Bracknell Forest Council

A3095 CORRIDOR IMPROVEMENTS

Business Case

70021768/001
JULY 2018

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EXECUTIVE SUMMARY

This Business Case presents the evidence base in favour of the proposed A3095 Corridor Improvements. The document has been prepared in accordance with the Department for Transport guidance on the five business case model and requires the following five cases to be considered:

- Strategic case
- Economic case
- Financial case
- Commercial case
- Management case.

SCHEME DESCRIPTION

The proposed scheme focusses upon the section of the A3095 from the Hanworth Roundabout through to the Golden Retriever Junction and includes the:

- Introduction of additional signalisation on Hanworth Roundabout
- Replacement of Golden Retriever Roundabout with a fully signalised junction
- Modification of the highway between the Hanworth Roundabout and the Golden Retriever junction to introduce an additional southbound lane.

STRATEGIC CASE

The A3095 Corridor Improvements will:

- Reduce north-south journey times
- Improve journey time reliability
- Improve accessibility to Bracknell Town Centre and employment areas
- Improve connectivity to the SRN
- Improve road safety and reduce the risk of accidents.

ECONOMIC CASE

The Economic case sets out the assessment of benefits that the scheme is forecast to deliver to society as a whole. The Value for Money (VfM) statement provides a summary of these benefits as in the following table.

Value for Money Statement

	Assessment	Detail
Initial BCR	2.78	Calculated using WebTAG, TUBA version 1.9.7 and COBALT
Adjusted BCR	2.78	Calculated using WebTAG, TUBA version 1.9.7 and COBALT
Qualitative assessment	Largely beneficial	
Optimism Bias	Scheme costs include for 30% Optimism Bias	No variation in the costs e.g. a reduced level of Optimism Bias has not been assessed as the BCR will only increase
Value for Money	High	BCR is in the High category which is supported by the qualitative assessment

The expected Benefit to Cost Ratio (BCR) of the scheme is **2.78** which represents a high value for money category.

FINANCIAL CASE

The Financial case provides a detailed cost estimate and a breakdown of how the scheme will be funded with the estimated scheme cost being £8.045m as shown in the following table.

Summary of final scheme costs (2016 Q1)

Cost element	Cost
Estimated scheme cost	£5,932,934
Inflation adjustment to 2019/2020	£925,538
Contingency & Cost	£1,186,587
Total	**£8,045,059**

The A3095 Corridor Improvements is a pipeline scheme planned to be delivered by BFC as part of the Thames Valley Berkshire Local Enterprise Partnership (TVBLEP) Growth Deal originally agreed between TVBLEP and Government in 2014. A total of £5.5m is currently allocated to the scheme.

An additional £2.5m will be provided through local S106 contribution secured by BFC. Any additional costs would be covered by BFC. The spend profile is shown in the following table.

Out-turn spend profile

Total	2019/2020	2020/2021
£8.0m	£2.0m	£6.0m

COMMERCIAL CASE

The outcomes which the procurement strategy must deliver are to:

- Achieve cost certainty, or certainty that the scheme can be delivered within the available funding constraint
- Minimise further preparation costs with respect to scheme design by ensuring best value, and appropriate quality
- Obtain contractor experience and input to the construction programme to ensure the implementation programme is robust and achievable
- Obtain contractor input to risk management and appraisals, including mitigation measures, to capitalise at an early stage on opportunities to reduce construction risk and improve out-turn certainty thereby reducing risks to a level that is 'As Low As Reasonably Practicable'.

The Output Based Specification for the A3095 Corridor Improvements has yet to be developed, this is to be expected at this stage for the following reasons:

- The need to secure funding approval for the preferred scheme prior to undertaking
- this significant piece of work
- The tendering process has not begun.

BFC will use either experienced in-house resources or external consultants, who have been involved in other recent highways projects, to develop the specifications.

MANAGEMENT CASE

BFC would establish a clear and robust structure to provide accountability and an effectual decision-making process for the management of the A3095 Corridor Improvements. The following members of staff would have dedicated roles on the project:

- Neil Mathews: Head of Transport Development – Project Delivery Manager
- Nick Rose: Transport Engineering Manager – Project Manager
- Stuart Jefferies: Transport Strategy and Implementation Manager – Steering Group Chair.

Ultimate responsibility for delivery of the scheme rests with BFC, who will assume an overall project management role and establish a Steering Group chaired by an officer from the Council's Transport Management section. The Steering Group will meet on a regular basis to review progress, update the risk register, and make key strategic decisions.

The day-to-day management and delivery of the project will be the responsibility of the Transport & Countryside Environment Department and the Engineering projects team within it. They will work closely with the Term Contractors and other delivery partners, and also form a point of contact for stakeholders.

The usual Council governance procedures will apply to all aspects of the project management, with issues being escalated in accordance with Council protocols as necessary.

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1

INTRODUCTION

1 INTRODUCTION

1.1 OVERVIEW

1.1.1. The Thames Valley Berkshire Local Enterprise Partnership (TVBLEP) brings together businesses, unitary authorities, education and the community sector to drive economic growth in the Thames Valley. The Thames Valley Berkshire Growth Deal will deliver growth by enhancing urban connectivity and addressing strategic infrastructure priorities across the LEP area. This will enable the delivery of essential housing at flagship sites in Newbury, Wokingham and Bracknell and improve access and reduce journey times across the LEP area.

1.1.2. This report sets out the Final Transport Business Case for the proposed A3095 Corridor Improvements between the Hanworth Roundabout and Golden Retriever Junction outside Bracknell, Berkshire. It sets out the evidence base in favour of the scheme, following the Department for Transport's (DfT) guidance on The Transport Business Cases by considering each of the five business cases in turn:

- Strategic Case
- Economic Case
- Financial Case
- Commercial Case
- Management Case.

1.2 AREA BACKGROUND

1.2.1. Bracknell is a post-war new town with a population of approximately 70,000 and is located in Berkshire between Reading and Heathrow Airport. It is an important employment area with Waitrose head office and central distribution centre located in the town.

1.2.2. The A3095 provides an important link from the centre of Bracknell towards Crowthorne and Sandhurst to the south west, ultimately connecting to the A30 and M3 strategic corridors.

1.2.3. The proposed scheme focusses upon the section of the A3095 from the Hanworth Roundabout through to the Golden Retriever Junction and includes the:

- Introduction of additional signalisation on Hanworth Roundabout
- Replacement of Golden Retriever Roundabout with a fully signalised junction
- Modification of the highway between the Hanworth Roundabout and the Golden Retriever junction to introduce an additional southbound lane.

1.2.4. An overview of the scheme's geographic location is provided in Figure 1.

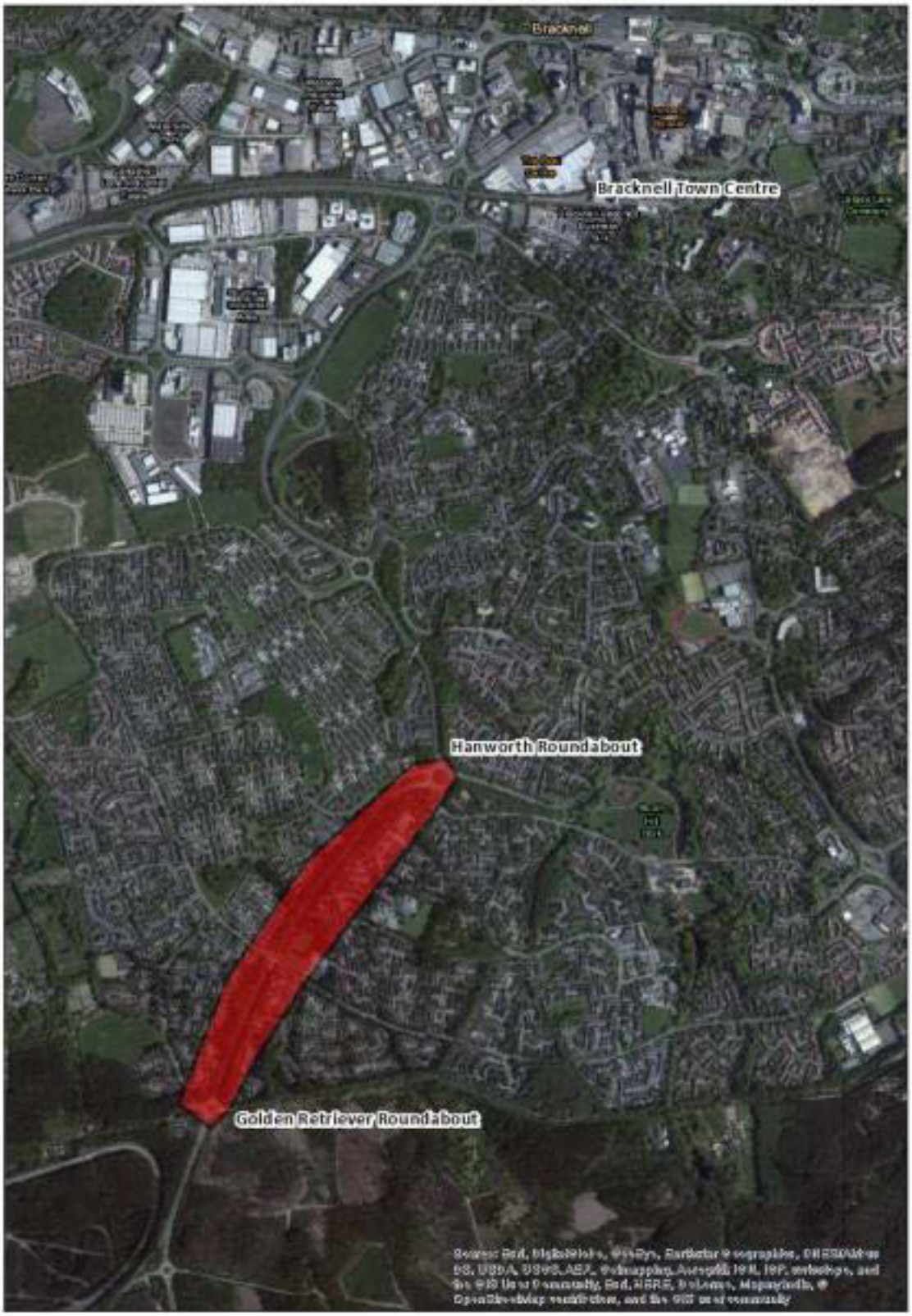


Figure 1: Scheme overview

1.2.5. The section of the A3095 encompassing the Hanworth Roundabout and Golden Retriever Roundabout and connecting highway currently suffers from a range of congestion issues. These affect the flow of traffic along the corridor and connections between Crowthorne and Sandhurst into and out from Bracknell.

1.2.6. At the Hanworth roundabout, significant queues that form back along the Mill Lane Southbound arm, which in peak times can stretch back as far as the Wildrings Roundabout, the next junction on the A3095. This affects the operation of both junctions.

1.2.7. At the Golden Retriever Roundabout congestion occurs in a northbound direction along Foresters Way, as well as Nine Mile Ride.

1.3 SCHEME DESCRIPTION

1.3.1. The key features of the scheme are:

- The full signalisation of the Hanworth Roundabout with additional lanes and enlargement of its footprint to increase capacity. As part of this scheme, the adjacent Hanworth Road / Ringmead priority junction will be replaced with a roundabout
- The replacement of the Golden Retriever roundabout with a fully signalised junction
- The introduction of a second southbound lane on the A3095 Crowthorne Road between the Hanworth Roundabout and the Golden Retriever Roundabout.

1.3.2. The local junction modelling work and wider VISUM network modelling work has indicated that the preferred scheme options will delivery significant enhancement to the operation of the individual junctions, as well as improved journey times along the A3095 corridor. This will support the continued growth of Bracknell as an employment centre, as well as wider residential growth across the region.

2

CONTENT AND STRUCTURE

2 CONTENT AND STRUCTURE

2.1 INTRODUCTION

2.1.1. WSP has prepared this business case on behalf of Bracknell Forest Council (BFC) to seek funding for the A3095 Corridor Improvements from the Thames Valley Berkshire Local Enterprise Partnership (TVBLEP).

2.1.2. It has been prepared using the agreed standards and format for business cases, as set out in 'The Transport Business Cases' (Department for Transport).

2.2 CONTENT AND STRUCTURE

2.2.1. Business case development is based on the five case model approach which shows whether a scheme:

- is supported by a robust case for change that fits with wider public policy objectives – the 'Strategic Case'
- demonstrates value for money – the '**Economic Case**'
- is financially affordable – the '**Financial Case**'
- is commercially viable – the '**Commercial Case**'
- is achievable – the '**Management Case'**.

2.2.2. The next chapter details the assessment of different options and is followed by a chapter for each of the five cases in the five-case business case model.

- The **Strategic Case**: This gives a description of the scheme and sets out the problems and objectives of the scheme, any alternatives and why the scheme is the preferred option for meeting the stated objectives
- The **Economic Case**: This assesses the options to identify all their impacts to fulfil the treasury's requirements for appraisal and demonstrating value for money in the use of taxpayers' money
- The **Financial Case**: This sets out the outturn costs of the proposals outlining the scheme's affordability and funding arrangements over the lifespan of the project
- The **Commercial Case**: This sets out why the scheme is commercially viable, in terms of structure, content and nature of the proposed investment deal and provides details on the justification for funding, opportunities and additional or alternative forms of funding and the scheme procurement process and outcomes
- The **Management Case**: This confirms how the scheme promoter aims to deliver the proposals effectively and the quality of the authorities' project management at various stages of implementation ensuring that the proposals that can be delivered and offer the best value for money.

2.2.3. This document identifies the economic benefits of the A3095 Corridor Improvements which include:

- The full signalisation of the Hanworth Roundabout with additional lanes and enlargement of its footprint to increase capacity. As part of this scheme, the adjacent Hanworth Road / Ringmead priority junction will be replaced with a roundabout
- The replacement of the Golden Retriever roundabout with a fully signalised junction
- The introduction of a second southbound lane on the A3095 Crowthorne Road between the Hanworth Roundabout and the Golden Retriever Roundabout.

2.2.4. This Business Case therefore documents that the proposed A3095 Corridor Improvements is the most financial advantageous and offers the best value for money.

3

OPTION ASSESSMENT

3 OPTION ASSESSMENT

3.1 OPTIONS

3.1.1. High level options considered were:

- Hanworth Roundabout, Golden Retriever Roundabout, and Crowthrone Road Enhancements (Preferred Scheme Option)
- Alternative scheme designs for Hanworth Roundabout, Golden Retriever Roundabout, and Crowthrone Road
- Extended corridor enhancements to include Wildrings Roundabout and Bracknell Road / Foresters Way
- Demand Management Measures.

3.1.2. A variety of variations to the highway scheme measures were considered, including alterative junction alignments, as well as incorporating additional junctions to the north and south to enhance the overall impact of the scheme (see Appendix A). Each of these was appraised in terms of design and safety criteria, as well as deliverability. The preferred highway scheme option was considered optimal in terms of compliance with DMRB standards (including swept path analysis), safety provision, and minimising scheme costs.

3.1.3. Measures to enhance the operation of the Wildrings Roundabout were considered to offer lower value for money as many of the issues identified at this junction relate to queues forming back from the Hanworth Roundabout. As such the proposed Hanworth Roundabout scheme resolves many of the issues at the Wildrings Roundabout.

3.1.4. Measure to enhance the operation of the Bracknell Road / Foresters Way scheme were likewise identified within the optioning process but not included within the preferred package of measures.

3.1.5. Consideration was given to alternative measures to manage the level of demand along the A3095 corridor. The Sandhurst/Crowthorne to Bracknell corridor is not served directly by rail and so bus services offer the only form of public transport provision. Route 194 provides services along parts of the route but only runs at a 20 minute frequency and is a relatively indirect route. As a result the service offers limited attraction in comparison to private car trips. It is also subject to the highway congestion along the route. Options to enhance bus service provision without associated highway enhancements are, therefore, considered to offer limited scope for improvement.

3.1.6. In addition to the design, safety and deliverability aspects, the formation of the preferred option also took due consideration of the economic, social and environmental impact of the scheme. Overall this sought to maximise the level of ongoing benefits from the scheme, whilst minimising the capital and maintenance costs across the life-time of the scheme.

3.1.7. The proposed layout of the preferred scheme elements are shown in Figure 2, Figure 3 and Figure 4. Further information is included in Appendix B which show the existing layout and the proposed layout.

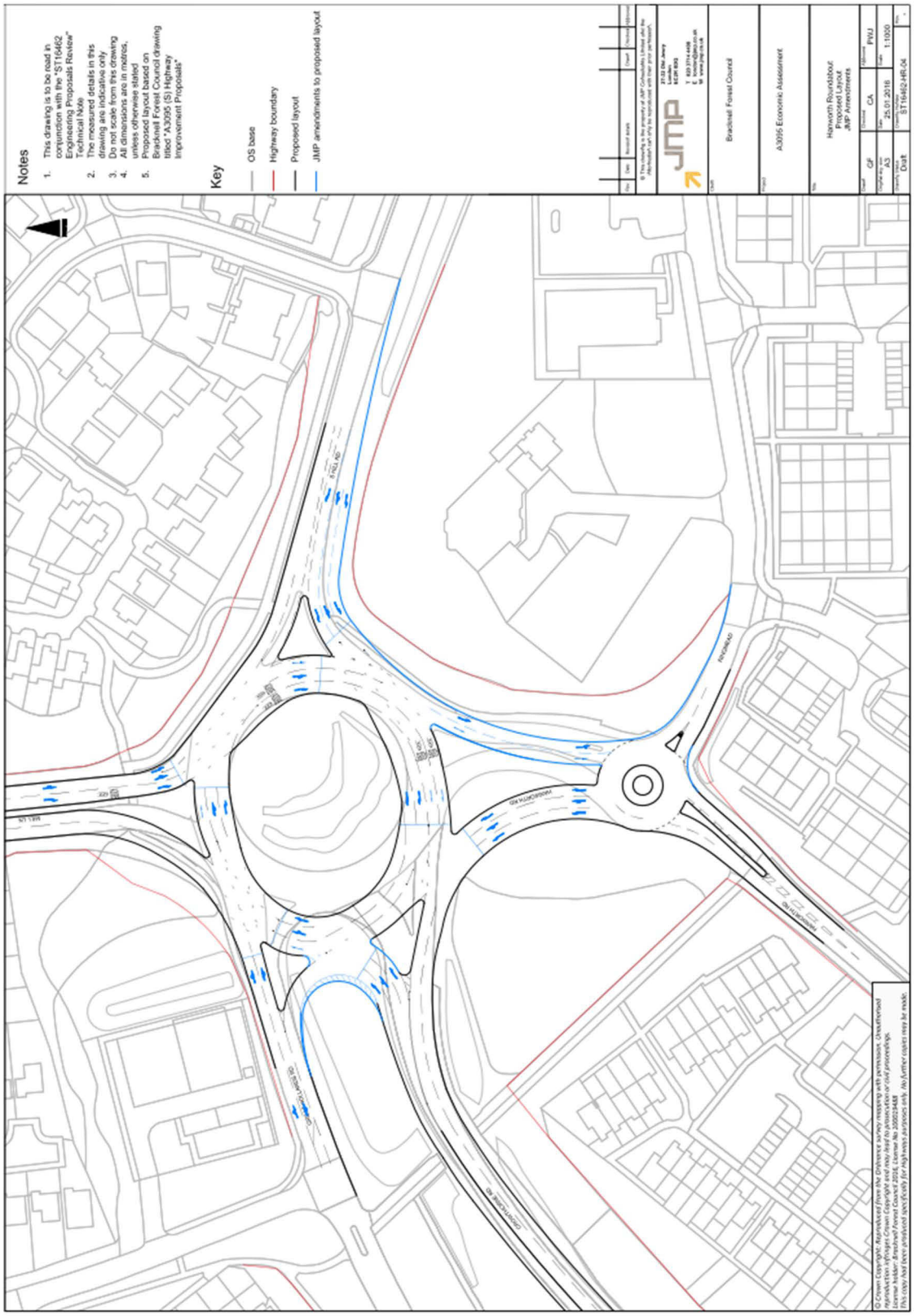


Figure 2: Proposed improvements to A3095/S Hill Road/Great Holland Road Hanworth roundabout

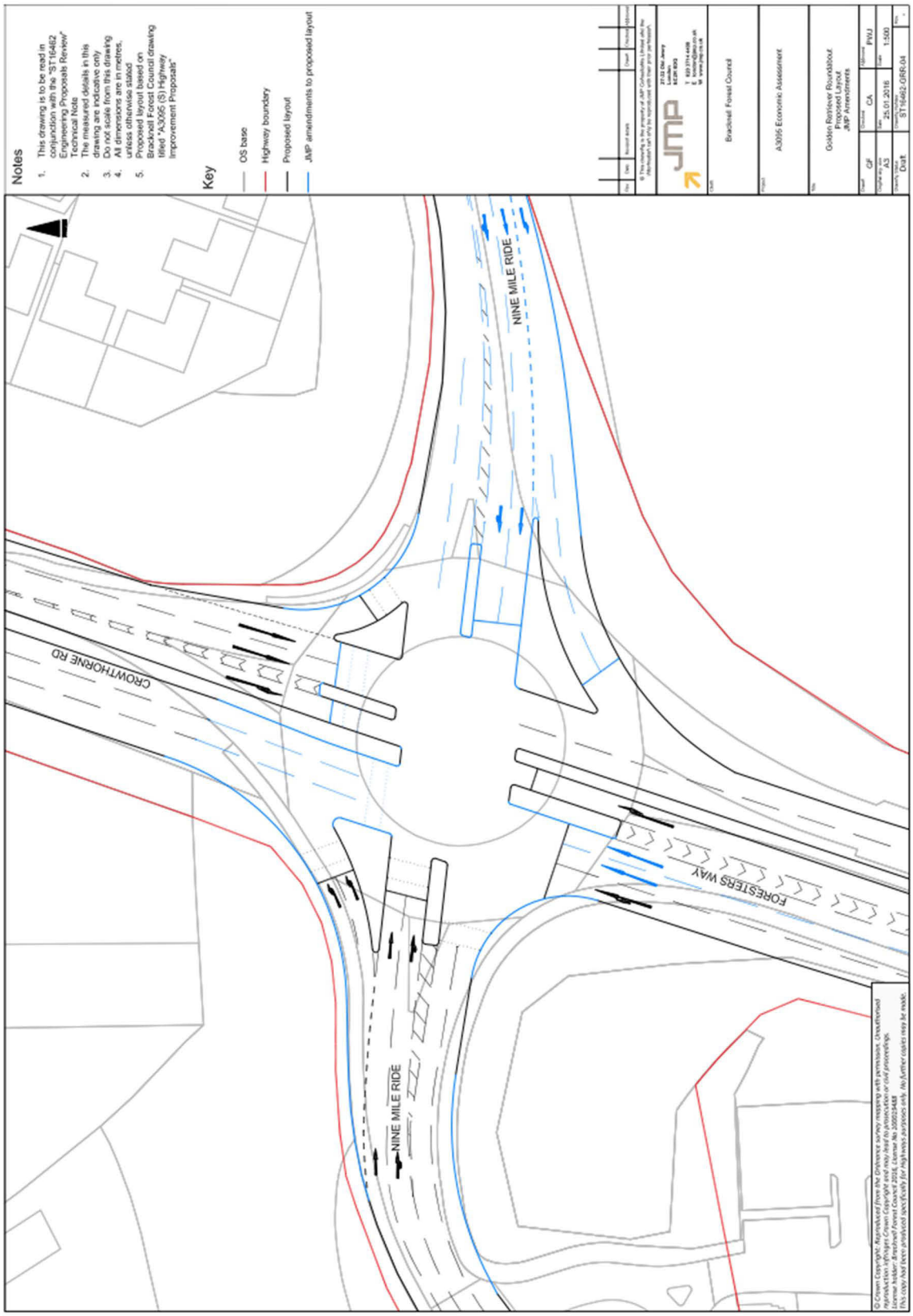


Figure 3: Proposed improvements to A3095/B3430 Golden Retriever roundabout

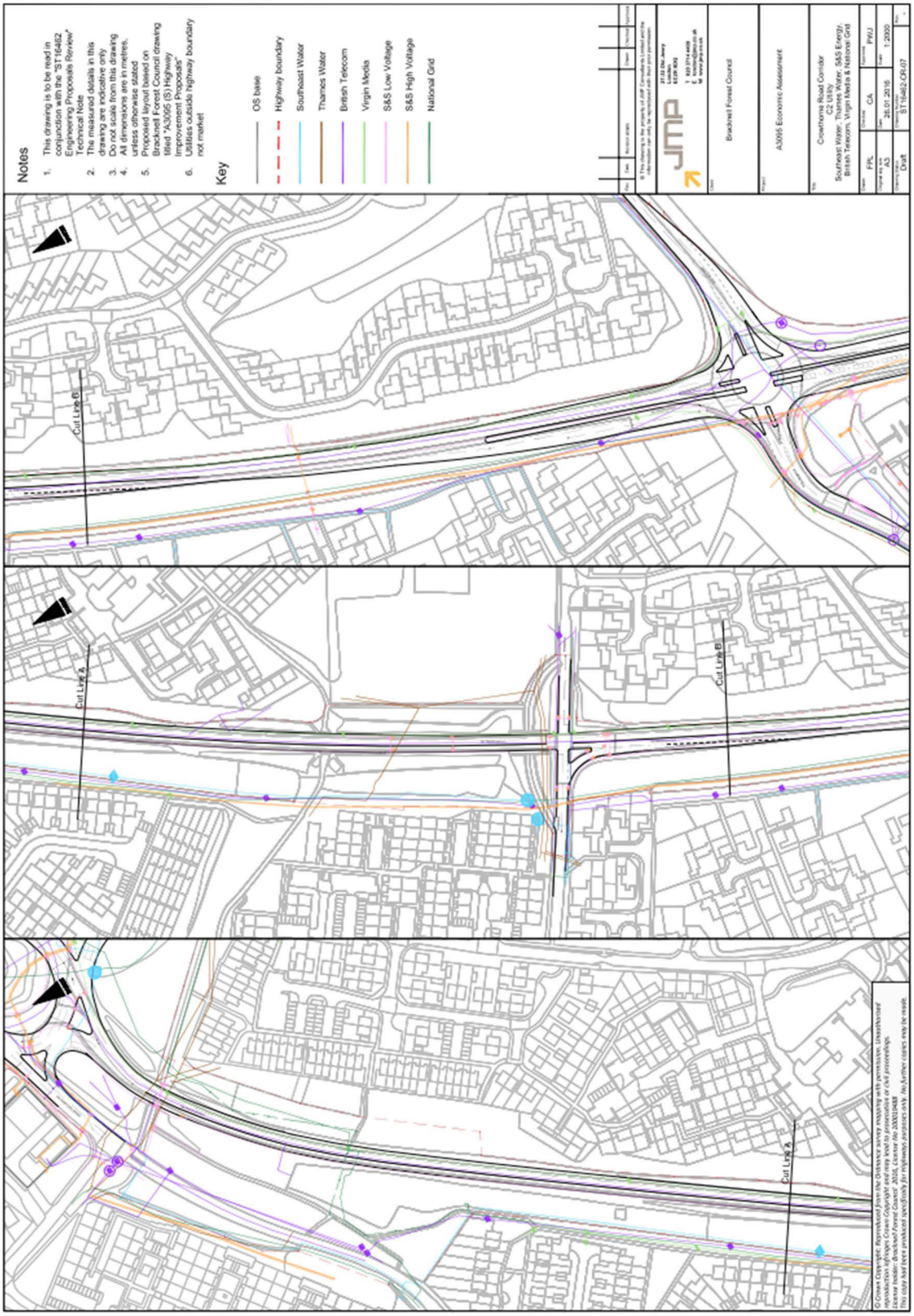


Figure 4: Proposed improvements to A3095 Crowthorne Road

4

STRATEGIC CASE

4 STRATEGIC CASE

4.1 INTRODUCTION

4.1.1. The Strategic Case is designed to determine whether or not an investment is needed. It demonstrates the case for change, the strategic fit, and the business need for a project (Department for Transport, The Transport Business Case).

4.1.2. The Strategic Case follows a defined structure as specified by government. Following this structure ensures all the necessary information is provided and enables efficient assessment of the proposal. Information is presented on the following elements:

- Business strategy
- Problem identified
- Impact of not changing
- Internal drivers for change - This is not assessed as part of the Outline Business Case
- External drivers for change - This is not assessed as part of the Outline Business Case
- Objectives
- Measures for success
- Scope
- Constraints
- Interdependencies
- Stakeholders
- Options.

4.2 SOCIO-ECONOMIC CHARACTERISTICS OF STUDY AREA

4.2.1. Bracknell Forest Council (BFC) is a unitary authority comprising 18 political wards and six separate parish and town councils. The major urban area of Bracknell Forest is situated in the centre of the borough, with the settlements of Sandhurst and Crowthorne to the south, Binfield to the north and North Ascot to the west. A number of these settlements cross boundaries with other authorities, in particular Crowthorne and North Ascot. Sandhurst has strong connections to Camberley in the adjoining authority of Surrey Heath.

4.2.2. At the time of the 2011 Census, Bracknell Forest had:

- 113,205 people are permanent residents in the borough in 45,878 households
- 86% of households own one or more cars or vans compared to the national average (England) of 74%
- The average number of cars owned per household across Bracknell Forest area is 1.49 which is higher than the national average (England) of 1.16
- The average household size is 2.41 people
- 78.3% of the population between 16 and 74 years old is considered to be economically active.

4.3 BUSINESS STRATEGY

4.3.1. The main aim of the LEP is to contribute to the sustainable economic growth of the Thames Valley Berkshire through the implementation of a Strategic Economic Plan, which has four programmes[1]:

- Enterprise and Innovation
- Employability and Skills
- International
- Infrastructure

4.3.2. As part of the last programme the LEP prioritises infrastructure that supports growth through investment in transport improvements to enhance connectivity.

4.3.3. The Thames Valley Berkshire Economic Plan[2] recognises the importance of connectivity to the continued growth of the region. Connections between residential areas to town centres and associated facilities, is important, and north-south routes linking to the major strategic corridors of the M3, M4 and M40 are particularly recognised.

4.4 BUSINESS STRATEGY: NATIONAL TRANSPORT PRIORITIES

4.4.1. The Government's National Infrastructure Plan outlines the Government's approach to identifying and delivering infrastructure that is required. The plan states that investment will drive economic benefits including supporting growth and creating jobs, raising the productive capacity of the economy, driving efficiency and boosting international competitiveness i.e. there is a strong economic case for infrastructure investment as it is shown to have a significant positive effect on output, productivity and growth rates.

4.4.2. The National Planning Policy Framework (NPPF) states that plans should help to build a strong and competitive economy through the creation of jobs and prosperity. The NPPF Consultation document (March 2018) makes more explicit the importance of supporting business growth and improved productivity, in a way that links to key aspects of the Government's Industrial Strategy.

4.4.3. The A3095 Corridor Improvements would improve access into and out of Bracknell therefore in accordance with the NPPF, to help achieve economic growth and bring forward stalled developments the Local Authority is working proactively, to help meet the development needs of business and support an economy fit for the 21st century.

4.5 BUSINESS STRATEGY: REGIONAL TRANSPORT PRIORITIES

4.5.1. The Thames Valley Berkshire Local Enterprise Partnership submitted their Strategic Economic Plan (SEP) in March 2014, which outlines the case for necessary investment to infrastructure, enterprise and employment that is required for the Thames Valley regions economic growth.

4.5.2. It states that the Thames Valley Berkshire area is ranked second, behind London for Business birth rate (12.4%) and in economic output per head which is valued at £32.8k. To keep up these standards, infrastructure will need to continually improve and grow.

4.5.3. The growth of the Thames Valley Berkshire economy is reliant upon transport and communications infrastructure and the SEP states that currently 'it is threatening to undermine our intrinsic growth potential'. It has therefore deemed important to focus on creating new networks and encouraging local sustainable transport networks to allow people to travel easily by foot, bicycle or by bus.

4.5.4. The Thames Valley Berkshire SEP states that the 'biggest single risk to the future economic contribution of TVB concerns our transport and communications infrastructure'. The A3095 Corridor Improvements will support and benefit existing users of the network and provide additional capacity across the course of the whole day and not just during the peak hours.

[1] http://thamesvalleyberkshire.co.uk/About/About-Us

[2] http://thamesvalleyberkshire.co.uk/Strategic_Economic_Plan

4.6 BUSINESS STRATEGY: LOCAL TRANSPORT PRIORITIES

Bracknell Forest Council: Core Strategy

4.6.1. Bracknell Forest Council (BFC) has an adopted Core Strategy Development Plan Document (February 2008) which identifies the vision for growth to 2026 which includes around 11,000 new dwellings and which identifies three major areas for growth (Policy CS3 – Bracknell Town Centre, CS4 – land at Amen Corner and CS5 – land north of Whitegrove and Quelm Park (now known as Warfield).

4.6.2. The sites in the Site Allocations Development Plan Document (SADPD) e.g. Land at Transprot Research Laboratory, Crowthorne are dependent on the provision of necessary infrastructure across Bracknell Forest which includes improvements to the A3095 corridor.

4.6.3. The South East Plan (SEP) notes that "the strategic road network *through the Thames Valley Berkshire area, and linking to neighbouring economies, is increasingly constrained; there is little scope for new roads, so the challenge is to maximise existing capacity and to tackle known 'pinch-points*".

4.6.4. With 11,000 new houses planned for in and around Bracknell over the next 15 years, traffic levels in the region are predicted to increase. Although some effects of this growth will be mitigated by developer contributions, growth in the region will struggle without further improvements to existing transport infrastructure.

4.6.5. Therefore in accordance with the National Planning Policy Framework, to help achieve economic growth and bring forward stalled developments the Local Authority is working proactively, to help meet the development needs of business and support an economy fit for the 21st century. This means the costs of these works are now being met, where possible, by the local authority with a mix of capital and developer contributions.

4.6.6. It must be stressed that no developments are directly dependant on the A3095 Corridor Improvements therefore no dependant development assessment will or has been undertaken. The emphasis is on maximising existing capacity and tackling known 'pinch-points' to enable growth to be realised across the borough.

4.6.7. The A3095 Corridor Improvements support a number of the policies outlined in the document, including:

- **Policy CS23** which states that the Council will use its planning and transport powers to:
  - Increase the safety of travel
  - Maintain and where possible improve the local road network
  - Provide improved access to key services and facilities
  - Secure the reliable movement of goods through the Borough
  - Enhance sub-regional connectivity to and from the Borough
  - Make representations and bids for funding major transport infrastructure to help deliver the Core Strategy and Local Transport Plan schemes.

Bracknell Forest Council: Local Transport Plan (LTP3)

4.6.8. Bracknell Forest's most recent Local Transport Plan (LTP3) was adopted in 2011. The A3095 Corridor Improvements support a number of the policy aspirations within the LTP3:

- **TP1** Accessibility - to maintain high levels of accessibility to key services such as employment, local centres, healthcare, supermarkets, education and leisure through:
  - Implementing key road capacity improvements
- **TP8** Walking and Cycling - the council will promote walking and cycling in the borough through:
  - Improving safety for pedestrians and cyclists
- **TP12** Traffic Management - the council will regulate traffic, where necessary, by improving the reliability of journey times
- **TP13** Congestion Management - the council will seek to reduce the impact of congestion through works and measures to improve the capacity and functionality of junctions and route corridors.

4.7 PROBLEM IDENTIFIED

4.7.1. The section of the A3095 encompassing the Hanworth Roundabout and Golden Retriever Roundabout and connecting highway currently suffers from a range of congestion issues. These affect the flow of traffic along the corridor and connections between Crowthorne and Sandhurst into and out from Bracknell.

4.7.2. At the Handworth roundabout, significant queues that form back along the Mill Lane Southbound arm, which in peak times can stretch back as far as the Wildrings Roundabout, the next junction on the A3095. This affects the operation of both junctions. At the Golden Retriever Roundabout congestion occurs in a northbound direction along Foresters Way, as well as Nine Mile Ride.

4.7.3. Traffic count data has been collected at the following locations:

- A3095 Crowthorne Road (North of B3430)
- B3430 Nine Mile Ride.

4.7.4. At Crowthorne Road the five-day average peak flow hour is just under 1,200 vehicles in each direction. The north and southbound flows are similar in volume for each peak.

4.7.5. At Nine Mile Ride the five-day average peak flow is approximately 600 vehicles travelling in both West and Eastbound. Travelling eastbound the peak is more pronounced in the AM whereas for Westbound movements both peak volumes are fairly similar.

4.8 IMPACT OF NOT CHANGING

4.8.1. If the current network is maintained, the growth in underlying trips are forecast to result in a deterioration of the performance of the A3095 network, with increasing congestion and delays at both the Hanworth and Golden Retriever Roundabouts, resulting in higher, and less reliable, journey times and further increases in economic inefficiencies.

4.8.2. This will impact upon north-south connectivity across the area affecting both strategic movements, as well as local accessibility to employment and town centre services and facilities.

4.9 INTERNAL DRIVERS FOR CHANGE

4.9.1. This is not assessed as part of the Business Case.

4.10 EXTERNAL DRIVERS FOR CHANGE

4.10.1. This is not assessed as part of the Business Case

4.11 OBJECTIVES

4.11.1. The proposed A3095 Corridor Improvement scheme will directly address the identified constraints at both junctions by providing additional capacity at both junctions, as well as on the highway link between them. The improvements will:

- Reduce north-south journey times
- Improve journey time reliability for all road users
- Improve accessibility to Bracknell Town Centre and employment areas
- Improve connectivity to the Strategic Road Network (SRN)
- Improve road safety and reduce the risk of accidents.

4.12 MEASURES OF SUCCESS

4.12.1. The local junction modelling work and wider VISUM network modelling has indicated that the preferred scheme options will delivery significant enhancement to the operation of the individual junctions, as well as improved journey times along the A3095 corridor. This will support the continued growth of Bracknell as an employment centre, as well as wider residential growth across the region.

4.12.2. In order to measure whether the scheme objectives set out above have been met, a series of specific; measurable; achievable; realistic and time-bound targets have been derived which are shown in Table 1.

Table 1: Measures of Success

Objective	Target
Reduce north-south journey times	10% reduction in peak hour journey times
Improve journey time reliability	5% reduction in day-to-day travel time variability
Improve accessibility to Bracknell Town Centre and employment areas	10% reduction in peak hour journey times
Improve connectivity to the SRN	10% reduction in peak hour journey times
Improve road safety and reduce the risk of accidents	5% reduction in accidents along the scheme

4.12.3. A full monitoring and evaluation plan is included in Chapter 8.

4.13 SCOPE

4.13.1. The scope of the scheme covers the section of the A3905 which encompasses the Hanworth and Golden Retriever Roundabouts as shown in the proposed layouts in Appendix B. All works will take place within the highway boundary.

4.14 CONSTRAINTS

4.14.1. The project represents a relatively standard highway design and build process with no specific constraints to delivery.

4.15 INTERDEPENDENCIES

4.15.1. The scheme is not dependent upon any specific factors for successful delivery.

4.16 STAKEHOLDERS

4.16.1. Bracknell Forest Council have engaged with necessary stakeholders throughout the option development process and will continue to do so throughout the development of the scheme.

4.17 OPTIONS APPRAISAL

4.17.1. Option assessment was undertaken as described in Chapter 3.

5

ECONOMIC CASE

5 ECONOMIC CASE

5.1 INTRODUCTION

5.1.1. The Economic case assessment is undertaken to ensure that all the options are assessed and to fulfil the treasury's requirements for appraisal and demonstrating value for money. Information is presented on the following:

- Options appraised
- Assumptions
- Sensitivity and risk profile
- Appraisal Summary Table
- Value for Money statement.

5.2 OPTIONS APPRAISED

5.2.1. Option assessment was undertaken as described in Chapter 3. In addition to the design, safety and deliverability aspects, the formation of the preferred option also took due consideration of the economic, social and environmental impact of the scheme. Overall this sought to maximise the level of ongoing benefits from the scheme, whilst minimising the capital and maintenance costs across the life-time of the scheme.

5.2.2. The proposed layout of the preferred scheme elements are shown in Figure 2, Figure 3 and Figure 4. Further information is included in Appendix B which show the existing layout and the proposed layout.

Reference Scenario

5.2.3. A Reference Scenario has been created that reflects committed development and the transport highway schemes that will be delivered prior to the proposed A3095 Corridor Improvements scheme opening.

Core Scenario

5.2.4. The Core Scenario reflects the Reference Scenario but includes the proposed preferred option A3095 Corridor Improvements scheme enhancements to the Hanworth and Golden Retriever Roundabouts and the connecting Crowthorne Road.

High and Low Growth Scenarios

5.2.5. High and low growth sensitivity tests have been undertaken to understand the impact of different underlying growth assumptions on the Core Scenario. The details of these sensitivity tests are set out in Section 5.21.

5.3 ASSUMPTIONS

5.3.1. The economic assessment is undertaken to ensure that the full extent of the impact of the scheme on the public account is understood and to ensure that the scheme offers value for money. The principals for this assessment are set out in WebTAG and have been followed within this economic appraisal.

5.3.2. To enable the scheme value for money to be calculated and to inform scheme design and environmental assessment, two traffic models have been developed. Local junction models using Linsig have been utilised to evaluate the proposed engineering scheme designs in detail and ensure that they will function effectively.

5.3.3. Additionally Bracknell Borough Council's Strategic Multi-Modal VISUM model has also been utilised to assess the network wide impact of the scheme proposals and to determine the impact on access times. Within this VISUM model a cordon model has been developed, focusing on the sub-area around Bracknell and the Sandhurst/Crowthorne Transport Corridor.

5.3.4. The primary modelled year is 2026 however, to cover the period from 2021 to 2026 matrices from the 2016 model have been utilised.

5.3.5. There are a number of assumptions used in the TUBA economic assessment:

- TUBA version 1.9.7 has been used
- Annualisation factor of 253 has been used which doesn't account for the shoulder periods therefore the benefits are an under-estimate
- GDP deflator of 112.11 assumed as taken from the TAG Data Book (December 2017)
- Supervision costs have been assumed to be 5% of the total cost of the scheme
- All HGV were defined as Vehicle Type 4 (OGV1) in TUBA. As these have lower operating costs than OGV2, this is likely to have resulted in a conservative estimate of benefits attributable to HGV
- Two model years have been used (2021 and 2026) although with an assumed opening year of 2022 no benefits/ disbenefits have been included for 2021.

5.4 MODELLING APPROACH

5.4.1. Modelling work has been undertaken at two spatial levels. Local junction models (Linsig) have been utilised to evaluate the proposed engineering scheme designs in detail and ensure they will function effectively.

5.4.2. A summary of the Linsig modelling work for the Hanworth and Golden Retriever Signalised Junctions, including details of the signal timings, is presented in detail in Appendix C.

5.4.3. Bracknell Borough Councils Strategic Multi-Modal VISUM model has also been utilised to assess the network wide impact of the scheme proposals and to determine the impact on access times.

5.5 BRACKNELL MULTI-MODAL TRANSPORT MODEL

5.5.1. WSP produced a multi modal transport model of Bracknell and wider related area on behalf of Bracknell Forest Council (BFC). The 2007 (Bracknell Multi-Modal Transport Model (BMMTM), base year model was subsequently used to produce 2026 forecast models to assess the Council's Core Strategy proposals.

2013 Base year model

5.5.2. In January 2013 BFC instructed WSP | Parsons Brinckerhoff to carry out a 'Minimal Update' to the 2007 model, which involved:

- Updating VISUM modelling software to latest version (VISUM 13.00-09)
- Disaggregating a number of zones with potential developments in the future
- Recalibrating assignment link flows and journey times to 2013 observed data
- Recalibrating the demand model to the latest mode split and distributional data.

5.5.3. The development and validation of the 2013 base models is detailed in the 2013 Model Development and Validation Report (MDVR) (June 2015).

5.5.4. The 2013 base model has been developed in VISUM 13.00-09 and uses updated traffic assignment procedures as recommended by PTV. The zone structure has been disaggregated in a number of areas specified by BFC (e.g. Amen Corner and Bracknell Town Centre), in order to allow more detailed assessment of forecast development impacts in such areas.

5.5.5. The 2013 base year assignment models have been calibrated to observed turning flows, link flows and journey times for an AM peak (08:00-09:00) and a PM peak (17:00-18:00) hour. The demand model has been calibrated at a 24-hour level to reflect mode choice and distributional data, from NTS, then subsequently cut down to represent AM and PM peak hour trip patterns.

5.5.6. The full network coverage of the VISUM model is provided in Figure 5 whilst the main study area is displayed in Figure 6.

Figure 5: **Bracknell VISUM Full network coverage**

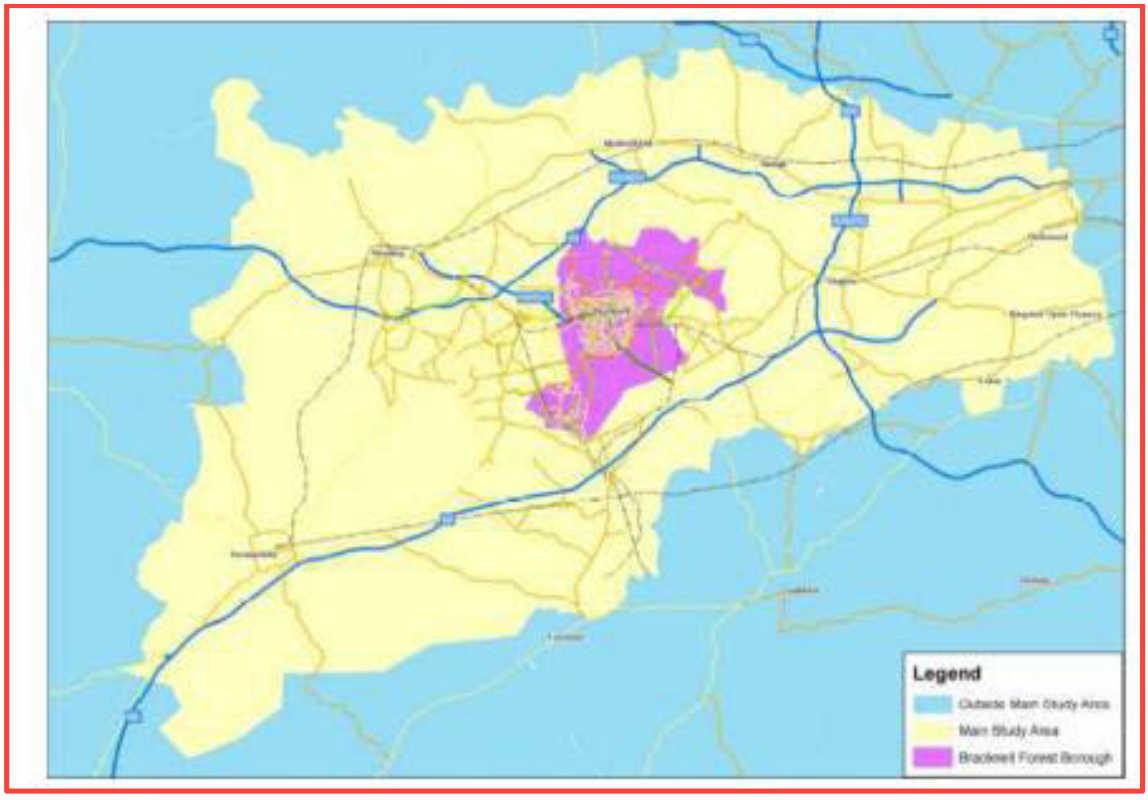


Figure 6: **Bracknell VISUM main model study area network coverage**

5.5.7. The highway assignment model has been calibrated and validated following DMRB's and latest WebTAG guidance. This is fully documented in a Local Model Validation Report (LMVR) produced by Bracknell Forest Borough Council.

5.5.8. The highway network was developed in a GIS environment using NAVTEQ road vector data where highway centre line alignments and detail such as speed limits, road classification, the number of lanes and geographically correct road lengths are incorporated and can aid the speedy and accurate development of the network. Following the development of the full network, an on-site inventory was carried out to check and clarify the number of lanes, link type, capacity and speed limit in some areas. The road network includes all A and B roads and other strategic local roads and rat runs. Other unclassified local roads have also been included to a high level of detail.

5.5.9. All strategic routes leading into Bracknell were modelled in detail including the A329, A3095, A322, B3430, B3408, B3018 and B3034. All junctions within the vicinity of these routes were modelled in some detail. The junction coding for the network included junction type (priority, roundabout or signalised), the number of approach lanes, saturation flows, and signal configurations where relevant.

5.5.10. The level of zoning detail is centred on Bracknell, with the zones increasing in size with distance away from Bracknell.

5.5.11. Table 2 provides a summary of the high level of overall calibration achieved for the AM peak and PM peak models for both car and HGV.

Table 2: Overall calibration statistics of the model

Model	GEH <5 Calibration	Flow Calibration
AM peak Car	90%	91%
AM peak HGV	90%	94%
PM peak Car	90%	90%
PM peak HGV	94%	99%

5.5.12. The model flows were validated against three screenlines, one encompassing the Sandhurst/Crowthorne Corridor, one to the north, and another central screen line.

5.5.13. Journey time validation was also undertaken along five routes. Both the AM peak and PM models validated well, with 9 of the 10 routes exceeding DMRB criteria in both cases.

5.5.14. The LMVR results indicate that the model flows validate well, in particular for the Sandhurst/Crowthorne Corridor, which is the focus of this scheme.

5.5.15. A further analysis of traffic flow data on the A3095 Crowthorne Road (north of B3430) indicates that the model validates well in the AM peak, with both GEH values under 5 for the north and southbound flows. The PM peak also validates well for the northbound flow, with a GEH value of under 5, with the southbound flow modelled as slightly higher than the count data, with a GEH value of 8. Whilst this does not indicate perfect validation of the model for the corridor, it is not an exceptional variation, being below the critical 10 GEH level.

5.5.16. In summary the Bracknell Multi-Modal Transport Model has the following characteristics:

- A total of 381 zones, covering the UK
- Two time periods: AM peak (08:00 to 09:00) and PM peak (17:00 to 18:00)
- Two modelled user classes (Cars and HGV.

2026 forecast year model

5.5.17. The purpose of the 2026 forecast year models was to provide an understanding of the future situation in the study area and examine the transport implications and potential infrastructure requirements of the proposed Local Development Framework (LDF) Core Strategy and Site Allocations DPD (SADPD) plans.

5.5.18. 2026 forecast models have been developed from the validated 2013 base year models, applying different assumptions of population, housing and employment levels and also highway and public transport infrastructure as part of the Core Strategy and SADPD proposals.

5.5.19. Outputs from the forecast demand model provide future year traffic matrices which have been assigned on the future year networks, the assessment of which provides an understanding of the potential impacts of the developments on the highway network in terms of links flows, ratio of flow to capacity, and journey times.

5.5.20. Key outcomes of the modelling assessment include:

- General growth in flow levels within Bracknell Forest Borough in 2026 and 2036 for the AM peak and PM peak
- Some re-routing of trips around the Town Centre following improvements at junctions such as Twin Bridges gyratory, and the new junctions on the A329(M)
- Some substantial increases in flows where new or improved junctions are introduced e.g. Peacock Lane and Three Legged Cross junction
- Particular locations where links approach flow capacity in 2026 e.g. A329(M), Peacock Lane
- Specific key junctions where delays are increased, leading to increased journey times along key routes traversing the Bracknell highway network e.g. Coral Reef, Golden Retriever
- Specific junctions that may require mitigation in order improve operation and reduce delays and improve journey times along key routes.

5.5.21. The assessment highlights where flows are expected to increase / decrease as a result of the Core Strategy and SADPD proposals, and also provides an indication of which junctions are likely to require improvements to reduce delays and improve journey times in the future. The model provides a tool to help formulate and manage the Local Development Framework (LDF), assess cumulative and individual development impacts and therefore inform where future mitigation measures will be needed, and to assist in the development of future transport policy and infrastructure investment decisions

5.6 PROPORTIONALITY OF MODELLING APPROACH

5.6.1. The LMVR demonstrates that the model validates well, particularly in the main area of interest along the Sandhurst/Crowthorne Corridor. It is observed that there may have been some changes since the model was initially developed. In addition, some recent modelling exercises have indicated that there can notable be instances of ‘noise’ in the outputs of the model associated with impact in the hinterland of the model.

5.6.2. The Guidance for Technical Project Managers in WebTAG discusses the concept of proportionality in relation to model design. Below is a summary of the salient points in that section that need to be considered.

5.6.3. WebTAG sets out that appropriate scheme modelling approaches will take into account the circumstances, objectives, and the stage of the appraisal and decision making process.

5.6.4. WebTAG discusses the trade-offs between model complexity and constraints on resource, data requirements and expertise. In general, the model design will depend on the nature of the problem and their likely solution, the size of the study area, the number of options to be tested, data availability and the need to update models and conduct new surveys, timescale for model development; and finally the required accuracy of the recommendations. The previous section has demonstrated the capabilities and robustness of the overall model and its appropriateness for use in appraising the scheme.

5.6.5. For highway schemes, WebTAG recommends that the potential effects of variable demand (resulting through induced or suppressed demand) are considered. Given the scale and scope of the highway scheme, the forecast impact upon travel times, and the limited alternative public transport options along the corridor, it is considered that a highway assignment approach is appropriate.

5.7 ADOPTED MODELLING APPROACH

5.7.1. The key objective of the strategic modelling was to be able to give an accurate forecast of the likely transport impacts of the proposed A3095 Corridor Improvements would have on highway users along the corridor and surrounding road network. The scheme is expected to improve journey times and the reliability highway network, through increased capacity and improved timings of the Hanworth and Golden Retriever Roundabouts, and the connecting Crowthorne Road.

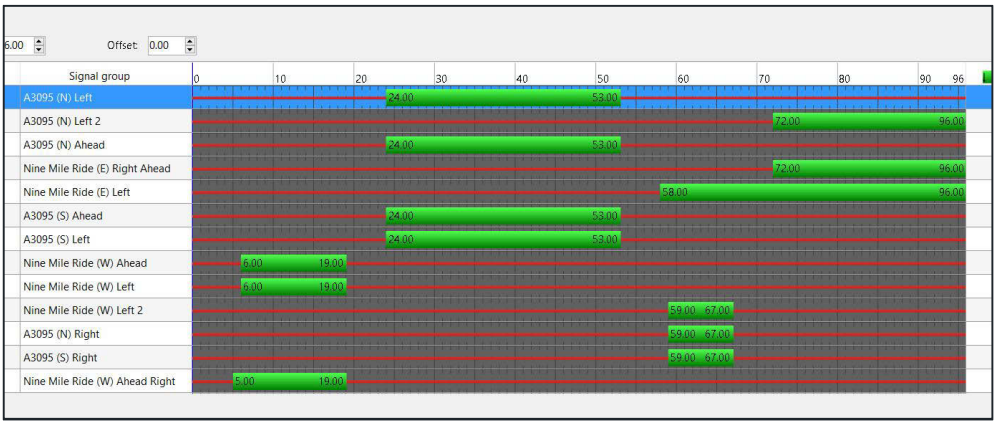
5.7.2. It is expected that the journey time savings are not sufficiently significant to impact on model shift. The potential impacts of the scheme measures will be analysed using the existing VISUM model, following a fixed assignment approach. It is assumed that benefit of the scheme to public transport users will be neutral.

5.7.3. Forecasts for two years, 2016 and 2026 have been carried out for two time periods (AM peak and PM peak).

5.7.4. Hereafter the 2026 'without scheme' scenario will be referred to as the Do Minimum (DM) scenario and the 2026 'with scheme' scenario will be referred to as the Do Something (DS) scenario.

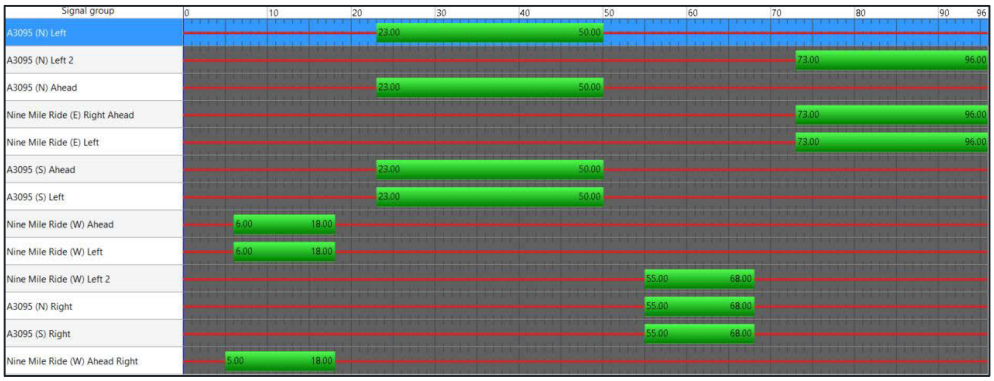
5.7.5. After examining the initial TUBA results it was noticed that there were unrealistically high disbenefits in the PM peak for O-D pairs passing through the A3095/ B3430 signalised junction, particularly in the high growth scenario. This is because the signal timings used for the PM DS scenario do not provide the optimal solution in terms of managing demand at the junction in the high growth situation. This then results in blocking back upstream of the junction, through other nodes, leading to greatly increased journey times and wider reassignment of traffic to alternative routes.

5.7.6. As such, signal timing optimisation has been carried out at this node, maintaining the existing cycle time and gaps between opposing signal groups, as shown in Figure 7 and Figure 8.



FromNodeNo	840	840	840	100869	100869	100869	834	834	834	854	854	854
FromLinkNo	2168	2168	2168	101704	101704	101704	2366	2366	2366	101688	101688	101688
FromLink\ToNodeOrientation	N	N	N	W	W	W	S	S	S	E	E	E
ToLinkNo	101704	2366	101688	2366	101688	2168	101688	2168	101704	2168	101704	2366
ToLink\FromNodeOrientation	W	S	E	S	E	N	E	N	W	N	W	S
ToNodeNo	100869	834	854	834	854	840	854	840	100869	840	100869	834
TypeNo	1	2	3	1	2	3	1	2	3	1	2	3
TSysSet	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT
CapPrT	99999	99999	99999	99999	99999	1670	99999	3960	99999	99999	99999	99999
t0PrT	0min	0min	0min	0min	0min	0min	0min	0min	0min	0min	0min	0min
VolPCUPrT(AH)	54020	383626	23961	19441	176573	179764	54020	257174	5530	7056	169344	161634
VolPCUPrT(AP)	148	1051	66	53	484	493	148	705	15	19	464	443
TCur_PrTSys(C)	3min 13s	1min 12s	13s	2min 47s	2min 47s	1min 53s	3min 13s	28s	28s	34s	34s	22s
TCur_PrTSys(H)	3min 13s	1min 12s	13s	2min 47s	2min 47s	1min 53s	3min 13s	28s	28s	34s	34s	22s
AddVal1	0	0	0	0	0	0	0	0	0	0	0	0
AddVal2	0	0	0	0	0	0	0	0	0	0	0	0
AddVal3	0	0	0	0	0	0	0	0	0	0	0	0
UsePresetCriticalGap	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐	☐
PresetCriticalGap	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00

Figure 7: Original timings and TCur



Turns: 12	1	2	3	4	5	6	7	8	9	10	11	12
FromNodeNo	840	840	840	100869	100869	100869	834	834	834	854	854	854
FromLinkNo	2168	2168	2168	101704	101704	101704	2366	2366	2366	101688	101688	101688
FromLink\ToNodeOrientation	N	N	N	W	W	W	S	S	S	E	E	E
ToLinkNo	101704	2366	101688	2366	101688	2168	101688	2168	101704	2168	101704	2366
ToLink\FromNodeOrientation	W	S	E	S	E	N	E	N	W	N	W	S
ToNodeNo	100869	834	854	834	854	840	854	840	100869	840	100869	834
TypeNo	1	2	3	1	2	3	1	2	3	1	2	3
TSysSet	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT	B,C,H,JT
CapPrT	99999	99999	99999	99999	99999	1670	99999	3960	99999	99999	99999	99999
t0PrT	0min	0min	0min	0min	0min	0min	0min	0min	0min	0min	0min	0min
VolPCUPrT(AH)	87600	360164	18166	19630	154258	205868	87600	286824	6978	5983	166450	162918
VolPCUPrT(AP)	240	987	50	54	423	564	240	786	19	16	456	446
TCur_PrTSys(C)	2min 37s	1min 20s	14s	1min 59s	1min 59s	36s	2min 37s	31s	31s	35s	35s	38s
TCur_PrTSys(H)	2min 37s	1min 20s	14s	1min 59s	1min 59s	36s	2min 37s	31s	31s	35s	35s	38s
AddVal1	0	0	0	0	0	0	0	0	0	0	0	0
AddVal2	0	0	0	0	0	0	0	0	0	0	0	0
AddVal3	0	0	0	0	0	0	0	0	0	0	0	0
UsePresetCriticalGap	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐	☐
PresetCriticalGap	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00

Figure 8: Optimised timings with reduced TCur

Assignment / Convergence

5.7.7. Figure 9 and Figure 10 show the demand flow differences between the DM and DS models for each time period (blue is a decrease, and orange is an increase), respectively. The green bars show the relative queue length in the DS model, which highlights a link which is experiencing queuing after assignment (due to the capacity of the link and/or capacity of the downstream turn being exceeded).

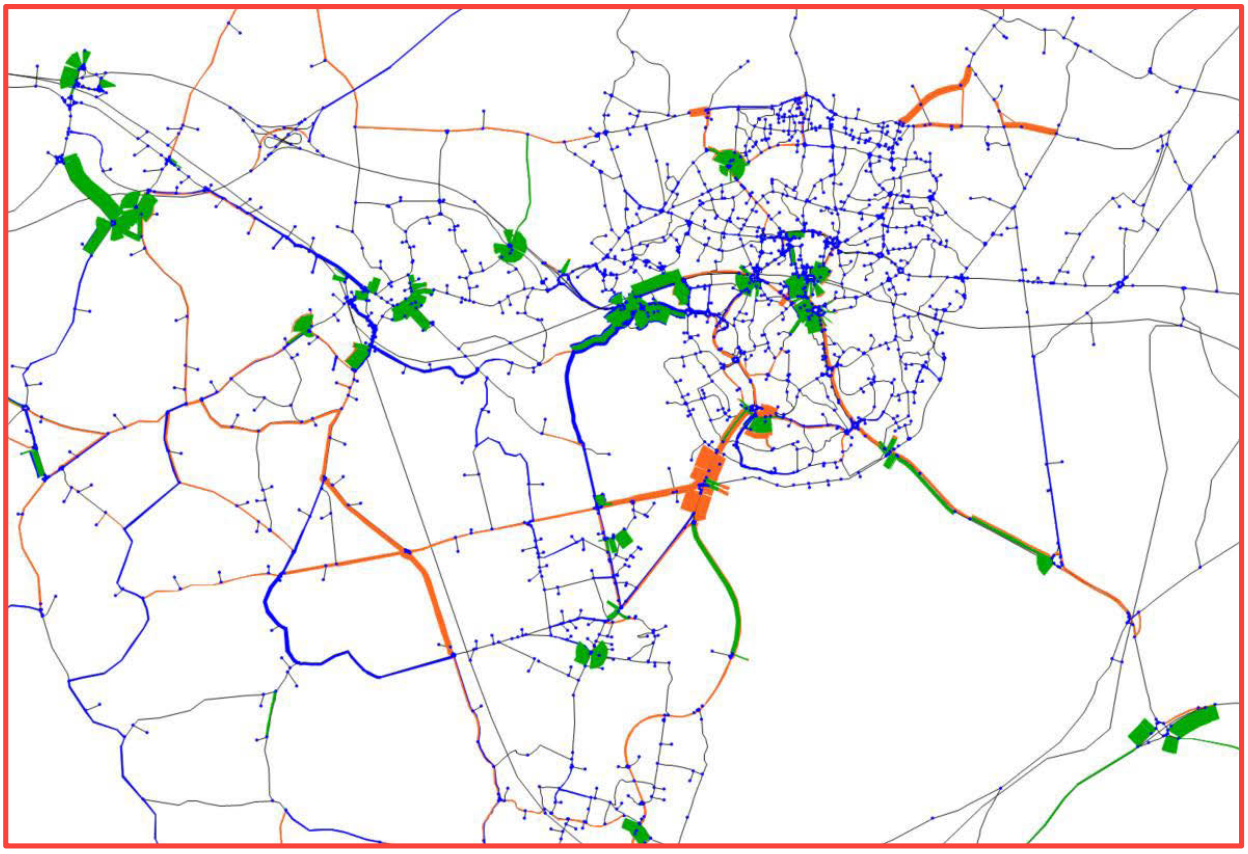


Figure 9: **AM Flow difference, DM to DS scenario, full model area**

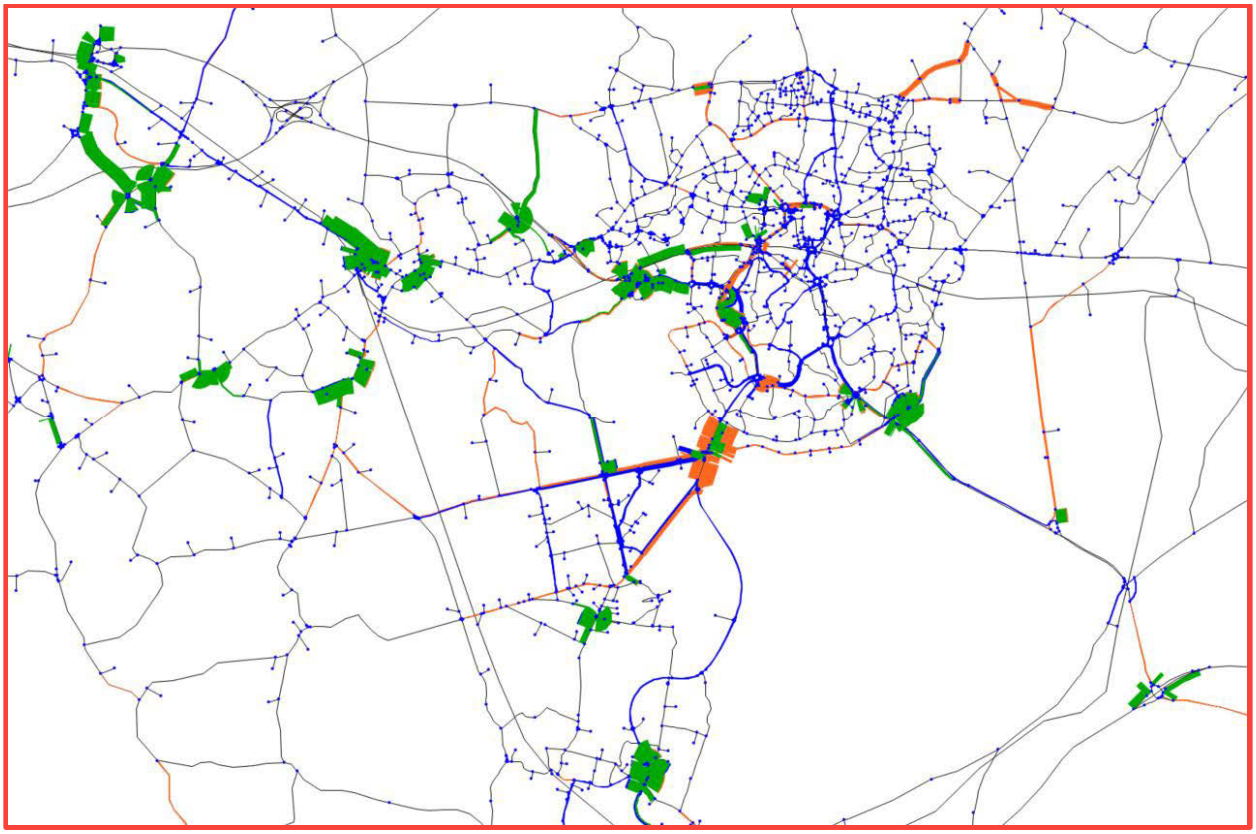


Figure 10: **PM Flow difference, DM to DS scenario, full model area**

5.7.8. As can be seen from Figure 9 and Figure 10, a number of junctions are heavily congested and there is widespread reassignment occurring away from the scheme, particularly in the AM peak. This effect is exacerbated in the high growth scenario, with the additional demand in the model.

5.7.9. The main cause for these issues is that in general the models are highly congested in both the DM scenario and the DS scenario. This results in difficulty reaching stable convergence, resulting in some large differences in terms of demand flow and queueing between modelled scenarios, away from the scheme itself. This effect is most significant at junctions which are very close to capacity, and are therefore sensitive to small changes in demand flow at one or more arms, resulting in large differences in journey times between modelled scenarios.

5.7.10. Therefore, to address these issues, the assignment parameters for relative gap and GEH between iterations have been tightened to 0.99, to try and get a more stable convergence result, as shown in Figure 11. However, due to the level of congestion in the models, a number of scenarios do not converge within 200 iterations, and it was decided to cordon the models down to a more contained area, and then reassign with the stricter parameters.

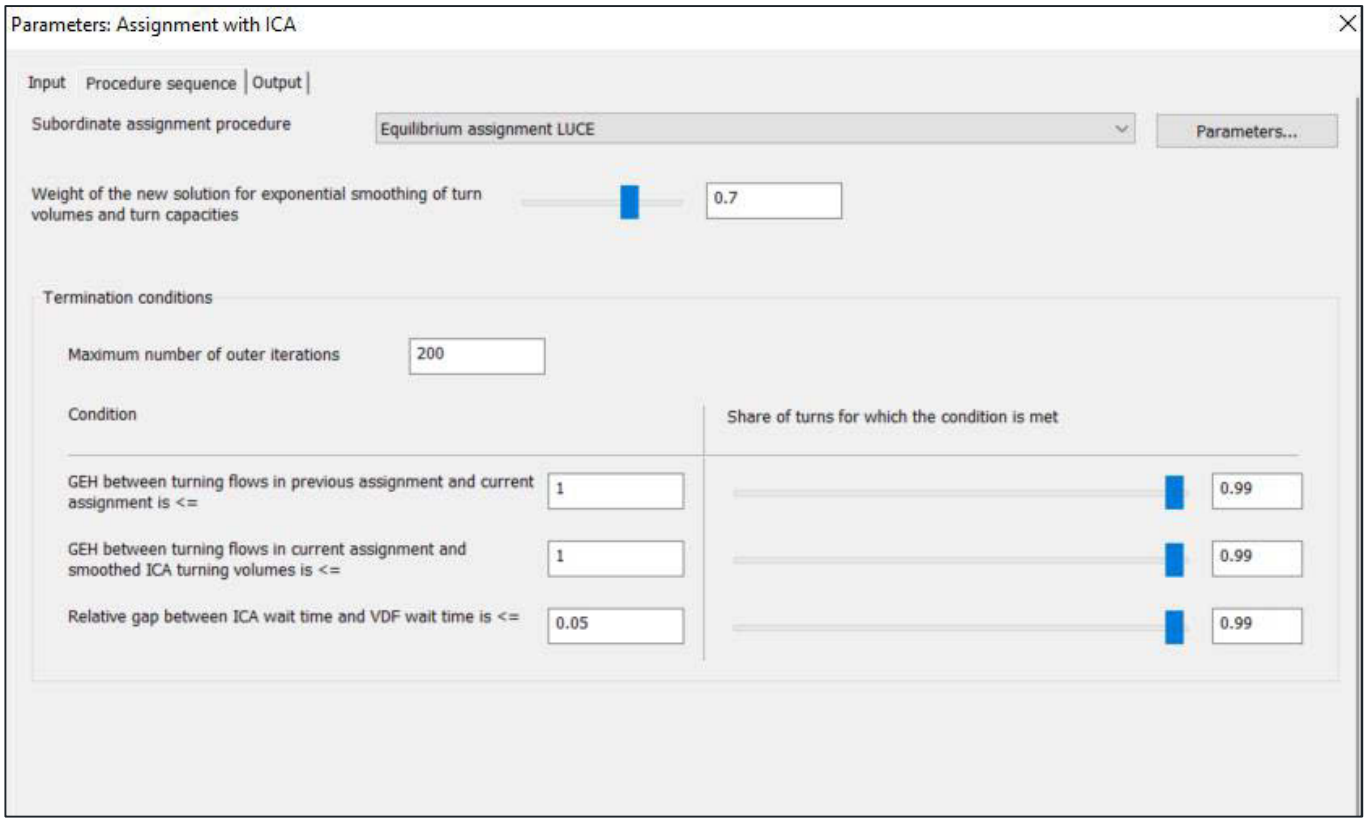


Figure 11: Revised assignment parameters

5.7.11. In order to focus the model outputs on the core area of impact around the Bracknell and the Sandhurst/Crowthorne Transport Corridor, and reduce 'noise' from the model, a cordon model has been created for this sub-area. The sub-area extents have been defined by examining the impacts of the scheme by comparing the with and without scheme networks.

5.7.12. The cordon area has been determined by examining the route choices taken by vehicles north and south of the scheme in both the AM peak and PM peak scenario to ensure all possible route choices related to the scheme are included. Figure 12 shows the final cordon area used for the TUBA assessment.

5.7.13. The cordon process takes the demand from the full model for zones within the cordon area, and creates new zones known as 'cordon points' where links cross the edge of the cordoned area. The demand at these cordon points is then determined by the demand flow on the respective link from the full model. As the TUBA assessment is only taking account of the Car and HGV demand segments, rail and bus matrices have been ignored.

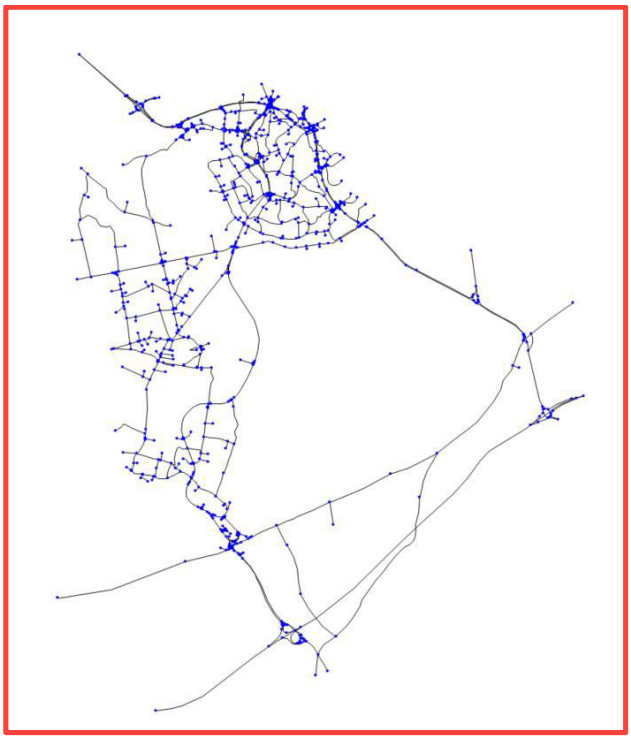


Figure 12: Cordon model network

5.7.14. After cordoning all models have been reassigned with the stricter assignment parameters shown in Figure 11 with all models converging successfully within 100 iterations.

5.7.15. After reassigning, the majority of routing issues and unstable ICA final capacities have been either removed or greatly reduced, resulting in a more logical and consistent pattern of flow differences between the DM scenario and the DS scenario, for each time period. Where route switching occurs it is either related to the scheme, or the number of vehicles affected is low, having a less significant impact on the TUBA result.

5.7.16. Figure 13 and Figure 14 show the demand flow differences between the DM cordon scenario and DS cordon scenario for the AM peak time period. Figure 15 and Figure 16 show the demand flow differences between the DM cordon scenario and DS cordon scenario for the PM peak time period.

5.7.17. Figure 17 and Figure 18 show the demand flow differences between the DM cordon scenario and DS cordon scenario for the AM peak time period. Figure 19 and Figure 19 show the demand flow differences between the DM cordon scenario and DS cordon scenario for the PM peak time period.

5.7.18. One thing to note is the VISUM does not allow for the difference in flow to be shown where there is a difference in the network coding. The large increase shown on Figure 13 and Figure 14 on the A3095 Corridor Improvement section of the network shows the Do Something scenario flow.

5.7.19. The reassignment in the AM peak and PM peak shows vehicles switching to the A3095 corridor as oppose to other parallel routes, as the upgraded corridor provides additional capacity compared with the DM situation. This is particularly relevant at the A3095/ B3430 roundabout, which is heavily congested in the DM scenario during the AM peak. The signal arrangement in the DS performs significantly better, drawing in additional demand to fill the extra capacity.

5.7.20. One thing to note is the VISUM does not allow for the difference in flow to be shown where there is a difference in the network coding. The large increase shown on Figure 13 and Figure 14 on the A3095 Corridor Improvement section of the network shows the Do Something scenario flow.

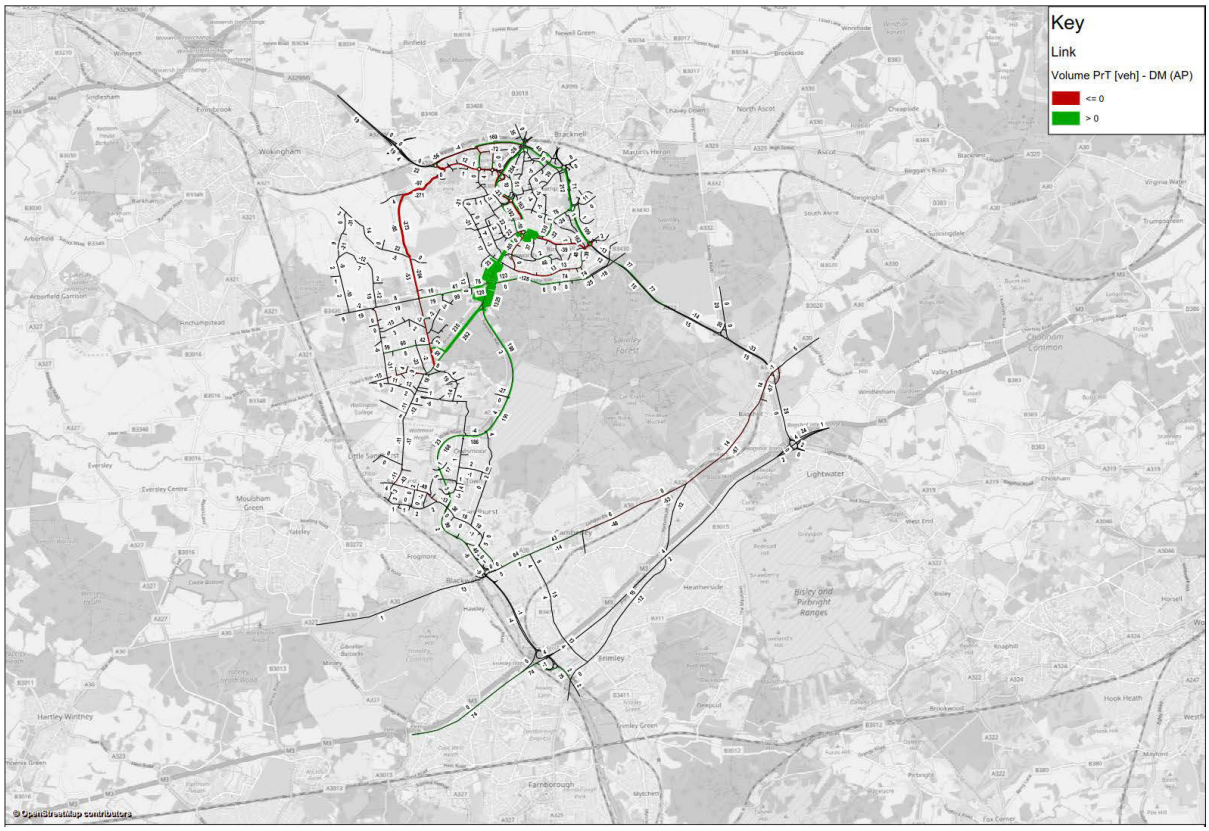


Figure 13: AM Flow difference, DM to DS, wider area (cordon scenario)

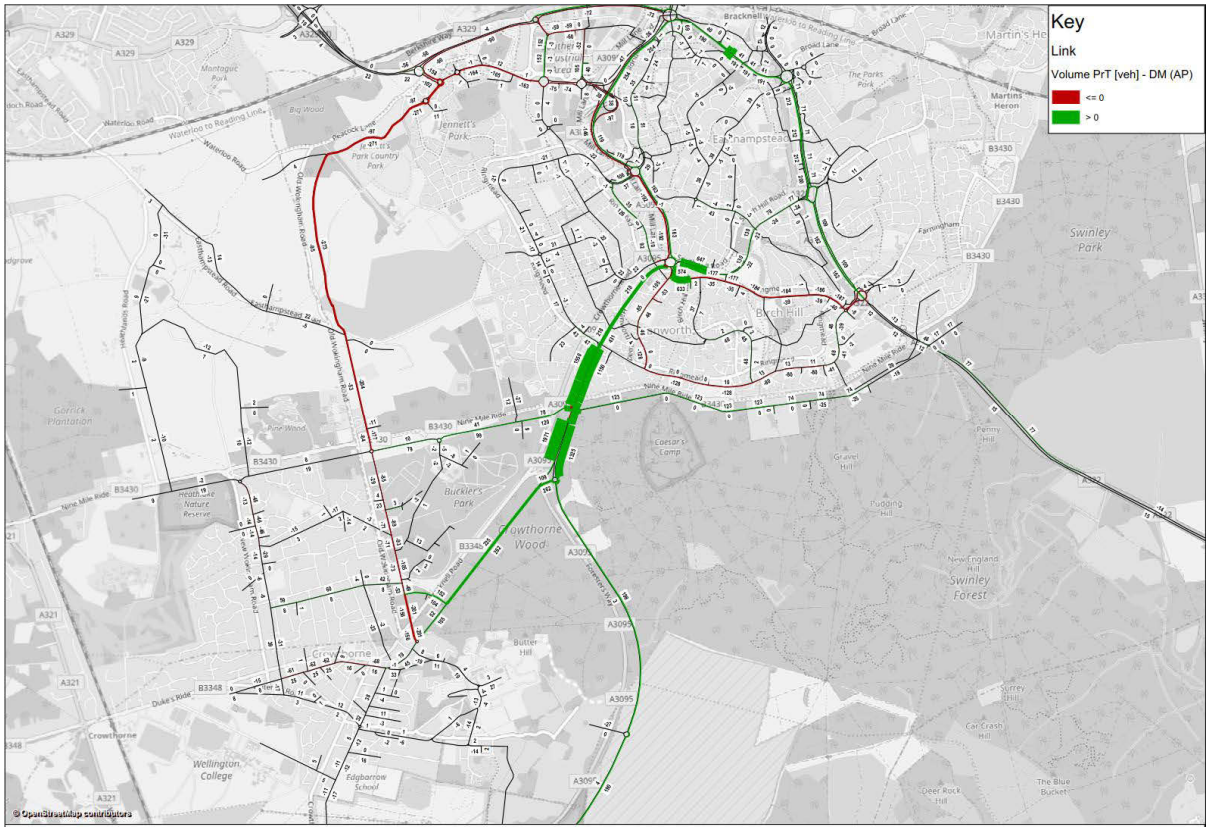


Figure 14: AM Flow difference, DM to DS, localised area (cordon scenario)

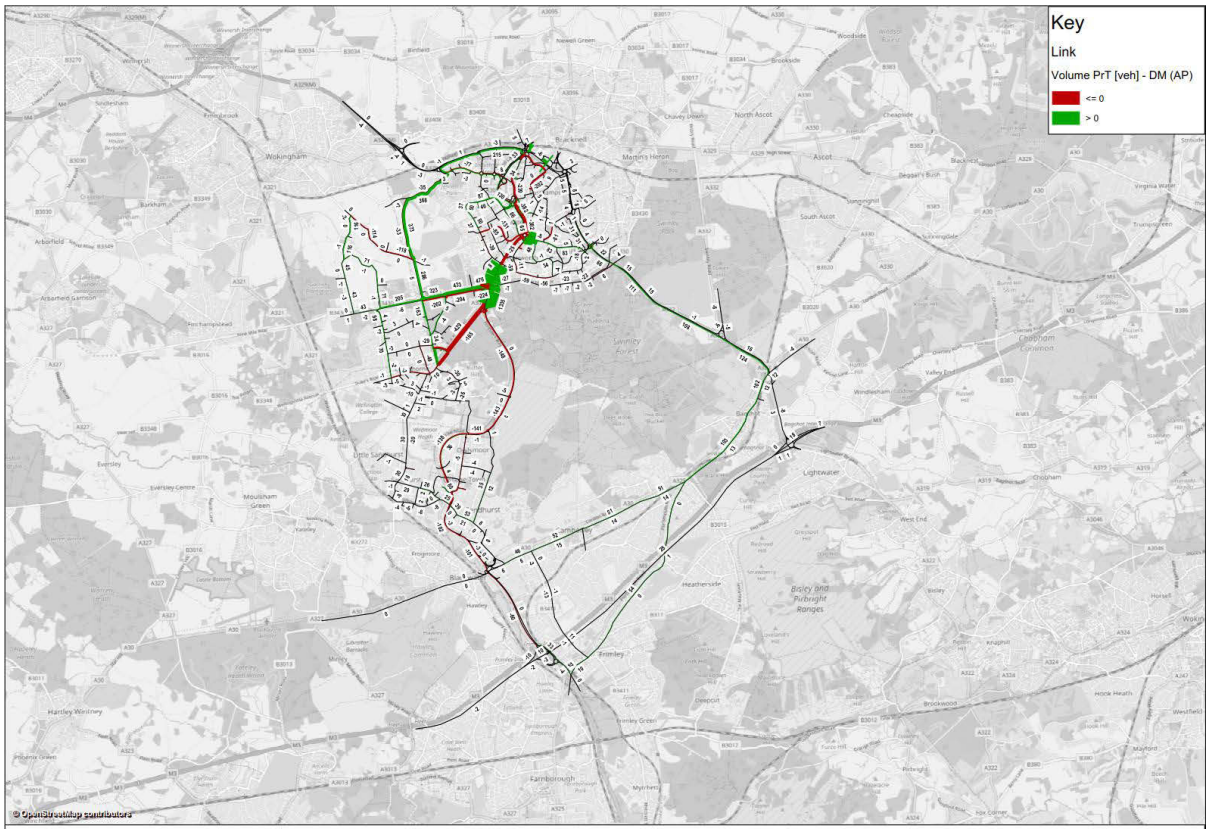


Figure 15: PM Flow difference, DM to DS, wider area (cordon scenario)

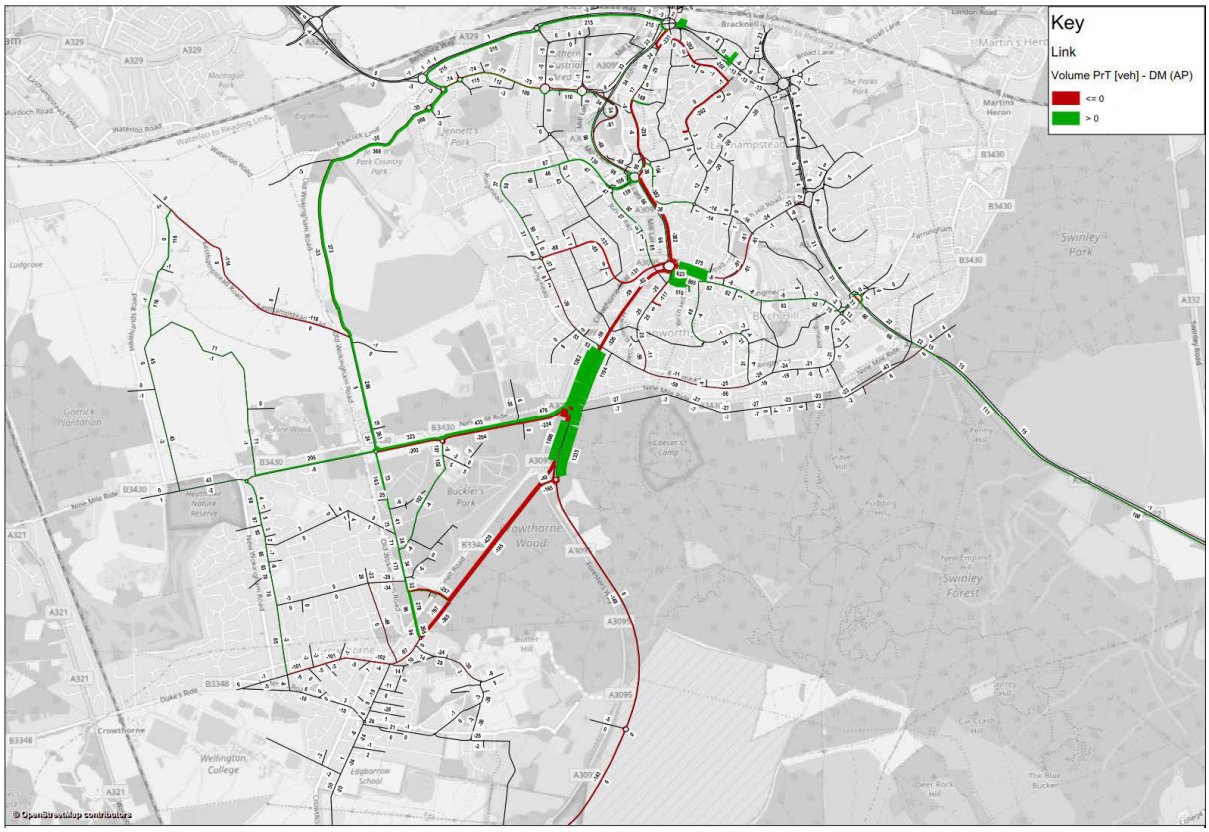


Figure 16: PM Flow difference, DM to DS, localised area (cordon scenario)

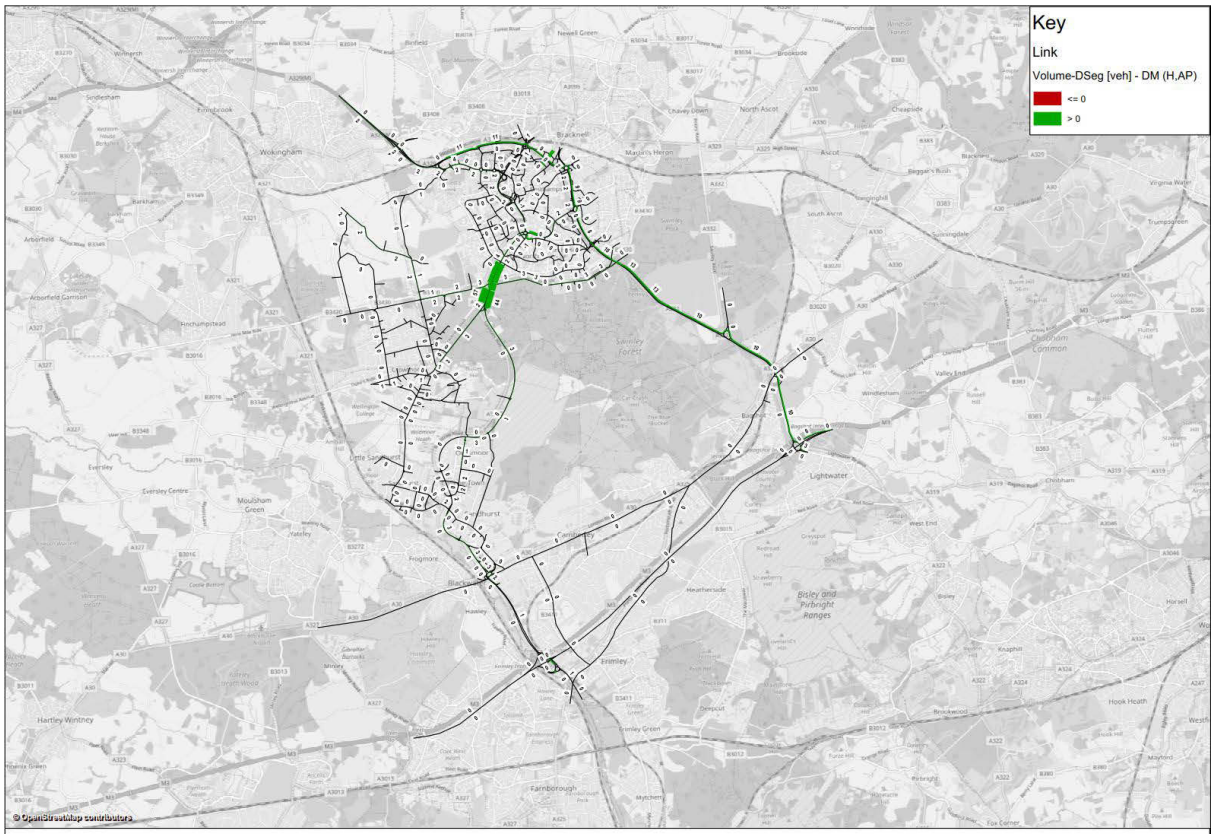


Figure 17: AM HGV Flow difference, DM to DS, wider area (cordon scenario)

Figure 18: AM HGV Flow difference, DM to DS, localised area (cordon scenario)

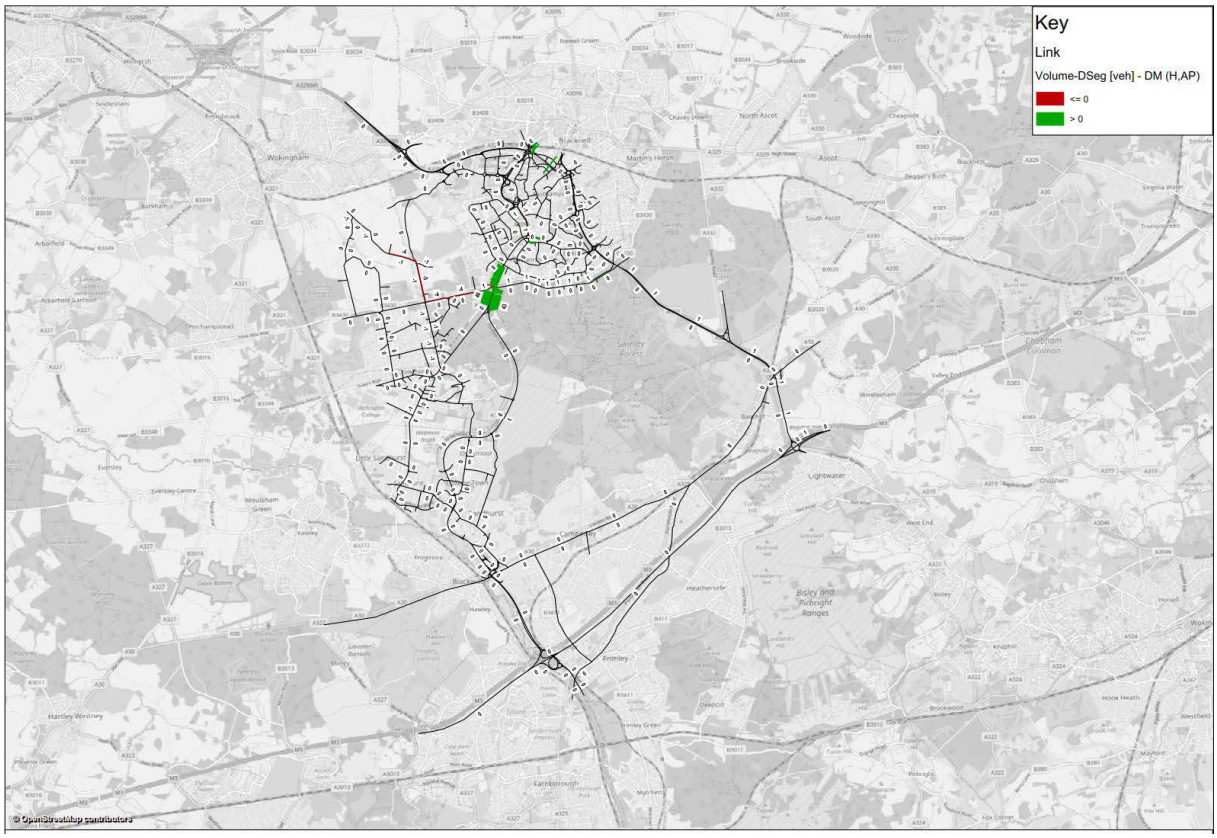


Figure 19: PM HGV Flow difference, DM to DS, wider area (cordon scenario)

Figure 20: PM HGV Flow difference, DM to DS, localised area (cordon scenario)

5.7.21. Appendix D.1 contains the 2026 flows for all vehicles and HGV for the AM peak and PM peak for the reference case scenario i.e. without scheme.

5.7.22. Appendix D.2 contains the 2026 flows for all vehicles and HGV for the AM peak and PM peak for the A3095 Corridor Improvements scenario i.e. with scheme.

5.7.23. Appendix E.1 contains the 2026 speeds for all vehicles and HGV for the AM peak and PM peak for the reference case scenario i.e. without scheme.

5.7.24. Appendix E.2 contains the 2026 speeds for all vehicles and HGV for the AM peak and PM peak for the A3095 Corridor Improvements scenario i.e. with scheme.

5.7.25. Appendix F.1 contains 2026 flow bundles on the A3095 Crowthorne Road for the AM peak in the northbound and southbound directions.

5.7.26. Appendix F.2 contains 2026 flow bundles on the A3095 Crowthorne Road for the PM peak in the northbound and southbound directions.

5.8 TRANSPORT BENEFITS

5.8.1. The investment in transport infrastructure will result in direct benefits for transport users. A reference case has been established to reflect the scenario without the highway improvements with the do something being the same as the reference case but including the planned highway improvements. The benefits have been assessed against the reference case with the main benefits being from journey time saving for road users.

5.8.2. These have been assessed accordingly under the guidance of TAG with the BMMTM used to assess the transport benefits of the proposed highway improvements.

TRANSPORT USER BENEFIT APPRAISAL (TUBA)

5.8.3. The economic elements that have been considered for the assessment of the A3095 Corridor Improvements using TUBA include:

- Time Savings
- Vehicle Operating Costs
- Scheme Costs
- Indirect tax revenue.

5.8.4. All costs and benefits reported by TUBA are based on willingness to pay and expressed in the market price unit of account. TUBA v1.9.7 has been used which is the current version and is consistent with parameters published in the TAG Data Book (July 2016). Scheme appraisal has been undertaken for a 60-year period, from the assumed scheme opening in 2022 to 2081.

Annualisation factors

5.8.5. TUBA makes a distinction between time slices and time periods. Standard time periods are defined in the economics file as:

- AM Peak (Weekday 07:00 – 10:00)
- PM Peak (Weekday 16:00 – 19:00)
- Inter-peak (Weekday 10:00 – 16:00)
- Off-peak (Weekday 19:00 – 07:00)
- Weekend.

5.8.6. The BMMTM VISUM model does not include weekend and the off-peak periods as origin-destination data were not collected for these time periods, therefore it has not been possible to determine potential benefits for these periods.

5.8.7. The BMMTM VISUM model has been assigned as an average hour model for the AM peak and PM peak period which enables the benefits for these peak periods to be used in TUBA.

5.8.8. In order to model the time slices in TUBA, an annualisation factor is required to convert to each time period. The annualisation factor is given by h x d where h is the number of this time slice in the time period and d is the number of days a year containing the time period. The annualisation factor is specified in the scheme input file.

5.8.9. Annualisation factors for the two modelled time periods are given in Table 3. The aggregated scheme benefits derived therefore relate only to those two weekday peak hours. This is considered to be a conservative approach in the absence of traffic model data outside of these peak hours.

Table 3: Annualisation factors

Period	Peak hour to peak period factor	Number per year	Annualisation factor
AM peak	1.000	253	253
PM peak	1.000	253	253

5.8.10. The calculated benefits have therefore been derived for an AM peak and PM peak hour only as there is no Inter-peak model. The weekends and the overnight period have not been considered, but these are assumed to have sufficiently low flows that the overall assessment of benefits will not be affected.

User classes

5.8.11. User classes have been defined as shown in Table 4 so that the definitions used in model development have been applied to the TUBA assessment.

Table 4: User class definitions

User class	Model definition	TUBA parameter		
		Vehicle Type	Purpose	Person Type
1	Car	Car	All	All
2	HGV	OGV2	Business	Driver

Matrix Input

5.8.12. Skim matrices have been generated for Car and HGV, and these have not been disaggregated further into person type or purpose. Therefore, the TUBA default splits specified in the economics file have been used.

5.8.13. Skim matrices have been extracted in format 2, taken from the respective VISUM cordon and full models for distance (km), time in (hours) and vehicles (trips per hour). This has been carried out for the core, high and low 2026 models and the core 2021 models. It should be noted that total vehicle trips between DM and DS vary slightly, as they have been generated from a cordon model.

5.8.14. All HGV were defined as Vehicle Type 4 (OGV1) in TUBA. As these have lower operating costs than OGV2, this is likely to have resulted in a conservative estimate of benefits attributable to HGV.

TUBA – RESULTS

5.8.15. Table 5 shows the output from the TUBA scheme economic assessment for the Core scenario.

Table 5: Analysis of Monetised Costs and Benefits

Type	Value (£000s)
Greenhouse gasses	0.152
Economic Efficiency: Consumer Users (Commuting)	3.950
Economic Efficiency: Consumer Users (Other)	1.810
Economic Efficiency: Business Users and Providers	7.025
Wider Public Finances (Indirect Tax Revenues)	-0.311
Present Value of Benefits (PVB)	**12.626**
Broad Transport Budget	4.906
Present Value of Costs (PVC)	**4.906**

OVERALL IMPACTS	
Net Present Value (NPV)	**7.720**
Initial Benefit to Cost Ratio (BCR)	**2.57**

5.8.16. Table 5 shows that the Present Value of Benefits (PVB) is **£12.626m** with the Present Value of Costs (PVC) being **£4.906m** with a Benefit to Cost Ratio (BCR) of **2.57**.

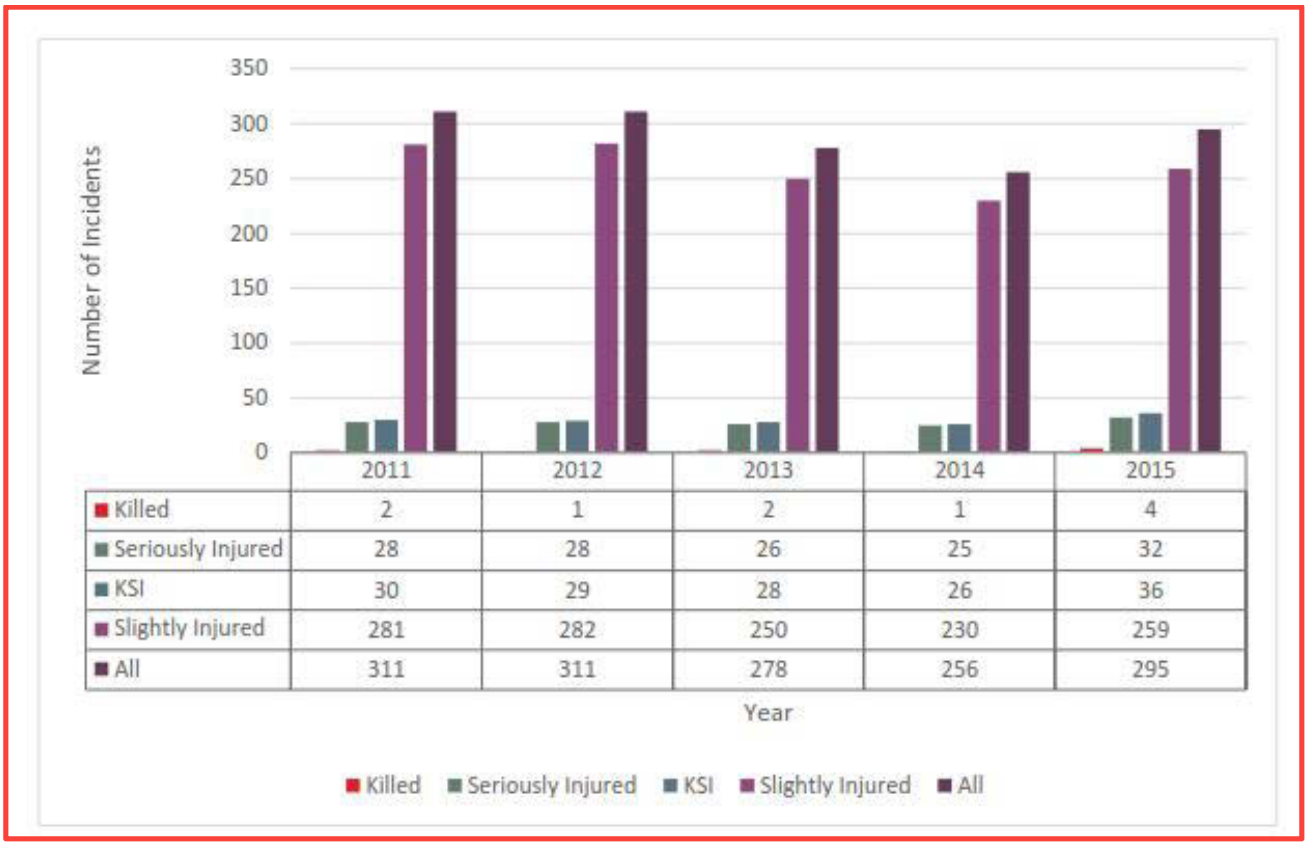
COST AND BENEFIT TO ACCIDENTS – LIGHT TOUCH (COBALT)

5.8.17. COBALT is a computer program developed by the Department for Transport (DfT) to undertake the analysis of the impact on accidents as part of economic appraisal for a road scheme. It uses detailed inputs of separate road links and road junctions impacted by the scheme.

5.8.18. The assessment is based on a comparison of accidents by severity and associated costs across an identified network in 'Without-Scheme' and 'With-Scheme' forecasts, using details of link and junction characteristics, relevant accident rates and costs and forecast traffic volumes by link and junction.

5.8.19. Accident data for Bracknell Forest has been collected from DfT road casualty statistics3 in order to identify the current levels of collisions within the broad study area.

5.8.20. Figure 21 displays reported accident data for Bracknell Forest from 2011 to 2015. All reported casualties have been reducing each year from 2011 to 2014 but there has then been a small increase in 2015. The same pattern is occurring for Killed or Seriously Injured casualties have remained fairly stabled at between 25/30 per year.



	2011	2012	2013	2014	2015
Killed	2	1	2	1	4
Seriously Injured	28	28	26	25	32
KSI	30	29	28	26	36
Slightly Injured	281	282	250	230	259
All	311	311	278	256	295

Figure 21: Reported Road Casualties – Bracknell Forest

[3] https://www.gov.uk/government/statistics/reported-road-casualties-in-great-britain-main-results-2015

5.8.21. The scheme data from the cordoned model area inputted into COBALT included:

- Link Classification:
  - COBALT link type (matched with the VISUM model link types)
  - Link length
  - Speed limit.
- Link Flow:
  - Base Year Annual Average Daily Traffic (AADT) flows
  - Without and with scheme AADT flows.

5.8.22. The COBALT assessment has been undertaken using links and junctions separately.

5.8.23. A number of count sites have been used to calculate the factors to produce the AADT flows from the AM peak and PM peak VISUM transport models. A factor of 4.611 has been used to produce a 12-hour modelled flows i.e. (AM peak + PM peak) * 4.611. The 12-hour flow has been factored using the same count information which produces a factor of 1.12 to from a 12-hour flow to the AADT flow which has been used to produce AADT flows for all vehicles and for Heavy Goods Vehicles (HGV).

5.8.24. As no specific local accident data was available this section was left blank as the inclusion of local accident data in COBALT is optional. The scheme was assessed over a 60-year appraisal period (as recommended in WebTAG Unit A1.1[4]) with a scheme opening year of 2021.

5.8.25. Table 6 shows the output from the COBALT scheme economic assessment which gives a benefit of **£1.021m**.

Table 6: COBALT – total accident benefits

Period	Value (£000s)
Total Without-Scheme Accident Costs	191.518
Total With-Scheme Accident Costs	190,497
Total Accident Benefits Saved by Scheme	**1.021**

5.9 SEVERANCE

5.9.1. Community severance is defined as “the separation of residents from facilities and services they use within their community”. Severance primarily concerns those using non-motorised modes, particularly pedestrians. The WebTAG guidance advices that to ensure a consistent approach, classification should be based on pedestrians only.

5.9.2. This scheme is proposing to fully signalise two junctions and will add an additional lane to a relatively small section of existing road. Although the average increase in peak period flows is expected to be around 29%, the process of signalisation of the junctions provides some additional crossing facilities. There are also some existing pedestrian crossing points at present that are underpasses, which will not be affected. The expected severance impact will, at worst, be slight – “all people wishing to make pedestrian movements will be able to do so, but there will probably be some hindrance to movement”[5].

5.9.3. Because of the minimal level of impact this will not be monetised and is presented as a qualitative assessment in the Appraisal Summary Table.

[4] https://www.gov.uk/government/publications/webtag-tag-unit-a1-1-cost-benefit-analysis-may-2018

[5] WebTAG Unit 4.1, section 5

5.10 JOURNEY QUALITY

5.10.1. Journey quality is defined within WebTAG Unit 4.1 as “a measure of the real and perceived physical and social environment experienced while travelling”. Many of these aspects relate to information provision and perceptions of safety but it also includes aspects relating to traveller stress, defined as “the frustration, fear of accidents and route uncertainty”.

5.10.2. The reductions in journey times and improved reliability will contribute a positive benefit for drivers’ journey quality across the corridor. Given the scale of the overall scheme, the impacts are expected to be slight beneficial and, as such, these have not been monetised.

5.11 AIR QUALITY

5.11.1. The A3095 scheme does not sit within any of the two Air Quality Management Area (AQMA) within Bracknell Borough, although the scheme could potentially affect traffic route choices that may influence the overall volume of traffic in each of these two areas. The AQMA are:

- AQMA1: location south of the scheme, encompassing Crowthorne High Street and the section of Bracknell Road from the High Street to the junction with Old Wokingham Road
- AQMA2: within Bracknell, along the A322, encompassing Bagshot Road, Devonshire way and Berkshire Way.

5.11.2. The requirement for an air quality assessment is determined in accordance with traffic change criteria set out in HA207/07 DMRB Volume 11 Section 3 Part 1. The traffic change criteria are:

- road alignment will change by 5m or more
- daily traffic flows will change by 1,000 annual average daily traffic (AADT) or more
- HGV flows will change by 200 AADT or more
- daily average speed will change by 10 km/hr or more
- peak hour speed will change by 20 km/hr or more.

5.11.3. The scheme encompasses an additional southbound lane on Crowthorne Road; however, this does not require the road alignment to change by 5m or more.

5.11.4. In simplistic terms, roads experiencing an increase in traffic are likely to experience a deterioration of air quality in the vicinity whilst roads experiencing a decrease are likely to experience an improvement. This does not take into account the effect of a number of other factors affecting vehicle emissions, and therefore air quality, including changes in speed and fleet composition, in particular the percentage of HGV’s.

5.11.5. The methodology that has been undertaken is:

- Evaluation of the road network and available traffic data against the screening criteria outlined in the DMRB Volume 11, Section 3, Part 1 (HA207/07) to determine the study area (i.e. the ‘affected’ road network) for the local and regional air quality assessments
- Property count alongside all ‘affected’ road links (in 50m bands up to 200m from the road centreline)
- Appraisal of local air quality impacts using the most recent DMRB Spreadsheet Methodology (obtained from Highways England) (which incorporates IAN 185/15 speed band emissions factors, derived from the EfTv8.0.1 emissions factors database). Using the Spreadsheet Methodology and following WebTAG, the change in population exposure to pollutant will be calculated within 50m bands alongside affected roads, as characterised by concentrations modelled at 20m, 70m, 115m and 175m from the roadside
- Calculation of property weighted NO2 and PM10 concentrations and calculation of link scores taking into account the above
- Assessment of regional air quality, greenhouse gases and monetary effects
- Completion of WebTAG Assessment/Appraisal Summary Tables (AST) for air quality excluding consideration of Distributional Impact (DI).

5.11.6. The results of the Air Quality assessment shows that there is a monetary benefit of £0.524m when the proposed A3095 Corridor Improvements are included. There is a change in the NOX emissions over the 60-year appraisal period of -60.

5.11.7. In terms of a sensitivity analysis the Lower estimate net present value of change in air quality is £0.209m while the Upper estimate net present value of change in air quality is £0.843m.

5.12 NOISE

5.12.1. Traffic data including Annual Average Weekday Traffic (AAWT) 18-hour flows and speeds have been provided from the BMMTM in order to determine the change in noise levels on the worst affected roads as a result of the scheme.

5.12.2. The traffic flow data have been interrogated to determine the road links with the greatest increases as a result of the scheme. The overall flow and the heavy goods vehicle percentages have been reviewed with four road links experiencing the highest change. The road links are all along the B4340 Nine Mile Road. Table 7 shows the 'do minimum' traffic flow (i.e. without the proposed scheme) and the 'do something' traffic flow (i.e. with the proposed scheme).

Table 7: Traffic flow data

		B3430 between the Golden Retriever pub and South Lodge	B3430 between TRL roundabout and South Road	B3430 between South Lodge and South Road	B3430 TRL roundabout
Without scheme	Overall traffic flow	4417	4760	4873	5469
	Heavy goods vehicle (%)	6	6.5	6.5	6
	Speed	6	56	42	46
With scheme	Overall traffic flow	7535	7428	7461	7951
	Heavy goods vehicle (%)	4	4	4	3.5
	Speed	73	73	73	44

5.12.3. The above flows have been used to calculate the Basic Noise Level (BNL) in accordance with the calculation methodology in the former Department of Transport/Welsh Office technical memorandum Calculation of Road Traffic Noise (CRTN). Table 8 shows the Reference Case i.e. without scheme and A3095 Corridor Improvements i.e. with scheme noise levels and the differences.

Table 8: Comparsion of basic noise levels, dB $L_{A10,18hour}$

	Basic Noise Level, dB LA10,18hour		Difference
	Reference Case	A3095 Corridor Improvements	
B3430 between The Golden Retriever Pub and South Lodge	73.2	67.7	-5.5
B3430 between TRL roundabout and South Road	64.8	67.7	+2.9
B3430 between South Lodge and South Road	63.8	67.7	+3.9
B3430 TRL roundabout	64.4	65.1	+0.7

5.12.4. Table 8 shows that there will be a benefit on the B3430 between The Golden Retriever pub and South Lodge as a result of the A3095 Corridor Improvements. On the other road links there will be an increase of up to 3.9dB. It is important to note that the above assessment is based on the individual links and does not consider any contribution to the noise climate from surrounding road links which could result in a smaller increase in noise levels experienced.

5.12.5. The above assessment is based on a short-term scenario – i.e. the Reference Case i.e. without scheme and A3095 Corridor Improvements i.e. with scheme years are the same. The Design Manual for Roads and Bridges Volume 11, Section 3, Part 7 (HD 213/11) revision 1 provides the data in Table 9 to assist in assessing short-term noise levels.

Table 9: Classification of Magnitude of Noise Impacts (DMRB HD 213/11)

Noise Change dB LA10,18hour	Magnitude of effect
0	No change
0.1 – 0.9	Negligible
1.0 – 2.9	Minor
3.0 – 4.9	Moderate
+5.0	Major

5.12.6. A comparison of the noise changes in Table 8 and the magnitude of effects in Table 9 shows that there will be a moderate negative effect on one very small road link and a minor negative effect on the two other road links. There will be a major beneficial change at the eastern end of the B4340 where it meets Foresters Way.

5.12.7. As there is an isolated residential property adjacent to the road link with a moderate negative effect, it is recommended that consideration should be given to undertaking a more detailed noise assessment is undertaken.

5.13 GREENHOUSE GASES

5.13.1. The requirement to conduct a detailed assessment of the impact of greenhouse gases applies the same criteria as for the air quality assessment and so is not considered necessary.

5.13.2. The outputs from the TUBA model assessment provide an assessment of benefits with a small increase in benefits forecast of £152,000 over a 60-year appraisal period discounted to 2010 prices.

5.14 LANDSCAPE AND TOWNSCAPE

5.14.1. It has been concluded the A3095 Corridor Improvements will have no impact upon Landscape and Townscape due to not being in the vicinity of any significant built environments.

5.15 HERITAGE AND HISTORIC RESOURCE

5.15.1. The A3095 Corridor Improvements will have no impact upon any heritage or historic resources as it does not pass through, or nearby, any such sites.

5.16 ECOLOGY AND NATURE CONSERVATION

5.16.1. Due to the small scale and localised nature of the A3095 Corridor Improvements it is not considered that the impacts would extend beyond the footprint of the road construction and its immediate surroundings.

5.16.2. There are no Wetlands of International Importance (Ramsar), Special Protection Areas (SPA), Special Area of Conservation (SAC), Sites of Special Scientific Interest (SSSI) within the immediate vicinity of the proposed works.

5.17 WATER ENVIRONMENT

5.17.1. The A3095 Corridor Improvements may impact upon drainage and water run-off as a result of the introduction of the additional southbound lane along Crowthorne Road. The proposals also include some expansion of the Hanworth and Golden Retriever Roundabouts.

5.17.2. The highway engineering has been designed to mitigate against any impact upon drainage, with culverts replaced, and replicating existing run-off. The scheme does not impact upon any existing water courses.

5.17.3. It is, therefore, concluded that the scheme will not any have any notable impact on the water environment, particularly as design mitigation measures will be incorporated, as required

5.18 SENSITIVITY AND RISK PROFILE

5.18.1. The capital costs of the scheme implementation are set out in detail within the Financial Case.

5.18.2. The cost estimate was recently reviewed by BFC in June 2017 and is considered by BFC to be up-to-date, robust and complete (including utilities costs).

5.18.3. The estimates were undertaken by SYSTRA who are experienced in highway scheme cost estimation. The full scheme cost was last updated in June 2017.

5.18.4. The base costs of implementing the scheme has been identified at £4.425m and are broken down as follows:

- Hanworth Roundabout: £1.15m
- Golden Retriever Roundabout: £1.25m
- Additional southbound lane on A3095: £1.15m
- Utilities (refined C3 Quotes): £0.875m.

5.18.5. Added to these costs is an allowance of 20% traffic management costs, 15% for preliminaries, and 20% for contingency / risk. They have been adjusted for real costs inflation as well optimism bias at 30% and for input into the cost benefit analysis they have been discounted to 2010 prices.

5.18.6. The maintenance costs associated with the scheme are not anticipated to be significantly greater than those already required to maintain the existing carriageway and part-time signals on the Hanworth Roundabout.

5.18.7. As part of the funding package set out in the Financial Case, BFC has secured a developer contribution of £2.5m towards the scheme costs.

5.19 APPRAISAL SUMMARY TABLE

This section sets out the qualitative and quantitate impacts of the transport scheme which will then be used to inform the Value for Money Statement (Section 5.20). The competed Appraisal Summary Table is provided in Appendix G.

5.20 VALUE FOR MONEY STATEMENT

5.20.1. This section provides a value for money conclusion by considering all of the evidence pulled together as part of the Appraisal Summary Table. This includes:

- Public Accounts (PA) – see Appendix H1
- Transport Economic Efficiency (TEE) – see Appendix H2
- Analysis of Monetised Costs and Benefits (AMCB) – see Appendix H3.

5.20.2. This provides evidence to inform the final judgement on the Value for Money category of the scheme as recommended by DfT[6]. Sensitivity tests have also been undertaken to the test the robustness of the scheme's forecasted benefits and the results of these are set out in Section 5.21.

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630704/value-for-money-framework.pdf

5.20.3. Table 10 show the AMBC for the Core scenario derived from TUBA as well as the Accident savings benefits provided by the COBALT analysis which shows a BCR of 2.78.

Table 10: Value for Money Statement

	Assessment	Detail
Initial BCR	2.78	Calculated using WebTAG, TUBA version 1.9.7 and COBALT
Adjusted BCR	2.78	Calculated using WebTAG, TUBA version 1.9.7 and COBALT
Qualitative assessment	Largely beneficial	
Optimism Bias	Scheme costs include for 30% Optimism Bias	No variation in the costs e.g. a reduced level of Optimism Bias has not been assessed as the BCR will only increase
Value for Money	High	BCR is in the High category which is supported by the qualitative assessment

5.20.4. The expected Benefit to Cost Ratio (BCR) of the scheme is **2.78** which represents a high value for money category.

5.21 LOW GROWTH AND HIGH GROWTH

5.21.1. WebTAG Unit M4 states that although the core scenario, of which results have been provided in Section 3.6, is intended to be the best basis for decision making there is no guarantee that the outturn will match assumptions.

5.21.2. Therefore sensitivity tests are undertaken to address the following questions:

- Under high demand assumptions, is the intervention still effective in reducing congestion or crowding, or are there any adverse effects, e.g. on safety or the environment?
- Under low demand assumptions, is the intervention still economically viable?

5.21.3. Section 4.2 of WebTAG Unit M4[7] sets out guidance on defining High and Low growth scenarios. The high growth scenario should consist of forecasts that are based on a proportion of base year demand added to the demand from the core scenario.

5.21.4. Low Growth and High Growth matrices have been generated for the 2026 DS and DM scenarios following TAG Unit M4 guidance, as set out in Table 11.

5.21.5. No growth scenarios have been generated for the 2021 models as these do not include the scheme and therefore there are no differences between the skim matrices used for the DM and DS 2021 input matrices.

[7] https://www.gov.uk/government/publications/webtag-tag-unit-m4-forecasting-and-uncertainty-may-2018

Table 11: Calculation of adjustment factor for high and low growth scenarios

Growth % to forecast					
Base year	Forecast year	Difference	SQRT	'P' parameter	Adjustment factor
2013	2026	13	3.61	2.5	+/- 0.0901

5.21.6. To generate the final growth scenario matrices, 9.01% of the base year demand has been added/ subtracted from the forecast year matrices on a cell by cell basis, for the Car and HGV matrices. This has then been assigned in the respective full DM and DS scenario networks, before cordoning, to generate the growth scenarios used in TUBA. TUBA assessments for the Low Growth and High Growth scenarios have been undertaken with the results shown in Table 12.

Table 12: Analysis of Monetised Costs and Benefits – Low growth and High growth

Type	Value (£000s)	
	Low Growth	**High Growth**
Greenhouse gasses	0.096	0.192
Economic Efficiency: Consumer Users (Commuting)	3.246	3.264
Economic Efficiency: Consumer Users (Other)	2.015	1.929
Economic Efficiency: Business Users and Providers	4.721	7.338
Wider Public Finances (Indirect Tax Revenues)	-0.201	-0.383
Present Value of Benefits (PVB)	**9.877**	**12.340**
Broad Transport Budget	4.906	4.906
Present Value of Costs (PVC)	**4.906**	**4.906**
OVERALL IMPACTS		
Net Present Value (NPV)	**4.971**	**7.434**
Initial Benefit to Cost Ratio (BCR)	**2.01**	**2.52**

5.21.7. Table 12 shows that the Low Growth scenario gives a PVB of **£9.877m** with the PVC being **£4.906m** with a BCR of **2.01**.

5.21.8. Table 12 shows that the High Growth scenario gives a PVB of **£12.340m** with the PVC being **£4.906m** with a BCR of **2.51**.

5.21.9. COBALT assessments for the Low Growth and High Growth scenarios have been undertaken with the results shown in Table 13. The Low Growth gives a benefit of **£1.030m** with the High Growth giving a benefit of **£1.695m**.

Table 13: COBALT – total accident benefits (Low growth and High growth)

Period	Low Growth	High Growth
Total Without-Scheme Accident Costs	181.563	200.927
Total With-Scheme Accident Costs	180.533	199.232
Total Accident Benefits Saved by Scheme	**1.030**	**1.695**

6

FINANCIAL CASE

6 FINANCIAL CASE

6.1 INTRODUCTION

6.1.1. The financial case concentrates on the affordability of the proposal, its funding arrangements and technical accounting issues (value for money is scrutinised in the economic case). It presents the financial profile of the different options and the impact of the proposed deal on the Department's budgets and accounts.

6.1.2. The Financial Case for the A3095 Corridor Improvements is based on significant scheme development and the identification and costing of the preferred option. The proposed funding arrangements are set out and described, including the Local Growth Fund allocation and local S106 contribution.

6.1.3. The financial case follows a defined structure as specified by government. Following this structure ensures all the necessary information is provided and enables efficient assessment of the proposal. Information is presented on the following:

- Costs
- Budgets / Funding Cover
- Accounting implications.

6.2 COSTS

6.2.1. Table 14 shows that the base cost estimate for the scheme is around £5,930,000. The cost estimate was recently reviewed by BFC in June 2017 and is considered by BFC to be up-to-date, robust and complete (including utilities costs).

6.2.2. The estimates were undertaken by SYSTRA who are experienced in highway scheme cost estimation. The full scheme cost was last updated in June 2017.

Table 14: Components of investment

Cost element	Cost
Site clearance	£111,833
Fencing	39,384
Road restraint system	66,943
Drainage & Ducting	312,006
Earthworks	411,930
Pavements	1,488,359
Kerbs & Footway	168,521
Signs, Signals & Road markings	527,037
Lighting	405,628
Electrical works	13,125
Utilities	850,000
Traffic management	878,953
Preliminaries	659,215
Sub-Total	**5,932,934**

6.3 INFLATION

6.3.1. An allowance for inflation has been applied to adjust the costs from 2015/16 prices to 2020/21 prices of @ 15.6% (£925,538).

6.4 CONTINGENCIES & RISK

6.4.1. An allowance of 20% (£1,186,587) has been applied to cover contingencies and risk within the project delivery.

6.5 OPTIMISM BIAS

6.5.1. Optimism bias refers to the tendency for scheme promoters to be overly optimistic about scheme costs. DfT WebTAG unit A1.2 sets out the recommended contingency which should be added to the scheme costs. However, in line with HM Treasury guidance document "Early financial cost estimates of infrastructure programmes and projects and the treatment of uncertainty and risk- March 2015" optimism bias should not be included in project funding. The risk-adjusted scheme cost estimate is therefore considered robust but will be reviewed as the scheme proceeds.

6.6 FINAL SCHEME COSTS

6.6.1. Table 15 indicates the costs associated with the proposed scheme including inflation and contingency & risk allowance.

Table 15: Summary of final scheme costs (2016 Q1)

Cost element	Cost
Estimated scheme cost	£5,932,934
Inflation adjustment to 2019/2020	£925,538
Contingency & Cost	£1,186,587
Total	**£8,045,059**

6.7 BUDGETS / FUNDING COVER

6.7.1. The A3095 Corridor Improvements is a pipeline scheme planned to be delivered by BFC as part of the Thames Valley Berkshire Local Enterprise Partnership (TVBLEP) Growth Deal originally agreed between TVBLEP and Government in 2014. A total of £5.5m is currently allocated to the scheme.

6.7.2. An additional £2.5m will be provided through local S106 contribution secured by BFC. Any additional costs would be covered by BFC. The spend profile is shown in Table 16.

Table 16: Out-turn spend profile

Total	2019/2020	2020/2021
£8.0m	£2.0m	£6.0m

6.8 WHOLE LIFE COSTS

6.8.1. Future maintenance works associated with the scheme will be added to the maintenance inventory and funded from BFC's maintenance budgets. It is anticipated that the provision of new or upgraded assets (such as drainage system and pavement/footways) could reduce some future maintenance liabilities on BFC.

6.9 ACCOUNTING IMPLICATIONS

6.9.1. The following implications on public accounts are expected:

- Devolved LEP funding of £5.5m (68%) of the scheme costs is requested with expenditure starting in the 2019/20 financial year
- Maintenance costs will be added to the maintenance inventory and funded from BFC's maintenance budgets.

7

COMMERCIAL CASE

7 COMMERCIAL CASE

7.1 INTRODUCTION

7.1.1. This chapter of the business case considers the scheme outputs required, and the procurement strategy for delivery.

7.1.2. The Commercial Case is designed to provide evidence of the commercial viability of a proposal and the procurement strategy which will be used. It will clearly set out the financial implications of the proposed procurement strategy and present evidence on risk allocation and transfer (Department for Transport, The Transport Business Case).

7.1.3. The Commercial Case follows a defined structure as specified by government. Following this structure ensures all the necessary information is provided and enables efficient assessment of the proposal.

7.1.4. The Commercial case provides evidence of the commercial viability of the project and the procurement strategy adopted. Information is presented on the following:

- Output based specification
- Procurement strategy
- Sourcing options
- Payment mechanisms
- Pricing framework and charging mechanisms
- Risk allocation and transfer
- Contract length
- Human resource issues
- Contract management.

7.2 OUTPUT BASED SPECIFICATION

7.2.1. The outcomes which the procurement strategy must deliver are to:

- Achieve cost certainty, or certainty that the scheme can be delivered within the available funding constraint
- Minimise further preparation costs with respect to scheme design by ensuring best value, and appropriate quality
- Obtain contractor experience and input to the construction programme to ensure the implementation programme is robust and achievable
- Obtain contractor input to risk management and appraisals, including mitigation measures, to capitalise at an early stage on opportunities to reduce construction risk and improve out-turn certainty thereby reducing risks to a level that is ‘As Low As Reasonably Practicable’.

7.2.2. The Output Based Specification for the A3095 Corridor Improvements has yet to be developed, this is to be expected at this stage for the following reasons:

- The need to secure funding approval for the preferred scheme prior to undertaking
- this significant piece of work
- The tendering process has not begun.

7.2.3. BFC will use either experienced in-house resources or external consultants, who have been involved in other recent highways projects, to develop the specifications.

7.2.4. The specification for the scheme is broadly as follows:

- Reconfiguration of the Hanworth Roundabout with full signalisation
- Signalisation of the current Golden Retriever Roundabout
- Construction of additional southbound lane of Crowthorne Road between the Hanworth and Golden Retriever junctions.

7.3 PROCUREMENT OPTIONS

7.3.1. BFC have identified two procurement options for the delivery of their LEP funded schemes. The alternative options are:

- Full OJEU Tender
- Delivery through existing Highways Term Maintenance Contract.

7.3.2. The 'Full OJEU' approach would require an 'open' tender, where anyone may submit a tender, or a 'restricted' tender, where a Pre-Qualification is used to whittle down the open market to a pre-determined number of tenderers. This process would take a number of months to establish and evaluate and would then be followed up by the main tender process with at least 6 weeks for tender returns, a review process, and a period of stand-still.

7.3.3. Delivery through BFC's existing highways term contract would not strictly be a procurement process as it is an existing contract. The contract is based on an agreed schedule that is utilised to determine a bill of quantities for any specific works. This provides BFC certainty on the magnitude of costs for delivering work. Given the relatively standard nature of the scheme, in highway design terms, this approach is considered to be an appropriate approach.

7.4 PROCUREMENT STRATEGY

7.4.1. BFC has chosen to utilise their existing highway term contract for the delivery of the scheme.

7.5 PAYMENT MECHANISMS

7.5.1. Payment timing will be adopted to maximise the value from the contract through minimising financing and construction costs. Prompt and fair payment mechanisms will be applied throughout the supply chain. This is covered under the procurement process and will be monitored during the contract to ensure full value is delivered.

7.6 PRICING FRAMEWORK AND CHARGING MECHANISMS

7.6.1. Under the preferred procurement approach to be adopted, BFCs Term Contractor will provide the A3095 construction works described for a defined sum of money. The contract provides for specified risks to be carried by the Employer which will result in the lump sum being adjusted if the compensation events occur.

7.7 RISK ALLOCATION AND TRANSFER

7.7.1. Although many of the design risks can only be resolved through rigorous design and review processes, once the design options are clear and the scope of planning and environmental requirements are fully identified, the primary risks will be related to construction. There is potential for transferring these risks through the construction procurement process. This will be explored with the terms of the existing term contract.

7.8 CONTRACT LENGTH

7.8.1. It is envisaged that the contract will be of approximately 2 years duration with an anticipated contract start date in 2019.

7.9 CONTRACT MANAGEMENT

7.9.1. BFC will meet with the contractor on a monthly basis throughout the construction period, or more frequently if this is deemed necessary by the Project Manager. The contractor will be contractually obliged to provide monthly progress and financial updates to BFC, which will include updates to the project programme.

8

MANAGEMENT CASE

8 MANAGEMENT CASE

8.1.1. This chapter forms the Management Case. It describes how the scheme will be delivered using project management best practice, confirms the project is deliverable within the timescales, and demonstrates an appropriate governance structure and assurance framework to oversee the project.

8.1.2. The Management Case has been prepared in line with Department for Transport (DfT) guidance for preparation of transport business cases, using the five case model and WebTAG.

8.1.3. The Management Case is designed to assess the deliverability of a proposal. It tests the project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance.

8.1.4. The Management Case follows a defined structure as specified by government. Following this structure ensures all the necessary information is provided and enables efficient assessment of the proposal. Information is presented on the following:

- Evidence of similar projects
- Programme / project dependencies
- Governance, organisational structure and roles
- Programme / project plan
- Assurance and approvals plan
- Communications and stakeholder management
- Programme / project reporting
- Implementation of work streams
- Key issues for implementation
- Contract management
- Risk management strategy
- Benefits realisation plan
- Monitoring and evaluation
- Contingency plan
- Options.

8.2 EVIDENCE OF SIMILAR PROJECTS

8.2.1. BFC can demonstrate a successful record of delivering highway improvements schemes across the borough network, working alongside their Highways Term Contractors.

8.3 PROJECT DEPENDENCIES

8.3.1. The scheme programme is relatively free from dependencies, with the exception of the require for utilities diversions.

Utility Diversions

8.3.2. It is anticipated that some utility diversions will be required as a consequence of the scheme. These diversions could involve some engineering challenges; however, early contractor involvement will mitigate against any potential utility or construction risks. Trial holes will be undertaken to establish the location of apparatus in key areas to ensure an accurate assessment of impacts and costs can be made at this stage of the project.

8.4 GOVERNANCE, ORGANISATIONAL STRUCTURE & ROLES

8.4.1. BFC would establish a clear and robust structure to provide accountability and an effectual decision-making process for the management of the A3095 Corridor Improvements. The following members of staff would have dedicated roles on the project:

- Neil Mathews: Head of Transport Development – Project Delivery Manager
- Nick Rose: Transport Engineering Manager – Project Manager
- Stuart Jefferies: Transport Strategy and Implementation Manager – Steering Group Chair.

8.4.2. Ultimate responsibility for delivery of the scheme rests with BFC, who will assume an overall project management role and establish a Steering Group chaired by an officer from the Council's Transport Management section. The Steering Group will meet on a regular basis to review progress, update the risk register, and make key strategic decisions.

8.4.3. The day-to-day management and delivery of the project will be the responsibility of the Transport & Countryside Environment Department and the Engineering projects team within it. They will work closely with the Term Contractors and other delivery partners, and also form a point of contact for stakeholders.

8.4.4. The usual Council governance procedures will apply to all aspects of the project management, with issues being escalated in accordance with Council protocols as necessary.

8.4.5. A detailed breakdown of the BFC specific meetings (along with the attendees, scope and output of each) which make up the established governance process is set out below.

8.5 PROJECT PLAN

8.5.1. A provisional Project Plan has been developed. It covers each key stage of the project and the critical path. The tasks that have a critical end date that affect the delivery timescale are highlighted on the Project Plan. The plan will be reviewed and updated on regular basis and will be considered at fortnightly Steering Group meetings.

8.5.2. The Project Manager will have overall responsibility for delivering the tasks required to achieve key milestones. Key milestones, timescales and tasks are summarised below:

- Full Business Case ready for submission: July 2018
- Approval sought from TVBLEP: July 2018
- Detailed design begins: Summer 2018
- Establishment of contracting arrangements: Autumn 2018
- Works begin on ground: Spring/Summer 2019
- Completion works: Early 2021.

8.6 ASSURANCE AND APPROVALS PLAN

8.6.1. Project assurance and approvals are the main responsibility of the Steering Group Chair supported by the Steering Group who will also ensure the quality of the work carried out. The scheme will be managed in line with the Project Plan and the Steering Group will sign off each stage and give the go/no go decision to start the following stage.

8.7 COMMUNICATIONS AND STAKEHOLDER MANAGEMENT

8.7.1. BFC have a tried and tested Stakeholder Engagement process which is used on all significant projects. Effective use of the process has resulted in limited adverse feedback from the public and ensured successful delivery of schemes both from a project management and public relations perspective.

8.7.2. The main aim from the Stakeholder Engagement process is to ensure that stakeholders and members of the general public are kept informed throughout the development and implementation of a scheme. This can range from keeping key stakeholders updated with critical information, essential to the successful delivery of the scheme to providing information to the general public.

8.7.3. A range of target audiences are identified, including: those who will benefit (directly or indirectly) from the scheme; those affected (directly or indirectly); those who may have an interest without being directly affected; those with a statutory role; and those involved in the funding of the scheme.

8.7.4. The level of information provided to each group will vary based upon the specific needs ranging from intensive consultation, general consultation, through to information provision.

8.7.5. A detailed stakeholder management strategy will be developed that identifies specific stakeholders and interest groups, categorises them in terms of impact, and establishes the required level of engagement.

8.8 PROJECT REPORTING

8.8.1. Progress Reports will be produced by the Project Manager and comprise updates on:

- General progress
- Project finances
- Issues
- Risks and governance meeting dates.

8.8.2. The report identifies any areas of concern or where decisions are required by the Steering Group.

8.9 RISK MANAGEMENT STRATEGY

8.9.1. Project risk will be managed as an on-going process as part of the scheme governance structure. A scheme risk register is maintained and updated at each of the two-weekly Steering Group meetings. Responsibility for the risk register being maintained is held by BFC's Senior Responsible Officer and is reported as part of the monthly Progress Reports.

8.9.2. Any high residual impact risks are then identified on the highlight report for discussion at the Steering Group meeting. Required mitigation measures are discussed and agreed at the meeting and actioned by BFC's Project Manager, as appropriate.

8.10 BENEFITS REALISATION AND MONITORING

8.10.1. The purpose of benefits realisation is to plan for and track the benefits that are expected to be accrued over the lifetime of the scheme. The plan will detail the activities required to track the progress of the scheme including project milestones and responsibilities.

8.10.2. Monitoring will take place prior to scheme opening (baseline) and at predefined intervals upon successful delivery of the scheme, notably:

- One year post scheme opening
- Three years post scheme opening
- Five years scheme opening.

8.10.3. The key scheme benefit indicators set out against the scheme objectives include those shown in Table 17.

Table 17: Scheme benefits indicators

Objective	Desired outcomes
Reduce north-south journey times	Reduction in travel time
Improve journey time reliability	Reduction in day to day variability of travel time
Improve accessibility to Bracknell Town Centre and employment areas	Reduction in journey times to and from the town centre and employment areas
Improve connectivity to the strategic road network	Reduction in journey times to and from to and from the strategic road network
Improve road safety and reduce the risk of accidents	Reduction in accidents along the scheme corridor

8.10.4. In order to ensure that the objectives are being realised, a method for measuring outputs from the scheme are classified in Table 18. The acceptable thresholds are deemed to be realistic and achievable based on outputs from the forecast highway model for A3095 Corridor Improvements.

Table 18: Outcome Measurement and Acceptability thresholds

Monitoring Indicator	Measurement	Acceptable Threshold
Reduce north-south journey times	Conduct Peak Hour Journey Time Surveys	10% reduction in peak hour journey times
Improve journey time reliability	Conduct Peak Hour Journey Time Surveys across a number of days	5% reduction in day-to-day travel time variability
Improve accessibility to Bracknell Town Centre and employment areas	Conduct Peak Hour Journey Time Surveys	10% reduction in peak hour journey times
Improve connectivity to the strategic road network	Conduct Peak Hour Journey Time Surveys	10% reduction in peak hour journey times
Improve road safety and reduce the risk of accidents	Analyse road traffic collision data along scheme corridor	5% reduction in accidents along the scheme

8.10.5. BFC will conduct a full evaluation of the impact of the scheme in the period after it is completed. The Council will prepare evaluation reports one year, three years and five years after scheme opening, using the information to be collected as set out above to gauge the impact of the scheme on the traffic network, and assess the success in meeting the scheme objectives. Unexpected effects of the scheme will be reported upon and, where appropriate, remedial measures identified.

9

SUMMARY

9 SUMMARY

9.1 INTRODUCTION

9.1.1. This Business Case presents the evidence base in favour of the proposed A3095 Corridor Improvements. The document has been prepared in accordance with the Department for Transport guidance on the five business case model. Guidance was published in April 2013, and requires the following five cases to be considered:

- Strategic case
- Economic case
- Financial case
- Commercial case
- Management case.

9.2 BUSINESS CASE

9.2.1. The Strategic case outlines the need for the A3095 Corridor Improvements and is one of several transport-related initiatives being proposed in order to promote economic growth. It is local in scale and focus and will provide improvements to existing transport infrastructure.

9.2.2. The Economic case sets out the assessment of benefits that the scheme is forecast to deliver to society as a whole. Over 60 years, the scheme is expected to generate Present Value of Benefits (PVB) of **£13.647m** with Present Value of Costs (PVC) of **£4.906m**.

9.2.3. The scheme generates a Benefit to Cost Ratio (BCR) of **2.78** so is considered a high value for money scheme.

9.2.4. The Financial case provides a detailed cost estimate and a breakdown of how the scheme will be funded. The total scheme cost is expected to be £8.045m of which £5.5m is sought from the Thames Valley Berkshire Local Enterprise Partnership (TVBLEP) to complete the scheme.

9.2.5. The Commercial case considers procurement of the scheme.

9.2.6. The Management case sets out the proposed project management procedures to be adopted throughout the life cycle of the project. An assurance and approvals plan is in place and measures have also been set out to ensure high quality and timely delivery. Stakeholder management and key risks are also discussed.

9.3 CONCLUSION

9.3.1. The proposed A3095 Corridor Improvements will generate substantial net benefits to the local economy, helping to fulfil Thames Valley Berkshire Local Enterprise Partnership remit.

Appendix A

OPTION ASSESSMENT

A3095 Option Appraisal Report

1.1 Introduction

1.1.1 Various layouts for each of the junctions have been examined over the years including signalising the existing roundabout and widening of exits. Whilst all delivered some improvement, they did require heavy investment for what now is considered little return.

1.1.2 Through the use of the Early Assessment and Sifting Tool (EAST) framework, developed by the DfT, BFC was able to test options that provided the most suitable solution (Appendix A).

1.2 Hanworth Roundabout – Option Appraisal Report

1.2.1 High levels of queuing and delay have been identified at the junction and this is predicted to get worse in future forecasts due to increased levels of traffic. All the scheme options attempt to reduce the queuing to provide a more free flowing traffic network and control over the junction.

1.2.2 All developed options have been designed to incorporate the proposed dual carriageway on Crowthorne Road to the south of the junction.

Scheme Options

1.2.3 Concept Option 1 - This option increases the signalisation over the existing layout of the junction by introducing control at the Mill Lane arm. The introduction of these signals is predicted to dramatically reduce the level of queuing on Mill Lane.

1.2.4 Concept Option 2a - Further to Option 1, this option introduces additional signalisation at the junction to cover four of the entry arms. In this case control over the South Hill Road arm was incorporated.

1.2.5 Concept Option 2b – A secondary option was also developed incorporating control over the Great Hollands Road arm rather than the South Hill Road arm.

1.2.6 Concept Option 3a - This option introduces a fully signalised junction whilst stopping up the Great Hollands Road arm to reduce the number of entry points onto the junction. Great Hollands Road is accessed via a signalised junction meeting Crowthorne Road to the south west of the junction. Access to South Hill Road is to be made via Hanworth Road in the form of an additional signalised junction. A slip road from Mill Lane to South Hill Road has also been introduced.

1.2.7 Concept Option 3b - This option introduces a fully signalised junction whilst removing the South Hill Road arm to reduce the number of entry points onto the junction. South Hill Road is accessed via a signalised junction meeting Hanworth Road to the south east of the junction. A slip road from Mill Lane to South Hill Road has also been introduced.

1.2.8 Concept Option 3c - This option introduces a fully signalised junction whilst stopping up the Great Hollands Road arm to reduce the number of entry points onto the junction. Great Hollands Road is accessed via a signalised junction meeting Crowthorne Road to the south west of the junction. A slip road from Mill Lane to South Hill Road has also been introduced along with a slip road from South Hill Road to Hanworth Road.

1.2.9 Concept Option 4 - The Flythrough option allows priority to the heaviest recorded movement on the junction, the north/south movement on the A3095. All other movements catered for in the form of a roundabout. This concept maintains the overall footprint of the

existing junction, with the obvious exception of the flythrough lanes through the existing roundabout and is designed to include the proposed dualling on Crowthorne Road to ensure exit capacity at this key arm of the roundabout. Whilst this option provides significant capacity in the shorter term, the projected traffic flows illustrate that there is potential for capacity problems in the future.

1.2.10 Concept Option 5 - This option introduces full signalisation to the roundabout whilst maintaining the existing footprint of the junction. In line with research undertaken, the number of arms being signalised over the existing layout has been incrementally increased. Whilst fewer signalised arms provide capacity improvements in the short term, over the longer term more and more signalisation will be required.

1.2.11 Concept Option 6 - Four lane circulatory layout to increase capacity around the roundabout. Four lanes are not required on the circulatory carriageway at Great Hollands Road and South Hill Road. This will be established by means of white lining. Further investigation is to be undertaken on the most efficient arms to be under signal control. Additional signalisation is to be introduced at the Mill Lane entrance to the junction to control the level of traffic and the requirement to give way to traffic crossing from Great Hollands Road. This measure will also allow additional traffic to access the roundabout from the South Hill Road arm of the junction. Careful consideration will be given to the spiral markings to ensure the most efficient use of road space.

1.2.12 Concept Option 7 – In order to maximise on the internal circulatory capacity of the proposed signalised roundabout, Option 7 increases the overall footprint whilst maintaining the number of circulatory lanes introduced in Option 6.

Scheme Option Appraisal

1.2.13 Each option has been subject to an appraisal process utilising EAST. This identified the likely impact of each scheme option in terms of strategic, economic, managerial, financial, and commercial impacts.

1.2.14 The results of the EAST analysis are presented within Appendix A.

1.2.15 Scheme Options 1, and 2a, are considered to have limited strategic impact, with Scheme Option 2b even lower impact. All three scheme provide a good fit with wider transport and government and other objectives. They are all considered to have neutral impact upon economic growth, carbon emissions, socio-distributional impacts, local environment, and wellbeing. The schemes are considered deliverable in management and commercial terms and low risk financially.

1.2.16 Scheme Options 3a and 3b has a positive strategic impact and good fit with objectives, with a neutral impact upon economic growth, socio-distributional impacts, and wellbeing. Scheme 3a is considered to have a potentially negative impact upon local environment, whilst Scheme 3b may have a negative impact upon carbon emissions. The schemes are deemed deliverable in management terms, but are higher cost and so less affordable with greater financial risk.

1.2.17 Scheme Option 3c is appraised in similar terms to Scheme 3b, albeit with potential to have a slightly greater strategic impact, but also with a potential negative impact upon socio-distributional impacts due to potential concerns over the Great Hollands Road closure.

1.2.18 Scheme Option 4 would have a positive strategic impact and good fit with objectives. It is considered to have a neutral impact across all five economic indicators. The scheme would be deliverable in management terms and is considered reasonably affordable.

1.2.19 Scheme Options 5, 6 and 7 generally have a positive strategic impact, with Option 7 likely to have the greatest impact. All three have good fit with objectives, along with a positive impact across all five economic indicators, with the exception of socio-distributional impacts

which are likely to be neutral. The schemes are deemed deliverable in management terms and are affordable with manageable levels of risk.

Preferred Scheme Option

1.2.20 The outputs from the EAST appraisal indicate that Scheme Options 5, 6, and 7, including the full signalisation of the roundabout deliver the highest economic benefits, whilst still be deliverable. It is concluded that a full signalisation scheme should be taken forward as the preferred option. Option 7 is likely to have the highest strategic impact through increasing the physical capacity of the junction, alongside the signalisation. Whilst this increases the cost and potentially reduces affordability of the scheme, the benefits were considered to outweigh potential costs. These impacts will, however, be closely examined within the full business case appraisal process.

1.3 The Hut Roundabout – Option Appraisal Report

1.3.1 High levels of queuing and delay have been identified at the junction and this is predicted to get worse in future forecasts due to increased levels of traffic. All the scheme options attempt to reduce the queuing to provide a more free flowing traffic network and control over the junction.

1.3.2 All developed options have been designed to incorporate the proposed dual carriageway leading from Crowthorne Road from the north of the junction.

Scheme Options

1.3.3 Concept Option 1 – *Signalised Roundabout*. The first of these options was to introduce signal control to the roundabout that would require very little physical alteration of the existing layout of the junction other than to provide stop lines and traffic signal infrastructure at each junction entry point and on the internal circulation. It was noted however that due to the size of the junction along with the level of traffic expected to pass through the junction in the future, the option was not progressed further as it would not provide sufficient capacity at the internal stop lines.

1.3.4 Concept Option 2 – *Signalised Junction with dedicated left turn lanes on all arms*. Further to the consideration of Concept Option 1, Concept Option 2 involved the removal of the roundabout to introduce a signalised crossroads. This option provided a more favourable solution that the signalised roundabout giving a better level of control at the junction, however when modelled the option was shown to operate above capacity in the future scenario.

1.3.5 Concept Option 3 - *Signalised Crossroads - Dedicated left turn lanes on all arms*. This option evolved from Concept Option 2. The alignment of the junction has been modified on the western arm of the junction on Nine Mile Ride to accommodate a dedicated right turn lane. Tapering heading westbound has been increased to allow for additional capacity, and the northern kerb line has been realigned to provide a buffer up to the highway boundary. This option is still predicted to operate over capacity during the future modelling scenarios.

1.3.6 Concept Option 4 - *Signalised Crossroads - Dedicated left turn lanes on all arms with the exception of A3095 Foresters Way northbound. Right turn only lane introduced on Nine Mile Ride Eastbound*. In this option, the dedicated left turn lane from the A3095 to the western arm of the junction has been replaced with a combined ahead and left lane to increase the overall capacity of the arm. This option is modelled to operate within capacity in all scenarios.

1.3.7 Concept Option 5 - *Signalised Crossroads - Dedicated left turn lanes on all arms with the exception of A3095 Foresters Way northbound. Right turn only lanes introduced on A3095 Foresters Way and A3095 Crowthorne Road*. This option removes the large island on the

western arm of the roundabout whilst still retaining the number of entry and exit lanes. Concept Option 5 models well in terms of practical reserved capacity in both the current and future scenarios. The junction models slightly worse than Concept Option 4, however in terms of cost, land take and impact on the local environment this is by far a more preferable option.

1.3.8 Concept Option 6 – *Final Concept* – This option is a refinement of Option 5, adding further exit capacity on to Nine Mile Ride on the western arm. The flares and lane lengths have been reduced to further rationalise land take and increase the buildability of the junction. Whilst undertaking these modifications, it was ensured that the junction remained within capacity for all scenarios.

Scheme Option Appraisal

1.3.9 Each option has been subject to an appraisal process utilising EAST. This identified the likely impact of each scheme option in terms of strategic, economic, managerial, financial, and commercial impacts.

1.3.10 The results of the EAST analysis are presented within Appendix A.

1.3.11 Scheme Option 1 is considered to have limited strategic impact, albeit providing a good fit with wider transport and government and other objectives. It is considered to have neutral impact upon economic growth, carbon emissions, socio-distributional impacts and wellbeing, although a positive impact on the local environment. The scheme is considered deliverable in management and commercial terms and low risk financially.

1.3.12 Scheme Options 2, 3, 4, and 5 are all considered to have good strategic impact and provide a good fit with wider transport and government and other objectives. All are considered to have positive impact on economic growth, carbon emissions, socio-distributional impacts and wellbeing; however Options 3 and 4 could potentially have a negative impact upon local environment to the south west corner of the junction and could be a key risk in deliverability.

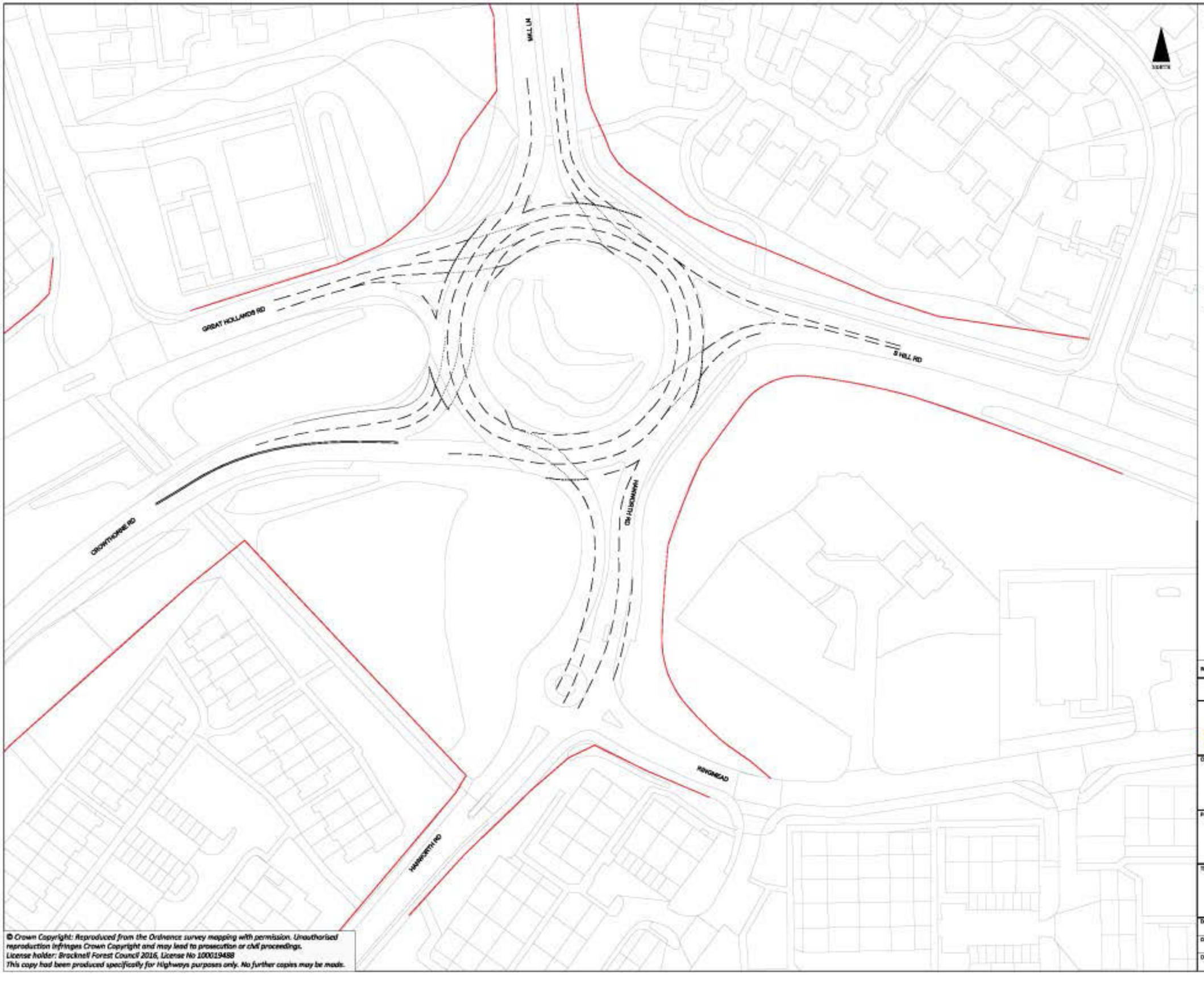
1.3.13 Scheme Option 6 is considered to have the most strategic impact and provide a good fit with wider transport and government and other objectives. It is considered to provide a high positive impact upon economic growth alongside a good impact on carbon emissions, socio-distributional impacts, local environment and wellbeing. Whilst the public acceptability is not clear at the time of the analysis, the scheme is considered to have good practical feasibility, financially affordable, and commercially deliverable.

Preferred Scheme Option

1.3.14 The outputs from the EAST analysis indicate that Scheme Option 6 is considered to offer the most benefits whilst remaining comparatively affordable to the other scheme measures and was therefore identified as likely to deliver the highest value for money from investment. It is, therefore, identified as the preferred scheme option.

Appendix B

SCHEME DRAWINGS



Notes

1. This drawing is to be read in conjunction with the "ST16462 Engineering Proposals Review" Technical Note
2. The measured details in this drawing are indicative only
3. Do not scale from this drawing
4. All dimensions are in metres, unless otherwise stated
5. Existing layout based on Bracknell Forest Council drawing titled "A3095 (S) Highway Improvement Proposals". No modifications are made to that layout

Key

- OS base
- Highway boundary
- Existing layout

Rev.	Date	Revision details	Drawn	Checked	Approved

JMP
27-32 Old Jewry
London
EC2R 8DQ
T 020 3714 4400
E london@jmp.co.uk
W www.jmp.co.uk

Client: Bracknell Forest Council

Project: A3095 Economic Assessment

Title: Harworth Roundabout Existing Layout

Drawn	Checked	Approved
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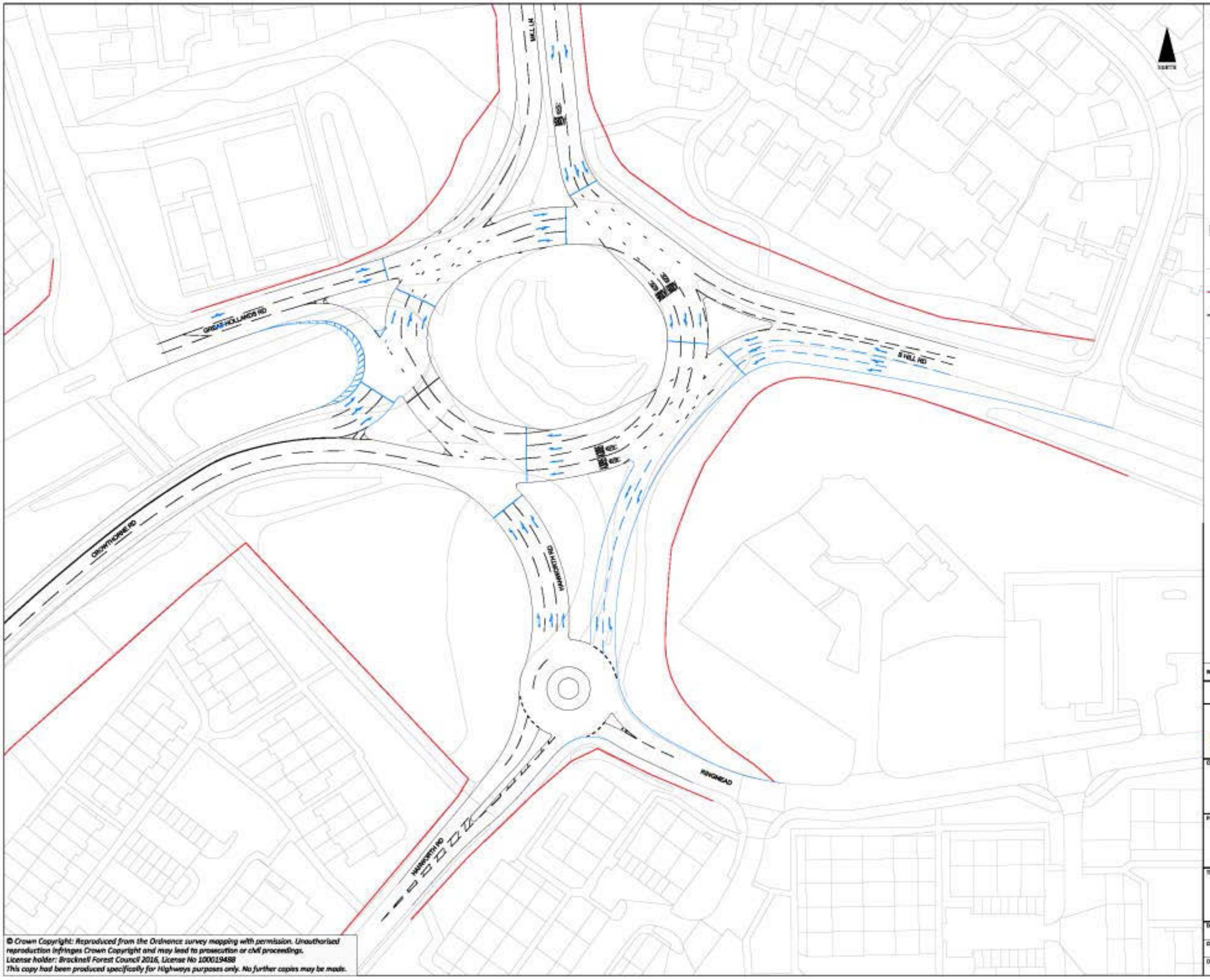
Original drg. size: A3	Date: 12.01.2016	Scale: 1:1000
Drawing Status: Draft	Drawing Number: ST16462-HR-01	Rev.: -



Notes

1. This drawing is to be read in conjunction with the "ST16462 Engineering Proposals Review" Technical Note
2. The measured details in this drawing are indicative only
3. Do not scale from this drawing
4. All dimensions are in metres, unless otherwise stated
5. Proposed layout based on Bracknell Forest Council drawing titled "A3095 (S) Highway Improvement Proposals"

Key

- OS base
- Highway boundary
- Proposed layout
- JMP amendments to proposed layout

Rev.	Date	Revision details	Drawn	Checked	Approved

JMP
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W www.jmp.co.uk

Client: Bracknell Forest Council

Project: A3095 Economic Assessment

Title: Hamworth Roundabout
Proposed Layout
JMP Amendments

Drawn	Checked	Approved
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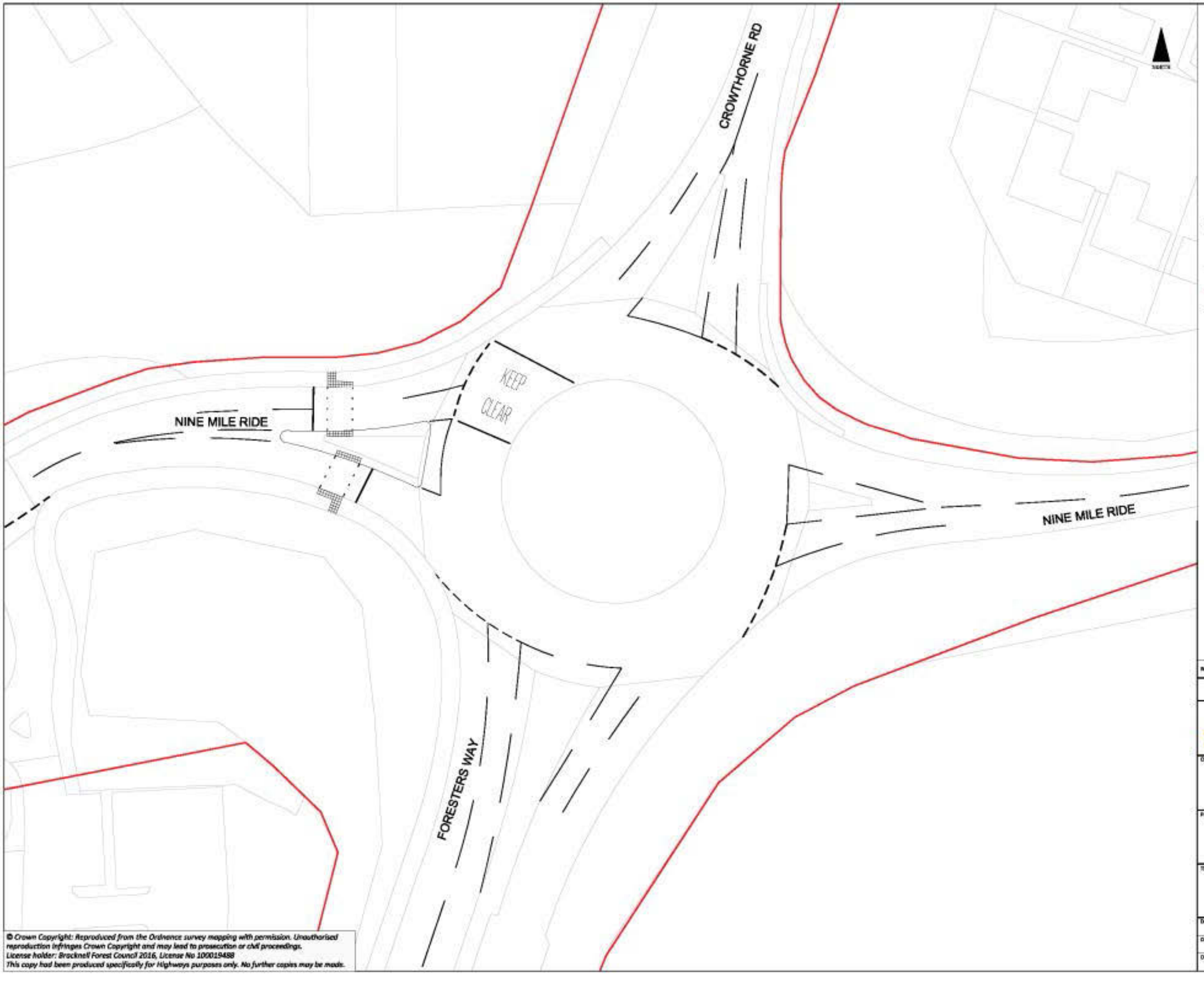

Notes

1. This drawing is to be read in conjunction with the "ST16462 Engineering Proposals Review" Technical Note
2. The measured details in this drawing are indicative only
3. Do not scale from this drawing
4. All dimensions are in metres, unless otherwise stated
5. Existing layout based on Bracknell Forest Council drawing titled "A3095 (S) Highway Improvement Proposals". No modifications are made to that layout

Key

- OS base
- Highway boundary
- Existing layout

Rev.	Date	Revision details	Drawn	Checked	Approved

JMP
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W www.jmp.co.uk

Client: Bracknell Forest Council

Project: A3095 Economic Assessment

Title: Golden Retriever Roundabout Existing Layout

Drawn	Checked	Approved
GF	CA	PWJ
Original drg. size: A3	Date: 12.01.2016	Scale: 1:500
Drawing Status: Draft	Drawing Number: ST16462-GRR-01	Rev. -

CROWTHORNE RD

NINE MILE RIDE

NINE MILE RIDE

FORESTERS WAY

Notes

1. This drawing is to be read in conjunction with the "ST16462 Engineering Proposals Review" Technical Note
2. The measured details in this drawing are indicative only
3. Do not scale from this drawing
4. All dimensions are in metres, unless otherwise stated
5. Proposed layout based on Bracknell Forest Council drawing titled "A3095 (S) Highway Improvement Proposals"

Key

- OS base
- Highway boundary
- Proposed layout
- JMP amendments to proposed layout

Rev.	Date	Revision details	Drawn	Checked	Approved

JMP
27-32 Old Jewry
London
EC2R 8DQ
T 020 3714 4400
E london@jmp.co.uk
W www.jmp.co.uk

Client: Bracknell Forest Council

Project: A3095 Economic Assessment

Title: Golden Retriever Roundabout
Proposed Layout
JMP Amendments

Drawn	Checked	Approved
GF	CA	PWJ
Original drg. size: A3	Date: 25.01.2016	Scale: 1:500
Drawing Status: Draft	Drawing Number: ST16462-GRR-04	Rev. -

GREAT HOLLANDS ROAD

CROWTHORNE ROAD

Cut Line A

CROWTHORNE ROAD

RINGMEAD

RINGMEAD

CROWTHORNE ROAD

Cut Line B

Cut Line A

Cut Line B

CROWTHORNE ROAD

NINE MILE RIDE

NINE MILE RIDE

FORESTERS WAY

Notes

1. This drawing is to be read in conjunction with the "ST16462 Engineering Proposals Review" Technical Note
2. The measured details in this drawing are indicative only
3. Do not scale from this drawing
4. All dimensions are in metres, unless otherwise stated
5. Existing layout based on Bracknell Forest Council drawing titled "A3095 (S) Highway Improvement Proposals". No modifications are made to that layout

Key

- OS base
- Highway boundary
- Existing layout (road markings shown at junctions only)

Rev.	Date	Revision details	Drawn	Checked	Approved

JMP
27-32 Old Jewry
London
EC2R 8DQ
T 020 3714 4400
E london@jmp.co.uk
W www.jmp.co.uk

Client: Bracknell Forest Council

Project: A3095 Economic Assessment

Title: Crowthorne Road Corridor Existing Layout

Drawn	Checked	Approved
GF	CA	PWJ
Original drg. size: A3	Date: 26.01.2016	Scale: 1:2000
Drawing Status: Draft	Drawing Number: ST16462-CR-01	Rev. -

RINGMEAD

CROWTHORNE RD

CROWTHORNE RD

RINGMEAD

Notes

1. This drawing is to be read in conjunction with the "ST16462 Engineering Proposals Review" Technical Note
2. The measured details in this drawing are indicative only
3. Do not scale from this drawing
4. All dimensions are in metres, unless otherwise stated
5. Proposed layout based on Bracknell Forest Council drawing titled "A3095 (S) Highway Improvement Proposals"

Key

- OS base
- Highway boundary
- Proposed layout
- JMP amendments to proposed layout

Rev.	Date	Revision details	Drawn	Checked	Approved

JMP
27-32 Old Jewry
London
EC2R 8DQ
T 020 3714 4400
E london@jmp.co.uk
W www.jmp.co.uk

Client: Bracknell Forest Council

Project: A3095 Economic Assessment

Title: Crowthorne Road Proposed Layout JMP Amendments

Drawn	Checked	Approved
GF	CA	PWJ
Original drg. size: A3	Date: 25.01.2016	Scale: 1:500
Drawing Status: Draft	Drawing Number: ST16462-CR-04	Rev.: -

Cut Line A

Cut Line B

Cut Line B

Cut Line A

Notes

1. This drawing is to be read in conjunction with the "ST16462 Engineering Proposals Review" Technical Note
2. The measured details in this drawing are indicative only
3. Do not scale from this drawing
4. All dimensions are in metres, unless otherwise stated
5. Proposed layout based on Bracknell Forest Council drawing titled "A3095 (S) Highway Improvement Proposals"
6. Utilities outside highway boundary not market

Key

- OS base
- Highway boundary
- Southeast Water
- Thames Water
- British Telecom
- Virgin Media
- S&S Low Voltage
- S&S High Voltage
- National Grid

Rev.	Date	Revision details	Drawn	Checked	Approved

JMP
27-32 Old Jewry
London
EC2R 8DQ
T 020 3714 4400
E london@jmp.co.uk
W www.jmp.co.uk

Client: Bracknell Forest Council

Project: A3095 Economic Assessment

Title: Crowthorne Road Corridor
C2 Utility
Southeast Water, Thames Water, S&S Energy, British Telecom, Virgin Media & National Grid

Drawn	Checked	Approved
FPL	CA	PWJ
Original orig. size: A3	Date: 26.01.2016	Scale: 1:2000
Drawing Status: Draft	Drawing Number: ST16462-CR-07	Rev: -

Appendix C

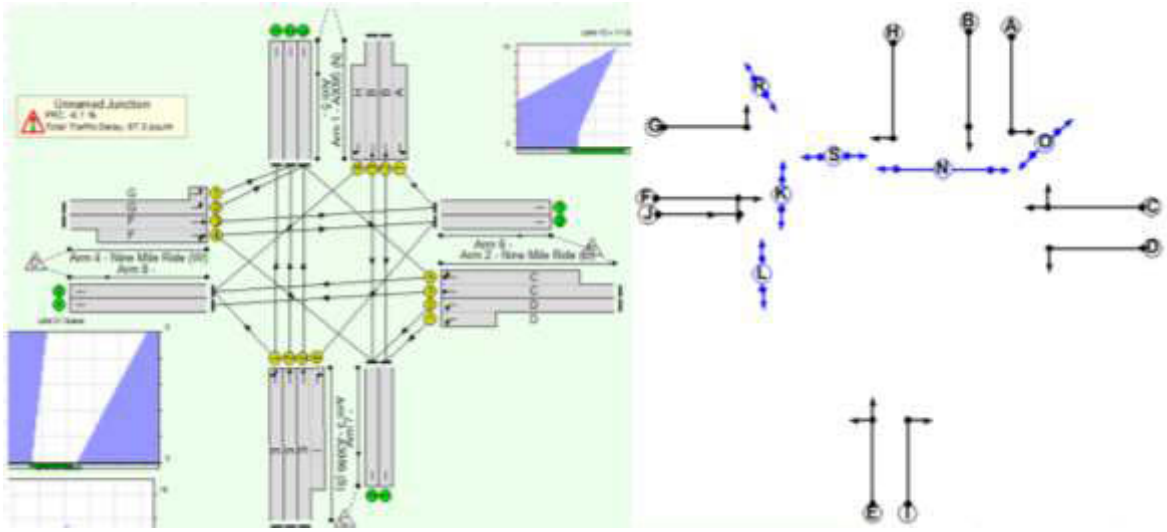
LINSIG OUTPUT

Golden Retriever Signalised Junction

Signal Timings

1.1 The signal timings applied within the Linsig model are shown in Figure 1.

Figure 1: Junction Phase and Lane Layout in LinSig



Review of Junction Performance

1.2 To assess the performance of the proposed traffic signal design at the Golden Retriever junction a worst case scenario was assumed. All pedestrian phases were assumed to be called every signal cycle. This causes traffic signal inter-stages to rise, causing traffic green time and junction traffic capacity to fall.

1.3 In the AM peak this causes the junction to operate at 97 percent degree of saturation on its most heavily trafficked arm, the A3095 (south) i.e. the junction copes with 2026 AM peak traffic demand but has only got three percent spare capacity on that arm. Also, because the junction operates at pretty close to the 120s maximum cycle time, there is very little scope for increasing capacity by increasing the signal cycle time.

1.4 Mean Max Queues (PCUs) are the estimated mean number of PCUs which have added onto the back of the queue up to the time when the queue finally clears. They are an indicator of how far back the rear of queue propagates – even though the front may well have discharged.

1.5 Traffic queues are at their highest on the A3095 (south) extending up to 24 PCU (138m) on average.

Table 1: 2026 AM Peak Junction Performance (Cycle Time 113s)

Lane Description	Degree of Sat (%)	Total Delay (PCU Hr)	Mean Max Queue (PCU)
A3095 (N) Left Ahead	82.1%	7	17
A3095 (N) Ahead Right	87.8%	10	15
Nine Mile Ride (E) Left	41.9%	3	5
Nine Mile Ride (E) Right Ahead	90.7%	10	11
A3095 (S) Ahead Left	92.1%	10	18
A3095 (S) Ahead	92.4%	10	19
A3095 (S) Ahead Right	97.3%	20	24
Nine Mile Ride (W) Left	36.9%	1	3
Nine Mile Ride (W) Ahead Right	93.5%	15	17

1.6 In the PM peak, with full pedestrian demand every signal cycle, the junction operates at 91 percent degree of saturation on its most heavily trafficked arm, the A3095 (north). So, again, the junction copes with 2026 PM peak traffic demand but has only got nine percent spare capacity on that arm. However, because the junction operates at a slightly lower cycle time than the AM peak, there is a little bit more scope for increasing capacity by increasing the signal cycle time.

1.7 Traffic queues are also predicated to be at their highest on the A3095 (north) extending up to 20 PCU (115m) on average.

Table 2: 2026 PM Peak Junction Performance (Cycle Time 104s)

Lane Description	Degree of Sat (%)	Total Delay (PCU Hr)	Mean Max Queue (PCU)
A3095 (N) Left Ahead	89.0%	9	20
A3095 (N) Ahead Right	90.6%	11	20
Nine Mile Ride (E) Left	62.2%	5	8
Nine Mile Ride (E) Right Ahead	88.9%	13	17
A3095 (S) Ahead Left	65.7%	4	10
A3095 (S) Ahead	66.3%	4	10
A3095 (S) Ahead Right	77.8%	7	12
Nine Mile Ride (W) Left	75.0%	4	6
Nine Mile Ride (W) Ahead Right	87.9%	10	11

Golden Retriever Signalised Junction

Signal Control & Timings

1.8 Traffic signal cycle times for the 2026 AM and PM peak scenarios were 44s and 67s respectively.

Review of Junction Performance

1.9 In the AM peak, degrees of saturation are generally all below 90% percent, with the exception of Great Hollands Road. The lower 44 sec cycle time is required in the AM peak to limit the length of queues on circulating links.

Table 3: 2026 AM Peak Junction Performance (Cycle Time 44s)

Lane Description	Degree of Sat (%)	Total Delay (PCU Hr)	Mean Max Queue (PCU)
Mill Lane N Ahead	67%	2	5
Mill Lane N Right Ahead	80%	3	9
Mill Lane N Right	55%	1	2
South Hill Rd Ahead	47%	2	6
South Hill Rd Right Ahead	69%	3	8
South Hill Rd Right	66%	2	9
Hanworth Rd Ahead	67%	2	3
Hanworth Rd Ahead	67%	1	3
Hanworth Rd Right	29%	1	2
Hanworth Rd Right	48%	2	6
Crowthorne Rd Ahead	43%	1	4
Crowthorne Rd Right	78%	3	6
Crowthorne Rd Right	77%	3	5
Great Hollands Rd Ahead	86%	5	10
Great Hollands Rd Right Ahead	87%	5	10
Great Hollands Rd Right	50%	1	1
Mill Lane Ahead Left	73%	3	7
Mill Lane Ahead	83%	5	10
South Hill Rd Left	2%	0	0
South Hill Rd Ahead	43%	1	3
South Hill Rd Ahead	78%	4	8
Hanworth Rd Ahead	73%	3	7
Hanworth Rd Ahead	46%	2	4
Hanworth Rd Ahead	40%	1	3
Crowthorne Rd Ahead Left	77%	4	7
Crowthorne Rd Ahead	76%	4	8
Crowthorne Rd Ahead	86%	5	10
Great Hollands Rd Ahead Left	97%	9	13
Great Hollands Rd Ahead Left	97%	10	13

1.10 In the PM peak, degrees of saturation are all below 91 percent. This shows that the there is a minimum of 9 percent spare capacity in this future scenario.

Table 4: 2026 PM Peak Junction Performance (Cycle Time 67s)

Lane Description	Degree of Sat (%)	Total Delay (PCU Hr)	Mean Max Queue (PCU)
Mill Lane N Ahead	80%	3	4
Mill Lane N Right Ahead	81%	3	6
Mill Lane N Right	58%	2	5
South Hill Rd Ahead	41%	0	1
South Hill Rd Right Ahead	60%	2	10
South Hill Rd Right	73%	1	2
Hanworth Rd Ahead	60%	2	5
Hanworth Rd Ahead	56%	1	5
Hanworth Rd Right	53%	1	4
Hanworth Rd Right	11%	0	3
Crowthorne Rd Ahead	71%	3	7
Crowthorne Rd Right	29%	1	4
Crowthorne Rd Right	28%	1	5
Great Hollands Rd Ahead	59%	1	1
Great Hollands Rd Right Ahead	62%	1	1
Great Hollands Rd Right	43%	0	0
Mill Lane Ahead Left	88%	8	22
Mill Lane Ahead	90%	8	23
South Hill Rd Left	5%	0	0
South Hill Rd Ahead	78%	4	8
South Hill Rd Ahead	71%	3	6
Hanworth Rd Ahead	55%	2	5
Hanworth Rd Ahead	50%	2	5
Hanworth Rd Ahead	49%	2	5
Crowthorne Rd Ahead Left	87%	6	12
Crowthorne Rd Ahead	88%	7	13
Crowthorne Rd Ahead	91%	8	14
Great Hollands Rd Ahead Left	52%	2	5
Great Hollands Rd Ahead Left	53%	2	5

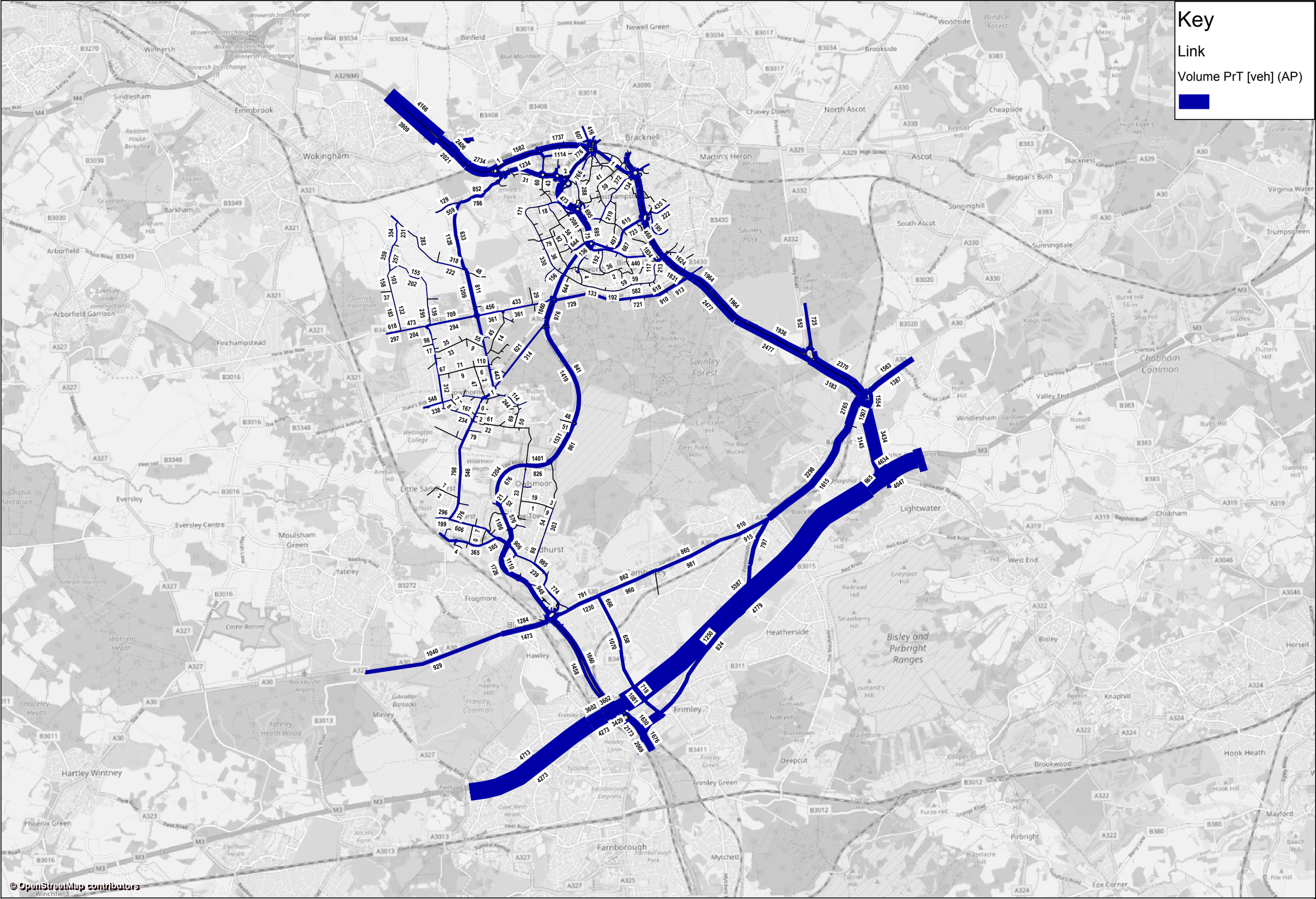
Appendix D

2026: TRAFFIC FLOWS

Appendix D.1

2026: REFERENCE CASE TRAFFIC

FLOWS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Virginia Water
Trumpsgreen
Longcross Studios
Chobham Common
Windlesham
Valley End
Lightwater
Chobham
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Pirbright
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Mayford
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Horsell
Farnborough
Mytchett
Fox Corner
Hawley
Minley
Hartley Wintney
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Eversley
Eversley Centre
Moulsham Green
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Frogmore
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Arborfield
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Barkham
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Sindlesham
Winnersh
Binfield
Newell Green
Oakmoor
Swinley Forest
Swinley Park
Whitmore Bog
Windsor Forest
Great Wood
Gravel Hill
Mezel Hill
Temple Hill
Fireball Hill
High Flyer's Hill
Virginia Water
Ship Hill
Burnt Hill
Kings Hill
Hatton Hill
Russell Hill
Butts Hill
Curley Hill
Sandpit Hill
Redroad Hill
Greyspot Hill
Dog Hill
Strawberry Hill
Loveland's Hill
Frith Hill
Mainstone Hill
Cooper's Hill
Furze Hill
Dawney Hill
Hazelacre Hill
Tunnel Hill
Pile Hill
Beech Hill
Starveirs Hill
Hook Hill
Chobham Ridges
Deer Rocks Hill
The Blue Bucket
Car Crash Hill
Tower Hill
Pudding Hill
Butter Hill
Ambarrow Hill
Little Sandhurst
Wellington College
Wildmoor Heath
Warren Heath
Castle Bottom
Yateley Heath Wood
Hazeley Heath
Gibraltar Barracks
Blackbushe Airport
Lakeside (under construction)
Gerrick Plantation
Ancells Farm
Farnborough Park
Farnborough Empress
Cove West Heath
Tatland
Frimley Green
Fleet Hill
Fleet Road
Forest Road
Nine Mile Ride
Wellington Avenue
Summit Avenue
Reading Road
Wokingham Road
Barkham Road
Mole Road
Lower Earley Way
Hatch Farm Way
Winnersh Interchange
Blue Mountain
Wildmoor Heath
Oakmoor
Bracknell Town
Bracknell Forest
Crowthorne
Wokingham
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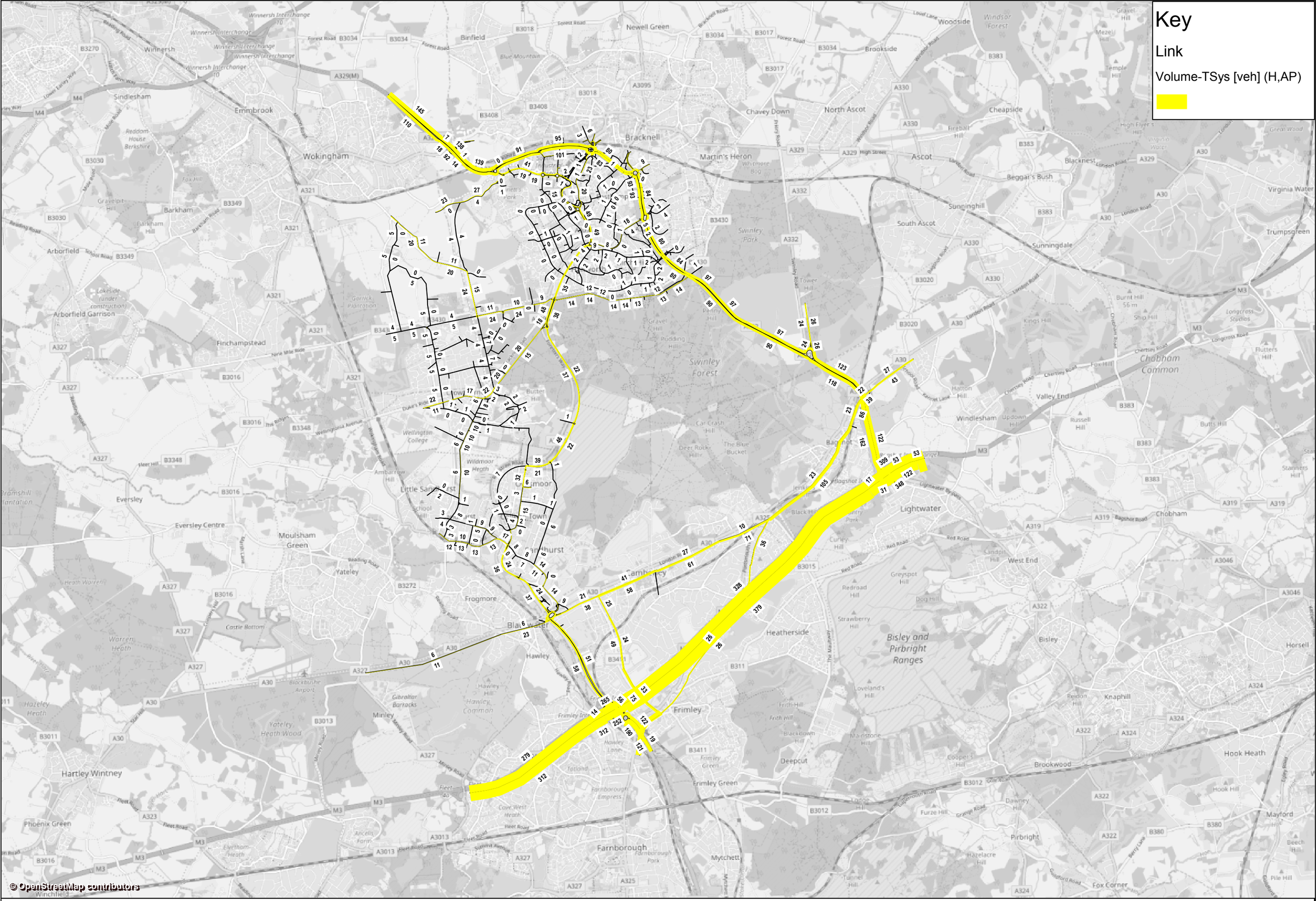
Fireball Hill
High Flyer's Hill

2026 AM Peak Final Forecast v17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Trumpsgreen
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Barkham
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Swinley Forest
Chobham Common
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Windlesham
Lightwater
Bagshot
Heatherside
Bisley and Pirbright Ranges
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Frimley Green
Deepcut
Camberley
Blackwater
Hawley
Yateley
Eversley
Eversley Centre
Moulsham Green
Hartley Wintney
Phoenix Green
Farnborough
Mytchett
Brookwood
Pirbright
Hook Heath
Knaphill
Chobham
Lightwater
West End
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Horsell
Mayford
Newell Green
Binfield
Brookside
Woodside
Windsor Forest
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Reddam House Berkshire
Barkham
Arborfield
Finchampstead
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Hartley Wintney
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Pirbright
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Bagshot
Martin's Heron
Chavey Down
North Ascot
Cheapside
Blacknest
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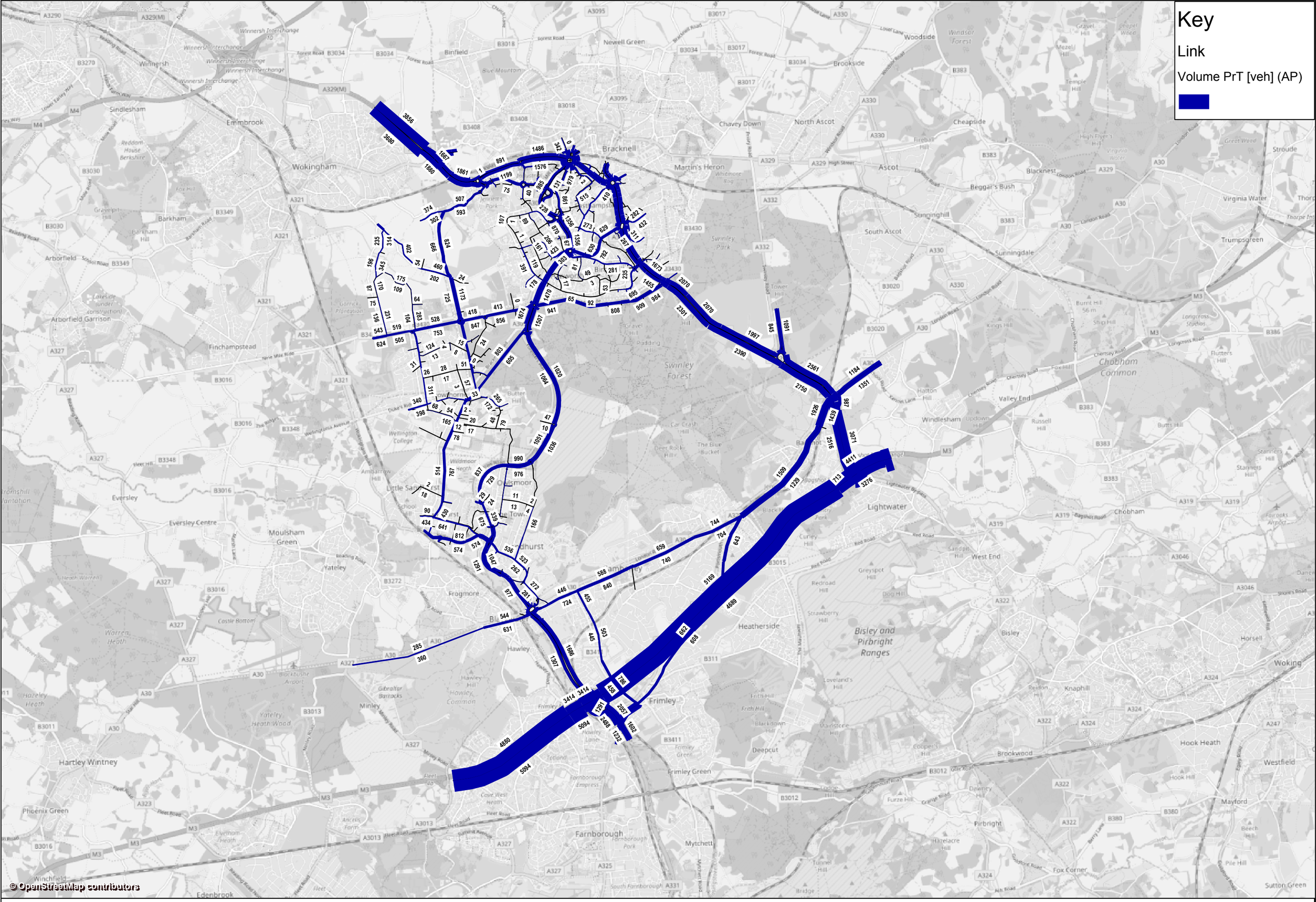
2026 AM Peak Final Forecast v17



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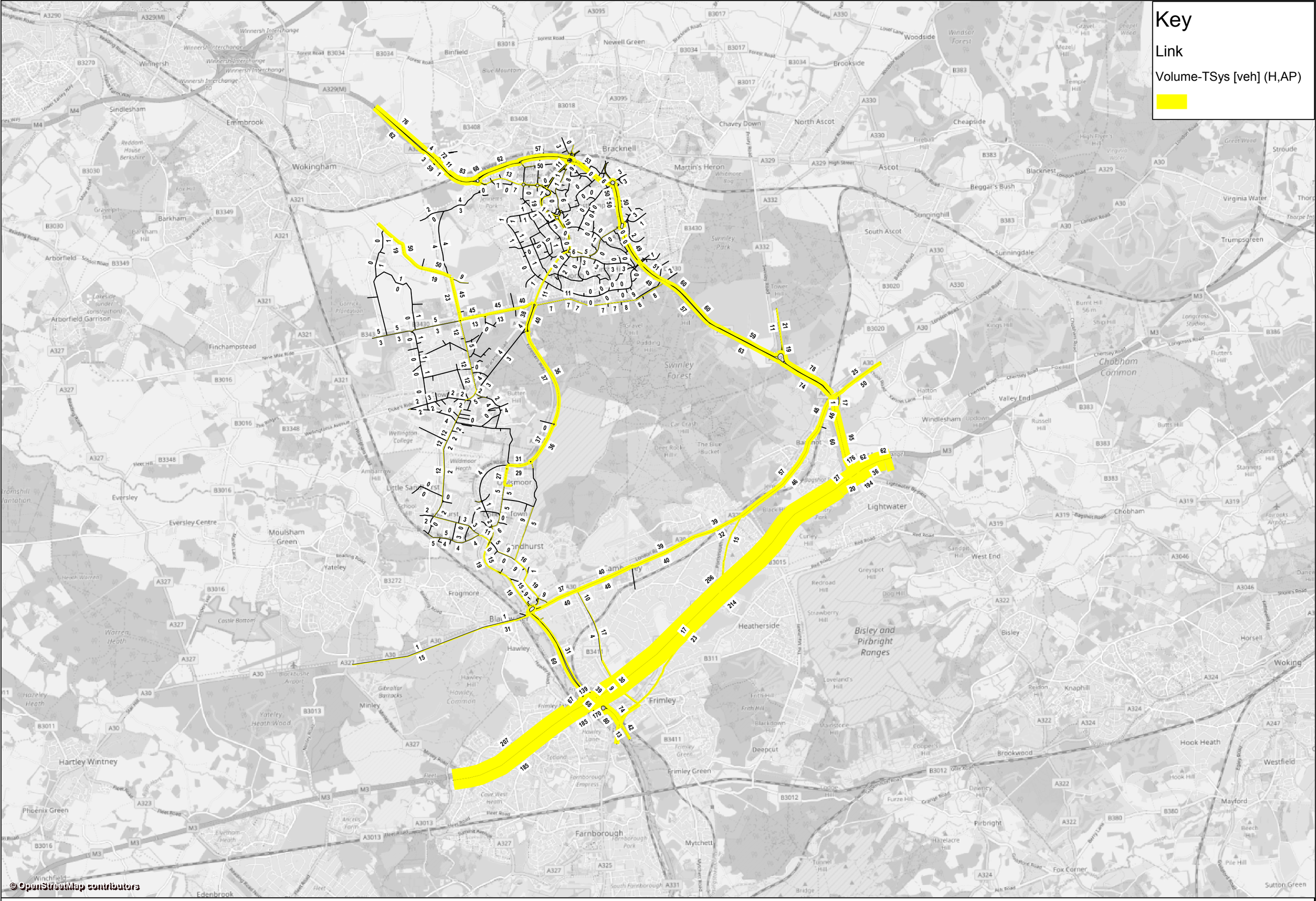
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Fox Corner
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Minley
Phoenix Green
Winchfield
Edenbrook
Arborfield
Barkham
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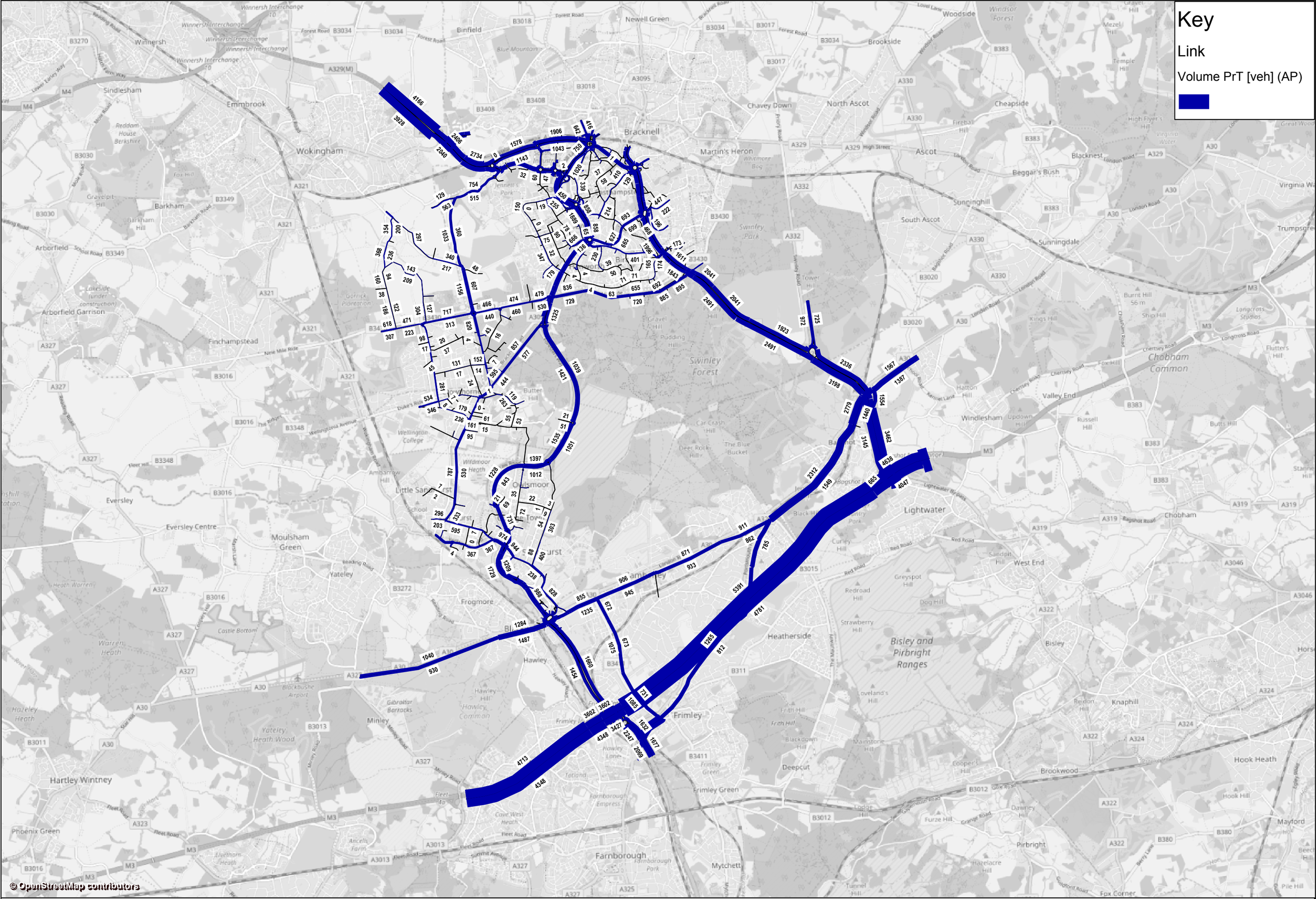
2026 AM Peak Final Forecast v17

Appendix D.2

2026: A3095 CORRIDOR

IMPROVEMENTS TRAFFIC FLOWS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Flutters Hill
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Fireball Hill
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Gravel Hill
Car Crash Hill
Deer Rocks Hill
The Blue Bucket
Black Hill
Frith Hill
Blackdown Hill
Mainstone Hill
Loveland's Hill
Reldon Hill
Cuckoo Hill
Lodge Hill
Frimley Green
Tetland
Cove West Heath
Farnborough Hill
Farnborough Park
Ancells Farm
Electhorn Heath
Castle Bottom
Warren Heath
Heath Warren
Hazeley Heath
Yateley Heath Wood
Gibraltar Barracks
Blockbushe Airport
Gorrick Plantation
Jennetts Park
Whitmore Bog
Blue Mountain
Reddam House Berkshire
Lakeside (under construction)
Fox Hill
Gravelpit Hill
Barkham Hill
Nine Mile Ride
Forest Road
Fleet Road
Wellington Avenue
Summit Avenue
Duke's Ride
The Ridges
Marsh Lane
Mole Road
Blow Road
Barkham Road
Basingstoke Road
Reading Road
Monks Farm Way
Lower Earley Way
Winnersh Interchange
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Priory Road
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Kennel Lane
Chertsey Road
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Longcross Road
Dukes Ride
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Summit Avenue
Fleet Road
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Cove Road
Cranmore Road
Berry Lane
Guildford Road
Bagshot Road
Red Road
Lightwater By-pass
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Frimley Road
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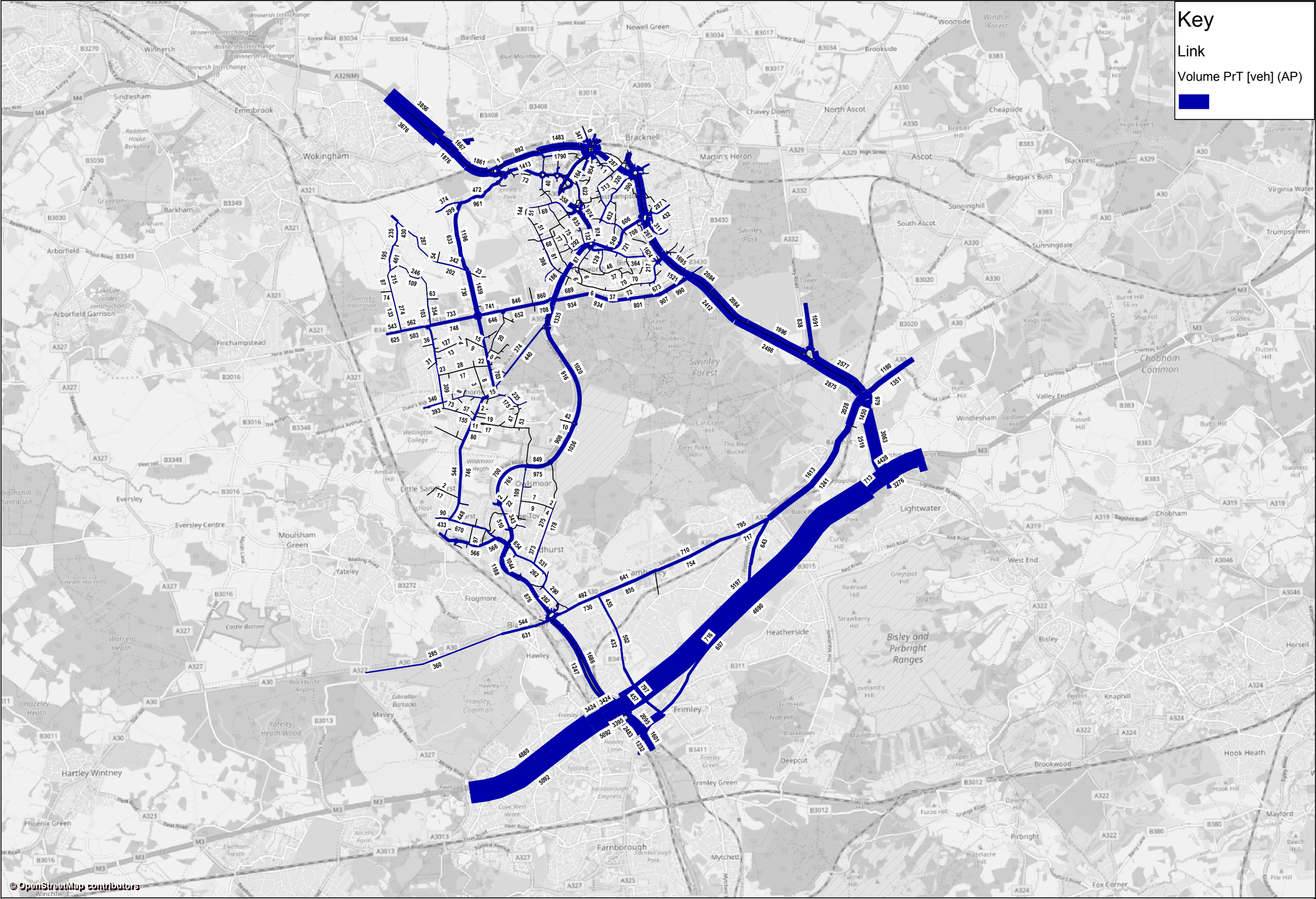
2026 AM Peak Final Forecast v17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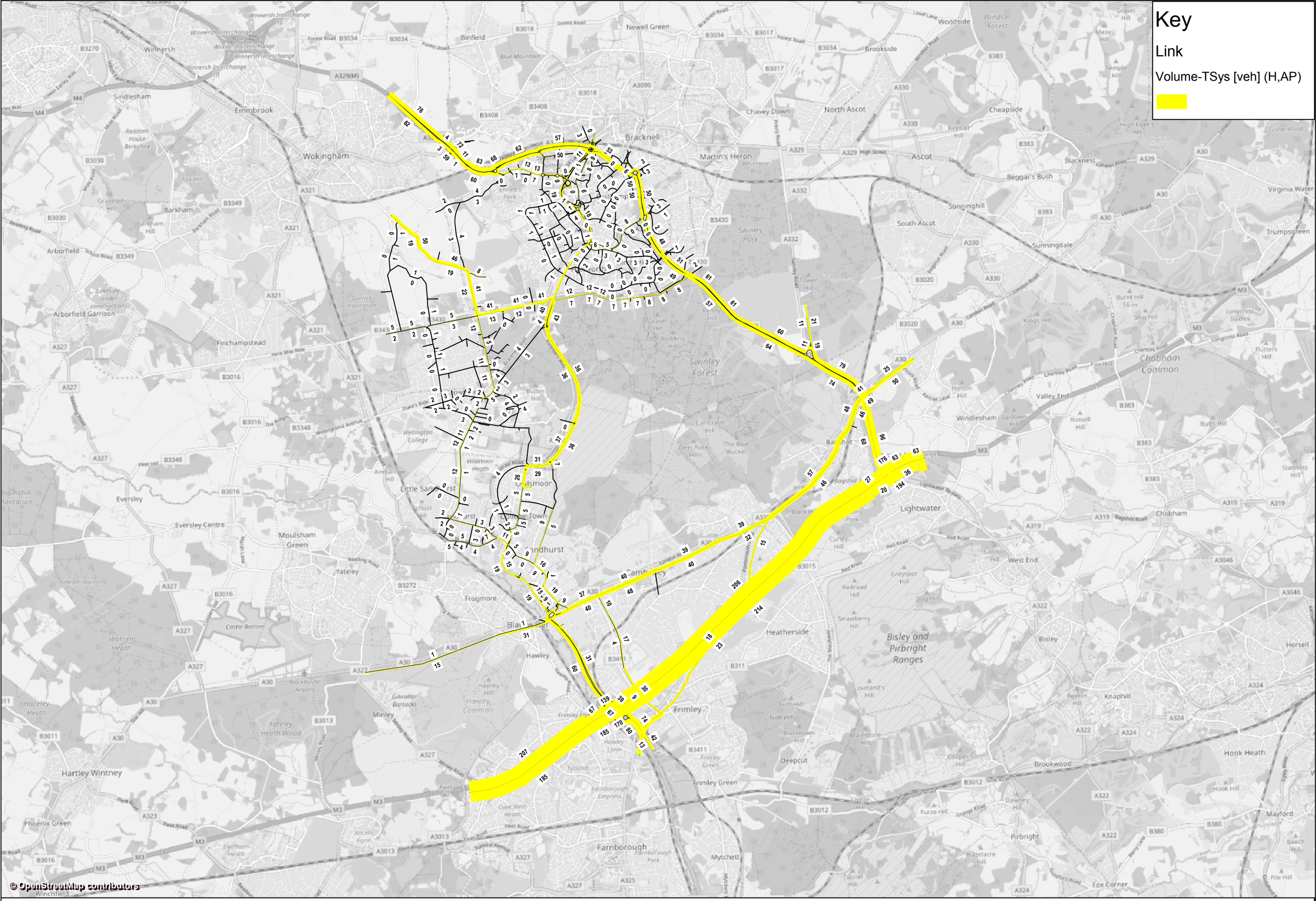
Sunningdale
Martin's Heron
Chavey Down
North Ascot
Cheapside
Blacknest
Beggar's Bush
Virginia Water
Trumpsgreen
Arborfield
Arborfield Garrison
Barkham
Finchampstead
Sindlesham
Emmbrook
Winnersh
Newell Green
Binfield
Brookside
Woodside
Windsor Forest
Swinley Forest
Chabham Common
Valley End
Windlesham
Lightwater
Chobham
West End
Bisley and Pirbright Ranges
Heatherside
Frimley
Frimley Green
Deepcut
Farnborough
Mytchett
Pirbright
Brookwood
Hook Heath
Knaphill
Mayford
Bisley
Horsell
Eversley
Eversley Centre
Moulsham Green
Yateley
Frogmore
Hawley
Minley
Hartley Wintney
Phoenix Green
Oulsmoor
Lightwater
Hatton Hill
Butter Hill
Wellington College
Gibraltar Barracks
Yateley Heath Wood
Castle Bottom
Warren Heath
Blackbushe Airport
Swinley Park
Whitmore Bog
Gorrick Plantation
Pudding Hill
Tower Hill
Car Crash Hill
The Blue Bucket
Deer Rocks Hill
Ambarrow Hill
Little Sandhurst
Wildmoor Heath
Ancells Farm
Fleet Hill
Hawley Common
Frith Hill
Blackdown Hill
Mainstone Hill
Cooper's Hill
Furze Hill
Dawney Hill
Hazelacre Hill
Tunnel Hill
Curley Hill
Redroad Hill
Dog Hill
Strawberry Hill
Greyspot Hill
Sandpit Hill
Fox Corner
Pile Hill
Butts Hill
Russell Hill
Hazeley Heath
Ship Hill
Burnt Hill
Kings Hill
Longcross Studios
Flutters Hill
Chobham Common
Windsor Forest
Mezel Hill
Temple Hill
Fireball Hill
High Flyer's Hill
Great Wood
Virginia Water
Whitmore Bog
Swinley Park
Tower Hill
Pudding Hill
Gravel Hill
Loveland's Hill
Reedham House Berkshire
Lakeside (under construction)
Gravelpit Hill
Fox Hill
Butter Hill
Wellington College

Key

Link

Volume PrT [veh] (AP)

2026 AM Peak Final Forecast v17



2026 AM Peak Final Forecast v17

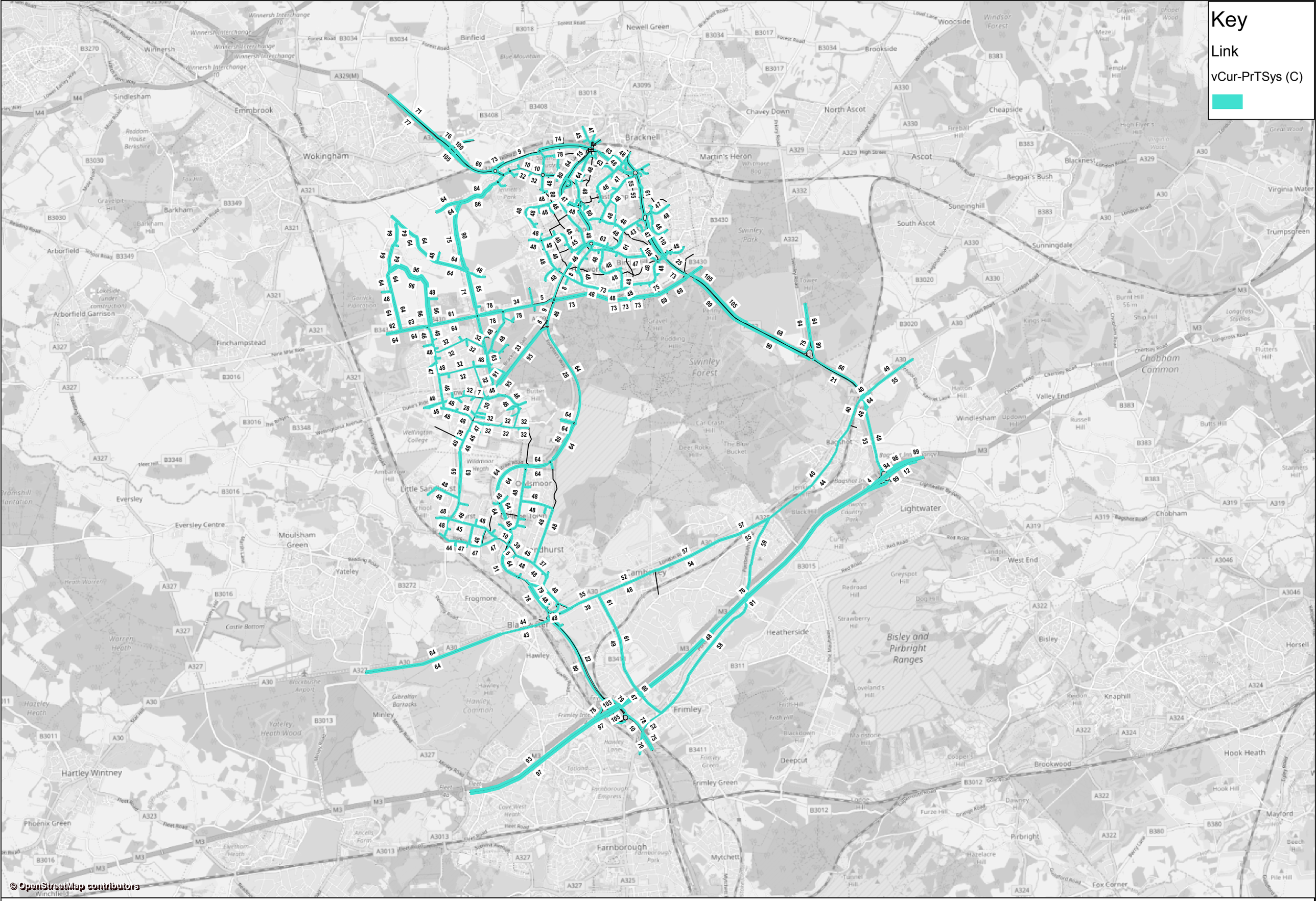
2026 AM Peak Final Forecast v17

Appendix E

2026: SPEEDS

Appendix E.1

2026: REFERENCE CASE SPEEDS



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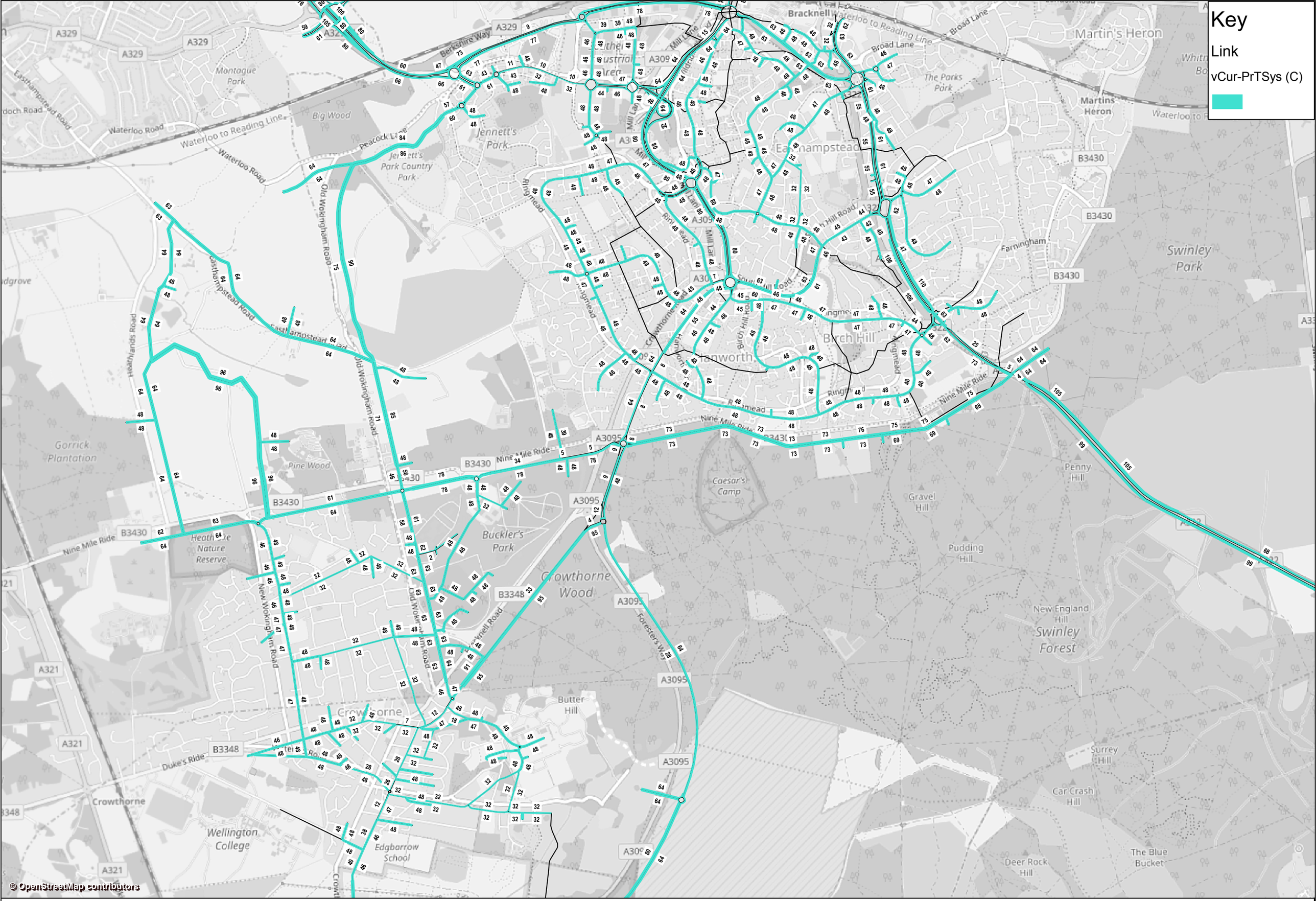
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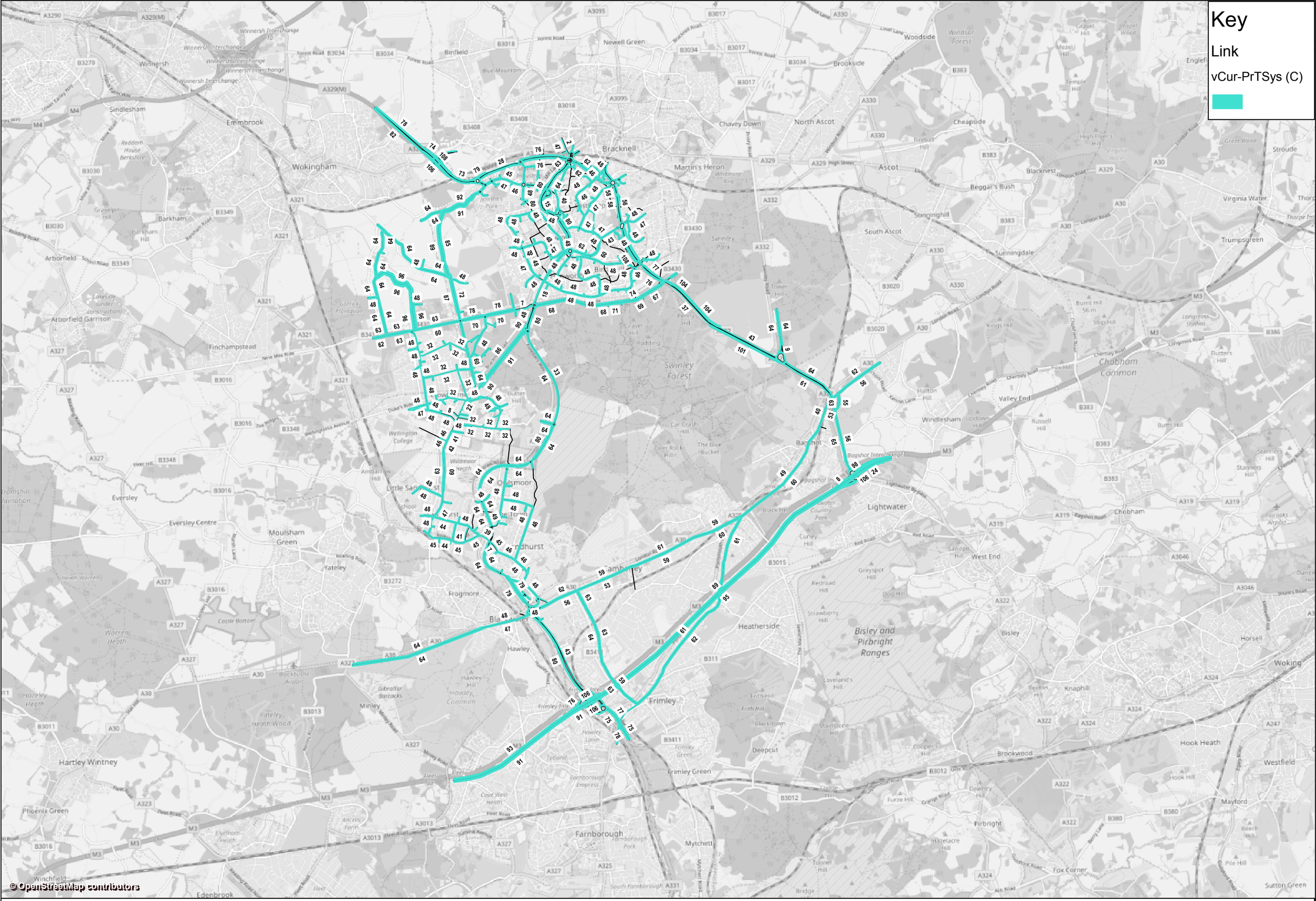
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Chobham Common
Lightwater
Bagshot
Frimley
Farnborough
Camberley
Arborfield Garrison
Finchampstead
Hartley Wintney
Eversley
Yateley
Frogmore
Hawley
Minley
Deepcut
Brookwood
Pirbright
Woking
Chobham
Virginia Water
Trumpsgreen
Hook Heath
Westfield
Mayford
Knaphill
Horsell
Sutton Green
Heatherside
Valley End
Windlesham
Chavey Down
North Ascot
Brookside
Woodside
Cheapside
Beggar's Bush
Blacknest
Martin's Heron
Newell Green
Binfield
Emmbrook
Sindlesham
Winnersh
Barkham
Arborfield
Moulsham Green
Eversley Centre
Little Sandhurst
Wellington College
Swinley Park
Gravel Hill
Pudding Hill
Butter Hill
Hatton Hill
Russell Hill
Kings Hill
Ship Hill
Burnt Hill
Longcross Studios
Flutters Hill
Stanners Hill
Chobham
Fairoaks Airport
West End
Redroad Hill
Greyspot Hill
Strawberry Hill
Dog Hill
Curley Hill
Sandpit Hill
Black Hill
Lightwater Country Park
Bisley
Reldon Hill
Cooper's Hill
Furze Hill
Dawney Hill
Hazelacre Hill
Pirbright
Fox Corner
Tunnel Hill
Mytchett
Frimley Green
Deer Rock Hill
The Blue Bucket
Car Crash Hill
Wildmoor Heath
Ambarrow Hill
Hawley Hill
Hawley Common
Gibraltar Barracks
Blackbushe Airport
Yateley Heath Wood
Heath Warren
Castle Bottom
Hazeley Heath
Edenbrook
Phoenix Green
Eversley
Reddam House Berkshire
Lakeside (under construction)
Jennetts Park
Whitmore Bog
Blue Mountain
Fox Hill
Barkham Hill
Gravelpits Hill
Garrick Plantation
Tower Hill
Penny Hill
Hawley Lane
Totland
Cove West Heath
Farnborough Park
Farnborough Empress
Ancells Farm
Bagshot Interchange
Lightwater By-pass
Frimley Interchange
Blackdown Hill
Frith Hill
Loveland's Hill
Mainstore Hill
Hook Hill
Beech Hill
Pile Hill
Stanners Hill
Great Wood
Chapel Wood
Temple Hill
Fireball Hill
High Flyers Hill
Virginia Water
Thorpe Interchange
Longcross Studios
Chertsey Road
Fox Hill
Valley End
Windlesham
Bagshot
Lightwater
Chobham
Woking
Horsell
Knaphill
Brookwood
Hook Heath
Westfield
Mayford
Sutton Green
Bisley
Heatherside
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Frimley Green
Farnborough
Mytchett
Pirbright
Fox Corner
Hawley
Minley
Hartley Wintney
Phoenix Green
Eversley
Eversley Centre
Moulsham Green
Yateley
Frogmore
Little Sandhurst
Wellington College
Finchampstead
Arborfield Garrison
Arborfield
Barkham
Sindlesham
Emmbrook
Winnersh
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Martin's Heron
Chavey Down
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Brookside
Woodside
Cheapside
Beggar's Bush
Blacknest
Sunninghill
Ascot
Sunningdale
South Ascot
Windsor Forest
Swinley Forest
Bisley and Pirbright Ranges
Chobham Common
Lightwater
Bagshot
Frimley
Farnborough
Camberley
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M4
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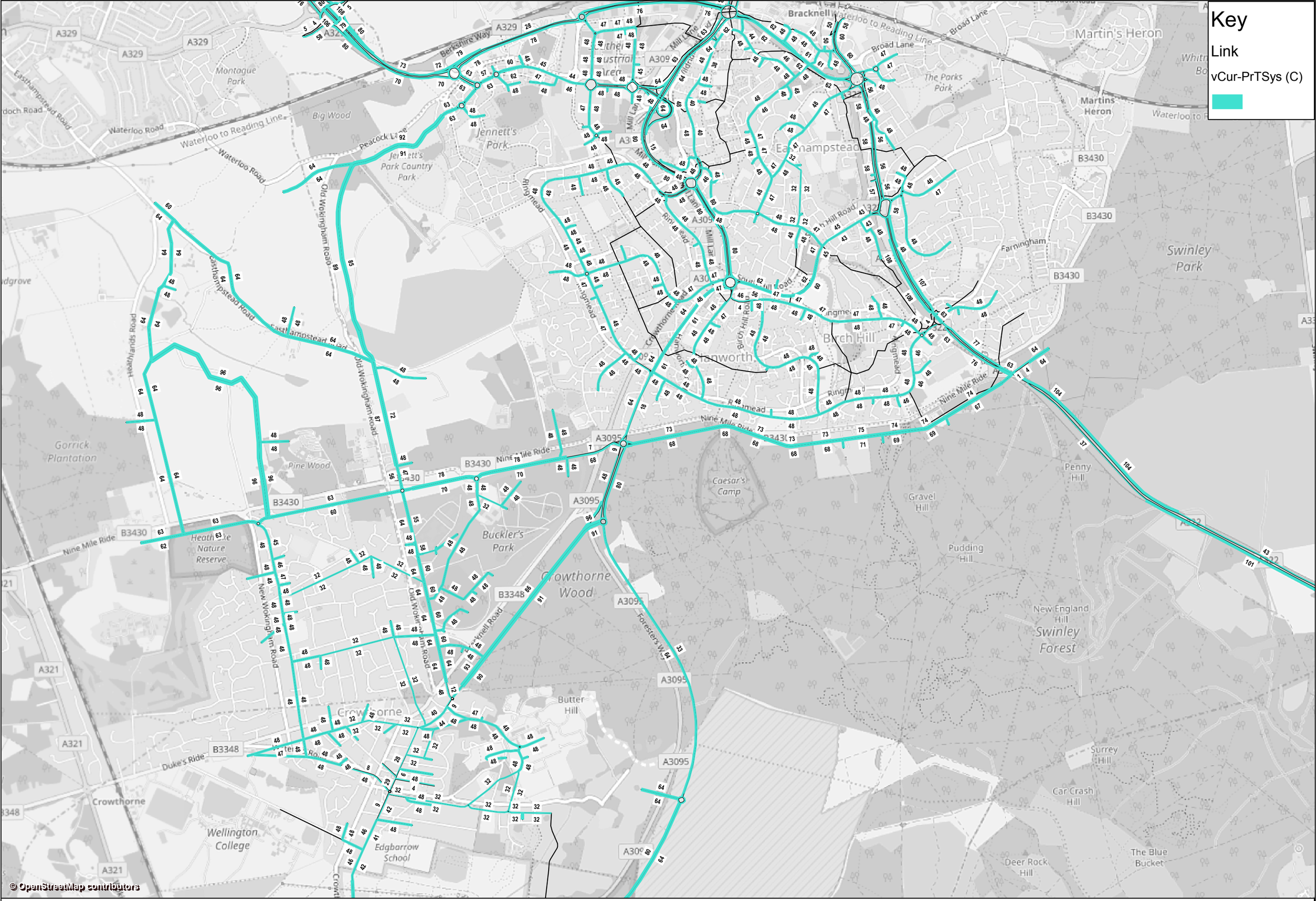
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Appendix E.2

2026: A3095 CORRIDOR

IMPROVEMENTS SPEEDS

Key

Link

vCur-PrTSys (C)

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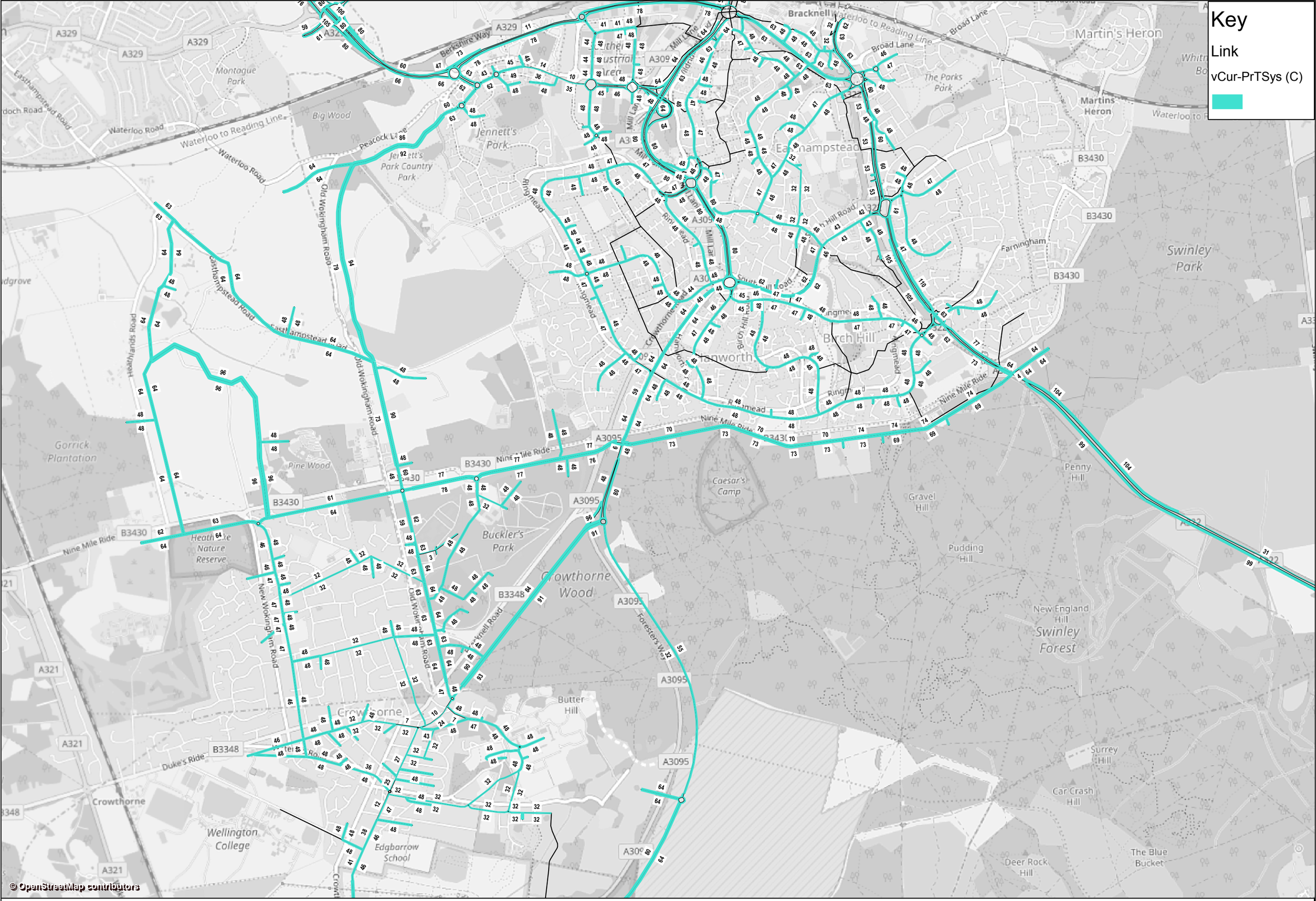
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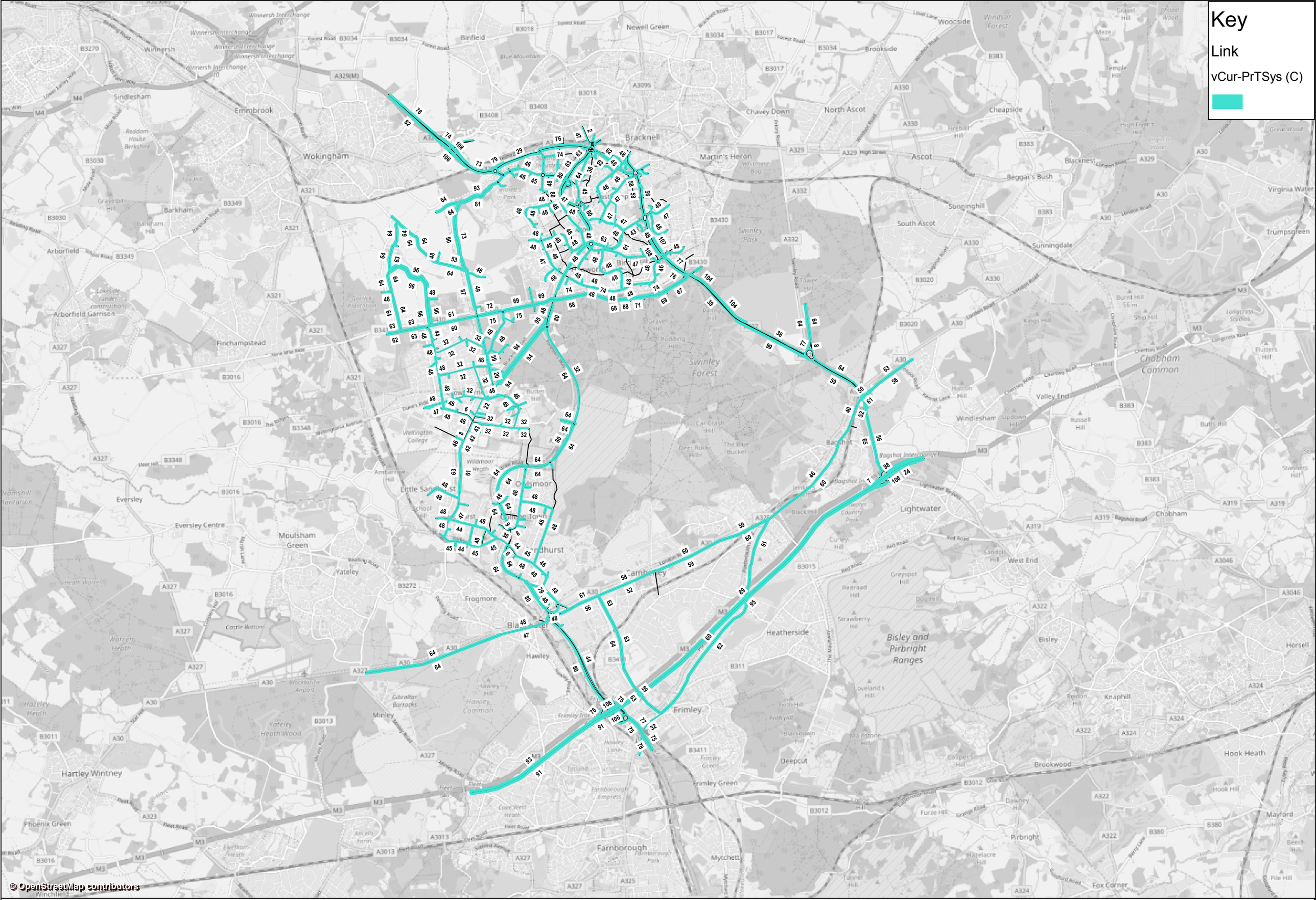

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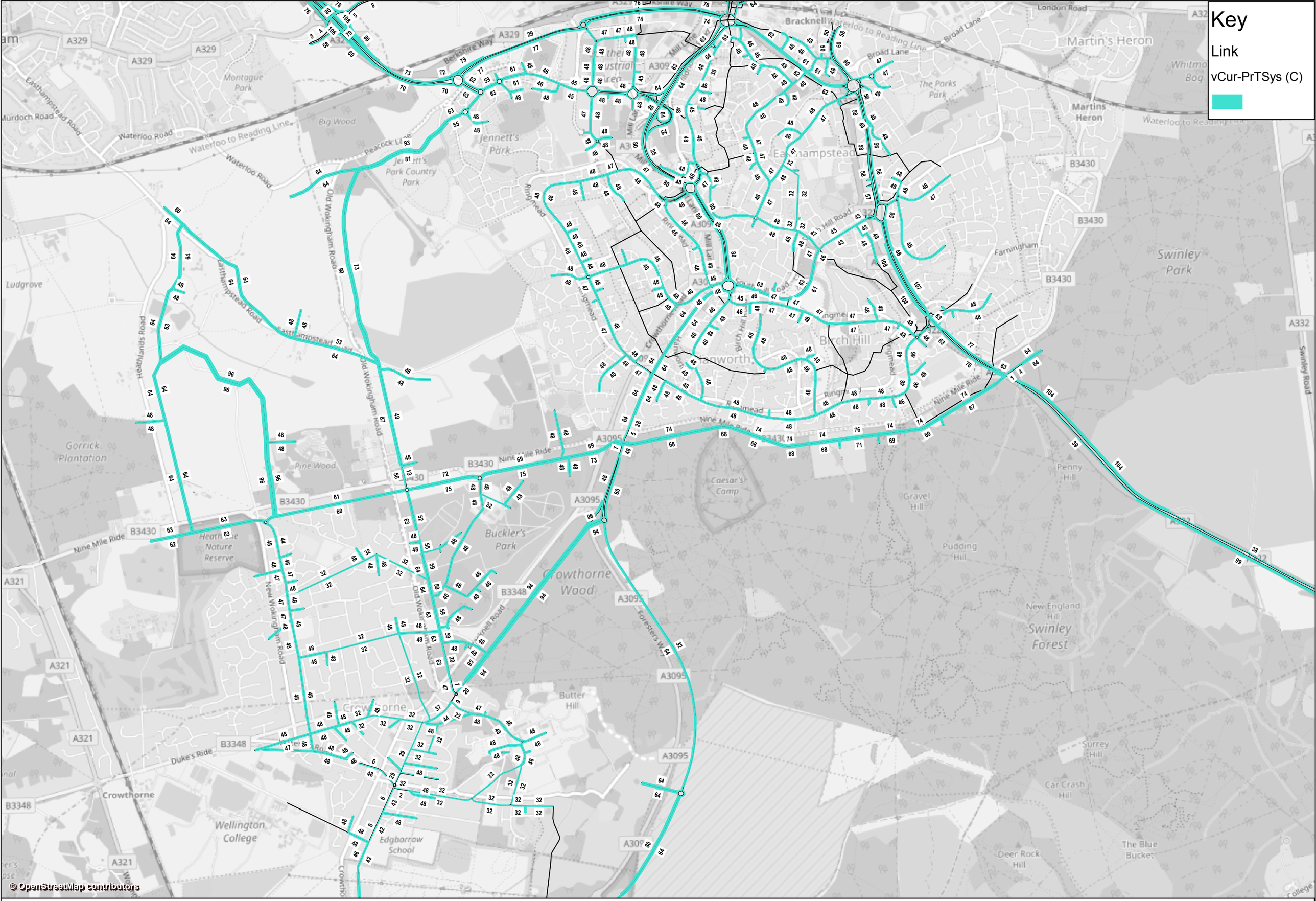


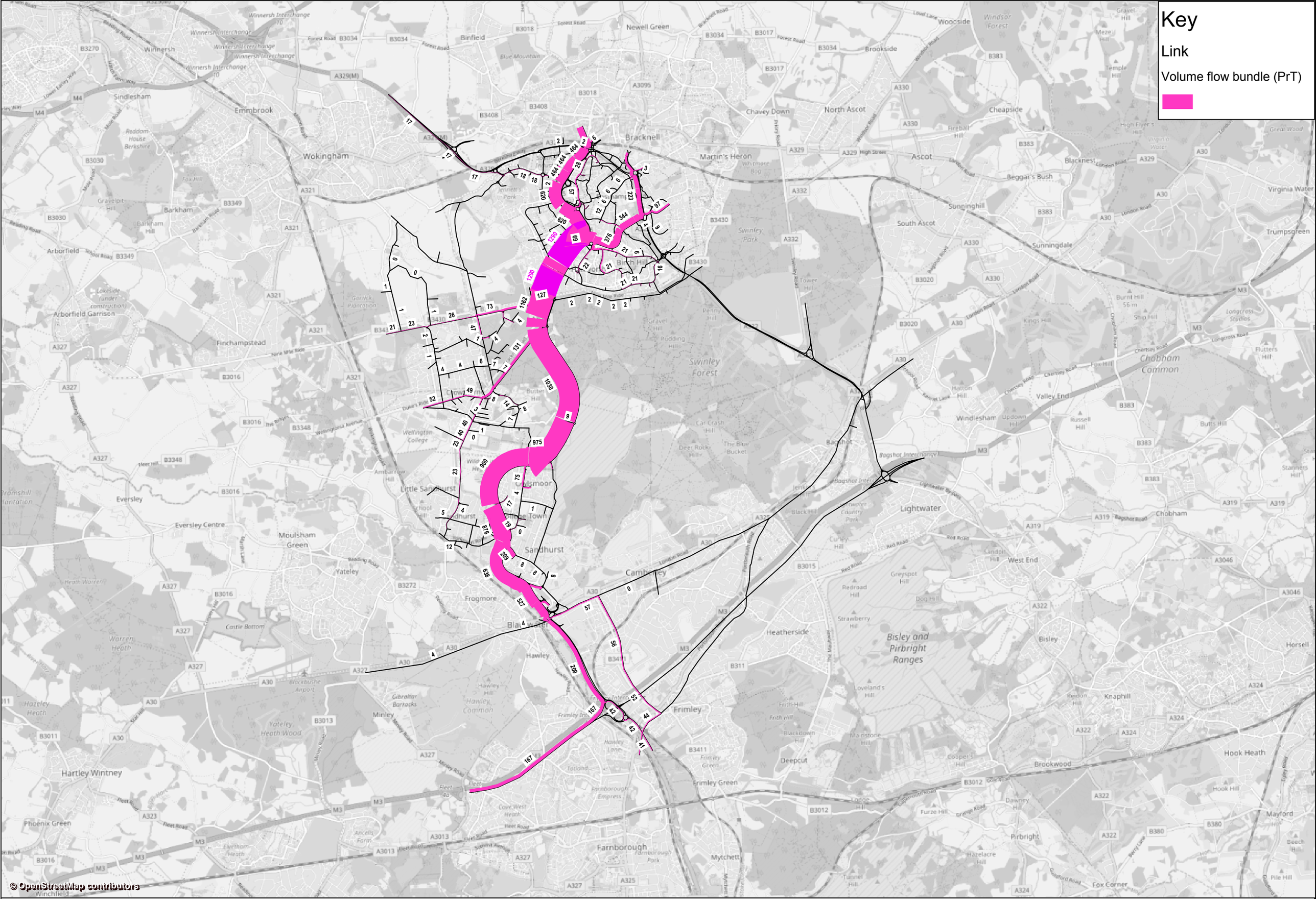
2026 AM Peak Final Forecast v17

Appendix F

2026 FLOW BUNDLES

Appendix F.1

2026: AM PEAK FLOW BUNDLES



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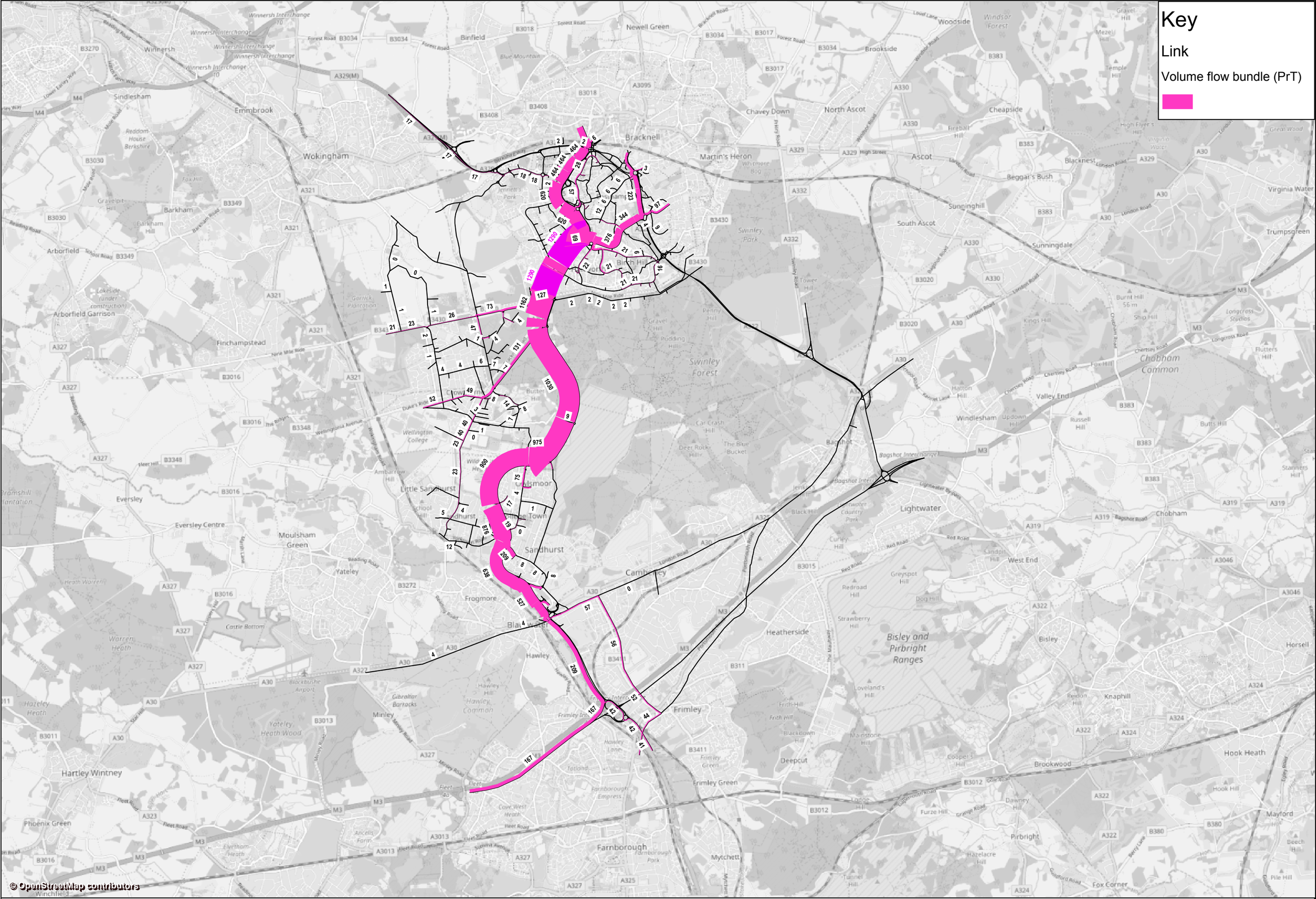

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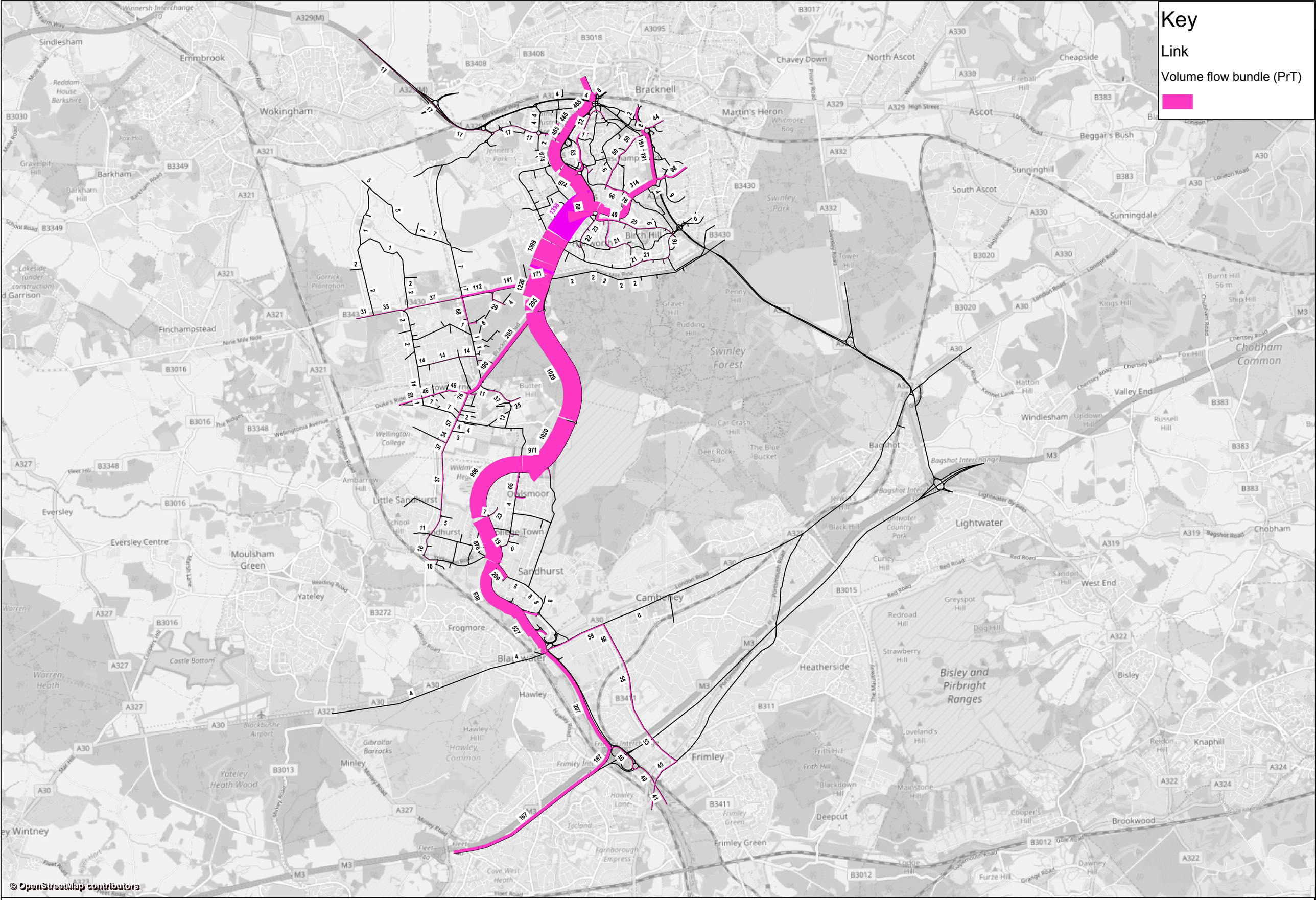

2026 AM Peak Final Forecast v17

2026 AM Peak Final Forecast v17

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Link

Volume flow bundle (PrT)

2026 AM Peak Final Forecast v17

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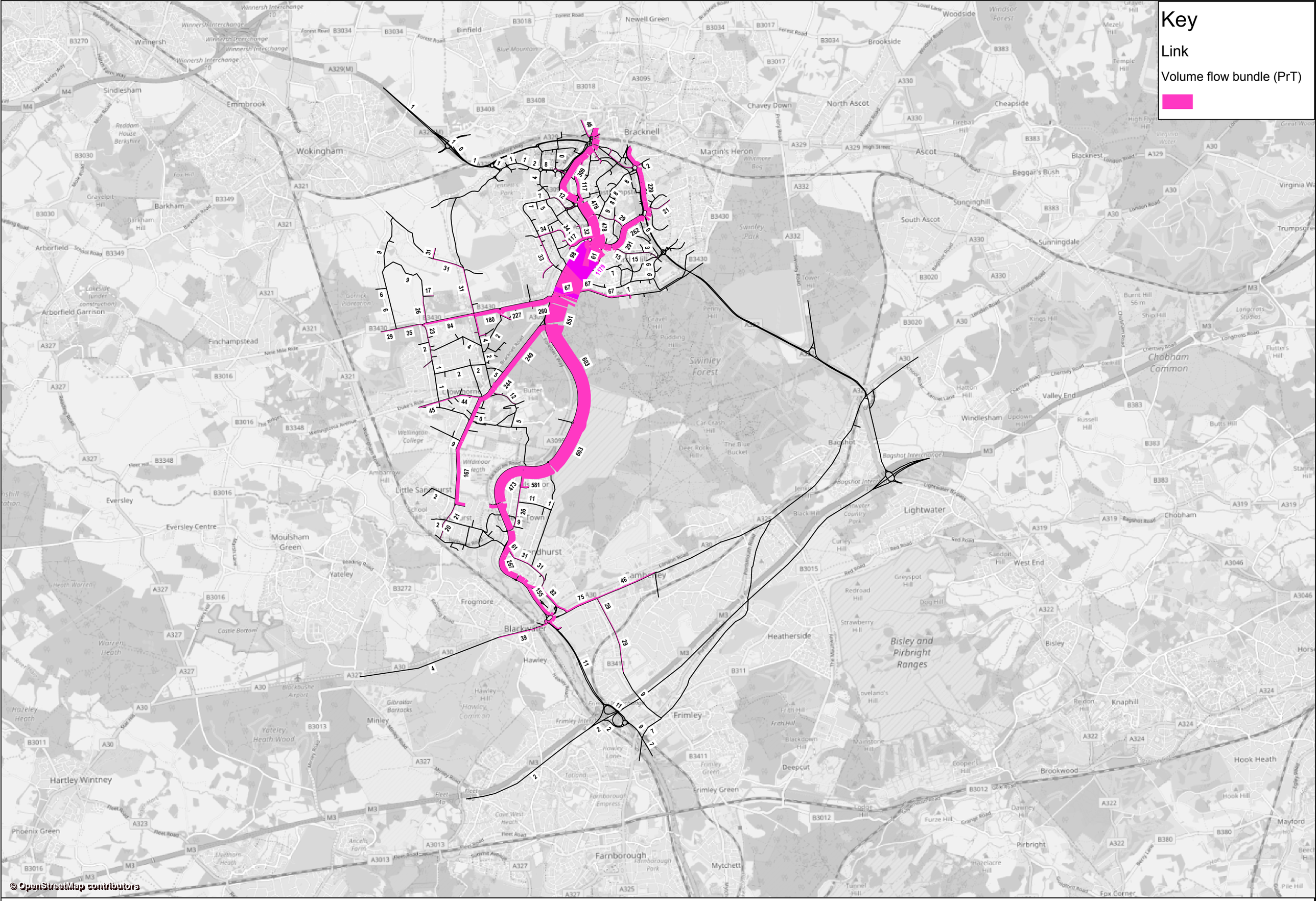
Volume flow bundle (PrT)

2026 AM Peak Final Forecast v17

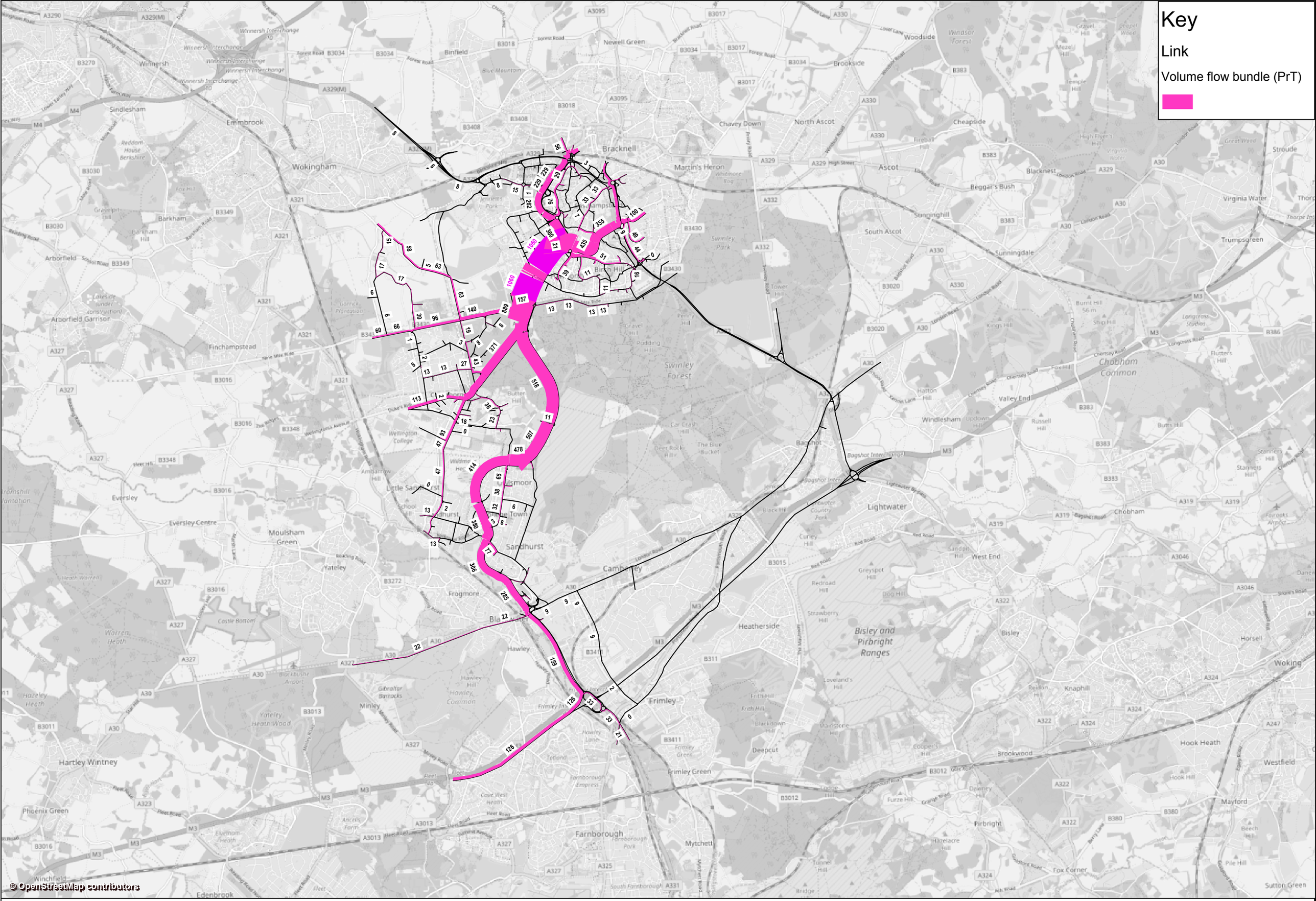


2026 AM Peak Final Forecast v17

2026 AM Peak Final Forecast v17

Appendix F.2

2026: PM PEAK FLOW BUNDLES



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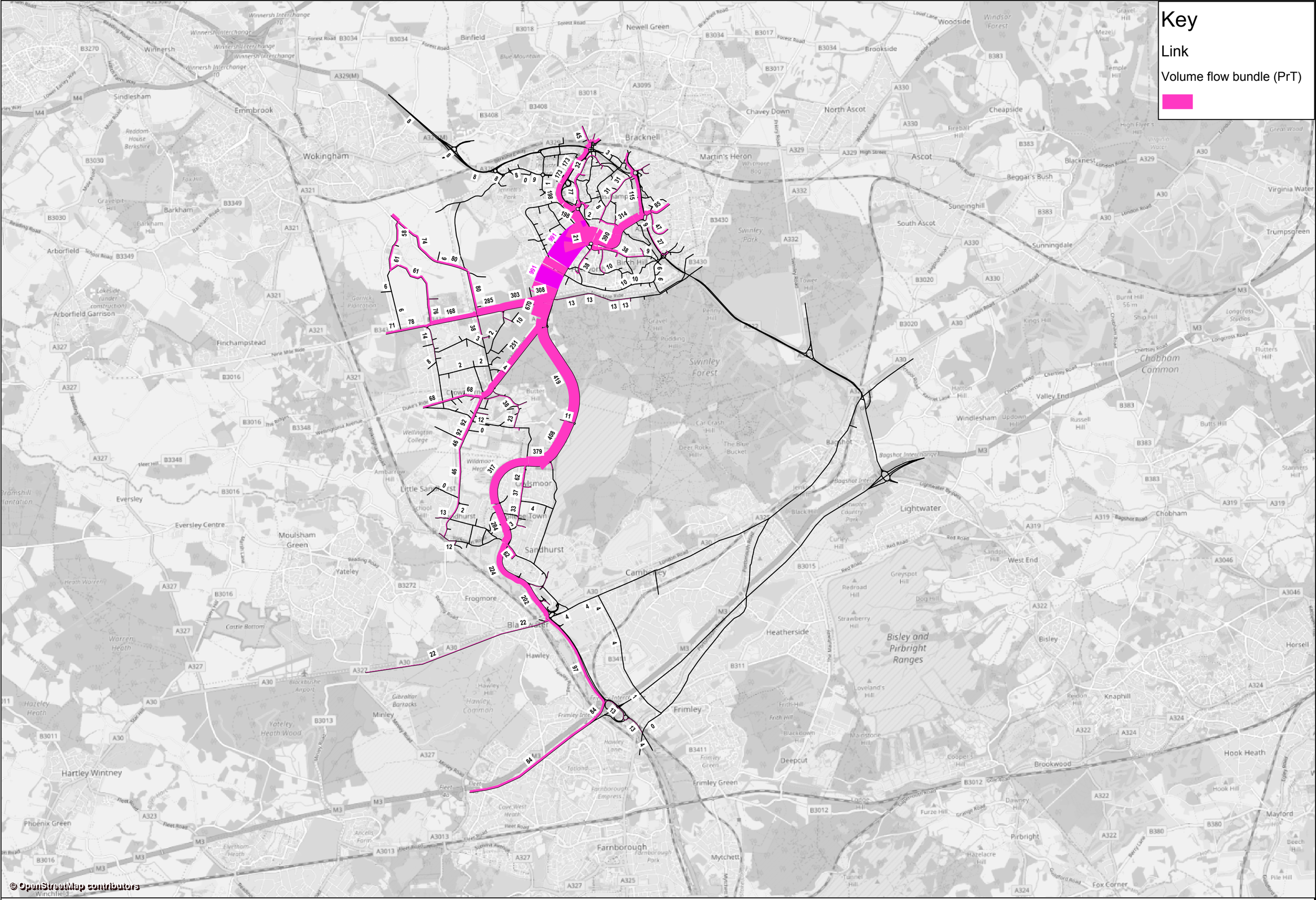

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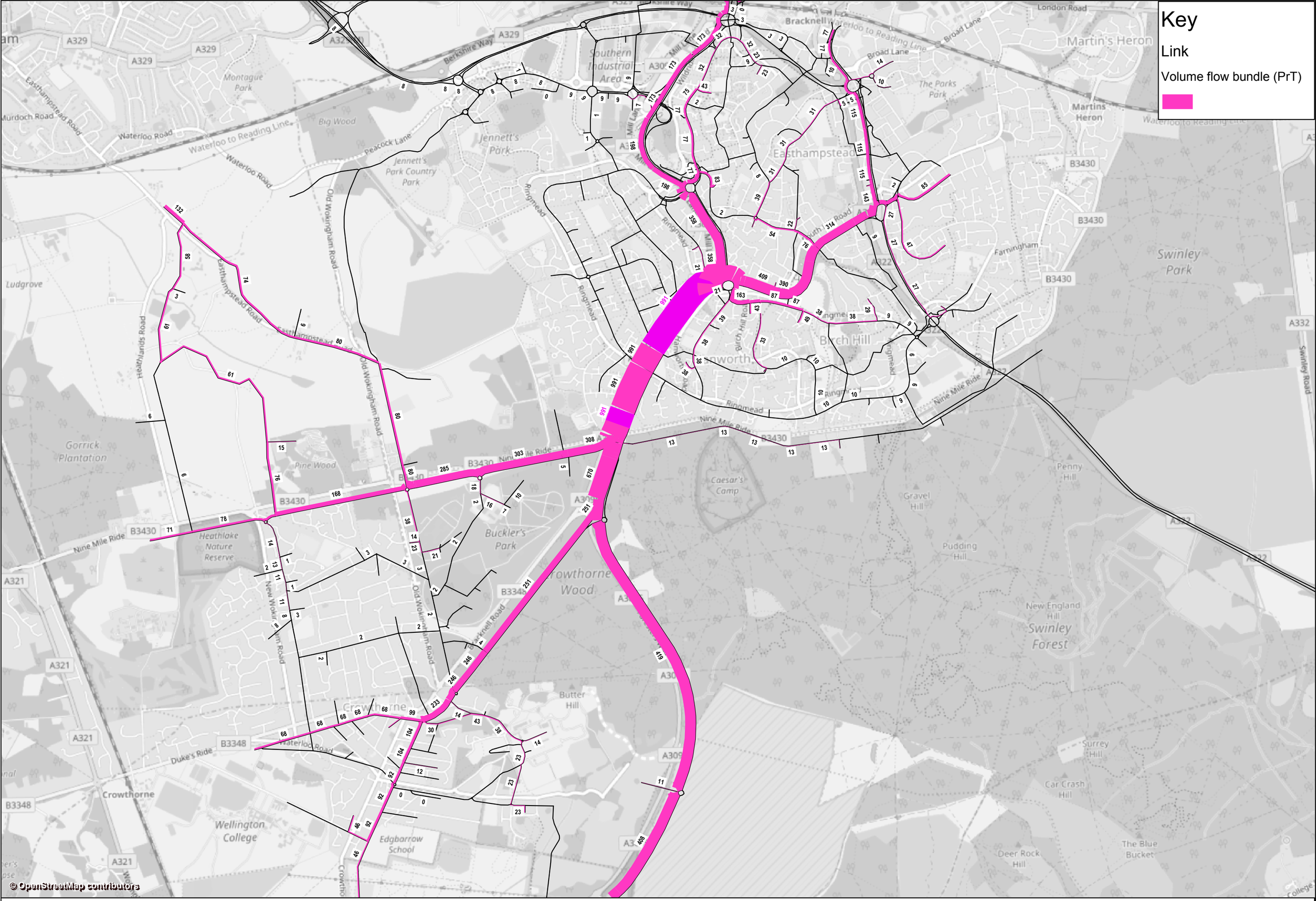

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Volume flow bundle (PrT)

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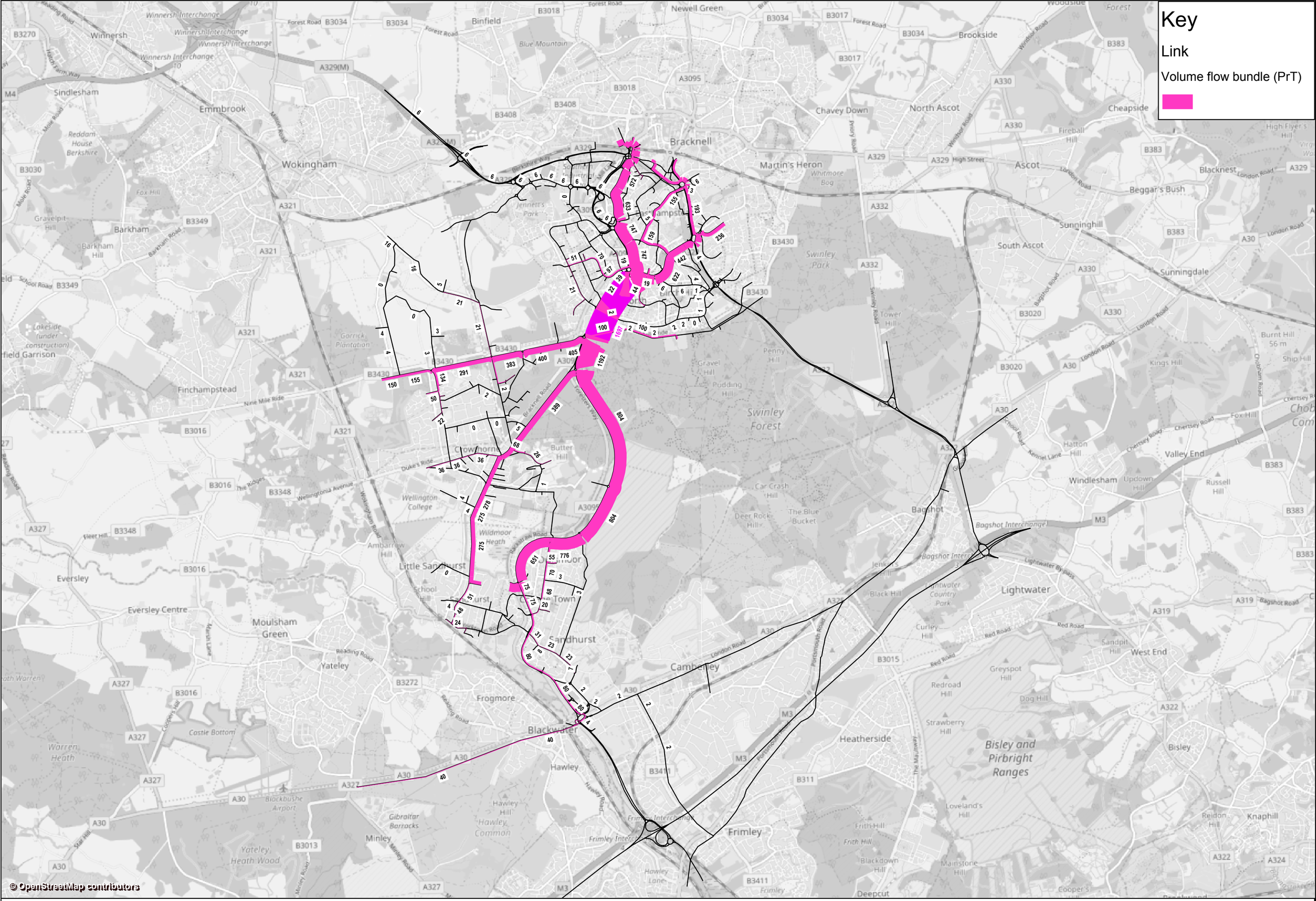
2026 AM Peak Final Forecast v17



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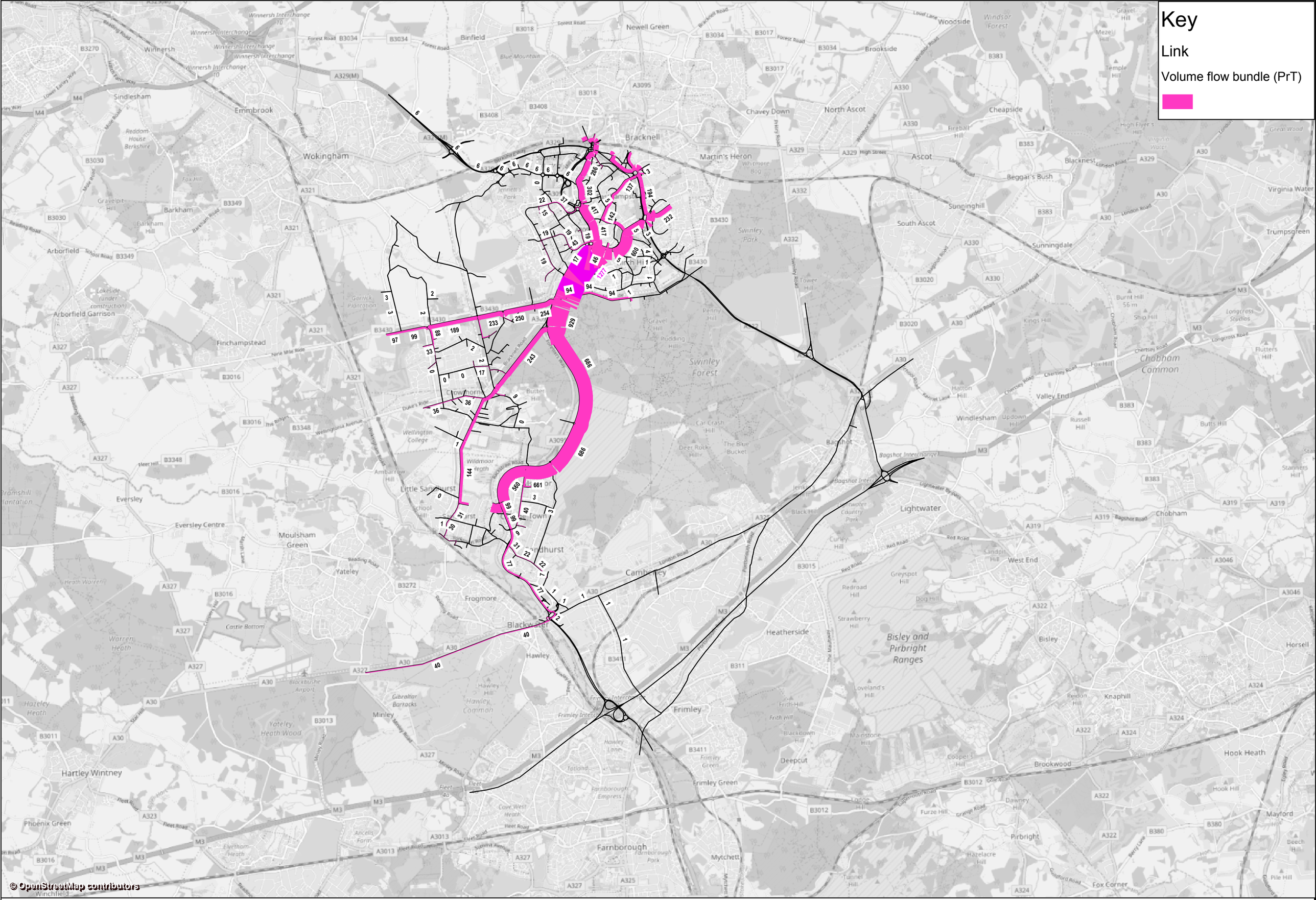

2026 AM Peak Final Forecast v17

2026 AM Peak Final Forecast v17

Appendix G

APPRAISAL SUMMARY TABLE

Appraisal Summary Table

Date produced:	5	7	2018

Contact:	
Name	Stuart Jefferies
Organisation	Bracknell Forest Council
Role	Transport Strategy and Implementation Officer

Name of scheme:	A3095 Corridor Improvements
Description of scheme:	Junction improvements to Hamworth and Golden Retriever Roundabouts as well as a second southbound lane on the A3095 Crowthorne Road.

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	The scheme will provide additional capacity along the corridor and is, therefore, forecast to reduce delays through improved journey times. The additional southbound carriageway, alongside signalisation of the Golden Retriever roundabout, provides particular benefits to southbound movements. Overall speeds are forecast to be improved by the scheme during peak periods.	Value of journey time changes(£): 8.853 Net journey time changes (£) 0 to 2min: 4.641 / 2 to 5min: 4.041 / > 5min: 0.171	High Beneficial	7.025	Neutral
	Reliability impact on Business users	The proposed scheme is anticipated to enhance the reliability of journey times as well, reducing unpredictable variation in journey times; however, insufficeint data is availble to quanitify this benefit.		Medium Beneficial	N/A	
	Regeneration	The scheme will support local development; however, specific regeneration impacts, as defined by WebTAG guidance, will not be realised and therefore no assessment has been carried out to capture these.		Small Beneficial	N/A	
	Wider Impacts	The scheme will have a positive impact on business in terms of business trips, deliveries, and commuting (labour supply); however, specific wider economic impacts, as defined by WebTAG guidance, will not be realised and therefore no assessment has been carried out to capture these.		Small Beneficial	N/A	
Environmental	Noise	The scheme passes through a residential areas although there is approximately 30m of Woodland seperating the road from these area. there will be a benefit on the B4340 between The Golden Retriever pub and South Lodge as a result of the scheme. On the other road links there will be an increase of up to 3.9 dB.		Small Beneficial	N/A	Neutral
	Air Quality	The results show that the introduction of the scheme has a beneficial impact on air quality. There is a monetary benefit of approximately £500k with the number of properties showing an improvement (3,258 properties) being greater than the number of properties showing a deterioration (2748 properties).		Small Beneficial	0.524	Beneficial
	Greenhouse gases	Delay reductions is resulting in vehicles driving more efficiently therefore providing modest greenhouse gas emissions benefits.	Change in non traded carbon over 60y (CO2e): -0.152 Change in traded carbon over 60y (CO2e): 0	Small Beneficial	0.152	
	Landscape	The scheme will have no impact upon Landscape and Townscape due to not being in the vicinity of any significant built environments.		No impact	N/A	
	Townscape	The scheme will have no impact upon any heritage or historic resources as it does not pass through, or nearby, any such sites.		No impact	N/A	
	Historic Environment	It is assumed that this proposed scheme will have no impact upon any heritage or historic resources as it does not pass through, or nearby, any such sites		No impact	N/A	
	Biodiversity	Due to the small scale and localised nature of the A3095 scheme it is not considered that the impacts would extend beyond the footprint of the road construction and its immediate surroundings.		No impact	N/A	
	Water Environment	Whilst incoporating an expansion of highway cpacity, the scheme has been desinged to mitigate all drainage impacts. No diversion of water courses are required.		No impact	N/A	
Social	Commuting and Other users	The scheme will provide additional capacity along the corridor and is, therefore, forecast to reduce delays through improved journey times. The additional southbound carriageway, alongside signalisation of the Golden Retriever roundabout, provides particular benefits to southbound movements. Overall speeds are forecast to improve across the scheme during peak periods.	Value of journey time changes(£): 5.761 Net journey time changes (£) 0 to 2min: 2.436 / 2 to 5min: 3.195 / > 5min: 0.13	High Beneficial	5.760	Neutral
	Reliability impact on Commuting and Other users	The proposed scheme is anticipated to enhance the reliability of journey times as well, reducing unpredictable variation in journey times; however, insufficeint data is availble to quanitify this.		Medium Beneficial	N/A	
	Physical activity	None		No impact	N/A	
	Journey quality	Considering the relatively small changes to the overall highway network this scheme is proposing it is expected to have slight beneficial which will not be monetised.		Small beneficial	N/A	
	Accidents	Accident in COBALT forecasts a small reduction in accidents and casualties over the appraisal period.	Scheme savings: Fatal = 0.0, Serious = 1.0, Slight = 38	Small	1.021	Neutral
	Security	None		No impact	N/A	N/A
	Access to services	None		No impact	N/A	N/A
	Affordability	None		No impact	N/A	N/A
	Severance	Whilst the scheme wil result in increased vehicle flows, it also incorporates signalisation of junctions, so the overall impact on pedestrians should be neutral. There are also some existing pedestrian underpasses of the road that will be unaffected by the scheme.		No impact	N/A	N/A
	Option and non-use values	None		No impact	N/A	
Public Accounts	Cost to Broad Transport Budget	Scheme costs total £8.045m, including allowance for 20% traffic management costs, 15% for preliminaries, and 20% for contingency / risk. They have been adjusted for real costs inflation as well optimism bias at 30% and for input into the cost benefit analysis they have been discounted to 2010 prices			4.906	
	Indirect Tax Revenues	The loss of indirect tax revenues as a result of road users making more efficient journeys is forecast as £0.311m over the 60 year appraisal period			-0.311	

Appendix H

SCHEME ECONOMICS

Appendix H.1

TRANSPORT ECONOMIC EFFICIENCY (TEE)

Economic Efficiency of the Transport System (TEE) - A3095 Corridor Improvements: Core scenario

Non-business: Commuting	**ALL MODES**	**ROAD**		**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**	**Private Cars and LGVs**		**Passengers**	**Passengers**	
Travel time	3802	3802		0	0	
Vehicle operating costs	148	148				
User charges	0	0		0	0	
During Construction & Maintenance	0	0		0	0	
COMMUTING	3950	3950		0	0	
Non-business: Other	**ALL MODES**	**ROAD**		**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**	**Private Cars and LGVs**		**Passengers**	**Passengers**	
Travel time	1782	1782		0	0	
Vehicle operating costs	27	27				
User charges	0	0		0	0	
During Construction & Maintenance	0	0		0	0	
NET NON-BUSINESS BENEFITS: OTHER	1809	1809		0	0	
Business						
User benefits		**Road (Personal)**	**Road (Freight)**	**Passengers**	**Freight**	**Passengers**
Travel time	8217	7120	1097	0	0	0
Vehicle operating costs	635	261	374			
User charges	0	0	0	0	0	0
During Construction & Maintenance	0	0	0	0	0	0
Subtotal	8852	7381	1471	0	0	0
Private sector provider impacts					**Freight**	**Passengers**
Revenue	0				0	0
Operating costs	0				0	0
Investment costs	0				0	0
Grant/subsidy	0				0	0
Subtotal	0				0	0
Other business impacts						
Developer contributions	-1827					
NET BUSINESS IMPACT	8852					
TOTAL						
Present Value of Transport Economic Efficiency Benefits (TEE)	12784					

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

Appendix H.2

PUBLIC ACCOUNTS (PA)

Public Accounts (PA) Table - A3095 Corridor Improvements: Core scenario

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	0		0			0
Operating Costs	0		0			0
Investment Costs	0		0			0
Developer and Other Contributions	0		0	0	0	0
Grant/Subsidy Payments	0		0	0	0	0
NET IMPACT	0	*(7)*	0	0	0	0
Central Government Funding: Transport						
Revenue	0		0			0
Operating costs	0		0			0
Investment Costs	6733		6733			0
Developer and Other Contributions	-1827		-1827	0	0	0
Grant/Subsidy Payments	0		0	0	0	0
NET IMPACT	4906	*(8)*	4906	0	0	0
Central Government Funding: Non-Transport						
Indirect Tax Revenues	311	*(9)*	311	0	0	0
TOTALS						
Broad Transport Budget	4906	*(10) = (7) + (8)*				
Wider Public Finances	311	*(11) = (9)*				

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

Appendix H.3

ANALYSIS OF MONETISED COSTS AND BENEFITS (AMCB)

Analysis of Monetised Costs and Benefits: A3095 Corridor Improvements: Core scenario

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases	152	*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents	1021	*(17)*
Economic Efficiency: Consumer Users (Commuting)	3950	*(1a)*
Economic Efficiency: Consumer Users (Other)	1810	*(1b)*
Economic Efficiency: Business Users and Providers	7025	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	311	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	13647	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	4906	*(10)*
Present Value of Costs (see notes) (PVC)	4906	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	8741	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	2.78	BCR=PVB/PVC

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

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