	0	0	**31**	5	7
32	0	1	**32**	0	0	**32**	5	7
33	0	0	**33**	0	0	**33**	0	0
34	0	0	**34**	0	0	**34**	0	1
35	0	0	**35**	0	0	**35**	0	1
36	0	0	**36**	0	0	**36**	0	1
37	0	0	**37**	0	0	**37**	0	0
38	0	0	**38**	0	0	**38**	0	0
39	0	0	**39**	0	0	**39**	0	0
40	0	0	**40**	0	0	**40**	0	0
41	0	0	**41**	0	0	**41**	0	0
42	0	1	**42**	0	0	**42**	5	7
	34	42		46	29		603	599

Road - Cycle	Arrival	Departure	**Road - Cycle**	Arrival	Departure	**Road - Cycle**	Arrival	Departure
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	0	0	**1**	1	0	**1**	6	5
2	0	0	**2**	0	0	**2**	4	3
3	0	0	**3**	0	0	**3**	2	2
4	0	0	**4**	0	0	**4**	3	2
5	0	0	**5**	0	0	**5**	1	1
6	0	0	**6**	0	0	**6**	0	1
7	0	0	**7**	0	0	**7**	2	1
8	0	0	**8**	0	0	**8**	0	1
9	0	0	**9**	0	0	**9**	0	1
10	0	0	**10**	0	0	**10**	0	0
11	0	0	**11**	0	0	**11**	0	0
12	0	0	**12**	0	0	**12**	0	0
13	0	0	**13**	0	0	**13**	0	0
14	0	0	**14**	0	0	**14**	0	0
15	0	0	**15**	0	0	**15**	0	0
16	0	0	**16**	0	0	**16**	2	2
17	0	0	**17**	0	0	**17**	0	0
18	0	0	**18**	0	0	**18**	0	0
19	0	0	**19**	0	0	**19**	0	0
20	0	0	**20**	0	0	**20**	0	0
21	0	0	**21**	0	0	**21**	1	1
22	0	0	**22**	0	0	**22**	0	1
23	0	0	**23**	0	0	**23**	0	0
24	0	0	**24**	0	0	**24**	0	0
25	0	0	**25**	0	0	**25**	0	0
26	0	0	**26**	0	0	**26**	0	0
27	0	0	**27**	0	0	**27**	0	0
28	0	0	**28**	0	0	**28**	0	0
29	0	0	**29**	0	0	**29**	0	0
30	0	0	**30**	0	0	**30**	0	0
31	0	0	**31**	0	0	**31**	0	0
32	0	0	**32**	0	0	**32**	0	0
33	0	0	**33**	0	0	**33**	0	0
34	0	0	**34**	0	0	**34**	0	0
35	0	0	**35**	0	0	**35**	0	0
36	0	0	**36**	0	0	**36**	0	0
37	0	0	**37**	0	0	**37**	0	0
38	0	0	**38**	0	0	**38**	0	0
39	0	0	**39**	0	0	**39**	0	0
40	0	0	**40**	0	0	**40**	0	0
41	0	0	**41**	0	0	**41**	0	0
42	0	0	**42**	0	0	**42**	0	0
	1	2		2	1		24	23

AM			PM			DAily		
Road - MC/Moped	Arrival	Departure	**Road - MC/Moped**	Arrival	Departure	**Road - MC/Moped**	Arrival	Departure
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	0	0	**1**	0	0	**1**	0	0
2	0	0	**2**	0	0	**2**	0	0
3	0	0	**3**	0	0	**3**	0	0
4	0	0	**4**	0	0	**4**	0	0
5	0	0	**5**	0	0	**5**	0	0
6	0	0	**6**	0	0	**6**	0	0
7	0	0	**7**	0	0	**7**	0	0
8	0	0	**8**	0	0	**8**	0	0
9	0	0	**9**	0	0	**9**	0	0
10	0	0	**10**	0	0	**10**	0	0
11	0	0	**11**	0	0	**11**	0	0
12	0	0	**12**	0	0	**12**	0	0
13	0	0	**13**	0	0	**13**	0	0
14	0	0	**14**	0	0	**14**	0	0
15	0	0	**15**	0	0	**15**	0	0
16	0	0	**16**	0	0	**16**	0	0
17	0	0	**17**	0	0	**17**	0	0
18	0	0	**18**	0	0	**18**	0	0
19	0	0	**19**	0	0	**19**	0	0
20	0	0	**20**	0	0	**20**	0	0
21	0	0	**21**	0	0	**21**	0	0
22	0	0	**22**	0	0	**22**	0	0
23	0	0	**23**	0	0	**23**	0	0
24	0	0	**24**	0	0	**24**	0	0
25	0	0	**25**	0	0	**25**	0	0
26	0	0	**26**	0	0	**26**	0	0
27	0	0	**27**	0	0	**27**	0	0
28	0	0	**28**	0	0	**28**	0	0
29	0	0	**29**	0	0	**29**	0	0
30	0	0	**30**	0	0	**30**	0	0
31	0	0	**31**	0	0	**31**	0	0
32	0	0	**32**	0	0	**32**	0	0
33	0	0	**33**	0	0	**33**	0	0
34	0	0	**34**	0	0	**34**	0	0
35	0	0	**35**	0	0	**35**	0	0
36	0	0	**36**	0	0	**36**	0	0
37	0	0	**37**	0	0	**37**	0	0
38	0	0	**38**	0	0	**38**	0	0
39	0	0	**39**	0	0	**39**	0	0
40	0	0	**40**	0	0	**40**	0	0
41	0	0	**41**	0	0	**41**	0	0
42	0	0	**42**	0	0	**42**	0	0
	0	0		0	0		1	1

Road - Scooter/E-Scooter	Arrival	Departure	**Road - Scooter/E-Scooter**	Arrival	Departure	**Road - Scooter/E-Scooter**	Arrival	Departure
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	0	0	**1**	0	0	**1**	1	1
2	0	0	**2**	0	0	**2**	1	0
3	0	0	**3**	0	0	**3**	0	0
4	0	0	**4**	0	0	**4**	0	0
5	0	0	**5**	0	0	**5**	0	0
6	0	0	**6**	0	0	**6**	0	0
7	0	0	**7**	0	0	**7**	0	0
8	0	0	**8**	0	0	**8**	0	0
9	0	0	**9**	0	0	**9**	0	0
10	0	0	**10**	0	0	**10**	0	0
11	0	0	**11**	0	0	**11**	0	0
12	0	0	**12**	0	0	**12**	0	0
13	0	0	**13**	0	0	**13**	0	0
14	0	0	**14**	0	0	**14**	0	0
15	0	0	**15**	0	0	**15**	0	0
16	0	0	**16**	0	0	**16**	0	0
17	0	0	**17**	0	0	**17**	0	0
18	0	0	**18**	0	0	**18**	0	0
19	0	0	**19**	0	0	**19**	0	0
20	0	0	**20**	0	0	**20**	0	0
21	0	0	**21**	0	0	**21**	0	0
22	0	0	**22**	0	0	**22**	0	0
23	0	0	**23**	0	0	**23**	0	0
24	0	0	**24**	0	0	**24**	0	0
25	0	0	**25**	0	0	**25**	0	0
26	0	0	**26**	0	0	**26**	0	0
27	0	0	**27**	0	0	**27**	0	0
28	0	0	**28**	0	0	**28**	0	0
29	0	0	**29**	0	0	**29**	0	0
30	0	0	**30**	0	0	**30**	0	0
31	0	0	**31**	0	0	**31**	0	0
32	0	0	**32**	0	0	**32**	0	0
33	0	0	**33**	0	0	**33**	0	0
34	0	0	**34**	0	0	**34**	0	0
35	0	0	**35**	0	0	**35**	0	0
36	0	0	**36**	0	0	**36**	0	0
37	0	0	**37**	0	0	**37**	0	0
38	0	0	**38**	0	0	**38**	0	0
39	0	0	**39**	0	0	**39**	0	0
40	0	0	**40**	0	0	**40**	0	0
41	0	0	**41**	0	0	**41**	0	0
42	0	0	**42**	0	0	**42**	0	0
	0	0		0	0		4	4

Road - Bus	AM		PM		Daily	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
0- Site	0	0	0	0	0	0
1	0	0	1	0	5	4
2	0	0	0	0	3	2
3	0	0	0	0	1	2
4	0	0	0	0	2	1
5	0	0	0	0	1	1
6	0	0	0	0	0	1
7	0	0	0	0	1	1
8	0	0	0	0	0	1
9	0	0	0	0	0	1
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	1
15	0	0	0	0	0	0
16	0	0	0	0	2	2
17	0	0	0	0	0	1
18	0	0	0	0	0	1
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	1	1
22	0	0	0	0	0	1
23	0	0	0	0	0	1
24	0	0	0	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	1
28	0	0	0	0	0	0
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	0	0	0	0
32	0	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
	1	2	1	1	22	23

Road - Car/Van Driver	AM		PM		Daily	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
0- Site	0	0	0	0	0	0
1	4	4	15	4	90	68
2	3	3	4	2	51	36
3	2	3	1	2	26	34
4	2	1	3	1	37	25
5	2	1	2	1	17	20
6	0	1	1	0	5	10
7	1	1	1	1	22	14
8	0	1	0	0	6	10
9	0	1	0	1	2	8
10	0	0	0	0	2	2
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	5	7
14	0	1	0	0	5	7
15	0	0	0	0	3	6
16	2	2	1	2	31	27
17	0	1	0	1	5	9
18	0	1	0	0	4	7
19	0	0	0	0	2	3
20	0	0	0	0	0	1
21	1	2	0	1	13	17
22	1	1	0	0	6	9
23	0	1	0	0	5	9
24	0	1	0	0	5	5
25	0	0	0	0	1	0
26	0	0	0	0	3	4
27	1	1	0	0	5	8
28	0	0	0	0	0	0
29	0	0	0	0	0	1
30	0	0	0	0	0	0
31	0	0	0	0	3	4
32	0	0	0	0	3	4
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	1
36	0	0	0	0	0	1
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	3	4
	20	25	27	18	362	361

Road - Car/Van Passenger	AM Arrival	AM Departure	PM Arrival	PM Departure	Daily Arrival	Daily Departure
0- Site	0	0	0	0	0	0
1	2	2	8	2	47	36
2	1	1	2	1	27	19
3	1	1	1	1	14	18
4	1	1	1	1	19	13
5	1	0	1	1	9	11
6	0	0	0	0	2	5
7	0	0	1	0	11	8
8	0	0	0	0	3	5
9	0	0	0	0	1	4
10	0	0	0	0	1	1
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	3	4
14	0	0	0	0	2	3
15	0	0	0	0	2	3
16	1	1	0	1	15	13
17	0	0	0	0	2	4
18	0	0	0	0	2	3
19	0	0	0	0	1	2
20	0	0	0	0	0	0
21	1	1	0	0	6	8
22	0	0	0	0	3	5
23	0	0	0	0	2	4
24	0	0	0	0	2	2
25	0	0	0	0	0	0
26	0	0	0	0	1	2
27	0	0	0	0	2	4
28	0	0	0	0	0	0
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	0	0	1	2
32	0	0	0	0	1	2
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	1	2
	10	13	14	9	185	182

Road - Taxi	AM Arrival	AM Departure	PM Arrival	PM Departure	Daily Arrival	Daily Departure
0- Site	0	0	0	0	0	0
1	0	0	0	0	1	1
2	0	0	0	0	1	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	0	0
24	0	0	0	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	0
28	0	0	0	0	0	0
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	0	0	0	0
32	0	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
	0	0	0	0	4	4

	AM			PM			Daily	
Walking	Arrival	Departure	**Walking**	Arrival	Departure	**Walking**	Arrival	Departure
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	5	5	**1**	21	5	**1**	111	84
2	2	3	**2**	2	2	**2**	46	40
3	1	0	**3**	0	0	**3**	9	5
4	1	1	**4**	0	1	**4**	5	12
5	0	0	**5**	0	0	**5**	1	1
6	0	0	**6**	0	0	**6**	0	0
7	1	0	**7**	2	1	**7**	18	11
8	0	0	**8**	0	0	**8**	0	0
9	0	0	**9**	0	0	**9**	0	0
10	0	0	**10**	0	0	**10**	0	0
11	0	0	**11**	0	0	**11**	0	0
12	0	0	**12**	0	0	**12**	0	0
13	0	0	**13**	0	0	**13**	0	0
14	0	0	**14**	0	0	**14**	0	0
15	0	0	**15**	0	0	**15**	0	0
16	0	0	**16**	1	0	**16**	7	6
17	0	0	**17**	0	0	**17**	0	0
18	0	0	**18**	0	0	**18**	0	0
19	0	0	**19**	0	0	**19**	0	0
20	0	0	**20**	0	0	**20**	0	0
21	0	0	**21**	0	0	**21**	0	0
22	0	0	**22**	0	0	**22**	0	0
23	0	0	**23**	0	0	**23**	0	0
24	0	0	**24**	0	0	**24**	0	0
25	0	0	**25**	0	0	**25**	0	0
26	0	0	**26**	0	0	**26**	0	0
27	0	0	**27**	0	0	**27**	0	0
28	0	0	**28**	0	0	**28**	0	0
29	0	0	**29**	0	0	**29**	0	0
30	0	0	**30**	0	0	**30**	0	0
31	0	0	**31**	0	0	**31**	0	0
32	0	0	**32**	0	0	**32**	0	0
33	0	0	**33**	0	0	**33**	0	0
34	0	0	**34**	0	0	**34**	0	0
35	0	0	**35**	0	0	**35**	0	0
36	0	0	**36**	0	0	**36**	0	0
37	0	0	**37**	0	0	**37**	0	0
38	0	0	**38**	0	0	**38**	0	0
39	0	0	**39**	0	0	**39**	0	0
40	0	0	**40**	0	0	**40**	0	0
41	0	0	**41**	0	0	**41**	0	0
42	0	0	**42**	0	0	**42**	0	0
	9	10		26	9		197	159
Rail	Arrival	Departure	**Rail**	Arrival	Departure	**Rail**	Arrival	Departure
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	0	0	**1**	0	0	**1**	0	0
2	0	0	**2**	0	0	**2**	0	0
3	0	0	**3**	0	0	**3**	0	0
4	0	0	**4**	0	0	**4**	0	0
5	0	0	**5**	0	0	**5**	0	0
6	0	0	**6**	0	0	**6**	0	0
7	0	0	**7**	0	0	**7**	0	0
8	0	0	**8**	0	0	**8**	0	0
9	0	0	**9**	0	0	**9**	0	0
10	0	0	**10**	0	0	**10**	0	0
11	0	0	**11**	0	0	**11**	0	0
12	0	0	**12**	0	0	**12**	0	0
13	0	0	**13**	0	0	**13**	0	0
14	0	0	**14**	0	0	**14**	0	0
15	0	0	**15**	0	0	**15**	0	0
16	0	0	**16**	0	0	**16**	0	0
17	0	0	**17**	0	0	**17**	0	0
18	0	0	**18**	0	0	**18**	0	0
19	0	0	**19**	0	0	**19**	2	3
20	0	0	**20**	0	0	**20**	0	0
21	0	0	**21**	0	0	**21**	0	0
22	0	0	**22**	0	0	**22**	0	0
23	0	0	**23**	0	0	**23**	0	2
24	0	0	**24**	0	0	**24**	0	1
25	0	0	**25**	0	0	**25**	0	0
26	0	0	**26**	0	0	**26**	0	1
27	0	0	**27**	0	0	**27**	0	0
28	0	0	**28**	0	0	**28**	0	0
29	0	1	**29**	0	0	**29**	0	5
30	0	0	**30**	0	0	**30**	0	0
31	0	0	**31**	0	0	**31**	0	0
32	0	0	**32**	0	0	**32**	0	0
33	0	0	**33**	0	0	**33**	0	0
34	0	0	**34**	0	0	**34**	0	0
35	0	0	**35**	0	0	**35**	0	1
36	0	0	**36**	0	0	**36**	0	2
37	0	0	**37**	0	0	**37**	0	0
38	0	0	**38**	0	0	**38**	0	0
39	0	0	**39**	0	0	**39**	0	0
40	0	0	**40**	0	0	**40**	0	0
41	0	0	**41**	0	0	**41**	0	0
42	0	0	**42**	0	0	**42**	0	0
	0	2		0	0		5	17
40	0	0	**40**	0	0	**40**		
41	0	0	**41**	0	0	**41**		
42	0	0	**42**	0	0	**42**		
39	0	0	**39**	0	0	**39**	2	0
40	0	1	**40**	0	0	**40**	3	0
41	0	3	**41**	1	0	**41**	6	0
42	0	0	**42**	0	0	**42**	0	0
	1	49		24	7		154	174

PRIMARY SCHOOL - MULTI-MODAL TRIP DISTRIBUTION

AM

Road	Arrival	Departure
0- Site	0	0
1	49	11
2	12	3
3	56	13
4	0	0
5	0	0
6	0	0
7	10	2
8	0	0
9	0	0
10	5	1
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

PM

Road	Arrival	Departure
0- Site	0	0
1	4	14
2	1	3
3	4	16
4	0	0
5	0	0
6	0	0
7	1	3
8	0	0
9	0	0
10	0	2
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Daily

Road	Arrive	Depart
0- Site	232	227
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
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31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		

Road - Cycle	Arrival	Departure
0- Site	0	0
1	3	1
2	1	0
3	4	1
4	0	0
5	0	0
6	0	0
7	1	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Road - Cycle	Arrival	Departure
0- Site	0	0
1	0	1
2	0	0
3	0	1
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Road - Cycle	Arrive	Depart
0- Site	17	16
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
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41		
42		

AM			**PM**			**Daily**		
Road - MC/Moped	Arrival	Departure	**Road - MC/Moped**	Arrival	Departure	**Road - MC/Moped**	Arrive	Depart
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	0	0	**1**	0	0	**1**		
2	0	0	**2**	0	0	**2**		
3	0	0	**3**	0	0	**3**		
4	0	0	**4**	0	0	**4**		
5	0	0	**5**	0	0	**5**		
6	0	0	**6**	0	0	**6**		
7	0	0	**7**	0	0	**7**		
8	0	0	**8**	0	0	**8**		
9	0	0	**9**	0	0	**9**		
10	0	0	**10**	0	0	**10**		
11	0	0	**11**	0	0	**11**		
12	0	0	**12**	0	0	**12**		
13	0	0	**13**	0	0	**13**		
14	0	0	**14**	0	0	**14**		
15	0	0	**15**	0	0	**15**		
16	0	0	**16**	0	0	**16**		
17	0	0	**17**	0	0	**17**		
18	0	0	**18**	0	0	**18**		
19	0	0	**19**	0	0	**19**		
20	0	0	**20**	0	0	**20**		
21	0	0	**21**	0	0	**21**		
22	0	0	**22**	0	0	**22**		
23	0	0	**23**	0	0	**23**		
24	0	0	**24**	0	0	**24**		
25	0	0	**25**	0	0	**25**		
26	0	0	**26**	0	0	**26**		
27	0	0	**27**	0	0	**27**		
28	0	0	**28**	0	0	**28**		
29	0	0	**29**	0	0	**29**		
30	0	0	**30**	0	0	**30**		
31	0	0	**31**	0	0	**31**		
32	0	0	**32**	0	0	**32**		
33	0	0	**33**	0	0	**33**		
34	0	0	**34**	0	0	**34**		
35	0	0	**35**	0	0	**35**		
36	0	0	**36**	0	0	**36**		
37	0	0	**37**	0	0	**37**		
38	0	0	**38**	0	0	**38**		
39	0	0	**39**	0	0	**39**		
40	0	0	**40**	0	0	**40**		
41	0	0	**41**	0	0	**41**		
42	0	0	**42**	0	0	**42**		

Road - Scooter/E-Scooter	Arrival	Departure	**Road - Scooter/E-Scooter**	Arrival	Departure	**Road - Scooter/E-Scooter**	Arrive	Depart
0- Site	0	0	**0- Site**	0	0	**0- Site**	6	5
1	1	0	**1**	0	0	**1**		
2	0	0	**2**	0	0	**2**		
3	1	0	**3**	0	0	**3**		
4	0	0	**4**	0	0	**4**		
5	0	0	**5**	0	0	**5**		
6	0	0	**6**	0	0	**6**		
7	0	0	**7**	0	0	**7**		
8	0	0	**8**	0	0	**8**		
9	0	0	**9**	0	0	**9**		
10	0	0	**10**	0	0	**10**		
11	0	0	**11**	0	0	**11**		
12	0	0	**12**	0	0	**12**		
13	0	0	**13**	0	0	**13**		
14	0	0	**14**	0	0	**14**		
15	0	0	**15**	0	0	**15**		
16	0	0	**16**	0	0	**16**		
17	0	0	**17**	0	0	**17**		
18	0	0	**18**	0	0	**18**		
19	0	0	**19**	0	0	**19**		
20	0	0	**20**	0	0	**20**		
21	0	0	**21**	0	0	**21**		
22	0	0	**22**	0	0	**22**		
23	0	0	**23**	0	0	**23**		
24	0	0	**24**	0	0	**24**		
25	0	0	**25**	0	0	**25**		
26	0	0	**26**	0	0	**26**		
27	0	0	**27**	0	0	**27**		
28	0	0	**28**	0	0	**28**		
29	0	0	**29**	0	0	**29**		
30	0	0	**30**	0	0	**30**		
31	0	0	**31**	0	0	**31**		
32	0	0	**32**	0	0	**32**		
33	0	0	**33**	0	0	**33**		
34	0	0	**34**	0	0	**34**		
35	0	0	**35**	0	0	**35**		
36	0	0	**36**	0	0	**36**		
37	0	0	**37**	0	0	**37**		
38	0	0	**38**	0	0	**38**		
39	0	0	**39**	0	0	**39**		
40	0	0	**40**	0	0	**40**		
41	0	0	**41**	0	0	**41**		
42	0	0	**42**	0	0	**42**		

AM		
Road - Bus	Arrival	Departure
0- Site	0	0
1	2	0
2	0	0
3	2	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

PM		
Road - Bus	Arrival	Departure
0- Site	0	0
1	0	0
2	0	0
3	0	1
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Daily		
Road - Bus	Arrive	Depart
0- Site	8	8
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
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25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		

Road - Car/Van Driver	Arrival	Departure
0- Site	0	0
1	18	8
2	4	2
3	20	9
4	0	0
5	0	0
6	0	0
7	4	2
8	0	0
9	0	0
10	2	1
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Road - Car/Van Driver	Arrival	Departure
0- Site	0	0
1	2	4
2	0	1
3	2	5
4	0	0
5	0	0
6	0	0
7	0	1
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Road - Car/Van Driver	Arrive	Depart
0- Site	100	98
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
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22		
23		
24		
25		
26		
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29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		

AM

Road - Car/Van Passenger	Arrival	Departure
0- Site	0	0
1	25	1
2	6	0
3	28	2
4	0	0
5	0	0
6	0	0
7	5	0
8	0	0
9	0	0
10	3	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

PM

Road - Car/Van Passenger	Arrival	Departure
0- Site	0	0
1	2	8
2	0	2
3	2	9
4	0	0
5	0	0
6	0	0
7	0	2
8	0	0
9	0	0
10	0	1
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Daily

Road - Car/Van Passenger	Arrive	Depart
0- Site	102	99
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		

Road - Taxi	Arrival	Departure
0- Site	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Road - Taxi	Arrival	Departure
0- Site	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0

Road - Taxi	Arrive	Depart
0- Site	0	0
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
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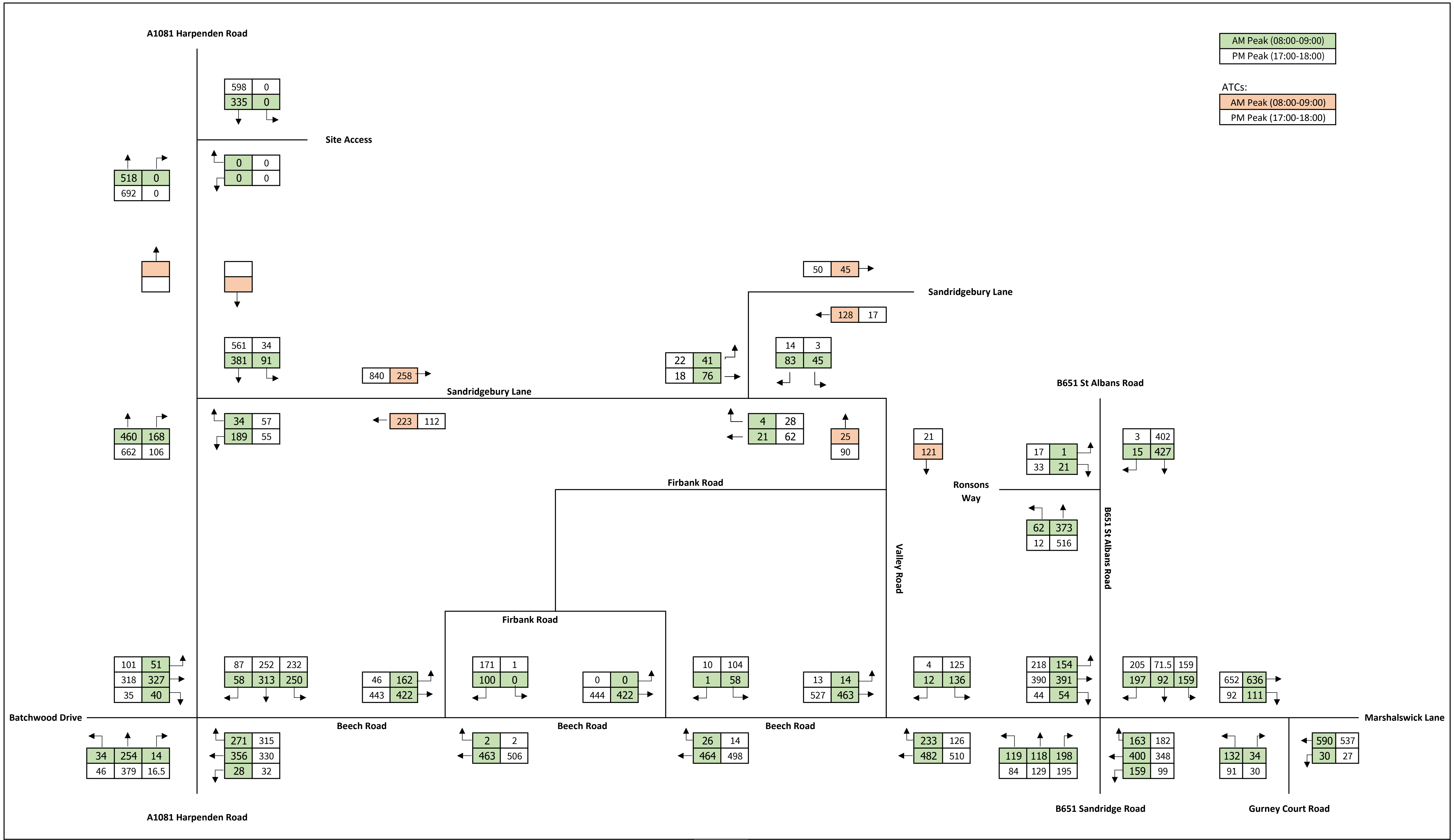
39		
40		
41		
42		

	AM			PM			Daily	
Walking	Arrival	Departure	**Walking**	Arrival	Departure	**Walking**	Arrive	Depart
0- Site	0	0	**0- Site**	0	0	**0- Site**	228	224
1	48	11	**1**	4	14	**1**		
2	12	3	**2**	1	3	**2**		
3	55	12	**3**	4	16	**3**		
4	0	0	**4**	0	0	**4**		
5	0	0	**5**	0	0	**5**		
6	0	0	**6**	0	0	**6**		
7	10	2	**7**	1	3	**7**		
8	0	0	**8**	0	0	**8**		
9	0	0	**9**	0	0	**9**		
10	5	1	**10**	0	1	**10**		
11	0	0	**11**	0	0	**11**		
12	0	0	**12**	0	0	**12**		
13	0	0	**13**	0	0	**13**		
14	0	0	**14**	0	0	**14**		
15	0	0	**15**	0	0	**15**		
16	0	0	**16**	0	0	**16**		
17	0	0	**17**	0	0	**17**		
18	0	0	**18**	0	0	**18**		
19	0	0	**19**	0	0	**19**		
20	0	0	**20**	0	0	**20**		
21	0	0	**21**	0	0	**21**		
22	0	0	**22**	0	0	**22**		
23	0	0	**23**	0	0	**23**		
24	0	0	**24**	0	0	**24**		
25	0	0	**25**	0	0	**25**		
26	0	0	**26**	0	0	**26**		
27	0	0	**27**	0	0	**27**		
28	0	0	**28**	0	0	**28**		
29	0	0	**29**	0	0	**29**		
30	0	0	**30**	0	0	**30**		
31	0	0	**31**	0	0	**31**		
32	0	0	**32**	0	0	**32**		
33	0	0	**33**	0	0	**33**		
34	0	0	**34**	0	0	**34**		
35	0	0	**35**	0	0	**35**		
36	0	0	**36**	0	0	**36**		
37	0	0	**37**	0	0	**37**		
38	0	0	**38**	0	0	**38**		
39	0	0	**39**	0	0	**39**		
40	0	0	**40**	0	0	**40**		
41	0	0	**41**	0	0	**41**		
42	0	0	**42**	0	0	**42**		

Rail	Arrival	Departure	**Rail**	Arrival	Departure	**Rail**	Arrive	Depart
0- Site	0	0	**0- Site**	0	0	**0- Site**	0	0
1	0	0	**1**	0	0	**1**		
2	0	0	**2**	0	0	**2**		
3	0	0	**3**	0	0	**3**		
4	0	0	**4**	0	0	**4**		
5	0	0	**5**	0	0	**5**		
6	0	0	**6**	0	0	**6**		
7	0	0	**7**	0	0	**7**		
8	0	0	**8**	0	0	**8**		
9	0	0	**9**	0	0	**9**		
10	0	0	**10**	0	0	**10**		
11	0	0	**11**	0	0	**11**		
12	0	0	**12**	0	0	**12**		
13	0	0	**13**	0	0	**13**		
14	0	0	**14**	0	0	**14**		
15	0	0	**15**	0	0	**15**		
16	0	0	**16**	0	0	**16**		
17	0	0	**17**	0	0	**17**		
18	0	0	**18**	0	0	**18**		
19	0	0	**19**	0	0	**19**		
20	0	0	**20**	0	0	**20**		
21	0	0	**21**	0	0	**21**		
22	0	0	**22**	0	0	**22**		
23	0	0	**23**	0	0	**23**		
24	0	0	**24**	0	0	**24**		
25	0	0	**25**	0	0	**25**		
26	0	0	**26**	0	0	**26**		
27	0	0	**27**	0	0	**27**		
28	0	0	**28**	0	0	**28**		
29	0	0	**29**	0	0	**29**		
30	0	0	**30**	0	0	**30**		
31	0	0	**31**	0	0	**31**		
32	0	0	**32**	0	0	**32**		
33	0	0	**33**	0	0	**33**		
34	0	0	**34**	0	0	**34**		
35	0	0	**35**	0	0	**35**		
36	0	0	**36**	0	0	**36**		
37	0	0	**37**	0	0	**37**		
38	0	0	**38**	0	0	**38**		
39	0	0	**39**	0	0	**39**		
40	0	0	**40**	0	0	**40**		
41	0	0	**41**	0	0	**41**		
42	0	0	**42**	0	0	**42**		
39	0	0	**39**	0	0	**39**	2	0
40	0	1	**40**	0	0	**40**	3	0
41	0	3	**41**	1	0	**41**	6	0
42	0	0	**42**	0	0	**42**	0	0
	1	49		24	7		154	174

Appendix I Traffic Flow Diagrams

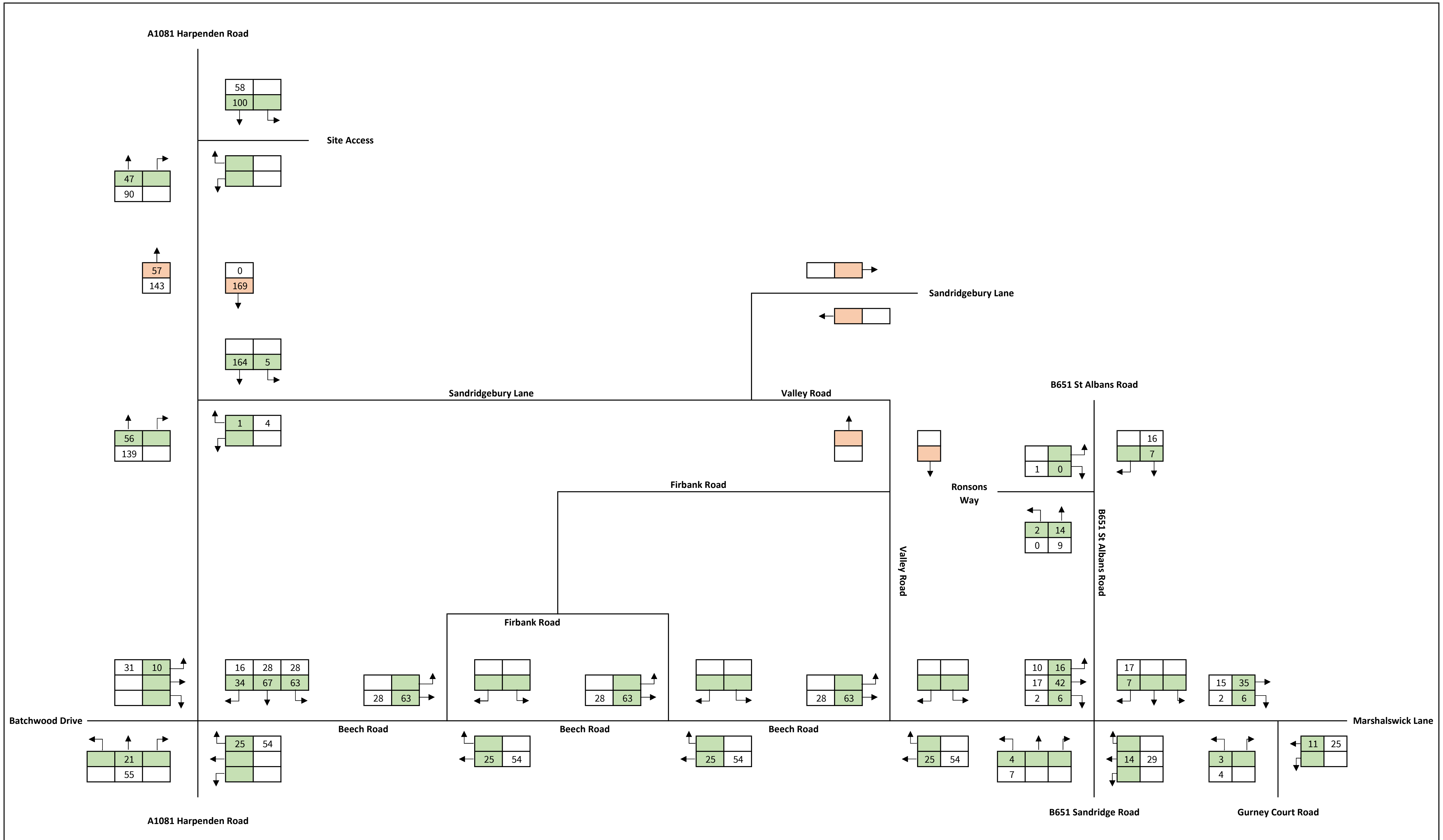


PJA
Brew House
Jacob Street
Tower Hill
Bristol
BS2 0EQ

bristol@pja.co.uk

PJA

Client:	Hallam Land Management
Project:	**Land at North St Albans**
Title:	**2022 Base (PCUs)**
Appendix L Date:	**23/07/2024**
Job No:	5920



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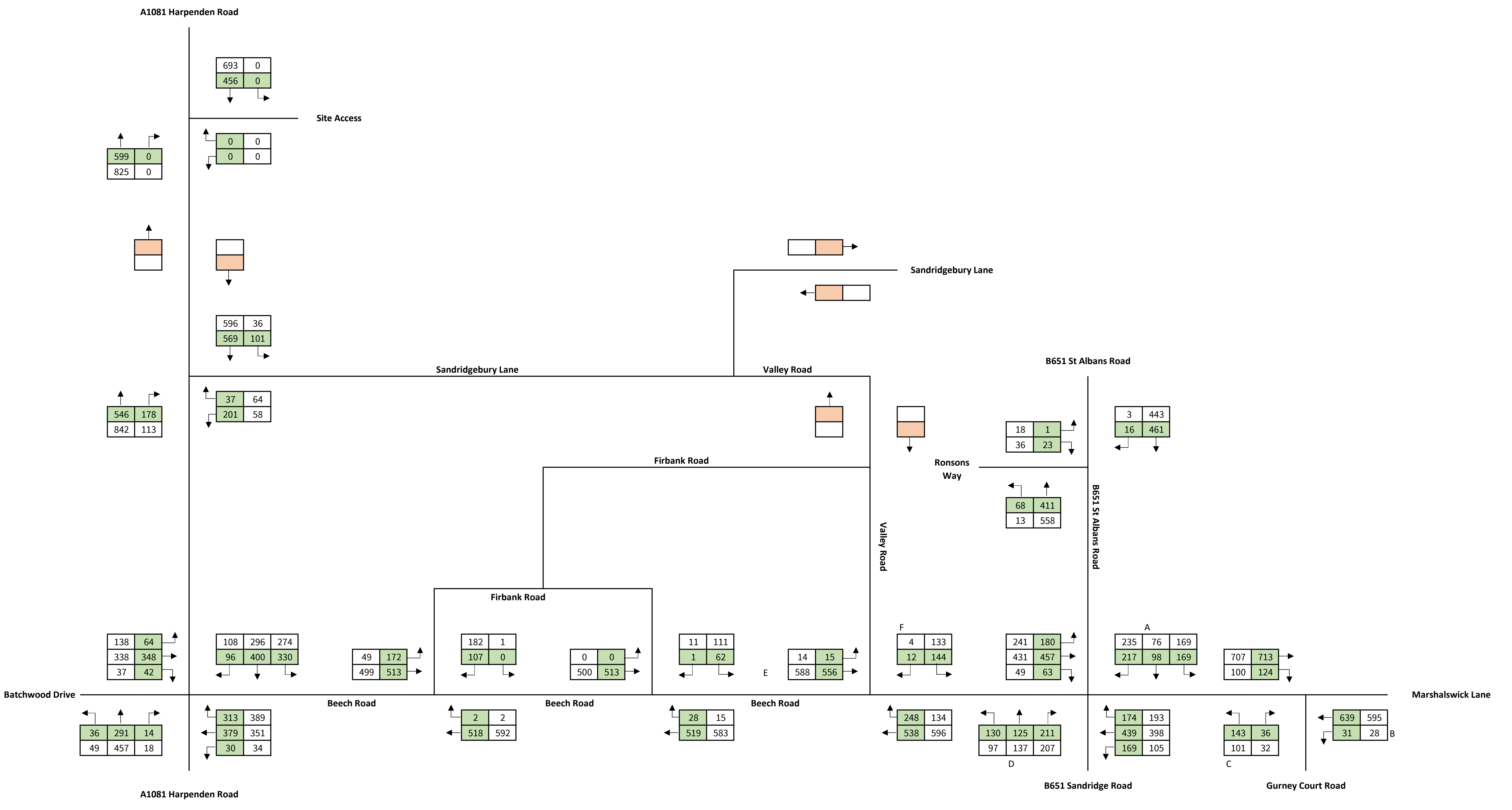
Client:	Hallam Land Management
Project:	**Land at North St Albans**
Title:	**Total Cmtd Dev**
Date:	**23/07/2024**
Job No:	5920

Appendix L



PJA
Brew House
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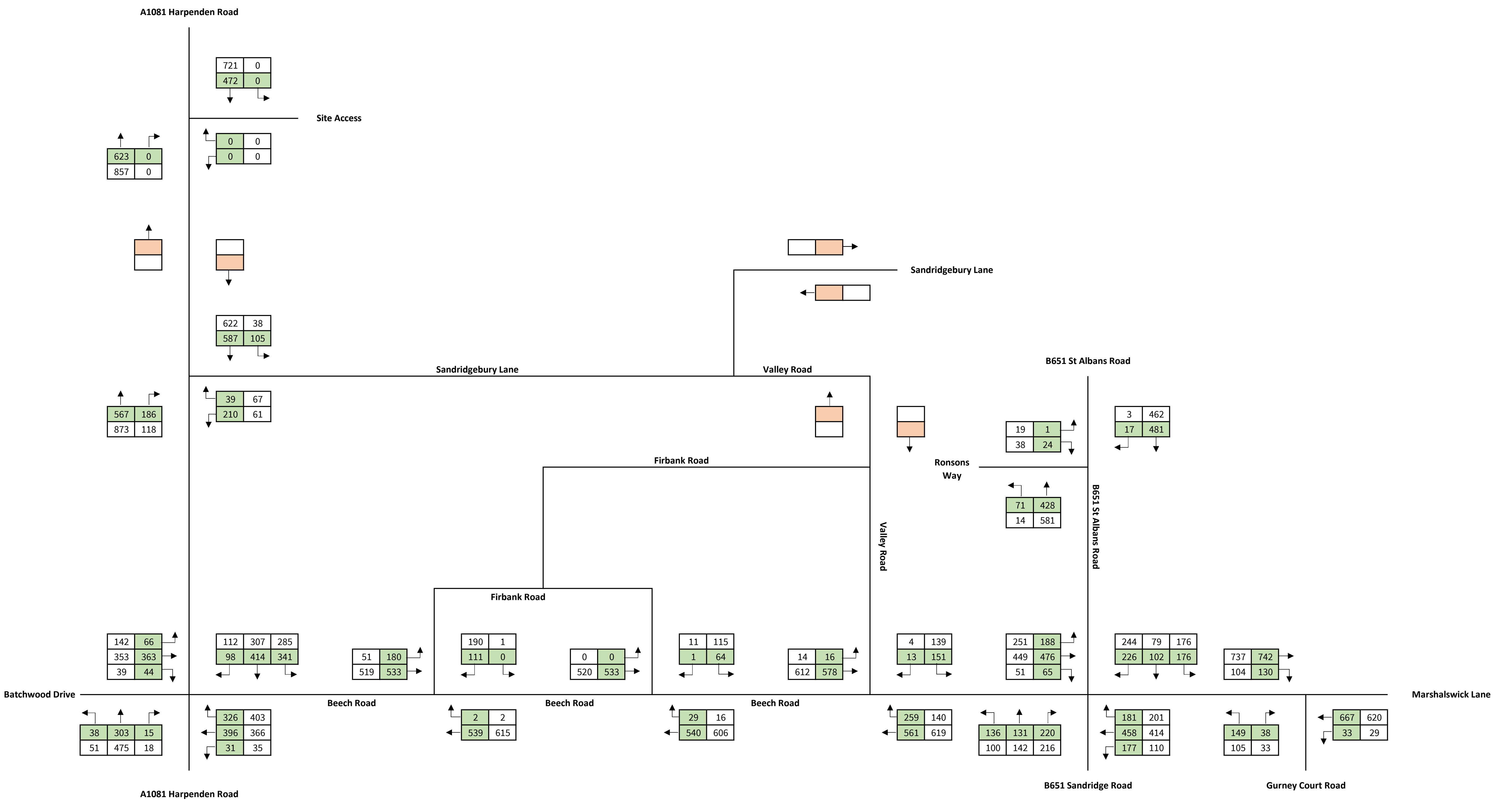
Client:	Hallam Land Management
Project:	Land at North St Albans
Title:	2028 Base + Committed Development
Appendix L	Date: 23/07/2024
	Job No: 5920



PJA
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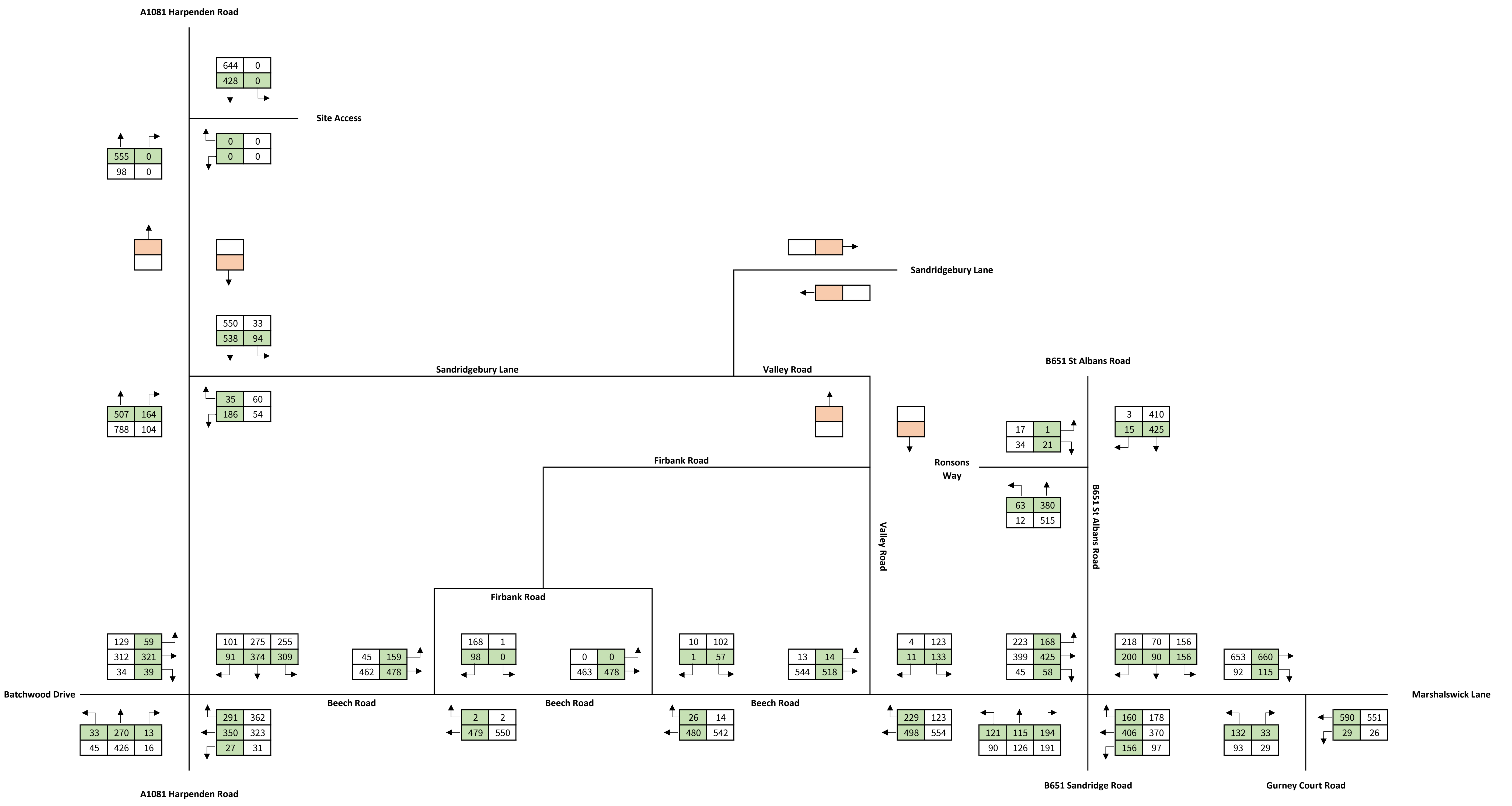
Client:	Hallam Land Management
Project:	Land at North St Albans
Title:	2033 Base + Committed Development

Appendix L	Date:	23/07/2024
	Job No:	5920



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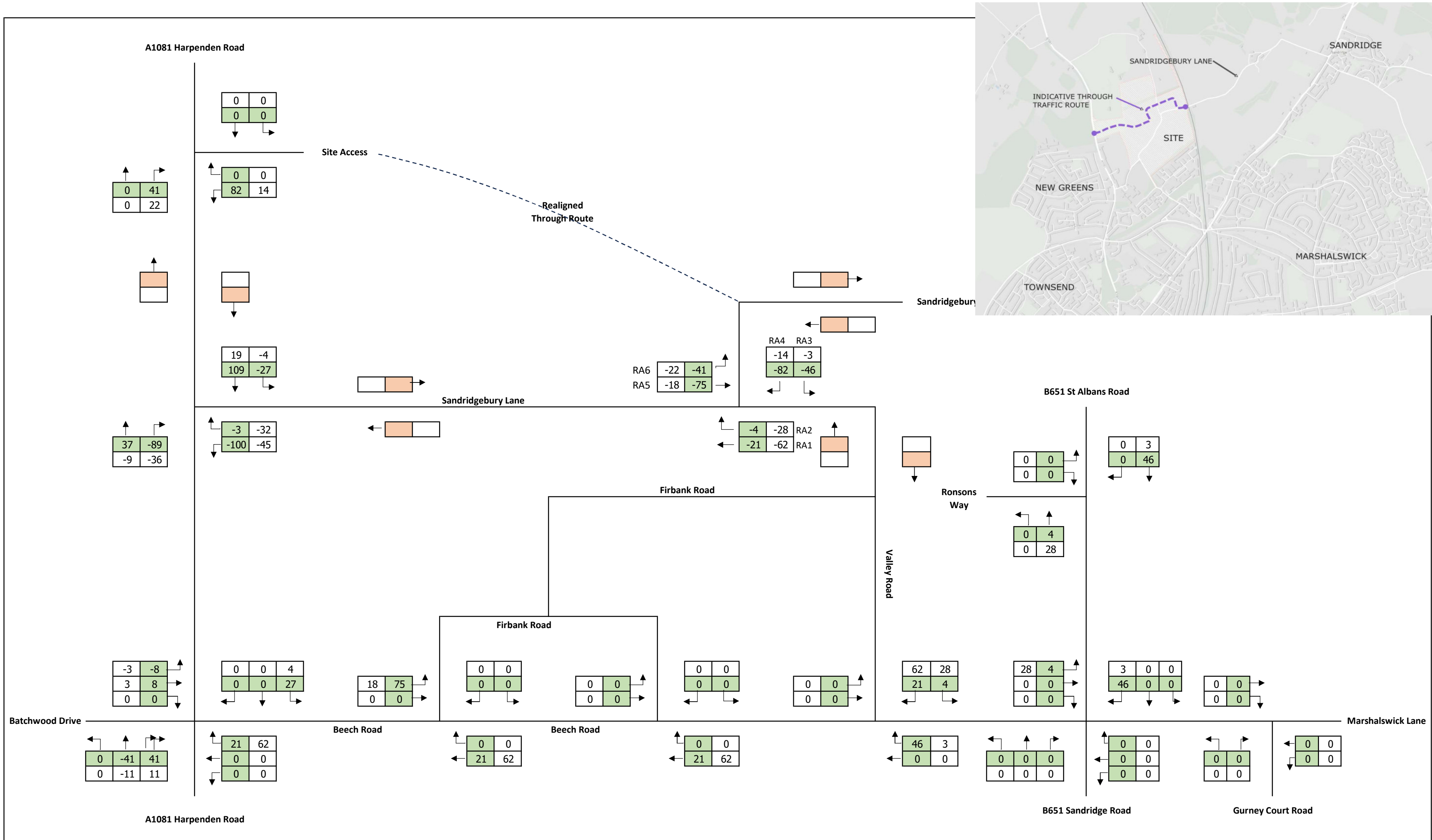
Client:	Hallam Land Management
Project:	Land at North St Albans
Title:	2033 Base + Committed Development (Behavioural)
Appendix L	Date: 23/07/2024
	Job No: 5920



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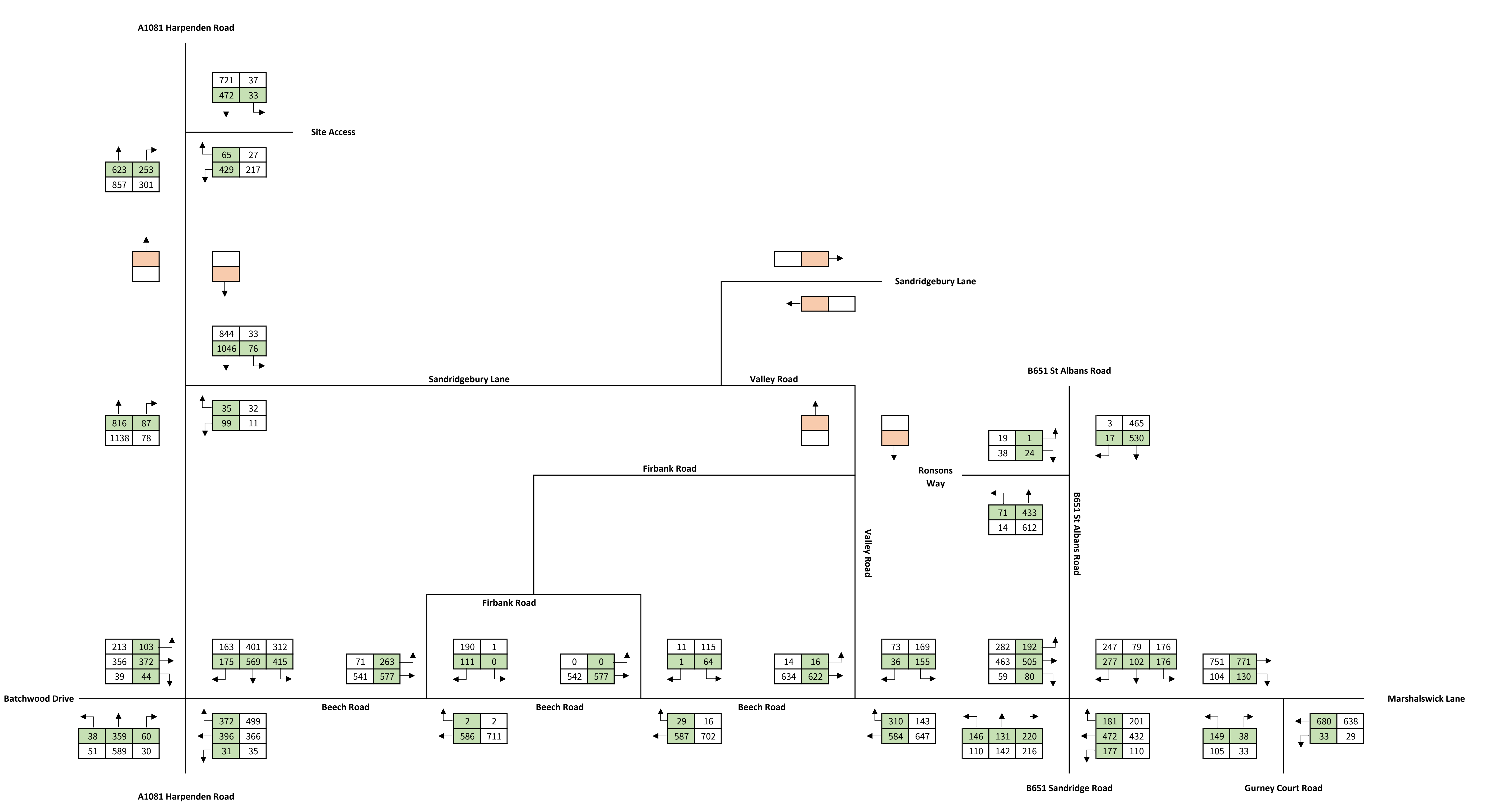
Client:	Hallam Land Management
Project:	Land at North St Albans
Title:	Sandridgebury Lane Reassignment (2022 Base Changes)

Appendix L	Date:	23/07/2024
	Job No:	5920



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Tower Hill
Bristol
BS2 0EQ

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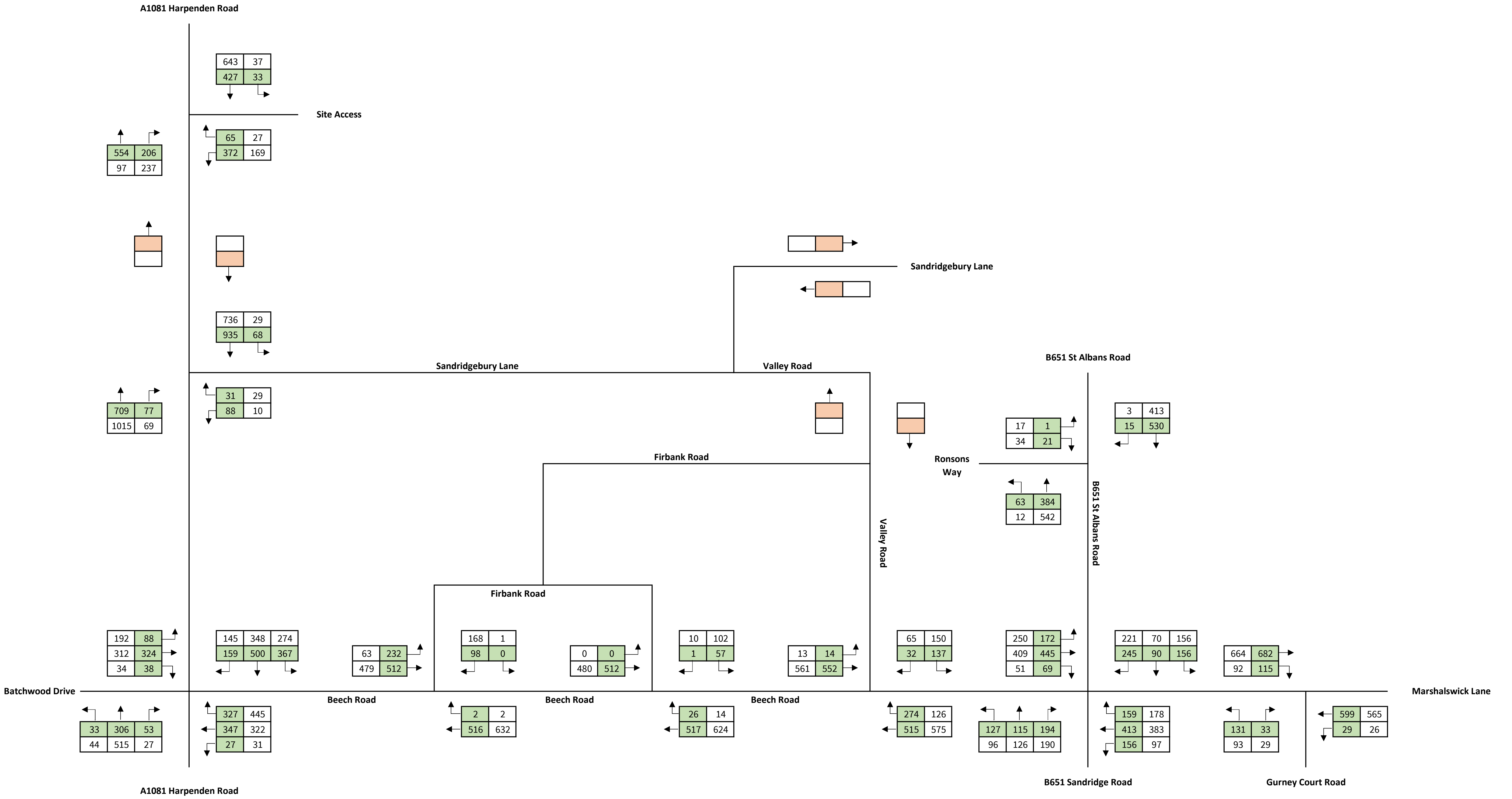
Client:	Hallam Land Management
Project:	Land at North St Albans
Title:	2033 Base (Core) + Committed + Development (Core)
Appendix H	Date: 26/11/2024
	Job No: 5920



PJA
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Jacob Street
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Bristol
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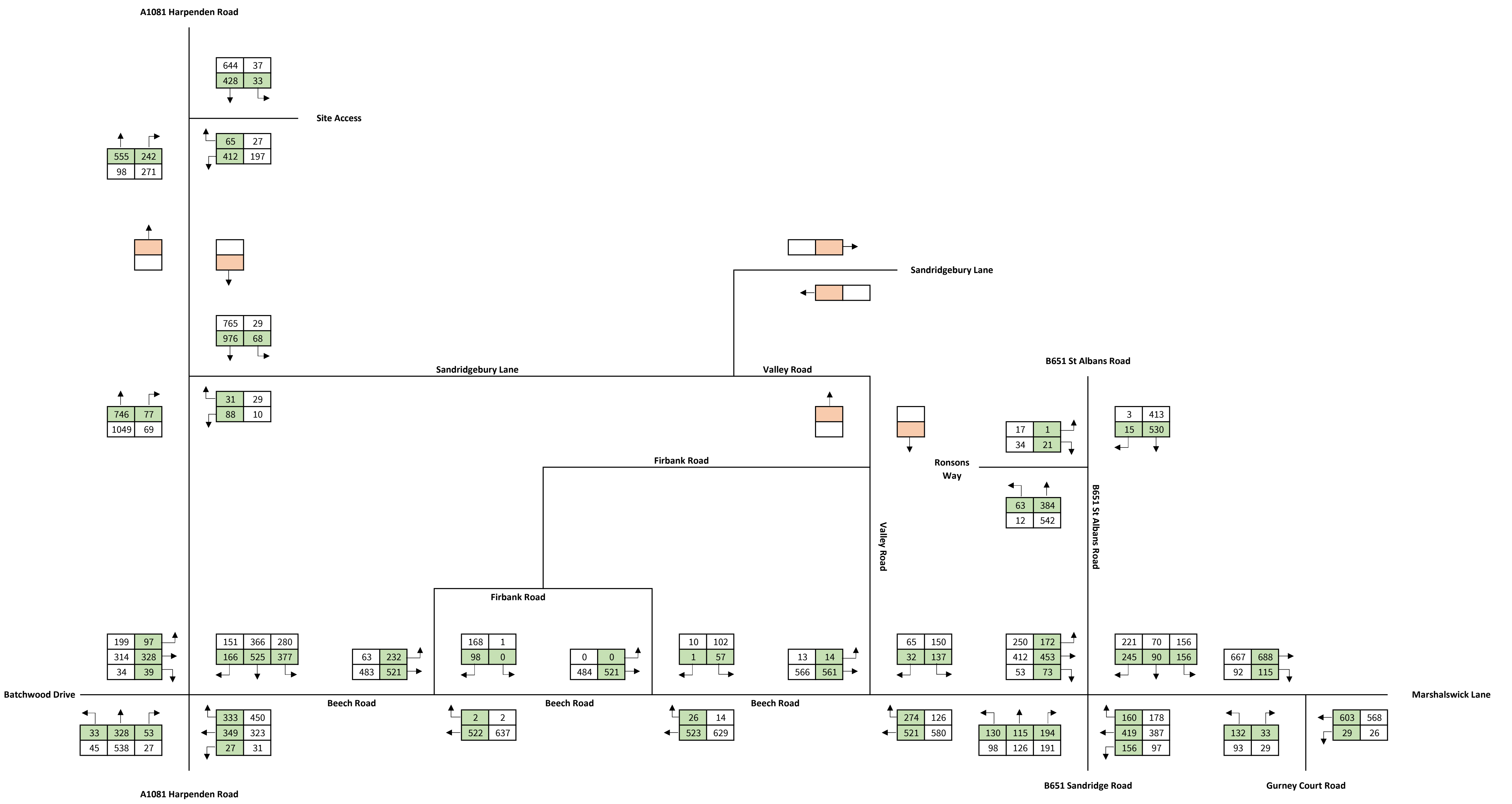
PJA

Client:	Hallam Land Management
Project:	Land at North St Albans
Title:	2033 Base (Behavioural) + Dev (High Modal Shift) + Background (High Modal Shift)
Appendix H	Date: 26/11/2024
	Job No: 5920



PJA
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Jacob Street
Tower Hill
Bristol
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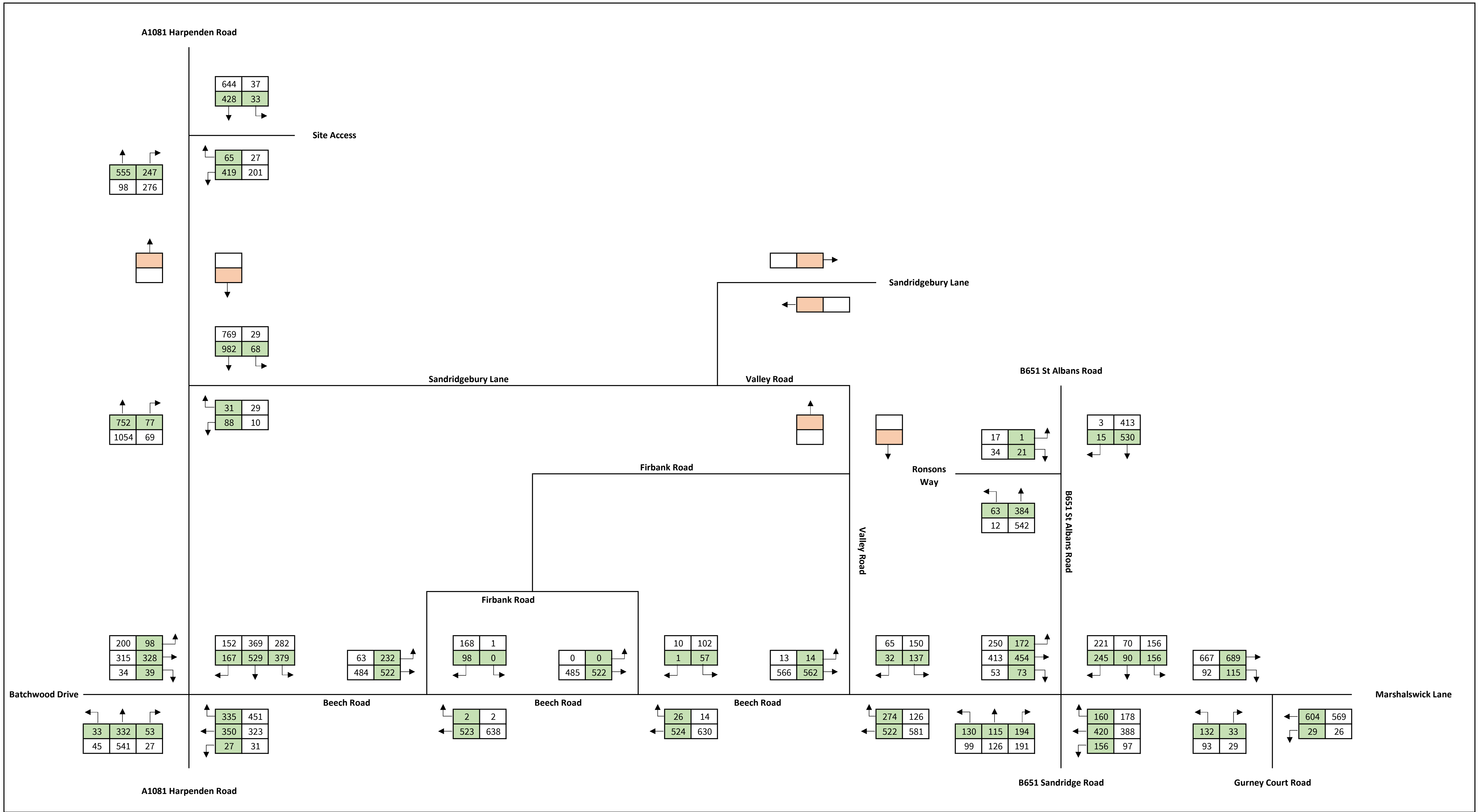
Client:	Hallam Land Management
Project:	Land at North St Albans
Title:	2033 Base (Behavioural) + Dev (Low Modal Shift) + Background (Low Modal Shift)
Appendix H	Date: 26/11/2024
	Job No: 5920



PJA
Brew House
Jacob Street
Tower Hill
Bristol
BS2 0EQ

bristol@pja.co.uk

Client:	Hallam Land Management
Project:	Land at North St Albans
Title:	2033 Base (Behavioural) + Committed + Development (Core)
Appendix H	Date: 26/11/2024
	Job No: 5920

Appendix JBase Year Junction Capacity Model Outputs

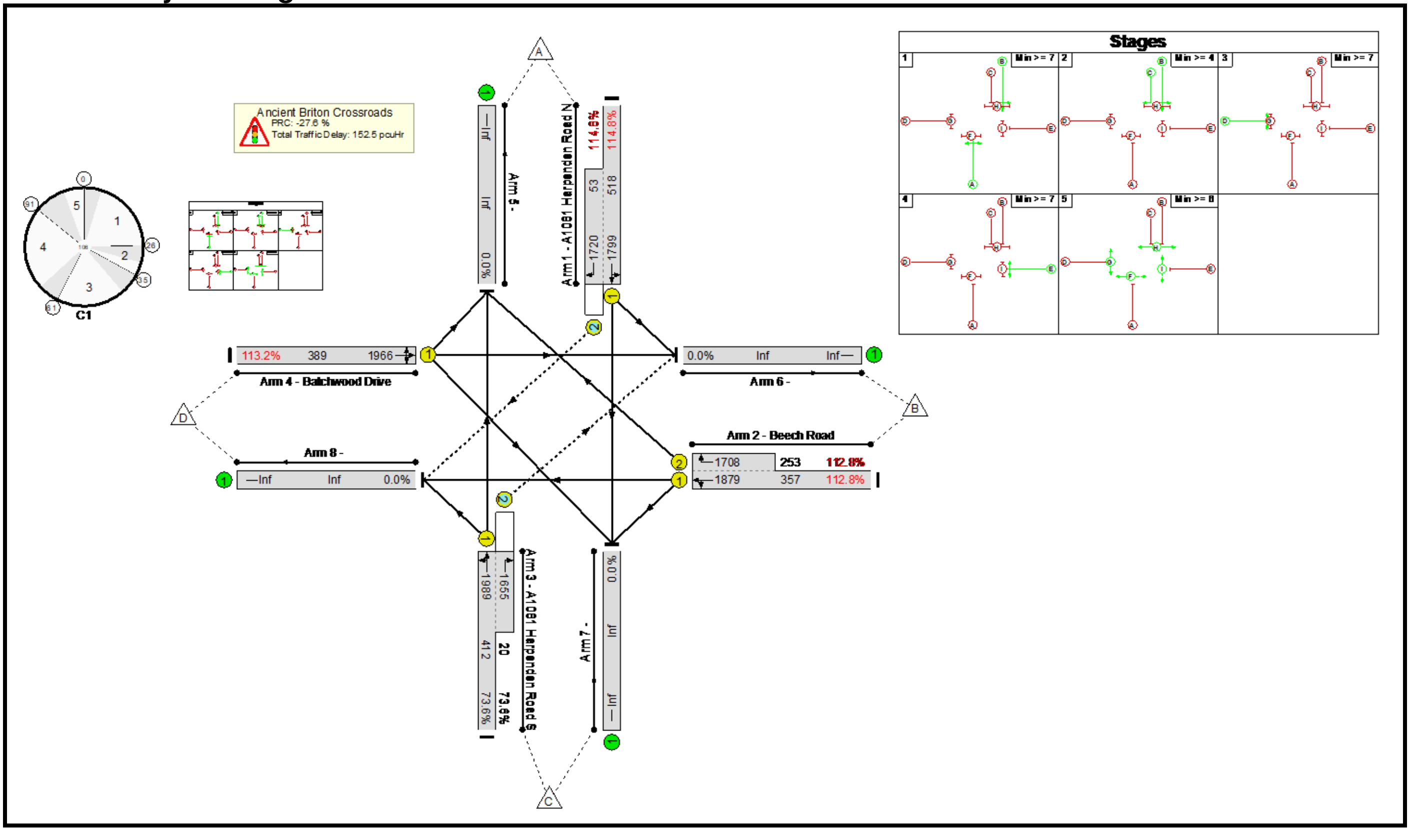
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-Ancient Briton Signals - Existing Layout - Revised Modelling.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2022 Base AM' (FG1: '2022 Base AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

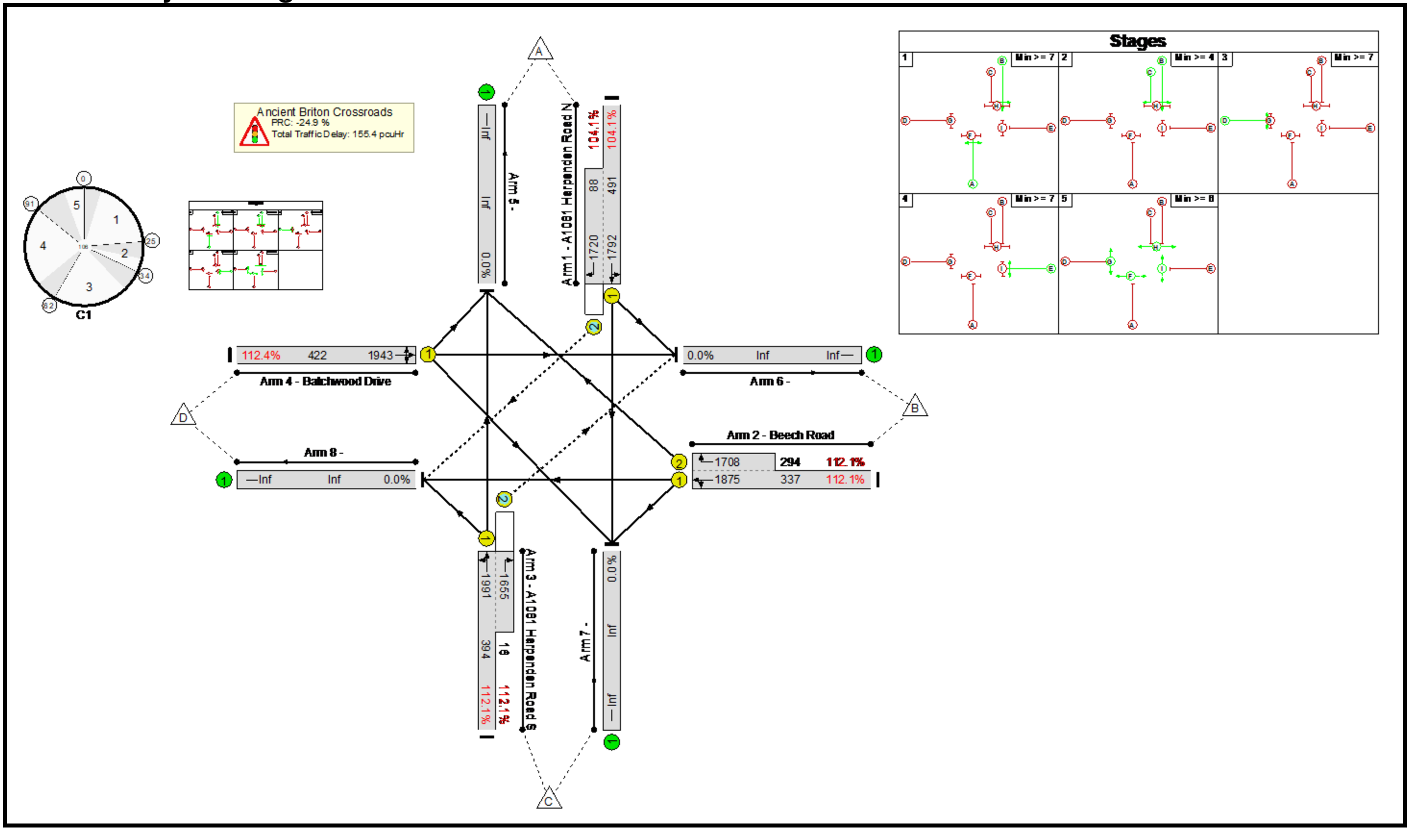
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**114.8%**	**37**	**11**	**20**	**152.5**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**114.8%**	**37**	**11**	**20**	**152.5**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	30	4	656	1799:1720	518+53	114.8 : 114.8%	37	11	5	57.2	313.9	68.3	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	24	-	688	1879:1708	357+253	112.8 : 112.8%	-	-	-	53.4	279.5	61.7	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	21	-	318	1989:1655	412+20	73.6 : 73.6%	0	0	15	4.9	55.7	9.7	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	20	-	441	1966	389	113.2%	-	-	-	37.0	301.8	44.0	4/1

C1 PRC for Signalled Lanes (%): -27.6 Total Delay for Signalled Lanes (pcuHr): 152.52 Cycle Time (s): 106
PRC Over All Lanes (%): -27.6 Total Delay Over All Lanes(pcuHr): 152.52

Basic Results Summary

Scenario 2: '2022 Base PM' (FG2: '2022 Base PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**112.4%**	**0**	**81**	**24**	**155.4**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**112.4%**	**0**	**81**	**24**	**155.4**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	29	4	603	1792:1720	491+88	104.1 : 104.1%	0	81	8	27.4	163.7	37.0	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	23	-	707	1875:1708	337+294	112.1 : 112.1%	-	-	-	53.1	270.2	60.4	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	20	-	460	1991:1655	394+16	112.1 : 112.1%	0	0	16	37.0	289.4	44.1	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	22	-	474	1943	422	112.4%	-	-	-	37.9	288.0	45.6	4/1

C1 PRC for Signalled Lanes (%): -24.9 Total Delay for Signalled Lanes (pcuHr): 155.36 Cycle Time (s): 106
PRC Over All Lanes (%): -24.9 Total Delay Over All Lanes(pcuHr): 155.36

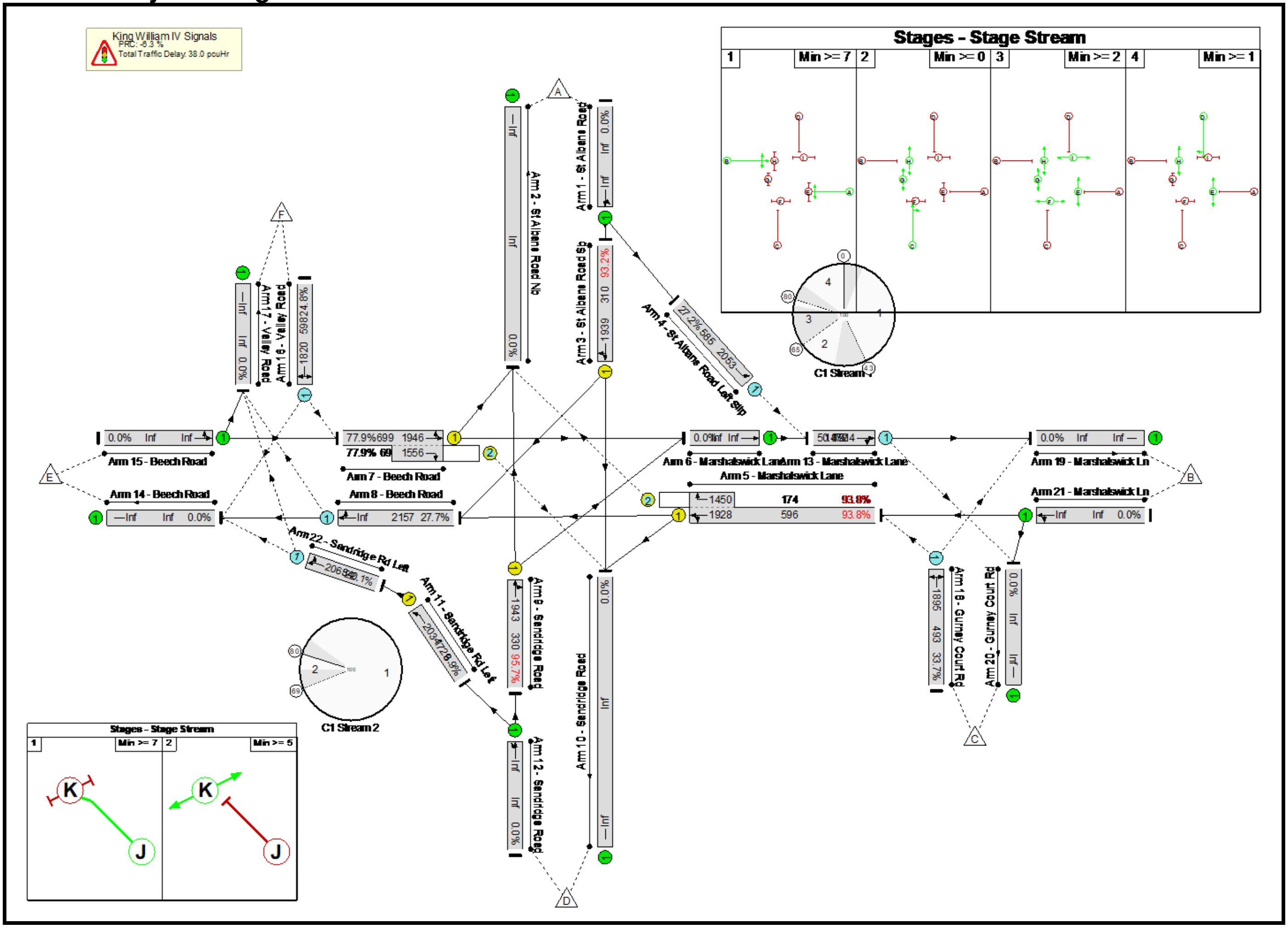
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-King William IV Signals - Existing Layout.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2022 Base AM' (FG1: '2022 Base AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	-	-	-		-	-	-	-	-	-	**95.7%**	**1039**	**0**	**70**	**38.0**	-	-	**Network**
King William IV Signals	-	-	-		-	-	-	-	-	-	**95.7%**	**1039**	**0**	**70**	**38.0**	-	-	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	15	-	289	1939	310	93.2%	-	-	-	8.0	100.2	12.6	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	159	2053	585	27.2%	159	0	0	0.2	4.2	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	38	-	722	1928:1450	596+174	93.8 : 93.8%	110	0	53	12.5	62.1	23.8	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	38	-	599	1946:1556	699+69	77.9 : 77.9%	37	0	17	6.4	38.4	15.5	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	597	Inf	2157	27.7%	189	0	0	0.2	1.2	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	16	-	316	1943	330	95.7%	-	-	-	9.6	109.5	14.7	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	119	2034	1729	6.9%	-	-	-	0.1	2.3	0.5	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	748	1914	1472	50.8%	111	0	0	0.5	2.5	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	148	1820	598	24.8%	148	0	0	0.2	4.0	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	166	1895	493	33.7%	166	0	0	0.3	5.5	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	119	2063	540	22.1%	119	0	0	0.1	4.3	0.6	22/1

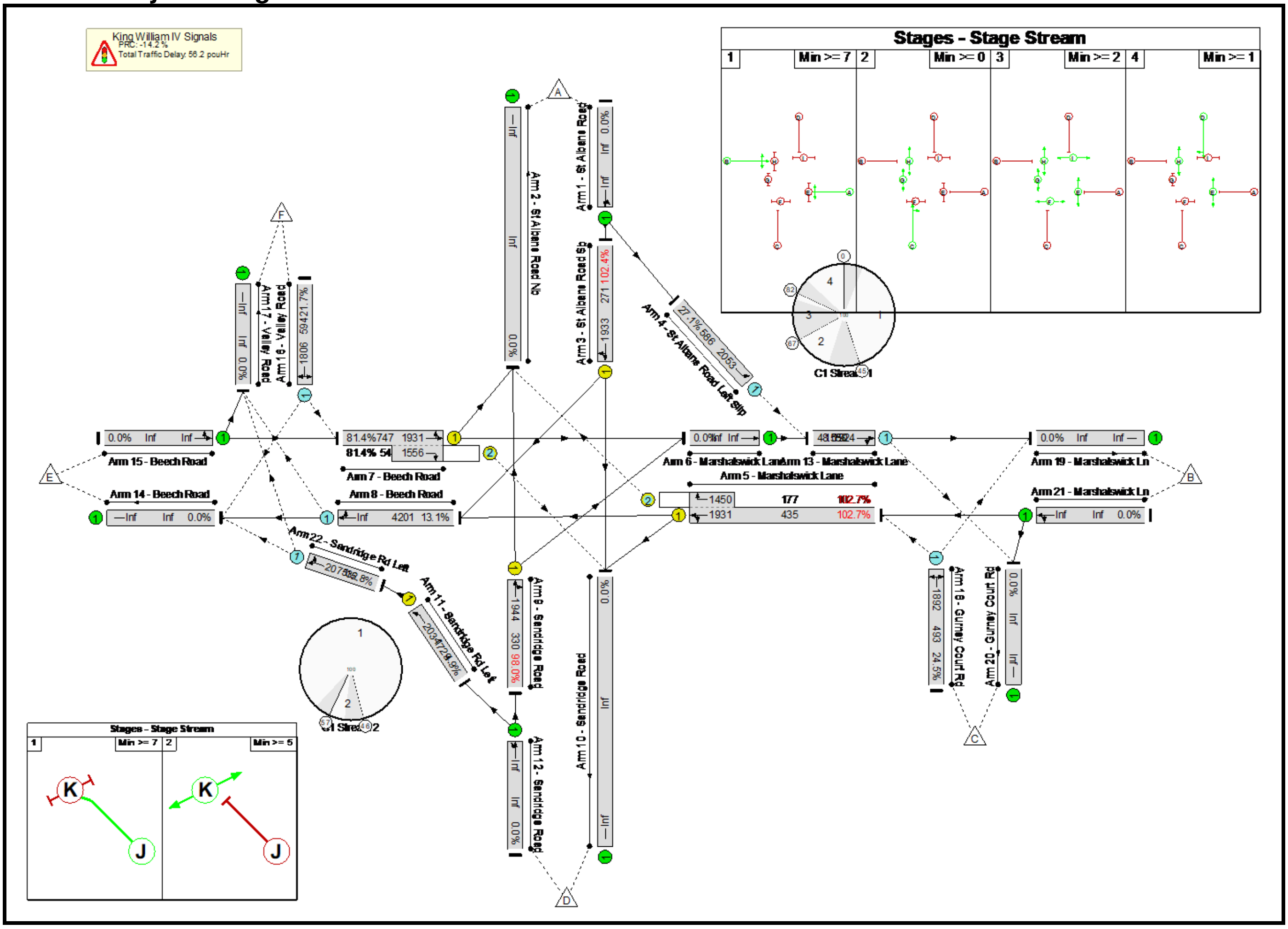
Basic Results Summary

C1	Stream: 1 PRC for Signalled Lanes (%):	-6.3	Total Delay for Signalled Lanes (pcuHr):	36.49	Cycle Time (s):	100
C1	Stream: 2 PRC for Signalled Lanes (%):	1207.6	Total Delay for Signalled Lanes (pcuHr):	0.08	Cycle Time (s):	100
	PRC Over All Lanes (%):	-6.3	Total Delay Over All Lanes(pcuHr):	38.02		

Basic Results Summary

Scenario 2: '2022 Base PM' (FG2: '2022 Base PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**102.7%**	**807**	**13**	**73**	**56.2**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**102.7%**	**807**	**13**	**73**	**56.2**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	13	-	277	1933	271	102.4%	-	-	-	13.7	178.6	17.9	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	159	2053	586	27.1%	159	0	0	0.2	4.2	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	40	-	629	1931:1450	435+177	102.7 : 102.7%	92	13	72	23.2	132.8	30.2	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	40	-	652	1931:1556	747+54	81.4 : 81.4%	43	0	1	6.9	37.9	17.7	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	553	Inf	4201	13.1%	86	0	0	0.1	0.5	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	16	-	324	1944	330	98.0%	-	-	-	11.2	124.9	16.4	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	84	2034	1729	4.9%	-	-	-	0.1	2.3	0.4	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	744	1924	1550	48.0%	92	0	0	0.5	2.2	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	129	1806	594	21.7%	129	0	0	0.1	3.9	0.1	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	121	1892	493	24.5%	121	0	0	0.2	4.8	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	84	2071	532	15.8%	84	0	0	0.1	4.0	0.3	22/1

Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-14.2	Total Delay for Signalled Lanes (pcuHr):	55.04	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1752.4	Total Delay for Signalled Lanes (pcuHr):	0.05	Cycle Time (s):	100
		PRC Over All Lanes (%):	-14.2	Total Delay Over All Lanes(pcuHr):	56.21		

Junctions 10

PICADY 10 - Priority Intersection Module

Filename: 05920 Firbank Road_Beech Road 2022 Outputs.j10
Path: C:\Users\emma beynon\OneDrive - Phil Jones Associates\05920 North St Albans\3. Technical\3.2 Modelling\Junctions 10 \July 2024 Selected Scenarios
Report generation date: 23/07/2024 16:25:43

»2022 Base , AM
»2022 Base, PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	[Lane Simulation] - 2022 Base									
Junction 1 - Arm A	D1	0.0	0.00		A	D2	0.0	0.00		A
Junction 1 - Arm B		0.4	15.43		C		1.1	20.24		C
Junction 1 - Arm C		0.0	0.04		A		0.0	0.04		A
Junction 2 - Arm A		0.0	0.00		A		0.0	0.00		A
Junction 2 - Arm B		0.1	6.98		A		0.3	8.49		A
Junction 2 - Arm C		0.1	0.45		A		0.0	0.21		A
Junction 3 - Arm A		0.0	0.00		A		0.1	0.21		A
Junction 3 - Arm B		0.1	7.60		A		0.0	7.55		A
Junction 3 - Arm C		0.0	0.00		A		0.0	0.00		A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay.

File summary

File Description

Title	
Location	
Site number	
Date	22/11/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PJA\Matthew Wykes
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use simulation for HCM roundabouts	Use iterations for HCM roundabouts
5.75						0.85	36.00	20.00		

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Calculate RFCs	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	Do not calculate	-1	3	1	60	✓			524468916	101	4.54

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2022 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2022 Base	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	✓	100.000	100.000

2022 Base , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Junction 1 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 2 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 3 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Info	Simulation	A1 - [Lane Simulation]	This run uses Simulation mode. For detailed information on this mode, please see the User Guide.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Western Priority	T-Junction	Two-way	Two-way	Two-way		1.35	A
2	Eastern Priority	T-Junction	Two-way	Two-way	Two-way		0.65	A
3	Northern Priority	T-Junction	Two-way	Two-way	Two-way		0.56	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.96	A

Arms

Arms

Junction	Arm	Name	Description	Arm type
1	A	Beech Road W		Major
	B	Firbank Rd		Minor
	C	Beech Rd E		Major
2	A	Beech Rd W		Major
	B	Firbank Rd		Minor
	C	Beech Road E		Major
3	A	Firbank Rd E		Major
	B	Firbank Rd W		Minor
	C	Firbank Rd S		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Width for right-turn storage (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)	Vehicles causing blocking (%)
1	C	6.73		✓	2.36	86.0	✓	8.20	100
2	C	6.73		✓	2.23	34.8	✓	6.20	100
3	C	8.10				125.0	✓	0.00	100

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
1	B	One lane plus flare	10.00	8.55	5.06	3.42	3.42	✓	2.00	20	44
2	B	One lane plus flare	10.00	5.47	4.34	3.62	3.58	✓	1.00	66	19
3	B	One lane plus flare	10.00	5.53	4.30	4.30	3.80	✓	1.00	17	35

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	575	0.101	0.256	0.161	0.365
	B-C	643	0.096	0.242	-	-
	C-B	635	0.238	0.238	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
2	B-A	495	0.087	0.220	0.138	0.314
	B-C	719	0.107	0.270	-	-
	C-B	596	0.224	0.224	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
3	B-A	574	0.095	0.240	0.151	0.343
	B-C	631	0.088	0.222	-	-
	C-B	646	0.228	0.228	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Lane Simulation: Arm options

Junction	Arm	Traffic considering secondary lanes (%)
1	A	10.00
	B	10.00
	C	10.00
2	A	10.00
	B	10.00
	C	10.00
3	A	10.00
	B	10.00
	C	10.00

Lanes

Junction	Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Has obstruction	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1	A	Entry	1	1	B, C		Infinity			0	99999	
		Exit	1	1			Infinity					
	B	Entry	1	1	C	✓	2.00			0	99999	
				2	A	✓	2.00			0	99999	
			2	1	(A, C)	✓	3.00					
		Exit	1	1		✓	3.00					
	C	Entry	1	1	A	✓	8.20			0	99999	
				2	B	✓	8.20			0	99999	
			2	1	(A, B)	✓	3.00					
		Exit	1	1		✓	3.00					
2	A	Entry	1	1	B, C	✓	3.00			0	99999	
		Exit	1	1		✓	3.00					
	B	Entry	1	1	C	✓	1.00			0	99999	
				2	A	✓	1.00			0	99999	
			2	1	(A, C)	✓	3.00					
		Exit	1	1		✓	3.00					
	C	Entry	1	1	A	✓	6.20			0	99999	
				2	B	✓	6.20			0	99999	
			2	1	(A, B)		Infinity					
		Exit	1	1			Infinity					
3	A	Entry	1	1	B, C		Infinity			0	99999	
		Exit	1	1			Infinity					
	B	Entry	1	1	C	✓	1.00			0	99999	
				2	A	✓	1.00			0	99999	
			2	1	(A, C)	✓	3.00					
		Exit	1	1		✓	3.00					
	C	Entry	1	1	A, B	✓	3.00			0	99999	
		Exit	1	1		✓	3.00					

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				A	B	C
1	A	1	1		✓	✓
	B	1	1			✓
			2	✓		
		2	1	✓		✓
	C	1	1	✓		
			2		✓	
		2	1	✓	✓	

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				A	B	C
2	A	1	1		✓	✓
	B	1	1			✓
			2	✓		
		2	1	✓		✓
	C	1	1	✓		
			2		✓	
		2	1	✓	✓	

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				A	B	C
3	A	1	1		✓	✓
	B	1	1			✓
			2	✓		
		2	1	✓		✓
	C	1	1	✓	✓	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2022 Base	AM	ONE HOUR	07:45	09:15	15	✓

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	B	3	C	Simple (vertical queueing)	Normal	0	100.00	
	C	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	C	Simple (vertical queueing)	Normal	0	100.00	
	B	3	B	Simple (vertical queueing)	Normal	0	100.00	
3	B	2	B	Simple (vertical queueing)	Normal	0	100.00	
	C	1	B	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	584	100.000
	B	✓				
	C	✓				
2	A	✓				
	B	✓				
	C		ONE HOUR	✓	490	100.000
3	A		ONE HOUR	✓	159	100.000
	B	✓				
	C	✓				

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	162	422
	B	100	0	0
	C	463	2	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	422
	B	1	0	58
	C	464	26	0

Junction 3

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	59	100
	B	26	0	0
	C	164	0	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Junction	PCU factor for a cyclist	PCU factor for a cyclist in controlling flow
1	0.20	0.80
2	0.20	0.80
3	0.20	0.80

Junction 1

Heavy Vehicle %

		To		
		A	B	C
From	A	0	2	2
	B	2	0	0
	C	2	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 2

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 3

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	A	0.00	0.0	A	534	801
	B	15.43	0.4	C	91	136
	C	0.04	0.0	A	425	638
2	A	0.00	0.0	A	384	576
	B	6.98	0.1	A	54	81
	C	0.45	0.1	A	448	673
3	A	0.00	0.0	A	145	217
	B	7.60	0.1	A	24	35
	C	0.00	0.0	A	152	228

Main Results for each time segment

07:45 - 08:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	429	107	429	439	408	0.0	0.0	0.000	A
	B	72	18	72	73	122	0.0	0.2	10.653	B
	C	339	85	339	352	309	0.0	0.0	0.041	A
2	A	309	77	309	319	338	0.0	0.0	0.000	A
	B	47	12	47	45	21	0.0	0.1	6.074	A
	C	358	90	359	370	355	0.0	0.0	0.411	A
3	A	119	30	119	119	142	0.0	0.0	0.000	A
	B	21	5	20	19	47	0.0	0.0	6.880	A
	C	122	30	122	122	72	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	514	129	514	531	496	0.0	0.0	0.000	A
	B	86	21	88	90	144	0.2	0.2	11.511	B
	C	409	102	409	411	372	0.0	0.0	0.028	A
2	A	373	93	373	385	411	0.0	0.0	0.000	A
	B	53	13	54	52	24	0.1	0.1	6.553	A
	C	434	108	434	434	426	0.0	0.0	0.366	A
3	A	139	35	139	142	170	0.0	0.0	0.000	A
	B	24	6	25	23	53	0.0	0.0	7.602	A
	C	146	36	146	149	86	0.0	0.0	0.000	A

08:15 - 08:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	637	159	637	643	617	0.0	0.0	0.000	A
	B	111	28	110	108	176	0.2	0.4	14.109	B
	C	508	127	508	509	463	0.0	0.0	0.035	A
2	A	463	116	463	464	507	0.0	0.0	0.000	A
	B	67	17	68	64	26	0.1	0.1	6.814	A
	C	532	133	532	534	530	0.0	0.1	0.448	A
3	A	178	44	178	173	202	0.0	0.0	0.000	A
	B	26	7	26	27	67	0.0	0.1	7.040	A
	C	177	44	177	180	111	0.0	0.0	0.000	A

08:30 - 08:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	643	161	643	644	625	0.0	0.0	0.000	A
	B	108	27	108	112	183	0.4	0.4	15.430	C
	C	519	130	519	511	462	0.0	0.0	0.027	A
2	A	459	115	459	462	522	0.0	0.0	0.000	A
	B	60	15	60	64	28	0.1	0.1	6.980	A
	C	547	137	548	538	518	0.1	0.0	0.376	A
3	A	168	42	168	176	211	0.0	0.0	0.000	A
	B	28	7	29	27	60	0.1	0.0	7.097	A
	C	183	46	183	181	108	0.0	0.0	0.000	A

08:45 - 09:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	524	131	524	524	513	0.0	0.0	0.000	A
	B	90	23	91	92	152	0.4	0.3	12.546	B
	C	425	106	425	419	373	0.0	0.0	0.033	A
2	A	374	93	374	380	424	0.0	0.0	0.000	A
	B	52	13	52	55	22	0.1	0.1	6.647	A
	C	445	111	445	441	425	0.0	0.0	0.427	A
3	A	141	35	141	145	175	0.0	0.0	0.000	A
	B	22	5	22	22	52	0.0	0.0	6.827	A
	C	153	38	153	146	89	0.0	0.0	0.000	A

09:00 - 09:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	457	114	457	441	427	0.0	0.0	0.000	A
	B	76	19	77	75	133	0.3	0.2	10.506	B
	C	352	88	352	346	326	0.0	0.0	0.030	A
2	A	325	81	325	320	353	0.0	0.0	0.000	A
	B	46	12	46	47	21	0.1	0.1	6.091	A
	C	374	93	374	366	370	0.0	0.0	0.397	A
3	A	122	31	122	123	153	0.0	0.0	0.000	A
	B	21	5	21	21	46	0.0	0.1	6.760	A
	C	133	33	133	122	76	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	429	429	439	0.0	0.0	0.000	A
		Exit	1	1		408	408	423	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	72	72	73	0.0	0.2	10.333	B
			2	1	(A, C)	72	72	74	0.0	0.0	0.317	A
		Exit	1	1		122	122	122	0.0	0.0	0.000	A
	C	Entry	1	1	A	337	337	350	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.583	A
			2	1	(A, B)	339	339	352	0.0	0.0	0.000	A
		Exit	1	1		309	309	319	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	309	309	319	0.0	0.0	0.000	A
		Exit	1	1		338	338	351	0.0	0.0	0.000	A
	B	Entry	1	1	C	46	46	44	0.0	0.1	5.535	A
				2	A	0.48	0.36	0.51	0.0	0.0	10.114	B
			2	1	(A, C)	47	47	45	0.0	0.0	0.471	A
		Exit	1	1		21	21	19	0.0	0.0	0.000	A
	C	Entry	1	1	A	338	338	351	0.0	0.0	0.000	A
				2	B	20	21	19	0.0	0.0	7.681	A
			2	1	(A, B)	358	358	370	0.0	0.0	0.000	A
		Exit	1	1		355	355	364	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	119	119	119	0.0	0.0	0.000	A
		Exit	1	1		142	142	141	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	21	20	19	0.0	0.0	6.592	A
			2	1	(A, C)	21	21	19	0.0	0.0	0.288	A
		Exit	1	1		47	47	45	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	122	122	122	0.0	0.0	0.000	A
		Exit	1	1		72	72	74	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	514	514	531	0.0	0.0	0.000	A
		Exit	1	1		496	496	500	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	86	88	90	0.2	0.2	10.793	B
			2	1	(A, C)	86	86	90	0.0	0.0	0.720	A
		Exit	1	1		144	144	148	0.0	0.0	0.000	A
	C	Entry	1	1	A	408	408	410	0.0	0.0	0.000	A
				2	B	1	1	2	0.0	0.0	6.719	A
			2	1	(A, B)	409	409	411	0.0	0.0	0.000	A
		Exit	1	1		372	372	385	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	373	373	385	0.0	0.0	0.000	A
		Exit	1	1		411	411	413	0.0	0.0	0.000	A
	B	Entry	1	1	C	52	53	51	0.1	0.1	5.961	A
				2	A	1	1	1	0.0	0.0	11.436	B
			2	1	(A, C)	53	53	52	0.0	0.0	0.480	A
		Exit	1	1		24	24	23	0.0	0.0	0.000	A
	C	Entry	1	1	A	410	410	412	0.0	0.0	0.000	A
				2	B	24	24	23	0.0	0.0	6.777	A
			2	1	(A, B)	434	434	435	0.0	0.0	0.000	A
		Exit	1	1		426	426	436	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	139	139	142	0.0	0.0	0.000	A
		Exit	1	1		170	170	171	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	24	25	23	0.0	0.0	7.279	A
			2	1	(A, C)	24	24	23	0.0	0.0	0.324	A
		Exit	1	1		53	53	52	0.0	0.0	0.003	A
	C	Entry	1	1	A, B	146	146	149	0.0	0.0	0.000	A
		Exit	1	1		86	86	91	0.0	0.0	0.005	A

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	637	637	643	0.0	0.0	0.000	A
		Exit	1	1		617	617	615	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	111	110	108	0.2	0.4	12.799	B
			2	1	(A, C)	111	111	109	0.0	0.0	1.319	A
		Exit	1	1		176	176	180	0.0	0.0	0.000	A
	C	Entry	1	1	A	506	506	507	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	9.089	A
			2	1	(A, B)	508	508	509	0.0	0.0	0.000	A
		Exit	1	1		463	463	465	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	463	463	464	0.0	0.0	0.000	A
		Exit	1	1		507	507	508	0.0	0.0	0.000	A
	B	Entry	1	1	C	67	67	63	0.1	0.1	5.939	A
				2	A	0.71	0.71	0.63	0.0	0.0	11.656	B
			2	1	(A, C)	67	67	64	0.0	0.0	0.818	A
		Exit	1	1		26	26	27	0.0	0.0	0.000	A
	C	Entry	1	1	A	506	506	507	0.0	0.0	0.000	A
				2	B	26	26	27	0.0	0.1	8.683	A
			2	1	(A, B)	532	532	534	0.0	0.0	0.000	A
		Exit	1	1		530	530	528	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	178	178	173	0.0	0.0	0.000	A
		Exit	1	1		202	202	207	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	26	26	27	0.0	0.1	6.752	A
			2	1	(A, C)	26	26	27	0.0	0.0	0.287	A
		Exit	1	1		67	67	64	0.0	0.0	0.012	A
	C	Entry	1	1	A, B	177	177	180	0.0	0.0	0.000	A
		Exit	1	1		111	111	109	0.0	0.0	0.024	A

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	643	643	644	0.0	0.0	0.000	A
		Exit	1	1		625	625	621	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	108	108	112	0.4	0.4	13.694	B
			2	1	(A, C)	108	108	112	0.0	0.0	1.726	A
		Exit	1	1		183	183	182	0.0	0.0	0.000	A
	C	Entry	1	1	A	516	516	509	0.0	0.0	0.000	A
				2	B	2	3	2	0.0	0.0	5.928	A
			2	1	(A, B)	519	519	511	0.0	0.0	0.000	A
		Exit	1	1		462	462	464	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	459	459	462	0.0	0.0	0.000	A
		Exit	1	1		522	522	512	0.0	0.0	0.000	A
	B	Entry	1	1	C	59	58	63	0.1	0.1	6.186	A
				2	A	1	1	1	0.0	0.0	11.730	B
			2	1	(A, C)	60	60	64	0.0	0.0	0.680	A
		Exit	1	1		28	28	27	0.0	0.0	0.000	A
	C	Entry	1	1	A	520	520	510	0.0	0.0	0.000	A
				2	B	27	28	27	0.1	0.0	7.348	A
			2	1	(A, B)	547	547	537	0.0	0.0	0.000	A
		Exit	1	1		518	518	526	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	168	168	176	0.0	0.0	0.000	A
		Exit	1	1		211	211	209	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	28	29	27	0.1	0.0	6.643	A
			2	1	(A, C)	28	28	27	0.0	0.0	0.454	A
		Exit	1	1		60	60	64	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	183	183	181	0.0	0.0	0.000	A
		Exit	1	1		108	108	112	0.0	0.0	0.069	A

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	524	524	524	0.0	0.0	0.000	A
		Exit	1	1		513	513	509	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	90	91	92	0.4	0.3	11.784	B
			2	1	(A, C)	90	90	91	0.0	0.0	0.755	A
		Exit	1	1		152	152	147	0.0	0.0	0.000	A
	C	Entry	1	1	A	422	422	417	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	6.933	A
			2	1	(A, B)	425	425	419	0.0	0.0	0.000	A
		Exit	1	1		373	373	380	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	374	374	380	0.0	0.0	0.000	A
		Exit	1	1		424	424	420	0.0	0.0	0.000	A
	B	Entry	1	1	C	51	51	53	0.1	0.1	5.857	A
				2	A	0.95	0.95	1	0.0	0.0	13.081	B
			2	1	(A, C)	52	52	54	0.0	0.0	0.644	A
		Exit	1	1		22	22	22	0.0	0.0	0.000	A
	C	Entry	1	1	A	423	423	419	0.0	0.0	0.000	A
				2	B	22	22	22	0.0	0.0	8.358	A
			2	1	(A, B)	445	445	441	0.0	0.0	0.000	A
		Exit	1	1		425	425	434	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	141	141	145	0.0	0.0	0.000	A
		Exit	1	1		175	175	169	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	22	22	22	0.0	0.0	6.556	A
			2	1	(A, C)	22	22	22	0.0	0.0	0.271	A
		Exit	1	1		52	52	54	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	153	153	146	0.0	0.0	0.000	A
		Exit	1	1		89	89	91	0.0	0.0	0.002	A

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	457	457	441	0.0	0.0	0.000	A
		Exit	1	1		427	427	420	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	76	77	75	0.3	0.2	10.148	B
			2	1	(A, C)	76	76	75	0.0	0.0	0.365	A
		Exit	1	1		133	133	122	0.0	0.0	0.000	A
	C	Entry	1	1	A	350	350	344	0.0	0.0	0.000	A
				2	B	1	1	1	0.0	0.0	7.182	A
			2	1	(A, B)	352	352	346	0.0	0.0	0.000	A
		Exit	1	1		326	326	321	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	325	325	320	0.0	0.0	0.000	A
		Exit	1	1		353	353	345	0.0	0.0	0.000	A
	B	Entry	1	1	C	46	46	47	0.1	0.1	5.630	A
				2	A	0.48	0.36	0.48	0.0	0.0	8.634	A
			2	1	(A, C)	46	46	47	0.0	0.0	0.434	A
		Exit	1	1		21	21	21	0.0	0.0	0.000	A
	C	Entry	1	1	A	353	353	345	0.0	0.0	0.000	A
				2	B	21	21	21	0.0	0.0	6.903	A
			2	1	(A, B)	374	374	366	0.0	0.0	0.000	A
		Exit	1	1		370	370	367	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	122	122	123	0.0	0.0	0.000	A
		Exit	1	1		153	153	143	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	21	21	21	0.0	0.1	6.382	A
			2	1	(A, C)	21	21	21	0.0	0.0	0.375	A
		Exit	1	1		46	46	47	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	133	133	122	0.0	0.0	0.000	A
		Exit	1	1		76	76	75	0.0	0.0	0.000	A

Lane movements: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	120	30	-	-	-	120	120	0.0	0.0	0.000	A
					C	309	77	-	-	-	309	319	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	72	18	575	427	0.168	72	73	0.0	0.2	10.333	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	72	18	-	-	-	72	74	0.0	0.0	0.317	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	337	84	-	-	-	337	350	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.50	232	193	0.010	2	2	0.0	0.0	7.583	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	337	84	-	-	-	337	350	0.0	0.0	0.000	A

			2	1	B	2	0.50	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	309	77	-	-	-	309	319	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	46	12	719	634	0.073	46	44	0.0	0.1	5.535	A
				2	A	0.48	0.12	69	52	0.009	0.36	0.51	0.0	0.0	10.114	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.48	0.12	-	-	-	0.48	0.55	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	47	12	-	-	-	46	45	0.0	0.0	0.477	A
	C	Entry	1	1	A	338	84	-	-	-	338	351	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	20	5	590	519	0.039	21	19	0.0	0.0	7.681	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	338	84	-	-	-	338	351	0.0	0.0	0.000	A
					B	20	5	-	-	-	20	19	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	47	12	-	-	-	47	45	0.0	0.0	0.000	A
					C	72	18	-	-	-	72	74	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	21	5	569	528	0.039	20	19	0.0	0.0	6.592	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	21	5	-	-	-	21	19	0.0	0.0	0.288	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	122	30	-	-	-	122	122	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	143	36	-	-	-	143	146	0.0	0.0	0.000	A
					C	372	93	-	-	-	372	385	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	86	21	575	399	0.216	88	90	0.2	0.2	10.793	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	86	21	-	-	-	86	90	0.0	0.0	0.720	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1	1	A	408	102	-	-	-	408	410	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A

	C	Entry		2	B	1	0.36	201	163	0.009	1	2	0.0	0.0	6.719	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	408	102	-	-	-	408	410	0.0	0.0	0.000	A
					B	1	0.36	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	373	93	-	-	-	373	385	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	52	13	719	617	0.084	53	51	0.1	0.1	5.961	A
				2	A	1	0.33	127	90	0.015	1	1	0.0	0.0	11.436	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	1	0.33	-	-	-	1	1	0.0	0.0	0.242	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	52	13	-	-	-	52	51	0.0	0.0	0.486	A
	C	Entry	1	1	A	410	102	-	-	-	410	412	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	24	6	596	513	0.048	24	23	0.0	0.0	6.777	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	410	102	-	-	-	410	412	0.0	0.0	0.000	A
					B	24	6	-	-	-	24	23	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	53	13	-	-	-	53	52	0.0	0.0	0.000	A
					C	86	21	-	-	-	86	91	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	24	6	574	526	0.046	25	23	0.0	0.0	7.279	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	24	6	-	-	-	24	23	0.0	0.0	0.324	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	146	36	-	-	-	146	149	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	174	43	-	-	-	174	178	0.0	0.0	0.000	A
					C	463	116	-	-	-	463	465	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	111	28	575	357	0.312	110	108	0.2	0.4	12.799	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	111	28	-	-	-	111	109	0.0	0.0	1.319	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	506	127	-	-	-	506	507	0.0	0.0	0.000	A

	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.53	245	188	0.011	2	2	0.0	0.0	9.089	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	506	127	-	-	-	506	507	0.0	0.0	0.000	A
					B	2	0.53	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	463	116	-	-	-	463	464	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	67	17	719	593	0.112	67	63	0.1	0.1	5.939	A
				2	A	0.71	0.18	73	47	0.015	0.71	0.63	0.0	0.0	11.656	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.71	0.18	-	-	-	0.71	0.63	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	66	17	-	-	-	67	64	0.0	0.0	0.826	A
	C	Entry	1	1	A	506	127	-	-	-	506	507	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	26	7	596	492	0.054	26	27	0.0	0.1	8.683	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	506	127	-	-	-	506	507	0.0	0.0	0.000	A
					B	26	7	-	-	-	26	27	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	67	17	-	-	-	67	64	0.0	0.0	0.000	A
					C	111	28	-	-	-	111	109	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	26	7	574	514	0.051	26	27	0.0	0.1	6.752	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	26	7	-	-	-	26	27	0.0	0.0	0.287	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	177	44	-	-	-	177	180	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	180	45	-	-	-	180	179	0.0	0.0	0.000	A
					C	462	116	-	-	-	462	464	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	108	27	575	352	0.306	108	112	0.4	0.4	13.694	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	108	27	-	-	-	108	112	0.0	0.0	1.726	A

1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	516	129	-	-	-	516	509	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.62	295	224	0.011	3	2	0.0	0.0	5.928	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	516	129	-	-	-	516	509	0.0	0.0	0.000	A
					B	2	0.62	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	459	115	-	-	-	459	462	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	59	15	719	594	0.099	58	63	0.1	0.1	6.186	A
				2	A	1	0.36	132	84	0.017	1	1	0.0	0.0	11.730	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	1	0.36	-	-	-	1	1	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	59	15	-	-	-	59	63	0.0	0.0	0.694	A
	C	Entry	1	1	A	520	130	-	-	-	520	510	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	27	7	596	492	0.054	28	27	0.1	0.0	7.348	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	520	130	-	-	-	520	510	0.0	0.0	0.000	A
					B	27	7	-	-	-	27	27	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	60	15	-	-	-	60	64	0.0	0.0	0.000	A
					C	108	27	-	-	-	108	112	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	28	7	574	514	0.054	29	27	0.1	0.0	6.643	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	28	7	-	-	-	28	27	0.0	0.0	0.454	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	183	46	-	-	-	183	181	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	150	38	-	-	-	150	145	0.0	0.0	0.000	A
					C	373	93	-	-	-	373	380	0.0	0.0	0.000	A
				1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

1	B	Entry	1		C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	90	23	575	396	0.228	91	92	0.4	0.3	11.784	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	90	23	-	-	-	90	91	0.0	0.0	0.755	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	422	106	-	-	-	422	417	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.50	245	195	0.010	2	2	0.0	0.0	6.933	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	422	106	-	-	-	422	417	0.0	0.0	0.000	A
					B	2	0.50	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	374	93	-	-	-	374	380	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	51	13	719	617	0.082	51	53	0.1	0.1	5.857	A
				2	A	0.95	0.24	127	88	0.011	0.95	1	0.0	0.0	13.081	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.95	0.24	-	-	-	0.95	1	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	51	13	-	-	-	51	53	0.0	0.0	0.657	A
	C	Entry	1	1	A	423	106	-	-	-	423	419	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	22	5	596	511	0.042	22	22	0.0	0.0	8.358	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	423	106	-	-	-	423	419	0.0	0.0	0.000	A
					B	22	5	-	-	-	22	22	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	52	13	-	-	-	52	54	0.0	0.0	0.000	A
					C	89	22	-	-	-	89	91	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	22	5	574	527	0.041	22	22	0.0	0.0	6.556	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	22	5	-	-	-	22	22	0.0	0.0	0.271	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	153	38	-	-	-	153	146	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	131	33	-	-	-	131	121	0.0	0.0	0.000	A

1					C	326	81	-	-	-	326	321	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	76	19	575	422	0.181	77	75	0.3	0.2	10.148	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	76	19	-	-	-	76	75	0.0	0.0	0.365	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	350	88	-	-	-	350	344	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.36	207	171	0.008	1	1	0.0	0.0	7.182	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	350	88	-	-	-	350	344	0.0	0.0	0.000	A
					B	1	0.36	-	-	-	1	1	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	325	81	-	-	-	325	320	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	46	11	719	632	0.073	46	47	0.1	0.1	5.630	A
				2	A	0.48	0.12	64	46	0.010	0.36	0.48	0.0	0.0	8.634	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.48	0.12	-	-	-	0.48	0.51	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	46	11	-	-	-	46	47	0.0	0.0	0.439	A
	C	Entry	1	1	A	353	88	-	-	-	353	345	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	21	5	590	519	0.040	21	21	0.0	0.0	6.903	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	353	88	-	-	-	353	345	0.0	0.0	0.000	A
					B	21	5	-	-	-	21	21	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	46	12	-	-	-	46	47	0.0	0.0	0.000	A
					C	76	19	-	-	-	76	75	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	21	5	569	526	0.040	21	21	0.0	0.1	6.382	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	21	5	-	-	-	21	21	0.0	0.0	0.375	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	133	33	-	-	-	133	122	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

2022 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Junction 1 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 2 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 3 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Info	Simulation	A1 - [Lane Simulation]	This run uses Simulation mode. For detailed information on this mode, please see the User Guide.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Western Priority	T-Junction	Two-way	Two-way	Two-way		3.00	A
2	Eastern Priority	T-Junction	Two-way	Two-way	Two-way		1.00	A
3	Northern Priority	T-Junction	Two-way	Two-way	Two-way		0.46	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	1.83	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2022 Base	PM	ONE HOUR	16:45	18:15	15	✓

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	B	3	C	Simple (vertical queueing)	Normal	0	100.00	
	C	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	C	Simple (vertical queueing)	Normal	0	100.00	
	B	3	B	Simple (vertical queueing)	Normal	0	100.00	
3	B	2	B	Simple (vertical queueing)	Normal	0	100.00	
	C	1	B	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	489	100.000
	B	✓				
	C	✓				
2	A	✓				
	B	✓				
	C		ONE HOUR	✓	512	100.000
3	A		ONE HOUR	✓	286	100.000
	B	✓				
	C	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	46	443
	B	171	0	1
	C	506	2	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	444
	B	10	0	104
	C	498	14	0

Junction 3

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	114	172
	B	14	0	0
	C	48	0	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Junction	PCU factor for a cyclist	PCU factor for a cyclist in controlling flow
1	0.20	0.80
2	0.20	0.80
3	0.20	0.80

Junction 1

Heavy Vehicle %

		To		
		A	B	C
From	A	0	4	1
	B	0	0	0
	C	1	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 2

Heavy Vehicle %

	To			
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Cyclist %

	To			
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 3

Heavy Vehicle %

	To			
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	4	0	0

Cyclist %

	To			
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	A	0.00	0.0	A	445	667
	B	20.24	1.1	C	158	237
	C	0.04	0.0	A	469	703
2	A	0.00	0.0	A	404	606
	B	8.49	0.3	A	104	156
	C	0.21	0.0	A	471	707
3	A	0.21	0.1	A	262	393
	B	7.55	0.0	A	12	18
	C	0.00	0.0	A	44	66

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	367	92	367	364	515	0.0	0.0	0.000	A
	B	129	32	131	132	35	0.0	0.4	12.912	B
	C	386	97	386	386	335	0.0	0.0	0.036	A
2	A	336	84	336	332	387	0.0	0.0	0.000	A
	B	87	22	86	87	11	0.0	0.2	7.092	A
	C	390	97	389	388	413	0.0	0.0	0.186	A
3	A	216	54	216	221	47	0.0	0.0	0.000	A
	B	11	3	11	10	87	0.0	0.0	6.412	A
	C	36	9	36	35	129	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	423	106	423	435	614	0.0	0.0	0.000	A
	B	159	40	159	154	41	0.4	0.8	15.227	C
	C	457	114	457	459	384	0.0	0.0	0.022	A
2	A	385	96	385	397	456	0.0	0.0	0.000	A
	B	102	26	102	103	12	0.2	0.2	7.446	A
	C	459	115	459	461	477	0.0	0.0	0.193	A
3	A	261	65	261	259	55	0.0	0.0	0.078	A
	B	12	3	12	12	102	0.0	0.0	7.555	A
	C	43	11	43	42	159	0.0	0.0	0.000	A

17:15 - 17:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	525	131	525	534	749	0.0	0.0	0.000	A
	B	190	47	191	190	53	0.8	1.1	20.238	C
	C	561	140	561	555	475	0.0	0.0	0.026	A
2	A	476	119	476	486	560	0.0	0.0	0.000	A
	B	125	31	125	124	13	0.2	0.2	8.103	A
	C	564	141	564	559	592	0.0	0.0	0.173	A
3	A	315	79	315	316	68	0.0	0.0	0.116	A
	B	13	3	13	14	125	0.0	0.0	7.329	A
	C	54	14	54	52	190	0.0	0.0	0.000	A

17:30 - 17:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	547	137	547	533	753	0.0	0.0	0.000	A
	B	188	47	189	188	53	1.1	1.0	19.795	C
	C	566	142	567	560	496	0.0	0.0	0.023	A
2	A	496	124	496	483	566	0.0	0.0	0.000	A
	B	119	30	118	123	14	0.2	0.3	8.485	A
	C	569	142	569	563	603	0.0	0.0	0.213	A
3	A	308	77	307	311	67	0.0	0.1	0.211	A
	B	14	3	14	15	119	0.0	0.0	7.186	A
	C	54	13	54	53	188	0.0	0.0	0.000	A

17:45 - 18:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	437	109	437	436	619	0.0	0.0	0.000	A
	B	152	38	152	157	41	1.0	0.8	15.880	C
	C	470	118	470	458	400	0.0	0.0	0.034	A
2	A	398	100	398	398	469	0.0	0.0	0.000	A
	B	107	27	107	107	12	0.3	0.2	7.425	A
	C	471	118	471	460	495	0.0	0.0	0.201	A
3	A	260	65	260	262	53	0.1	0.0	0.060	A
	B	12	3	12	12	107	0.0	0.0	7.116	A
	C	41	10	41	41	152	0.0	0.0	0.000	A

18:00 - 18:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	369	92	369	375	499	0.0	0.0	0.000	A
	B	129	32	129	133	37	0.8	0.4	13.019	B
	C	372	93	372	378	334	0.0	0.0	0.036	A
2	A	335	84	335	340	373	0.0	0.0	0.000	A
	B	86	21	84	84	10	0.2	0.3	6.797	A
	C	376	94	376	382	411	0.0	0.0	0.200	A
3	A	215	54	215	216	47	0.0	0.0	0.000	A
	B	10	3	10	10	86	0.0	0.0	6.217	A
	C	37	9	37	37	129	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	367	367	364	0.0	0.0	0.000	A
		Exit	1	1		515	515	515	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.59	0.59	0.71	0.0	0.0	7.810	A
				2	A	129	131	131	0.0	0.3	11.683	B
			2	1	(A, C)	129	130	133	0.0	0.0	1.249	A
		Exit	1	1		35	35	35	0.0	0.0	0.000	A
	C	Entry	1	1	A	385	385	384	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.499	A
			2	1	(A, B)	386	386	386	0.0	0.0	0.000	A
		Exit	1	1		335	335	331	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	336	336	332	0.0	0.0	0.000	A
		Exit	1	1		387	387	386	0.0	0.0	0.000	A
	B	Entry	1	1	C	78	77	79	0.0	0.1	5.917	A
				2	A	9	9	8	0.0	0.0	9.856	A
			2	1	(A, C)	87	87	88	0.0	0.0	0.806	A
		Exit	1	1		11	11	10	0.0	0.0	0.000	A
	C	Entry	1	1	A	378	378	378	0.0	0.0	0.000	A
				2	B	12	11	10	0.0	0.0	6.996	A
			2	1	(A, B)	390	390	388	0.0	0.0	0.000	A
		Exit	1	1		413	413	411	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	216	216	221	0.0	0.0	0.000	A
		Exit	1	1		47	47	45	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	11	11	10	0.0	0.0	6.362	A
			2	1	(A, C)	11	11	10	0.0	0.0	0.050	A
		Exit	1	1		87	87	88	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	36	36	35	0.0	0.0	0.000	A
		Exit	1	1		129	129	133	0.0	0.0	0.037	A

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	423	423	435	0.0	0.0	0.000	A
		Exit	1	1		614	614	611	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.71	0.71	0.87	0.0	0.0	8.168	A
				2	A	159	159	153	0.3	0.6	12.759	B
			2	1	(A, C)	159	160	155	0.0	0.1	2.479	A
		Exit	1	1		41	41	41	0.0	0.0	0.000	A
	C	Entry	1	1	A	455	455	458	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	5.918	A
			2	1	(A, B)	457	457	459	0.0	0.0	0.000	A
		Exit	1	1		384	384	396	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	385	385	397	0.0	0.0	0.000	A
		Exit	1	1		456	456	459	0.0	0.0	0.000	A
	B	Entry	1	1	C	93	93	93	0.1	0.2	5.754	A
				2	A	10	9	10	0.0	0.0	11.333	B
			2	1	(A, C)	102	102	103	0.0	0.0	1.149	A
		Exit	1	1		12	12	12	0.0	0.0	0.000	A
	C	Entry	1	1	A	446	446	449	0.0	0.0	0.000	A
				2	B	13	12	12	0.0	0.0	7.276	A
			2	1	(A, B)	459	459	461	0.0	0.0	0.000	A
		Exit	1	1		477	477	490	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	261	261	259	0.0	0.0	0.078	A
		Exit	1	1		55	55	54	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	12	12	12	0.0	0.0	7.380	A
			2	1	(A, C)	12	12	12	0.0	0.0	0.174	A
		Exit	1	1		102	102	103	0.0	0.0	0.015	A
	C	Entry	1	1	A, B	43	43	42	0.0	0.0	0.000	A
		Exit	1	1		159	159	156	0.0	0.0	0.373	A

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	525	525	534	0.0	0.0	0.000	A
		Exit	1	1		749	749	742	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.36	0.36	1	0.0	0.0	9.130	A
				2	A	191	191	189	0.6	0.8	15.285	C
			2	1	(A, C)	190	191	191	0.1	0.2	4.979	A
		Exit	1	1		53	53	51	0.0	0.0	0.000	A
	C	Entry	1	1	A	558	558	553	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	6.470	A
			2	1	(A, B)	561	561	555	0.0	0.0	0.000	A
		Exit	1	1		475	475	486	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	476	476	486	0.0	0.0	0.000	A
		Exit	1	1		560	560	555	0.0	0.0	0.000	A
	B	Entry	1	1	C	115	116	114	0.2	0.1	6.089	A
				2	A	10	9	10	0.0	0.1	11.781	B
			2	1	(A, C)	125	125	124	0.0	0.0	1.542	A
		Exit	1	1		13	13	14	0.0	0.0	0.000	A
	C	Entry	1	1	A	551	551	545	0.0	0.0	0.000	A
				2	B	13	13	14	0.0	0.0	7.114	A
			2	1	(A, B)	564	564	559	0.0	0.0	0.000	A
		Exit	1	1		592	592	600	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	315	315	316	0.0	0.0	0.116	A
		Exit	1	1		68	68	66	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	13	13	14	0.0	0.0	7.022	A
			2	1	(A, C)	13	13	14	0.0	0.0	0.307	A
		Exit	1	1		125	125	124	0.0	0.0	0.028	A
	C	Entry	1	1	A, B	54	54	52	0.0	0.0	0.000	A
		Exit	1	1		190	190	191	0.0	0.0	0.724	A

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	547	547	533	0.0	0.0	0.000	A
		Exit	1	1		753	753	745	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.83	0.83	0.55	0.0	0.0	7.193	A
				2	A	187	188	187	0.8	0.8	15.157	C
			2	1	(A, C)	188	188	187	0.2	0.2	4.650	A
		Exit	1	1		53	53	52	0.0	0.0	0.000	A
	C	Entry	1	1	A	565	565	558	0.0	0.0	0.000	A
				2	B	1	2	2	0.0	0.0	7.190	A
			2	1	(A, B)	566	566	560	0.0	0.0	0.000	A
		Exit	1	1		496	496	483	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	496	496	483	0.0	0.0	0.000	A
		Exit	1	1		566	566	559	0.0	0.0	0.000	A
	B	Entry	1	1	C	107	107	112	0.1	0.2	6.570	A
				2	A	11	11	11	0.1	0.0	11.095	B
			2	1	(A, C)	119	118	123	0.0	0.1	1.508	A
		Exit	1	1		14	14	15	0.0	0.0	0.000	A
	C	Entry	1	1	A	555	555	548	0.0	0.0	0.000	A
				2	B	14	14	15	0.0	0.0	7.963	A
			2	1	(A, B)	569	569	563	0.0	0.0	0.000	A
		Exit	1	1		603	603	595	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	308	307	311	0.0	0.1	0.211	A
		Exit	1	1		67	67	67	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	14	14	15	0.0	0.0	6.907	A
			2	1	(A, C)	14	14	15	0.0	0.0	0.279	A
		Exit	1	1		119	119	123	0.0	0.0	0.001	A
	C	Entry	1	1	A, B	54	54	53	0.0	0.0	0.000	A
		Exit	1	1		188	188	187	0.0	0.0	0.683	A

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	437	437	436	0.0	0.0	0.000	A
		Exit	1	1		619	619	611	0.0	0.0	0.000	A
	B	Entry	1	1	C	1	1	0.83	0.0	0.0	7.098	A
				2	A	151	151	156	0.8	0.7	13.147	B
			2	1	(A, C)	152	152	156	0.2	0.2	2.816	A
		Exit	1	1		41	41	40	0.0	0.0	0.000	A
	C	Entry	1	1	A	469	469	456	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	8.360	A
			2	1	(A, B)	470	470	458	0.0	0.0	0.000	A
		Exit	1	1		400	400	398	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	398	398	398	0.0	0.0	0.000	A
		Exit	1	1		469	469	457	0.0	0.0	0.000	A
	B	Entry	1	1	C	98	97	97	0.2	0.1	5.912	A
				2	A	9	10	10	0.0	0.0	10.884	B
			2	1	(A, C)	107	107	107	0.1	0.0	1.069	A
		Exit	1	1		12	12	12	0.0	0.0	0.000	A
	C	Entry	1	1	A	459	459	447	0.0	0.0	0.000	A
				2	B	12	12	12	0.0	0.0	7.358	A
			2	1	(A, B)	471	471	460	0.0	0.0	0.000	A
		Exit	1	1		495	495	495	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	260	260	262	0.1	0.0	0.060	A
		Exit	1	1		53	53	53	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	12	12	12	0.0	0.0	7.044	A
			2	1	(A, C)	12	12	12	0.0	0.0	0.071	A
		Exit	1	1		107	107	106	0.0	0.0	0.007	A
	C	Entry	1	1	A, B	41	41	41	0.0	0.0	0.000	A
		Exit	1	1		153	152	156	0.0	0.0	0.175	A

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	369	369	375	0.0	0.0	0.000	A
		Exit	1	1		499	499	509	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.83	0.83	0.95	0.0	0.0	6.308	A
				2	A	129	128	132	0.7	0.4	11.748	B
			2	1	(A, C)	129	129	132	0.2	0.0	1.303	A
		Exit	1	1		37	37	38	0.0	0.0	0.000	A
	C	Entry	1	1	A	371	371	377	0.0	0.0	0.000	A
				2	B	1	1	2	0.0	0.0	7.544	A
			2	1	(A, B)	372	372	378	0.0	0.0	0.000	A
		Exit	1	1		334	334	340	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	335	335	340	0.0	0.0	0.000	A
		Exit	1	1		373	373	378	0.0	0.0	0.000	A
	B	Entry	1	1	C	78	77	77	0.1	0.2	5.715	A
				2	A	8	7	7	0.0	0.0	10.448	B
			2	1	(A, C)	86	86	85	0.0	0.0	0.669	A
		Exit	1	1		10	10	10	0.0	0.0	0.000	A
	C	Entry	1	1	A	366	366	371	0.0	0.0	0.000	A
				2	B	10	10	10	0.0	0.0	7.357	A
			2	1	(A, B)	376	376	382	0.0	0.0	0.000	A
		Exit	1	1		411	411	417	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	215	215	216	0.0	0.0	0.000	A
		Exit	1	1		47	47	48	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	10	10	10	0.0	0.0	6.203	A
			2	1	(A, C)	10	10	10	0.0	0.0	0.014	A
		Exit	1	1		86	86	85	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	37	37	37	0.0	0.0	0.000	A
		Exit	1	1		129	129	131	0.0	0.0	0.069	A

Lane movements: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	33	8	-	-	-	33	33	0.0	0.0	0.000	A
					C	334	84	-	-	-	334	330	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.59	0.15	95	76	0.008	0.59	0.71	0.0	0.0	7.810	A
				2	A	129	32	575	423	0.305	131	131	0.0	0.3	11.683	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	128	32	-	-	-	129	132	0.0	0.0	1.256	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.59	0.15	-	-	-	0.59	0.71	0.0	0.0	0.116	A
	C	Entry	1	1	A	385	96	-	-	-	385	384	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.45	232	201	0.009	2	2	0.0	0.0	7.499	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	385	96	-	-	-	385	384	0.0	0.0	0.000	A

			2	1	B	2	0.45	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	336	84	-	-	-	336	332	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	78	19	719	624	0.125	77	79	0.0	0.1	5.917	A
				2	A	9	2	407	297	0.030	9	8	0.0	0.0	9.856	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	9	2	-	-	-	9	8	0.0	0.0	0.288	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	78	19	-	-	-	78	80	0.0	0.0	0.860	A
	C	Entry	1	1	A	378	94	-	-	-	378	378	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	12	3	578	506	0.023	11	10	0.0	0.0	6.996	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	378	94	-	-	-	378	378	0.0	0.0	0.000	A
					B	12	3	-	-	-	12	10	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	87	22	-	-	-	87	88	0.0	0.0	0.000	A
					C	129	32	-	-	-	129	133	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	11	3	557	513	0.022	11	10	0.0	0.0	6.362	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	11	3	-	-	-	11	10	0.0	0.0	0.050	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	36	9	-	-	-	36	35	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	40	10	-	-	-	40	40	0.0	0.0	0.000	A
					C	383	96	-	-	-	383	395	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.71	0.18	121	95	0.008	0.71	0.87	0.0	0.0	8.168	A
				2	A	159	40	575	399	0.398	159	153	0.3	0.6	12.759	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	158	40	-	-	-	159	154	0.0	0.1	2.491	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.71	0.18	-	-	-	0.71	0.87	0.0	0.0	0.469	A
			1	1	A	455	114	-	-	-	455	458	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A

	C	Entry		2	B	2	0.42	207	174	0.010	2	2	0.0	0.0	5.918	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	455	114	-	-	-	455	458	0.0	0.0	0.000	A
					B	2	0.42	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	385	96	-	-	-	385	397	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	93	23	719	605	0.153	93	93	0.1	0.2	5.754	A
				2	A	10	2	461	320	0.030	9	10	0.0	0.0	11.333	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	10	2	-	-	-	10	10	0.0	0.0	0.356	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	93	23	-	-	-	93	93	0.0	0.0	1.235	A
	C	Entry	1	1	A	446	112	-	-	-	446	449	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	13	3	572	488	0.026	12	12	0.0	0.0	7.276	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	446	112	-	-	-	446	449	0.0	0.0	0.000	A
					B	13	3	-	-	-	13	12	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	102	26	-	-	-	102	103	0.0	0.0	0.041	A
					C	159	40	-	-	-	159	156	0.0	0.0	0.104	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	12	3	552	501	0.025	12	12	0.0	0.0	7.380	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	12	3	-	-	-	12	12	0.0	0.0	0.174	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	43	11	-	-	-	43	42	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	50	13	-	-	-	50	49	0.0	0.0	0.000	A
					C	475	119	-	-	-	475	485	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.36	0.09	153	108	0.003	0.36	1	0.0	0.0	9.130	A
				2	A	191	48	575	357	0.534	191	189	0.6	0.8	15.285	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	189	47	-	-	-	191	190	0.1	0.2	4.997	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.36	0.09	-	-	-	0.36	1	0.0	0.0	1.700	A
					A	558	140	-	-	-	558	553	0.0	0.0	0.000	A

	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.59	289	234	0.010	2	2	0.0	0.0	6.470	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	558	140	-	-	-	558	553	0.0	0.0	0.000	A
					B	2	0.59	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	476	119	-	-	-	476	486	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	115	29	719	582	0.197	116	114	0.2	0.1	6.089	A
				2	A	10	2	461	288	0.034	9	10	0.0	0.1	11.781	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	10	2	-	-	-	10	10	0.0	0.0	0.778	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	115	29	-	-	-	115	114	0.0	0.0	1.611	A
	C	Entry	1	1	A	551	138	-	-	-	551	545	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	13	3	572	466	0.029	13	14	0.0	0.0	7.114	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	551	138	-	-	-	551	545	0.0	0.0	0.000	A
					B	13	3	-	-	-	13	13	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	125	31	-	-	-	125	124	0.0	0.0	0.082	A
					C	190	47	-	-	-	190	192	0.0	0.0	0.137	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	13	3	552	489	0.027	13	14	0.0	0.0	7.022	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	13	3	-	-	-	13	14	0.0	0.0	0.307	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	54	14	-	-	-	54	52	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	51	13	-	-	-	51	50	0.0	0.0	0.000	A
					C	495	124	-	-	-	495	483	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.83	0.21	76	51	0.016	0.83	0.55	0.0	0.0	7.193	A
				2	A	187	47	575	352	0.533	188	187	0.8	0.8	15.157	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	187	47	-	-	-	187	187	0.2	0.2	4.660	A

1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.83	0.21	-	-	-	0.83	0.55	0.0	0.0	1.175	A
	C	Entry	1	1	A	565	141	-	-	-	565	558	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.36	245	197	0.007	2	2	0.0	0.0	7.190	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	565	141	-	-	-	565	558	0.0	0.0	0.000	A
					B	1	0.36	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	496	124	-	-	-	496	483	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	107	27	719	581	0.184	107	112	0.1	0.2	6.570	A
				2	A	11	3	470	292	0.038	11	11	0.1	0.0	11.095	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	11	3	-	-	-	11	11	0.0	0.0	0.949	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	107	27	-	-	-	107	112	0.0	0.1	1.563	A
	C	Entry	1	1	A	555	139	-	-	-	555	548	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	14	3	572	468	0.029	14	15	0.0	0.0	7.963	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	555	139	-	-	-	555	548	0.0	0.0	0.000	A
					B	14	3	-	-	-	14	15	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	119	30	-	-	-	119	123	0.0	0.0	0.171	A
					C	189	47	-	-	-	188	187	0.0	0.0	0.238	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	14	3	552	489	0.028	14	15	0.0	0.0	6.907	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	14	3	-	-	-	14	15	0.0	0.0	0.279	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	54	13	-	-	-	54	53	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	39	10	-	-	-	39	38	0.0	0.0	0.000	A
					C	399	100	-	-	-	399	397	0.0	0.0	0.000	A
				1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

1	B	Entry	1		C	1	0.30	134	102	0.012	1	0.83	0.0	0.0	7.098	A
				2	A	151	38	575	393	0.383	151	156	0.8	0.7	13.147	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	151	38	-	-	-	151	155	0.2	0.2	2.821	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.30	-	-	-	1	0.83	0.0	0.0	1.868	A
	C	Entry	1	1	A	469	117	-	-	-	469	456	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.42	245	204	0.008	2	2	0.0	0.0	8.360	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	469	117	-	-	-	469	456	0.0	0.0	0.000	A
					B	2	0.42	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	398	100	-	-	-	398	398	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	98	24	719	605	0.161	97	97	0.2	0.1	5.912	A
				2	A	9	2	456	311	0.030	10	10	0.0	0.0	10.884	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	9	2	-	-	-	9	9	0.0	0.0	0.787	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	98	24	-	-	-	98	97	0.1	0.0	1.097	A
	C	Entry	1	1	A	459	115	-	-	-	459	447	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	12	3	567	481	0.025	12	12	0.0	0.0	7.358	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	459	115	-	-	-	459	447	0.0	0.0	0.000	A
					B	12	3	-	-	-	12	12	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	107	27	-	-	-	107	106	0.0	0.0	0.091	A
					C	153	38	-	-	-	153	156	0.0	0.0	0.039	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	12	3	546	496	0.024	12	12	0.0	0.0	7.044	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	12	3	-	-	-	12	12	0.0	0.0	0.071	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	41	10	-	-	-	41	41	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	36	9	-	-	-	36	36	0.0	0.0	0.000	A

1					C	333	83	-	-	-	333	339	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.83	0.21	153	122	0.007	0.83	0.95	0.0	0.0	6.308	A
				2	A	129	32	575	424	0.303	128	132	0.7	0.4	11.748	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	128	32	-	-	-	129	131	0.2	0.0	1.307	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.83	0.21	-	-	-	0.83	0.95	0.0	0.0	0.774	A
	C	Entry	1	1	A	371	93	-	-	-	371	377	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.33	226	194	0.007	1	2	0.0	0.0	7.544	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	371	93	-	-	-	371	377	0.0	0.0	0.000	A
					B	1	0.33	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	335	84	-	-	-	335	340	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	78	19	719	619	0.126	77	77	0.1	0.2	5.715	A
				2	A	8	2	407	297	0.026	7	7	0.0	0.0	10.448	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	8	2	-	-	-	8	7	0.0	0.0	0.398	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	78	20	-	-	-	78	77	0.0	0.0	0.695	A
	C	Entry	1	1	A	366	91	-	-	-	366	371	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	10	3	555	482	0.021	10	10	0.0	0.0	7.357	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	366	91	-	-	-	366	371	0.0	0.0	0.000	A
					B	10	3	-	-	-	10	10	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	86	21	-	-	-	86	85	0.0	0.0	0.000	A
					C	129	32	-	-	-	129	131	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	10	3	534	492	0.021	10	10	0.0	0.0	6.203	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	10	3	-	-	-	10	10	0.0	0.0	0.014	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	37	9	-	-	-	37	37	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

Junctions 10

PICADY 10 - Priority Intersection Module

Filename: 05920 Harpenden Road_Sandridgebury Drive 2022 Ouputs.j10
Path: C:\Users\emma beynon\OneDrive - Phil Jones Associates\05920 North St Albans\3. Technical\3.2 Modelling\Junctions 10 \July 2024 Selected Scenarios
Report generation date: 23/07/2024 16:22:10

»2022 Base, AM
»2022 Base, PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2022 Base									
Stream B-C	D1	0.6	9.84	0.36	A	D2	0.1	7.40	0.11	A
Stream B-A		0.1	12.84	0.12	B		0.3	18.44	0.24	C
Stream C-AB		1.8	8.86	0.52	A		1.6	6.23	0.42	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	22/11/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PJA\Matthew Wykes
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2022 Base	AM	ONE HOUR	07:45	09:15	15
D2	2022 Base	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2022 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Harpenden Road / Sandridgebury Lane	T-Junction	Two-way	Two-way	Two-way		4.13	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.13	A

Arms

Arms

Arm	Name	Description	Arm type
A	Harpenden Road N		Major
B	Sandridgebury Drive		Minor
C	Harpenden Road S		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.35			80.8	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	4.27	4.18	4.02	3.91	✓	1.00	51	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	608	0.104	0.264	0.166	0.376
B-C	722	0.104	0.263	-	-
C-B	621	0.226	0.226	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2022 Base	AM	ONE HOUR	07:45	09:15	15

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	472	100.000
B		✓	223	100.000
C		✓	628	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	91	381
	B	34	0	189
	C	460	168	0

Vehicle Mix

Heavy Vehicle %

		To		
		A	B	C
From	A	0	1	4
	B	0	0	2
	C	3	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.36	9.84	0.6	A
B-A	0.12	12.84	0.1	B
C-AB	0.52	8.86	1.8	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	142	629	0.226	141	0.3	7.511	A
B-A	26	416	0.062	25	0.1	9.211	A
C-AB	227	783	0.290	224	0.6	6.595	A
C-A	246			246			
A-B	69			69			
A-C	287			287			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	170	609	0.279	170	0.4	8.341	A
B-A	31	376	0.081	30	0.1	10.430	B
C-AB	307	818	0.375	306	1.0	7.217	A
C-A	257			257			
A-B	82			82			
A-C	343			343			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	208	581	0.358	207	0.6	9.805	A
B-A	37	319	0.118	37	0.1	12.787	B
C-AB	447	869	0.514	444	1.8	8.722	A
C-A	244			244			
A-B	100			100			
A-C	419			419			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	208	581	0.358	208	0.6	9.842	A
B-A	37	318	0.118	37	0.1	12.842	B
C-AB	449	871	0.516	449	1.8	8.863	A
C-A	242			242			
A-B	100			100			
A-C	419			419			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	170	609	0.279	171	0.4	8.382	A
B-A	31	374	0.082	31	0.1	10.484	B
C-AB	309	821	0.377	312	1.0	7.355	A
C-A	255			255			
A-B	82			82			
A-C	343			343			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	142	629	0.226	143	0.3	7.561	A
B-A	26	415	0.062	26	0.1	9.257	A
C-AB	229	784	0.292	230	0.7	6.698	A
C-A	244			244			
A-B	69			69			
A-C	287			287			

2022 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Harpenden Road / Sandridgebury Lane	T-Junction	Two-way	Two-way	Two-way		2.34	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	2.34	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2022 Base	PM	ONE HOUR	16:45	18:15	15

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	595	100.000
B		✓	112	100.000
C		✓	768	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	34	561
	B	57	0	55
	C	662	106	0

Vehicle Mix

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.11	7.40	0.1	A
B-A	0.24	18.44	0.3	C
C-AB	0.42	6.23	1.6	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	41	627	0.066	41	0.1	6.146	A
B-A	43	358	0.120	42	0.1	11.376	B
C-AB	186	874	0.213	184	0.5	5.245	A
C-A	392			392			
A-B	26			26			
A-C	422			422			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	49	596	0.083	49	0.1	6.591	A
B-A	51	316	0.162	51	0.2	13.560	B
C-AB	267	930	0.287	265	0.8	5.464	A
C-A	424			424			
A-B	31			31			
A-C	504			504			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	61	547	0.111	60	0.1	7.391	A
B-A	63	259	0.243	62	0.3	18.295	C
C-AB	423	1012	0.418	420	1.6	6.166	A
C-A	423			423			
A-B	37			37			
A-C	618			618			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	61	547	0.111	61	0.1	7.402	A
B-A	63	258	0.243	63	0.3	18.435	C
C-AB	425	1013	0.419	425	1.6	6.231	A
C-A	421			421			
A-B	37			37			
A-C	618			618			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	49	595	0.083	50	0.1	6.601	A
B-A	51	315	0.162	52	0.2	13.673	B
C-AB	269	933	0.288	271	0.9	5.534	A
C-A	422			422			
A-B	31			31			
A-C	504			504			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	41	626	0.066	41	0.1	6.160	A
B-A	43	357	0.120	43	0.1	11.460	B
C-AB	188	876	0.214	189	0.5	5.300	A
C-A	391			391			
A-B	26			26			
A-C	422			422			

Appendix K Future Year Junction Capacity Model Outputs

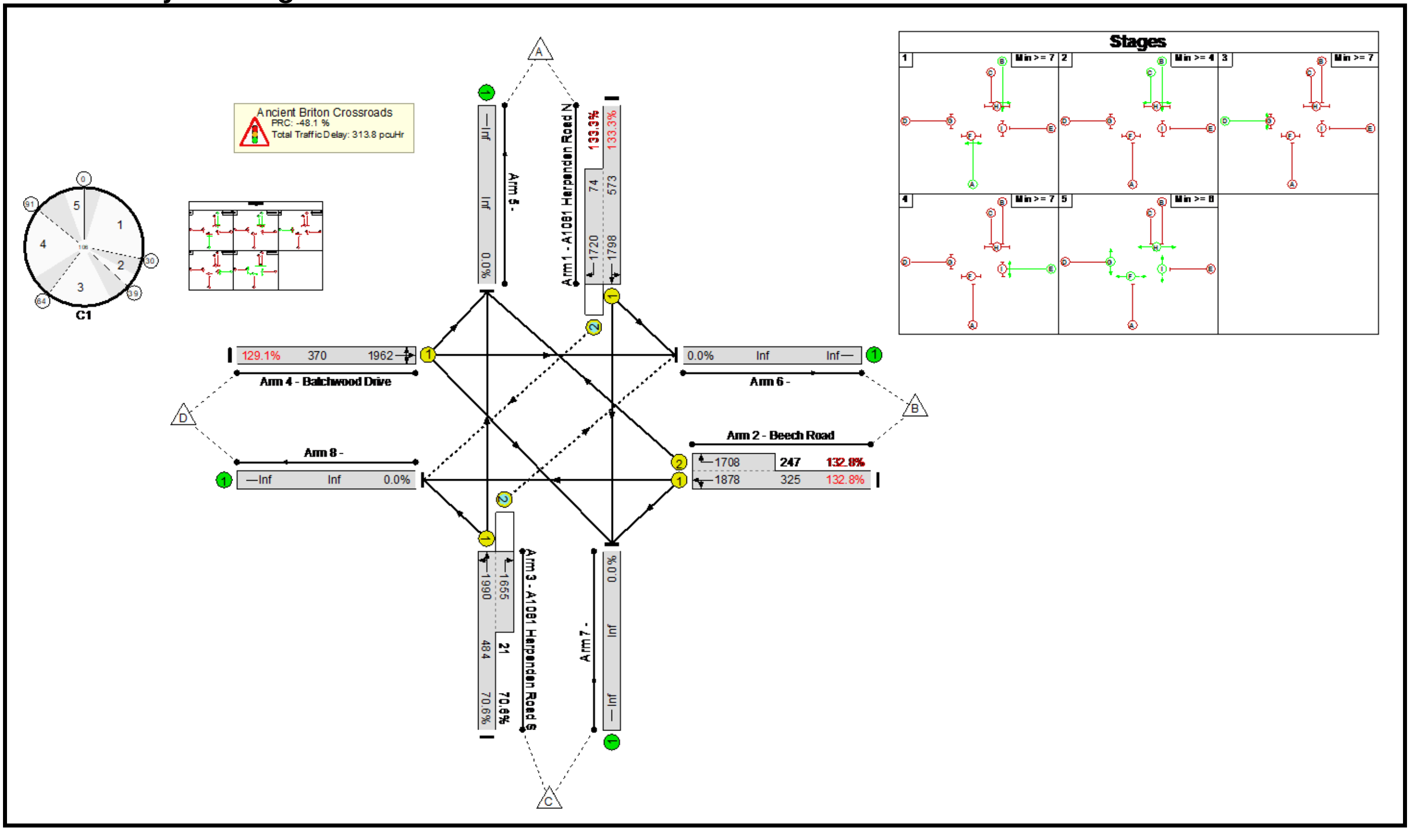
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-Ancient Briton Signals - Existing Layout - Revised Modelling.lsg3x
Author:	
Company:	
Address:	

Scenario 3: '2028 Opening Year AM' (FG3: '2028 Opening Year AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

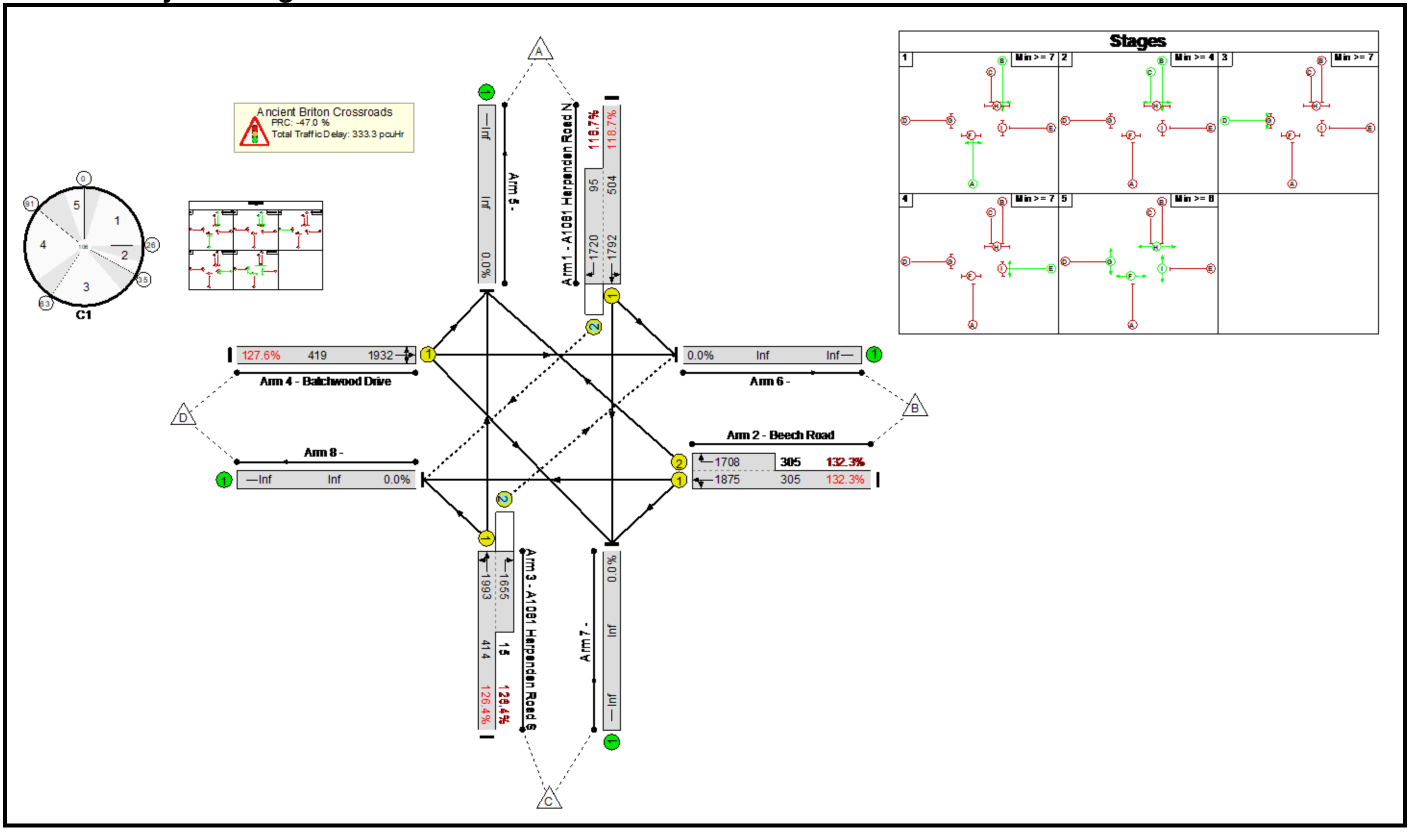
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**133.3%**	**55**	**14**	**21**	**313.8**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**133.3%**	**55**	**14**	**21**	**313.8**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	34	4	863	1798:1720	573+74	133.3 : 133.3%	55	14	6	129.5	540.0	142.3	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	21	-	759	1878:1708	325+247	132.8 : 132.8%	-	-	-	113.0	536.0	121.2	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	25	-	357	1990:1655	484+21	70.6 : 70.6%	0	0	15	4.9	49.4	10.4	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	19	-	478	1962	370	129.1%	-	-	-	66.4	500.1	73.3	4/1

C1 PRC for Signalled Lanes (%): -48.1 Total Delay for Signalled Lanes (pcuHr): 313.76 Cycle Time (s): 106
PRC Over All Lanes (%): -48.1 Total Delay Over All Lanes(pcuHr): 313.76

Basic Results Summary

Scenario 4: '2028 Opening Year PM' (FG4: '2028 Opening Year PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

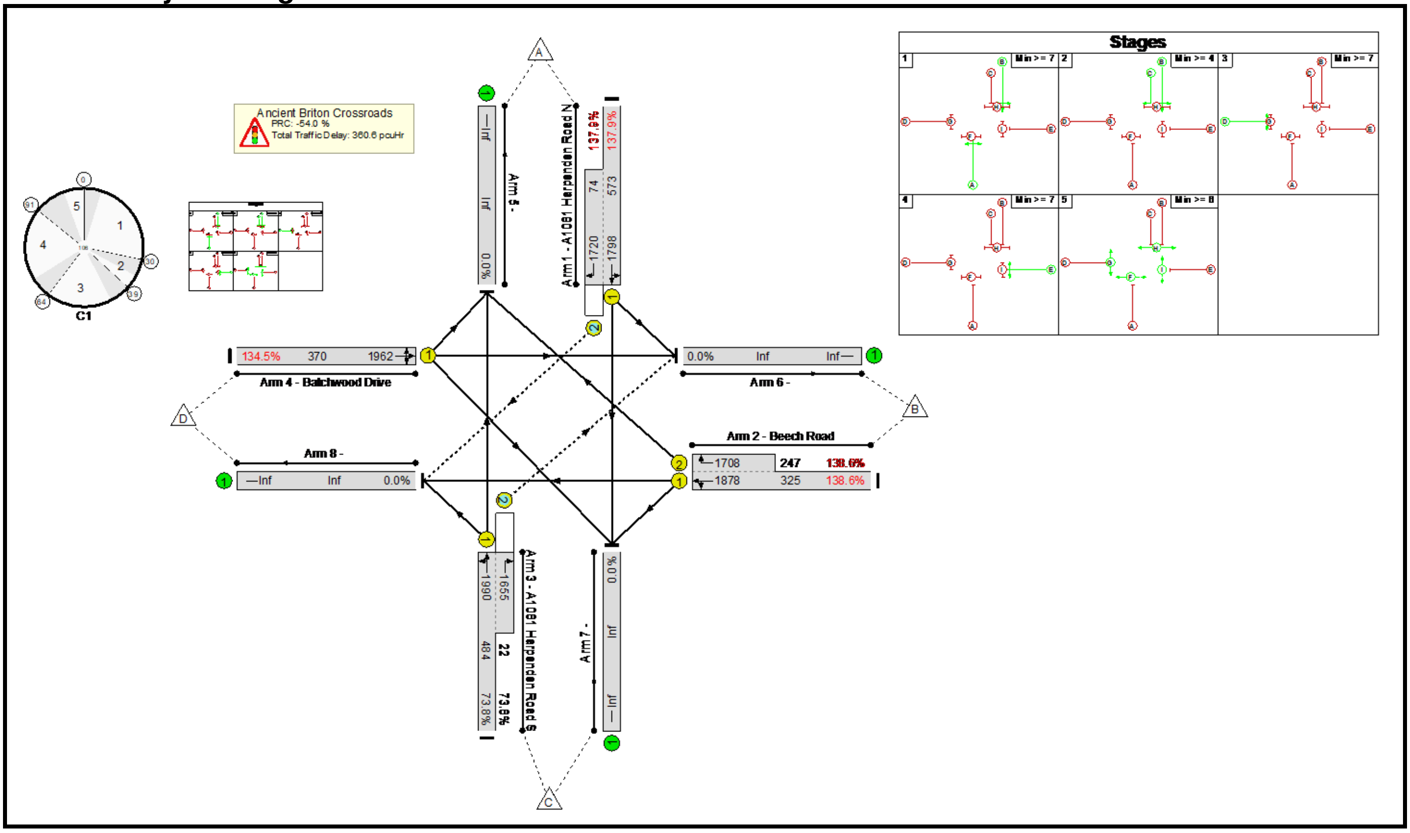
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**132.3%**	**0**	**87**	**23**	**333.3**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**132.3%**	**0**	**87**	**23**	**333.3**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	30	4	711	1792:1720	504+95	118.7 : 118.7%	0	87	8	72.6	367.5	83.2	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	22	-	807	1875:1708	305+305	132.3 : 132.3%	-	-	-	117.8	525.4	126.3	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	21	-	542	1993:1655	414+15	126.4 : 126.4%	0	0	15	71.5	475.0	78.8	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	22	-	535	1932	419	127.6%	-	-	-	71.4	480.2	79.3	4/1

C1 PRC for Signalled Lanes (%): -47.0 Total Delay for Signalled Lanes (pcuHr): 333.26 Cycle Time (s): 106
PRC Over All Lanes (%): -47.0 Total Delay Over All Lanes(pcuHr): 333.26

Basic Results Summary

Scenario 5: '2033 Future Year (Core) AM' (FG5: '2033 Future Year (Core) AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

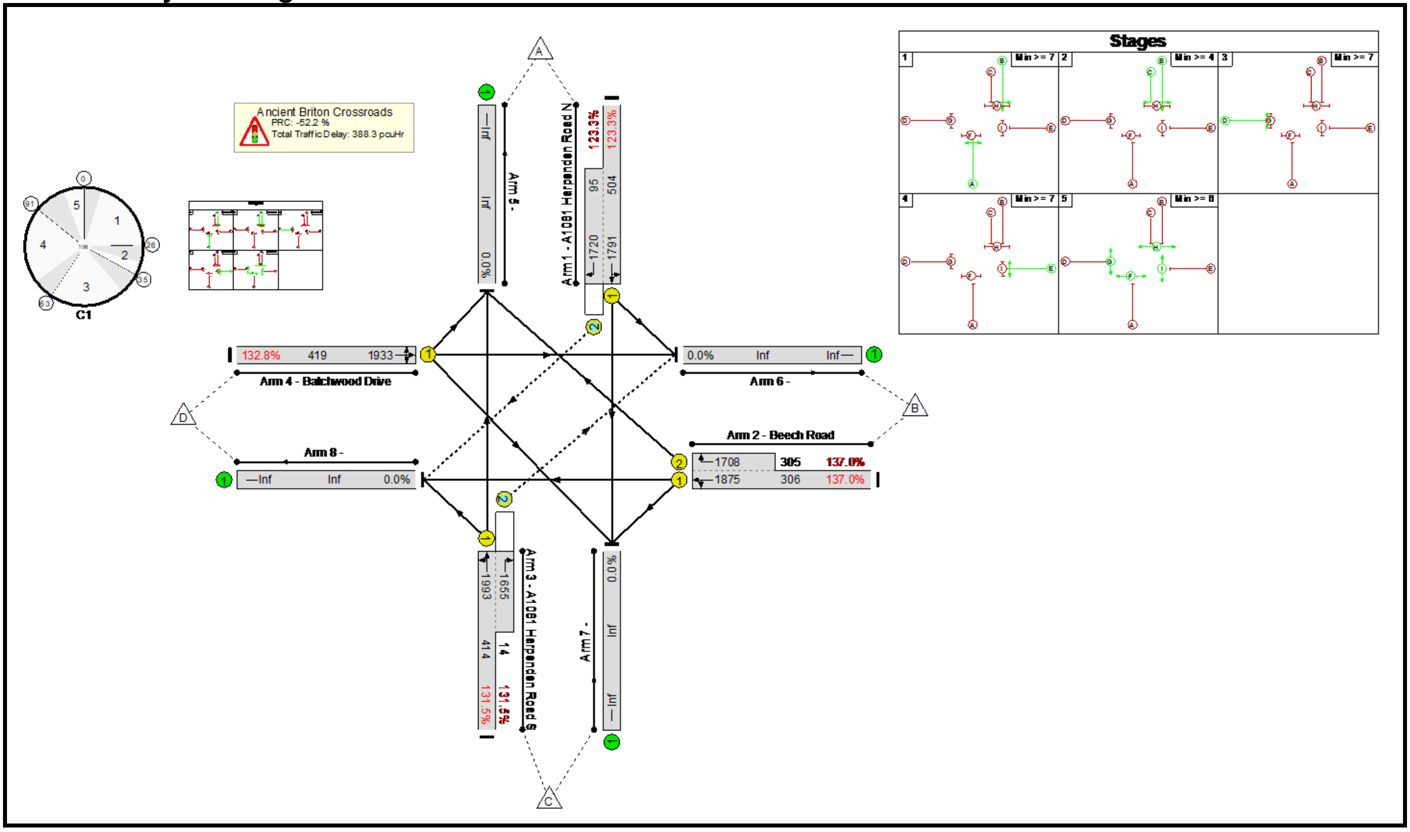
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**138.6%**	**55**	**13**	**22**	**360.6**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**138.6%**	**55**	**13**	**22**	**360.6**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	34	4	893	1798:1720	573+74	137.9 : 137.9%	55	13	6	146.3	589.6	159.1	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	21	-	792	1878:1708	325+247	138.6 : 138.6%	-	-	-	131.8	599.0	140.5	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	25	-	373	1990:1655	484+22	73.8 : 73.8%	0	0	16	5.3	51.1	11.1	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	19	-	498	1962	370	134.5%	-	-	-	77.3	558.6	84.2	4/1

C1 PRC for Signalled Lanes (%): -54.0 Total Delay for Signalled Lanes (pcuHr): 360.62 Cycle Time (s): 106
PRC Over All Lanes (%): -54.0 Total Delay Over All Lanes(pcuHr): 360.62

Basic Results Summary

Scenario 6: '2033 Future Year (Core) PM' (FG6: '2033 Future Year (Core) PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

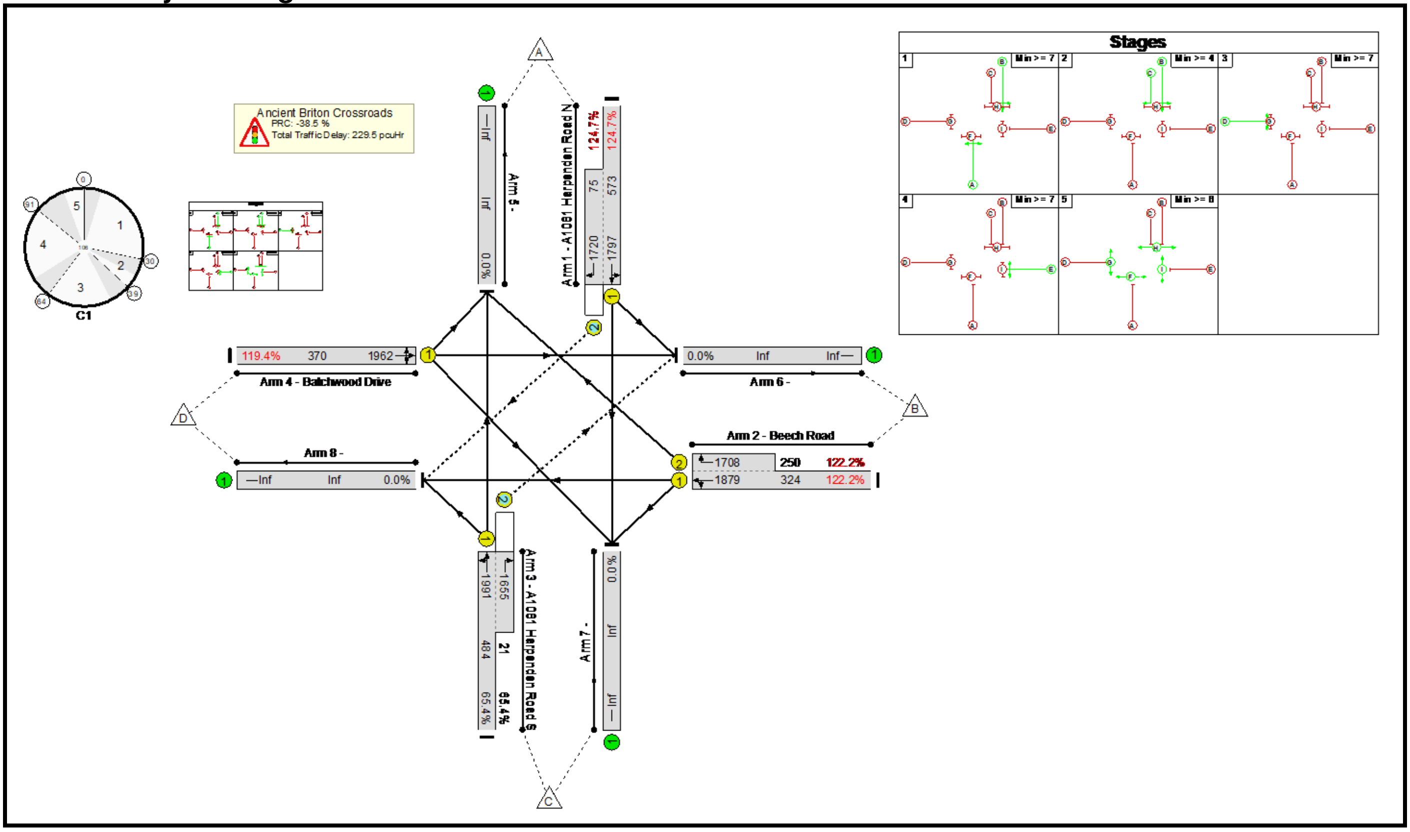
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**137.0%**	**0**	**87**	**22**	**388.3**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**137.0%**	**0**	**87**	**22**	**388.3**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	30	4	738	1791:1720	504+95	123.3 : 123.3%	0	87	8	87.5	426.8	98.1	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	22	-	837	1875:1708	306+305	137.0 : 137.0%	-	-	-	134.1	576.9	143.0	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	21	-	563	1993:1655	414+14	131.5 : 131.5%	0	0	14	83.4	533.6	90.6	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	22	-	557	1933	419	132.8%	-	-	-	83.2	537.8	91.2	4/1

C1 PRC for Signalled Lanes (%): -52.2 Total Delay for Signalled Lanes (pcuHr): 388.28 Cycle Time (s): 106
PRC Over All Lanes (%): -52.2 Total Delay Over All Lanes(pcuHr): 388.28

Basic Results Summary

Scenario 7: '2033 Future Year (Behavioural) AM' (FG7: '2033 Future Year (Behavioural) AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

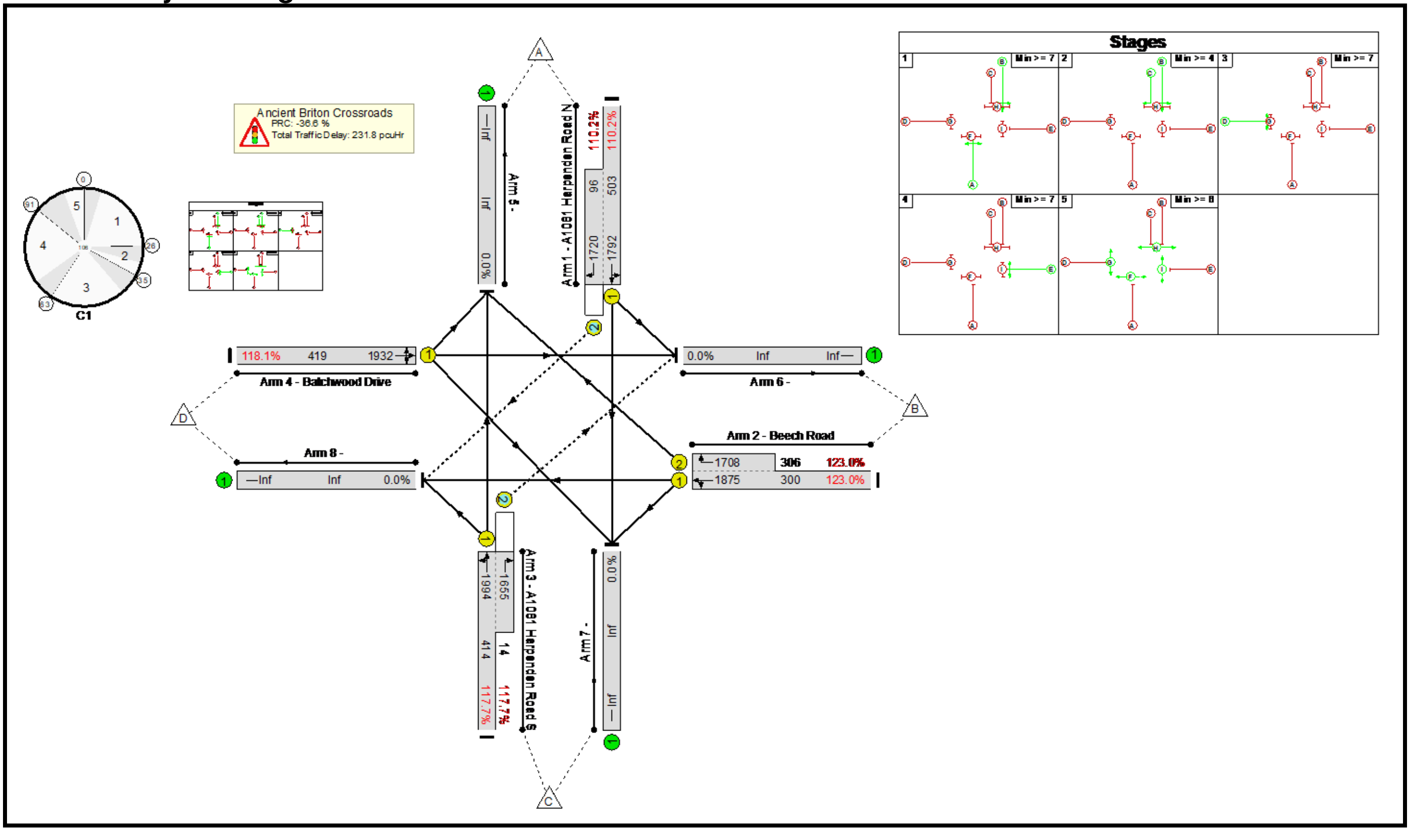
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.7%**	**56**	**14**	**20**	**229.5**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.7%**	**56**	**14**	**20**	**229.5**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	34	4	808	1797:1720	573+75	124.7 : 124.7%	56	14	6	98.7	439.8	111.6	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	21	-	701	1879:1708	324+250	122.2 : 122.2%	-	-	-	79.3	407.1	86.7	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	25	-	331	1991:1655	484+21	65.4 : 65.4%	0	0	14	4.3	47.2	9.3	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	19	-	442	1962	370	119.4%	-	-	-	47.1	383.9	53.9	4/1

C1 PRC for Signalled Lanes (%): -38.5 Total Delay for Signalled Lanes (pcuHr): 229.45 Cycle Time (s): 106
PRC Over All Lanes (%): -38.5 Total Delay Over All Lanes(pcuHr): 229.45

Basic Results Summary

Scenario 8: '2033 Future Year (Behavioural) PM' (FG8: '2033 Future Year (Behavioural) PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**123.0%**	**0**	**88**	**23**	**231.8**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**123.0%**	**0**	**88**	**23**	**231.8**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	30	4	661	1792:1720	503+96	110.2 : 110.2%	0	88	8	45.7	249.1	56.5	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	22	-	745	1875:1708	300+306	123.0 : 123.0%	-	-	-	85.2	411.5	92.9	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	21	-	504	1994:1655	414+14	117.7 : 117.7%	0	0	14	51.0	364.3	58.5	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	22	-	495	1932	419	118.1%	-	-	-	50.0	363.3	57.7	4/1

C1 PRC for Signalled Lanes (%): -36.6 Total Delay for Signalled Lanes (pcuHr): 231.84 Cycle Time (s): 106
PRC Over All Lanes (%): -36.6 Total Delay Over All Lanes(pcuHr): 231.84

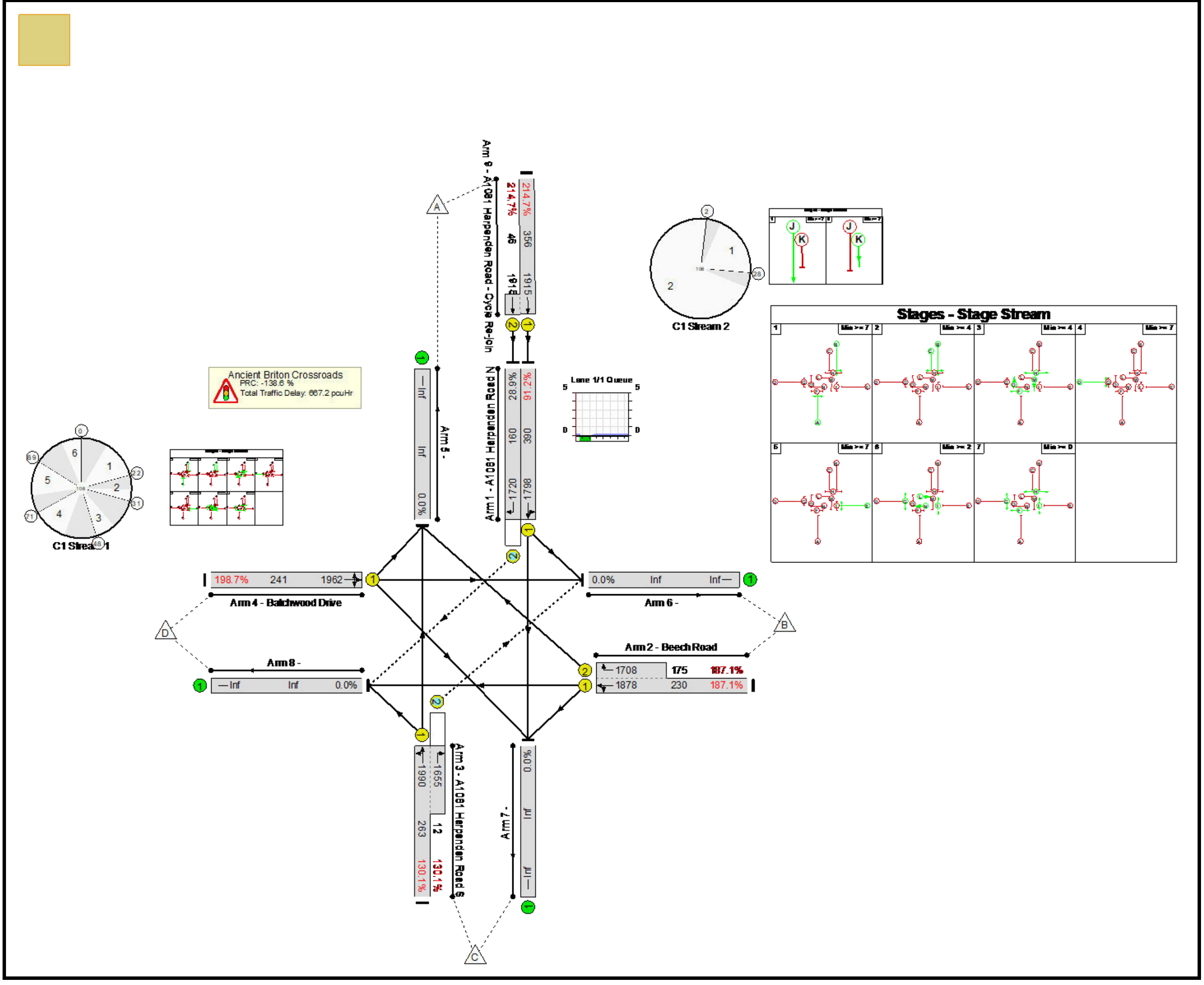
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-Ancient Briton Signals - FY Committed Layout - Revised Modelling.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2028 Opening Year AM' (FG1: '2028 Opening Year AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

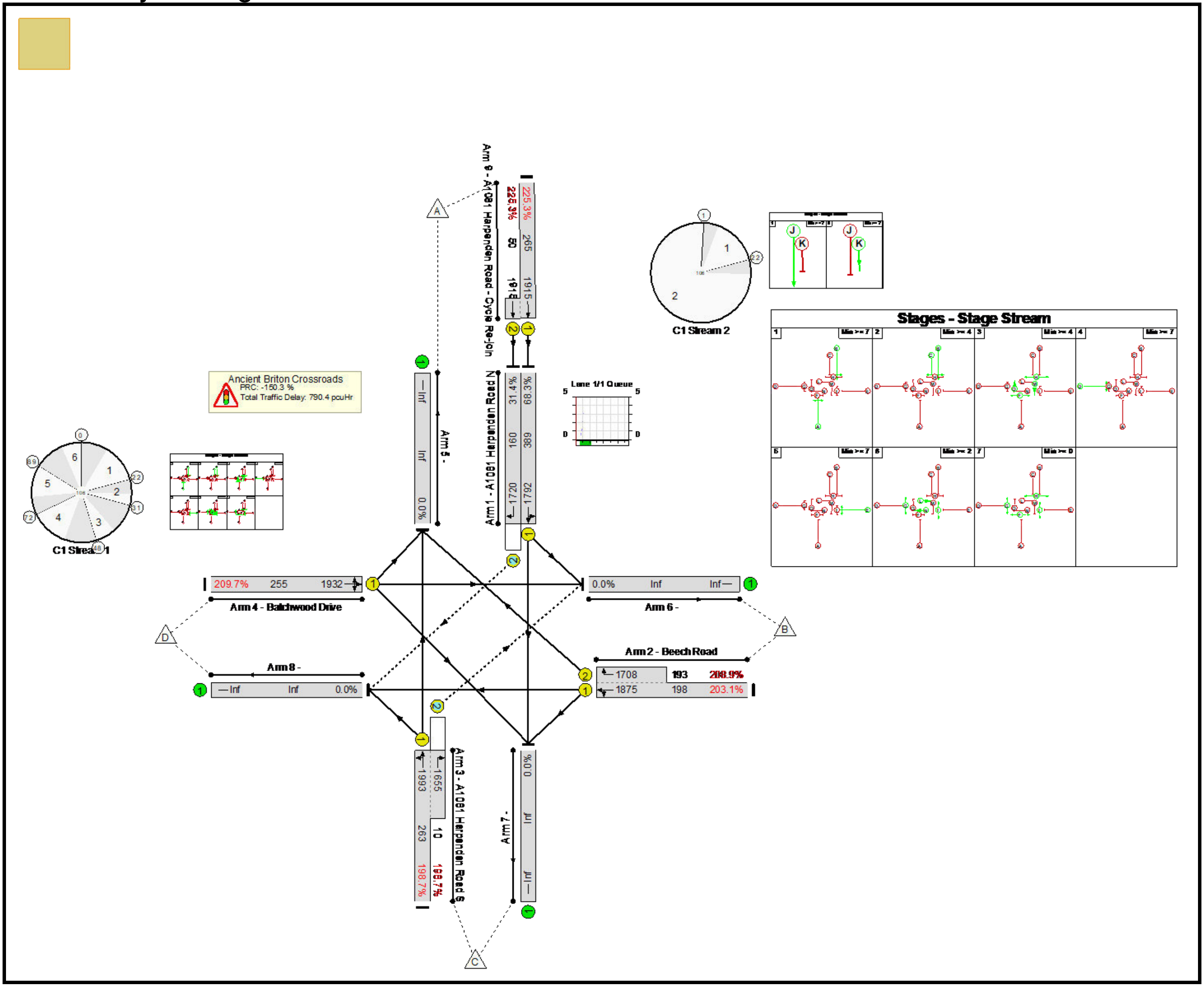
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**214.7%**	**6**	**41**	**10**	**667.2**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**214.7%**	**6**	**41**	**10**	**667.2**	**-**	**-**	**Ancient Briton Crossroads**
1/1	A1081 Harpenden Road N Left Ahead	U	B		1	22	-	764	1798	390	91.2%	-	-	-	4.3	43.3	4.3	1/1
1/2	A1081 Harpenden Road N Right	O	B	C	1	22	4	99	1720	160	28.9%	0	41	5	0.3	21.4	0.2	1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	12	-	759	1878:1708	230+175	187.1 : 187.1%	-	-	-	205.8	976.3	212.6	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	13	-	357	1990:1655	263+12	130.1 : 130.1%	6	0	5	52.5	529.2	56.5	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	12	-	478	1962	241	198.7%	-	-	-	138.2	1040.6	143.5	4/1
9/1+9/2	A1081 Harpenden Road - Cycle Re-join Ahead	U	J		1	21	-	863	1915:1915	356+46	214.7 : 214.7%	-	-	-	266.2	1110.4	276.3	9/1+9/2

C1 Stream: 1 PRC for Signalled Lanes (%): -120.7 Total Delay for Signalled Lanes (pcuHr): 401.02 Cycle Time (s): 106
C1 Stream: 2 PRC for Signalled Lanes (%): -138.6 Total Delay for Signalled Lanes (pcuHr): 266.18 Cycle Time (s): 106
PRC Over All Lanes (%): -138.6 Total Delay Over All Lanes(pcuHr): 667.20

Basic Results Summary

Scenario 2: '2028 Opening Year PM' (FG2: '2028 Opening Year PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

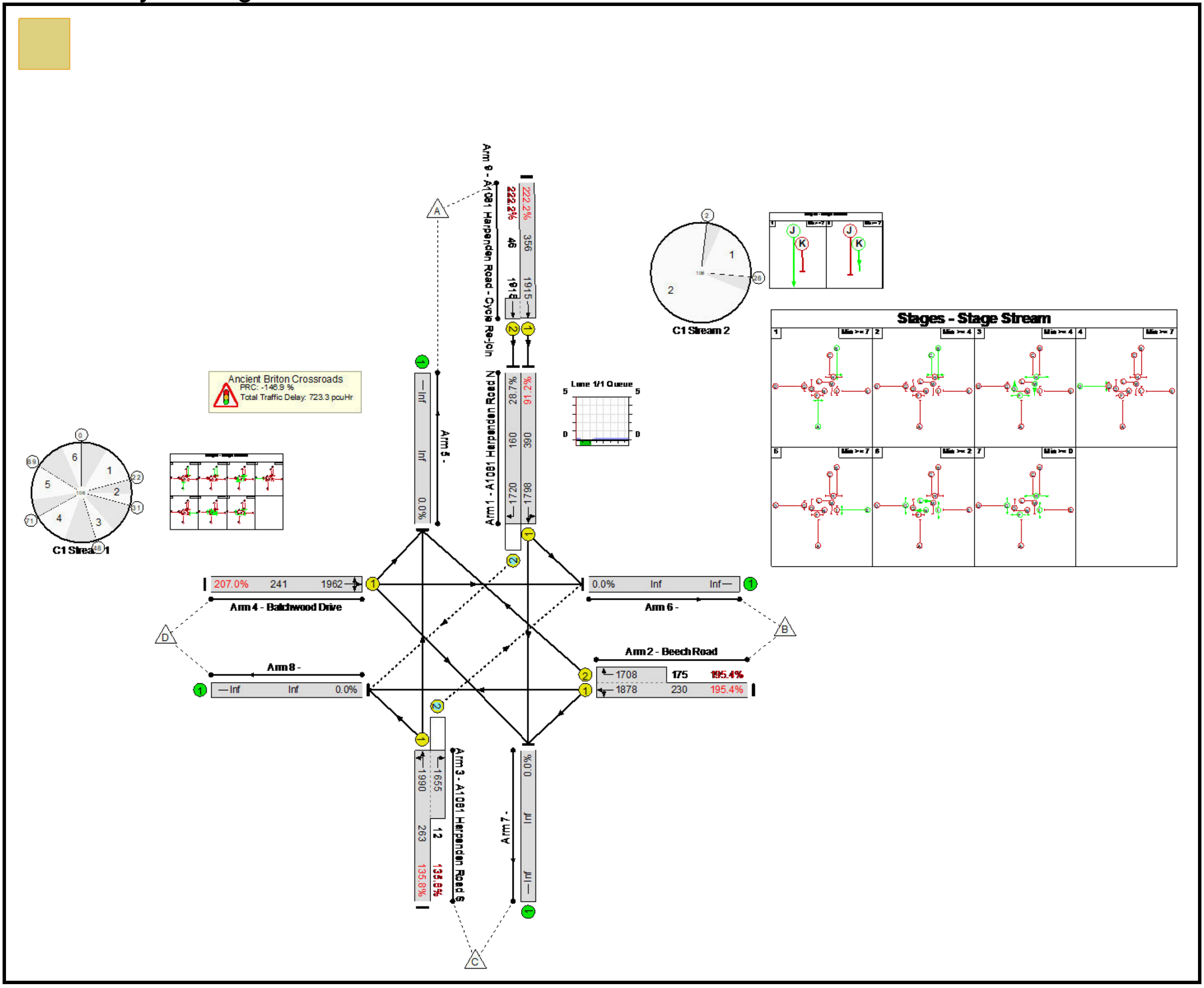
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**225.3%**	**10**	**50**	**0**	**790.4**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**225.3%**	**10**	**50**	**0**	**790.4**	**-**	**-**	**Ancient Briton Crossroads**
1/1	A1081 Harpenden Road N Left Ahead	U	B		1	22	-	598	1792	389	68.3%	-	-	-	1.1	14.5	4.1	1/1
1/2	A1081 Harpenden Road N Right	O	B	C	1	22	4	113	1720	160	31.4%	0	50	0	0.3	23.3	0.5	1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	11	-	807	1875:1708	198+193	203.1 : 208.9%	-	-	-	240.4	1072.4	247.0	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	13	-	542	1993:1655	263+10	198.7 : 198.7%	10	0	0	157.1	1043.6	163.4	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	13	-	535	1932	255	209.7%	-	-	-	162.6	1093.9	168.5	4/1
9/1+9/2	A1081 Harpenden Road - Cycle Re-join Ahead	U	J		1	16	-	711	1915:1915	265+50	225.3 : 225.3%	-	-	-	228.9	1158.9	237.5	9/1+9/2

C1 Stream: 1 PRC for Signalled Lanes (%): -133.0 Total Delay for Signalled Lanes (pcuHr): 561.49 Cycle Time (s): 106
C1 Stream: 2 PRC for Signalled Lanes (%): -150.3 Total Delay for Signalled Lanes (pcuHr): 228.88 Cycle Time (s): 106
PRC Over All Lanes (%): -150.3 Total Delay Over All Lanes(pcuHr): 790.36

Basic Results Summary

Scenario 3: '2033 Future Year (Core) AM' (FG3: '2033 Future Year (Core) AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

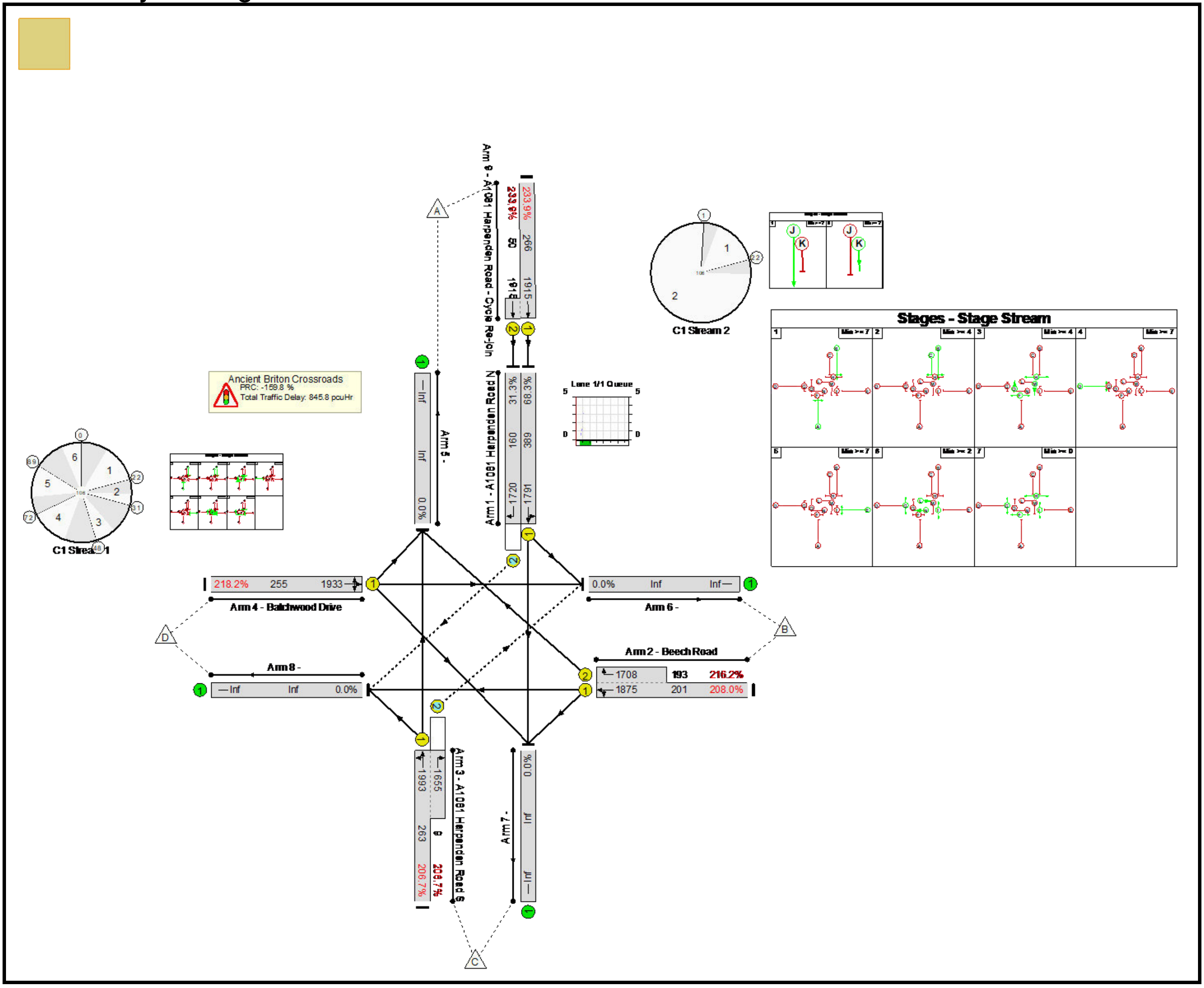
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**222.2%**	**6**	**41**	**10**	**723.3**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**222.2%**	**6**	**41**	**10**	**723.3**	**-**	**-**	**Ancient Briton Crossroads**
1/1	A1081 Harpenden Road N Left Ahead	U	B		1	22	-	791	1798	390	91.2%	-	-	-	4.3	43.4	4.3	1/1
1/2	A1081 Harpenden Road N Right	O	B	C	1	22	4	102	1720	160	28.7%	0	41	5	0.3	21.4	0.2	1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	12	-	792	1878:1708	230+175	195.4 : 195.4%	-	-	-	224.8	1021.7	232.0	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	13	-	373	1990:1655	263+12	135.8 : 135.8%	6	0	5	61.2	590.5	65.1	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	12	-	498	1962	241	207.0%	-	-	-	149.6	1081.4	155.0	4/1
9/1+9/2	A1081 Harpenden Road - Cycle Re-join Ahead	U	J		1	21	-	893	1915:1915	356+46	222.2 : 222.2%	-	-	-	283.1	1141.4	293.7	9/1+9/2

C1 Stream: 1 PRC for Signalled Lanes (%): -130.0 Total Delay for Signalled Lanes (pcuHr): 440.13 Cycle Time (s): 106
C1 Stream: 2 PRC for Signalled Lanes (%): -146.9 Total Delay for Signalled Lanes (pcuHr): 283.13 Cycle Time (s): 106
PRC Over All Lanes (%): -146.9 Total Delay Over All Lanes(pcuHr): 723.26

Basic Results Summary

Scenario 4: '2033 Future Year (Core) PM' (FG4: '2033 Future Year (Core) PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

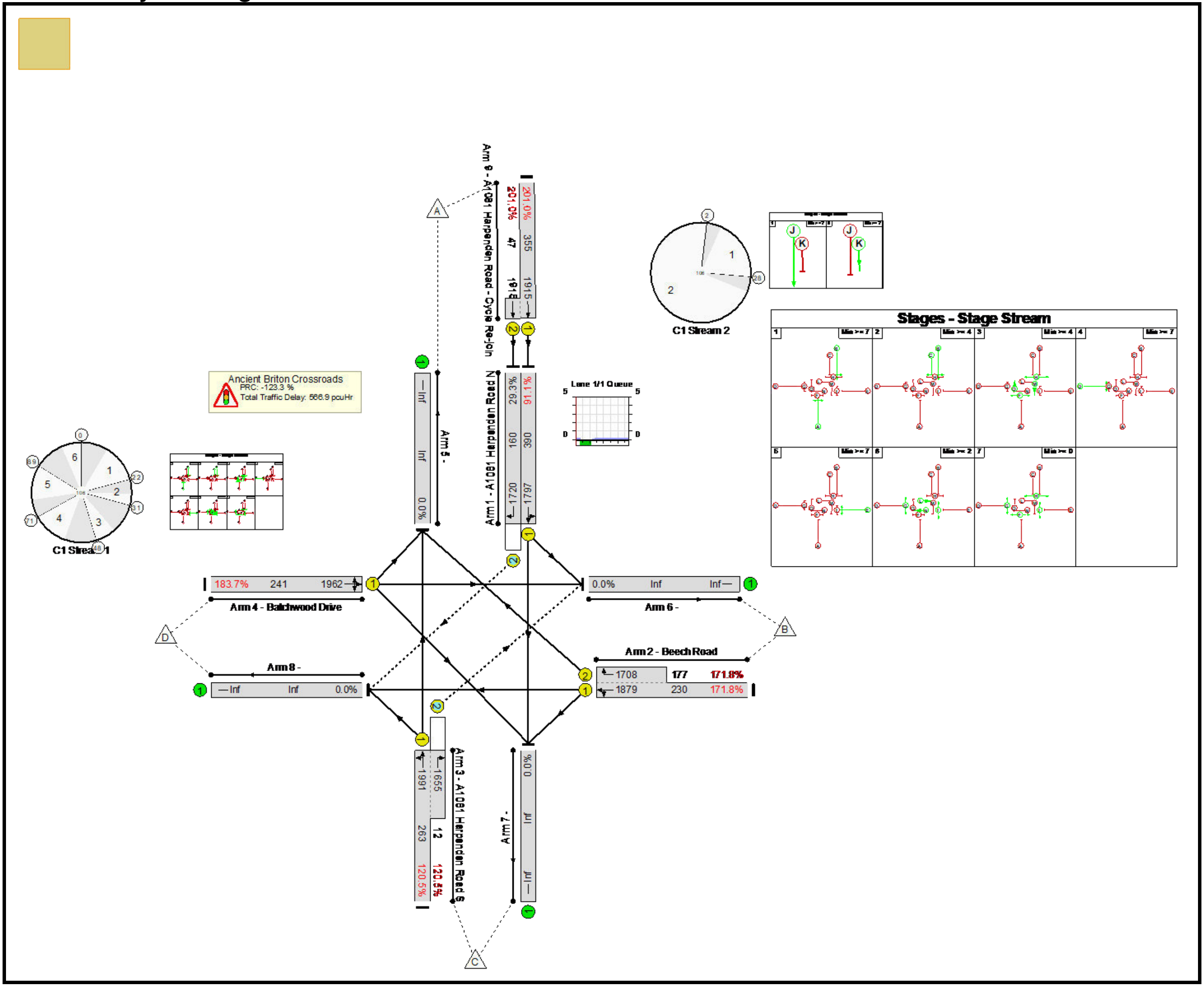
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**233.9%**	**9**	**50**	**0**	**845.8**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**233.9%**	**9**	**50**	**0**	**845.8**	**-**	**-**	**Ancient Briton Crossroads**
1/1	A1081 Harpenden Road N Left Ahead	U	B		1	22	-	621	1791	389	68.3%	-	-	-	1.1	14.6	4.1	1/1
1/2	A1081 Harpenden Road N Right	O	B	C	1	22	4	117	1720	160	31.3%	0	50	0	0.3	23.3	0.4	1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	11	-	837	1875:1708	201+193	208.0 : 216.2%	-	-	-	256.0	1101.1	262.9	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	13	-	563	1993:1655	263+9	206.7 : 206.7%	9	0	0	169.2	1081.8	175.8	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	13	-	557	1933	255	218.2%	-	-	-	175.1	1131.6	181.1	4/1
9/1+9/2	A1081 Harpenden Road - Cycle Re-join Ahead	U	J		1	16	-	738	1915:1915	266+50	233.9 : 233.9%	-	-	-	244.2	1191.1	253.2	9/1+9/2

C1 Stream: 1 PRC for Signalled Lanes (%): -142.4 Total Delay for Signalled Lanes (pcuHr): 601.67 Cycle Time (s): 106
C1 Stream: 2 PRC for Signalled Lanes (%): -159.8 Total Delay for Signalled Lanes (pcuHr): 244.18 Cycle Time (s): 106
PRC Over All Lanes (%): -159.8 Total Delay Over All Lanes(pcuHr): 845.85

Basic Results Summary

Scenario 5: '2033 Future Year (Behavioural) AM' (FG5: '2033 Future Year (Behavioural) AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

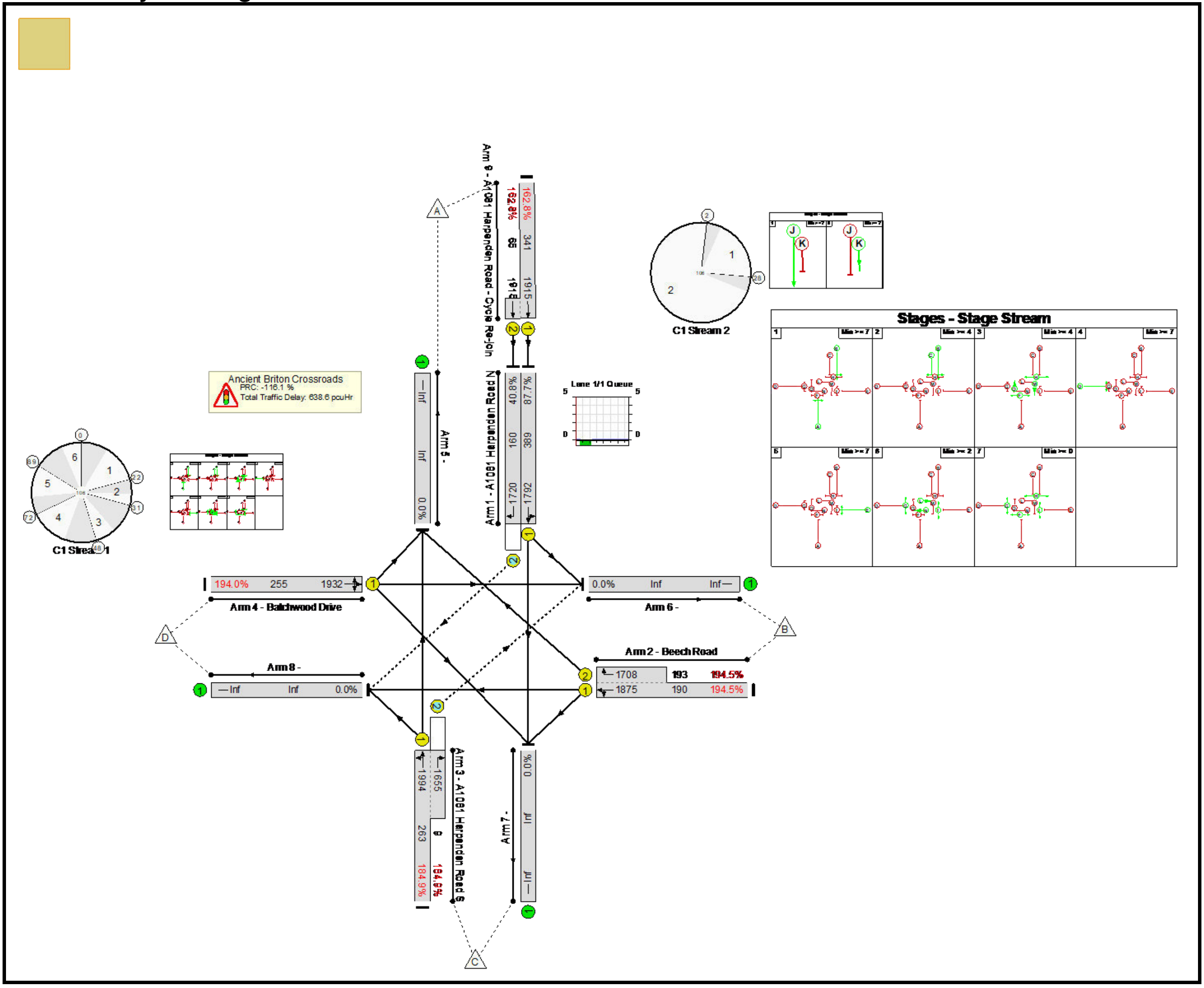
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	-	-	-		-	-	-	-	-	-	**201.0%**	**6**	**42**	**10**	**566.9**	-	-	**Network**
Ancient Briton Crossroads	-	-	-		-	-	-	-	-	-	**201.0%**	**6**	**42**	**10**	**566.9**	-	-	**Ancient Briton Crossroads**
1/1	A1081 Harpenden Road N Left Ahead	U	B		1	22	-	714	1797	390	91.1%	-	-	-	4.2	43.0	4.3	1/1
1/2	A1081 Harpenden Road N Right	O	B	C	1	22	4	94	1720	160	29.3%	0	42	5	0.3	21.5	0.2	1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	12	-	701	1879:1708	230+177	171.8 : 171.8%	-	-	-	171.5	880.6	177.5	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	13	-	331	1991:1655	263+12	120.5 : 120.5%	6	0	5	38.2	416.0	42.5	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	12	-	442	1962	241	183.7%	-	-	-	117.6	957.8	122.7	4/1
9/1+9/2	A1081 Harpenden Road - Cycle Re-join Ahead	U	J		1	21	-	808	1915:1915	355+47	201.0 : 201.0%	-	-	-	235.1	1047.4	244.4	9/1+9/2

C1 Stream: 1 PRC for Signalled Lanes (%): -104.1 Total Delay for Signalled Lanes (pcuHr): 331.83 Cycle Time (s): 106
C1 Stream: 2 PRC for Signalled Lanes (%): -123.3 Total Delay for Signalled Lanes (pcuHr): 235.08 Cycle Time (s): 106
PRC Over All Lanes (%): -123.3 Total Delay Over All Lanes(pcuHr): 566.91

Basic Results Summary

Scenario 6: '2033 Future Year (Behavioural) PM' (FG6: '2033 Future Year (Behavioural) PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**194.5%**	**7**	**58**	**9**	**638.6**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**194.5%**	**7**	**58**	**9**	**638.6**	**-**	**-**	**Ancient Briton Crossroads**
1/1	A1081 Harpenden Road N Left Ahead	U	B		1	22	-	555	1792	389	87.7%	-	-	-	3.2	34.3	3.3	1/1
1/2	A1081 Harpenden Road N Right	O	B	C	1	22	4	106	1720	160	40.8%	0	58	7	0.4	24.9	0.4	1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	11	-	745	1875:1708	190+193	194.5 : 194.5%	-	-	-	209.4	1011.9	215.4	2/1+2/2
3/1+3/2	A1081 Harpenden Road S Ahead Right Left	U+O	A		1	13	-	504	1994:1655	263+9	184.9 : 184.9%	7	0	2	135.8	970.0	141.5	3/1+3/2
4/1	Batchwood Drive Left Ahead Right	U	D		1	13	-	495	1932	255	194.0%	-	-	-	139.7	1015.9	145.4	4/1
9/1+9/2	A1081 Harpenden Road - Cycle Re-join Ahead	U	J		1	21	-	661	1915:1915	341+65	162.8 : 162.8%	-	-	-	150.1	817.2	157.1	9/1+9/2

C1 Stream: 1 PRC for Signalled Lanes (%): -116.1 Total Delay for Signalled Lanes (pcuHr): 488.59 Cycle Time (s): 106
C1 Stream: 2 PRC for Signalled Lanes (%): -80.9 Total Delay for Signalled Lanes (pcuHr): 150.05 Cycle Time (s): 106
PRC Over All Lanes (%): -116.1 Total Delay Over All Lanes(pcuHr): 638.65

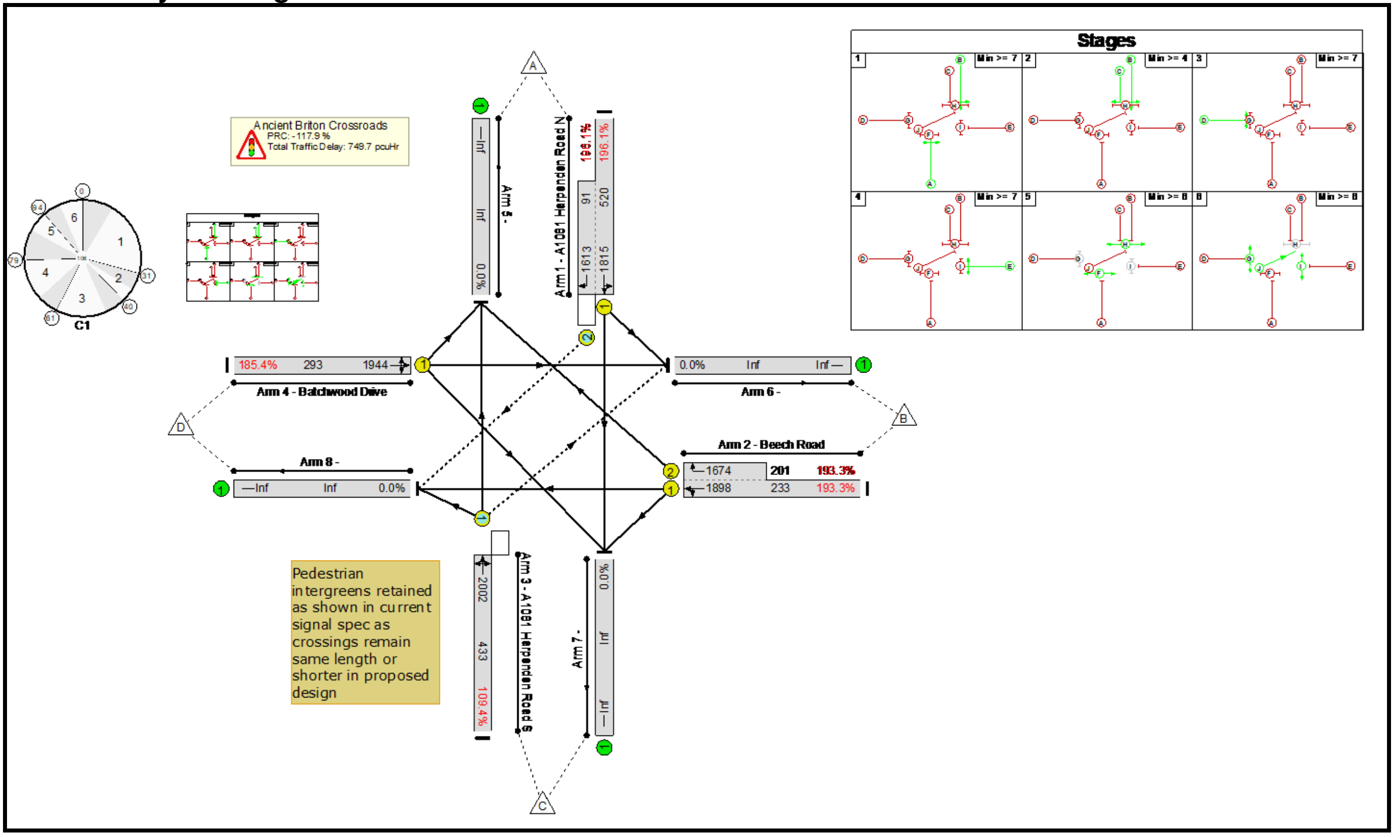
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-Ancient Briton Signals - FY Proposed Layout - Revised Modelling.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2033 Future Year (Core) + Development (Core) AM' (FG1: '2033 Future Year (Core) + Development (Core) + SBL Reassign AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

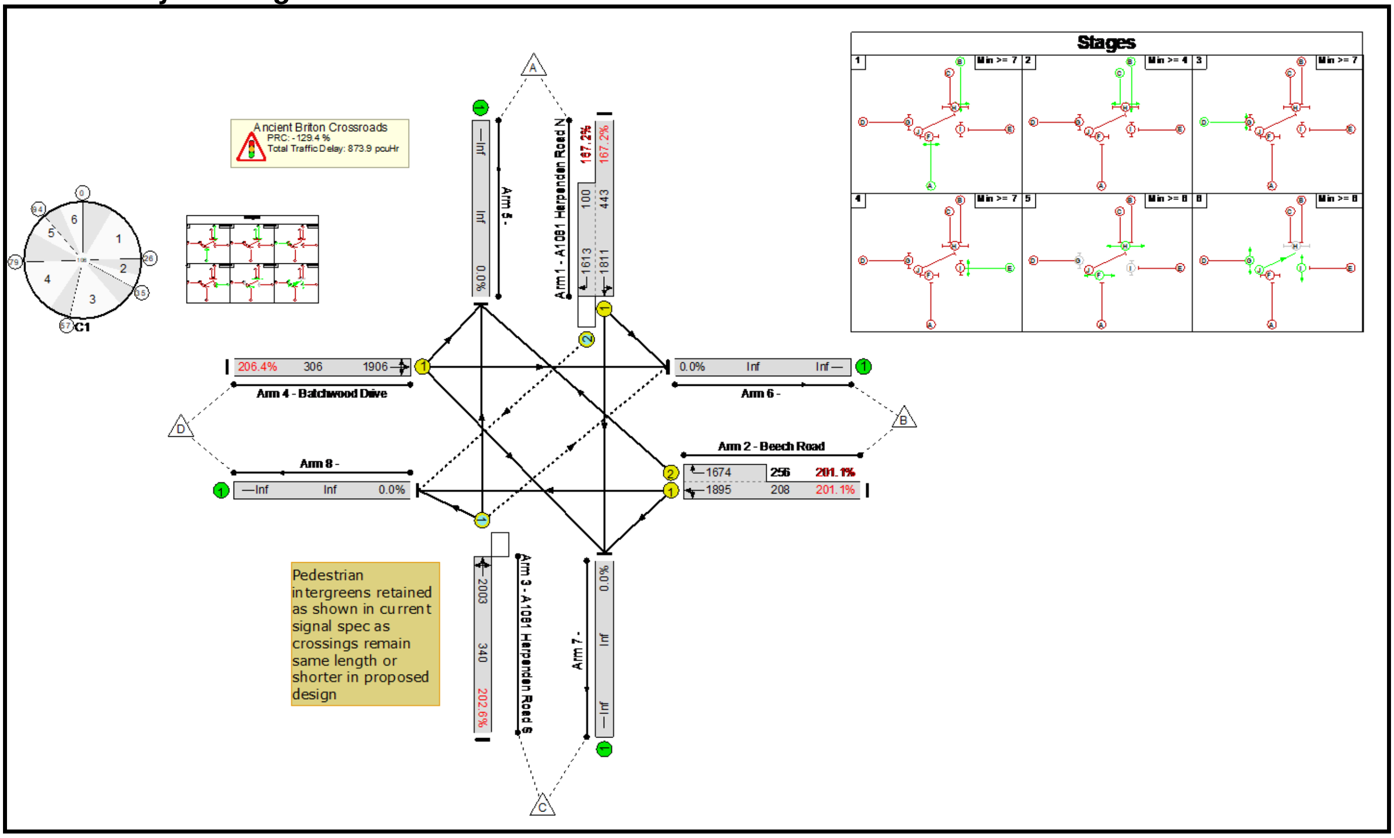
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**196.1%**	**0**	**84**	**63**	**749.7**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**196.1%**	**0**	**84**	**63**	**749.7**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	31	4	1199	1815:1613	520+91	196.1 : 196.1%	0	84	8	337.6	1013.6	348.7	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	12	-	838	1898:1674	233+201	193.3 : 193.3%	-	-	-	234.1	1005.6	240.2	2/1+2/2
3/1	A1081 Harpenden Road S Ahead Right Left	O	A		1	22	-	474	2002	433	109.4%	0	0	56	33.0	250.5	40.2	3/1
4/1	Batchwood Drive Left Ahead Right	U	D		1	15	-	544	1944	293	185.4%	-	-	-	145.1	960.1	150.8	4/1

C1 PRC for Signalled Lanes (%): -117.9 Total Delay for Signalled Lanes (pcuHr): 749.74 Cycle Time (s): 106
PRC Over All Lanes (%): -117.9 Total Delay Over All Lanes(pcuHr): 749.74

Basic Results Summary

Scenario 2: '2033 Future Year (Core) + Development (Core) PM' (FG2: '2033 Future Year (Core) + Development (Core) + SBL Reassign PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

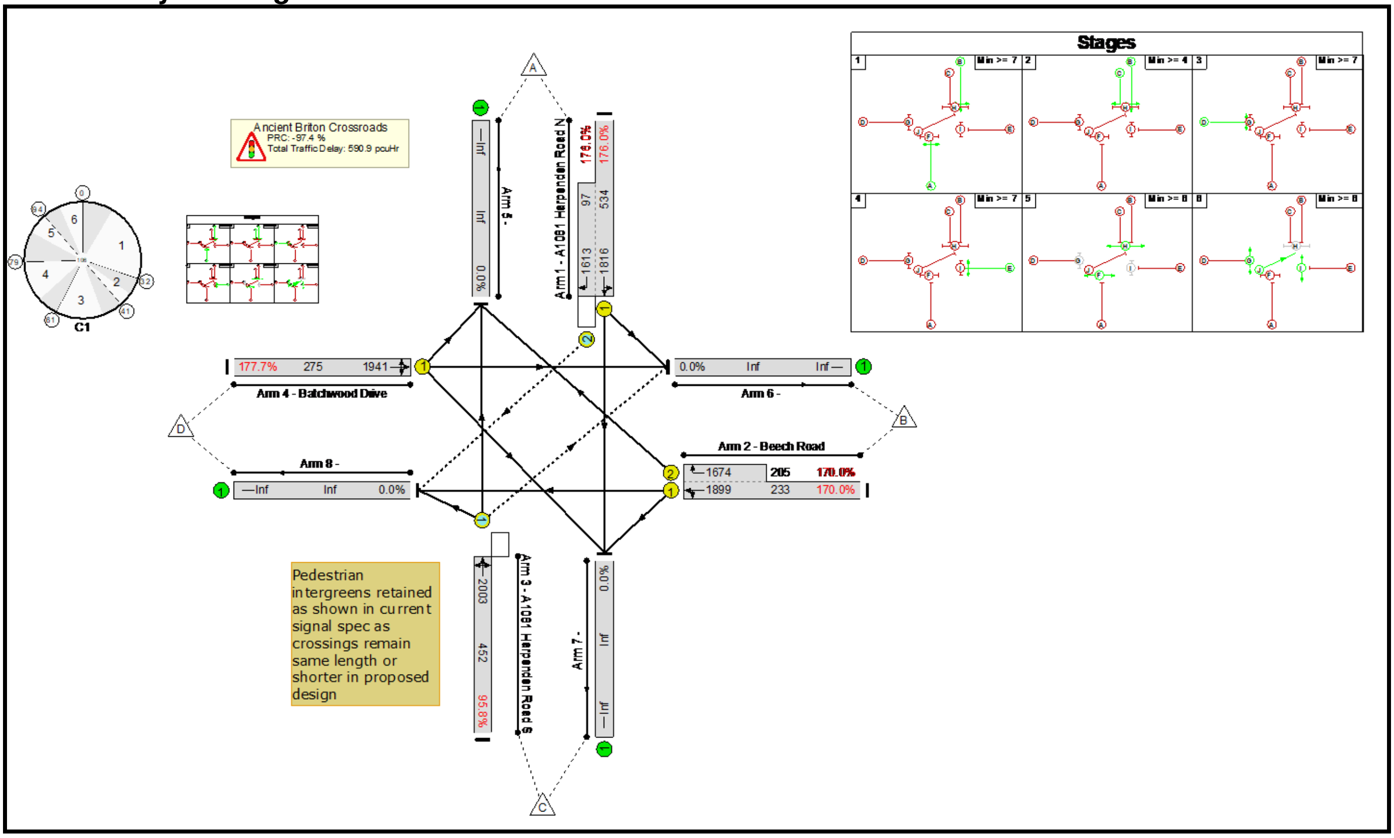
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	-	-	-		-	-	-	-	-	-	**206.4%**	**0**	**91**	**25**	**873.9**	-	-	**Network**
Ancient Briton Crossroads	-	-	-		-	-	-	-	-	-	**206.4%**	**0**	**91**	**25**	**873.9**	-	-	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	26	4	909	1811:1613	443+100	167.2 : 167.2%	0	91	9	213.2	844.4	221.5	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	16	-	934	1895:1674	208+256	201.1 : 201.1%	-	-	-	270.6	1043.0	279.0	2/1+2/2
3/1	A1081 Harpenden Road S Ahead Right Left	O	A		1	17	-	689	2003	340	202.6%	0	0	15	202.6	1058.4	210.7	3/1
4/1	Batchwood Drive Left Ahead Right	U	D		1	16	-	631	1906	306	206.4%	-	-	-	187.5	1069.7	193.3	4/1

C1 PRC for Signalled Lanes (%): -129.4 Total Delay for Signalled Lanes (pcuHr): 873.87 Cycle Time (s): 106
PRC Over All Lanes (%): -129.4 Total Delay Over All Lanes(pcuHr): 873.87

Basic Results Summary

Scenario 3: '2033 Future Year (Behavioural) + Development (Core) + SDBL Opt 2 AM' (FG3: '2033 Future Year (Behavioural) + Development (Core) + SDBL Opt 2 AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary
Network Results

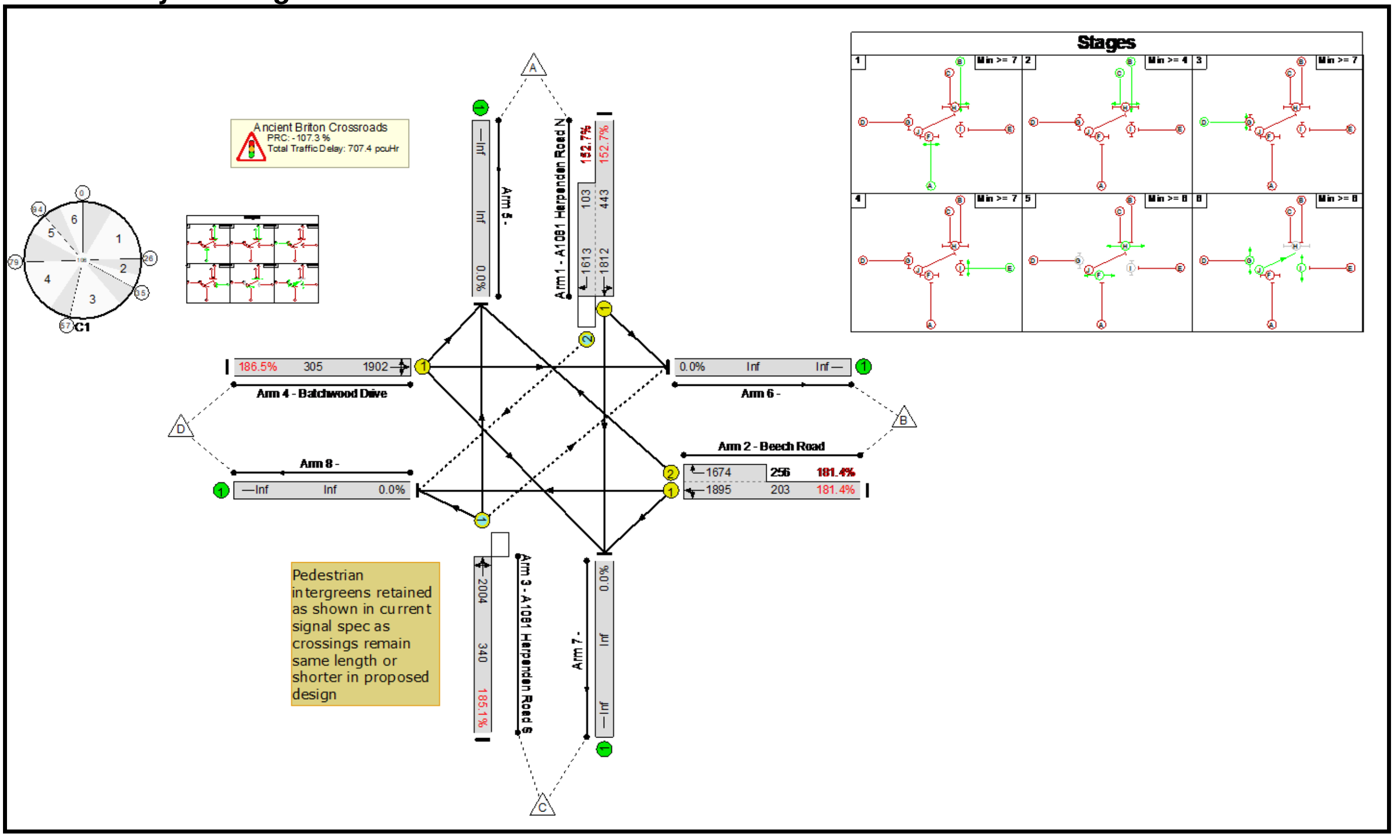
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**177.7%**	**11**	**78**	**62**	**590.9**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**177.7%**	**11**	**78**	**62**	**590.9**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	32	4	1109	1816:1613	534+97	176.0 : 176.0%	11	78	8	276.7	898.1	288.4	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	12	-	745	1899:1674	233+205	170.0 : 170.0%	-	-	-	178.5	862.7	183.5	2/1+2/2
3/1	A1081 Harpenden Road S Ahead Right Left	O	A		1	23	-	433	2003	452	95.8%	0	0	54	11.9	98.7	19.2	3/1
4/1	Batchwood Drive Left Ahead Right	U	D		1	14	-	488	1941	275	177.7%	-	-	-	123.8	913.3	129.0	4/1

C1 PRC for Signalled Lanes (%): -97.4 Total Delay for Signalled Lanes (pcuHr): 590.86 Cycle Time (s): 106
PRC Over All Lanes (%): -97.4 Total Delay Over All Lanes(pcuHr): 590.86

Basic Results Summary

Scenario 4: '2033 Future Year (Behavioural) + Development (Core) + SDBL Opt 2 PM' (FG4: '2033 Future Year (Behavioural) + Development (Core) + SDBL Opt 2 PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**186.5%**	**0**	**93**	**25**	**707.4**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**186.5%**	**0**	**93**	**25**	**707.4**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	26	4	833	1812:1613	443+103	152.7 : 152.7%	0	93	9	169.6	733.0	178.0	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	16	-	834	1895:1674	203+256	181.4 : 181.4%	-	-	-	216.3	933.5	223.7	2/1+2/2
3/1	A1081 Harpenden Road S Ahead Right Left	O	A		1	17	-	630	2004	340	185.1%	0	0	15	169.2	966.8	176.5	3/1
4/1	Batchwood Drive Left Ahead Right	U	D		1	16	-	569	1902	305	186.5%	-	-	-	152.4	964.2	158.1	4/1

C1 PRC for Signalled Lanes (%): -107.3 Total Delay for Signalled Lanes (pcuHr): 707.45 Cycle Time (s): 106
PRC Over All Lanes (%): -107.3 Total Delay Over All Lanes(pcuHr): 707.45

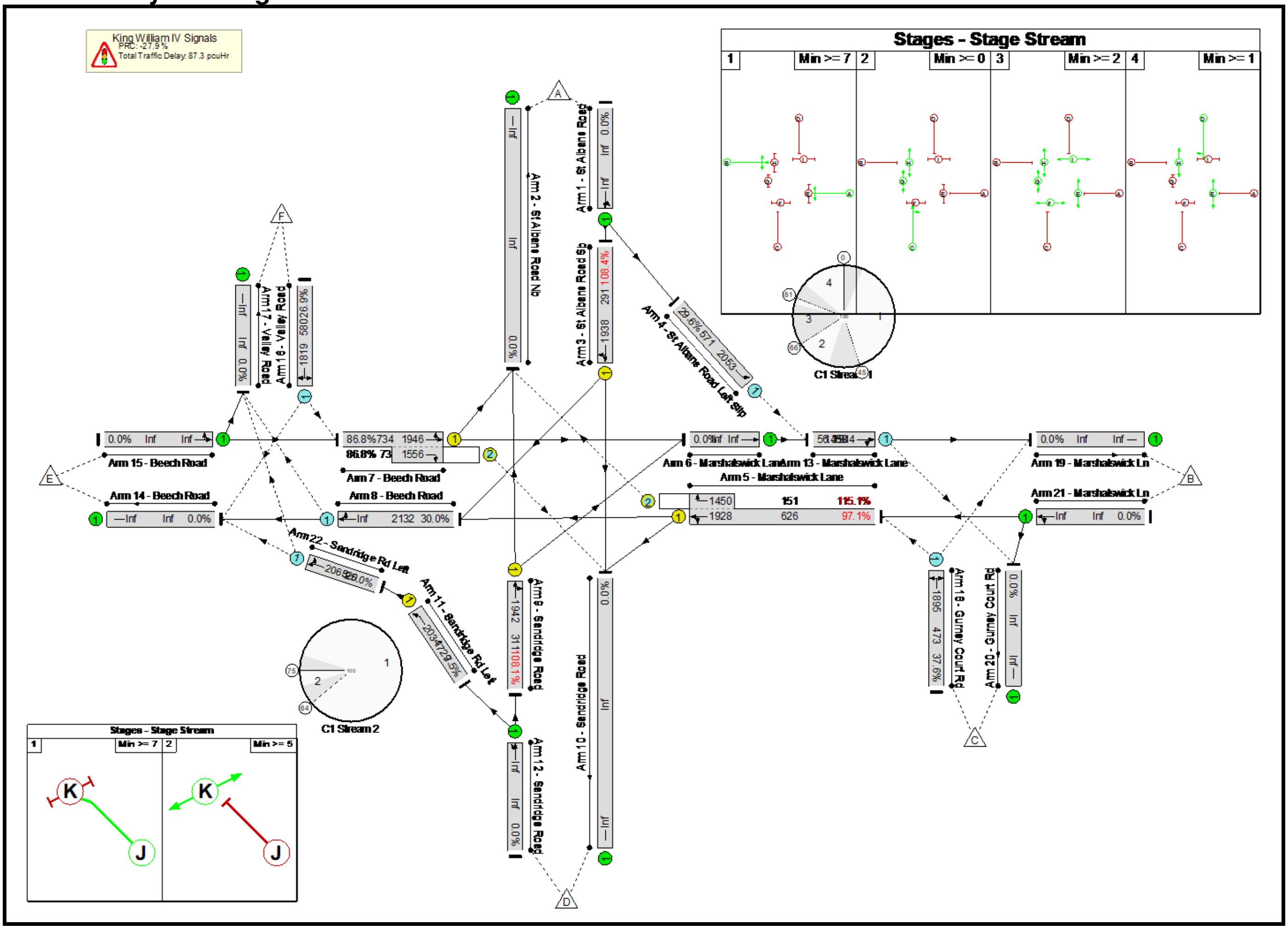
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-King William IV Signals - Existing Layout.lsg3x
Author:	
Company:	
Address:	

Scenario 3: '2028 Opening Year AM' (FG3: '2028 Opening Year AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**115.1%**	**1032**	**14**	**118**	**87.3**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**115.1%**	**1032**	**14**	**118**	**87.3**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	14	-	315	1938	291	108.4%	-	-	-	21.9	250.6	26.7	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	169	2053	571	29.6%	169	0	0	0.2	4.5	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	40	-	782	1928:1450	626+151	97.1 : 115.1%	66	14	72	32.5	149.8	44.1	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	40	-	700	1946:1556	734+73	86.8 : 86.8%	17	0	46	8.6	44.3	20.3	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	656	Inf	2132	30.0%	195	0	0	0.2	1.2	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	15	-	336	1942	311	108.1%	-	-	-	22.4	239.5	27.5	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	130	2034	1729	7.5%	-	-	-	0.1	2.3	0.6	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	837	1914	1458	56.3%	122	0	0	0.7	2.9	7.9	13/1
16/1	Valley Road Left Right	O	-		-	-	-	156	1819	580	26.9%	156	0	0	0.2	4.2	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	178	1895	473	37.6%	178	0	0	0.3	6.1	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	130	2063	520	25.0%	130	0	0	0.2	4.7	0.8	22/1

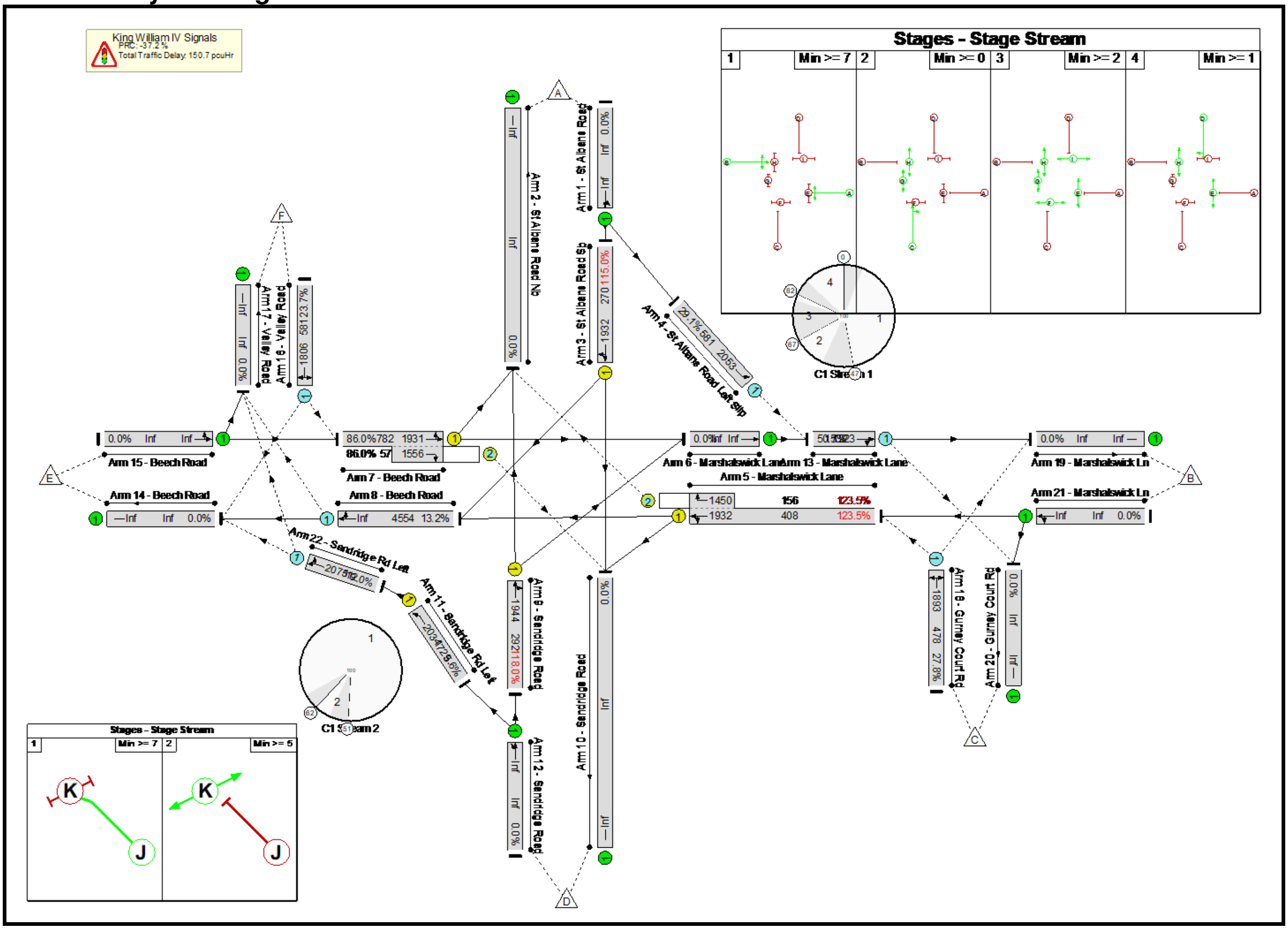
Basic Results Summary

C1	Stream: 1 PRC for Signalled Lanes (%):	-27.9	Total Delay for Signalled Lanes (pcuHr):	85.43	Cycle Time (s):	100
C1	Stream: 2 PRC for Signalled Lanes (%):	1096.9	Total Delay for Signalled Lanes (pcuHr):	0.08	Cycle Time (s):	100
	PRC Over All Lanes (%):	-27.9	Total Delay Over All Lanes(pcuHr):	87.25		

Basic Results Summary

Scenario 4: '2028 Opening Year PM' (FG4: '2028 Opening Year PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**123.5%**	**836**	**15**	**73**	**150.7**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**123.5%**	**836**	**15**	**73**	**150.7**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	13	-	311	1932	270	115.0%	-	-	-	29.6	342.4	34.2	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	169	2053	581	29.1%	169	0	0	0.2	4.4	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	42	-	697	1932:1450	408+156	123.5 : 123.5%	70	15	72	76.4	394.8	83.8	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	42	-	722	1931:1556	782+57	86.0 : 86.0%	48	0	1	8.1	40.6	20.6	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	634	Inf	4554	13.2%	85	0	0	0.1	0.5	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	14	-	344	1944	292	118.0%	-	-	-	35.2	368.6	40.2	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	97	2034	1729	5.6%	-	-	-	0.1	2.3	0.4	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	808	1923	1532	50.7%	97	0	0	0.5	2.4	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	138	1806	581	23.7%	138	0	0	0.2	4.1	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	133	1893	478	27.8%	133	0	0	0.2	5.2	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	97	2071	512	19.0%	97	0	0	0.1	4.4	0.5	22/1

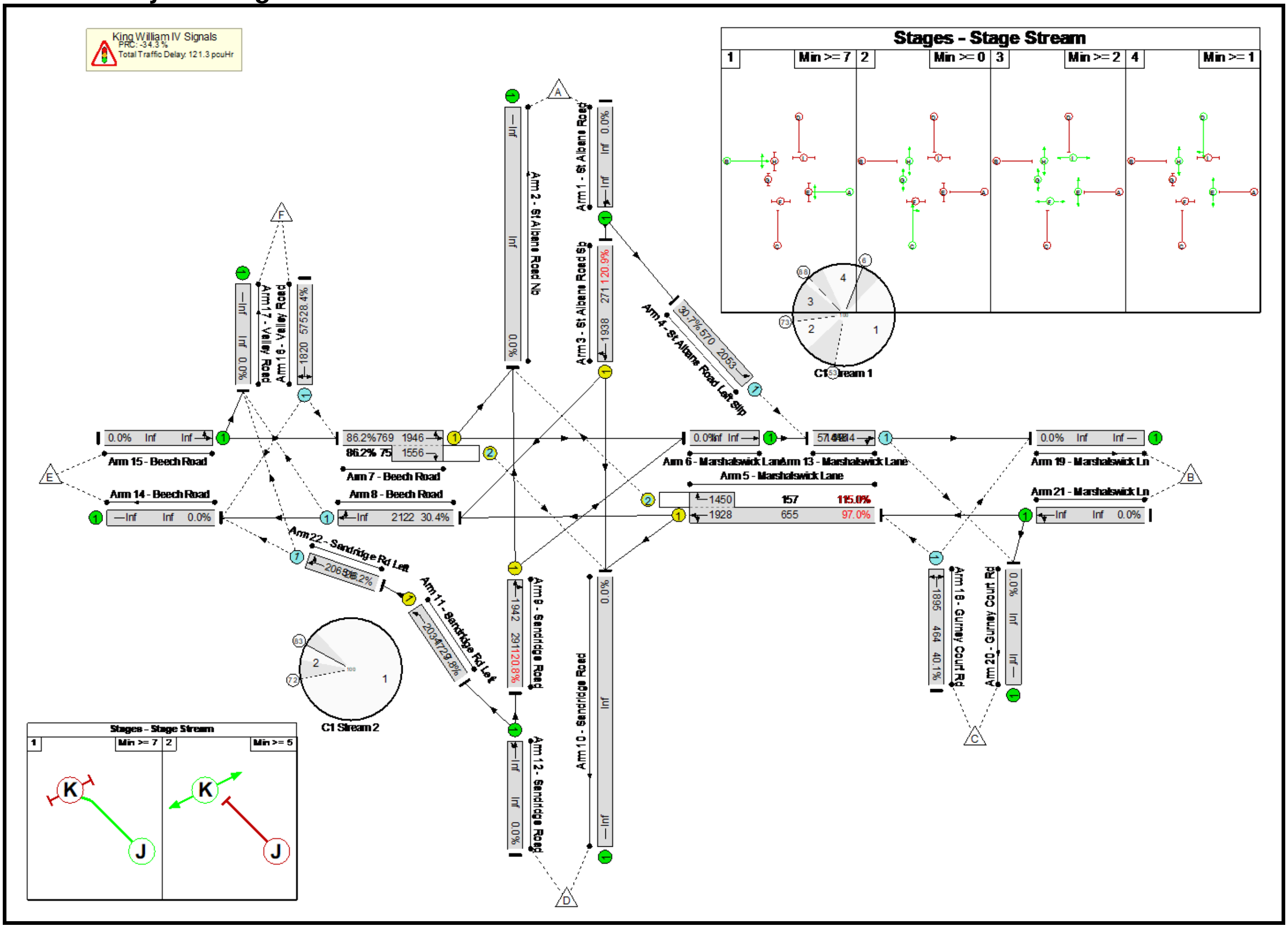
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-37.2	Total Delay for Signalled Lanes (pcuHr):	149.38	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1504.1	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s):	100
		PRC Over All Lanes (%):	-37.2	Total Delay Over All Lanes(pcuHr):	150.70		

Basic Results Summary

Scenario 5: '2033 Future Year (Core) AM' (FG5: '2033 Future Year (Core) AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**120.9%**	**1068**	**15**	**118**	**121.3**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**120.9%**	**1068**	**15**	**118**	**121.3**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	13	-	328	1938	271	120.9%	-	-	-	38.0	417.4	42.4	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	175	2053	570	30.7%	175	0	0	0.2	4.5	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	42	-	816	1928:1450	655+157	97.0 : 115.0%	71	15	72	33.5	147.7	45.9	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	42	-	728	1946:1556	769+75	86.2 : 86.2%	19	0	46	8.5	41.9	20.7	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	684	Inf	2122	30.4%	195	0	0	0.2	1.2	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	14	-	352	1942	291	120.8%	-	-	-	39.4	402.9	44.5	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	135	2034	1729	7.8%	-	-	-	0.1	2.3	0.6	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	871	1914	1446	57.6%	124	0	0	0.7	3.0	11.1	13/1
16/1	Valley Road Left Right	O	-		-	-	-	163	1820	575	28.4%	163	0	0	0.2	4.4	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	186	1895	464	40.1%	186	0	0	0.3	6.5	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	135	2063	516	26.2%	135	0	0	0.2	4.8	0.8	22/1

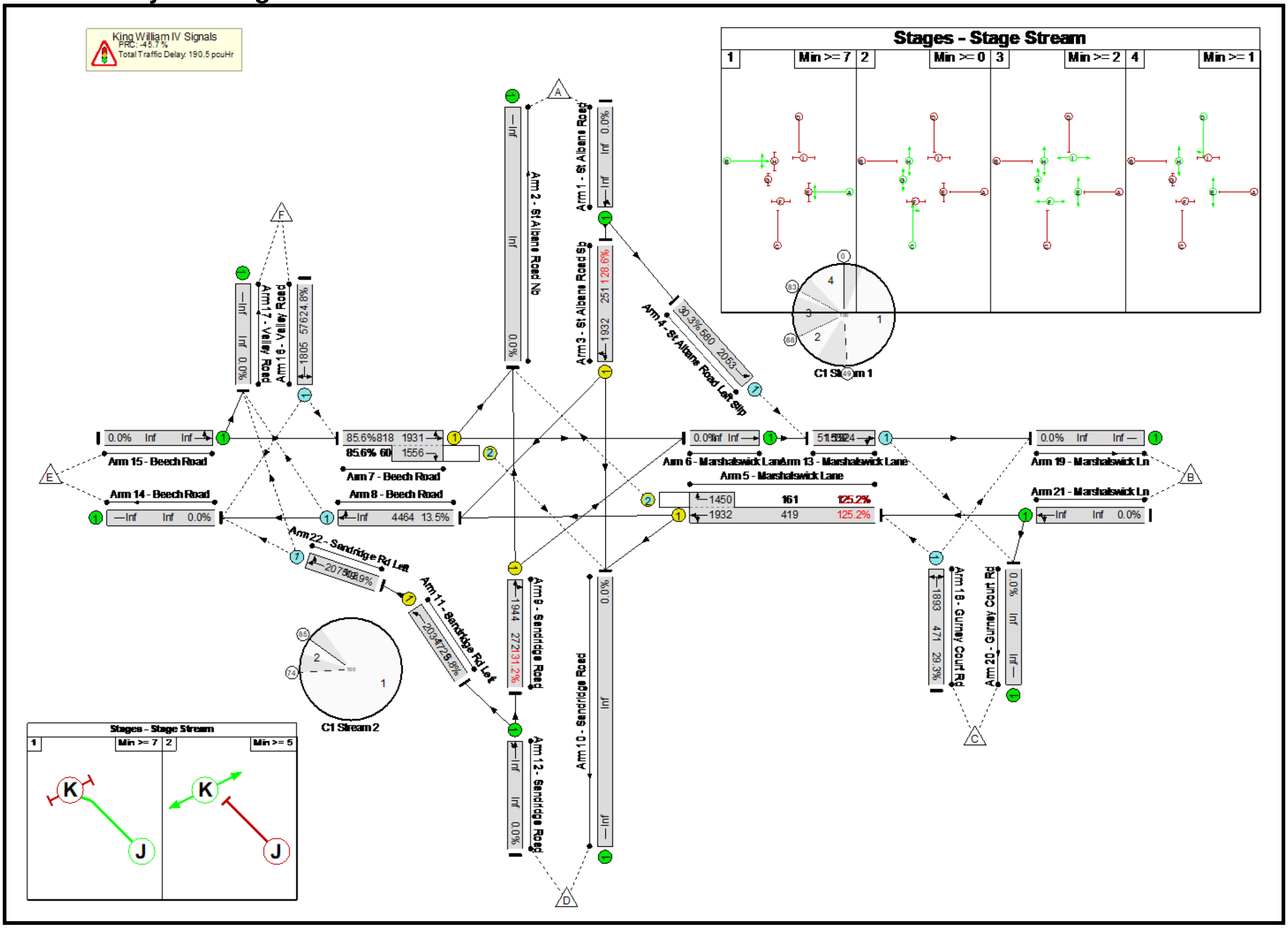
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-34.3	Total Delay for Signalled Lanes (pcuHr):	119.38	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1052.6	Total Delay for Signalled Lanes (pcuHr):	0.09	Cycle Time (s):	100
		PRC Over All Lanes (%):	-34.3	Total Delay Over All Lanes(pcuHr):	121.32		

Basic Results Summary

Scenario 6: '2033 Future Year (Core) PM' (FG6: '2033 Future Year (Core) PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**131.2%**	**863**	**15**	**74**	**190.5**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**131.2%**	**863**	**15**	**74**	**190.5**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	12	-	323	1932	251	128.6%	-	-	-	46.0	512.9	50.7	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	176	2053	580	30.3%	176	0	0	0.2	4.4	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	44	-	725	1932:1450	419+161	125.2 : 125.2%	74	15	72	83.2	413.1	90.6	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	44	-	751	1931:1556	818+60	85.6 : 85.6%	49	0	2	8.0	38.5	21.1	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	658	Inf	4464	13.5%	85	0	0	0.1	0.5	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	13	-	357	1944	272	131.2%	-	-	-	51.9	523.5	56.7	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	101	2034	1729	5.8%	-	-	-	0.1	2.3	0.5	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	840	1924	1532	51.5%	96	0	0	0.5	2.4	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	143	1805	576	24.8%	143	0	0	0.2	4.2	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	138	1893	471	29.3%	138	0	0	0.2	5.4	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	101	2071	508	19.9%	101	0	0	0.1	4.5	0.5	22/1

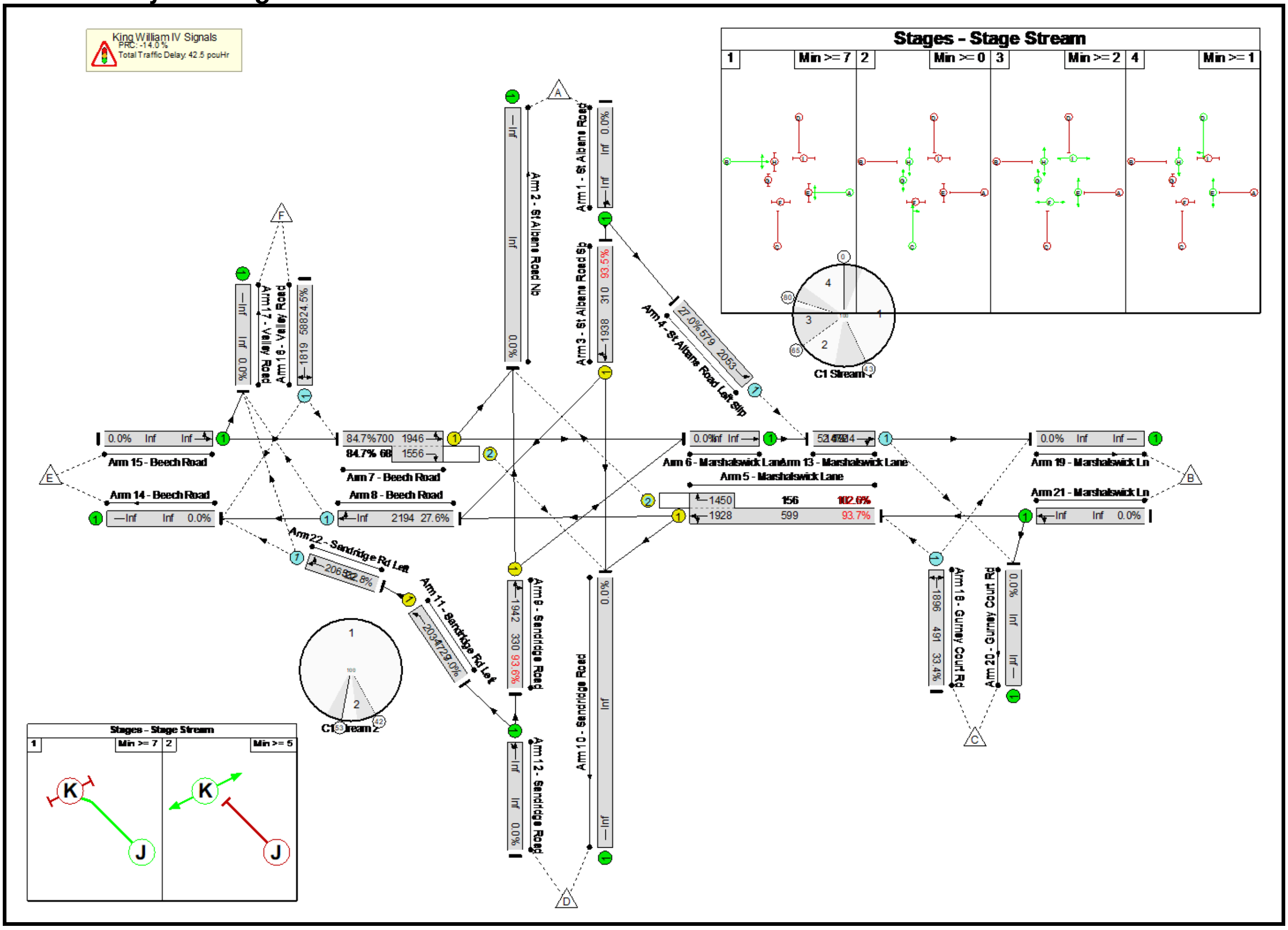
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-45.7	Total Delay for Signalled Lanes (pcuHr):	189.14	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1440.6	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s):	100
		PRC Over All Lanes (%):	-45.7	Total Delay Over All Lanes(pcuHr):	190.53		

Basic Results Summary

Scenario 7: '2033 Future Year (Behavioural) AM' (FG7: '2033 Future Year (Behavioural) AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**102.6%**	**992**	**12**	**93**	**42.5**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**102.6%**	**992**	**12**	**93**	**42.5**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	15	-	290	1938	310	93.5%	-	-	-	8.2	101.9	12.8	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	579	27.0%	156	0	0	0.2	4.3	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	38	-	721	1928:1450	599+156	93.7 : 102.6%	72	12	72	16.4	81.7	27.3	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	38	-	651	1946:1556	700+68	84.7 : 84.7%	37	0	21	7.9	43.6	18.4	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	605	Inf	2194	27.6%	183	0	0	0.2	1.1	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	16	-	309	1942	330	93.6%	-	-	-	8.5	98.9	13.4	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	121	2034	1729	7.0%	-	-	-	0.1	2.3	0.5	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	775	1914	1472	52.6%	115	0	0	0.6	2.6	4.6	13/1
16/1	Valley Road Left Right	O	-		-	-	-	144	1819	588	24.5%	144	0	0	0.2	4.1	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	164	1896	491	33.4%	164	0	0	0.3	5.5	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	121	2063	532	22.8%	121	0	0	0.1	4.4	0.6	22/1

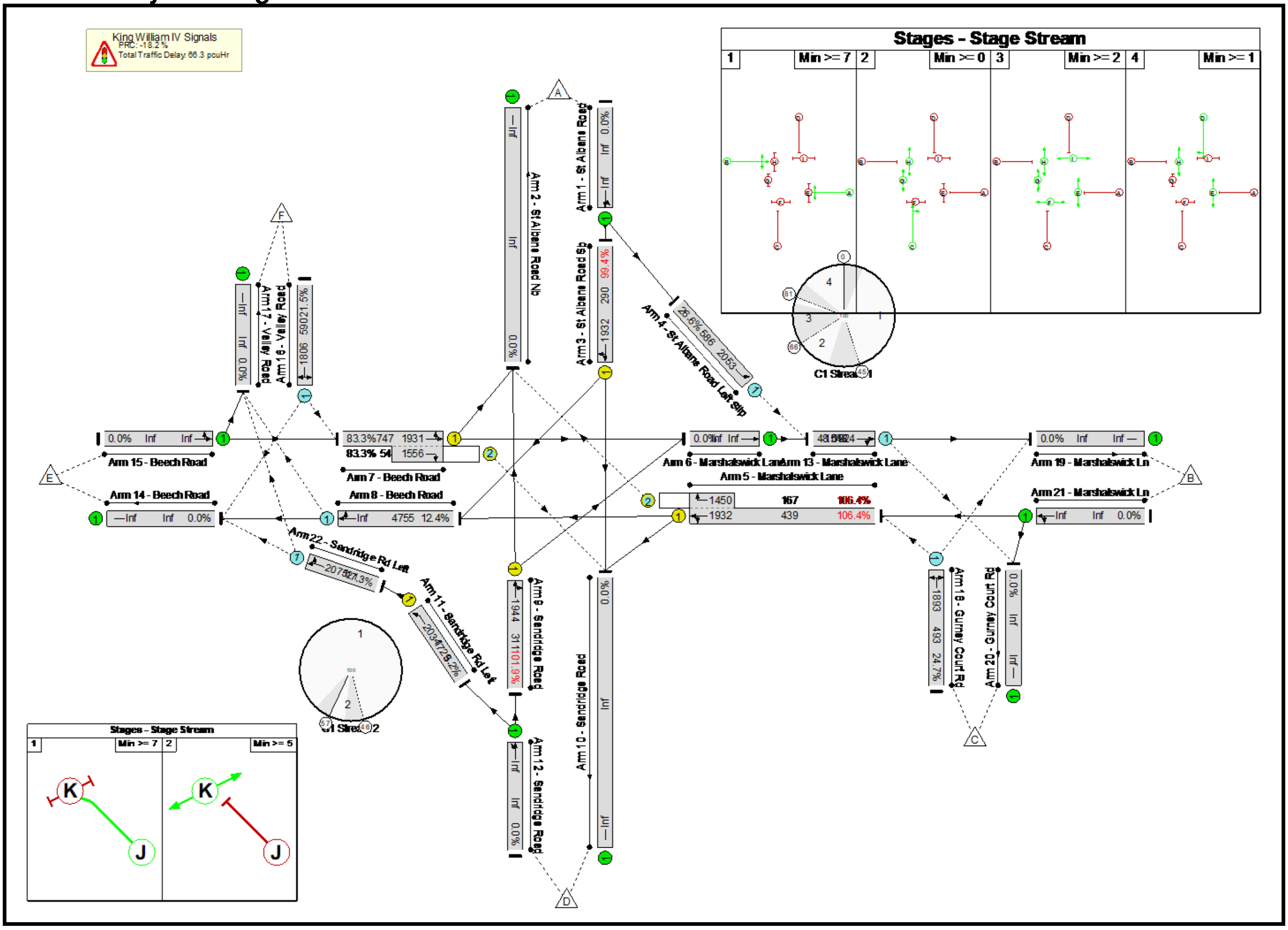
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-14.0	Total Delay for Signalled Lanes (pcuHr):	40.94	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1186.0	Total Delay for Signalled Lanes (pcuHr):	0.08	Cycle Time (s):	100
		PRC Over All Lanes (%):	-14.0	Total Delay Over All Lanes(pcuHr):	42.51		

Basic Results Summary

Scenario 8: '2033 Future Year (Behavioural) PM' (FG8: '2033 Future Year (Behavioural) PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	-	-	-		-	-	-	-	-	-	**106.4%**	**793**	**13**	**73**	**66.3**	-	-	**Network**
King William IV Signals	-	-	-		-	-	-	-	-	-	**106.4%**	**793**	**13**	**73**	**66.3**	-	-	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	14	-	288	1932	290	99.4%	-	-	-	11.4	143.0	16.0	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	586	26.6%	156	0	0	0.2	4.2	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	40	-	645	1932:1450	439+167	106.4 : 106.4%	82	13	72	31.9	178.0	39.3	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	40	-	667	1931:1556	747+54	83.3 : 83.3%	44	0	1	7.3	39.5	18.5	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	588	Inf	4755	12.4%	81	0	0	0.1	0.4	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	15	-	317	1944	311	101.9%	-	-	-	14.4	164.0	19.5	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	90	2034	1729	5.2%	-	-	-	0.1	2.3	0.4	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	746	1924	1548	48.0%	92	0	0	0.5	2.2	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	127	1806	590	21.5%	127	0	0	0.1	3.9	0.1	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	122	1893	493	24.7%	122	0	0	0.2	4.8	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	90	2071	521	17.3%	90	0	0	0.1	4.2	0.3	22/1

Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-18.2	Total Delay for Signalled Lanes (pcuHr):	65.11	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1628.9	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s):	100
		PRC Over All Lanes (%):	-18.2	Total Delay Over All Lanes(pcuHr):	66.28		

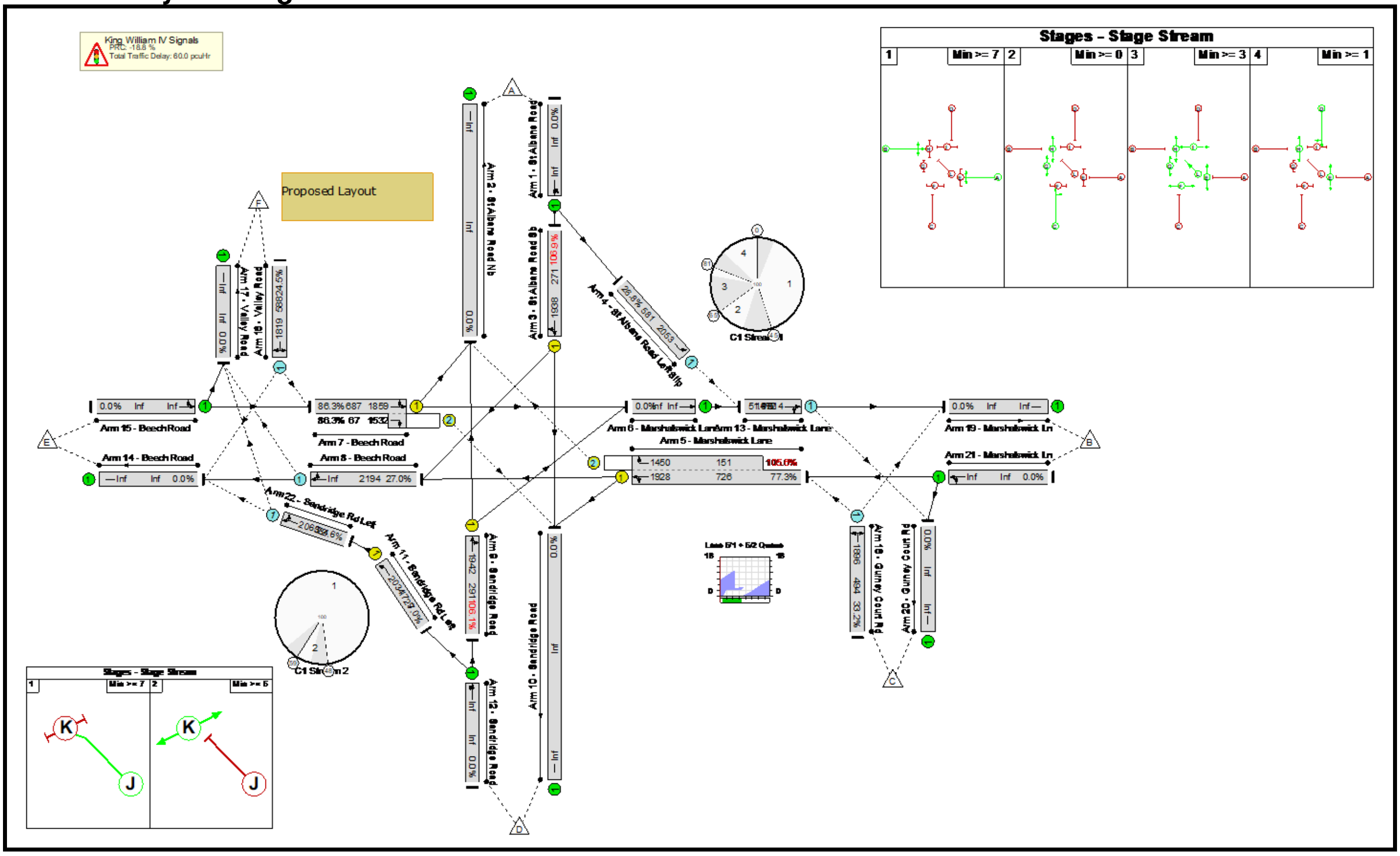
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-King William IV Signals - Proposed Layout - Revised Modelling.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2033 Future Year (Behavioural) AM' (FG1: '2033 Future Year (Behavioural) AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**106.9%**	**1002**	**11**	**74**	**60.0**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**106.9%**	**1002**	**11**	**74**	**60.0**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	13	-	290	1938	271	106.9%	-	-	-	18.9	234.7	23.2	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	581	26.8%	156	0	0	0.2	4.2	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	40	-	721	1928:1450	726+151	77.3 : 105.6%	69	11	72	13.0	65.1	19.4	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	40	-	651	1859:1532	687+67	86.3 : 86.3%	56	0	2	8.0	44.0	19.2	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	605	Inf	2194	27.0%	179	0	0	0.2	1.1	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	14	-	309	1942	291	106.1%	-	-	-	18.6	216.7	23.3	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	121	2034	1729	7.0%	-	-	-	0.1	2.3	0.5	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	775	1914	1472	51.9%	113	0	0	0.5	2.5	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	144	1819	588	24.5%	144	0	0	0.2	4.1	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	164	1896	494	33.2%	164	0	0	0.2	5.5	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	121	2063	534	22.6%	121	0	0	0.1	4.4	0.6	22/1

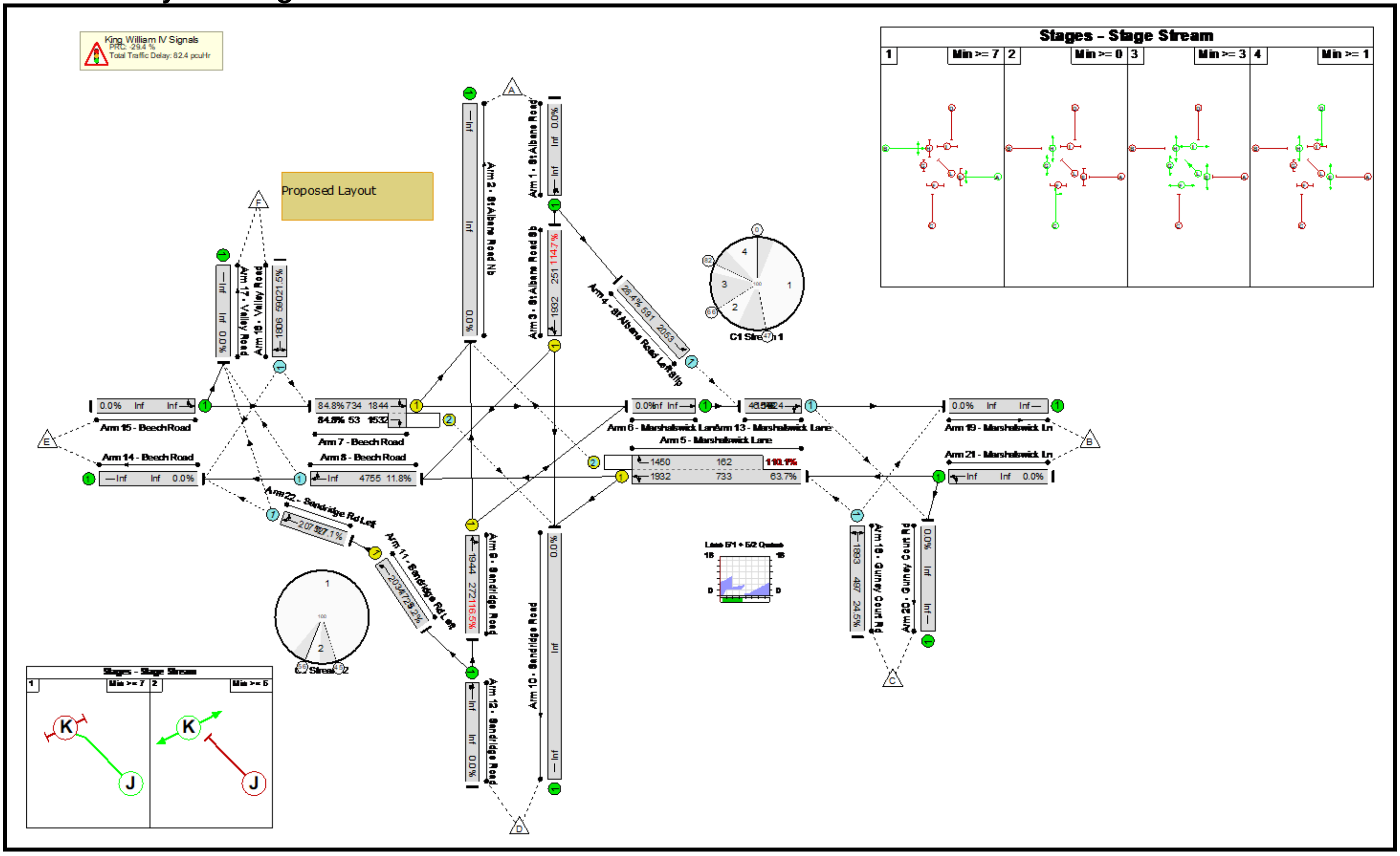
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-18.8	Total Delay for Signalled Lanes (pcuHr):	58.50	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1186.0	Total Delay for Signalled Lanes (pcuHr):	0.08	Cycle Time (s):	100
		PRC Over All Lanes (%):	-18.8	Total Delay Over All Lanes(pcuHr):	60.05		

Basic Results Summary

Scenario 2: '2033 Future Year (Behavioural) AM' (FG2: '2033 Future Year (Behavioural) PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**116.5%**	**781**	**13**	**73**	**82.4**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**116.5%**	**781**	**13**	**73**	**82.4**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	12	-	288	1932	251	114.7%	-	-	-	27.3	341.3	31.5	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	591	26.4%	156	0	0	0.2	4.1	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	42	-	645	1932:1450	733+162	63.7 : 110.1%	76	13	72	15.5	86.7	19.2	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	42	-	667	1844:1532	734+53	84.8 : 84.8%	44	0	1	7.4	40.1	19.0	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	588	Inf	4755	11.8%	77	0	0	0.1	0.4	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	13	-	317	1944	272	116.5%	-	-	-	31.0	352.5	35.6	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	90	2034	1729	5.2%	-	-	-	0.1	2.3	0.4	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	746	1924	1548	46.5%	88	0	0	0.4	2.2	0.4	13/1
16/1	Valley Road Left Right	O	-		-	-	-	127	1806	590	21.5%	127	0	0	0.1	3.9	0.1	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	122	1893	497	24.5%	122	0	0	0.2	4.8	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	90	2071	527	17.1%	90	0	0	0.1	4.1	0.3	22/1

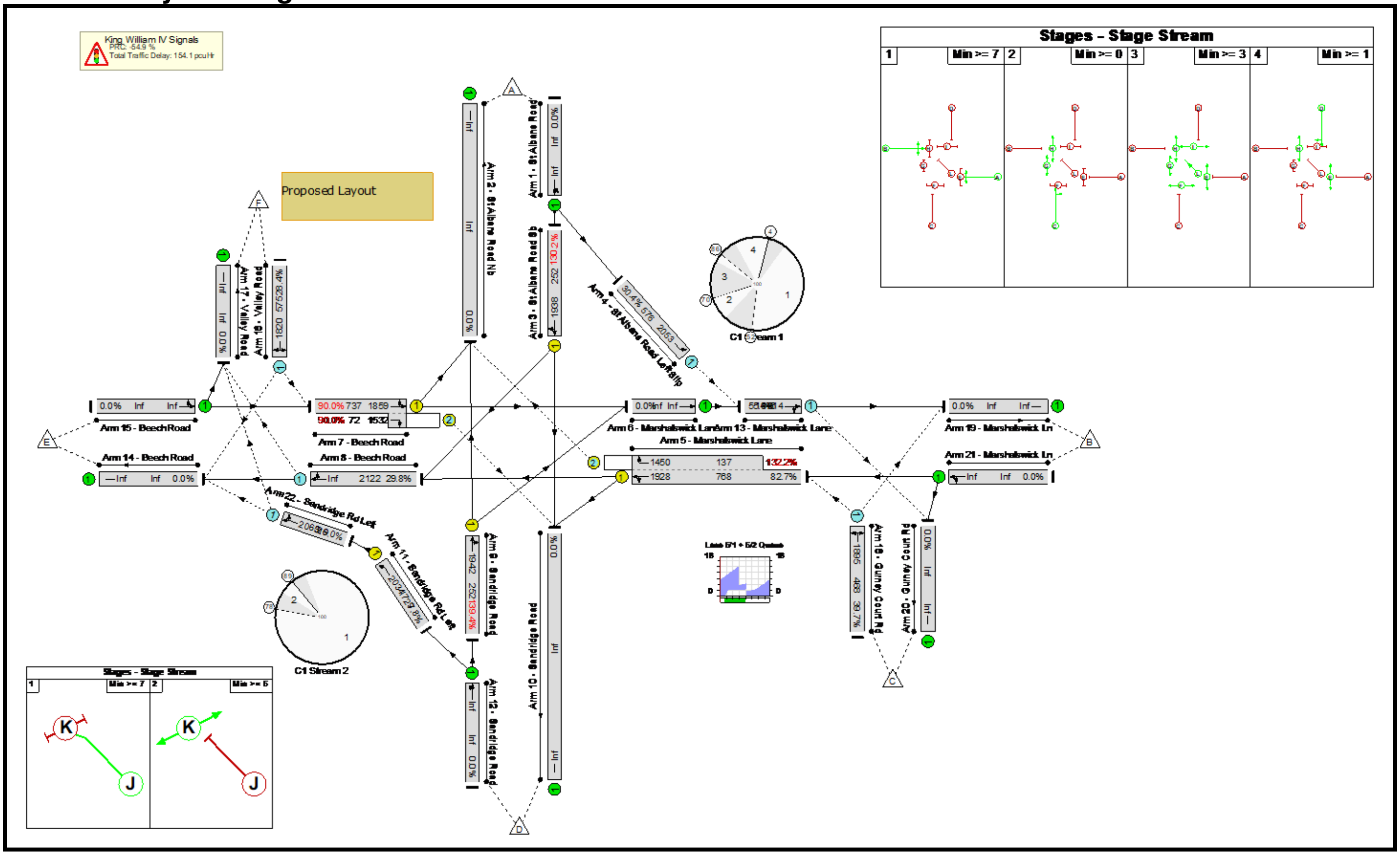
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-29.4	Total Delay for Signalled Lanes (pcuHr):	81.30	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1628.9	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s):	100
		PRC Over All Lanes (%):	-29.4	Total Delay Over All Lanes(pcuHr):	82.44		

Basic Results Summary

Scenario 3: '2033 Future Year (Core) AM' (FG3: '2033 Future Year (Core) AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**139.4%**	**1084**	**15**	**74**	**154.1**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**139.4%**	**1084**	**15**	**74**	**154.1**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	12	-	328	1938	252	130.2%	-	-	-	48.3	529.7	52.8	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	175	2053	576	30.4%	175	0	0	0.2	4.5	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	43	-	816	1928:1450	768+137	82.7 : 132.2%	50	15	72	34.9	153.9	41.1	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	43	-	728	1859:1532	737+72	90.0 : 90.0%	63	0	2	9.5	47.0	22.5	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	684	Inf	2122	29.8%	191	0	0	0.2	1.2	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	12	-	352	1942	252	139.4%	-	-	-	59.6	609.2	64.1	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	135	2034	1729	7.8%	-	-	-	0.1	2.3	0.6	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	871	1914	1446	55.9%	120	0	0	0.6	2.8	0.6	13/1
16/1	Valley Road Left Right	O	-		-	-	-	163	1820	575	28.4%	163	0	0	0.2	4.4	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	186	1895	468	39.7%	186	0	0	0.3	6.4	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	135	2063	519	26.0%	135	0	0	0.2	4.8	0.8	22/1

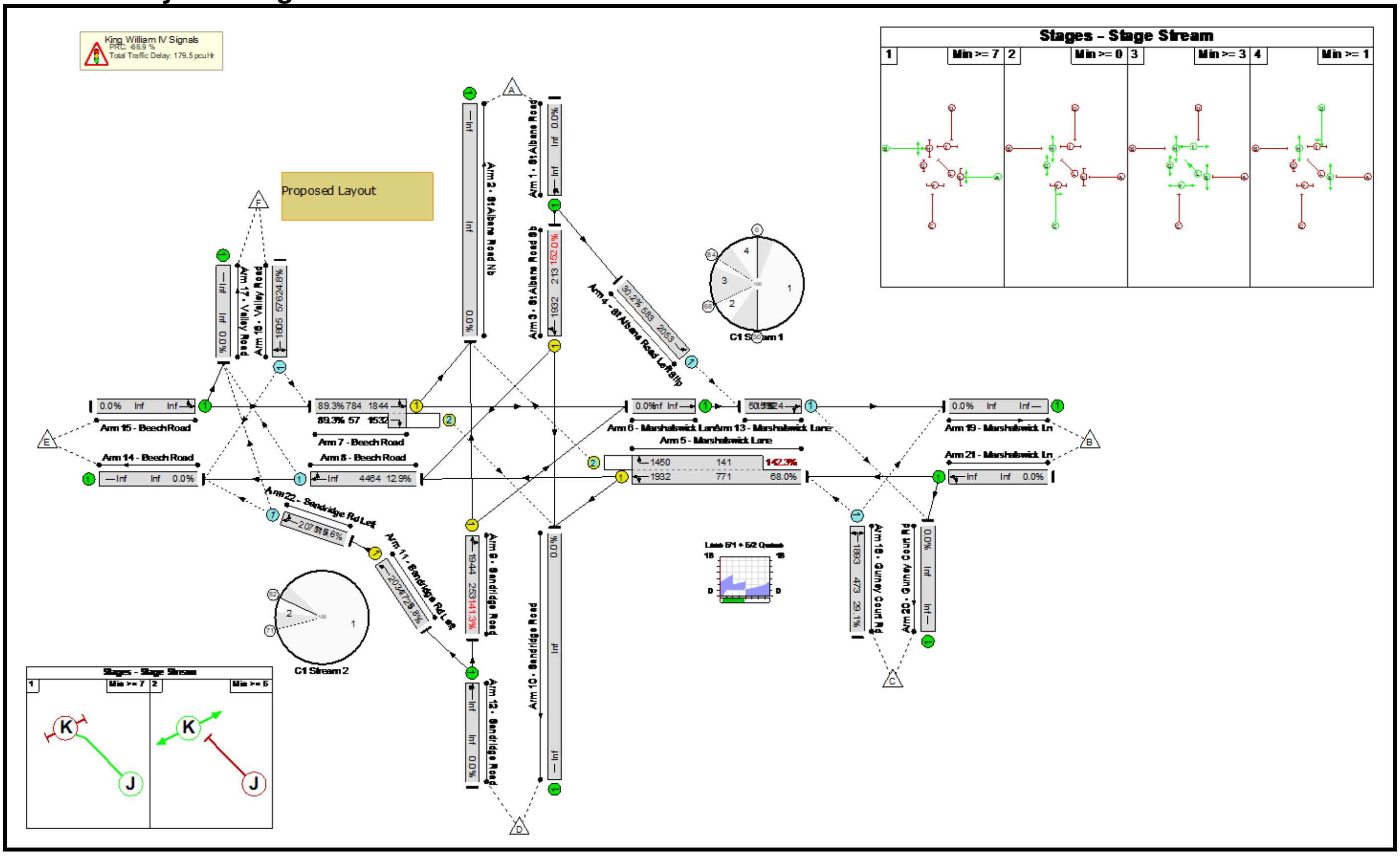
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-54.9	Total Delay for Signalled Lanes (pcuHr):	152.21	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1052.6	Total Delay for Signalled Lanes (pcuHr):	0.09	Cycle Time (s):	100
		PRC Over All Lanes (%):	-54.9	Total Delay Over All Lanes(pcuHr):	154.06		

Basic Results Summary

Scenario 4: '2033 Future Year (Core) PM' (FG4: '2033 Future Year (Core) PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	-	-	-		-	-	-	-	-	-	**152.0%**	**838**	**15**	**74**	**179.5**	-	-	**Network**
King William IV Signals	-	-	-		-	-	-	-	-	-	**152.0%**	**838**	**15**	**74**	**179.5**	-	-	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	10	-	323	1932	213	152.0%	-	-	-	66.9	745.5	71.5	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	176	2053	583	30.2%	176	0	0	0.2	4.4	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	45	-	725	1932:1450	771+141	68.0 : 142.3%	55	15	72	40.1	199.1	42.5	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	45	-	751	1844:1532	784+57	89.3 : 89.3%	49	0	2	9.0	43.3	22.7	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	658	Inf	4464	12.9%	81	0	0	0.1	0.5	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	12	-	357	1944	253	141.3%	-	-	-	62.1	625.9	66.6	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	101	2034	1729	5.8%	-	-	-	0.1	2.3	0.5	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	840	1924	1532	50.7%	95	0	0	0.5	2.4	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	143	1805	576	24.8%	143	0	0	0.2	4.2	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	138	1893	473	29.1%	138	0	0	0.2	5.4	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	101	2071	515	19.6%	101	0	0	0.1	4.4	0.5	22/1

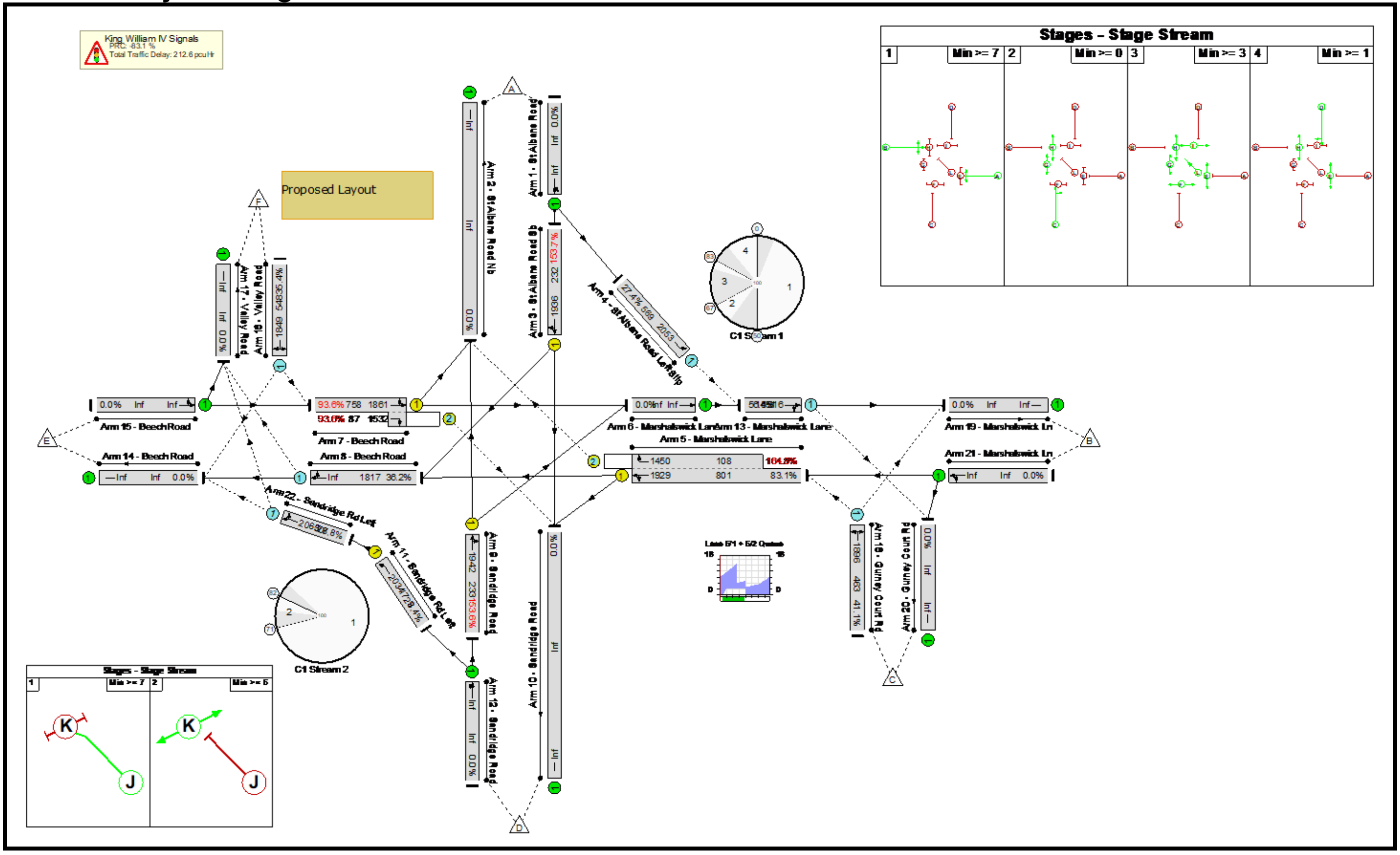
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-68.9	Total Delay for Signalled Lanes (pcuHr):	178.10	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1440.6	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s):	100
		PRC Over All Lanes (%):	-68.9	Total Delay Over All Lanes(pcuHr):	179.46		

Basic Results Summary

Scenario 5: '2033 Future Year (Core) + Development (Core) - SDBL Option 2 AM' (FG5: '2033 Future Year (Core) + Development (Core) - SDBL Option 2 AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**164.8%**	**1138**	**3**	**74**	**212.6**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**164.8%**	**1138**	**3**	**74**	**212.6**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	11	-	357	1936	232	153.7%	-	-	-	75.2	757.8	80.3	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	569	27.4%	156	0	0	0.2	4.4	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	45	-	844	1929:1450	801+108	83.1 : 164.8%	33	3	72	50.1	213.6	56.3	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	45	-	791	1861:1532	758+87	93.6 : 93.6%	79	0	2	11.8	53.8	26.4	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	747	Inf	1817	36.2%	223	0	0	0.3	1.6	0.3	8/1
9/1	Sandridge Road Ahead Right	U	C		1	11	-	358	1942	233	153.6%	-	-	-	73.5	738.9	77.8	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	146	2034	1729	8.4%	-	-	-	0.1	2.4	0.7	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	899	1916	1451	56.5%	118	0	0	0.6	2.8	0.6	13/1
16/1	Valley Road Left Right	O	-		-	-	-	194	1849	548	35.4%	194	0	0	0.3	5.1	0.3	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	190	1896	463	41.1%	190	0	0	0.3	6.6	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	146	2063	507	28.8%	146	0	0	0.2	5.1	0.9	22/1

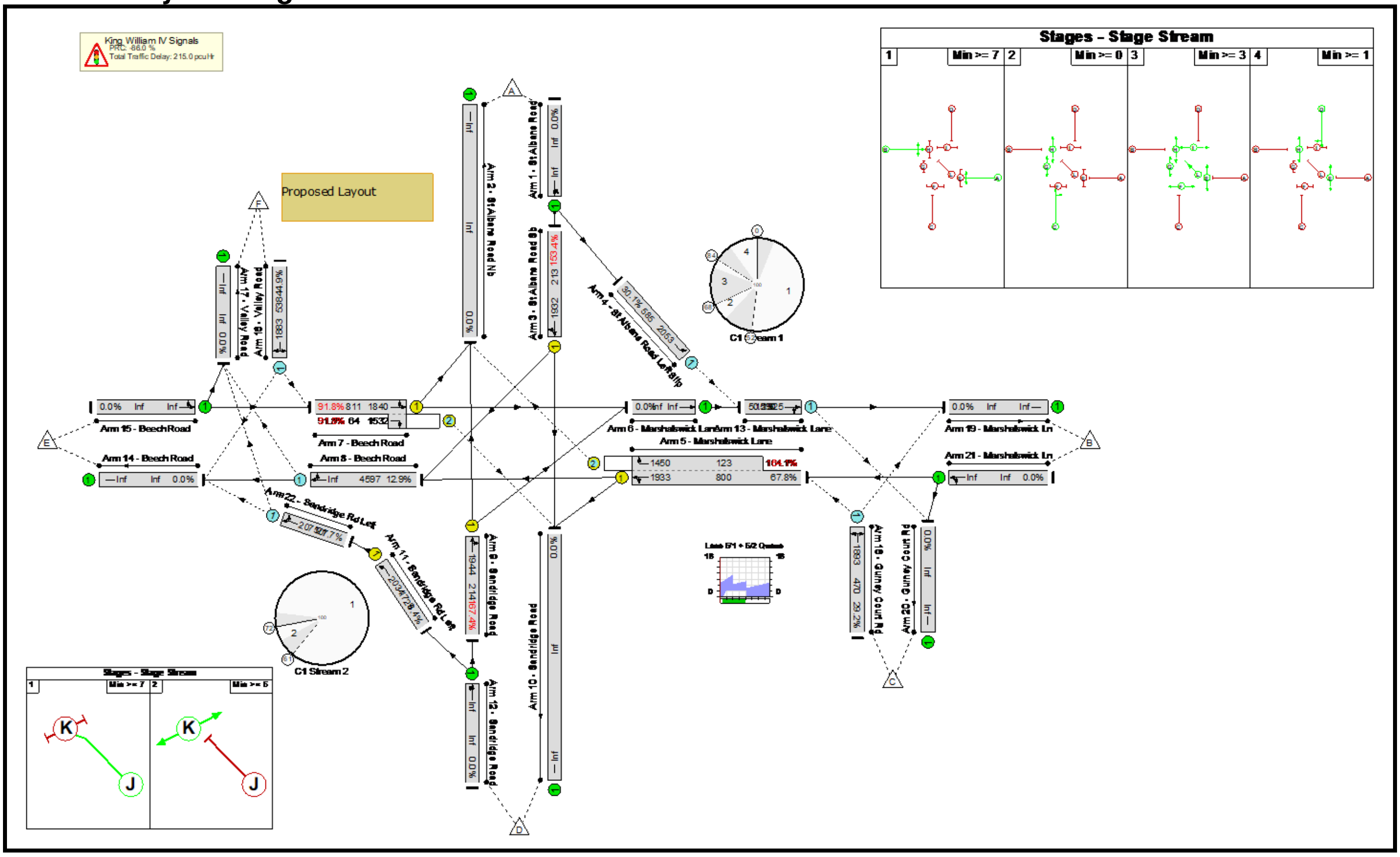
Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-83.1	Total Delay for Signalled Lanes (pcuHr):	210.52	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	965.8	Total Delay for Signalled Lanes (pcuHr):	0.10	Cycle Time (s):	100
		PRC Over All Lanes (%):	-83.1	Total Delay Over All Lanes(pcuHr):	212.56		

Basic Results Summary

Scenario 6: '2033 Future Year (Core) + Development (Core) - SDBL Option 2 PM' (FG6: '2033 Future Year (Core) + Development (Core) - SDBL Option 2 PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**167.4%**	**937**	**7**	**74**	**215.0**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**167.4%**	**937**	**7**	**74**	**215.0**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	10	-	326	1932	213	153.4%	-	-	-	68.6	757.2	73.2	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	176	2053	585	30.1%	176	0	0	0.2	4.4	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	47	-	743	1933:1450	800+123	67.8 : 164.1%	44	7	72	50.2	243.1	52.1	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	47	-	804	1840:1532	811+64	91.8 : 91.8%	57	0	2	10.4	46.5	25.3	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	679	Inf	4597	12.9%	78	0	0	0.1	0.4	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	10	-	358	1944	214	167.4%	-	-	-	84.3	847.2	88.4	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	110	2034	1729	6.4%	-	-	-	0.1	2.3	0.5	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	855	1925	1530	50.2%	93	0	0	0.5	2.4	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	242	1883	538	44.9%	242	0	0	0.4	6.1	0.4	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	137	1893	470	29.2%	137	0	0	0.2	5.4	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	110	2071	507	21.7%	110	0	0	0.1	4.6	0.6	22/1

Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-86.0	Total Delay for Signalled Lanes (pcuHr):	213.37	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1314.6	Total Delay for Signalled Lanes (pcuHr):	0.07	Cycle Time (s):	100
		PRC Over All Lanes (%):	-86.0	Total Delay Over All Lanes(pcuHr):	214.99		

Junctions 10

PICADY 10 - Priority Intersection Module

Filename: 05920 Firbank Road_Beech Road 2028-2033 Outputs.j10
Path: C:\Users\emma beynon\OneDrive - Phil Jones Associates\05920 North St Albans\3. Technical\3.2 Modelling\Junctions 10 \July 2024 Selected Scenarios
Report generation date: 23/07/2024 16:29:23

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	[Lane Simulation] - 2028 Opening Year									
Junction 1 - Arm A	D3	0.0	0.00		A	D4	0.0	0.00		A
Junction 1 - Arm B		0.7	17.78		C		1.6	26.81		D
Junction 1 - Arm C		0.0	0.04		A		0.0	0.03		A
Junction 2 - Arm A		0.0	0.00		A		0.0	0.00		A
Junction 2 - Arm B		0.1	7.33		A		0.4	8.68		A
Junction 2 - Arm C		0.1	0.47		A		0.0	0.23		A
Junction 3 - Arm A		0.0	0.00		A		0.1	0.86		A
Junction 3 - Arm B		0.1	7.66		A		0.0	7.73		A
Junction 3 - Arm C		0.0	0.00		A		0.0	0.00		A
	[Lane Simulation] - 2033 Future Year (Core)									
Junction 1 - Arm A	D5	0.0	0.00		A	D6	0.0	0.00		A
Junction 1 - Arm B		0.8	20.10		C		2.0	29.75		D
Junction 1 - Arm C		0.0	0.03		A		0.0	0.03		A
Junction 2 - Arm A		0.0	0.00		A		0.0	0.00		A
Junction 2 - Arm B		0.2	7.61		A		0.3	8.76		A
Junction 2 - Arm C		0.1	0.51		A		0.1	0.25		A
Junction 3 - Arm A		0.0	0.03		A		0.1	0.93		A
Junction 3 - Arm B		0.1	8.09		A		0.0	7.70		A
Junction 3 - Arm C		0.0	0.00		A		0.0	0.00		A
	[Lane Simulation] - 2033 Future Year (Core) + Development (Core) - SDBL Option 2									
Junction 1 - Arm A	D21	0.0	0.00		A	D22	0.0	0.00		A
Junction 1 - Arm B		1.1	28.64		D		2.8	44.36		E
Junction 1 - Arm C		0.0	0.04		A		0.0	0.03		A
Junction 2 - Arm A		0.0	0.00		A		0.0	0.00		A
Junction 2 - Arm B		0.2	7.98		A		0.4	9.44		A
Junction 2 - Arm C		0.1	0.46		A		0.1	0.22		A
Junction 3 - Arm A		0.0	0.05		A		1.1	8.34		A
Junction 3 - Arm B		0.1	8.40		A		0.0	8.53		A
Junction 3 - Arm C		0.0	0.00		A		0.0	0.00		A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay.

File summary

File Description

Title	
Location	
Site number	
Date	22/11/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PJA\Matthew Wykes
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use simulation for HCM roundabouts	Use iterations for HCM roundabouts
5.75						0.85	36.00	20.00		

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Calculate RFCs	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	Do not calculate	-1	3	1	60	✓			2134366885	101	4.97

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2028 Opening Year	AM	ONE HOUR	07:45	09:15	15	✓
D4	2028 Opening Year	PM	ONE HOUR	16:45	18:15	15	✓
D5	2033 Future Year (Core)	AM	ONE HOUR	07:45	09:15	15	✓
D6	2033 Future Year (Core)	PM	ONE HOUR	16:45	18:15	15	✓
D21	2033 Future Year (Core) + Development (Core) - SDBL Option 2	AM	ONE HOUR	07:45	09:15	15	✓
D22	2033 Future Year (Core) + Development (Core) - SDBL Option 2	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	✓	100.000	100.000

2028 Opening Year, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Junction 1 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 2 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 3 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Info	Simulation	A1 - [Lane Simulation]	This run uses Simulation mode. For detailed information on this mode, please see the User Guide.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Western Priority	T-Junction	Two-way	Two-way	Two-way		1.46	A
2	Eastern Priority	T-Junction	Two-way	Two-way	Two-way		0.65	A
3	Northern Priority	T-Junction	Two-way	Two-way	Two-way		0.56	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	1.01	A

Arms

Arms

Junction	Arm	Name	Description	Arm type
1	A	Beech Road W		Major
	B	Firbank Rd		Minor
	C	Beech Rd E		Major
2	A	Beech Rd W		Major
	B	Firbank Rd		Minor
	C	Beech Road E		Major
3	A	Firbank Rd E		Major
	B	Firbank Rd W		Minor
	C	Firbank Rd S		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Width for right-turn storage (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)	Vehicles causing blocking (%)
1	C	6.73		✓	2.36	86.0	✓	8.20	100
2	C	6.73		✓	2.23	34.8	✓	6.20	100
3	C	8.10				125.0	✓	0.00	100

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
1	B	One lane plus flare	10.00	8.55	5.06	3.42	3.42	✓	2.00	20	44
2	B	One lane plus flare	10.00	5.47	4.34	3.62	3.58	✓	1.00	66	19
3	B	One lane plus flare	10.00	5.53	4.30	4.30	3.80	✓	1.00	17	35

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	575	0.101	0.256	0.161	0.365
	B-C	643	0.096	0.242	-	-
	C-B	635	0.238	0.238	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
2	B-A	495	0.087	0.220	0.138	0.314
	B-C	719	0.107	0.270	-	-
	C-B	596	0.224	0.224	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
3	B-A	574	0.095	0.240	0.151	0.343
	B-C	631	0.088	0.222	-	-
	C-B	646	0.228	0.228	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Lane Simulation: Arm options

Junction	Arm	Traffic considering secondary lanes (%)
1	A	10.00
	B	10.00
	C	10.00
2	A	10.00
	B	10.00
	C	10.00
3	A	10.00
	B	10.00
	C	10.00

Lanes

Junction	Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Has obstruction	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1	A	Entry	1	1	B, C		Infinity			0	99999	
		Exit	1	1			Infinity					
	B	Entry	1	1	C	✓	2.00			0	99999	
				2	A	✓	2.00			0	99999	
			2	1	(A, C)	✓	3.00					
		Exit	1	1		✓	3.00					
	C	Entry	1	1	A	✓	8.20			0	99999	
				2	B	✓	8.20			0	99999	
			2	1	(A, B)	✓	3.00					
		Exit	1	1		✓	3.00					
2	A	Entry	1	1	B, C	✓	3.00			0	99999	
		Exit	1	1		✓	3.00					
	B	Entry	1	1	C	✓	1.00			0	99999	
				2	A	✓	1.00			0	99999	
			2	1	(A, C)	✓	3.00					
		Exit	1	1		✓	3.00					
	C	Entry	1	1	A	✓	6.20			0	99999	
				2	B	✓	6.20			0	99999	
			2	1	(A, B)		Infinity					
		Exit	1	1			Infinity					
3	A	Entry	1	1	B, C		Infinity			0	99999	
		Exit	1	1			Infinity					
	B	Entry	1	1	C	✓	1.00			0	99999	
				2	A	✓	1.00			0	99999	
			2	1	(A, C)	✓	3.00					
		Exit	1	1		✓	3.00					
	C	Entry	1	1	A, B	✓	3.00			0	99999	
		Exit	1	1		✓	3.00					

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				A	B	C
1	A	1	1		✓	✓
	B	1	1			✓
			2	✓		
		2	1	✓		✓
	C	1	1	✓		
			2		✓	
		2	1	✓	✓	

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				A	B	C
2	A	1	1		✓	✓
	B	1	1			✓
			2	✓		
		2	1	✓		✓
	C	1	1	✓		
			2		✓	
		2	1	✓	✓	

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				A	B	C
3	A	1	1		✓	✓
	B	1	1			✓
			2	✓		
		2	1	✓		✓
	C	1	1	✓	✓	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2028 Opening Year	AM	ONE HOUR	07:45	09:15	15	✓

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	B	3	C	Simple (vertical queueing)	Normal	0	100.00	
	C	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	C	Simple (vertical queueing)	Normal	0	100.00	
	B	3	B	Simple (vertical queueing)	Normal	0	100.00	
3	B	2	B	Simple (vertical queueing)	Normal	0	100.00	
	C	1	B	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	685	100.000
	B	✓				
	C	✓				
2	A	✓				
	B	✓				
	C		ONE HOUR	✓	547	100.000
3	A		ONE HOUR	✓	170	100.000
	B	✓				
	C	✓				

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	172	513
	B	107	0	0
	C	518	2	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	513
	B	1	0	62
	C	519	28	0

Junction 3

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	63	107
	B	28	0	0
	C	174	0	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Junction	PCU factor for a cyclist	PCU factor for a cyclist in controlling flow
1	0.20	0.80
2	0.20	0.80
3	0.20	0.80

Junction 1

Heavy Vehicle %

		To		
		A	B	C
From	A	0	2	14
	B	2	0	0
	C	6	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 2

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	14
	B	0	0	0
	C	6	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 3

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	A	0.00	0.0	A	617	926
	B	17.78	0.7	C	97	145
	C	0.04	0.0	A	479	719
2	A	0.00	0.0	A	464	697
	B	7.33	0.1	A	58	88
	C	0.47	0.1	A	503	755
3	A	0.00	0.0	A	155	233
	B	7.66	0.1	A	25	37
	C	0.00	0.0	A	156	234

Main Results for each time segment

07:45 - 08:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	514	128	514	514	467	0.0	0.0	0.000	A
	B	81	20	81	83	127	0.0	0.3	11.593	B
	C	388	97	388	391	388	0.0	0.0	0.038	A
2	A	388	97	388	386	388	0.0	0.0	0.000	A
	B	48	12	48	47	21	0.0	0.1	6.424	A
	C	409	102	408	411	436	0.0	0.0	0.387	A
3	A	129	32	129	131	149	0.0	0.0	0.000	A
	B	21	5	21	20	48	0.0	0.0	6.305	A
	C	128	32	128	129	81	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	614	154	614	617	568	0.0	0.0	0.000	A
	B	94	24	93	95	153	0.3	0.4	13.404	B
	C	477	119	476	466	463	0.0	0.0	0.019	A
2	A	459	115	459	465	479	0.0	0.0	0.000	A
	B	60	15	60	58	22	0.1	0.1	6.441	A
	C	500	125	500	491	518	0.0	0.1	0.404	A
3	A	154	38	154	153	176	0.0	0.0	0.000	A
	B	22	6	22	24	60	0.0	0.0	6.729	A
	C	154	38	154	155	94	0.0	0.0	0.000	A

08:15 - 08:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	738	184	738	742	671	0.0	0.0	0.000	A
	B	113	28	113	114	183	0.4	0.7	17.600	C
	C	560	140	560	563	557	0.0	0.0	0.026	A
2	A	560	140	560	559	564	0.0	0.0	0.000	A
	B	70	17	70	69	29	0.1	0.1	6.927	A
	C	590	148	591	592	629	0.1	0.0	0.467	A
3	A	182	45	182	183	211	0.0	0.0	0.000	A
	B	29	7	28	29	70	0.0	0.1	7.154	A
	C	183	46	183	187	112	0.0	0.0	0.000	A

08:30 - 08:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	744	186	744	745	703	0.0	0.0	0.000	A
	B	119	30	118	117	184	0.7	0.6	17.782	C
	C	586	147	586	575	562	0.0	0.0	0.029	A
2	A	564	141	564	559	583	0.0	0.0	0.000	A
	B	73	18	72	73	31	0.1	0.1	7.331	A
	C	612	153	612	607	635	0.0	0.1	0.451	A
3	A	192	48	192	190	216	0.0	0.0	0.000	A
	B	31	8	31	32	73	0.1	0.0	7.655	A
	C	184	46	184	188	119	0.0	0.0	0.000	A

08:45 - 09:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	595	149	595	607	568	0.0	0.0	0.000	A
	B	99	25	98	98	156	0.6	0.5	14.160	B
	C	472	118	472	472	441	0.0	0.0	0.038	A
2	A	442	111	442	458	473	0.0	0.0	0.000	A
	B	60	15	59	61	24	0.1	0.1	6.885	A
	C	495	124	495	495	501	0.1	0.1	0.412	A
3	A	158	40	158	158	180	0.0	0.0	0.000	A
	B	24	6	23	25	60	0.0	0.0	6.861	A
	C	157	39	157	154	99	0.0	0.0	0.000	A

09:00 - 09:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	498	124	498	512	468	0.0	0.0	0.000	A
	B	76	19	76	81	130	0.5	0.2	11.600	B
	C	393	98	393	395	370	0.0	0.0	0.029	A
2	A	374	93	374	382	391	0.0	0.0	0.000	A
	B	41	10	41	44	22	0.1	0.1	6.176	A
	C	412	103	413	414	414	0.1	0.0	0.384	A
3	A	117	29	117	123	150	0.0	0.0	0.000	A
	B	22	5	21	21	41	0.0	0.1	7.223	A
	C	129	32	129	131	75	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	514	514	514	0.0	0.0	0.000	A
		Exit	1	1		467	467	473	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	81	81	83	0.0	0.3	10.970	B
			2	1	(A, C)	81	81	84	0.0	0.0	0.625	A
		Exit	1	1		127	127	128	0.0	0.0	0.000	A
	C	Entry	1	1	A	386	386	390	0.0	0.0	0.000	A
				2	B	2	2	1	0.0	0.0	9.485	A
			2	1	(A, B)	388	388	391	0.0	0.0	0.000	A
		Exit	1	1		388	388	387	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	388	388	386	0.0	0.0	0.000	A
		Exit	1	1		388	388	391	0.0	0.0	0.000	A
	B	Entry	1	1	C	47	48	46	0.0	0.1	5.959	A
				2	A	0.71	0.83	0.79	0.0	0.0	8.983	A
			2	1	(A, C)	48	48	47	0.0	0.0	0.407	A
		Exit	1	1		21	21	20	0.0	0.0	0.000	A
	C	Entry	1	1	A	387	387	390	0.0	0.0	0.000	A
				2	B	22	21	20	0.0	0.0	7.347	A
			2	1	(A, B)	409	409	411	0.0	0.0	0.000	A
		Exit	1	1		436	436	432	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	129	129	131	0.0	0.0	0.000	A
		Exit	1	1		149	149	149	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	21	21	20	0.0	0.0	6.154	A
			2	1	(A, C)	21	21	20	0.0	0.0	0.160	A
		Exit	1	1		48	48	48	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	128	128	129	0.0	0.0	0.000	A
		Exit	1	1		81	81	84	0.0	0.0	0.004	A

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	614	614	617	0.0	0.0	0.000	A
		Exit	1	1		568	568	560	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	94	93	95	0.3	0.4	12.339	B
			2	1	(A, C)	94	94	96	0.0	0.0	1.049	A
		Exit	1	1		153	153	154	0.0	0.0	0.000	A
	C	Entry	1	1	A	475	475	464	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	4.539	A
			2	1	(A, B)	477	477	466	0.0	0.0	0.000	A
		Exit	1	1		463	463	464	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	459	459	465	0.0	0.0	0.000	A
		Exit	1	1		479	479	467	0.0	0.0	0.000	A
	B	Entry	1	1	C	59	59	57	0.1	0.1	5.876	A
				2	A	1	1	0.87	0.0	0.0	11.320	B
			2	1	(A, C)	60	60	57	0.0	0.0	0.489	A
		Exit	1	1		22	22	24	0.0	0.0	0.000	A
	C	Entry	1	1	A	478	478	466	0.0	0.0	0.000	A
				2	B	23	22	24	0.0	0.1	7.747	A
			2	1	(A, B)	500	500	491	0.0	0.0	0.000	A
		Exit	1	1		518	518	522	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	154	154	153	0.0	0.0	0.000	A
		Exit	1	1		176	176	179	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	22	22	24	0.0	0.0	6.402	A
			2	1	(A, C)	22	22	24	0.0	0.0	0.318	A
		Exit	1	1		60	60	57	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	154	154	155	0.0	0.0	0.000	A
		Exit	1	1		94	94	96	0.0	0.0	0.052	A

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	738	738	742	0.0	0.0	0.000	A
		Exit	1	1		671	671	674	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	112	113	114	0.4	0.5	14.823	B
			2	1	(A, C)	113	112	114	0.0	0.2	2.783	A
		Exit	1	1		183	183	187	0.0	0.0	0.000	A
	C	Entry	1	1	A	558	558	561	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	5.612	A
			2	1	(A, B)	560	560	563	0.0	0.0	0.000	A
		Exit	1	1		557	557	558	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	560	560	559	0.0	0.0	0.000	A
		Exit	1	1		564	564	564	0.0	0.0	0.000	A
	B	Entry	1	1	C	69	69	68	0.1	0.1	6.069	A
				2	A	1	1	1	0.0	0.0	11.043	B
			2	1	(A, C)	70	70	69	0.0	0.0	0.772	A
		Exit	1	1		29	29	30	0.0	0.0	0.000	A
	C	Entry	1	1	A	563	563	562	0.0	0.0	0.000	A
				2	B	28	29	30	0.1	0.0	8.835	A
			2	1	(A, B)	590	590	592	0.0	0.0	0.000	A
		Exit	1	1		629	629	627	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	182	182	183	0.0	0.0	0.000	A
		Exit	1	1		211	211	216	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	29	28	29	0.0	0.1	6.901	A
			2	1	(A, C)	29	29	30	0.0	0.0	0.253	A
		Exit	1	1		70	70	69	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	183	183	187	0.0	0.0	0.000	A
		Exit	1	1		112	112	114	0.0	0.0	0.108	A

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	744	744	745	0.0	0.0	0.000	A
		Exit	1	1		703	703	691	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	120	118	117	0.5	0.5	15.440	C
			2	1	(A, C)	119	120	117	0.2	0.1	2.342	A
		Exit	1	1		184	184	187	0.0	0.0	0.000	A
	C	Entry	1	1	A	585	585	573	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.397	A
			2	1	(A, B)	586	586	575	0.0	0.0	0.000	A
		Exit	1	1		562	562	560	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	564	564	559	0.0	0.0	0.000	A
		Exit	1	1		583	583	576	0.0	0.0	0.000	A
	B	Entry	1	1	C	71	71	71	0.1	0.1	6.352	A
				2	A	2	2	1	0.0	0.0	14.598	B
			2	1	(A, C)	73	73	73	0.0	0.0	0.851	A
		Exit	1	1		31	31	31	0.0	0.0	0.000	A
	C	Entry	1	1	A	581	581	575	0.0	0.0	0.000	A
				2	B	31	31	31	0.0	0.1	8.224	A
			2	1	(A, B)	612	612	607	0.0	0.0	0.000	A
		Exit	1	1		635	635	630	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	192	192	190	0.0	0.0	0.000	A
		Exit	1	1		216	216	219	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	31	31	32	0.1	0.0	7.045	A
			2	1	(A, C)	31	31	31	0.0	0.0	0.610	A
		Exit	1	1		73	73	73	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	184	184	188	0.0	0.0	0.000	A
		Exit	1	1		119	119	117	0.0	0.0	0.040	A

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	595	595	607	0.0	0.0	0.000	A
		Exit	1	1		568	568	567	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	98	98	98	0.5	0.4	13.103	B
			2	1	(A, C)	99	98	97	0.1	0.0	1.050	A
		Exit	1	1		156	156	154	0.0	0.0	0.000	A
	C	Entry	1	1	A	470	470	470	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.150	A
			2	1	(A, B)	472	472	472	0.0	0.0	0.000	A
		Exit	1	1		441	441	455	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	442	442	458	0.0	0.0	0.000	A
		Exit	1	1		473	473	471	0.0	0.0	0.000	A
	B	Entry	1	1	C	59	58	59	0.1	0.1	6.047	A
				2	A	0.59	0.71	1	0.0	0.0	11.407	B
			2	1	(A, C)	60	60	60	0.0	0.0	0.736	A
		Exit	1	1		24	24	25	0.0	0.0	0.000	A
	C	Entry	1	1	A	472	472	470	0.0	0.0	0.000	A
				2	B	23	24	25	0.1	0.1	7.671	A
			2	1	(A, B)	495	495	495	0.0	0.0	0.000	A
		Exit	1	1		501	501	517	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	158	158	158	0.0	0.0	0.000	A
		Exit	1	1		180	180	180	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	24	23	25	0.0	0.0	6.625	A
			2	1	(A, C)	24	24	25	0.0	0.0	0.236	A
		Exit	1	1		60	60	60	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	157	157	154	0.0	0.0	0.000	A
		Exit	1	1		99	99	97	0.0	0.0	0.022	A

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	498	498	512	0.0	0.0	0.000	A
		Exit	1	1		468	468	474	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	76	76	81	0.4	0.2	10.931	B
			2	1	(A, C)	76	76	80	0.0	0.0	0.688	A
		Exit	1	1		130	130	132	0.0	0.0	0.000	A
	C	Entry	1	1	A	391	391	393	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	6.302	A
			2	1	(A, B)	393	393	395	0.0	0.0	0.000	A
		Exit	1	1		370	370	382	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	374	374	382	0.0	0.0	0.000	A
		Exit	1	1		391	391	394	0.0	0.0	0.000	A
	B	Entry	1	1	C	41	40	44	0.1	0.1	5.750	A
				2	A	0.24	0.24	0.36	0.0	0.0	7.566	A
			2	1	(A, C)	41	41	44	0.0	0.0	0.415	A
		Exit	1	1		22	22	21	0.0	0.0	0.000	A
	C	Entry	1	1	A	391	391	393	0.0	0.0	0.000	A
				2	B	21	22	21	0.1	0.0	7.347	A
			2	1	(A, B)	412	412	414	0.0	0.0	0.000	A
		Exit	1	1		414	414	425	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	117	117	123	0.0	0.0	0.000	A
		Exit	1	1		150	150	152	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	21	21	21	0.0	0.1	6.875	A
			2	1	(A, C)	22	21	21	0.0	0.0	0.360	A
		Exit	1	1		41	41	44	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	129	129	131	0.0	0.0	0.000	A
		Exit	1	1		75	75	79	0.0	0.0	0.020	A

Lane movements: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	125	31	-	-	-	125	127	0.0	0.0	0.000	A
					C	388	97	-	-	-	388	387	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	81	20	575	400	0.202	81	83	0.0	0.3	10.970	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	81	20	-	-	-	81	84	0.0	0.0	0.625	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	386	97	-	-	-	386	390	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.45	189	151	0.012	2	1	0.0	0.0	9.485	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	386	97	-	-	-	386	390	0.0	0.0	0.000	A

			2	1	B	2	0.45	-	-	-	2	1	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	388	97	-	-	-	388	386	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	47	12	719	614	0.077	48	46	0.0	0.1	5.959	A
				2	A	0.71	0.18	83	57	0.012	0.83	0.79	0.0	0.0	8.983	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.71	0.18	-	-	-	0.71	0.79	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	47	12	-	-	-	47	47	0.0	0.0	0.414	A
	C	Entry	1	1	A	387	97	-	-	-	387	390	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	22	5	590	506	0.043	21	20	0.0	0.0	7.347	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	387	97	-	-	-	387	390	0.0	0.0	0.000	A
					B	22	5	-	-	-	22	21	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	48	12	-	-	-	48	48	0.0	0.0	0.000	A
					C	81	20	-	-	-	81	84	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	21	5	569	526	0.040	21	20	0.0	0.0	6.154	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	21	5	-	-	-	21	20	0.0	0.0	0.160	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	128	32	-	-	-	128	129	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	151	38	-	-	-	151	153	0.0	0.0	0.000	A
					C	463	116	-	-	-	463	464	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	94	24	575	364	0.259	93	95	0.3	0.4	12.339	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	94	24	-	-	-	94	96	0.0	0.0	1.049	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1	1	A	475	119	-	-	-	475	464	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A

	C	Entry		2	B	2	0.42	232	179	0.009	2	2	0.0	0.0	4.539	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	475	119	-	-	-	475	464	0.0	0.0	0.000	A
					B	2	0.42	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	459	115	-	-	-	459	465	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	59	15	719	595	0.099	59	57	0.1	0.1	5.876	A
				2	A	1	0.27	93	60	0.018	1	0.87	0.0	0.0	11.320	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	1	0.27	-	-	-	1	0.87	0.0	0.0	0.099	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	59	15	-	-	-	59	57	0.0	0.0	0.495	A
	C	Entry	1	1	A	478	119	-	-	-	478	466	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	23	6	596	493	0.046	22	24	0.0	0.1	7.747	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	478	119	-	-	-	478	466	0.0	0.0	0.000	A
					B	23	6	-	-	-	23	24	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	60	15	-	-	-	60	57	0.0	0.0	0.000	A
					C	94	23	-	-	-	94	96	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	22	6	574	523	0.042	22	24	0.0	0.0	6.402	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	22	6	-	-	-	22	24	0.0	0.0	0.318	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	154	38	-	-	-	154	155	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	181	45	-	-	-	181	184	0.0	0.0	0.000	A
					C	557	139	-	-	-	557	558	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	112	28	575	325	0.345	113	114	0.4	0.5	14.823	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	113	28	-	-	-	112	114	0.0	0.2	2.783	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	558	140	-	-	-	558	561	0.0	0.0	0.000	A

	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.53	289	213	0.010	2	2	0.0	0.0	5.612	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	558	140	-	-	-	558	561	0.0	0.0	0.000	A
					B	2	0.53	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	560	140	-	-	-	560	559	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	69	17	719	569	0.121	69	68	0.1	0.1	6.069	A
				2	A	1	0.30	127	72	0.016	1	1	0.0	0.0	11.043	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	1	0.30	-	-	-	1	1	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	68	17	-	-	-	69	68	0.0	0.0	0.786	A
	C	Entry	1	1	A	563	141	-	-	-	563	562	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	28	7	596	473	0.059	29	30	0.1	0.0	8.835	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	563	141	-	-	-	563	562	0.0	0.0	0.000	A
					B	28	7	-	-	-	28	30	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	70	17	-	-	-	70	69	0.0	0.0	0.000	A
					C	112	28	-	-	-	112	114	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	29	7	574	512	0.056	28	29	0.0	0.1	6.901	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	29	7	-	-	-	29	30	0.0	0.0	0.253	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	183	46	-	-	-	183	187	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	182	46	-	-	-	182	185	0.0	0.0	0.000	A
					C	562	140	-	-	-	562	560	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	120	30	575	320	0.374	118	117	0.5	0.5	15.440	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	119	30	-	-	-	120	117	0.2	0.1	2.342	A

1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	585	146	-	-	-	585	573	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1		C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry		2	B	2	0.39	270	196	0.008	2	2	0.0	0.0	7.397	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	585	146	-	-	-	585	573	0.0	0.0	0.000	A
			2	1	B	2	0.39	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	564	141	-	-	-	564	559	0.0	0.0	0.000	A
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			1		C	71	18	719	567	0.125	71	71	0.1	0.1	6.352	A
					A	2	0.42	122	72	0.023	2	1	0.0	0.0	14.598	B
	B	Entry		2	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	2	0.42	-	-	-	2	1	0.0	0.0	0.000	A
2			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	71	18	-	-	-	71	72	0.0	0.0	0.865	A
					A	581	145	-	-	-	581	575	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1		C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry		2	B	31	8	596	470	0.066	31	31	0.0	0.1	8.224	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	581	145	-	-	-	581	575	0.0	0.0	0.000	A
			2	1	B	31	8	-	-	-	31	31	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	73	18	-	-	-	73	73	0.0	0.0	0.000	A
					C	119	30	-	-	-	119	117	0.0	0.0	0.000	A
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			1		C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	31	8	574	511	0.061	31	32	0.1	0.0	7.045	A
3	B	Entry		2	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	31	8	-	-	-	31	31	0.0	0.0	0.610	A
			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	184	46	-	-	-	184	188	0.0	0.0	0.000	A
	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	154	38	-	-	-	154	152	0.0	0.0	0.000	A
					C	441	110	-	-	-	441	455	0.0	0.0	0.000	A
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

1	B	Entry	1		C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	98	25	575	371	0.266	98	98	0.5	0.4	13.103	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	99	25	-	-	-	98	97	0.1	0.0	1.050	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	470	117	-	-	-	470	470	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.62	276	213	0.012	2	2	0.0	0.0	7.150	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	470	117	-	-	-	470	470	0.0	0.0	0.000	A
					B	2	0.62	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	442	111	-	-	-	442	458	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	59	15	719	599	0.098	58	59	0.1	0.1	6.047	A
				2	A	0.59	0.15	113	69	0.009	0.71	1	0.0	0.0	11.407	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.59	0.15	-	-	-	0.59	1	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	59	15	-	-	-	59	59	0.0	0.0	0.750	A
	C	Entry	1	1	A	472	118	-	-	-	472	470	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	23	6	596	494	0.047	24	25	0.1	0.1	7.671	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	472	118	-	-	-	472	470	0.0	0.0	0.000	A
					B	23	6	-	-	-	23	25	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	60	15	-	-	-	60	60	0.0	0.0	0.000	A
					C	99	25	-	-	-	99	97	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	24	6	574	521	0.045	23	25	0.0	0.0	6.625	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	24	6	-	-	-	24	25	0.0	0.0	0.236	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	157	39	-	-	-	157	154	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	128	32	-	-	-	128	130	0.0	0.0	0.000	A

1					C	370	93	-	-	-	370	382	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	76	19	575	403	0.188	76	81	0.4	0.2	10.931	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	76	19	-	-	-	76	80	0.0	0.0	0.688	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	391	98	-	-	-	391	393	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.48	220	176	0.011	2	2	0.0	0.0	6.302	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	391	98	-	-	-	391	393	0.0	0.0	0.000	A
					B	2	0.48	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	374	93	-	-	-	374	382	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	41	10	719	618	0.066	40	44	0.1	0.1	5.750	A
				2	A	0.24	0.06	44	30	0.008	0.24	0.36	0.0	0.0	7.566	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.24	0.06	-	-	-	0.24	0.36	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	41	10	-	-	-	41	44	0.0	0.0	0.419	A
	C	Entry	1	1	A	391	98	-	-	-	391	393	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	21	5	596	512	0.041	22	21	0.1	0.0	7.347	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	391	98	-	-	-	391	393	0.0	0.0	0.000	A
					B	21	5	-	-	-	21	21	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	41	10	-	-	-	41	44	0.0	0.0	0.000	A
					C	75	19	-	-	-	75	79	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	21	5	574	532	0.040	21	21	0.0	0.1	6.875	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	22	5	-	-	-	21	21	0.0	0.0	0.360	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	129	32	-	-	-	129	131	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

2028 Opening Year, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Junction 1 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 2 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 3 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Info	Simulation	A1 - [Lane Simulation]	This run uses Simulation mode. For detailed information on this mode, please see the User Guide.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Western Priority	T-Junction	Two-way	Two-way	Two-way		3.69	A
2	Eastern Priority	T-Junction	Two-way	Two-way	Two-way		0.99	A
3	Northern Priority	T-Junction	Two-way	Two-way	Two-way		1.02	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	2.22	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2028 Opening Year	PM	ONE HOUR	16:45	18:15	15	✓

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	B	3	C	Simple (vertical queueing)	Normal	0	100.00	
	C	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	C	Simple (vertical queueing)	Normal	0	100.00	
	B	3	B	Simple (vertical queueing)	Normal	0	100.00	
3	B	2	B	Simple (vertical queueing)	Normal	0	100.00	
	C	1	B	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	548	100.000
	B	✓				
	C	✓				
2	A	✓				
	B	✓				
	C		ONE HOUR	✓	598	100.000
3	A		ONE HOUR	✓	304	100.000
	B	✓				
	C	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	49	499
	B	182	0	1
	C	592	2	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	500
	B	11	0	111
	C	583	15	0

Junction 3

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	121	183
	B	15	0	0
	C	51	0	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Junction	PCU factor for a cyclist	PCU factor for a cyclist in controlling flow
1	0.20	0.80
2	0.20	0.80
3	0.20	0.80

Junction 1

Heavy Vehicle %

		To		
		A	B	C
From	A	0	4	6
	B	0	0	0
	C	10	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 2

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	6
	B	0	0	0
	C	10	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 3

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	4	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	A	0.00	0.0	A	513	770
	B	26.81	1.6	D	168	252
	C	0.03	0.0	A	545	817
2	A	0.00	0.0	A	470	704
	B	8.68	0.4	A	114	171
	C	0.23	0.0	A	547	820
3	A	0.86	0.1	A	282	423
	B	7.73	0.0	A	14	21
	C	0.00	0.0	A	46	70

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	429	107	429	415	586	0.0	0.0	0.000	A
	B	144	36	146	140	39	0.0	0.4	14.167	B
	C	443	111	443	455	392	0.0	0.0	0.021	A
2	A	390	97	390	382	439	0.0	0.0	0.000	A
	B	93	23	94	93	13	0.0	0.1	7.674	A
	C	441	110	441	456	474	0.0	0.0	0.202	A
3	A	237	59	237	234	52	0.0	0.0	0.002	A
	B	13	3	13	12	93	0.0	0.0	7.175	A
	C	40	10	40	37	144	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	516	129	516	498	695	0.0	0.0	0.000	A
	B	166	41	165	162	49	0.4	0.9	16.485	C
	C	532	133	532	531	470	0.0	0.0	0.018	A
2	A	471	118	471	454	531	0.0	0.0	0.000	A
	B	115	29	116	113	12	0.1	0.2	7.799	A
	C	534	133	534	533	578	0.0	0.0	0.224	A
3	A	281	70	281	277	61	0.0	0.0	0.000	A
	B	12	3	13	14	115	0.0	0.0	7.020	A
	C	48	12	48	47	166	0.0	0.0	0.000	A

17:15 - 17:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	609	152	609	604	854	0.0	0.0	0.000	A
	B	195	49	198	194	54	0.9	1.4	26.810	D
	C	659	165	659	654	558	0.0	0.0	0.029	A
2	A	551	138	551	550	655	0.0	0.0	0.000	A
	B	138	34	139	130	17	0.2	0.3	8.664	A
	C	659	165	659	652	678	0.0	0.0	0.197	A
3	A	331	83	332	327	72	0.0	0.0	0.428	A
	B	17	4	17	16	138	0.0	0.0	7.469	A
	C	55	14	55	56	195	0.0	0.0	0.000	A

17:30 - 17:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	616	154	616	603	861	0.0	0.0	0.000	A
	B	204	51	203	202	54	1.4	1.6	26.390	D
	C	661	165	661	660	565	0.0	0.0	0.035	A
2	A	569	142	569	554	661	0.0	0.0	0.000	A
	B	135	34	135	134	17	0.3	0.4	8.682	A
	C	664	166	664	662	690	0.0	0.0	0.225	A
3	A	341	85	340	337	71	0.0	0.1	0.855	A
	B	17	4	17	16	135	0.0	0.0	7.382	A
	C	54	14	54	55	204	0.0	0.0	0.000	A

17:45 - 18:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	499	125	499	489	692	0.0	0.0	0.000	A
	B	169	42	171	169	45	1.6	0.7	18.916	C
	C	524	131	524	543	456	0.0	0.0	0.028	A
2	A	458	114	458	444	519	0.0	0.0	0.000	A
	B	109	27	109	111	16	0.4	0.2	8.068	A
	C	525	131	526	547	558	0.0	0.0	0.226	A
3	A	278	70	278	275	60	0.1	0.0	0.085	A
	B	16	4	16	15	109	0.0	0.0	7.727	A
	C	44	11	44	47	169	0.0	0.0	0.000	A

18:00 - 18:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	411	103	411	420	578	0.0	0.0	0.000	A
	B	129	32	130	138	38	0.7	0.5	14.423	B
	C	450	112	450	442	376	0.0	0.0	0.034	A
2	A	379	95	379	384	455	0.0	0.0	0.000	A
	B	95	24	94	94	11	0.2	0.2	7.228	A
	C	457	114	457	449	465	0.0	0.0	0.206	A
3	A	224	56	224	231	47	0.0	0.0	0.000	A
	B	11	3	10	12	95	0.0	0.0	6.977	A
	C	37	9	37	39	129	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	429	429	415	0.0	0.0	0.000	A
		Exit	1	1		586	586	592	0.0	0.0	0.000	A
	B	Entry	1	1	C	1	1	1	0.0	0.0	6.513	A
				2	A	144	144	138	0.0	0.3	12.270	B
			2	1	(A, C)	144	145	141	0.0	0.0	1.935	A
		Exit	1	1		39	39	36	0.0	0.0	0.000	A
	C	Entry	1	1	A	442	442	454	0.0	0.0	0.000	A
				2	B	1	1	1	0.0	0.0	6.849	A
			2	1	(A, B)	443	443	455	0.0	0.0	0.000	A
		Exit	1	1		392	392	381	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	390	390	382	0.0	0.0	0.000	A
		Exit	1	1		439	439	452	0.0	0.0	0.000	A
	B	Entry	1	1	C	83	84	84	0.0	0.1	5.939	A
				2	A	10	11	9	0.0	0.0	11.375	B
			2	1	(A, C)	93	93	93	0.0	0.0	1.201	A
		Exit	1	1		13	13	12	0.0	0.0	0.000	A
	C	Entry	1	1	A	428	428	443	0.0	0.0	0.000	A
				2	B	13	13	12	0.0	0.0	6.872	A
			2	1	(A, B)	441	441	456	0.0	0.0	0.000	A
		Exit	1	1		474	474	465	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	237	237	234	0.0	0.0	0.002	A
		Exit	1	1		52	52	49	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	13	13	12	0.0	0.0	7.083	A
			2	1	(A, C)	13	13	12	0.0	0.0	0.092	A
		Exit	1	1		93	93	93	0.0	0.0	0.048	A
	C	Entry	1	1	A, B	40	40	37	0.0	0.0	0.000	A
		Exit	1	1		144	144	141	0.0	0.0	0.126	A

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	516	516	498	0.0	0.0	0.000	A
		Exit	1	1		695	695	690	0.0	0.0	0.000	A
	B	Entry	1	1	C	1	1	0.99	0.0	0.0	7.235	A
				2	A	165	164	161	0.3	0.7	13.791	B
			2	1	(A, C)	166	166	164	0.0	0.1	2.749	A
		Exit	1	1		49	49	47	0.0	0.0	0.000	A
	C	Entry	1	1	A	531	531	529	0.0	0.0	0.000	A
				2	B	1	1	2	0.0	0.0	5.087	A
			2	1	(A, B)	532	532	531	0.0	0.0	0.000	A
		Exit	1	1		470	470	454	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	471	471	454	0.0	0.0	0.000	A
		Exit	1	1		531	531	530	0.0	0.0	0.000	A
	B	Entry	1	1	C	106	107	103	0.1	0.1	6.005	A
				2	A	9	9	10	0.0	0.0	12.387	B
			2	1	(A, C)	115	115	113	0.0	0.0	1.249	A
		Exit	1	1		12	12	14	0.0	0.0	0.000	A
	C	Entry	1	1	A	522	522	520	0.0	0.0	0.000	A
				2	B	12	12	14	0.0	0.0	7.951	A
			2	1	(A, B)	534	534	534	0.0	0.0	0.000	A
		Exit	1	1		578	578	557	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	281	281	277	0.0	0.0	0.000	A
		Exit	1	1		61	61	61	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	12	13	14	0.0	0.0	6.862	A
			2	1	(A, C)	12	12	14	0.0	0.0	0.158	A
		Exit	1	1		115	115	113	0.0	0.0	0.006	A
	C	Entry	1	1	A, B	48	48	47	0.0	0.0	0.000	A
		Exit	1	1		165	166	164	0.0	0.0	0.193	A

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	609	609	604	0.0	0.0	0.000	A
		Exit	1	1		854	854	845	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.95	1	1	0.0	0.0	6.033	A
				2	A	196	197	193	0.7	1.0	18.296	C
			2	1	(A, C)	195	197	195	0.1	0.4	8.496	A
		Exit	1	1		54	54	55	0.0	0.0	0.000	A
	C	Entry	1	1	A	657	657	652	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.080	A
			2	1	(A, B)	659	659	654	0.0	0.0	0.000	A
		Exit	1	1		558	558	553	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	551	551	550	0.0	0.0	0.000	A
		Exit	1	1		655	655	648	0.0	0.0	0.000	A
	B	Entry	1	1	C	126	126	118	0.1	0.2	6.473	A
				2	A	12	13	12	0.0	0.0	12.406	B
			2	1	(A, C)	138	139	130	0.0	0.0	1.622	A
		Exit	1	1		17	17	16	0.0	0.0	0.000	A
	C	Entry	1	1	A	642	642	636	0.0	0.0	0.000	A
				2	B	17	17	16	0.0	0.0	7.212	A
			2	1	(A, B)	659	659	652	0.0	0.0	0.000	A
		Exit	1	1		678	678	668	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	331	332	327	0.0	0.0	0.428	A
		Exit	1	1		72	72	72	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	17	17	16	0.0	0.0	7.271	A
			2	1	(A, C)	17	17	16	0.0	0.0	0.198	A
		Exit	1	1		138	138	130	0.0	0.0	0.015	A
	C	Entry	1	1	A, B	55	55	56	0.0	0.0	0.000	A
		Exit	1	1		194	195	196	0.0	0.1	1.939	A

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	616	616	603	0.0	0.0	0.000	A
		Exit	1	1		861	861	859	0.0	0.0	0.000	A
	B	Entry	1	1	C	1	1	1	0.0	0.0	10.589	B
				2	A	201	202	200	1.0	1.0	18.301	C
			2	1	(A, C)	204	202	202	0.4	0.6	8.132	A
		Exit	1	1		54	54	55	0.0	0.0	0.000	A
	C	Entry	1	1	A	659	659	658	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	9.748	A
			2	1	(A, B)	661	661	660	0.0	0.0	0.000	A
		Exit	1	1		565	565	552	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	569	569	554	0.0	0.0	0.000	A
		Exit	1	1		661	661	658	0.0	0.0	0.000	A
	B	Entry	1	1	C	122	121	122	0.2	0.2	6.417	A
				2	A	13	14	12	0.0	0.0	13.000	B
			2	1	(A, C)	135	135	134	0.0	0.1	1.677	A
		Exit	1	1		17	17	16	0.0	0.0	0.000	A
	C	Entry	1	1	A	647	647	646	0.0	0.0	0.000	A
				2	B	17	17	16	0.0	0.0	8.415	A
			2	1	(A, B)	664	664	662	0.0	0.0	0.000	A
		Exit	1	1		690	690	676	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	341	340	337	0.0	0.1	0.855	A
		Exit	1	1		71	71	71	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	17	17	16	0.0	0.0	7.269	A
			2	1	(A, C)	17	17	16	0.0	0.0	0.112	A
		Exit	1	1		135	135	134	0.0	0.0	0.009	A
	C	Entry	1	1	A, B	54	54	55	0.0	0.0	0.000	A
		Exit	1	1		205	204	202	0.1	0.2	1.937	A

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	499	499	489	0.0	0.0	0.000	A
		Exit	1	1		692	692	709	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.95	0.95	0.83	0.0	0.0	10.070	B
				2	A	169	170	168	1.0	0.6	14.765	B
			2	1	(A, C)	169	170	167	0.6	0.1	4.316	A
		Exit	1	1		45	45	47	0.0	0.0	0.000	A
	C	Entry	1	1	A	522	522	541	0.0	0.0	0.000	A
				2	B	1	1	1	0.0	0.0	9.215	A
			2	1	(A, B)	524	524	543	0.0	0.0	0.000	A
		Exit	1	1		456	456	444	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	458	458	444	0.0	0.0	0.000	A
		Exit	1	1		519	519	543	0.0	0.0	0.000	A
	B	Entry	1	1	C	99	101	101	0.2	0.1	6.278	A
				2	A	9	9	10	0.0	0.0	11.239	B
			2	1	(A, C)	109	108	111	0.1	0.1	1.334	A
		Exit	1	1		16	16	15	0.0	0.0	0.000	A
	C	Entry	1	1	A	510	510	532	0.0	0.0	0.000	A
				2	B	15	16	15	0.0	0.0	7.698	A
			2	1	(A, B)	525	525	547	0.0	0.0	0.000	A
		Exit	1	1		558	558	545	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	278	278	275	0.1	0.0	0.085	A
		Exit	1	1		60	60	62	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	16	16	15	0.0	0.0	7.442	A
			2	1	(A, C)	16	16	15	0.0	0.0	0.286	A
		Exit	1	1		109	109	111	0.0	0.0	0.014	A
	C	Entry	1	1	A, B	44	44	47	0.0	0.0	0.000	A
		Exit	1	1		169	169	165	0.2	0.0	0.797	A

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	411	411	420	0.0	0.0	0.000	A
		Exit	1	1		578	578	578	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.24	0.24	0.59	0.0	0.0	4.923	A
				2	A	129	130	138	0.6	0.5	12.631	B
			2	1	(A, C)	129	130	138	0.1	0.0	1.813	A
		Exit	1	1		38	38	38	0.0	0.0	0.000	A
	C	Entry	1	1	A	448	448	440	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	8.309	A
			2	1	(A, B)	450	450	442	0.0	0.0	0.000	A
		Exit	1	1		376	376	384	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	379	379	384	0.0	0.0	0.000	A
		Exit	1	1		455	455	446	0.0	0.0	0.000	A
	B	Entry	1	1	C	87	86	85	0.1	0.1	5.878	A
				2	A	8	8	8	0.0	0.0	10.348	B
			2	1	(A, C)	95	95	94	0.1	0.0	0.942	A
		Exit	1	1		11	11	12	0.0	0.0	0.000	A
	C	Entry	1	1	A	446	446	437	0.0	0.0	0.000	A
				2	B	11	11	12	0.0	0.0	7.001	A
			2	1	(A, B)	457	457	449	0.0	0.0	0.000	A
		Exit	1	1		465	465	470	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	224	224	231	0.0	0.0	0.000	A
		Exit	1	1		47	47	51	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	11	10	12	0.0	0.0	6.804	A
			2	1	(A, C)	11	11	12	0.0	0.0	0.190	A
		Exit	1	1		95	95	93	0.0	0.0	0.001	A
	C	Entry	1	1	A, B	37	37	39	0.0	0.0	0.000	A
		Exit	1	1		129	129	137	0.0	0.0	0.036	A

Lane movements: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	38	10	-	-	-	38	35	0.0	0.0	0.000	A
					C	391	98	-	-	-	391	380	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.30	166	129	0.009	1	1	0.0	0.0	6.513	A
				2	A	144	36	575	399	0.359	144	138	0.0	0.3	12.270	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	143	36	-	-	-	144	140	0.0	0.0	1.942	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.30	-	-	-	1	1	0.0	0.0	1.171	A
	C	Entry	1	1	A	442	110	-	-	-	442	454	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.30	176	145	0.008	1	1	0.0	0.0	6.849	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	442	110	-	-	-	442	454	0.0	0.0	0.000	A

			2	1	B	1	0.30	-	-	-	1	1	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	390	97	-	-	-	390	382	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	83	21	719	611	0.135	84	84	0.0	0.1	5.939	A
				2	A	10	3	451	315	0.032	11	9	0.0	0.0	11.375	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	10	3	-	-	-	10	9	0.0	0.0	1.550	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	83	21	-	-	-	83	84	0.0	0.0	1.164	A
	C	Entry	1	1	A	428	107	-	-	-	428	443	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	13	3	584	500	0.026	13	12	0.0	0.0	6.872	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	428	107	-	-	-	428	443	0.0	0.0	0.000	A
					B	13	3	-	-	-	13	12	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	93	23	-	-	-	93	93	0.0	0.0	0.000	A
					C	144	36	-	-	-	144	141	0.0	0.0	0.003	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	13	3	563	515	0.025	13	12	0.0	0.0	7.083	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	13	3	-	-	-	13	12	0.0	0.0	0.092	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	40	10	-	-	-	40	37	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	48	12	-	-	-	48	46	0.0	0.0	0.000	A
					C	469	117	-	-	-	469	453	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.30	140	103	0.012	1	0.99	0.0	0.0	7.235	A
				2	A	165	41	575	365	0.452	164	161	0.3	0.7	13.791	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	164	41	-	-	-	165	163	0.0	0.1	2.756	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.30	-	-	-	1	0.95	0.0	0.0	1.468	A
			1	1	A	531	133	-	-	-	531	529	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A

	C	Entry		2	B	1	0.30	207	169	0.007	1	2	0.0	0.0	5.087	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	531	133	-	-	-	531	529	0.0	0.0	0.000	A
					B	1	0.30	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	471	118	-	-	-	471	454	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	106	27	719	590	0.180	107	103	0.1	0.1	6.005	A
				2	A	9	2	461	296	0.031	9	10	0.0	0.0	12.387	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	9	2	-	-	-	9	10	0.0	0.0	0.370	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	106	27	-	-	-	106	103	0.0	0.0	1.332	A
	C	Entry	1	1	A	522	130	-	-	-	522	520	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	12	3	561	465	0.026	12	14	0.0	0.0	7.951	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	522	130	-	-	-	522	520	0.0	0.0	0.000	A
					B	12	3	-	-	-	12	14	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	115	29	-	-	-	115	113	0.0	0.0	0.000	A
					C	165	41	-	-	-	165	164	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	12	3	540	485	0.026	13	14	0.0	0.0	6.862	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	12	3	-	-	-	12	14	0.0	0.0	0.158	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	48	12	-	-	-	48	47	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	52	13	-	-	-	52	52	0.0	0.0	0.000	A
					C	557	139	-	-	-	557	552	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.95	0.24	159	109	0.009	1	1	0.0	0.0	6.033	A
				2	A	196	49	575	321	0.609	197	193	0.7	1.0	18.296	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	194	49	-	-	-	196	194	0.1	0.4	8.509	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.95	0.24	-	-	-	0.95	1	0.0	0.0	6.314	A
					A	657	164	-	-	-	657	652	0.0	0.0	0.000	A

	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.45	283	222	0.008	2	2	0.0	0.0	7.080	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	657	164	-	-	-	657	652	0.0	0.0	0.000	A
					B	2	0.45	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	551	138	-	-	-	551	550	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	126	32	719	564	0.224	126	118	0.1	0.2	6.473	A
				2	A	12	3	471	266	0.046	13	12	0.0	0.0	12.406	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	12	3	-	-	-	12	13	0.0	0.0	0.647	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	126	31	-	-	-	126	118	0.0	0.0	1.726	A
	C	Entry	1	1	A	642	161	-	-	-	642	636	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	17	4	590	470	0.035	17	16	0.0	0.0	7.212	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	642	161	-	-	-	642	636	0.0	0.0	0.000	A
					B	17	4	-	-	-	17	16	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	138	34	-	-	-	138	130	0.0	0.0	0.255	A
					C	194	48	-	-	-	194	196	0.0	0.0	0.542	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	17	4	569	500	0.033	17	16	0.0	0.0	7.271	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	17	4	-	-	-	17	16	0.0	0.0	0.198	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	55	14	-	-	-	55	56	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	52	13	-	-	-	52	52	0.0	0.0	0.000	A
					C	564	141	-	-	-	564	551	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.33	166	111	0.012	1	1	0.0	0.0	10.589	B
				2	A	201	50	575	318	0.632	202	200	1.0	1.0	18.301	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	203	51	-	-	-	201	201	0.4	0.6	8.165	A

1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.33	-	-	-	1	1	0.0	0.0	2.357	A
	C	Entry	1	1	A	659	165	-	-	-	659	658	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.50	239	184	0.011	2	2	0.0	0.0	9.748	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	659	165	-	-	-	659	658	0.0	0.0	0.000	A
					B	2	0.50	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	569	142	-	-	-	569	554	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	122	30	719	555	0.219	121	122	0.2	0.2	6.417	A
				2	A	13	3	476	266	0.050	14	12	0.0	0.0	13.000	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	13	3	-	-	-	13	12	0.0	0.0	1.213	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	122	31	-	-	-	122	122	0.0	0.1	1.722	A
	C	Entry	1	1	A	647	162	-	-	-	647	646	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	17	4	584	462	0.036	17	16	0.0	0.0	8.415	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	647	162	-	-	-	647	646	0.0	0.0	0.000	A
					B	17	4	-	-	-	17	16	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	136	34	-	-	-	135	134	0.0	0.0	0.745	A
					C	205	51	-	-	-	205	203	0.0	0.0	0.928	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	17	4	563	493	0.033	17	16	0.0	0.0	7.269	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	17	4	-	-	-	17	16	0.0	0.0	0.112	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	54	14	-	-	-	54	55	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	44	11	-	-	-	44	46	0.0	0.0	0.000	A
					C	455	114	-	-	-	455	443	0.0	0.0	0.000	A
				1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

1	B	Entry	1		C	0.95	0.24	127	95	0.010	0.95	0.83	0.0	0.0	10.070	B
				2	A	169	42	575	368	0.460	170	168	1.0	0.6	14.765	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	168	42	-	-	-	169	166	0.6	0.1	4.308	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.95	0.24	-	-	-	0.95	0.83	0.0	0.0	5.891	A
	C	Entry	1	1	A	522	131	-	-	-	522	541	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.36	207	168	0.008	1	1	0.0	0.0	9.215	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	522	131	-	-	-	522	541	0.0	0.0	0.000	A
					B	1	0.36	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	458	114	-	-	-	458	444	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	99	25	719	593	0.168	101	101	0.2	0.1	6.278	A
				2	A	9	2	466	296	0.030	9	10	0.0	0.0	11.239	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	9	2	-	-	-	9	10	0.0	0.0	0.524	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	100	25	-	-	-	99	101	0.1	0.1	1.416	A
	C	Entry	1	1	A	510	127	-	-	-	510	532	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	15	4	567	471	0.032	16	15	0.0	0.0	7.698	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	510	127	-	-	-	510	532	0.0	0.0	0.000	A
					B	15	4	-	-	-	15	15	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	109	27	-	-	-	109	111	0.0	0.0	0.083	A
					C	169	42	-	-	-	169	164	0.0	0.0	0.086	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	16	4	546	491	0.032	16	15	0.0	0.0	7.442	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	16	4	-	-	-	16	15	0.0	0.0	0.286	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	44	11	-	-	-	44	47	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	36	9	-	-	-	36	37	0.0	0.0	0.000	A

					C	376	94	-	-	-	376	384	0.0	0.0	0.000	A
1	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.24	0.06	95	73	0.003	0.24	0.59	0.0	0.0	4.923	A
				2	A	129	32	575	402	0.322	130	138	0.6	0.5	12.631	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	129	32	-	-	-	129	137	0.1	0.0	1.821	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.24	0.06	-	-	-	0.24	0.59	0.0	0.0	0.000	A
	C	Entry	1	1	A	448	112	-	-	-	448	440	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.45	239	198	0.009	2	2	0.0	0.0	8.309	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	448	112	-	-	-	448	440	0.0	0.0	0.000	A
					B	2	0.45	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	379	95	-	-	-	379	384	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	87	22	719	613	0.142	86	85	0.1	0.1	5.878	A
				2	A	8	2	446	310	0.026	8	8	0.0	0.0	10.348	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	8	2	-	-	-	8	8	0.0	0.0	0.450	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	87	22	-	-	-	87	85	0.1	0.0	0.991	A
	C	Entry	1	1	A	446	112	-	-	-	446	437	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	11	3	567	486	0.022	11	12	0.0	0.0	7.001	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	446	112	-	-	-	446	437	0.0	0.0	0.000	A
					B	11	3	-	-	-	11	12	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	95	24	-	-	-	95	93	0.0	0.0	0.000	A
					C	129	32	-	-	-	129	137	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	11	3	546	500	0.021	10	12	0.0	0.0	6.804	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	11	3	-	-	-	11	12	0.0	0.0	0.190	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	37	9	-	-	-	37	39	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

2033 Future Year (Core), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Junction 1 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 2 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 3 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Info	Simulation	A1 - [Lane Simulation]	This run uses Simulation mode. For detailed information on this mode, please see the User Guide.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Western Priority	T-Junction	Two-way	Two-way	Two-way		1.63	A
2	Eastern Priority	T-Junction	Two-way	Two-way	Two-way		0.67	A
3	Northern Priority	T-Junction	Two-way	Two-way	Two-way		0.65	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	1.12	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2033 Future Year (Core)	AM	ONE HOUR	07:45	09:15	15	✓

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	B	3	C	Simple (vertical queueing)	Normal	0	100.00	
	C	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	C	Simple (vertical queueing)	Normal	0	100.00	
	B	3	B	Simple (vertical queueing)	Normal	0	100.00	
3	B	2	B	Simple (vertical queueing)	Normal	0	100.00	
	C	1	B	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	713	100.000
	B	✓				
	C	✓				
2	A	✓				
	B	✓				
	C		ONE HOUR	✓	569	100.000
3	A		ONE HOUR	✓	177	100.000
	B	✓				
	C	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	180	533
	B	111	0	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	533
	B	1	0	64
	C	540	29	0

Junction 3

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	66	111
	B	29	0	0
	C	182	0	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Junction	PCU factor for a cyclist	PCU factor for a cyclist in controlling flow
1	0.20	0.80
2	0.20	0.80
3	0.20	0.80

Junction 1

Heavy Vehicle %

		To		
		A	B	C
From	A	0	2	14
	B	2	0	0
	C	6	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 2

Heavy Vehicle %

	To			
From		A	B	C
	A	0	0	14
	B	0	0	0
	C	6	0	0

Cyclist %

	To			
From		A	B	C
	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 3

Heavy Vehicle %

	To			
From		A	B	C
	A	0	0	2
	B	0	0	0
	C	2	0	0

Cyclist %

	To			
From		A	B	C
	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	A	0.00	0.0	A	654	981
	B	20.10	0.8	C	101	152
	C	0.03	0.0	A	499	749
2	A	0.00	0.0	A	491	736
	B	7.61	0.2	A	61	91
	C	0.51	0.1	A	526	789
3	A	0.03	0.0	A	162	243
	B	8.09	0.1	A	28	42
	C	0.00	0.0	A	166	249

Main Results for each time segment

07:45 - 08:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	535	134	535	542	484	0.0	0.0	0.000	A
	B	84	21	85	85	132	0.0	0.2	11.934	B
	C	401	100	401	412	404	0.0	0.0	0.025	A
2	A	407	102	407	409	403	0.0	0.0	0.000	A
	B	46	12	47	47	21	0.0	0.0	6.978	A
	C	424	106	424	433	453	0.0	0.0	0.458	A
3	A	130	32	130	133	153	0.0	0.0	0.000	A
	B	21	5	21	22	46	0.0	0.1	7.346	A
	C	132	33	132	137	84	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	635	159	635	644	600	0.0	0.0	0.000	A
	B	98	25	102	100	168	0.2	0.4	14.419	B
	C	501	125	501	494	469	0.0	0.0	0.030	A
2	A	464	116	464	477	495	0.0	0.0	0.000	A
	B	61	15	61	59	27	0.0	0.1	6.602	A
	C	521	130	521	517	524	0.0	0.0	0.455	A
3	A	160	40	160	160	196	0.0	0.0	0.000	A
	B	27	7	28	27	61	0.1	0.0	7.911	A
	C	168	42	168	167	99	0.0	0.0	0.000	A

08:15 - 08:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	777	194	777	777	725	0.0	0.0	0.000	A
	B	123	31	123	122	193	0.4	0.8	20.099	C
	C	605	151	604	598	586	0.0	0.0	0.025	A
2	A	593	148	593	587	608	0.0	0.0	0.000	A
	B	74	18	74	75	34	0.1	0.2	7.571	A
	C	640	160	641	633	665	0.0	0.1	0.506	A
3	A	197	49	197	199	228	0.0	0.0	0.030	A
	B	34	8	34	34	74	0.0	0.1	7.546	A
	C	194	49	194	195	123	0.0	0.0	0.000	A

08:30 - 08:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	797	199	797	789	717	0.0	0.0	0.000	A
	B	124	31	123	119	207	0.8	0.7	19.669	C
	C	596	149	596	595	592	0.0	0.0	0.034	A
2	A	593	148	593	585	594	0.0	0.0	0.000	A
	B	73	18	74	76	32	0.2	0.1	7.607	A
	C	626	156	625	625	666	0.1	0.1	0.433	A
3	A	197	49	197	195	237	0.0	0.0	0.000	A
	B	32	8	32	31	73	0.1	0.1	8.092	A
	C	206	51	206	206	125	0.0	0.0	0.000	A

08:45 - 09:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	632	158	632	645	579	0.0	0.0	0.000	A
	B	97	24	97	101	161	0.7	0.4	14.998	B
	C	483	121	483	489	472	0.0	0.0	0.024	A
2	A	479	120	479	483	484	0.0	0.0	0.000	A
	B	64	16	62	61	30	0.1	0.2	6.979	A
	C	513	128	513	517	540	0.1	0.0	0.440	A
3	A	160	40	160	160	190	0.0	0.0	0.000	A
	B	30	7	30	28	64	0.1	0.0	7.462	A
	C	160	40	160	168	97	0.0	0.0	0.000	A

09:00 - 09:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	547	137	547	544	487	0.0	0.0	0.000	A
	B	80	20	78	85	137	0.4	0.3	11.852	B
	C	409	102	409	408	412	0.0	0.0	0.018	A
2	A	410	102	410	403	408	0.0	0.0	0.000	A
	B	46	11	46	48	23	0.2	0.1	6.638	A
	C	431	108	431	428	455	0.0	0.0	0.424	A
3	A	127	32	127	133	158	0.0	0.0	0.000	A
	B	23	6	22	22	46	0.0	0.1	6.945	A
	C	136	34	136	139	81	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	535	535	542	0.0	0.0	0.000	A
		Exit	1	1		484	484	495	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	84	85	85	0.0	0.2	11.159	B
			2	1	(A, C)	84	84	86	0.0	0.0	0.775	A
		Exit	1	1		132	132	137	0.0	0.0	0.000	A
	C	Entry	1	1	A	399	399	410	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	6.535	A
			2	1	(A, B)	401	401	412	0.0	0.0	0.000	A
		Exit	1	1		404	404	406	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	407	407	409	0.0	0.0	0.000	A
		Exit	1	1		403	403	411	0.0	0.0	0.000	A
	B	Entry	1	1	C	45	46	46	0.0	0.0	6.335	A
				2	A	0.83	0.83	0.67	0.0	0.0	5.892	A
			2	1	(A, C)	46	46	47	0.0	0.0	0.649	A
		Exit	1	1		21	21	23	0.0	0.0	0.000	A
	C	Entry	1	1	A	402	402	410	0.0	0.0	0.000	A
				2	B	22	21	23	0.0	0.0	8.229	A
			2	1	(A, B)	424	424	433	0.0	0.0	0.000	A
		Exit	1	1		453	453	455	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	130	130	133	0.0	0.0	0.000	A
		Exit	1	1		153	153	159	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	21	21	22	0.0	0.1	7.052	A
			2	1	(A, C)	21	21	23	0.0	0.0	0.294	A
		Exit	1	1		46	46	47	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	132	132	137	0.0	0.0	0.000	A
		Exit	1	1		84	84	85	0.0	0.0	0.004	A

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	635	635	644	0.0	0.0	0.000	A
		Exit	1	1		600	600	592	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	98	102	100	0.2	0.4	13.219	B
			2	1	(A, C)	98	98	101	0.0	0.1	1.174	A
		Exit	1	1		168	168	166	0.0	0.0	0.000	A
	C	Entry	1	1	A	499	499	492	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	8.204	A
			2	1	(A, B)	501	501	494	0.0	0.0	0.000	A
		Exit	1	1		469	469	479	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	464	464	477	0.0	0.0	0.000	A
		Exit	1	1		495	495	490	0.0	0.0	0.000	A
	B	Entry	1	1	C	60	60	58	0.0	0.1	5.790	A
				2	A	0.71	0.71	0.67	0.0	0.0	10.496	B
			2	1	(A, C)	61	61	59	0.0	0.0	0.755	A
		Exit	1	1		27	27	27	0.0	0.0	0.000	A
	C	Entry	1	1	A	494	494	490	0.0	0.0	0.000	A
				2	B	27	27	27	0.0	0.0	8.292	A
			2	1	(A, B)	521	521	517	0.0	0.0	0.000	A
		Exit	1	1		524	524	535	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	160	160	160	0.0	0.0	0.000	A
		Exit	1	1		196	196	194	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	27	28	27	0.1	0.0	7.445	A
			2	1	(A, C)	27	27	27	0.0	0.0	0.466	A
		Exit	1	1		61	61	59	0.0	0.0	0.003	A
	C	Entry	1	1	A, B	168	168	167	0.0	0.0	0.000	A
		Exit	1	1		99	99	101	0.0	0.0	0.024	A

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	777	777	777	0.0	0.0	0.000	A
		Exit	1	1		725	725	719	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	123	123	122	0.4	0.7	16.506	C
			2	1	(A, C)	123	123	124	0.1	0.1	3.601	A
		Exit	1	1		193	193	195	0.0	0.0	0.000	A
	C	Entry	1	1	A	602	602	596	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.203	A
			2	1	(A, B)	605	605	598	0.0	0.0	0.000	A
		Exit	1	1		586	586	585	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	593	593	587	0.0	0.0	0.000	A
		Exit	1	1		608	608	600	0.0	0.0	0.000	A
	B	Entry	1	1	C	72	72	74	0.1	0.1	6.301	A
				2	A	1	1	1	0.0	0.0	12.708	B
			2	1	(A, C)	74	73	75	0.0	0.1	1.179	A
		Exit	1	1		34	34	34	0.0	0.0	0.000	A
	C	Entry	1	1	A	607	607	599	0.0	0.0	0.000	A
				2	B	33	34	34	0.0	0.1	8.865	A
			2	1	(A, B)	640	640	633	0.0	0.0	0.000	A
		Exit	1	1		665	665	660	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	197	197	199	0.0	0.0	0.030	A
		Exit	1	1		228	228	229	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	34	34	34	0.0	0.1	7.067	A
			2	1	(A, C)	34	34	34	0.0	0.0	0.476	A
		Exit	1	1		74	74	75	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	194	194	195	0.0	0.0	0.000	A
		Exit	1	1		123	123	124	0.0	0.0	0.452	A

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	797	797	789	0.0	0.0	0.000	A
		Exit	1	1		717	717	712	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	124	123	119	0.7	0.5	16.362	C
			2	1	(A, C)	124	124	119	0.1	0.1	3.278	A
		Exit	1	1		207	207	206	0.0	0.0	0.000	A
	C	Entry	1	1	A	593	593	593	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.988	A
			2	1	(A, B)	596	596	595	0.0	0.0	0.000	A
		Exit	1	1		592	592	585	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	593	593	585	0.0	0.0	0.000	A
		Exit	1	1		594	594	594	0.0	0.0	0.000	A
	B	Entry	1	1	C	72	73	75	0.1	0.1	6.511	A
				2	A	0.83	0.95	1	0.0	0.0	13.186	B
			2	1	(A, C)	73	73	76	0.1	0.0	1.001	A
		Exit	1	1		32	32	31	0.0	0.0	0.000	A
	C	Entry	1	1	A	593	593	593	0.0	0.0	0.000	A
				2	B	33	32	31	0.1	0.1	8.100	A
			2	1	(A, B)	626	626	625	0.0	0.0	0.000	A
		Exit	1	1		666	666	660	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	197	197	195	0.0	0.0	0.000	A
		Exit	1	1		237	237	237	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	32	32	31	0.1	0.1	7.549	A
			2	1	(A, C)	32	32	31	0.0	0.0	0.552	A
		Exit	1	1		73	73	76	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	206	206	206	0.0	0.0	0.000	A
		Exit	1	1		125	125	119	0.0	0.0	0.229	A

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	632	632	645	0.0	0.0	0.000	A
		Exit	1	1		579	579	589	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	97	97	101	0.5	0.4	13.486	B
			2	1	(A, C)	97	97	100	0.1	0.0	1.550	A
		Exit	1	1		161	161	168	0.0	0.0	0.000	A
	C	Entry	1	1	A	482	482	488	0.0	0.0	0.000	A
				2	B	1	1	1	0.0	0.0	7.412	A
			2	1	(A, B)	483	483	489	0.0	0.0	0.000	A
		Exit	1	1		472	472	478	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	479	479	483	0.0	0.0	0.000	A
		Exit	1	1		484	484	490	0.0	0.0	0.000	A
	B	Entry	1	1	C	63	61	60	0.1	0.2	6.138	A
				2	A	0.83	0.71	0.87	0.0	0.0	13.522	B
			2	1	(A, C)	64	64	61	0.0	0.0	0.718	A
		Exit	1	1		30	30	28	0.0	0.0	0.000	A
	C	Entry	1	1	A	483	483	489	0.0	0.0	0.000	A
				2	B	30	30	28	0.1	0.0	7.742	A
			2	1	(A, B)	513	513	517	0.0	0.0	0.000	A
		Exit	1	1		540	540	543	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	160	160	160	0.0	0.0	0.000	A
		Exit	1	1		190	190	197	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	30	30	28	0.1	0.0	7.061	A
			2	1	(A, C)	30	30	28	0.0	0.0	0.393	A
		Exit	1	1		64	64	61	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	160	160	168	0.0	0.0	0.000	A
		Exit	1	1		97	97	99	0.0	0.0	0.035	A

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	547	547	544	0.0	0.0	0.000	A
		Exit	1	1		487	487	492	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	80	78	85	0.4	0.3	11.129	B
			2	1	(A, C)	80	80	85	0.0	0.0	0.746	A
		Exit	1	1		137	137	139	0.0	0.0	0.000	A
	C	Entry	1	1	A	408	408	407	0.0	0.0	0.000	A
				2	B	1	1	0.95	0.0	0.0	7.095	A
			2	1	(A, B)	409	409	408	0.0	0.0	0.000	A
		Exit	1	1		412	412	405	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	410	410	403	0.0	0.0	0.000	A
		Exit	1	1		408	408	407	0.0	0.0	0.000	A
	B	Entry	1	1	C	45	45	47	0.2	0.1	5.921	A
				2	A	0.59	0.59	1	0.0	0.0	13.144	B
			2	1	(A, C)	46	46	48	0.0	0.0	0.565	A
		Exit	1	1		23	23	22	0.0	0.0	0.000	A
	C	Entry	1	1	A	408	408	406	0.0	0.0	0.000	A
				2	B	23	23	22	0.0	0.0	7.816	A
			2	1	(A, B)	431	431	428	0.0	0.0	0.000	A
		Exit	1	1		455	455	450	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	127	127	133	0.0	0.0	0.000	A
		Exit	1	1		158	158	161	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	23	22	22	0.0	0.1	6.766	A
			2	1	(A, C)	23	23	22	0.0	0.0	0.187	A
		Exit	1	1		46	46	48	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	136	136	139	0.0	0.0	0.000	A
		Exit	1	1		81	81	86	0.0	0.0	0.000	A

Lane movements: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	131	33	-	-	-	131	135	0.0	0.0	0.000	A
					C	404	101	-	-	-	404	406	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	84	21	575	393	0.214	85	85	0.0	0.2	11.159	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	84	21	-	-	-	84	86	0.0	0.0	0.775	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	399	100	-	-	-	399	410	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.39	195	153	0.010	2	2	0.0	0.0	6.535	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	399	100	-	-	-	399	410	0.0	0.0	0.000	A

			2	1	B	2	0.39	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	407	102	-	-	-	407	409	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	45	11	719	610	0.074	46	46	0.0	0.0	6.335	A
				2	A	0.83	0.21	78	54	0.015	0.83	0.67	0.0	0.0	5.892	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.83	0.21	-	-	-	0.83	0.67	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	45	11	-	-	-	45	47	0.0	0.0	0.658	A
	C	Entry	1	1	A	402	101	-	-	-	402	410	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	22	5	596	505	0.043	21	23	0.0	0.0	8.229	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	402	101	-	-	-	402	410	0.0	0.0	0.000	A
					B	22	5	-	-	-	22	23	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	46	12	-	-	-	46	47	0.0	0.0	0.000	A
					C	84	21	-	-	-	84	85	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	21	5	574	528	0.040	21	22	0.0	0.1	7.052	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	21	5	-	-	-	21	23	0.0	0.0	0.294	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	132	33	-	-	-	132	137	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	166	41	-	-	-	166	165	0.0	0.0	0.000	A
					C	469	117	-	-	-	469	479	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	98	25	575	356	0.276	102	100	0.2	0.4	13.219	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	98	25	-	-	-	98	101	0.0	0.1	1.174	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1	1	A	499	125	-	-	-	499	492	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A

	C	Entry		2	B	2	0.56	220	165	0.014	2	2	0.0	0.0	8.204	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	499	125	-	-	-	499	492	0.0	0.0	0.000	A
					B	2	0.56	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	464	116	-	-	-	464	477	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	60	15	719	593	0.101	60	58	0.0	0.1	5.790	A
				2	A	0.71	0.18	78	50	0.014	0.71	0.67	0.0	0.0	10.496	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.71	0.18	-	-	-	0.71	0.67	0.0	0.0	0.192	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	60	15	-	-	-	60	58	0.0	0.0	0.761	A
	C	Entry	1	1	A	494	123	-	-	-	494	490	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	27	7	596	490	0.056	27	27	0.0	0.0	8.292	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	494	123	-	-	-	494	490	0.0	0.0	0.000	A
					B	27	7	-	-	-	27	27	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	61	15	-	-	-	61	59	0.0	0.0	0.000	A
					C	99	25	-	-	-	99	101	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	27	7	574	518	0.053	28	27	0.1	0.0	7.445	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	27	7	-	-	-	27	27	0.0	0.0	0.466	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	168	42	-	-	-	168	167	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	191	48	-	-	-	191	193	0.0	0.0	0.000	A
					C	586	146	-	-	-	586	585	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	123	31	575	308	0.400	123	122	0.4	0.7	16.506	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	123	31	-	-	-	123	124	0.1	0.1	3.601	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	602	151	-	-	-	602	596	0.0	0.0	0.000	A

	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.53	251	183	0.012	2	2	0.0	0.0	7.203	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	602	151	-	-	-	602	596	0.0	0.0	0.000	A
					B	2	0.53	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	593	148	-	-	-	593	587	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	72	18	719	558	0.129	72	74	0.1	0.1	6.301	A
				2	A	1	0.36	137	78	0.018	1	1	0.0	0.0	12.708	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	1	0.36	-	-	-	1	1	0.0	0.0	0.954	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	72	18	-	-	-	72	74	0.0	0.1	1.182	A
	C	Entry	1	1	A	607	152	-	-	-	607	599	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	33	8	596	463	0.071	34	34	0.0	0.1	8.865	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	607	152	-	-	-	607	599	0.0	0.0	0.000	A
					B	33	8	-	-	-	33	34	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	74	18	-	-	-	74	75	0.0	0.0	0.011	A
					C	123	31	-	-	-	123	124	0.0	0.0	0.041	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	34	8	574	507	0.067	34	34	0.0	0.1	7.067	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	34	8	-	-	-	34	34	0.0	0.0	0.476	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	194	49	-	-	-	194	195	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	205	51	-	-	-	205	204	0.0	0.0	0.000	A
					C	592	148	-	-	-	592	585	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	124	31	575	307	0.403	123	119	0.7	0.5	16.362	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	124	31	-	-	-	124	119	0.1	0.1	3.278	A

1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	593	148	-	-	-	593	593	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.62	276	197	0.013	2	2	0.0	0.0	7.988	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	593	148	-	-	-	593	593	0.0	0.0	0.000	A
					B	2	0.62	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	593	148	-	-	-	593	585	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	72	18	719	560	0.129	73	75	0.1	0.1	6.511	A
				2	A	0.83	0.21	118	66	0.013	0.95	1	0.0	0.0	13.186	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.83	0.21	-	-	-	0.83	0.99	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	72	18	-	-	-	72	75	0.1	0.0	1.014	A
	C	Entry	1	1	A	593	148	-	-	-	593	593	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	33	8	596	466	0.070	32	31	0.1	0.1	8.100	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	593	148	-	-	-	593	593	0.0	0.0	0.000	A
					B	33	8	-	-	-	33	32	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	73	18	-	-	-	73	76	0.0	0.0	0.000	A
					C	125	31	-	-	-	125	119	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	32	8	574	506	0.063	32	31	0.1	0.1	7.549	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	32	8	-	-	-	32	31	0.0	0.0	0.552	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	206	51	-	-	-	206	206	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	160	40	-	-	-	160	167	0.0	0.0	0.000	A
					C	472	118	-	-	-	472	478	0.0	0.0	0.000	A
				1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

1	B	Entry	1		C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	97	24	575	360	0.270	97	101	0.5	0.4	13.486	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	97	24	-	-	-	97	100	0.1	0.0	1.550	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	482	121	-	-	-	482	488	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.30	176	131	0.009	1	1	0.0	0.0	7.412	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	482	121	-	-	-	482	488	0.0	0.0	0.000	A
					B	1	0.30	-	-	-	1	1	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	479	120	-	-	-	479	483	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	63	16	719	589	0.107	61	60	0.1	0.2	6.138	A
				2	A	0.83	0.21	98	63	0.013	0.71	0.87	0.0	0.0	13.522	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.83	0.21	-	-	-	0.83	0.95	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	63	16	-	-	-	63	60	0.0	0.0	0.729	A
	C	Entry	1	1	A	483	121	-	-	-	483	489	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	30	7	596	488	0.061	30	28	0.1	0.0	7.742	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	483	121	-	-	-	483	489	0.0	0.0	0.000	A
					B	30	7	-	-	-	30	28	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	64	16	-	-	-	64	61	0.0	0.0	0.000	A
					C	97	24	-	-	-	97	99	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	30	7	574	521	0.057	30	28	0.1	0.0	7.061	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	30	7	-	-	-	30	28	0.0	0.0	0.393	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	160	40	-	-	-	160	168	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	135	34	-	-	-	135	138	0.0	0.0	0.000	A

1					C	412	103	-	-	-	412	405	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	80	20	575	390	0.205	78	85	0.4	0.3	11.129	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	80	20	-	-	-	80	85	0.0	0.0	0.746	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	408	102	-	-	-	408	407	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.27	145	115	0.009	1	0.95	0.0	0.0	7.095	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	408	102	-	-	-	408	407	0.0	0.0	0.000	A
					B	1	0.27	-	-	-	1	0.95	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	410	102	-	-	-	410	403	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	45	11	719	606	0.075	45	47	0.2	0.1	5.921	A
				2	A	0.59	0.15	108	74	0.008	0.59	1	0.0	0.0	13.144	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.59	0.15	-	-	-	0.59	0.99	0.0	0.0	1.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	45	11	-	-	-	45	47	0.0	0.0	0.556	A
	C	Entry	1	1	A	408	102	-	-	-	408	406	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	23	6	596	503	0.046	23	22	0.0	0.0	7.816	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	408	102	-	-	-	408	406	0.0	0.0	0.000	A
					B	23	6	-	-	-	23	22	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	46	11	-	-	-	46	48	0.0	0.0	0.000	A
					C	81	20	-	-	-	81	86	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	23	6	574	528	0.043	22	22	0.0	0.1	6.766	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	23	6	-	-	-	23	22	0.0	0.0	0.187	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	136	34	-	-	-	136	139	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

2033 Future Year (Core), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Junction 1 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 2 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 3 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Info	Simulation	A1 - [Lane Simulation]	This run uses Simulation mode. For detailed information on this mode, please see the User Guide.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Western Priority	T-Junction	Two-way	Two-way	Two-way		4.16	A
2	Eastern Priority	T-Junction	Two-way	Two-way	Two-way		0.98	A
3	Northern Priority	T-Junction	Two-way	Two-way	Two-way		1.09	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	2.44	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2033 Future Year (Core)	PM	ONE HOUR	16:45	18:15	15	✓

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	B	3	C	Simple (vertical queueing)	Normal	0	100.00	
	C	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	C	Simple (vertical queueing)	Normal	0	100.00	
	B	3	B	Simple (vertical queueing)	Normal	0	100.00	
3	B	2	B	Simple (vertical queueing)	Normal	0	100.00	
	C	1	B	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	570	100.000
	B	✓				
	C	✓				
2	A	✓				
	B	✓				
	C		ONE HOUR	✓	622	100.000
3	A		ONE HOUR	✓	317	100.000
	B	✓				
	C	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	51	519
	B	190	0	1
	C	615	2	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	520
	B	11	0	115
	C	606	16	0

Junction 3

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	126	191
	B	16	0	0
	C	53	0	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Junction	PCU factor for a cyclist	PCU factor for a cyclist in controlling flow
1	0.20	0.80
2	0.20	0.80
3	0.20	0.80

Junction 1

Heavy Vehicle %

		To		
		A	B	C
From	A	0	4	6
	B	0	0	0
	C	9	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 2

Heavy Vehicle %

	To			
		A	B	C
From	A	0	0	6
	B	0	0	0
	C	10	0	0

Cyclist %

	To			
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 3

Heavy Vehicle %

	To			
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	4	0	0

Cyclist %

	To			
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	A	0.00	0.0	A	519	779
	B	29.75	2.0	D	176	264
	C	0.03	0.0	A	566	850
2	A	0.00	0.0	A	477	715
	B	8.76	0.3	A	114	171
	C	0.25	0.1	A	577	866
3	A	0.93	0.1	A	290	435
	B	7.70	0.0	A	15	22
	C	0.00	0.0	A	46	69

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	427	107	427	430	604	0.0	0.0	0.000	A
	B	145	36	148	145	37	0.0	0.4	15.767	C
	C	457	114	457	464	392	0.0	0.0	0.018	A
2	A	397	99	397	394	462	0.0	0.0	0.000	A
	B	93	23	93	93	13	0.0	0.2	7.128	A
	C	468	117	468	472	482	0.0	0.0	0.220	A
3	A	238	59	238	240	49	0.0	0.0	0.000	A
	B	13	3	13	13	93	0.0	0.0	7.341	A
	C	36	9	36	40	145	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	514	128	514	512	718	0.0	0.0	0.000	A
	B	173	43	171	168	46	0.4	1.0	18.049	C
	C	550	137	550	550	471	0.0	0.0	0.026	A
2	A	470	117	470	469	558	0.0	0.0	0.000	A
	B	112	28	112	114	14	0.2	0.3	7.924	A
	C	561	140	560	560	571	0.0	0.1	0.201	A
3	A	286	71	286	286	60	0.0	0.0	0.068	A
	B	14	4	14	14	112	0.0	0.0	7.093	A
	C	45	11	45	47	173	0.0	0.0	0.000	A

17:15 - 17:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	618	155	618	616	888	0.0	0.0	0.000	A
	B	203	51	203	203	56	1.0	1.7	26.771	D
	C	689	172	689	677	567	0.0	0.0	0.030	A
2	A	566	142	566	561	694	0.0	0.0	0.000	A
	B	139	35	141	137	17	0.3	0.2	8.756	A
	C	698	175	699	684	694	0.1	0.0	0.207	A
3	A	343	86	343	344	73	0.0	0.1	0.225	A
	B	17	4	17	16	139	0.0	0.0	7.573	A
	C	56	14	56	59	203	0.0	0.0	0.000	A

17:30 - 17:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	634	158	634	635	892	0.0	0.0	0.000	A
	B	215	54	211	204	53	1.7	2.0	29.755	D
	C	682	171	682	670	583	0.0	0.0	0.034	A
2	A	584	146	584	579	690	0.0	0.0	0.000	A
	B	140	35	140	137	18	0.2	0.3	8.595	A
	C	694	173	694	684	711	0.0	0.0	0.249	A
3	A	353	88	354	342	71	0.1	0.1	0.929	A
	B	18	5	18	19	140	0.0	0.0	6.823	A
	C	53	13	53	59	215	0.0	0.0	0.000	A

17:45 - 18:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	500	125	500	509	722	0.0	0.0	0.000	A
	B	172	43	174	176	49	2.0	0.7	21.425	C
	C	551	138	551	547	453	0.0	0.0	0.019	A
2	A	452	113	452	464	560	0.0	0.0	0.000	A
	B	102	26	104	112	15	0.3	0.1	7.840	A
	C	565	141	565	557	547	0.0	0.0	0.227	A
3	A	274	68	274	282	65	0.1	0.0	0.176	A
	B	15	4	14	14	102	0.0	0.0	7.699	A
	C	50	13	50	47	172	0.0	0.0	0.000	A

18:00 - 18:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	422	106	422	429	613	0.0	0.0	0.000	A
	B	147	37	147	142	37	0.7	0.7	14.544	B
	C	469	117	469	461	388	0.0	0.0	0.027	A
2	A	392	98	392	397	474	0.0	0.0	0.000	A
	B	98	24	98	98	13	0.1	0.2	7.309	A
	C	478	119	477	471	481	0.0	0.0	0.205	A
3	A	245	61	245	239	49	0.0	0.0	0.003	A
	B	13	3	12	13	98	0.0	0.0	6.576	A
	C	37	9	37	37	147	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	427	427	430	0.0	0.0	0.000	A
		Exit	1	1		604	604	607	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.12	0.12	0.36	0.0	0.0	9.987	A
				2	A	145	148	145	0.0	0.4	13.516	B
			2	1	(A, C)	145	145	147	0.0	0.0	2.260	A
		Exit	1	1		37	37	40	0.0	0.0	0.000	A
	C	Entry	1	1	A	456	456	462	0.0	0.0	0.000	A
				2	B	2	2	1	0.0	0.0	5.598	A
			2	1	(A, B)	457	457	464	0.0	0.0	0.000	A
		Exit	1	1		392	392	392	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	397	397	394	0.0	0.0	0.000	A
		Exit	1	1		462	462	466	0.0	0.0	0.000	A
	B	Entry	1	1	C	85	85	84	0.0	0.1	5.882	A
				2	A	7	7	8	0.0	0.0	10.202	B
			2	1	(A, C)	93	93	93	0.0	0.0	0.864	A
		Exit	1	1		13	13	13	0.0	0.0	0.000	A
	C	Entry	1	1	A	455	455	458	0.0	0.0	0.000	A
				2	B	13	13	13	0.0	0.0	7.054	A
			2	1	(A, B)	468	468	472	0.0	0.0	0.000	A
		Exit	1	1		482	482	479	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	238	238	240	0.0	0.0	0.000	A
		Exit	1	1		49	49	53	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	13	13	13	0.0	0.0	7.158	A
			2	1	(A, C)	13	13	13	0.0	0.0	0.183	A
		Exit	1	1		93	93	93	0.0	0.0	0.006	A
	C	Entry	1	1	A, B	36	36	40	0.0	0.0	0.000	A
		Exit	1	1		145	145	147	0.0	0.0	0.094	A

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	514	514	512	0.0	0.0	0.000	A
		Exit	1	1		718	718	715	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.83	0.83	0.95	0.0	0.0	11.073	B
				2	A	170	170	167	0.4	0.7	14.391	B
			2	1	(A, C)	173	171	170	0.0	0.2	3.636	A
		Exit	1	1		46	46	47	0.0	0.0	0.000	A
	C	Entry	1	1	A	548	548	548	0.0	0.0	0.000	A
				2	B	1	2	2	0.0	0.0	7.101	A
			2	1	(A, B)	550	550	550	0.0	0.0	0.000	A
		Exit	1	1		471	471	469	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	470	470	469	0.0	0.0	0.000	A
		Exit	1	1		558	558	556	0.0	0.0	0.000	A
	B	Entry	1	1	C	101	101	104	0.1	0.2	6.253	A
				2	A	12	11	11	0.0	0.1	10.563	B
			2	1	(A, C)	112	113	115	0.0	0.1	1.257	A
		Exit	1	1		14	14	14	0.0	0.0	0.000	A
	C	Entry	1	1	A	546	546	545	0.0	0.0	0.000	A
				2	B	15	14	14	0.0	0.1	7.055	A
			2	1	(A, B)	561	561	560	0.0	0.0	0.000	A
		Exit	1	1		571	571	572	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	286	286	286	0.0	0.0	0.068	A
		Exit	1	1		60	60	61	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	14	14	14	0.0	0.0	6.963	A
			2	1	(A, C)	14	14	14	0.0	0.0	0.130	A
		Exit	1	1		112	112	115	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	45	45	47	0.0	0.0	0.000	A
		Exit	1	1		173	173	170	0.0	0.0	0.460	A

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	618	618	616	0.0	0.0	0.000	A
		Exit	1	1		888	888	877	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.83	0.83	0.48	0.0	0.0	10.321	B
				2	A	201	202	203	0.7	1.1	18.091	C
			2	1	(A, C)	203	202	205	0.2	0.7	8.605	A
		Exit	1	1		56	56	58	0.0	0.0	0.000	A
	C	Entry	1	1	A	686	686	674	0.0	0.0	0.000	A
				2	B	3	3	2	0.0	0.0	7.455	A
			2	1	(A, B)	689	689	677	0.0	0.0	0.000	A
		Exit	1	1		567	567	562	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	566	566	561	0.0	0.0	0.000	A
		Exit	1	1		694	694	680	0.0	0.0	0.000	A
	B	Entry	1	1	C	127	128	124	0.2	0.1	6.434	A
				2	A	13	13	13	0.1	0.0	11.711	B
			2	1	(A, C)	139	139	137	0.1	0.0	1.818	A
		Exit	1	1		17	17	16	0.0	0.0	0.000	A
	C	Entry	1	1	A	681	681	667	0.0	0.0	0.000	A
				2	B	17	17	16	0.1	0.0	8.002	A
			2	1	(A, B)	698	698	684	0.0	0.0	0.000	A
		Exit	1	1		694	694	685	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	343	343	344	0.0	0.1	0.225	A
		Exit	1	1		73	73	75	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	17	17	16	0.0	0.0	7.341	A
			2	1	(A, C)	17	17	16	0.0	0.0	0.232	A
		Exit	1	1		139	139	137	0.0	0.0	0.010	A
	C	Entry	1	1	A, B	56	56	59	0.0	0.0	0.000	A
		Exit	1	1		204	203	207	0.0	0.2	1.854	A

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	634	634	635	0.0	0.0	0.000	A
		Exit	1	1		892	892	872	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.36	0.36	0.55	0.0	0.0	5.543	A
				2	A	212	211	204	1.1	1.2	19.133	C
			2	1	(A, C)	215	213	205	0.7	0.7	10.703	B
		Exit	1	1		53	53	59	0.0	0.0	0.000	A
	C	Entry	1	1	A	681	681	668	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	8.660	A
			2	1	(A, B)	682	682	670	0.0	0.0	0.000	A
		Exit	1	1		583	583	580	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	584	584	579	0.0	0.0	0.000	A
		Exit	1	1		690	690	678	0.0	0.0	0.000	A
	B	Entry	1	1	C	127	127	124	0.1	0.2	6.433	A
				2	A	13	13	12	0.0	0.1	12.410	B
			2	1	(A, C)	140	140	137	0.0	0.0	1.616	A
		Exit	1	1		18	18	19	0.0	0.0	0.000	A
	C	Entry	1	1	A	676	676	665	0.0	0.0	0.000	A
				2	B	18	18	19	0.0	0.0	8.342	A
			2	1	(A, B)	694	694	684	0.0	0.0	0.000	A
		Exit	1	1		711	711	703	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	353	354	342	0.1	0.1	0.929	A
		Exit	1	1		71	71	77	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	18	18	19	0.0	0.0	6.593	A
			2	1	(A, C)	18	18	19	0.0	0.0	0.214	A
		Exit	1	1		140	140	137	0.0	0.0	0.040	A
	C	Entry	1	1	A, B	53	53	59	0.0	0.0	0.000	A
		Exit	1	1		214	215	205	0.2	0.1	3.146	A

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	500	500	509	0.0	0.0	0.000	A
		Exit	1	1		722	722	720	0.0	0.0	0.000	A
	B	Entry	1	1	C	1	1	1	0.0	0.0	7.779	A
				2	A	171	173	175	1.2	0.6	16.004	C
			2	1	(A, C)	172	172	173	0.7	0.1	5.565	A
		Exit	1	1		49	49	47	0.0	0.0	0.000	A
	C	Entry	1	1	A	549	549	545	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	6.126	A
			2	1	(A, B)	551	551	547	0.0	0.0	0.000	A
		Exit	1	1		453	453	465	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	452	452	464	0.0	0.0	0.000	A
		Exit	1	1		560	560	553	0.0	0.0	0.000	A
	B	Entry	1	1	C	93	95	102	0.2	0.1	6.048	A
				2	A	9	10	10	0.1	0.0	11.655	B
			2	1	(A, C)	102	102	112	0.0	0.0	1.288	A
		Exit	1	1		15	15	14	0.0	0.0	0.000	A
	C	Entry	1	1	A	550	550	542	0.0	0.0	0.000	A
				2	B	14	15	14	0.0	0.0	8.042	A
			2	1	(A, B)	565	565	557	0.0	0.0	0.000	A
		Exit	1	1		547	547	566	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	274	274	282	0.1	0.0	0.176	A
		Exit	1	1		65	65	62	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	14	14	14	0.0	0.0	7.471	A
			2	1	(A, C)	15	14	14	0.0	0.0	0.242	A
		Exit	1	1		102	102	112	0.0	0.0	0.012	A
	C	Entry	1	1	A, B	50	50	47	0.0	0.0	0.000	A
		Exit	1	1		172	172	171	0.1	0.0	0.882	A

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	422	422	429	0.0	0.0	0.000	A
		Exit	1	1		613	613	600	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.36	0.36	0.67	0.0	0.0	5.841	A
				2	A	146	146	141	0.6	0.6	12.776	B
			2	1	(A, C)	147	146	142	0.1	0.1	1.858	A
		Exit	1	1		37	37	37	0.0	0.0	0.000	A
	C	Entry	1	1	A	467	467	459	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.045	A
			2	1	(A, B)	469	469	461	0.0	0.0	0.000	A
		Exit	1	1		388	388	395	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	392	392	397	0.0	0.0	0.000	A
		Exit	1	1		474	474	466	0.0	0.0	0.000	A
	B	Entry	1	1	C	88	89	89	0.1	0.1	5.973	A
				2	A	9	9	8	0.0	0.0	10.158	B
			2	1	(A, C)	98	97	98	0.0	0.0	0.988	A
		Exit	1	1		13	13	13	0.0	0.0	0.000	A
	C	Entry	1	1	A	465	465	458	0.0	0.0	0.000	A
				2	B	13	13	13	0.0	0.0	6.611	A
			2	1	(A, B)	478	478	471	0.0	0.0	0.000	A
		Exit	1	1		481	481	486	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	245	245	239	0.0	0.0	0.003	A
		Exit	1	1		49	49	50	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	13	12	13	0.0	0.0	6.426	A
			2	1	(A, C)	13	13	13	0.0	0.0	0.158	A
		Exit	1	1		98	98	98	0.0	0.0	0.007	A
	C	Entry	1	1	A, B	37	37	37	0.0	0.0	0.000	A
		Exit	1	1		147	147	141	0.0	0.0	0.088	A

Lane movements: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	36	9	-	-	-	36	38	0.0	0.0	0.000	A
					C	392	98	-	-	-	392	392	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.12	0.03	57	43	0.003	0.12	0.36	0.0	0.0	9.987	A
				2	A	145	36	575	398	0.365	148	145	0.0	0.4	13.516	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	145	36	-	-	-	145	146	0.0	0.0	2.265	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.12	0.03	-	-	-	0.12	0.36	0.0	0.0	0.000	A
	C	Entry	1	1	A	456	114	-	-	-	456	462	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.39	163	137	0.011	2	1	0.0	0.0	5.598	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	456	114	-	-	-	456	462	0.0	0.0	0.000	A

			2	1	B	2	0.39	-	-	-	2	1	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	397	99	-	-	-	397	394	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	85	21	719	611	0.140	85	84	0.0	0.1	5.882	A
				2	A	7	2	436	299	0.025	7	8	0.0	0.0	10.202	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	7	2	-	-	-	7	8	0.0	0.0	0.199	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	85	21	-	-	-	85	85	0.0	0.0	0.928	A
	C	Entry	1	1	A	455	114	-	-	-	455	458	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	13	3	549	468	0.027	13	13	0.0	0.0	7.054	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	455	114	-	-	-	455	458	0.0	0.0	0.000	A
					B	13	3	-	-	-	13	13	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	93	23	-	-	-	93	93	0.0	0.0	0.000	A
					C	145	36	-	-	-	145	147	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	13	3	529	484	0.027	13	13	0.0	0.0	7.158	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	13	3	-	-	-	13	13	0.0	0.0	0.183	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	36	9	-	-	-	36	40	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	44	11	-	-	-	44	45	0.0	0.0	0.000	A
					C	470	117	-	-	-	470	468	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.83	0.21	127	94	0.009	0.83	0.95	0.0	0.0	11.073	B
				2	A	170	43	575	361	0.471	170	167	0.4	0.7	14.391	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	172	43	-	-	-	170	169	0.0	0.2	3.651	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.83	0.21	-	-	-	0.83	0.95	0.0	0.0	0.965	A
			1	1	A	548	137	-	-	-	548	548	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A

	C	Entry		2	B	1	0.36	251	203	0.007	2	2	0.0	0.0	7.101	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	548	137	-	-	-	548	548	0.0	0.0	0.000	A
					B	1	0.36	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	470	117	-	-	-	470	469	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	101	25	719	588	0.172	101	104	0.1	0.2	6.253	A
				2	A	12	3	461	290	0.040	11	11	0.0	0.1	10.563	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	12	3	-	-	-	12	11	0.0	0.0	0.528	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	101	25	-	-	-	101	104	0.0	0.1	1.334	A
	C	Entry	1	1	A	546	136	-	-	-	546	545	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	15	4	584	480	0.031	14	14	0.0	0.1	7.055	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	546	136	-	-	-	546	545	0.0	0.0	0.000	A
					B	15	4	-	-	-	15	14	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	112	28	-	-	-	112	115	0.0	0.0	0.085	A
					C	173	43	-	-	-	173	171	0.0	0.0	0.056	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	14	4	563	505	0.028	14	14	0.0	0.0	6.963	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	14	4	-	-	-	14	14	0.0	0.0	0.130	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	45	11	-	-	-	45	47	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	52	13	-	-	-	52	55	0.0	0.0	0.000	A
					C	566	141	-	-	-	566	561	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.83	0.21	70	48	0.017	0.83	0.48	0.0	0.0	10.321	B
				2	A	201	50	575	313	0.641	202	203	0.7	1.1	18.091	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	202	51	-	-	-	201	204	0.2	0.6	8.619	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.95	0.24	-	-	-	0.83	0.48	0.0	0.0	2.840	A
					A	686	172	-	-	-	686	674	0.0	0.0	0.000	A

	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	3	0.80	270	208	0.015	3	2	0.0	0.0	7.455	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	686	172	-	-	-	686	674	0.0	0.0	0.000	A
					B	3	0.80	-	-	-	3	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	566	142	-	-	-	566	561	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	127	32	719	559	0.226	128	124	0.2	0.1	6.434	A
				2	A	13	3	495	274	0.046	13	13	0.1	0.0	11.711	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	13	3	-	-	-	13	13	0.0	0.0	0.851	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	126	32	-	-	-	127	124	0.1	0.0	1.918	A
	C	Entry	1	1	A	681	170	-	-	-	681	667	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	17	4	590	467	0.036	17	16	0.1	0.0	8.002	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	681	170	-	-	-	681	667	0.0	0.0	0.000	A
					B	17	4	-	-	-	17	16	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	139	35	-	-	-	139	137	0.0	0.0	0.160	A
					C	204	51	-	-	-	204	207	0.0	0.0	0.269	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	17	4	569	497	0.035	17	16	0.0	0.0	7.341	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	17	4	-	-	-	17	16	0.0	0.0	0.232	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	56	14	-	-	-	56	59	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	51	13	-	-	-	51	56	0.0	0.0	0.000	A
					C	583	146	-	-	-	583	579	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.36	0.09	89	60	0.006	0.36	0.55	0.0	0.0	5.543	A
				2	A	212	53	575	310	0.685	211	204	1.1	1.2	19.133	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	214	54	-	-	-	212	204	0.6	0.7	10.726	B

1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.36	0.09	-	-	-	0.36	0.55	0.0	0.0	1.591	A
	C	Entry	1	1	A	681	170	-	-	-	681	668	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.48	302	231	0.008	2	2	0.0	0.0	8.660	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	681	170	-	-	-	681	668	0.0	0.0	0.000	A
					B	2	0.48	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	584	146	-	-	-	584	579	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	127	32	719	554	0.229	127	124	0.1	0.2	6.433	A
				2	A	13	3	475	260	0.052	13	12	0.0	0.1	12.410	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	13	3	-	-	-	13	13	0.0	0.0	0.868	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	127	32	-	-	-	127	124	0.0	0.0	1.692	A
	C	Entry	1	1	A	676	169	-	-	-	676	665	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	18	4	584	458	0.039	18	19	0.0	0.0	8.342	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	676	169	-	-	-	676	665	0.0	0.0	0.000	A
					B	18	4	-	-	-	18	19	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	140	35	-	-	-	140	137	0.0	0.0	0.761	A
					C	213	53	-	-	-	214	205	0.0	0.0	1.041	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	18	4	563	492	0.036	18	19	0.0	0.0	6.593	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	18	5	-	-	-	18	19	0.0	0.0	0.214	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	53	13	-	-	-	53	59	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	48	12	-	-	-	48	45	0.0	0.0	0.000	A
					C	452	113	-	-	-	452	464	0.0	0.0	0.000	A
				1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

1	B	Entry	1		C	1	0.27	172	118	0.009	1	1	0.0	0.0	7.779	A
				2	A	171	43	575	366	0.466	173	175	1.2	0.6	16.004	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	170	43	-	-	-	171	172	0.7	0.1	5.592	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.27	-	-	-	1	1	0.0	0.0	1.847	A
	C	Entry	1	1	A	549	137	-	-	-	549	545	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.42	207	167	0.010	2	2	0.0	0.0	6.126	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	549	137	-	-	-	549	545	0.0	0.0	0.000	A
					B	2	0.42	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	452	113	-	-	-	452	464	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	93	23	719	596	0.156	95	102	0.2	0.1	6.048	A
				2	A	9	2	461	288	0.032	10	10	0.1	0.0	11.655	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	9	2	-	-	-	9	10	0.0	0.0	0.491	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	93	23	-	-	-	93	102	0.0	0.0	1.367	A
	C	Entry	1	1	A	550	138	-	-	-	550	542	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	14	4	590	487	0.030	15	14	0.0	0.0	8.042	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	550	138	-	-	-	550	542	0.0	0.0	0.000	A
					B	14	4	-	-	-	14	14	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	102	26	-	-	-	102	112	0.0	0.0	0.180	A
					C	172	43	-	-	-	172	171	0.0	0.0	0.174	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	14	4	569	509	0.028	14	14	0.0	0.0	7.471	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	15	4	-	-	-	14	14	0.0	0.0	0.242	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	50	13	-	-	-	50	47	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	35	9	-	-	-	35	35	0.0	0.0	0.000	A

1					C	388	97	-	-	-	388	394	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.36	0.09	89	70	0.005	0.36	0.67	0.0	0.0	5.841	A
				2	A	146	37	575	396	0.369	146	141	0.6	0.6	12.776	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	147	37	-	-	-	146	141	0.1	0.1	1.852	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.36	0.09	-	-	-	0.36	0.67	0.0	0.0	3.097	A
	C	Entry	1	1	A	467	117	-	-	-	467	459	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.48	232	192	0.010	2	2	0.0	0.0	7.045	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	467	117	-	-	-	467	459	0.0	0.0	0.000	A
					B	2	0.48	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	392	98	-	-	-	392	397	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	88	22	719	607	0.146	89	89	0.1	0.1	5.973	A
				2	A	9	2	446	303	0.030	9	8	0.0	0.0	10.158	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	9	2	-	-	-	9	8	0.0	0.0	0.298	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	89	22	-	-	-	88	89	0.0	0.0	1.052	A
	C	Entry	1	1	A	465	116	-	-	-	465	458	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	13	3	572	488	0.026	13	13	0.0	0.0	6.611	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	465	116	-	-	-	465	458	0.0	0.0	0.000	A
					B	13	3	-	-	-	13	13	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	98	24	-	-	-	98	98	0.0	0.0	0.000	A
					C	147	37	-	-	-	147	141	0.0	0.0	0.004	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	13	3	552	504	0.025	12	13	0.0	0.0	6.426	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	13	3	-	-	-	13	13	0.0	0.0	0.158	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	37	9	-	-	-	37	37	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

2033 Future Year (Core) + Development (Core) - SDBL Option 2, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Junction 1 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 2 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 3 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Info	Simulation	A1 - [Lane Simulation]	This run uses Simulation mode. For detailed information on this mode, please see the User Guide.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Western Priority	T-Junction	Two-way	Two-way	Two-way		1.93	A
2	Eastern Priority	T-Junction	Two-way	Two-way	Two-way		0.61	A
3	Northern Priority	T-Junction	Two-way	Two-way	Two-way		0.54	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	1.22	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D21	2033 Future Year (Core) + Development (Core) - SDBL Option 2	AM	ONE HOUR	07:45	09:15	15	✓

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	B	3	C	Simple (vertical queueing)	Normal	0	100.00	
	C	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	C	Simple (vertical queueing)	Normal	0	100.00	
	B	3	B	Simple (vertical queueing)	Normal	0	100.00	
3	B	2	B	Simple (vertical queueing)	Normal	0	100.00	
	C	1	B	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	896	100.000
	B	✓				
	C	✓				
2	A	✓				
	B	✓				
	C		ONE HOUR	✓	644	100.000
3	A		ONE HOUR	✓	177	100.000
	B	✓				
	C	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	263	633
	B	111	0	0
	C	614	2	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	633
	B	1	0	64
	C	615	29	0

Junction 3

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	66	111
	B	29	0	0
	C	265	0	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Junction	PCU factor for a cyclist	PCU factor for a cyclist in controlling flow
1	0.20	0.80
2	0.20	0.80
3	0.20	0.80

Junction 1

Heavy Vehicle %

		To		
		A	B	C
From	A	0	2	27
	B	2	0	0
	C	14	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 2

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	27
	B	0	0	0
	C	14	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 3

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	A	0.00	0.0	A	821	1232
	B	28.64	1.1	D	99	149
	C	0.04	0.0	A	561	841
2	A	0.00	0.0	A	585	877
	B	7.98	0.2	A	60	91
	C	0.46	0.1	A	588	882
3	A	0.05	0.0	A	160	239
	B	8.40	0.1	A	27	40
	C	0.00	0.0	A	241	361

Main Results for each time segment

07:45 - 08:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	669	167	669	671	553	0.0	0.0	0.000	A
	B	81	20	79	81	199	0.0	0.3	14.428	B
	C	476	119	476	461	471	0.0	0.0	0.029	A
2	A	473	118	473	470	483	0.0	0.0	0.000	A
	B	51	13	52	51	22	0.0	0.1	6.525	A
	C	503	126	504	488	524	0.0	0.0	0.381	A
3	A	133	33	133	134	220	0.0	0.0	0.000	A
	B	22	5	22	21	51	0.0	0.0	6.759	A
	C	197	49	197	203	82	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	790	198	790	804	647	0.0	0.0	0.000	A
	B	95	24	96	95	230	0.3	0.4	16.153	C
	C	553	138	553	549	563	0.0	0.0	0.033	A
2	A	565	141	565	568	554	0.0	0.0	0.000	A
	B	56	14	57	55	28	0.1	0.1	6.759	A
	C	581	145	581	579	620	0.0	0.0	0.458	A
3	A	152	38	152	151	259	0.0	0.0	0.000	A
	B	28	7	28	27	56	0.0	0.0	7.241	A
	C	231	58	231	237	96	0.0	0.0	0.000	A

08:15 - 08:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	975	244	975	985	777	0.0	0.0	0.000	A
	B	118	29	119	115	283	0.4	0.9	27.220	D
	C	659	165	659	670	694	0.0	0.0	0.039	A
2	A	703	176	703	704	665	0.0	0.0	0.000	A
	B	72	18	72	70	32	0.1	0.2	7.822	A
	C	697	174	697	703	774	0.0	0.1	0.419	A
3	A	190	47	190	188	317	0.0	0.0	0.052	A
	B	32	8	33	32	72	0.0	0.0	7.917	A
	C	284	71	284	286	118	0.0	0.0	0.000	A

08:30 - 08:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	994	248	994	996	786	0.0	0.0	0.000	A
	B	124	31	123	123	300	0.9	1.1	28.642	D
	C	665	166	665	672	696	0.0	0.0	0.032	A
2	A	696	174	696	699	666	0.0	0.0	0.000	A
	B	72	18	72	71	32	0.2	0.2	7.976	A
	C	696	174	697	701	767	0.1	0.0	0.434	A
3	A	196	49	196	195	332	0.0	0.0	0.010	A
	B	32	8	32	31	72	0.0	0.1	8.396	A
	C	300	75	300	296	124	0.0	0.0	0.000	A

08:45 - 09:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	814	203	814	803	642	0.0	0.0	0.000	A
	B	93	23	96	102	233	1.1	0.4	18.726	C
	C	548	137	548	549	583	0.0	0.0	0.025	A
2	A	586	147	586	567	547	0.0	0.0	0.000	A
	B	59	15	58	57	24	0.2	0.2	7.319	A
	C	569	142	569	573	643	0.0	0.1	0.432	A
3	A	152	38	152	156	257	0.0	0.0	0.001	A
	B	24	6	25	27	59	0.1	0.0	7.291	A
	C	233	58	233	237	94	0.0	0.0	0.000	A

09:00 - 09:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	684	171	684	681	542	0.0	0.0	0.000	A
	B	83	21	81	84	199	0.4	0.4	13.787	B
	C	463	116	463	463	486	0.0	0.0	0.027	A
2	A	485	121	485	483	458	0.0	0.0	0.000	A
	B	52	13	51	51	23	0.2	0.1	7.050	A
	C	480	120	480	478	535	0.1	0.1	0.386	A
3	A	136	34	136	135	222	0.0	0.0	0.000	A
	B	23	6	23	22	52	0.0	0.0	7.760	A
	C	199	50	199	197	83	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	669	669	671	0.0	0.0	0.000	A
		Exit	1	1		553	553	540	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	81	79	81	0.0	0.3	13.533	B
			2	1	(A, C)	81	81	82	0.0	0.0	0.895	A
		Exit	1	1		199	199	203	0.0	0.0	0.000	A
	C	Entry	1	1	A	474	474	460	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.800	A
			2	1	(A, B)	476	476	461	0.0	0.0	0.000	A
		Exit	1	1		471	471	470	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	473	473	470	0.0	0.0	0.000	A
		Exit	1	1		483	483	468	0.0	0.0	0.000	A
	B	Entry	1	1	C	50	51	50	0.0	0.1	5.973	A
				2	A	0.83	0.83	1	0.0	0.0	11.030	B
			2	1	(A, C)	51	51	51	0.0	0.0	0.434	A
		Exit	1	1		22	22	21	0.0	0.0	0.000	A
	C	Entry	1	1	A	482	482	467	0.0	0.0	0.000	A
				2	B	21	22	21	0.0	0.0	7.663	A
			2	1	(A, B)	503	503	488	0.0	0.0	0.000	A
		Exit	1	1		524	524	520	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	133	133	134	0.0	0.0	0.000	A
		Exit	1	1		220	220	224	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	22	22	21	0.0	0.0	6.504	A
			2	1	(A, C)	22	22	21	0.0	0.0	0.256	A
		Exit	1	1		51	51	51	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	197	197	203	0.0	0.0	0.000	A
		Exit	1	1		82	82	82	0.0	0.0	0.050	A

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	790	790	804	0.0	0.0	0.000	A
		Exit	1	1		647	647	642	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	96	96	95	0.3	0.4	14.627	B
			2	1	(A, C)	95	96	95	0.0	0.0	1.533	A
		Exit	1	1		230	230	237	0.0	0.0	0.000	A
	C	Entry	1	1	A	551	551	547	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.997	A
			2	1	(A, B)	553	553	549	0.0	0.0	0.000	A
		Exit	1	1		563	563	569	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	565	565	568	0.0	0.0	0.000	A
		Exit	1	1		554	554	553	0.0	0.0	0.000	A
	B	Entry	1	1	C	55	56	55	0.1	0.1	6.113	A
				2	A	0.83	0.83	0.83	0.0	0.0	13.851	B
			2	1	(A, C)	56	56	55	0.0	0.0	0.527	A
		Exit	1	1		28	28	27	0.0	0.0	0.000	A
	C	Entry	1	1	A	553	553	552	0.0	0.0	0.000	A
				2	B	28	28	27	0.0	0.0	8.666	A
			2	1	(A, B)	581	581	579	0.0	0.0	0.000	A
		Exit	1	1		620	620	623	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	152	152	151	0.0	0.0	0.000	A
		Exit	1	1		259	259	264	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	28	28	27	0.0	0.0	6.887	A
			2	1	(A, C)	28	28	27	0.0	0.0	0.354	A
		Exit	1	1		56	56	55	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	231	231	237	0.0	0.0	0.000	A
		Exit	1	1		96	96	96	0.0	0.0	0.015	A

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	975	975	985	0.0	0.0	0.000	A
		Exit	1	1		777	777	782	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	120	119	115	0.4	0.7	20.920	C
			2	1	(A, C)	118	120	116	0.0	0.2	6.246	A
		Exit	1	1		283	283	286	0.0	0.0	0.000	A
	C	Entry	1	1	A	658	658	667	0.0	0.0	0.000	A
				2	B	1	1	2	0.0	0.0	9.805	A
			2	1	(A, B)	659	659	670	0.0	0.0	0.000	A
		Exit	1	1		694	694	702	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	703	703	704	0.0	0.0	0.000	A
		Exit	1	1		665	665	672	0.0	0.0	0.000	A
	B	Entry	1	1	C	72	72	70	0.1	0.2	6.677	A
				2	A	0.71	0.71	0.75	0.0	0.0	13.117	B
			2	1	(A, C)	72	72	71	0.0	0.1	1.076	A
		Exit	1	1		32	32	32	0.0	0.0	0.000	A
	C	Entry	1	1	A	665	665	671	0.0	0.0	0.000	A
				2	B	32	32	32	0.0	0.1	8.095	A
			2	1	(A, B)	697	697	703	0.0	0.0	0.000	A
		Exit	1	1		774	774	774	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	190	190	188	0.0	0.0	0.052	A
		Exit	1	1		317	317	318	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	32	33	32	0.0	0.0	7.361	A
			2	1	(A, C)	32	32	32	0.0	0.0	0.556	A
		Exit	1	1		72	72	71	0.0	0.0	0.010	A
	C	Entry	1	1	A, B	284	284	286	0.0	0.0	0.000	A
		Exit	1	1		117	118	117	0.0	0.0	0.921	A

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	994	994	996	0.0	0.0	0.000	A
		Exit	1	1		786	786	793	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	124	123	123	0.7	0.8	21.831	C
			2	1	(A, C)	124	124	123	0.2	0.3	6.787	A
		Exit	1	1		300	300	297	0.0	0.0	0.000	A
	C	Entry	1	1	A	663	663	670	0.0	0.0	0.000	A
				2	B	1	1	2	0.0	0.0	9.579	A
			2	1	(A, B)	665	665	672	0.0	0.0	0.000	A
		Exit	1	1		696	696	701	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	696	696	699	0.0	0.0	0.000	A
		Exit	1	1		666	666	670	0.0	0.0	0.000	A
	B	Entry	1	1	C	72	71	70	0.2	0.2	6.846	A
				2	A	0.95	0.95	1	0.0	0.0	13.559	B
			2	1	(A, C)	72	73	71	0.1	0.0	1.017	A
		Exit	1	1		32	32	32	0.0	0.0	0.000	A
	C	Entry	1	1	A	665	665	669	0.0	0.0	0.000	A
				2	B	31	32	32	0.1	0.0	8.557	A
			2	1	(A, B)	696	696	701	0.0	0.0	0.000	A
		Exit	1	1		767	767	769	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	196	196	195	0.0	0.0	0.010	A
		Exit	1	1		332	332	327	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	32	32	31	0.0	0.1	7.821	A
			2	1	(A, C)	32	32	32	0.0	0.0	0.575	A
		Exit	1	1		72	72	71	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	300	300	296	0.0	0.0	0.000	A
		Exit	1	1		123	124	124	0.0	0.0	0.704	A

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	814	814	803	0.0	0.0	0.000	A
		Exit	1	1		642	642	649	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	94	96	102	0.8	0.4	16.196	C
			2	1	(A, C)	93	94	100	0.3	0.0	2.686	A
		Exit	1	1		233	233	237	0.0	0.0	0.000	A
	C	Entry	1	1	A	546	546	547	0.0	0.0	0.000	A
				2	B	1	2	2	0.0	0.0	7.564	A
			2	1	(A, B)	548	548	549	0.0	0.0	0.000	A
		Exit	1	1		583	583	568	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	586	586	567	0.0	0.0	0.000	A
		Exit	1	1		547	547	548	0.0	0.0	0.000	A
	B	Entry	1	1	C	57	57	56	0.2	0.1	6.472	A
				2	A	1	1	1	0.0	0.0	18.112	C
			2	1	(A, C)	59	58	57	0.0	0.0	0.623	A
		Exit	1	1		24	24	27	0.0	0.0	0.000	A
	C	Entry	1	1	A	545	545	547	0.0	0.0	0.000	A
				2	B	24	24	27	0.0	0.1	8.266	A
			2	1	(A, B)	569	569	573	0.0	0.0	0.000	A
		Exit	1	1		643	643	623	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	152	152	156	0.0	0.0	0.001	A
		Exit	1	1		257	257	264	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	24	25	27	0.1	0.0	6.880	A
		Exit	1	1		59	59	57	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	233	233	237	0.0	0.0	0.000	A
		Exit	1	1		94	94	99	0.0	0.0	0.239	A

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	684	684	681	0.0	0.0	0.000	A
		Exit	1	1		542	542	545	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	83	81	84	0.4	0.3	12.760	B
			2	1	(A, C)	83	83	84	0.0	0.0	1.028	A
		Exit	1	1		199	199	197	0.0	0.0	0.000	A
	C	Entry	1	1	A	461	461	461	0.0	0.0	0.000	A
				2	B	2	2	1	0.0	0.0	8.887	A
			2	1	(A, B)	463	463	463	0.0	0.0	0.000	A
		Exit	1	1		486	486	485	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	485	485	483	0.0	0.0	0.000	A
		Exit	1	1		458	458	457	0.0	0.0	0.000	A
	B	Entry	1	1	C	51	50	50	0.1	0.1	6.222	A
				2	A	0.71	0.83	0.79	0.0	0.0	9.949	A
			2	1	(A, C)	52	52	51	0.0	0.0	0.781	A
		Exit	1	1		23	23	22	0.0	0.0	0.000	A
	C	Entry	1	1	A	458	458	456	0.0	0.0	0.000	A
				2	B	23	23	22	0.1	0.1	7.468	A
			2	1	(A, B)	480	480	478	0.0	0.0	0.000	A
		Exit	1	1		535	535	534	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	136	136	135	0.0	0.0	0.000	A
		Exit	1	1		222	222	219	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	23	23	22	0.0	0.0	7.347	A
			2	1	(A, C)	23	23	22	0.0	0.0	0.411	A
		Exit	1	1		52	52	51	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	199	199	197	0.0	0.0	0.000	A
		Exit	1	1		83	83	84	0.0	0.0	0.010	A

Lane movements: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	198	49	-	-	-	198	202	0.0	0.0	0.000	A
					C	471	118	-	-	-	471	470	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	81	20	575	358	0.227	79	81	0.0	0.3	13.533	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	81	20	-	-	-	81	82	0.0	0.0	0.895	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	474	119	-	-	-	474	460	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.39	195	147	0.010	2	2	0.0	0.0	7.800	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	474	119	-	-	-	474	460	0.0	0.0	0.000	A

			2	1	B	2	0.39	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	473	118	-	-	-	473	470	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	50	13	719	594	0.084	51	50	0.0	0.1	5.973	A
				2	A	0.83	0.21	127	82	0.010	0.83	1	0.0	0.0	11.030	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.83	0.21	-	-	-	0.83	1	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	50	13	-	-	-	50	50	0.0	0.0	0.444	A
	C	Entry	1	1	A	482	120	-	-	-	482	467	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	21	5	590	489	0.044	22	21	0.0	0.0	7.663	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	482	120	-	-	-	482	467	0.0	0.0	0.000	A
					B	21	5	-	-	-	21	21	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	51	13	-	-	-	51	51	0.0	0.0	0.000	A
					C	82	20	-	-	-	82	82	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	22	5	569	515	0.043	22	21	0.0	0.0	6.504	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	22	5	-	-	-	22	21	0.0	0.0	0.256	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	197	49	-	-	-	197	203	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	228	57	-	-	-	228	235	0.0	0.0	0.000	A
					C	563	141	-	-	-	563	569	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	96	24	575	319	0.300	96	95	0.3	0.4	14.627	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	95	24	-	-	-	96	95	0.0	0.0	1.533	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1	1	A	551	138	-	-	-	551	547	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A

	C	Entry		2	B	2	0.53	239	169	0.013	2	2	0.0	0.0	7.997	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	551	138	-	-	-	551	547	0.0	0.0	0.000	A
			2	1	B	2	0.53	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	565	141	-	-	-	565	568	0.0	0.0	0.000	A
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	55	14	719	568	0.097	56	55	0.1	0.1	6.113	A
			1		A	0.83	0.21	98	57	0.015	0.83	0.83	0.0	0.0	13.851	B
	B	Entry		2	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	0.83	0.21	-	-	-	0.83	0.83	0.0	0.0	0.000	A
2			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	55	14	-	-	-	55	55	0.0	0.0	0.535	A
					A	553	138	-	-	-	553	552	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			1		A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry		2	B	28	7	596	470	0.059	28	27	0.0	0.0	8.666	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	553	138	-	-	-	553	552	0.0	0.0	0.000	A
			2	1	B	28	7	-	-	-	28	27	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	56	14	-	-	-	56	55	0.0	0.0	0.000	A
					C	96	24	-	-	-	96	96	0.0	0.0	0.000	A
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1		A	28	7	574	510	0.054	28	27	0.0	0.0	6.887	A
3	B	Entry		2	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	28	7	-	-	-	28	27	0.0	0.0	0.354	A
			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	231	58	-	-	-	231	237	0.0	0.0	0.000	A
	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	281	70	-	-	-	281	284	0.0	0.0	0.000	A
					C	694	174	-	-	-	694	702	0.0	0.0	0.000	A
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1		A	120	30	575	263	0.455	119	115	0.4	0.7	20.920	C
	B	Entry		2	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	118	29	-	-	-	120	116	0.0	0.2	6.246	A
1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	658	164	-	-	-	658	667	0.0	0.0	0.000	A

	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.33	295	187	0.007	1	2	0.0	0.0	9.805	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	658	164	-	-	-	658	667	0.0	0.0	0.000	A
					B	1	0.33	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	703	176	-	-	-	703	704	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	72	18	719	529	0.135	72	70	0.1	0.2	6.677	A
				2	A	0.71	0.18	93	46	0.016	0.71	0.75	0.0	0.0	13.117	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.71	0.18	-	-	-	0.71	0.75	0.0	0.0	0.174	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	72	18	-	-	-	72	70	0.0	0.1	1.086	A
	C	Entry	1	1	A	665	166	-	-	-	665	671	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	32	8	596	438	0.073	32	32	0.0	0.1	8.095	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	665	166	-	-	-	665	671	0.0	0.0	0.000	A
					B	32	8	-	-	-	32	32	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	72	18	-	-	-	72	71	0.0	0.0	0.005	A
					C	117	29	-	-	-	117	117	0.0	0.0	0.081	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	32	8	574	497	0.065	33	32	0.0	0.0	7.361	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	32	8	-	-	-	32	32	0.0	0.0	0.556	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	284	71	-	-	-	284	286	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	298	75	-	-	-	298	295	0.0	0.0	0.000	A
					C	696	174	-	-	-	696	701	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	124	31	575	260	0.478	123	123	0.7	0.8	21.831	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	124	31	-	-	-	124	123	0.2	0.3	6.787	A

1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	663	166	-	-	-	663	670	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	1	0.36	245	155	0.009	1	2	0.0	0.0	9.579	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	663	166	-	-	-	663	670	0.0	0.0	0.000	A
					B	1	0.36	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	696	174	-	-	-	696	699	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	72	18	719	531	0.135	71	70	0.2	0.2	6.846	A
				2	A	0.95	0.24	122	57	0.017	0.95	1	0.0	0.0	13.559	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.95	0.24	-	-	-	0.95	1	0.0	0.0	0.093	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	72	18	-	-	-	72	70	0.1	0.0	1.033	A
	C	Entry	1	1	A	665	166	-	-	-	665	669	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	31	8	596	439	0.072	32	32	0.1	0.0	8.557	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	665	166	-	-	-	665	669	0.0	0.0	0.000	A
					B	31	8	-	-	-	31	32	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	72	18	-	-	-	72	71	0.0	0.0	0.000	A
					C	123	31	-	-	-	123	124	0.0	0.0	0.015	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	32	8	574	494	0.065	32	31	0.0	0.1	7.821	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	32	8	-	-	-	32	32	0.0	0.0	0.575	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	300	75	-	-	-	300	296	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	231	58	-	-	-	231	235	0.0	0.0	0.000	A
					C	583	146	-	-	-	583	568	0.0	0.0	0.000	A
				1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

			1		C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	94	24	575	314	0.299	96	102	0.8	0.4	16.196	C
	B	Entry		2	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	93	23	-	-	-	94	100	0.3	0.0	2.686	A
1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	546	137	-	-	-	546	547	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			1		A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry		2	B	1	0.36	207	147	0.010	2	2	0.0	0.0	7.564	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	546	137	-	-	-	546	547	0.0	0.0	0.000	A
			2	1	B	1	0.36	-	-	-	1	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	586	147	-	-	-	586	567	0.0	0.0	0.000	A
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	57	14	719	561	0.102	57	56	0.2	0.1	6.472	A
			1		A	1	0.27	118	67	0.016	1	1	0.0	0.0	18.112	C
	B	Entry		2	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	1	0.27	-	-	-	1	1	0.0	0.0	0.000	A
2			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	58	14	-	-	-	57	56	0.0	0.0	0.635	A
					A	545	136	-	-	-	545	547	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			1		A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry		2	B	24	6	596	469	0.052	24	27	0.0	0.1	8.266	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	545	136	-	-	-	545	547	0.0	0.0	0.000	A
			2	1	B	24	6	-	-	-	24	27	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	59	15	-	-	-	59	57	0.0	0.0	0.000	A
					C	94	23	-	-	-	94	99	0.0	0.0	0.001	A
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			1		A	24	6	574	510	0.048	25	27	0.1	0.0	6.880	A
3	B	Entry		2	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	24	6	-	-	-	24	27	0.0	0.0	0.410	A
			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	233	58	-	-	-	233	237	0.0	0.0	0.000	A
	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
	A	Entry	1	1	B	198	49	-	-	-	198	196	0.0	0.0	0.000	A

1					C	486	122	-	-	-	486	485	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	83	21	575	356	0.232	81	84	0.4	0.3	12.760	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	83	21	-	-	-	83	84	0.0	0.0	1.028	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	461	115	-	-	-	461	461	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.42	157	117	0.014	2	1	0.0	0.0	8.887	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	461	115	-	-	-	461	461	0.0	0.0	0.000	A
					B	2	0.42	-	-	-	2	1	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	485	121	-	-	-	485	483	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	51	13	719	590	0.087	50	50	0.1	0.1	6.222	A
				2	A	0.71	0.18	93	59	0.012	0.83	0.79	0.0	0.0	9.949	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	0.71	0.18	-	-	-	0.71	0.79	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	51	13	-	-	-	51	50	0.0	0.0	0.793	A
	C	Entry	1	1	A	458	114	-	-	-	458	456	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	23	6	596	488	0.047	23	22	0.1	0.1	7.468	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	458	114	-	-	-	458	456	0.0	0.0	0.000	A
					B	23	6	-	-	-	23	22	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	52	13	-	-	-	52	51	0.0	0.0	0.000	A
					C	83	21	-	-	-	83	84	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	23	6	574	518	0.044	23	22	0.0	0.0	7.347	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	23	6	-	-	-	23	22	0.0	0.0	0.411	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	199	50	-	-	-	199	197	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

2033 Future Year (Core) + Development (Core) - SDBL Option 2, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Junction 1 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 2 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Junction 3 - Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Info	Simulation	A1 - [Lane Simulation]	This run uses Simulation mode. For detailed information on this mode, please see the User Guide.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Western Priority	T-Junction	Two-way	Two-way	Two-way		5.38	A
2	Eastern Priority	T-Junction	Two-way	Two-way	Two-way		0.94	A
3	Northern Priority	T-Junction	Two-way	Two-way	Two-way		6.87	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.69	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D22	2033 Future Year (Core) + Development (Core) - SDBL Option 2	PM	ONE HOUR	16:45	18:15	15	✓

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	B	3	C	Simple (vertical queueing)	Normal	0	100.00	
	C	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	C	Simple (vertical queueing)	Normal	0	100.00	
	B	3	B	Simple (vertical queueing)	Normal	0	100.00	
3	B	2	B	Simple (vertical queueing)	Normal	0	100.00	
	C	1	B	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	642	100.000
	B	✓				
	C	✓				
2	A	✓				
	B	✓				
	C		ONE HOUR	✓	761	100.000
3	A		ONE HOUR	✓	317	100.000
	B	✓				
	C	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	71	571
	B	190	0	1
	C	754	2	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	572
	B	11	0	115
	C	745	16	0

Junction 3

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	126	191
	B	16	0	0
	C	74	0	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Junction	PCU factor for a cyclist	PCU factor for a cyclist in controlling flow
1	0.20	0.80
2	0.20	0.80
3	0.20	0.80

Junction 1

Heavy Vehicle %

		To		
		A	B	C
From	A	0	4	15
	B	0	0	0
	C	19	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 2

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	15
	B	0	0	0
	C	19	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Junction 3

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	4	0	0

Cyclist %

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	A	0.00	0.0	A	588	883
	B	44.36	2.8	E	177	266
	C	0.03	0.0	A	696	1044
2	A	0.00	0.0	A	522	784
	B	9.44	0.4	A	116	174
	C	0.22	0.1	A	697	1046
3	A	8.34	1.1	A	293	439
	B	8.53	0.0	A	15	22
	C	0.00	0.0	A	67	100

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	477	119	477	483	729	0.0	0.0	0.000	A
	B	143	36	146	142	55	0.0	0.6	16.323	C
	C	584	146	584	582	422	0.0	0.0	0.017	A
2	A	420	105	420	429	579	0.0	0.0	0.000	A
	B	94	24	94	97	10	0.0	0.2	7.697	A
	C	581	145	581	586	506	0.0	0.0	0.186	A
3	A	237	59	237	242	66	0.0	0.0	0.000	A
	B	10	3	10	11	94	0.0	0.0	6.455	A
	C	56	14	56	55	143	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	594	148	594	584	835	0.0	0.0	0.000	A
	B	162	41	160	167	65	0.6	1.1	20.128	C
	C	677	169	677	680	530	0.0	0.0	0.021	A
2	A	522	130	522	515	673	0.0	0.0	0.000	A
	B	110	28	110	113	14	0.2	0.2	8.099	A
	C	677	169	677	683	622	0.0	0.1	0.225	A
3	A	272	68	272	281	79	0.0	0.0	0.015	A
	B	14	4	14	15	110	0.0	0.0	7.022	A
	C	65	16	65	68	162	0.0	0.0	0.000	A

17:15 - 17:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	698	175	698	698	1062	0.0	0.0	0.000	A
	B	222	56	220	205	78	1.1	2.7	40.850	E
	C	846	211	846	838	624	0.0	0.0	0.023	A
2	A	630	157	630	622	844	0.0	0.0	0.000	A
	B	143	36	143	138	19	0.2	0.4	9.271	A
	C	851	213	851	843	761	0.1	0.0	0.196	A
3	A	364	91	365	352	98	0.0	0.7	4.819	A
	B	19	5	20	19	143	0.0	0.0	7.507	A
	C	79	20	79	81	222	0.0	0.0	0.000	A

17:30 - 17:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	711	178	711	709	1027	0.0	0.0	0.000	A
	B	204	51	202	209	86	2.7	2.8	44.359	E
	C	828	207	828	840	629	0.0	0.0	0.022	A
2	A	624	156	624	623	827	0.0	0.0	0.000	A
	B	138	34	138	138	18	0.4	0.4	9.435	A
	C	833	208	833	843	750	0.0	0.0	0.222	A
3	A	347	87	344	348	103	0.7	1.1	8.343	A
	B	18	4	18	18	138	0.0	0.0	8.528	A
	C	85	21	85	84	204	0.0	0.0	0.000	A

17:45 - 18:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	576	144	576	582	855	0.0	0.0	0.000	A
	B	186	46	187	187	64	2.8	1.4	30.709	D
	C	672	168	672	676	515	0.0	0.0	0.026	A
2	A	512	128	512	519	665	0.0	0.0	0.000	A
	B	120	30	120	119	15	0.4	0.3	8.496	A
	C	669	167	670	678	621	0.0	0.0	0.197	A
3	A	302	76	304	298	79	1.1	0.0	3.002	A
	B	15	4	15	15	120	0.0	0.0	7.278	A
	C	64	16	64	66	186	0.0	0.0	0.000	A

18:00 - 18:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	475	119	475	487	711	0.0	0.0	0.000	A
	B	145	36	141	148	50	1.4	0.9	17.035	C
	C	571	143	571	569	427	0.0	0.0	0.022	A
2	A	426	107	426	435	569	0.0	0.0	0.000	A
	B	90	23	91	93	12	0.3	0.1	7.441	A
	C	573	143	573	573	509	0.0	0.0	0.172	A
3	A	235	59	235	238	62	0.0	0.0	0.001	A
	B	12	3	12	12	90	0.0	0.0	6.910	A
	C	50	13	50	55	145	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	477	477	483	0.0	0.0	0.000	A
		Exit	1	1		729	729	722	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.24	0.24	0.55	0.0	0.0	4.602	A
				2	A	144	146	142	0.0	0.6	13.929	B
			2	1	(A, C)	143	144	144	0.0	0.1	2.437	A
		Exit	1	1		55	55	55	0.0	0.0	0.000	A
	C	Entry	1	1	A	583	583	580	0.0	0.0	0.000	A
				2	B	0.36	0.59	1	0.0	0.0	6.272	A
			2	1	(A, B)	584	584	582	0.0	0.0	0.000	A
		Exit	1	1		422	422	430	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	420	420	429	0.0	0.0	0.000	A
		Exit	1	1		579	579	583	0.0	0.0	0.000	A
	B	Entry	1	1	C	86	86	88	0.0	0.2	6.245	A
				2	A	8	8	8	0.0	0.0	11.066	B
			2	1	(A, C)	94	94	97	0.0	0.0	1.041	A
		Exit	1	1		10	10	11	0.0	0.0	0.000	A
	C	Entry	1	1	A	571	571	575	0.0	0.0	0.000	A
				2	B	10	10	11	0.0	0.0	7.951	A
			2	1	(A, B)	581	581	586	0.0	0.0	0.000	A
		Exit	1	1		506	506	517	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	237	237	242	0.0	0.0	0.000	A
		Exit	1	1		66	66	67	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	10	10	11	0.0	0.0	6.313	A
			2	1	(A, C)	10	10	11	0.0	0.0	0.142	A
		Exit	1	1		94	94	97	0.0	0.0	0.004	A
	C	Entry	1	1	A, B	56	56	55	0.0	0.0	0.000	A
		Exit	1	1		143	143	145	0.0	0.0	0.095	A

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	594	594	584	0.0	0.0	0.000	A
		Exit	1	1		835	835	845	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.12	0.12	0.51	0.0	0.0	8.411	A
				2	A	161	160	166	0.6	0.8	15.777	C
			2	1	(A, C)	162	162	168	0.1	0.2	4.351	A
		Exit	1	1		65	65	68	0.0	0.0	0.000	A
	C	Entry	1	1	A	675	675	678	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	6.207	A
			2	1	(A, B)	677	677	680	0.0	0.0	0.000	A
		Exit	1	1		530	530	519	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	522	522	515	0.0	0.0	0.000	A
		Exit	1	1		673	673	677	0.0	0.0	0.000	A
	B	Entry	1	1	C	101	100	103	0.2	0.2	6.289	A
				2	A	10	10	9	0.0	0.0	12.388	B
			2	1	(A, C)	110	110	113	0.0	0.0	1.305	A
		Exit	1	1		14	14	15	0.0	0.0	0.000	A
	C	Entry	1	1	A	663	663	668	0.0	0.0	0.000	A
				2	B	14	14	15	0.0	0.1	8.682	A
			2	1	(A, B)	677	677	683	0.0	0.0	0.000	A
		Exit	1	1		622	622	618	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	272	272	281	0.0	0.0	0.015	A
		Exit	1	1		79	79	82	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	14	14	15	0.0	0.0	6.888	A
			2	1	(A, C)	14	14	15	0.0	0.0	0.134	A
		Exit	1	1		110	110	113	0.0	0.0	0.001	A
	C	Entry	1	1	A, B	65	65	68	0.0	0.0	0.000	A
		Exit	1	1		162	162	169	0.0	0.0	0.435	A

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	698	698	698	0.0	0.0	0.000	A
		Exit	1	1		1062	1062	1041	0.0	0.0	0.000	A
	B	Entry	1	1	C	1	1	0.83	0.0	0.0	7.153	A
				2	A	221	218	204	0.8	1.5	23.106	C
			2	1	(A, C)	222	222	208	0.2	1.2	17.716	C
		Exit	1	1		78	78	81	0.0	0.0	0.000	A
	C	Entry	1	1	A	844	844	836	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	8.821	A
			2	1	(A, B)	846	846	838	0.0	0.0	0.000	A
		Exit	1	1		624	624	620	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	630	630	622	0.0	0.0	0.000	A
		Exit	1	1		844	844	835	0.0	0.0	0.000	A
	B	Entry	1	1	C	130	131	126	0.2	0.2	6.575	A
				2	A	12	12	11	0.0	0.0	15.550	C
			2	1	(A, C)	143	143	138	0.0	0.1	1.970	A
		Exit	1	1		19	19	19	0.0	0.0	0.000	A
	C	Entry	1	1	A	832	832	824	0.0	0.0	0.000	A
				2	B	19	19	19	0.1	0.0	7.553	A
			2	1	(A, B)	851	851	842	0.0	0.0	0.000	A
		Exit	1	1		761	761	748	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	364	365	352	0.0	0.7	4.819	A
		Exit	1	1		98	98	99	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	19	20	19	0.0	0.0	7.275	A
			2	1	(A, C)	19	19	19	0.0	0.0	0.231	A
		Exit	1	1		143	143	138	0.0	0.0	0.013	A
	C	Entry	1	1	A, B	79	79	81	0.0	0.0	0.000	A
		Exit	1	1		221	222	212	0.0	0.6	7.833	A

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	711	711	709	0.0	0.0	0.000	A
		Exit	1	1		1027	1027	1047	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.48	0.48	0.75	0.0	0.0	7.439	A
				2	A	202	202	208	1.5	1.5	24.079	C
			2	1	(A, C)	204	203	209	1.2	1.3	20.330	C
		Exit	1	1		86	86	84	0.0	0.0	0.000	A
	C	Entry	1	1	A	826	826	838	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.193	A
			2	1	(A, B)	828	828	840	0.0	0.0	0.000	A
		Exit	1	1		629	629	628	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	624	624	623	0.0	0.0	0.000	A
		Exit	1	1		827	827	838	0.0	0.0	0.000	A
	B	Entry	1	1	C	126	126	125	0.2	0.2	6.595	A
				2	A	12	12	13	0.0	0.0	14.432	B
			2	1	(A, C)	138	138	138	0.1	0.1	2.097	A
		Exit	1	1		18	18	18	0.0	0.0	0.000	A
	C	Entry	1	1	A	815	815	825	0.0	0.0	0.000	A
				2	B	18	18	18	0.0	0.0	8.925	A
			2	1	(A, B)	833	833	843	0.0	0.0	0.000	A
		Exit	1	1		750	750	749	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	347	344	348	0.7	1.1	8.343	A
		Exit	1	1		103	103	102	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	18	18	18	0.0	0.0	7.941	A
			2	1	(A, C)	18	18	18	0.0	0.0	0.587	A
		Exit	1	1		138	138	138	0.0	0.0	0.034	A
	C	Entry	1	1	A, B	85	85	84	0.0	0.0	0.000	A
		Exit	1	1		206	204	210	0.6	0.6	9.630	A

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	576	576	582	0.0	0.0	0.000	A
		Exit	1	1		855	855	860	0.0	0.0	0.000	A
	B	Entry	1	1	C	1	1	1	0.0	0.0	9.551	A
				2	A	184	185	186	1.5	1.0	19.448	C
			2	1	(A, C)	186	186	185	1.3	0.5	11.496	B
		Exit	1	1		64	64	66	0.0	0.0	0.000	A
	C	Entry	1	1	A	670	670	674	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	7.100	A
			2	1	(A, B)	672	672	676	0.0	0.0	0.000	A
		Exit	1	1		515	515	519	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	512	512	519	0.0	0.0	0.000	A
		Exit	1	1		665	665	673	0.0	0.0	0.000	A
	B	Entry	1	1	C	110	110	109	0.2	0.2	6.336	A
				2	A	10	10	10	0.0	0.0	12.457	B
			2	1	(A, C)	120	120	119	0.1	0.0	1.654	A
		Exit	1	1		15	15	15	0.0	0.0	0.000	A
	C	Entry	1	1	A	655	655	663	0.0	0.0	0.000	A
				2	B	15	15	15	0.0	0.0	7.799	A
			2	1	(A, B)	669	669	677	0.0	0.0	0.000	A
		Exit	1	1		621	621	628	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	302	304	298	1.1	0.0	3.002	A
		Exit	1	1		79	79	80	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	15	15	15	0.0	0.0	7.104	A
			2	1	(A, C)	15	15	15	0.0	0.0	0.174	A
		Exit	1	1		120	120	119	0.0	0.0	0.105	A
	C	Entry	1	1	A, B	64	64	66	0.0	0.0	0.000	A
		Exit	1	1		184	186	182	0.6	0.0	4.179	A

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	B, C	475	475	487	0.0	0.0	0.000	A
		Exit	1	1		711	711	715	0.0	0.0	0.000	A
	B	Entry	1	1	C	0.36	0.36	0.63	0.0	0.0	4.219	A
				2	A	142	141	147	1.0	0.7	14.313	B
			2	1	(A, C)	145	143	147	0.5	0.2	2.917	A
		Exit	1	1		50	50	55	0.0	0.0	0.000	A
	C	Entry	1	1	A	569	569	568	0.0	0.0	0.000	A
				2	B	2	2	2	0.0	0.0	6.622	A
			2	1	(A, B)	571	571	569	0.0	0.0	0.000	A
		Exit	1	1		427	427	434	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	426	426	435	0.0	0.0	0.000	A
		Exit	1	1		569	569	569	0.0	0.0	0.000	A
	B	Entry	1	1	C	83	83	85	0.2	0.1	6.074	A
				2	A	7	8	8	0.0	0.0	10.782	B
			2	1	(A, C)	90	90	92	0.0	0.0	0.960	A
		Exit	1	1		12	12	12	0.0	0.0	0.000	A
	C	Entry	1	1	A	562	562	561	0.0	0.0	0.000	A
				2	B	12	12	12	0.0	0.0	6.834	A
			2	1	(A, B)	573	573	573	0.0	0.0	0.000	A
		Exit	1	1		509	509	520	0.0	0.0	0.000	A
3	A	Entry	1	1	B, C	235	235	238	0.0	0.0	0.001	A
		Exit	1	1		62	62	67	0.0	0.0	0.000	A
	B	Entry	1	1	C	0	0	0	0.0	0.0	0.000	A
				2	A	12	12	12	0.0	0.0	6.605	A
			2	1	(A, C)	12	12	12	0.0	0.0	0.303	A
		Exit	1	1		90	90	92	0.0	0.0	0.008	A
	C	Entry	1	1	A, B	50	50	55	0.0	0.0	0.000	A
		Exit	1	1		145	145	146	0.0	0.0	0.208	A

Lane movements: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	55	14	-	-	-	55	54	0.0	0.0	0.000	A
					C	422	106	-	-	-	422	430	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.24	0.06	83	59	0.004	0.24	0.55	0.0	0.0	4.602	A
				2	A	144	36	575	368	0.391	146	142	0.0	0.6	13.929	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	142	36	-	-	-	144	144	0.0	0.1	2.439	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.24	0.06	-	-	-	0.24	0.55	0.0	0.0	1.853	A
	C	Entry	1	1	A	583	146	-	-	-	583	580	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0.36	0.09	176	145	0.002	0.59	1	0.0	0.0	6.272	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	583	146	-	-	-	583	580	0.0	0.0	0.000	A

			2	1	B	0.36	0.09	-	-	-	0.36	1	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	420	105	-	-	-	420	429	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	86	22	719	601	0.144	86	88	0.0	0.2	6.245	A
				2	A	8	2	431	276	0.028	8	8	0.0	0.0	11.066	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	8	2	-	-	-	8	8	0.0	0.0	1.129	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	87	22	-	-	-	86	89	0.0	0.0	1.033	A
	C	Entry	1	1	A	571	143	-	-	-	571	575	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	10	3	561	470	0.022	10	11	0.0	0.0	7.951	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	571	143	-	-	-	571	575	0.0	0.0	0.000	A
					B	10	3	-	-	-	10	12	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	94	24	-	-	-	94	97	0.0	0.0	0.000	A
					C	143	36	-	-	-	143	145	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	10	3	540	492	0.021	10	11	0.0	0.0	6.313	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	10	3	-	-	-	10	11	0.0	0.0	0.142	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	56	14	-	-	-	56	55	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	63	16	-	-	-	63	66	0.0	0.0	0.000	A
					C	530	132	-	-	-	530	518	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.12	0.03	76	55	0.002	0.12	0.51	0.0	0.0	8.411	A
				2	A	161	40	575	324	0.498	160	166	0.6	0.8	15.777	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	162	41	-	-	-	161	168	0.1	0.2	4.361	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.12	0.03	-	-	-	0.12	0.51	0.0	0.0	0.975	A
			1	1	A	675	169	-	-	-	675	678	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A

	C	Entry		2	B	2	0.56	220	172	0.013	2	2	0.0	0.0	6.207	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	675	169	-	-	-	675	678	0.0	0.0	0.000	A
					B	2	0.56	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	522	130	-	-	-	522	515	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	101	25	719	575	0.175	100	103	0.2	0.2	6.289	A
				2	A	10	2	451	263	0.037	10	9	0.0	0.0	12.388	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	10	2	-	-	-	10	9	0.0	0.0	0.511	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	101	25	-	-	-	101	103	0.0	0.0	1.378	A
	C	Entry	1	1	A	663	166	-	-	-	663	668	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	14	4	584	471	0.030	14	15	0.0	0.1	8.682	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	663	166	-	-	-	663	668	0.0	0.0	0.000	A
					B	14	4	-	-	-	14	15	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	110	28	-	-	-	110	113	0.0	0.0	0.005	A
					C	162	40	-	-	-	162	169	0.0	0.0	0.022	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	14	4	563	503	0.028	14	15	0.0	0.0	6.888	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	14	4	-	-	-	14	15	0.0	0.0	0.134	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	65	16	-	-	-	65	68	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	76	19	-	-	-	76	79	0.0	0.0	0.000	A
					C	622	156	-	-	-	622	619	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.27	121	73	0.015	1	0.83	0.0	0.0	7.153	A
				2	A	221	55	575	271	0.813	218	204	0.8	1.5	23.106	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	221	55	-	-	-	221	207	0.2	1.2	17.737	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.27	-	-	-	1	0.83	0.0	0.0	12.355	B
					A	844	211	-	-	-	844	836	0.0	0.0	0.000	A

	C	Entry	1	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.50	226	167	0.012	2	2	0.0	0.0	8.821	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	844	211	-	-	-	844	836	0.0	0.0	0.000	A
					B	2	0.50	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	630	157	-	-	-	630	622	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	130	33	719	546	0.239	131	126	0.2	0.2	6.575	A
				2	A	12	3	470	226	0.055	12	11	0.0	0.0	15.550	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	12	3	-	-	-	12	11	0.0	0.0	0.963	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	131	33	-	-	-	130	127	0.0	0.1	2.061	A
	C	Entry	1	1	A	832	208	-	-	-	832	824	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	19	5	590	450	0.041	19	19	0.1	0.0	7.553	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	832	208	-	-	-	832	824	0.0	0.0	0.000	A
					B	19	5	-	-	-	19	18	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	142	36	-	-	-	143	138	0.0	0.2	4.094	A
					C	221	55	-	-	-	221	214	0.0	0.5	5.286	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	19	5	569	494	0.039	20	19	0.0	0.0	7.275	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	19	5	-	-	-	19	19	0.0	0.0	0.231	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	79	20	-	-	-	79	81	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	83	21	-	-	-	83	82	0.0	0.0	0.000	A
					C	628	157	-	-	-	628	627	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.48	0.12	102	65	0.007	0.48	0.75	0.0	0.0	7.439	A
				2	A	202	51	575	272	0.743	202	208	1.5	1.5	24.079	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					A	204	51	-	-	-	202	209	1.2	1.3	20.346	C

1			2	1	B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.48	0.12	-	-	-	0.48	0.75	0.0	0.0	15.813	C
	C	Entry	1	1	A	826	206	-	-	-	826	838	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.59	289	212	0.011	2	2	0.0	0.0	7.193	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	826	206	-	-	-	826	838	0.0	0.0	0.000	A
					B	2	0.59	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	624	156	-	-	-	624	623	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	126	31	719	542	0.232	126	125	0.2	0.2	6.595	A
				2	A	12	3	470	228	0.052	12	13	0.0	0.0	14.432	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	12	3	-	-	-	12	13	0.0	0.0	1.653	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	126	31	-	-	-	126	125	0.1	0.1	2.142	A
	C	Entry	1	1	A	815	204	-	-	-	815	825	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	18	4	584	446	0.039	18	18	0.0	0.0	8.925	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	815	204	-	-	-	815	825	0.0	0.0	0.000	A
					B	18	4	-	-	-	18	18	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	140	35	-	-	-	138	138	0.2	0.5	8.080	A
					C	207	52	-	-	-	206	210	0.5	0.6	8.516	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	18	4	563	487	0.036	18	18	0.0	0.0	7.941	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	18	4	-	-	-	18	18	0.0	0.0	0.587	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	85	21	-	-	-	85	84	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	62	15	-	-	-	62	64	0.0	0.0	0.000	A
					C	514	128	-	-	-	514	518	0.0	0.0	0.000	A
				1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

1	B	Entry	1		C	1	0.33	166	110	0.012	1	1	0.0	0.0	9.551	A
				2	A	184	46	575	329	0.561	185	186	1.5	1.0	19.448	C
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	184	46	-	-	-	184	184	1.3	0.5	11.539	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	1	0.33	-	-	-	1	1	0.0	0.0	4.232	A
	C	Entry	1	1	A	670	167	-	-	-	670	674	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.56	276	215	0.010	2	2	0.0	0.0	7.100	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	670	167	-	-	-	670	674	0.0	0.0	0.000	A
					B	2	0.56	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	512	128	-	-	-	512	519	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	110	27	719	574	0.191	110	109	0.2	0.2	6.336	A
				2	A	10	3	446	255	0.040	10	10	0.0	0.0	12.457	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	10	3	-	-	-	10	10	0.0	0.0	1.034	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	110	27	-	-	-	110	109	0.1	0.0	1.711	A
	C	Entry	1	1	A	655	164	-	-	-	655	663	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	15	4	584	472	0.031	15	15	0.0	0.0	7.799	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	655	164	-	-	-	655	663	0.0	0.0	0.000	A
					B	15	4	-	-	-	15	14	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	119	30	-	-	-	120	119	0.5	0.0	2.733	A
					C	183	46	-	-	-	184	179	0.6	0.0	3.180	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	15	4	563	500	0.030	15	15	0.0	0.0	7.104	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	15	4	-	-	-	15	15	0.0	0.0	0.174	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	64	16	-	-	-	64	66	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	To Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Simulation max flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	49	12	-	-	-	49	53	0.0	0.0	0.000	A

1					C	426	107	-	-	-	426	433	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.36	0.09	89	68	0.005	0.36	0.63	0.0	0.0	4.219	A
				2	A	142	36	575	367	0.388	141	147	1.0	0.7	14.313	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	144	36	-	-	-	142	146	0.5	0.2	2.924	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0.36	0.09	-	-	-	0.36	0.63	0.0	0.0	1.278	A
	C	Entry	1	1	A	569	142	-	-	-	569	568	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	2	0.39	207	170	0.009	2	2	0.0	0.0	6.622	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	569	142	-	-	-	569	568	0.0	0.0	0.000	A
					B	2	0.39	-	-	-	2	2	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
2	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	426	107	-	-	-	426	435	0.0	0.0	0.000	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	83	21	719	599	0.138	83	85	0.2	0.1	6.074	A
				2	A	7	2	441	281	0.027	8	8	0.0	0.0	10.782	B
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	7	2	-	-	-	7	8	0.0	0.0	0.758	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	83	21	-	-	-	83	84	0.0	0.0	0.979	A
	C	Entry	1	1	A	562	140	-	-	-	562	561	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
				2	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	12	3	584	486	0.024	12	12	0.0	0.0	6.834	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
			2	1	A	562	140	-	-	-	562	561	0.0	0.0	0.000	A
					B	12	3	-	-	-	12	12	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
3	A	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					B	90	23	-	-	-	90	92	0.0	0.0	0.000	A
					C	145	36	-	-	-	145	146	0.0	0.0	0.002	A
	B	Entry	1	1	A	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
				2	A	12	3	569	516	0.023	12	12	0.0	0.0	6.605	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
			2	1	A	12	3	-	-	-	12	12	0.0	0.0	0.303	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
	C	Entry	1	1	A	50	13	-	-	-	50	55	0.0	0.0	0.000	A
					B	0	0	0	0	0.000	0	0	0.0	0.0	0.000	A
					C	0	0	0	0	0.000	0	0	0.0	0.0	0.000	

Junctions 10

PICADY 10 - Priority Intersection Module

Filename: 05920 Harpenden Road_Sandridgebury Drive 2028-2033 Outputs.j10
Path: C:\Users\emma beynon\OneDrive - Phil Jones Associates\05920 North St Albans\3. Technical\3.2 Modelling\Junctions 10 \July 2024 Selected Scenarios
Report generation date: 23/07/2024 16:36:15

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2028 Opening Year									
Stream B-C	D3	0.8	12.39	0.43	B	D4	0.1	8.02	0.12	A
Stream B-A		0.2	18.93	0.17	C		0.5	26.71	0.33	D
Stream C-AB		3.7	13.02	0.66	B		3.4	8.36	0.56	A
	2033 Future Year (Core)									
Stream B-C	D5	0.8	13.27	0.46	B	D6	0.2	8.49	0.14	A
Stream B-A		0.2	20.88	0.19	C		0.6	30.71	0.37	D
Stream C-AB		4.7	15.37	0.71	C		4.4	9.58	0.63	A
	2033 Future Year (Core) + Development (Core) - SDBL Option 2									
Stream B-C	D23	0.5	15.23	0.31	C	D24	0.0	8.39	0.03	A
Stream B-A		0.6	56.65	0.37	F		0.5	53.51	0.33	F
Stream C-AB		4.9	10.63	0.58	B		10.8	15.28	0.75	C

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	22/11/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PJA\Matthew Wykes
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2028 Opening Year	AM	ONE HOUR	07:45	09:15	15
D4	2028 Opening Year	PM	ONE HOUR	16:45	18:15	15
D5	2033 Future Year (Core)	AM	ONE HOUR	07:45	09:15	15
D6	2033 Future Year (Core)	PM	ONE HOUR	16:45	18:15	15
D23	2033 Future Year (Core) + Development (Core) - SDBL Option 2	AM	ONE HOUR	07:45	09:15	15
D24	2033 Future Year (Core) + Development (Core) - SDBL Option 2	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2028 Opening Year, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Harpenden Road / Sandridgebury Lane	T-Junction	Two-way	Two-way	Two-way		5.61	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.61	A

Arms

Arms

Arm	Name	Description	Arm type
A	Harpenden Road N		Major
B	Sandridgebury Drive		Minor
C	Harpenden Road S		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.35			80.8	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	4.27	4.18	4.02	3.91	✓	1.00	51	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	608	0.104	0.264	0.166	0.376
B-C	722	0.104	0.263	-	-
C-B	621	0.226	0.226	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2028 Opening Year	AM	ONE HOUR	07:45	09:15	15

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	670	100.000
B		✓	238	100.000
C		✓	724	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	101	569
	B	37	0	201
	C	546	178	0

Vehicle Mix

Heavy Vehicle %

		To		
		A	B	C
From	A	0	6	32
	B	3	0	2
	C	13	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.43	12.39	0.8	B
B-A	0.17	18.93	0.2	C
C-AB	0.66	13.02	3.7	B
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	151	589	0.257	150	0.3	8.314	A
B-A	28	363	0.077	28	0.1	11.039	B
C-AB	275	802	0.343	271	0.9	7.272	A
C-A	270			270			
A-B	76			76			
A-C	428			428			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	181	561	0.322	180	0.5	9.638	A
B-A	33	311	0.107	33	0.1	13.316	B
C-AB	386	845	0.457	383	1.5	8.440	A
C-A	265			265			
A-B	91			91			
A-C	512			512			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	221	518	0.427	220	0.7	12.287	B
B-A	41	238	0.171	40	0.2	18.688	C
C-AB	592	906	0.653	584	3.5	12.245	B
C-A	205			205			
A-B	111			111			
A-C	626			626			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	221	517	0.428	221	0.8	12.394	B
B-A	41	237	0.172	41	0.2	18.934	C
C-AB	598	910	0.657	597	3.7	13.019	B
C-A	199			199			
A-B	111			111			
A-C	626			626			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	181	560	0.323	182	0.5	9.729	A
B-A	33	309	0.108	34	0.1	13.496	B
C-AB	391	850	0.460	400	1.7	8.988	A
C-A	259			259			
A-B	91			91			
A-C	512			512			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	151	589	0.257	152	0.4	8.421	A
B-A	28	361	0.077	28	0.1	11.136	B
C-AB	278	805	0.346	281	1.0	7.516	A
C-A	267			267			
A-B	76			76			
A-C	428			428			

2028 Opening Year, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Harpenden Road / Sandridgebury Lane	T-Junction	Two-way	Two-way	Two-way		3.54	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.54	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2028 Opening Year	PM	ONE HOUR	16:45	18:15	15

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	632	100.000
B		✓	122	100.000
C		✓	955	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	36	596
	B	64	0	58
	C	842	113	0

Vehicle Mix

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	1
	B	6	0	0
	C	18	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.12	8.02	0.1	A
B-A	0.33	26.71	0.5	D
C-AB	0.56	8.36	3.4	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	44	614	0.071	43	0.1	6.304	A
B-A	48	329	0.147	47	0.2	13.541	B
C-AB	247	966	0.256	244	0.8	5.541	A
C-A	472			472			
A-B	27			27			
A-C	449			449			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	52	578	0.090	52	0.1	6.846	A
B-A	58	281	0.205	57	0.3	17.053	C
C-AB	375	1044	0.359	372	1.4	6.021	A
C-A	484			484			
A-B	32			32			
A-C	536			536			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	64	515	0.124	64	0.1	7.983	A
B-A	70	215	0.328	70	0.5	26.152	D
C-AB	646	1155	0.560	639	3.3	7.983	A
C-A	405			405			
A-B	40			40			
A-C	656			656			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	64	513	0.125	64	0.1	8.021	A
B-A	70	213	0.331	70	0.5	26.712	D
C-AB	655	1160	0.565	654	3.4	8.360	A
C-A	397			397			
A-B	40			40			
A-C	656			656			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	52	577	0.090	52	0.1	6.868	A
B-A	58	279	0.207	58	0.3	17.401	C
C-AB	381	1050	0.363	389	1.5	6.344	A
C-A	477			477			
A-B	32			32			
A-C	536			536			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	44	613	0.071	44	0.1	6.322	A
B-A	48	327	0.147	49	0.2	13.711	B
C-AB	251	969	0.259	254	0.9	5.701	A
C-A	468			468			
A-B	27			27			
A-C	449			449			

2033 Future Year (Core), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Harpenden Road / Sandridgebury Lane	T-Junction	Two-way	Two-way	Two-way		6.65	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.65	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2033 Future Year (Core)	AM	ONE HOUR	07:45	09:15	15

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	692	100.000
B		✓	249	100.000
C		✓	753	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	105	587
	B	39	0	210
	C	567	186	0

Vehicle Mix

Heavy Vehicle %

		To		
		A	B	C
From	A	0	6	31
	B	3	0	2
	C	13	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.46	13.27	0.8	B
B-A	0.19	20.88	0.2	C
C-AB	0.71	15.37	4.7	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	158	584	0.271	157	0.4	8.563	A
B-A	29	354	0.083	29	0.1	11.414	B
C-AB	296	810	0.365	292	1.0	7.453	A
C-A	271			271			
A-B	79			79			
A-C	442			442			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	189	554	0.341	188	0.5	10.013	B
B-A	35	299	0.117	35	0.1	14.005	B
C-AB	418	855	0.489	415	1.7	8.867	A
C-A	259			259			
A-B	94			94			
A-C	528			528			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	231	509	0.455	230	0.8	13.119	B
B-A	43	223	0.193	43	0.2	20.498	C
C-AB	649	920	0.705	638	4.4	14.032	B
C-A	180			180			
A-B	116			116			
A-C	646			646			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	231	508	0.455	231	0.8	13.268	B
B-A	43	220	0.195	43	0.2	20.880	C
C-AB	658	926	0.710	657	4.7	15.373	C
C-A	171			171			
A-B	116			116			
A-C	646			646			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	189	554	0.341	190	0.5	10.131	B
B-A	35	296	0.118	35	0.1	14.260	B
C-AB	426	863	0.494	437	2.0	9.642	A
C-A	251			251			
A-B	94			94			
A-C	528			528			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	158	584	0.271	159	0.4	8.656	A
B-A	29	351	0.084	30	0.1	11.529	B
C-AB	300	814	0.368	303	1.1	7.743	A
C-A	267			267			
A-B	79			79			
A-C	442			442			

2033 Future Year (Core), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Harpenden Road / Sandridgebury Lane	T-Junction	Two-way	Two-way	Two-way		4.24	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.24	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2033 Future Year (Core)	PM	ONE HOUR	16:45	18:15	15

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	660	100.000
B		✓	128	100.000
C		✓	991	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	38	622
	B	67	0	61
	C	873	118	0

Vehicle Mix

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	1
	B	6	0	0
	C	17	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.14	8.49	0.2	A
B-A	0.37	30.71	0.6	D
C-AB	0.63	9.58	4.4	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	606	0.076	46	0.1	6.416	A
B-A	50	319	0.158	50	0.2	14.149	B
C-AB	270	980	0.275	266	0.9	5.592	A
C-A	476			476			
A-B	29			29			
A-C	468			468			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55	567	0.097	55	0.1	7.022	A
B-A	60	269	0.224	60	0.3	18.246	C
C-AB	414	1061	0.390	411	1.6	6.204	A
C-A	477			477			
A-B	34			34			
A-C	559			559			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	67	494	0.136	67	0.2	8.418	A
B-A	74	200	0.370	73	0.6	29.770	D
C-AB	728	1177	0.618	718	4.1	8.955	A
C-A	363			363			
A-B	42			42			
A-C	685			685			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	67	491	0.137	67	0.2	8.486	A
B-A	74	198	0.373	74	0.6	30.713	D
C-AB	741	1184	0.625	739	4.4	9.583	A
C-A	351			351			
A-B	42			42			
A-C	685			685			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55	565	0.097	55	0.1	7.057	A
B-A	60	266	0.226	61	0.3	18.758	C
C-AB	423	1070	0.395	433	1.8	6.618	A
C-A	468			468			
A-B	34			34			
A-C	559			559			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	606	0.076	46	0.1	6.437	A
B-A	50	317	0.159	51	0.2	14.360	B
C-AB	274	984	0.279	277	1.0	5.770	A
C-A	472			472			
A-B	29			29			
A-C	468			468			

2033 Future Year (Core) + Development (Core) - SDBL Option 2, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Harpenden Road / Sandridgebury Lane	T-Junction	Two-way	Two-way	Two-way		3.69	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.69	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D23	2033 Future Year (Core) + Development (Core) - SDBL Option 2	AM	ONE HOUR	07:45	09:15	15

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1122	100.000
B		✓	134	100.000
C		✓	903	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	76	1046
	B	35	0	99
	C	816	87	0

Vehicle Mix

Heavy Vehicle %

		To		
		A	B	C
From	A	0	6	56
	B	3	0	2
	C	36	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.31	15.23	0.5	C
B-A	0.37	56.65	0.6	F
C-AB	0.58	10.63	4.9	B
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	75	495	0.151	74	0.2	8.699	A
B-A	26	267	0.099	26	0.1	15.339	C
C-AB	208	897	0.232	204	0.9	6.399	A
C-A	472			472			
A-B	57			57			
A-C	787			787			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	89	446	0.199	89	0.3	10.264	B
B-A	31	200	0.158	31	0.2	21.969	C
C-AB	329	968	0.340	326	1.6	7.023	A
C-A	483			483			
A-B	68			68			
A-C	940			940			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	109	355	0.307	108	0.4	14.847	B
B-A	39	106	0.364	37	0.5	52.935	F
C-AB	610	1073	0.569	599	4.5	9.847	A
C-A	384			384			
A-B	84			84			
A-C	1152			1152			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	109	350	0.312	109	0.5	15.234	C
B-A	39	104	0.372	38	0.6	56.650	F
C-AB	623	1082	0.576	622	4.9	10.633	B
C-A	371			371			
A-B	84			84			
A-C	1152			1152			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	89	444	0.200	90	0.3	10.379	B
B-A	31	196	0.160	33	0.2	22.869	C
C-AB	338	979	0.346	350	1.9	7.660	A
C-A	473			473			
A-B	68			68			
A-C	940			940			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	75	495	0.151	75	0.2	8.752	A
B-A	26	266	0.099	27	0.1	15.546	C
C-AB	212	902	0.235	216	1.0	6.677	A
C-A	468			468			
A-B	57			57			
A-C	787			787			

2033 Future Year (Core) + Development (Core) - SDBL Option 2, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Harpenden Road / Sandridgebury Lane	T-Junction	Two-way	Two-way	Two-way		5.41	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.41	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D24	2033 Future Year (Core) + Development (Core) - SDBL Option 2	PM	ONE HOUR	16:45	18:15	15

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	877	100.000
B		✓	43	100.000
C		✓	1216	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	33	844
	B	32	0	11
	C	1138	78	0

Vehicle Mix

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	25
	B	6	0	0
	C	37	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.03	8.39	0.0	A
B-A	0.33	53.51	0.5	F
C-AB	0.75	15.28	10.8	C
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	573	0.014	8	0.0	6.372	A
B-A	24	257	0.094	24	0.1	16.297	C
C-AB	262	1104	0.238	258	1.1	5.394	A
C-A	653			653			
A-B	25			25			
A-C	635			635			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	530	0.019	10	0.0	6.920	A
B-A	29	196	0.147	28	0.2	22.798	C
C-AB	453	1216	0.372	448	2.2	6.043	A
C-A	640			640			
A-B	30			30			
A-C	759			759			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	12	448	0.027	12	0.0	8.260	A
B-A	35	111	0.319	34	0.5	49.220	E
C-AB	992	1381	0.718	965	8.8	11.729	B
C-A	347			347			
A-B	36			36			
A-C	929			929			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	12	441	0.027	12	0.0	8.387	A
B-A	35	106	0.332	35	0.5	53.514	F
C-AB	1054	1400	0.753	1047	10.8	15.275	C
C-A	284			284			
A-B	36			36			
A-C	929			929			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	528	0.019	10	0.0	6.955	A
B-A	29	189	0.152	30	0.2	24.161	C
C-AB	486	1244	0.391	518	2.6	7.054	A
C-A	607			607			
A-B	30			30			
A-C	759			759			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	573	0.014	8	0.0	6.382	A
B-A	24	255	0.094	24	0.1	16.541	C
C-AB	270	1110	0.243	275	1.2	5.666	A
C-A	646			646			
A-B	25			25			
A-C	635			635			

Appendix L Modal Shift Junction Capacity Modelling Outputs

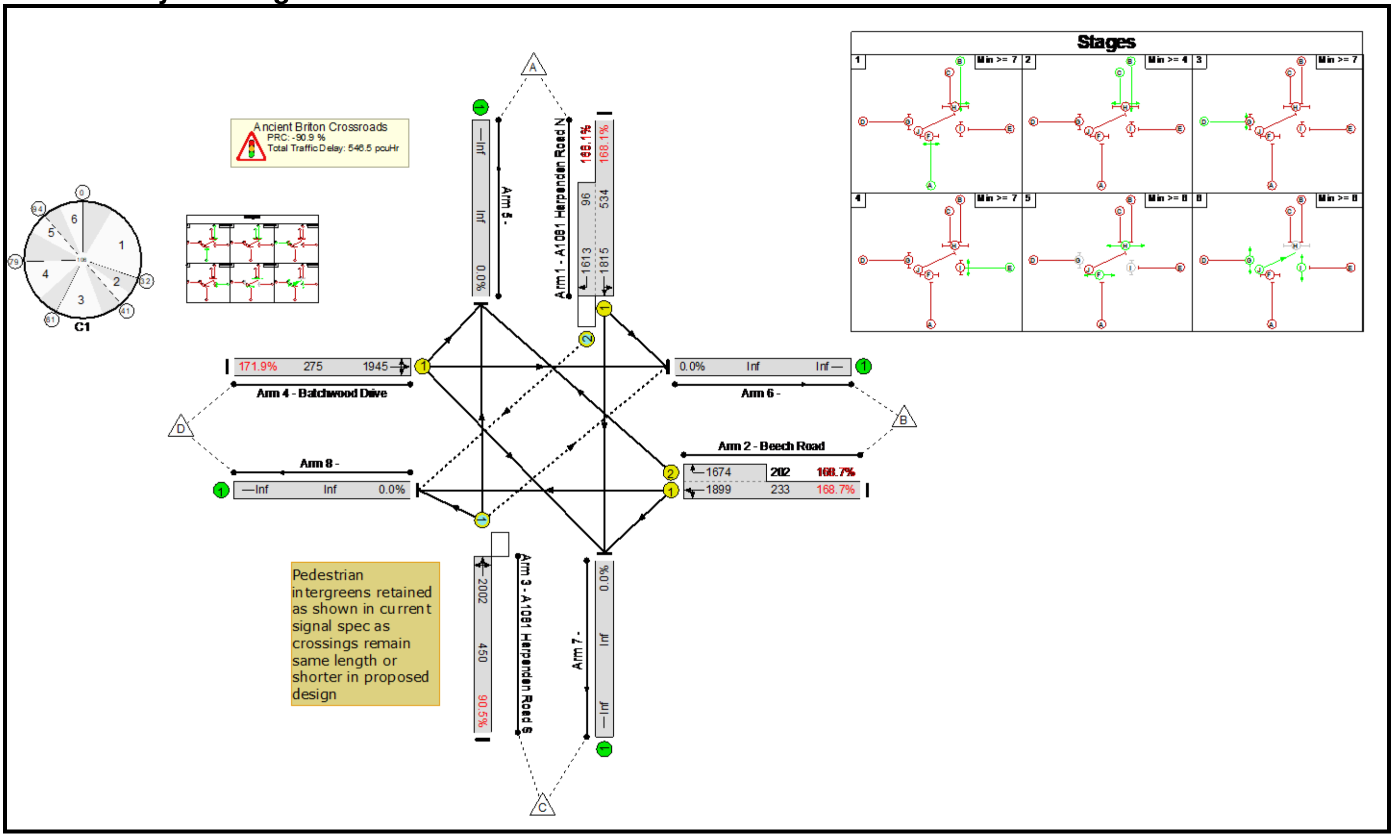
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-Ancient Briton Signals - FY Proposed Layout - Revised Modelling.lsg3x
Author:	
Company:	
Address:	

Scenario 5: '2033 Future Year (Behavioural) + Development (High) + Background (High) - SDBL Option 2 AM' (FG7: '2033 Future Year (Behavioural) + Development (High) + Background (High) - SDBL Option 2 AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**171.9%**	**30**	**59**	**62**	**546.5**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**171.9%**	**30**	**59**	**62**	**546.5**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	32	4	1059	1815:1613	534+96	168.1 : 168.1%	30	59	8	248.8	845.7	260.5	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	12	-	734	1899:1674	233+202	168.7 : 168.7%	-	-	-	174.0	853.2	179.0	2/1+2/2
3/1	A1081 Harpenden Road S Ahead Right Left	O	A		1	23	-	407	2002	450	90.5%	0	0	54	8.9	78.5	15.5	3/1
4/1	Batchwood Drive Left Ahead Right	U	D		1	14	-	473	1945	275	171.9%	-	-	-	114.9	874.6	120.1	4/1

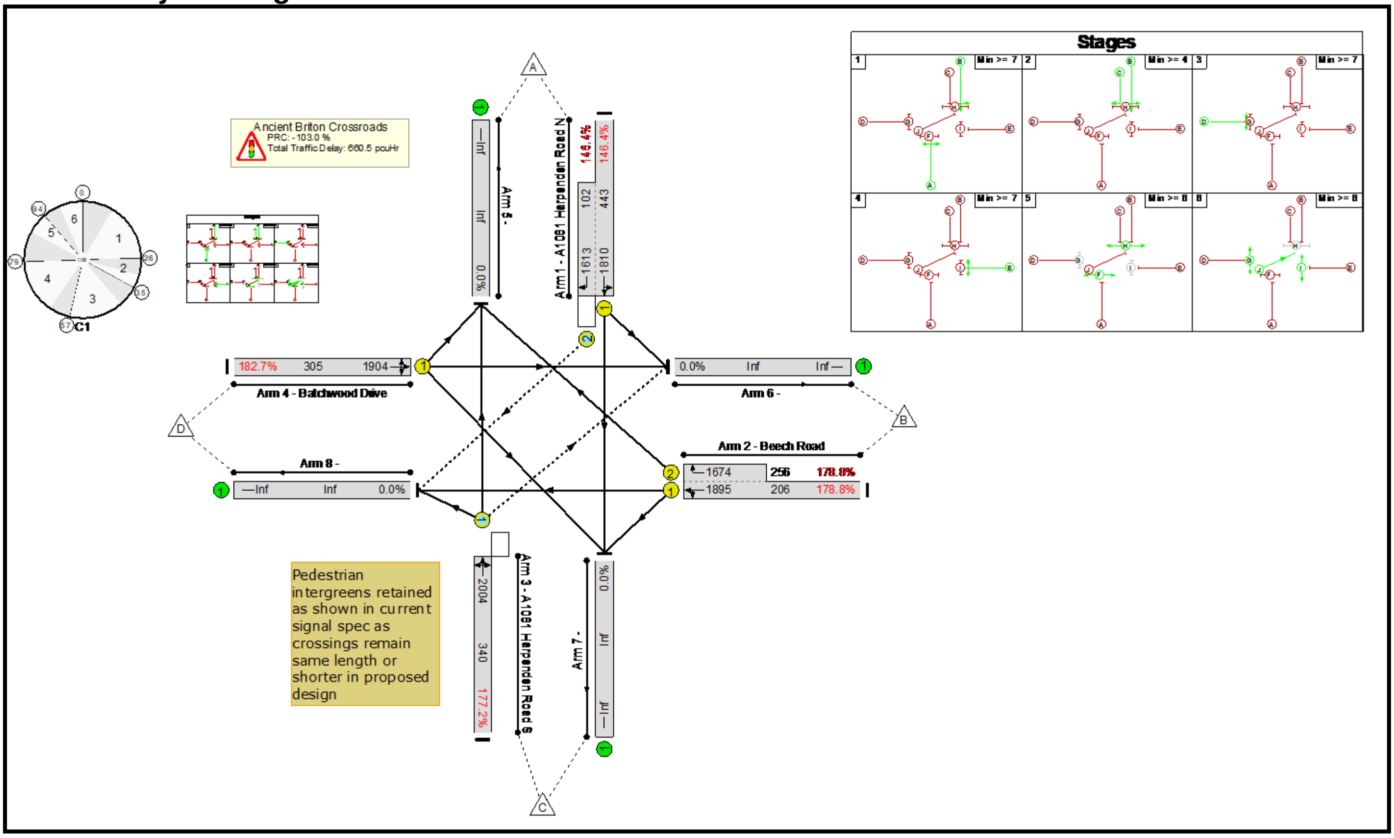
C1 PRC for Signalled Lanes (%): -90.9 Total Delay for Signalled Lanes (pcuHr): 546.51 Cycle Time (s): 106
PRC Over All Lanes (%): -90.9 Total Delay Over All Lanes(pcuHr): 546.51

Basic Results Summary

Scenario 6: '2033 Future Year (Behavioural) + Development (High) + Background (High) - SDBL Option 2 PM'

(FG8: '2033 Future Year (Behavioural) + Development (High) + Background (High) - SDBL Option 2 PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**182.7%**	**0**	**93**	**25**	**660.5**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**182.7%**	**0**	**93**	**25**	**660.5**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	26	4	798	1810:1613	443+102	146.4 : 146.4%	0	93	9	150.2	677.7	158.7	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	16	-	826	1895:1674	206+256	178.8 : 178.8%	-	-	-	210.3	916.8	217.7	2/1+2/2
3/1	A1081 Harpenden Road S Ahead Right Left	O	A		1	17	-	603	2004	340	177.2%	0	0	16	154.0	919.3	160.9	3/1
4/1	Batchwood Drive Left Ahead Right	U	D		1	16	-	558	1904	305	182.7%	-	-	-	145.9	941.4	151.6	4/1

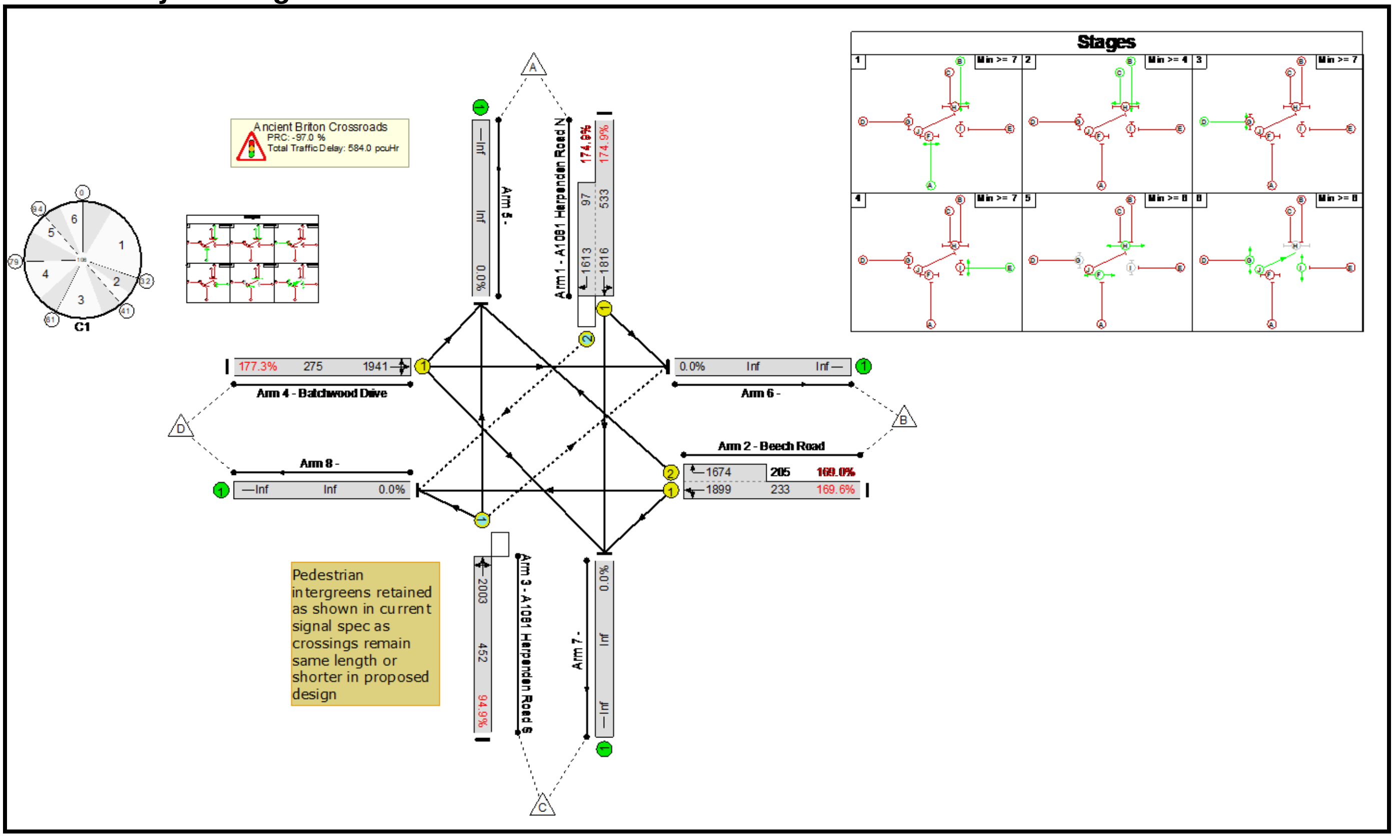
C1 PRC for Signalled Lanes (%): -103.0 Total Delay for Signalled Lanes (pcuHr): 660.48 Cycle Time (s): 106
PRC Over All Lanes (%): -103.0 Total Delay Over All Lanes(pcuHr): 660.48

Basic Results Summary

Scenario 7: '2033 Future Year (Behavioural) + Development (Low) + Background (Low) + SDBL Opt 2 AM'

(FG5: '2033 Future Year (Behavioural) + Development (Low) + Background (Low) + SDBL Opt 2 AM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**177.3%**	**14**	**75**	**62**	**584.0**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**177.3%**	**14**	**75**	**62**	**584.0**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	32	4	1102	1816:1613	533+97	174.9 : 174.9%	14	75	8	272.7	890.9	284.4	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	12	-	742	1899:1674	233+205	169.6 : 169.0%	-	-	-	176.8	857.9	181.8	2/1+2/2
3/1	A1081 Harpenden Road S Ahead Right Left	O	A		1	23	-	429	2003	452	94.9%	0	0	54	11.3	94.5	18.5	3/1
4/1	Batchwood Drive Left Ahead Right	U	D		1	14	-	487	1941	275	177.3%	-	-	-	123.2	910.9	128.5	4/1

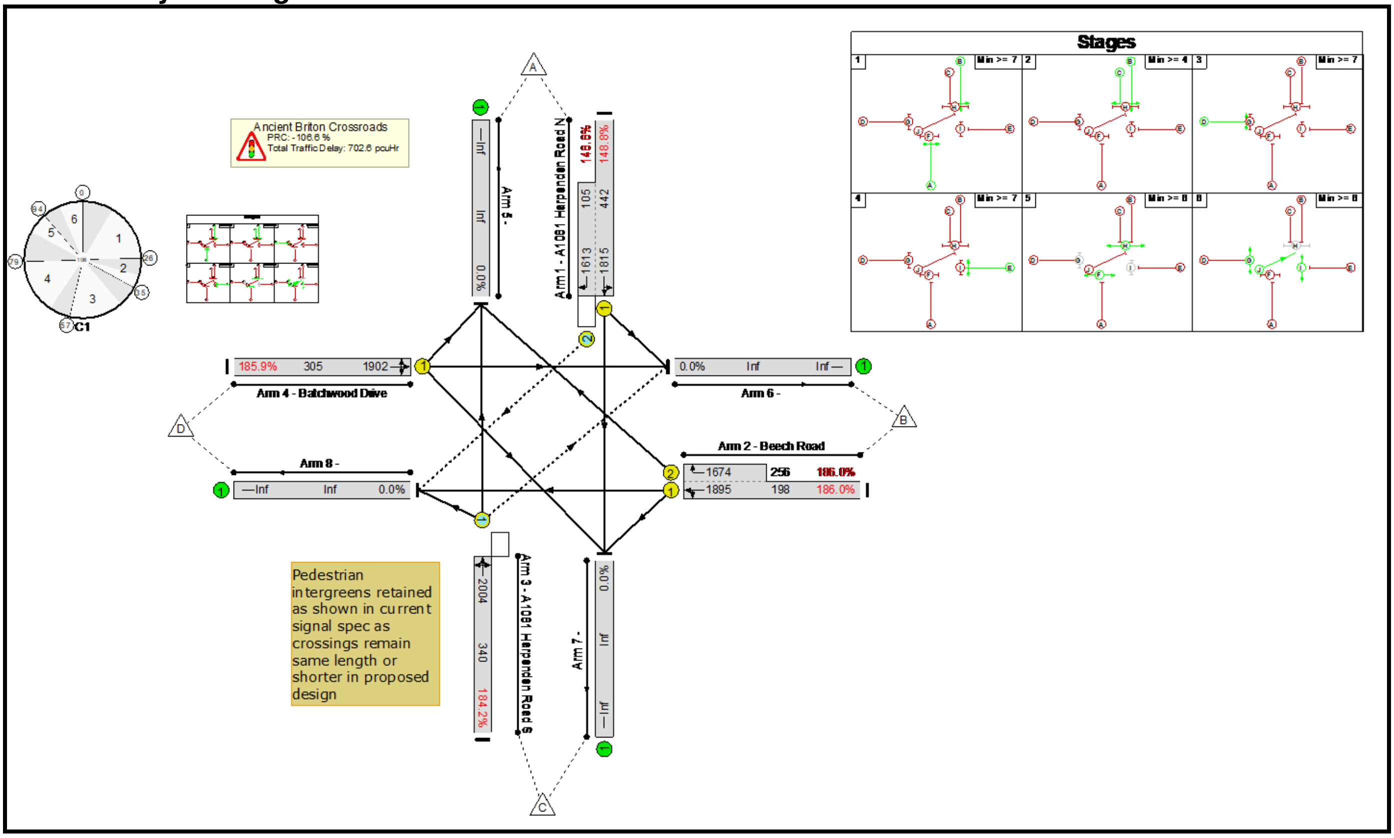
C1 PRC for Signalled Lanes (%): -97.0 Total Delay for Signalled Lanes (pcuHr): 584.03 Cycle Time (s): 106
PRC Over All Lanes (%): -97.0 Total Delay Over All Lanes(pcuHr): 584.03

Basic Results Summary

Scenario 8: '2033 Future Year (Behavioural) + Development (Low) + Background (Low) + SDBL Opt 2 PM'

(FG6: '2033 Future Year (Behavioural) + Development (Low) + Background (Low) + SDBL Opt 2 PM', Plan 1: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**186.0%**	**0**	**95**	**25**	**702.6**	**-**	**-**	**Network**
Ancient Briton Crossroads	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**186.0%**	**0**	**95**	**25**	**702.6**	**-**	**-**	**Ancient Briton Crossroads**
1/1+1/2	A1081 Harpenden Road N Left Ahead Right	U+O	B	C	1	26	4	814	1815:1613	442+105	148.8 : 148.8%	0	95	10	158.0	698.9	166.5	1/1+1/2
2/1+2/2	Beech Road Right Left Ahead	U	E		1	16	-	846	1895:1674	198+256	186.0 : 186.0%	-	-	-	225.8	960.8	233.5	2/1+2/2
3/1	A1081 Harpenden Road S Ahead Right Left	O	A		1	17	-	627	2004	340	184.2%	0	0	15	167.5	961.8	174.7	3/1
4/1	Batchwood Drive Left Ahead Right	U	D		1	16	-	567	1902	305	185.9%	-	-	-	151.2	960.3	156.9	4/1

C1 PRC for Signalled Lanes (%): -106.6 Total Delay for Signalled Lanes (pcuHr): 702.58 Cycle Time (s): 106
PRC Over All Lanes (%): -106.6 Total Delay Over All Lanes(pcuHr): 702.58

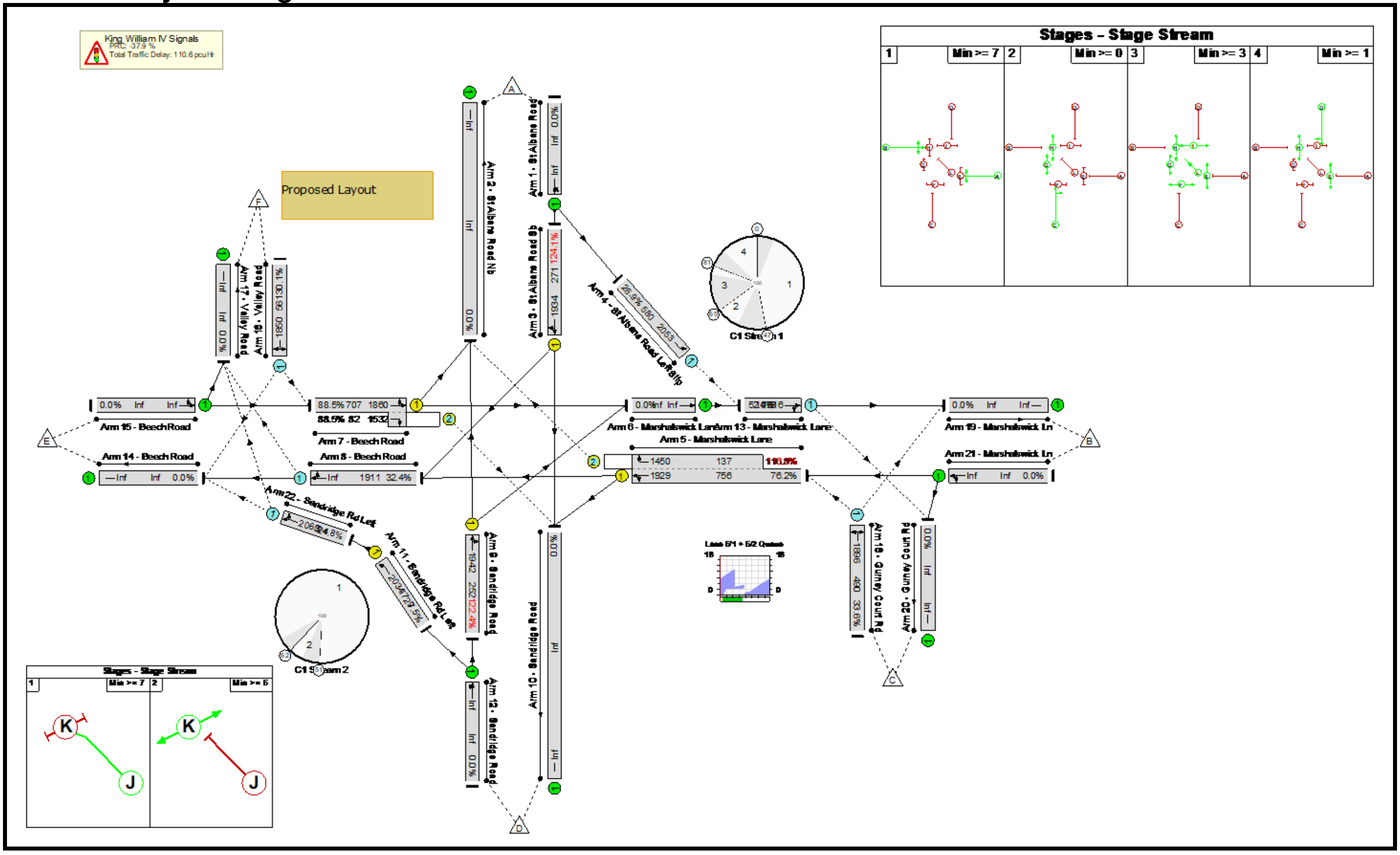
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	05920-King William IV Signals - Proposed Layout - Revised Modelling.lsg3x
Author:	
Company:	
Address:	

Scenario 7: '2033 Future Year (Behavioural) + Development (Core) AM + SDBL Opt 2' (FG7: '2033 Future Year (Behavioural) + Development (Core) AM + SDBL Opt 2', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.1%**	**1070**	**4**	**74**	**110.6**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.1%**	**1070**	**4**	**74**	**110.6**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	13	-	336	1934	271	124.1%	-	-	-	42.7	457.9	47.7	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	580	26.9%	156	0	0	0.2	4.2	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	42	-	736	1929:1450	756+137	76.2 : 116.8%	61	4	72	20.7	101.4	26.7	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	42	-	699	1860:1532	707+82	88.5 : 88.5%	71	0	2	8.8	45.2	21.0	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	666	Inf	1911	32.4%	208	0	0	0.2	1.4	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	12	-	309	1942	252	122.4%	-	-	-	36.7	427.5	40.9	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	130	2034	1729	7.5%	-	-	-	0.1	2.3	0.6	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	804	1916	1479	52.0%	111	0	0	0.5	2.5	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	169	1850	561	30.1%	169	0	0	0.2	4.6	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	165	1896	490	33.6%	165	0	0	0.3	5.5	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	130	2063	524	24.8%	130	0	0	0.2	4.7	0.8	22/1

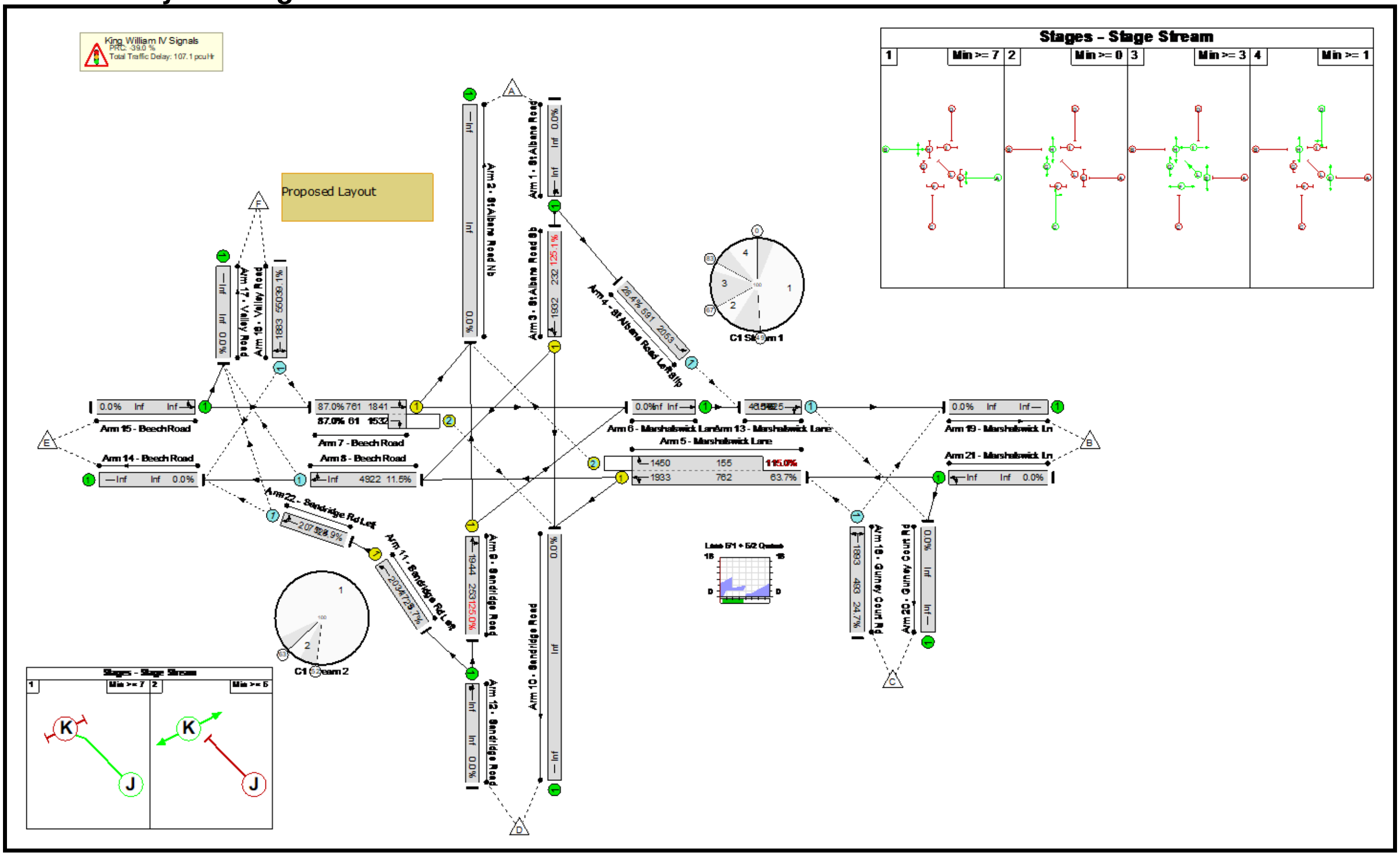
Basic Results Summary

C1	Stream: 1 PRC for Signalled Lanes (%):	-37.9	Total Delay for Signalled Lanes (pcuHr):	108.94	Cycle Time (s):	100
C1	Stream: 2 PRC for Signalled Lanes (%):	1096.9	Total Delay for Signalled Lanes (pcuHr):	0.08	Cycle Time (s):	100
	PRC Over All Lanes (%):	-37.9	Total Delay Over All Lanes(pcuHr):	110.62		

Basic Results Summary

Scenario 8: '2033 Future Year (Behavioural) + Development (Core) + SDBL Opt 2 PM' (FG8: '2033 Future Year (Behavioural) + Development (Core) PM + SDBL Opt 2', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**125.1%**	**872**	**14**	**74**	**107.1**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**125.1%**	**872**	**14**	**74**	**107.1**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	11	-	290	1932	232	125.1%	-	-	-	38.2	474.5	42.4	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	591	26.4%	156	0	0	0.2	4.1	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	44	-	663	1933:1450	762+155	63.7 : 115.0%	68	14	72	19.2	104.5	22.8	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	44	-	715	1841:1532	761+61	87.0 : 87.0%	51	0	2	8.1	41.0	20.9	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	608	Inf	4922	11.5%	73	0	0	0.1	0.4	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	12	-	316	1944	253	125.0%	-	-	-	40.2	457.9	44.5	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	99	2034	1729	5.7%	-	-	-	0.1	2.3	0.4	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	758	1925	1549	46.5%	87	0	0	0.4	2.2	0.4	13/1
16/1	Valley Road Left Right	O	-		-	-	-	215	1883	550	39.1%	215	0	0	0.3	5.4	0.3	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	122	1893	493	24.7%	122	0	0	0.2	4.8	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	99	2071	524	18.9%	99	0	0	0.1	4.3	0.5	22/1

Basic Results Summary

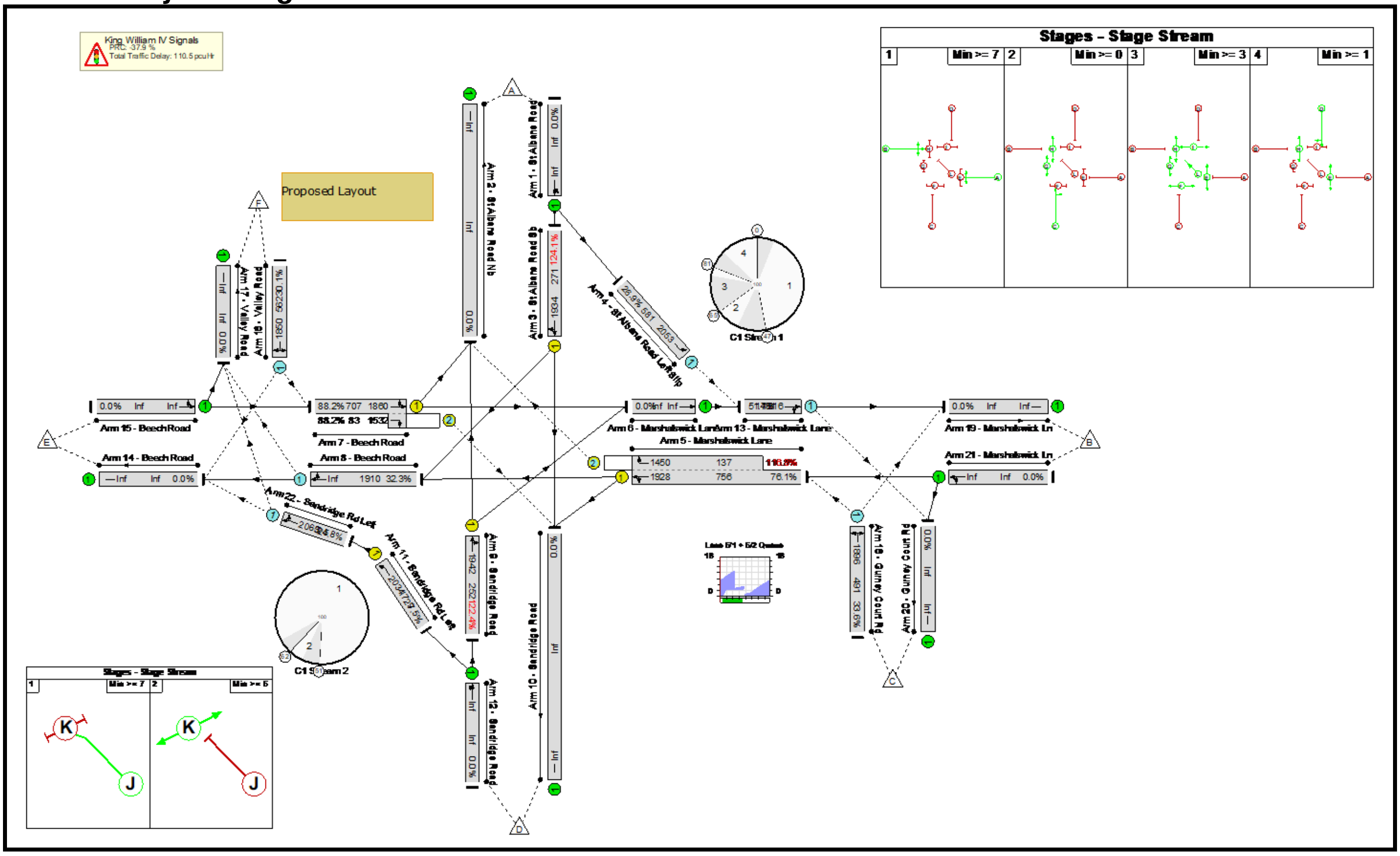
C1	Stream: 1	PRC for Signalled Lanes (%):	-39.0	Total Delay for Signalled Lanes (pcuHr):	105.79	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1471.7	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s):	100
		PRC Over All Lanes (%):	-39.0	Total Delay Over All Lanes(pcuHr):	107.14		

Basic Results Summary

Scenario 9: '2033 Future Year (Behavioural) + Development (Low) + Background (Low) + SDBL Opt 2 AM'

(FG9: '2033 Future Year (Behavioural) + Development (Low) + Background (Low) + SDBL Opt 2 AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.1%**	**1070**	**4**	**74**	**110.5**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.1%**	**1070**	**4**	**74**	**110.5**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	13	-	336	1934	271	124.1%	-	-	-	42.7	457.9	47.7	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	581	26.9%	156	0	0	0.2	4.2	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	42	-	735	1928:1450	756+137	76.1 : 116.8%	61	4	72	20.7	101.4	26.7	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	42	-	697	1860:1532	707+83	88.2 : 88.2%	71	0	2	8.7	44.8	20.9	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	665	Inf	1910	32.3%	208	0	0	0.2	1.4	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	12	-	309	1942	252	122.4%	-	-	-	36.7	427.5	40.9	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	130	2034	1729	7.5%	-	-	-	0.1	2.3	0.6	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	802	1916	1481	51.7%	110	0	0	0.5	2.5	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	169	1850	562	30.1%	169	0	0	0.2	4.6	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	165	1896	491	33.6%	165	0	0	0.3	5.5	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	130	2063	525	24.8%	130	0	0	0.2	4.6	0.8	22/1

Basic Results Summary

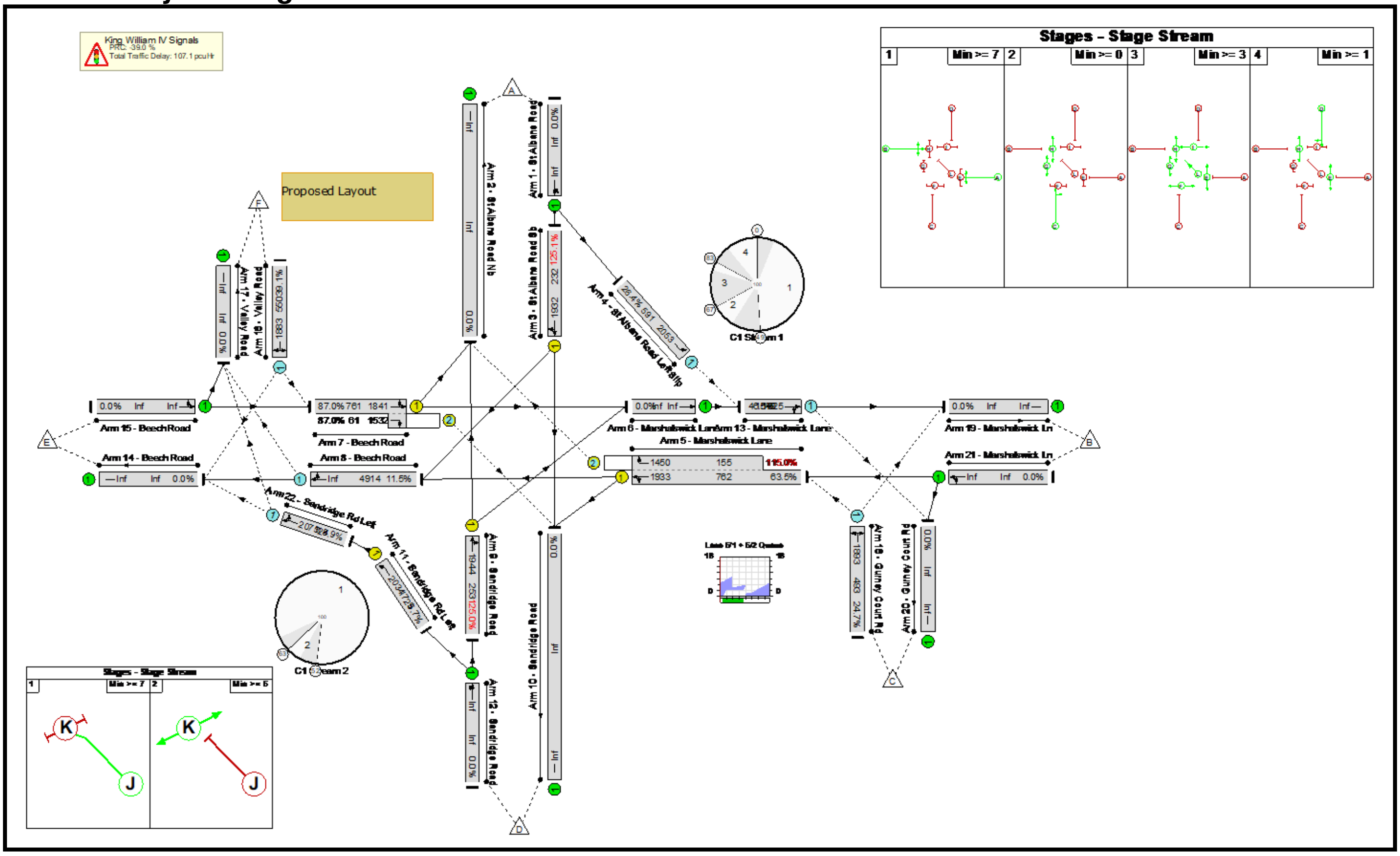
C1	Stream: 1	PRC for Signalled Lanes (%):	-37.9	Total Delay for Signalled Lanes (pcuHr):	108.81	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1096.9	Total Delay for Signalled Lanes (pcuHr):	0.08	Cycle Time (s):	100
		PRC Over All Lanes (%):	-37.9	Total Delay Over All Lanes(pcuHr):	110.49		

Basic Results Summary

Scenario 10: '2033 Future Year (Behavioural) + Development (Low) + Background (Low) + SDBL Opt 2 PM'

(FG10: '2033 Future Year (Behavioural) + Development (Low) + Background (Low) + SDBL Opt 2 PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**125.1%**	**872**	**14**	**74**	**107.1**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**125.1%**	**872**	**14**	**74**	**107.1**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	11	-	290	1932	232	125.1%	-	-	-	38.2	474.5	42.4	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	591	26.4%	156	0	0	0.2	4.1	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	44	-	662	1933:1450	762+155	63.5 : 115.0%	68	14	72	19.2	104.6	22.7	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	44	-	715	1841:1532	761+61	87.0 : 87.0%	51	0	2	8.1	41.0	20.9	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	607	Inf	4914	11.5%	73	0	0	0.1	0.4	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	12	-	316	1944	253	125.0%	-	-	-	40.2	457.9	44.5	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	99	2034	1729	5.7%	-	-	-	0.1	2.3	0.4	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	758	1925	1549	46.5%	87	0	0	0.4	2.2	0.4	13/1
16/1	Valley Road Left Right	O	-		-	-	-	215	1883	550	39.1%	215	0	0	0.3	5.4	0.3	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	122	1893	493	24.7%	122	0	0	0.2	4.8	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	99	2071	524	18.9%	99	0	0	0.1	4.3	0.5	22/1

Basic Results Summary

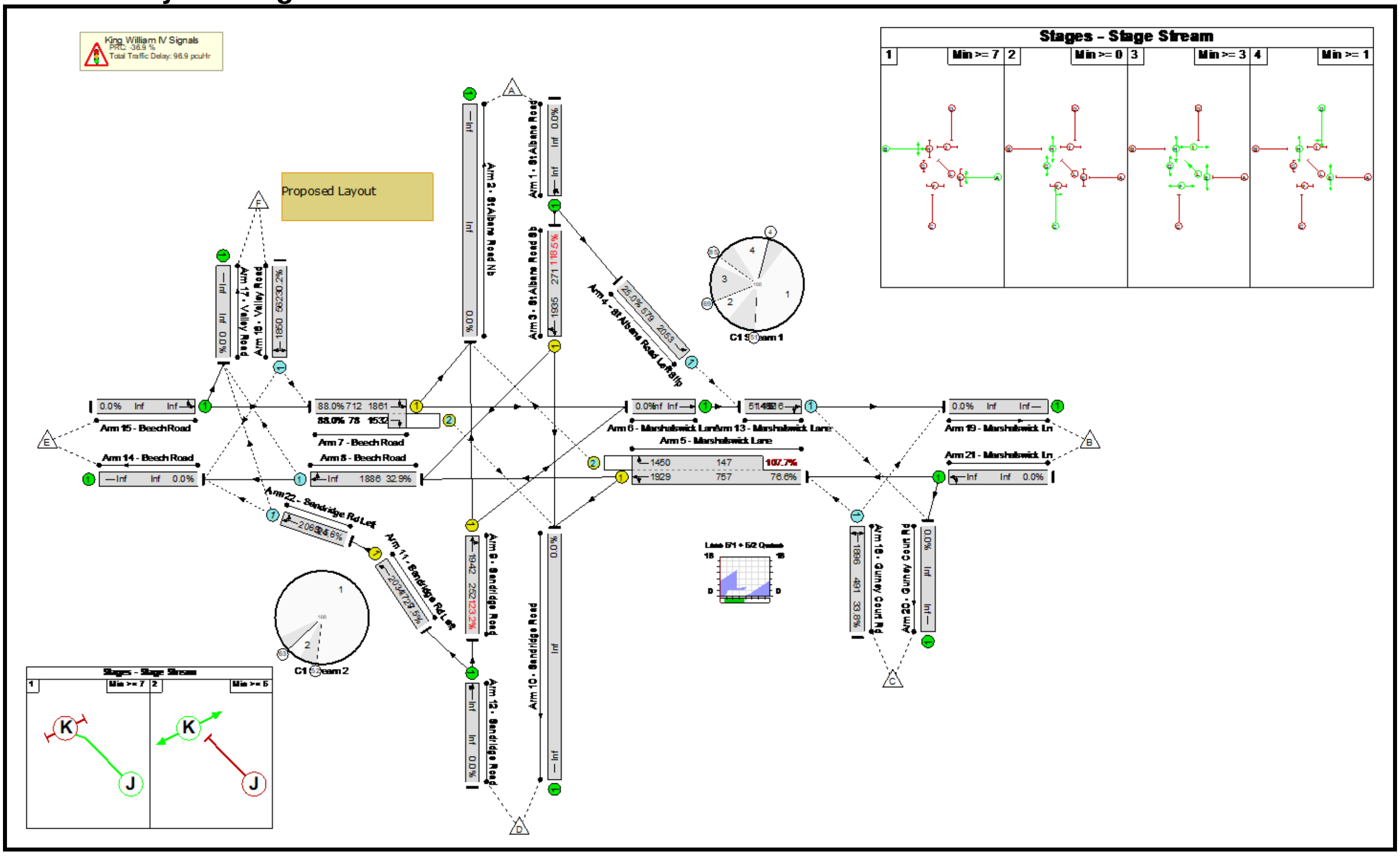
C1	Stream: 1	PRC for Signalled Lanes (%):	-39.0	Total Delay for Signalled Lanes (pcuHr):	105.78	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1471.7	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s):	100
		PRC Over All Lanes (%):	-39.0	Total Delay Over All Lanes(pcuHr):	107.12		

Basic Results Summary

Scenario 11: '2033 Future Year (Behavioural) + Development (High) + Background (High) + SDBL Opt 2 AM'

(FG11: '2033 Future Year (Behavioural) + Development (High) + Background (High) + SDBL Opt 2 AM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**123.2%**	**1059**	**13**	**74**	**96.9**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**123.2%**	**1059**	**13**	**74**	**96.9**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	13	-	321	1935	271	118.5%	-	-	-	34.5	387.5	39.0	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	145	2053	579	25.0%	145	0	0	0.2	4.1	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	42	-	738	1929:1450	757+147	76.6 : 107.7%	61	13	72	14.4	70.3	20.9	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	42	-	696	1861:1532	712+78	88.0 : 88.0%	67	0	2	8.6	44.5	20.8	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	656	Inf	1886	32.9%	213	0	0	0.2	1.4	0.2	8/1
9/1	Sandridge Road Ahead Right	U	C		1	12	-	311	1942	252	123.2%	-	-	-	37.7	436.1	42.0	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	129	2034	1729	7.5%	-	-	-	0.1	2.3	0.6	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	798	1916	1482	51.4%	109	0	0	0.5	2.5	0.5	13/1
16/1	Valley Road Left Right	O	-		-	-	-	170	1850	562	30.2%	170	0	0	0.2	4.6	0.2	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	166	1896	491	33.8%	166	0	0	0.3	5.5	0.3	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	129	2063	525	24.6%	129	0	0	0.2	4.6	0.7	22/1

Basic Results Summary

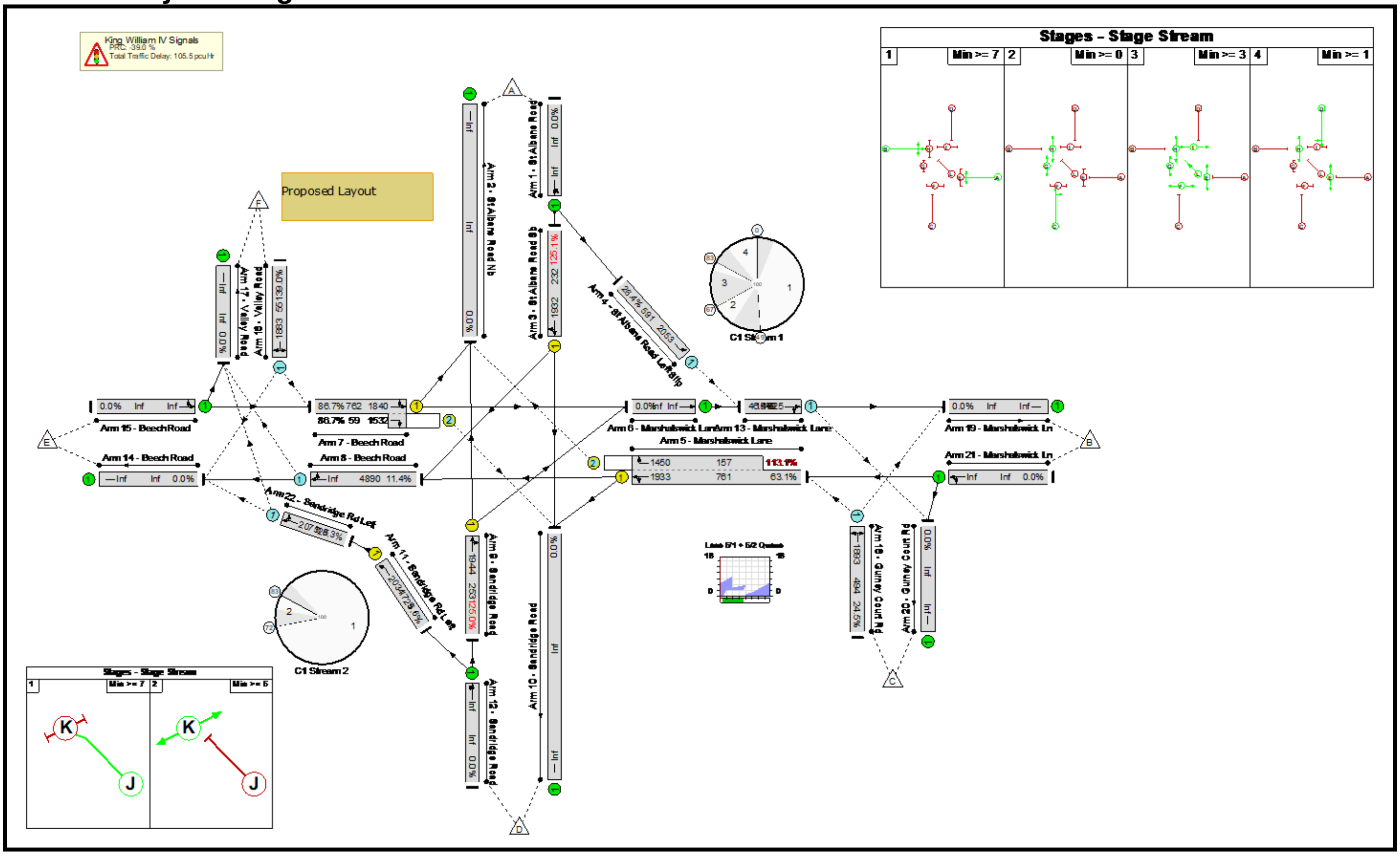
C1	Stream: 1	PRC for Signalled Lanes (%):	-36.9	Total Delay for Signalled Lanes (pcuHr):	95.24	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1106.2	Total Delay for Signalled Lanes (pcuHr):	0.08	Cycle Time (s):	100
		PRC Over All Lanes (%):	-36.9	Total Delay Over All Lanes(pcuHr):	96.90		

Basic Results Summary

Scenario 12: '2033 Future Year (Behavioural) + Development (High) + Background (High) + SDBL Opt 2 PM'

(FG12: '2033 Future Year (Behavioural) + Development (High) + Background (High) + SDBL Opt 2 PM', Plan 2: 'Peds Every Cycle')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	Item
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**125.1%**	**869**	**14**	**74**	**105.5**	**-**	**-**	**Network**
King William IV Signals	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**125.1%**	**869**	**14**	**74**	**105.5**	**-**	**-**	**King William IV Signals**
3/1	St Albans Road Sb Right Ahead	U	D		1	11	-	290	1932	232	125.1%	-	-	-	38.2	474.5	42.4	3/1
4/1	St Albans Road Left Slip Left	O	-		-	-	-	156	2053	591	26.4%	156	0	0	0.2	4.1	0.2	4/1
5/1+5/2	Marshalswick Lane Right Ahead Left	U+O	A		1	44	-	658	1933:1450	761+157	63.1 : 113.1%	71	14	72	17.8	97.1	21.3	5/1+5/2
7/1+7/2	Beech Road Left Ahead Right	U+O	B		1	44	-	712	1840:1532	762+59	86.7 : 86.7%	49	0	2	8.0	40.5	20.7	7/1+7/2
8/1	Beech Road Ahead Right	O	-		-	-	-	603	Inf	4890	11.4%	73	0	0	0.1	0.4	0.1	8/1
9/1	Sandridge Road Ahead Right	U	C		1	12	-	316	1944	253	125.0%	-	-	-	40.2	457.9	44.5	9/1
11/1	Sandridge Rd Left Ahead	U	J		1	84	-	96	2034	1729	5.6%	-	-	-	0.1	2.3	0.4	11/1
13/1	Marshalswick Lane Ahead Right	O	-		-	-	-	756	1925	1549	46.4%	87	0	0	0.4	2.2	0.4	13/1
16/1	Valley Road Left Right	O	-		-	-	-	215	1883	551	39.0%	215	0	0	0.3	5.4	0.3	16/1
18/1	Gurney Court Rd Left Right	O	-		-	-	-	121	1893	494	24.5%	121	0	0	0.2	4.8	0.2	18/1
22/1	Sandridge Rd Left Ahead Right	O	-		-	-	-	96	2071	525	18.3%	96	0	0	0.1	4.2	0.5	22/1

Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-39.0	Total Delay for Signalled Lanes (pcuHr):	104.19	Cycle Time (s):	100
C1	Stream: 2	PRC for Signalled Lanes (%):	1520.8	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s):	100
		PRC Over All Lanes (%):	-39.0	Total Delay Over All Lanes(pcuHr):	105.52		

ST ALBANS SCHOOL

Hallam Land

PART OF HENRY BOOT

WOOLLAM PARK

North St Albans