Hertfordshire County Council and St Albans District Council

St Albans Local Plan

Traffic Modelling Report

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Hertfordshire County Council and St Albans District Council

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Executive summary

This report presents the results of the transport modelling work undertaken by WSP to assess the impact of the St Albans District Council (SADC) Local Plan proposals on the highway network. The assessment used the Countywide Model of Transport (COMET) which covers the entire county of Hertfordshire and surrounding areas. The COMET model comprises a highway assignment model, a public transport model and a variable demand model. The base year of the model is 2014 and the future year is 2041, which reflects the end year of the Local Plan period.

The main objectives of the modelling work were to:

Review the performance of the base year model in the St Albans district and the Strategic Road Network (SRN) and make improvements where necessary;
Develop a range of future year scenarios to test the impact of the Local Plan allocations and associated infrastructure improvements;
Provide evidence of the impacts that the Local Plan sites could have on the existing highway network and junctions;

The following sections summarise the key findings of the modelling work for each scenario and the main conclusions and recommendations.

Introduction

The introduction chapter provides an overview of the COMET model, the scenarios developed, the Local Plan allocations, the purpose and structure of the report. The scenarios are as follows:

Option 0: This reflects completed or committed developments and transport schemes across Hertfordshire over the period 2014-2041. This scenario is constrained to the growth in households and jobs within the Department for Transport (DfT) National Trip End Model (NTEM) for all districts in Hertfordshire except St Albans;
Option 1: This builds on Option 0 by including the SADC Local Plan allocations;
Option 2: This builds on Option 1 by including the transport infrastructure schemes set out in the SADC Infrastructure Delivery Plan (IDP) and also including a 10% mode shift away from car across SADC;
Option 3: This is an alternative to Option 2 which also reflects the IDP schemes but takes a more nuanced approach to mode shift with different levels applied in different areas of the district based on the type of people who live there and the type of journeys they make.

Key Findings

The key findings of the modelling work are as follows:

The base year model review identified some areas of improvement in the St Albans district and the SRN, which were addressed by making network and matrix adjustments. The improved base year model was used as a robust basis for the forecasting work;
The Option 0 scenario showed significant increases in traffic flow and congestion on the SRN and the local network in St Albans between 2014 and 2041, as a result of the predicted future year growth in traffic and the completed and committed developments;
The Option 1 scenario showed further increases in traffic flow and congestion due to the Local Plan allocations, especially around the East Hemel Hempstead site which is the largest development in the district. The development traffic also affected the M1, M25 and A414 corridors and some local roads;
The Option 2 scenario showed some improvements in traffic flow and congestion due to the IDP schemes and the 10% mode shift assumption. The IDP schemes reduced delays at some key junctions such as A414 Breakspear Way/Green Lane and A414 Park Street. The mode shift assumption reduced car trips within the district;
The Option 3 scenario showed similar results to Option 2, but with a slightly higher reduction in car trips due to the Opportunity to Shift Modes (OSM) tool, which estimated the potential for mode shift based on journey distance, the availability of alternative modes and the propensity of residents to walk, cycle or use public transport in St Albans.

Base Model Review

The base model review chapter provides details of the checks and improvements made to the base year model in the St Albans district and the SRN. The review included the following tasks:

Review of the network coverage;
Review of the traffic flow performance between 2014 observed and modelled data;
Review of the journey time performance between 2014 and modelled data;
Comparison of observed traffic flows between 2014 and 2023;
Comparison of 2014 modelled traffic flow and 2023 observed traffic flows;
Comparison of 2014 link delays against 2024 google map typical traffic on key routes.

The review identified some areas of improvement in the AM peak model, which were addressed by making network coding and undertaking matrix estimation. The IP and PM peak models were close to meeting the DfT Transport Analysis Guidance (TAG) criteria and were updated with the AM peak changes to ensure consistency in between the networks. The review also indicated that traffic flow has reduced between 2014 and 2023 predominantly in the AM and PM peak hours, which provides a robust basis for forecasting as 2014 flows are higher than 2023.

Future Year Scenarios

The future year scenarios chapter provides an overview of the scenarios developed for the forecasting work, including the future year of 2041, the time periods of AM and PM peak, and the scenario definitions of Option 0 to Option 3.

COMET Model Forecast Methodology

The COMET model forecast methodology chapter describes the forecasting approach for the highway and public transport models, including the variable demand model, the model structure, the COMET trip end model, and the generalised cost parameters. The forecast trip matrix is an estimation of future trips based on available population and employment data for Hertfordshire and growth assumptions for the rest of Great Britain from the most recent version of the DfT NTEM. The COMET trip end model is used to forecast future trip ends for each model zone, which are used to build a reference matrix for the forecast year. The reference matrix is then adjusted based on the forecast highway and public transport assignments through the variable demand model, which takes into account the changes in transport infrastructure, travel times and costs in future years.

2041 Option 0 Assumptions

The 2041 Option 0 assumptions chapter provides details of the assumptions used to develop the Option 0 scenario, which represents the completed or committed developments and transport schemes across Hertfordshire over the period 2014-2041. The chapter covers the following aspects:

Planning data for Hertfordshire, including the processing of the data, the calculation of the number of jobs from the floorspace for employment data, the allocation of the sites to model zones, the constraining of the data to NTEM, and the summary of the data by district;
Planning data for outside Hertfordshire, which is assumed to align with NTEM values;
Goods vehicle demand, which is uplifted based on the DfT National Road Traffic Projections 2022 (NRTP22);
Transport infrastructure, which is based on the existing COMET 7 NTEM network as a starting point and includes additional schemes in St Albans and Dacorum districts due to their improved certainty status since the COMET 7 update in 2022;
Base year network adjustment, which reflects the network coding changes made as a result of the base year model review.

2041 Option 1 Assumptions

The 2041 Option 1 assumptions chapter provides details of the assumptions used to develop the Option 1 scenario, which builds on Option 0 and includes the SADC Local Plan allocations. The chapter covers the following aspects:

Planning data for St Albans, including the list of the Local Plan allocations, the number of dwellings and jobs, the allocation of the sites to model zones, and the location of the sites;
Transport infrastructure, which remains broadly the same as Option 0 except for the new connections from the development sites to the highway network;
Zone connectors, which represent the access points for the largest Local Plan sites;
Trip generation adjustment, which uplifts the highway trip generation for the key Local Plan sites based on generic or site-specific trip rates provided by HCC.

2041 Option 2 Assumptions

The 2041 Option 2 assumptions chapter provides details of the assumptions used to develop the Option 2 scenario, which builds on Option 1 by including the transport infrastructure schemes set out in the SADC IDP and also including a 10% mode shift away from car across SADC. The chapter covers the following aspects:

Transport infrastructure schemes, which include a number of highway and public transport schemes based on the infrastructure proposals developed as part of the SADC IDP;
Traffic signal optimisation, which adjusts the signal timings at some key junctions where high increases in delay were forecast between Option 1 and 2;
Modal shift, which assumes a 10% shift away from car for all model zones within the SADC district, reflecting the impact of measures that cannot be directly modelled such as new walking and cycling infrastructure, improved travel information, bike hire schemes, car share schemes, promotional activities and travel planning.

2041 Option 3 Assumptions

The 2041 Option 3 assumptions chapter provides details of the assumptions used to develop the Option 3 scenario, which is an alternative to Option 2 which also reflects the IDP schemes but takes a more nuanced approach to mode shift with different levels applied in different areas of the district based on the type of people who live there and the type of journeys they make. The chapter covers the following aspects:

Alternative mode shift assumptions, which are derived from the WSP Opportunity to Shift Modes (OSM) tool, which estimates the potential for mode shift based on journey distance, the availability of alternative modes and the propensity of residents to walk, cycle or use public transport in St Albans.

Results

The results chapter provides a summary of the main findings and recommendations of the modelling work, as follows:

The Option 0 scenario showed that there will be significant increases in traffic flow and congestion on the SRN and the local network in St Albans between 2014 and 2041, as a result of the predicted future year growth in traffic and the completed and committed developments;
The Option 1 scenario showed that the SADC Local Plan allocations will have further impacts on the existing highway network and junctions, especially around the East Hemel Hempstead site which is the largest development in the district. The development traffic also affected the M1, M25 and A414 corridors and some local roads;
The Option 2 scenario showed that the IDP schemes and the 10% mode shift assumption will provide some reductions in traffic flow and congestion, however some delays do remain. The IDP schemes reduces delays at some key junctions such as A414 Breakspear Way/Green Lane and A414 Park Street.
The Option 3 scenario showed similar results to Option 2, but with a more nuanced approach to car trip reductions using the OSM tool.

Conclusions

Overall, this report has presented the results of the base year and four 2041 future year scenarios Option 0 to 3. These are explained below:

- **2014 Base Year**
- **2041 Option 0**
  - All committed and consented developments and transport schemes
- **2041 Option 1**
  - Option 0 plus the SADC Local Plan allocations
- **2041 Option 2**
  - Option 1 plus the SADC Infrastructure Delivery Plan (IDP) schemes and 10% mode shift
- **2041 Option 3**
  - Option 1 plus the SADC IDP schemes and Opportunity to Shift Mode Tool impacts

In summary as a result of background growth in vehicles and committed developments these are the impacts which occur acros St Albans district:

- **Option 0,** in SAD there is an increase in vehicles of between 13%-18% in the peak hours which results in an average speed reduction of around 10% in the peak hours.
- **Option 1**, the number of vehicles increases by a further 8% and average speeds reduce by 6%-7%.
- **Option 2,** compared to Option 1 across SAD there is a reduction of around 4% of vehicles and increases in speeds of between 5%-7% in the peak hours.
- **Option 3**, compared to Option 1, across SAD there is a reduction of around 4% of vehicles and increases in speeds of between 6%-7% in the peak hours

It is clear from the results that as part of the Local Plan growth improvements in infrastructure and modal shift are required to mitigate against the impact of the proposed developments to ensure the highway network operates effectively. Overall, in Option 2 and 3 the highway network operates satisfactory however there are parts of the highway network which experience increases in delays, on links and junctions, of over 2 minutes in Option 2 and 3 compared to Option 1. However, it is envisaged that these impacts could be mitigated against subject to further investigation.

In general journey times across SAD increase between Base year, Option 0 and Option 1, with reductions in Option 2 and 3 compared to Option 1. However, there are some journey times where there are increases in Option 2 and 3 and further investigation could be considered alongside potential mitigation measures to look to reduce delays.

There are critical pieces of infrastructure that are needed to support key developments, such as the A414/ Green Lane junction improvement close to the East Hemel site. These are needed to improve congestion and delays and to prevent traffic diverting to less suitable roads in the area. It is also necessary to close some minor roads to through traffic in the East Hemel and north of St Albans area to prevent unsuitable volumes of traffic using narrow minor roads such as Punchbowl Lane, Hogg End Lane, Sandridgebury Lane and Valley Road.

There are increases in traffic flow on the Strategic Road Network as a result of the Local Plan proposals. The key percentage increases which occur are on slip roads to access the SRN whereas percentages increases on the main carriage way remain within -/+ 10%. There are increases in delay at some access points onto the SRN further investigation could be considered alongside potential mitigation measures to look to reduce delays.

1 Introduction

1.1 Overview

1.1.1. WSP were commissioned by St Albans District Council (SADC) to undertake transport modelling work to assess the impact of SADC's Local Plan proposals. The assessment of the local plan allocations and associated infrastructure improvements will provide SADC, Hertfordshire County Council (HCC) and National Highways (NH) with evidence of the impacts that the Regulation 19 Local Plan sites could have on the existing highway network and junctions.

1.1.2. The Countywide Model of Transport (COMET) transport model was used as a basis of the SADC Local Plan assessment. COMET is developed in the transport modelling software EMME and SATURN. WSP have undertaken the assessment of the Local Plan for both the AM (8:00-9:00) and PM (17:00-18:00) peak using a 2041 forecast year. Four scenarios have been developed to determine the impact of the Local Plan sites, the proposed infrastructure improvements and potential mode shift away from car which could occur.

1.1.3. This report provides details of the COMET model, the forecast scenarios developed, the methodology adopted and assumptions alongside the results of the scenarios.

1.2 Background to COMET Model

1.2.1. HCC own and maintain the COMET transport model, comprising a highway assignment model built in SATURN and public transport and Variable Demand Model (VDM) in EMME. The latest version of COMET which was used for the basis of this work has a base year of 2014. An updated COMET model with a base year of 2023 is currently being developed but still under construction at the time this work was undertaken.

1.2.2. COMET provides a multi-purpose transport modelling tool to test a range of potential transport schemes and policies including:

Highway scheme appraisals
Inputs for transport business cases and funding applications
Inputs for environmental appraisal
Local plan/ core strategy assessments
Development impact assessments

1.2.3. COMET covers the entire county of Hertfordshire and surrounding area to varying degrees of detail, as shown in Figure 1-1. The area of detailed modelling, where all junctions are simulated, (within the green boundary line) includes all roads with significant traffic volumes and all realistic route choices. Outside of Hertfordshire, the rest of the fully modelled area encompasses a reduced level of detail, with principal strategic routes modelled and capacity restraint achieved using speed flow curves.

1.2.4. The external area includes a simplified network allowing traffic to enter the fully modelled area at the correct location without capacity restraint. It includes a skeleton network with approximate distances to allow the demand model to capture the full trip length.

1.2.5. This work has used COMET version 7.1 which aligns with Department for Transport (DfT) National Trip End Mode (NTEM) 8[1] and the most recent Transport Analysis Guidance (TAG) data book.[2]

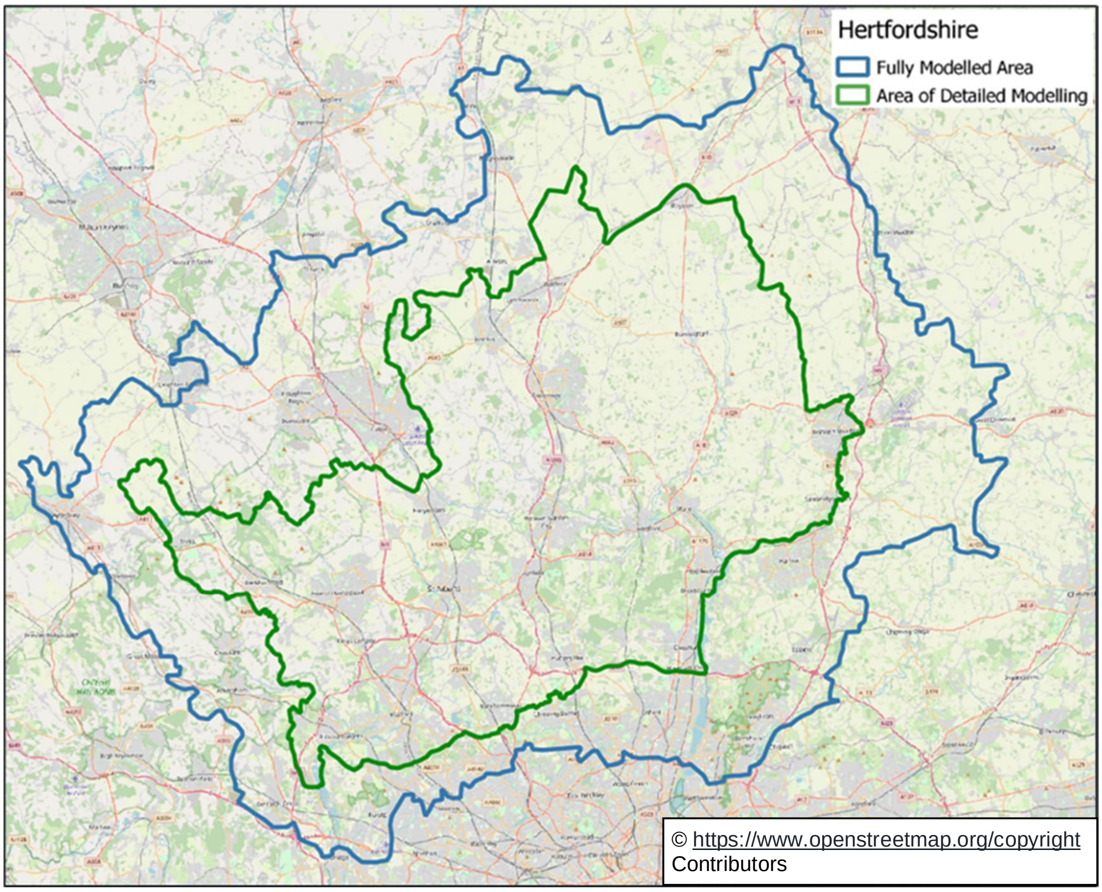

Figure 1-1: COMET Model Extent

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[1] The National Trip End Model (NTEM) model forecasts the growth in trip origin-destinations (or productions-attractions) up to 2051 for use in transport modelling. The forecasts take into account national projections of:

- population
- employment
- housing
- car ownership
- trip rates

[2] The TAG data book provides all of the appraisal and modelling values referred to in TAG guidance. The data book features historical information and factual reference information about the appraisal and modelling values.

1.3 Scenarios

1.3.1. A range of transport modelling scenarios have been used and generated for the purpose of assessing the SADC Local Plan, this includes the following:

- **2014 Base Year**
- **2041 Option 0**
  - All committed and consented developments and transport schemes
- **2041 Option 1**
  - Option 0 plus the SADC Local Plan allocations
- **2041 Option 2**
  - Option 1 plus the SADC Infrastructure Delivery Plan (IDP) schemes and 10% mode shift3
- **2041 Option 3**
  - Option 1 plus the SADC IDP schemes and Opportunity to Shift Mode Tool impacts

1.3.2. Further details of the assumptions relating to these scenarios can be found in Chapters 2 for the base year, Chapter 3 for an overview of the scenarios and Chapters 5 to 8 of all the assumptions used to develop Option 0 to 3.

1.4 St Albans Local Plan Allocations

1.4.1. In total the Local Plan allocates 14,417 new houses and is expected to deliver 9,589 jobs through employment allocations over the plan period between 2014-41. This includes numerous smaller allocations and windfall development across the district, as well as a number of key sites which provide a larger concentration of development, as listed in Table 1-1 and illustrated in Figure 1-2.

1.4.2. The key sites in Table 1-1, except B7 and B8, have been treated separately within the transport modelling, and for these sites it is possible to isolate vehicle trips within the model and examine their trip generation and distribution patterns.

1.4.3. It is important to note that the East Hemel Hempstead site allocation is part of the broader Hemel Garden Community growth area which also includes sites within Dacorum Borough Council. For this assessment in agreement with SADC and HCC only the St Albans portion of the development has been included in the assessment. It is noted that 8,000 is a worse case and latest predictions are around 6,000 jobs.

[3] 10% mode shift applied to internal journeys within St Albans district and trips to and from it as a proxy to allow for the impact of measures such as travel planning, off road cycle infrastructure and other measures that can't be directly modelled.

Table 1-1: Key Local Plan Sites

Development Name	Planning Ref	Households	Jobs
East Hemel Hempstead South	H4	2,165	0
East Hemel Hempstead North	H2	1,335	0
North St Albans	B1	996	0
West of London Colney	B6	405	0
North East Harpenden	B2	762	0
East St Albans	B4	522	0
North Hemel Hempstead	H1	1,250	0
Glinwell, Hatfield Road, St Albans	B5	436	0
West Redbourn, Redbourn	B3	593	0
North West Harpenden	B7	293	69
Harper Lane	B8	274	0
East Hemel Hempstead (Central)	H3	0	8,000

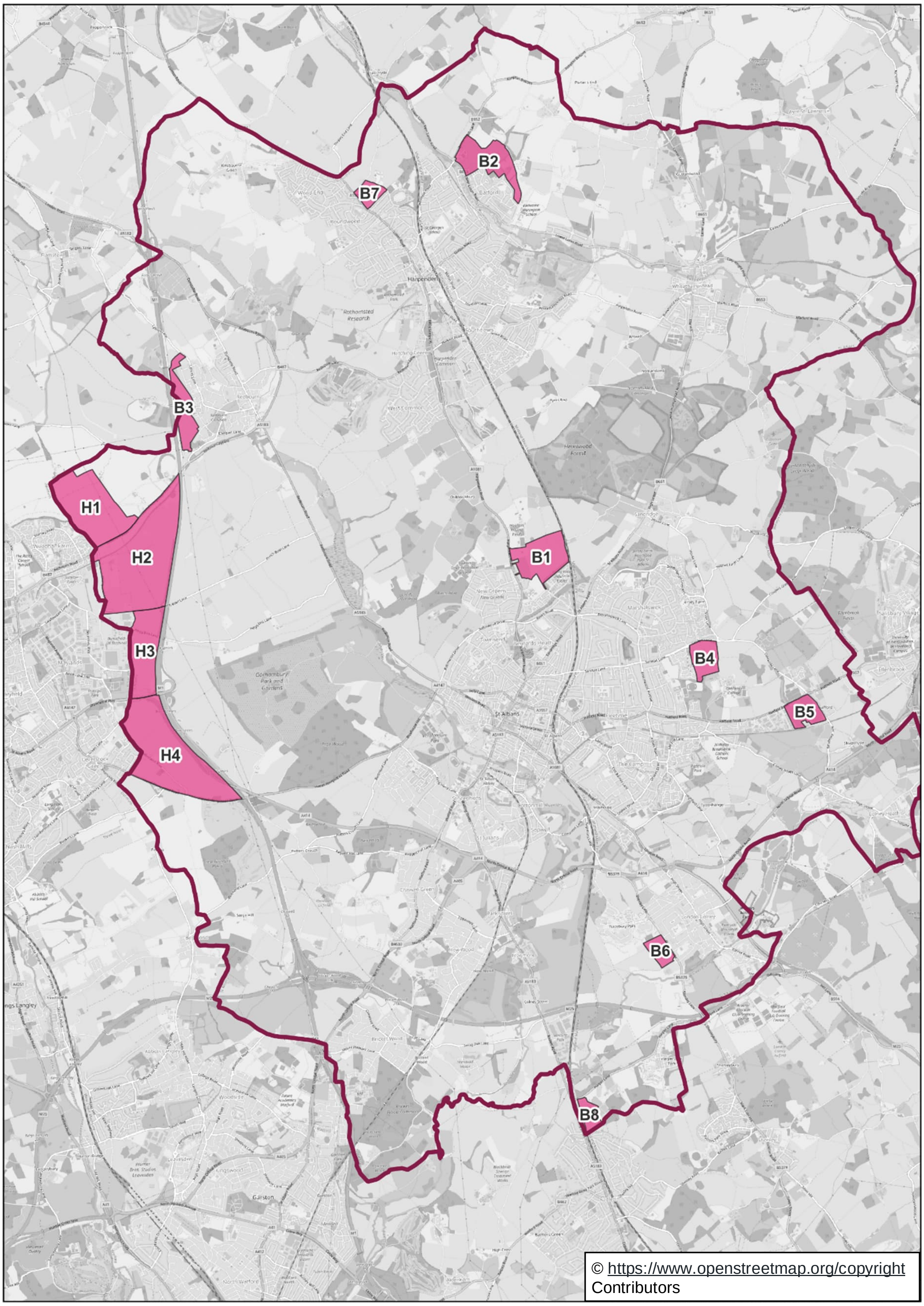

Figure 1-2: Location of Key Local Plan Sites

1.5 Purpose of the Report

1.5.1. The purpose of this report is to document the details of the forecast modelling process used to assess the SADC Local Plan development sites. This report outlines the methodology used for the development of the forecast matrices and forecast networks, it also describes the details of the proposed development modelled and their results. The analysis within this Forecasting Report has been undertaken and presented to support SADC's Regulation 19 Local Plan.

1.6 Structure of Report

1.6.1. The purpose of this report is to summarise the work carried out by WSP in the development of the 2041 Scenarios which assess the Regulation 19 Local Plan sites and associated infrastructure. This report is structured as follows:

- **Chapter 2: Base Year Model Review**
- **Chapter 3: Future Year Scenarios**
- **Chapter 4: COMET Model Forecast Methodology**
- **Chapter 5: 2041 Option 0 Assumptions**
- **Chapter 6: 2041 Option 1 Assumptions**
- **Chapter 7: 2041 Option 2 Assumptions**
- **Chapter 8: 2031 Option 3 Assumptions**
- **Chapter 9: Modelling Results**
- **Chapter 10: Conclusions**

2 Base Model Review

2.1 Introduction

2.1.1. WSP have undertaken a base year review of the COMET model in the St Albans District (SAD) area to understand the performance of the model and ensure it is a robust basis to undertake forecasting for the Local Plan.

2.1.2. In addition to the review of SAD following consultation with National Highways the base year model has been reviewed in the St Albans District and Dacorum Borough to understand the performance of the COMET model on the Strategic Road Network (SRN) M1 and M25 and roads approaching the SRN such as A424 Breakspear Way, A41, A414, A405 and A1081.

2.1.3. The Technical Notes which present the full details of the reviews undertaken can provided by request.

2.2 SAD Base Year Model Review

2.2.1. The base year review within SAD included the following checks:

- Review of the network coverage
- Review of the traffic flow performance between 2014 observed and modelled data
- Review of the journey time performance between 2014 and modelled data
- Comparison of observed traffic flows between 2014 and 2023
- Comparison of 2014 modelled traffic flow and 2023 observed traffic flows
- Comparison of 2014 link delays against 2024 google map typical traffic on key routes

2.2.2. The St Albans Base Year Model Review Technical Note provides the full details of the above checks. In summary the review of the network coverage indicated that the base year model is fairly dense across Hertfordshire County and the density of the network within the SAD is appropriate. When reviewing the base year model performance, the AM peak is the weakest performing time period with IP and PM peak close to meeting the Department for Transport (DfT) Transport Analysis Guidance (TAG) criteria, full details can be found in the St Albans Base Year Model Review Technical Note. Count performance in each peak is graphically presented alongside the Local Plan allocations indicating how the transport model is performing in key areas where Local Plan development is proposed. This indicated that improvements were required in the AM peak model but not necessary in the IP and PM peak model.

2.2.3. The review in SAD indicated that traffic flow has reduced between 2014 and 2023 predominantly in the AM and PM peak hours with the interpeak reductions being a lot less. This therefore provides a robust basis for forecasting as 2014 flows are higher than 2023. A review of congestion and journey time data indicates delays and congestion are generally in the same key areas across the two years.

2.2.4. The St Albans Base Year Model Review Technical Note recommended that the overall performance of the AM peak model in SAD needed to be improved specifically in areas where Local Plan development are proposing to put their accesses and this has been undertaken.

2.3 SAD Base Year Model Improvements

2.3.1. The St Albans Base Year Model Review Addendum Technical Note provides a summary of the network and matrix improvements undertaken as a result of the SAD base year review. Within the transport model WSP investigated the key areas close to Local Plan sites which were not performing well against observed data. This results in identifying a range of network improvements to be fed into the base year model, which are documented in Table 1 in the St Albans Base Year Model Review Addendum Technical Note. Alongside the network improvements matrix estimation was re-ran, prioritising counts within SAD. Overall there was an improvement in the performance of the model against observed data with the network coding and matrix improvements in all peaks. This transport model was used as a basis for the SAD Local Plan work.

2.4 SRN Base Year Model Review

2.4.1. The base year review of the SRN, in the SRN Base Year Model Review Technical Note, included the following tasks:

- Comparison of 2014 Observed and Modelled traffic flow for the SRN road network and road which approach the SRN
- Journey Time Performance on the SRN
- Comparison between 2014 and 2023 traffic count data

2.4.2. Overall this this analysis showed that the AM peak is the weakest performing timing period, the AM peak however does meet TAG criteria for the calibration counts.

2.4.3. This Technical Note was shared with National Highways for comment.

2.5 SRN Base Year Model Review Update

2.5.1. The SRN Base Year Model Review Addendum presents an updated note which reflects the updated results from the network and matrix improvements undertaken in SAD. The updated technical note also provides the performance of the model against observed traffic data on the M25 just outside the St Albans and Dacorum Borough district boundary as requested by National Highways.

2.5.2. Overall the SRN Base Year Model Review Addendum shows that with the SAD network and matrix improvements there is an improvement in performance on the SRN and roads approaching the SRN and overall performance on the COMET model on the SRN is adequate for the purposes of assessing the SADC Local Plan.

3 Future Year Scenarios

3.1 Future Year

3.1.1. The future year modelled is 2041, reflecting the future year for the new St Albans Local Plan.

3.2 Time Periods

3.2.1. The following time periods have been assessed using the model:

- AM peak (08:00 to 09:00)
- PM peak (17:00 to 18:00)

3.3 Scenarios

3.3.1. The following scenarios have been run within the COMET model:

- **Option 0**: This reflects completed or committed development across Hertfordshire over the period 2014-2041. This scenario is constrained to the growth in households and jobs within DfT National Trip End Model for all districts in Hertfordshire except St Albans
- **Option 1**: This builds on option 0 by including the St Albans Local Plan Allocations
- **Option 2**: This builds on option 1 by including the transport infrastructure set out in the St Albans Infrastructure Delivery Plan (IDP) and also including a 10% mode shift (to account for the impact of measures that cannot be directly modelled such as new walking and transport infrastructure).
- **Option 3**: This is an alternative to option 2 which also reflects the IDP but takes a more nuanced approach to mode shift with different level applied in different areas of the district based on the type of people who live there and the type of journeys they make.

3.3.2. An overview of what is included in each scenario is also shown in Table 3-1.

Table 3-1: Scenario Overview

	Option 0	Option 1	Option 2	Option 3
Completed / Consented developments (NTEM constrained except in SADC)				
SADC Local Plan development growth				
10% Modal Shift				
Opportunity to Shift Mode Tool				
SADC IDP				

3.3.3. Details of how each scenario was developed, including information on inputs and assumptions is provided in Chapters 5 to 8.

4 COMET Model Forecast Methodology

4.1 Forecast Objectives

4.1.1. This chapter will set out the forecasting approach for the highway and public transport to understand the cumulative effect of the Local Plan growth for St Albans, in their respective scenarios.

4.1.2. This forecast takes into consideration the changes between 2014 and 2041 including increases in population, number of jobs and dwellings, rising cost of travel, and proposed transport infrastructure schemes. However, there is currently no allowance for factors that may fundamentally alter the nature of travel within Hertfordshire. These factors may include new technologies such as autonomous vehicles.

4.2 Model Time Periods

4.2.1. The time periods for the highway model are:

- AM Peak: 08:00 to 09:00
- Inter Peak: 10:00 to 16:00 (hourly average)
- PM Peak: 17:00 to 18:00

4.2.2. The time periods of the public transport model are:

- An average AM period hour (between 7:00am to 10:00am)
- An average Inter-peak hour (between 10:00am to 4:00pm)
- An average PM period hour (between 4:00pm to 7:00pm)

4.2.3. Although the Variable Demand Model covers periods spanning a full day, the assignment to the supply models has been undertaken in smaller but consistent time periods. The time periods are consistent with a three-hour time period in the Demand Model translated into a peak hour in the Highway assignment model and an average peak period in the Public Transport assignment model. As such, the analysis presented in this report reflects these time periods.

4.2.4. For the purpose of the SADC Local Plan assessment, the focus of results is on the AM and PM peaks within the highway model.

4.3 Treatment of Variable Demand

4.3.1. COMET includes a variable demand model, which has been used in the preparation of the forecast scenarios. The variable demand model is designed to estimate the effect of changes in transport infrastructure and travel cost upon patterns of demand. This considers changes in overall travel movements and is separate to modelling the way in which travellers respond to changes by choosing different routes. The latter is forecast by the highway and public transport assignment models.

4.4 Model Structure

4.4.1. The structure of the forecasting process, including the interaction between the demand models and assignment models is shown in Figure 4-1.

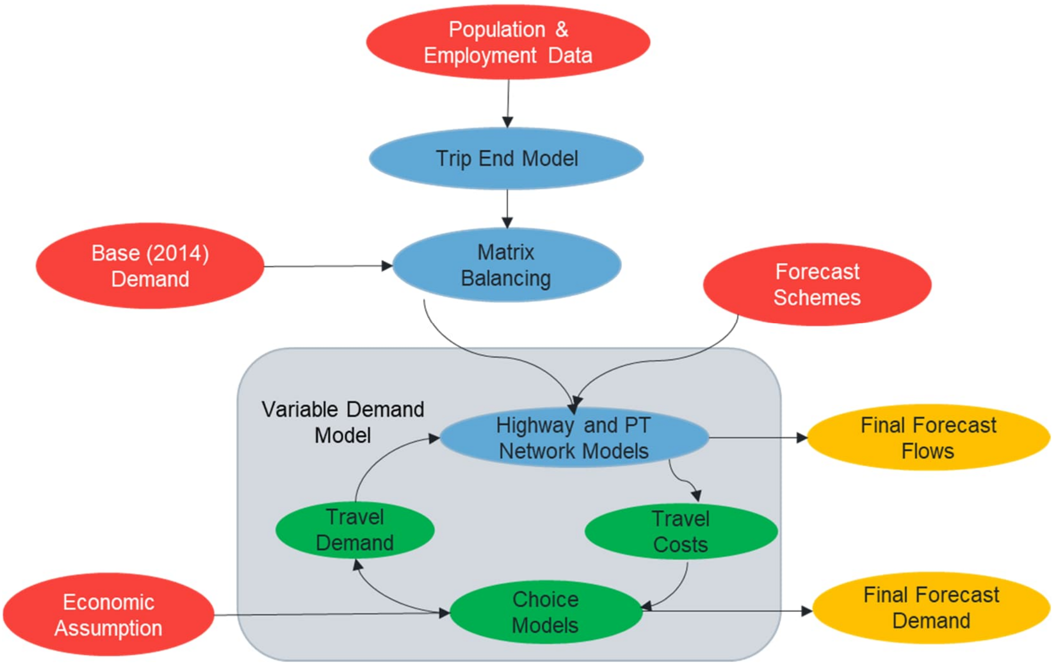

Figure 4-1: Model Structure

4.4.2. The forecast trip matrix is an estimation of future trips based on available population and employment data for Hertfordshire and growth assumptions for the rest of Great Britain from the most recent version of the Department for Transport (DfT) National Trip End Model (NTEM v8). Further details on the planning data for each assessment scenarios will be discussed in Chapters 5 to 8.

4.4.3. The COMET Trip End model is used to forecast future trip ends, i.e., total productions and attractions for each model zone. These trip ends are used to build a reference matrix for the forecast year (2041). The reference matrix is then adjusted based on the forecast Highway and Public Transport assignments through the VDM, which takes into account the changes in transport infrastructure, travel times and costs in future years. The resulting matrices constitute the forecast trip matrices.

4.5 COMET Trip End Model

4.5.1. A Trip End model has been built specifically for COMET as part of the COMET Base Year (2014) development. The COMET Trip End model is based on DfT's CTripEnd software package. The software creates trip end estimates based on NTEM planning data (v8) combined with a number of metrics based on population, car ownership and employment. It consists of a database of population/employment data and an executable file that runs a series of processes to create final trip end estimates for the desired model year, broken down by mode, time of day and demand segment.

4.5.2. If required more detailed information on the COMET Demand Model and CTripEnd model set up can be found in 2022-12-02 COMET 7 Forecasting Report_Final_Issued.pdf, which can be made available on request.

5 2041 Option 0 Assumptions

5.1 Overview

5.1.1. This scenario represents the completed or committed developments and transport infrastructure across Hertfordshire over the period 2014-2041. This scenario is constrained to the growth in households and jobs within DfT National Trip End Model for all districts in Hertfordshire except St Albans.

5.2 Planning Data - Hertfordshire

Data Received

5.2.1. Planning data for all districts in Hertfordshire was received from Hertfordshire County Council. This included all completions and sites given planning permission between 2014 and 2022 which was the latest year available when work commenced.

Processing of Planning Data

5.2.2. The list of planning data sites was processed to:

- Calculate the number of jobs from the floorspace for employment data
- Allocate the sites to a base zone in the model
- Allocate a new model development zone to it, for sites with more than 300 dwellings or 500 jobs
- Check that key sites and planning data totals were in line with the previous COMET 7 planning data

5.2.3. The employment planning data was provided with a floorspace and employment type rather than the number of jobs (which is the input the COMET model requires), the floorspace and employment type were used to calculate the number of jobs using assumed conversion factors. The factors used and the source of the factor is shown in Table 5-1. For user classes that were not available in the Employment Density Guide (EDG), the factors were calculated using TRICS data.

Table 5-1: Floorspace to Jobs Conversion Factors

Use Class type	User Class Name	Gross Floor Area per Employee	Source of conversion factor
B2	General industry	36	EDG 2015
B8	Warehouse, Distribution Centres	81	EDG 2015
C1	Hotels / guest houses	100	EDG 2015
C2	Residential institutions incl. hospitals, nursing homes, residential schools etc.	100	EDG 2015
D1	Non-residential institutions incl. churches, clinics, health centres, nurseries, museums, libraries etc.	36	EDG 2015
D2	Assembly and leisure incl. cinemas, music venues, sports facilities etc.	75	EDG 2015
Ea_A1_F2a	Shops	18	EDG 2015
Eb_A3	Restaurants and cafes	18	EDG 2015
Ec_A2	Financial and professional services e.g. banks, estate agents, betting offices etc.	16	EDG 2015
Ed	Indoor sport, recreation or fitness	83	EDG 2015
Ee	Provision of medical or health services	36	EDG 2015
Ef	Creche, day nursery or day centre	35	TRICS
Egi_B1a	Offices (not within A2)	10	EDG 2015
Egii_B1b	R&D	50	EDG 2015
Egiii_B1c	Light Industry	47	EDG 2015
F1	Schools	78	TRICS
F2	Community facilities	144	TRICS
SG	Sui Generis	70	EDG 2015

5.2.4. For sites with more than 300 dwellings or 500 jobs, specific new model development zones were allocated to the site. These sites with development zones that are in St Albans are shown in Table 5-2 and a full list of all development zones (including those in other districts) is provided in Appendix A.

Table 5-2: Committed Sites with Development Zones in St Albans

Zone Number	Planning Reference	Site Name	District	Number of dwellings	Number of jobs
9063	5/22/0927	Land South of Chiswell Green Lane	St Albans	391	67
9064	5/2013/2589	Oaklands College, Smallford Campus, St Albans, AL4 0JA	St Albans	385	
9110	5/2016/3006	Proposed Rail Freight, North Orbital Road, Chiswell Green	St Albans		4095
9136	5/2016/0264	St Albans Retail Park, Griffiths Way, St Albans, AL1 2RJ	St Albans		631
9166	5/2020/1773	Civic Centre Opportunity Site (South), Victoria Street, St Albans	St Albans		620

Summary (before constraining)

5.2.5. The total number of dwellings and jobs included in the planning data is shown in Table 5-3.

Table 5-3: Planning Data Summary by District

District	Dwellings (2014 to 2022)	Jobs (2014 to 2022)
Broxbourne	6,407	11,975
Dacorum	8,392	5,798
East Hertfordshire	11,515	4,825
Hertsmere	4,354	4,097
North Hertfordshire	5,263	2,094
St Albans	6,298	8,157
Stevenage	4,942	7,202
Three Rivers	3,079	4,998
Watford	7,185	8,931
Welwyn Hatfield	7,117	5,470
Hertfordshire Total	**64,552**	**63,547**

NTEM Constraining

5.2.6. The number of dwellings and jobs was constrained to NTEM at a Hertfordshire county level, but not including St Albans. The planning data for St Albans was excluded from the constraining process to accurately model the known planning data in the district. This is standard practise inline with DfT guidance, which retains the integrity of the St Albans planning data which is more accurate than NTEM predictions.

5.2.7. Thus the total number of dwellings and jobs for Hertfordshire without St Albans (so over 9 districts) was constrained to the NTEM total for those districts. The number of dwellings needed to be decreased by 7,059 dwellings and the number of jobs increased by 13,578 jobs to match the NTEM total. The constraint was applied in a way that preserves the planning data totals as far as possible.

5.2.8. For dwellings a reduction was not applied to North Hertfordshire or Welwyn Hatfield as the planning data total was already below NTEM in those districts. Reductions were applied in the other seven districts proportional to the size of the district, so larger districts have a larger reduction.

5.2.9. For jobs the increase was not applied to Broxbourne, Stevenage or Broxbourne as the planning data total was already above NTEM in those districts. Increases were applied in the other six districts proportional to the size of the district, so larger districts have a larger increase.

Summary (after constraining)

5.2.10. Table 5-4 and Table 5-5 shows the total number of dwellings and jobs respectively in each district after the NTEM constraint had been applied.

Table 5-4: Dwellings Summary after Constraining

	Dwellings in NTEM 8	Dwellings in planning data	Difference (planning data - NTEM 8)	Dwellings after constraint	Difference (after constraint - planning data)
Broxbourne	3,149	6,407	3,258	5,771	-636
Dacorum	7,133	8,392	1,259	6,952	-1,440
East Hertfordshire	10,237	11,515	1,278	9,449	-2,066
Hertsmere	3,030	4,354	1,324	3,742	-612
North Hertfordshire	6,521	5,263	-1,258	5,263	0
St Albans	6,420	6,298	-122	6,298	0
Stevenage	3,770	4,942	1,172	4,181	-761
Three Rivers	2,482	3,079	597	2,578	-501
Watford	5,780	7,185	1,405	6,018	-1,167
Welwyn Hatfield	8,970	7,117	-1,853	7,117	0
Hertfordshire	**57,493**	**64,552**	**7,059**	**57,370**	**-7,182**

Table 5-5: Jobs Summary after Constraining

	Jobs in NTEM 8	Jobs in planning data	Difference (planning data - NTEM 8)	Jobs after constraint	Difference (after constraint - planning data)
Broxbourne	5,368	11,975	6,607	11,975	0
Dacorum	9,477	5,798	-3,679	8,309	2,511
East Hertfordshire	8,415	4,825	-3,590	7,055	2,230
Hertsmere	6,584	4,097	-2,487	5,842	1,745
North Hertfordshire	7,558	2,094	-5,464	4,097	2,003
St Albans	9,271	8,157	-1,114	8,157	0
Stevenage	6,908	7,202	294	7,202	0
Three Rivers	5,076	4,998	-78	6,343	1,345
Watford	8,545	8,931	386	8,931	0
Welwyn Hatfield	9,922	5,470	-4,453	8,099	2,630
Hertfordshire	**77,124**	**63,547**	**-13,578**	**76,011**	**12,464**

5.3 Planning Data – Outside Hertfordshire

5.3.1. No planning data outside Hertfordshire was considered. The growth in other areas is therefore assumed to align with NTEM 8 values, which are national government forecasts.

5.4 Goods Vehicle Demand

5.4.1. An uplift was applied to reflect the additional 5 years of growth between the existing COMET model forecasts for 2036 and the local plan forecast year of 2041. This uplift was based on DfT National Road Traffic Projections 2022 (NRTP22) which include the predicted increase in vehicle kilometres in future years based on the DfT National Transport Model (NTM). The factors set out in Table 5-6 were applied to cells within the LGV and HGV matrices. These factors are based on vehicle kilometre projections for the South East region, across all road types. As NRTP includes values in five year increments, values for intermediate years (such as 2036 and 2041) were calculated through linear interpolation.

Table 5-6: Goods Vehicle uplift factors for 2036-41 based on NRTP22

Year	NRTP22 Vehicle Kilometres (billions)	
	LGV	HGV
2036	11.185	2.761
2041	11.986	2.840
Uplift Factor 2036-41	1.072	1.029

5.5 Transport Infrastructure

5.5.1. The forecast network for Option 0 scenario is based on the existing COMET 7 NTEM network as a starting point. The incorporated infrastructure schemes in this COMET 7 NTEM network are selected based on their certainty levels, which include schemes categorised as “near certain” and “more than likely” inline with DfT guidance. The proposed transport schemes were agreed upon with the districts in Spring 2022 and align with the Infrastructure Delivery Plans and Transport Strategies at that time.

5.5.2. In addition to the above schemes, a selection of infrastructure schemes situated in St Albans and Dacorum districts are also included for Option 0 forecast network due to their improved certainty status since the COMET 7 Update in 2022. These schemes are summarised in Table 5-7. Noting that the BSIP bus lane schemes although potentially funded and therefore assumed to be more than likely to go ahead when this modelling started subsequently were not supported during consultation and are currently not going ahead.

5.5.3. These highway schemes are modelled using the latest drawings and maps provided by HCC from the developers to inform the schemes details. Where sufficient detail is not provided by the scheme maps/drawings or other information WSP assumed the coding based on the information available.

Table 5-7: Additional Infrastructure Schemes Incorporated in Option 0

HCC_REF	Description of Scheme	District
RRv3	Radlett Rail freight, new access junction onto A414 and new spine road connecting to A5183 Radlett Road (south of Frogmore)	St Albans
RR_M25_21a	M25 junction 21a capacity improvements (Radlett Rail freight mitigation)	St Albans
PR140	St Albans City Centre 20mph zone expansion	St Albans
StAlbans_TC_Covid	Social distancing measures in St Albans high street area	St Albans
ITP170003-1	ATF Jarman Park Pedestrian & Cycling Improvements Phase 1	Dacorum
EATF_60	Amendment of existing facilities and junctions to facility better cycling journeys in the vicinity of St Albans town centre Status Ongoing/Active	St Albans
BSIP-Miles House and London Rd	Bus lane on Mile House and London Rd junction	St Albans
BSIP_ Drakes Lane_Lodnon Rd	Bus Lane on Drakes Lane_London Rd Junction	St Albans
BSIP_ London Colney	BSIP-Bus Lane on Lodnon Colney SB	St Albans
Bus route_907	Brookfield Centre to Stevenage. New route added not previously in the COMET NTEM model.	Hertfordshire/ Cross District
Bus route_908	Stevenage to Welwyn Garden City. New route added not previously in the COMET NTEM model.	Hertfordshire/ Cross District

HCC_REF	Description of Scheme	District
Bus route_323	Hertford to Welwyn Garden City. New route added not previously in the COMET NTEM model.	Hertfordshire/ Cross District
Bus route_725	Stevenage to Rickmansworth. New route added not previously in the COMET NTEM model.	Hertfordshire/ Cross District
Bus route_721	Luton to Hemel Hempstead. New route added not previously in the COMET NTEM model.	Hertfordshire/ Cross District
Bus route 324	Existing route to be revised	Hertfordshire/ Cross District
Bus route 390	Existing route to be revised	Hertfordshire/ Cross District
Bus route 724	Existing route to be revised	Hertfordshire/ Cross District

Base Year Network Adjustment

5.5.4. As discussed in Chapter 2, the base year model network coding in St Albans district was also reviewed with checks being undertaken to improve base year calibration. Issues including incorrect junction configuration or allocation of lane marking or incorrect saturation flow were revised accordingly. These network changes are also incorporated to all forecast scenarios.

5.6 Generalised Cost Parameters

5.6.1. The generalised cost parameters used in the forecast models are from the latest version of the TAG databook – November 2023 v1.22. Value of time is calculated in pence per minute (PPM) and vehicle operating cost is calculated in pence per kilometre (PPK). As in the base model, the value of time (PPM) for the HGVs was doubled from the value provided in the TAG databook. This is in line with TAG Unit A1.3 which advises for HGV that the driver's time does not take account of the influence of owners on the routing of these vehicles.

5.6.2. The generalised cost parameters adopted for the 2036 forecast year is shown in Table 5-8. A split of 36.4% OGV1 and 63.6% OGV2 has been used to calculate the average generalised cost parameters for HGVs and an average simulation network speed of 54 kph has been used.

Table 5-8: Generalised Cost Values 2041

User Class	VOC (PPK)			VOT (PPM)		
	AM	IP	PM	AM	IP	PM
UC1: Car Commute	4.71	4.71	4.71	26.6	27.0	26.7
UC2: Car Employers Business	9.22	9.22	9.22	39.6	40.6	40.2
UC3: Car Other	4.71	4.71	4.71	18.3	19.5	19.2
UC4: LGV	12.72	12.72	12.72	29.5	29.5	29.5
UC5: HGV	39.94	39.94	39.94	61.6	61.6	61.6

6 2041 Option 1 Assumptions

6.1 Overview

6.1.1. This scenario adds the SADC Local Plan allocations onto Option 0. There are no changes in other Hertfordshire districts or in the wider external model area.

6.2 Planning Data – St Albans

6.2.1. A list of the local plan allocations included as part of Option 1 was provided by SADC. The sites, together with the number of dwellings / jobs and the zone that they have been allocated to is provided in Appendix B and Appendix C. Sites where the number of dwellings is greater than 300 or jobs greater than 500 have been allocated a specific development zone (with a zone number over 9000). The locations of the sites are shown in Figure 6-1.

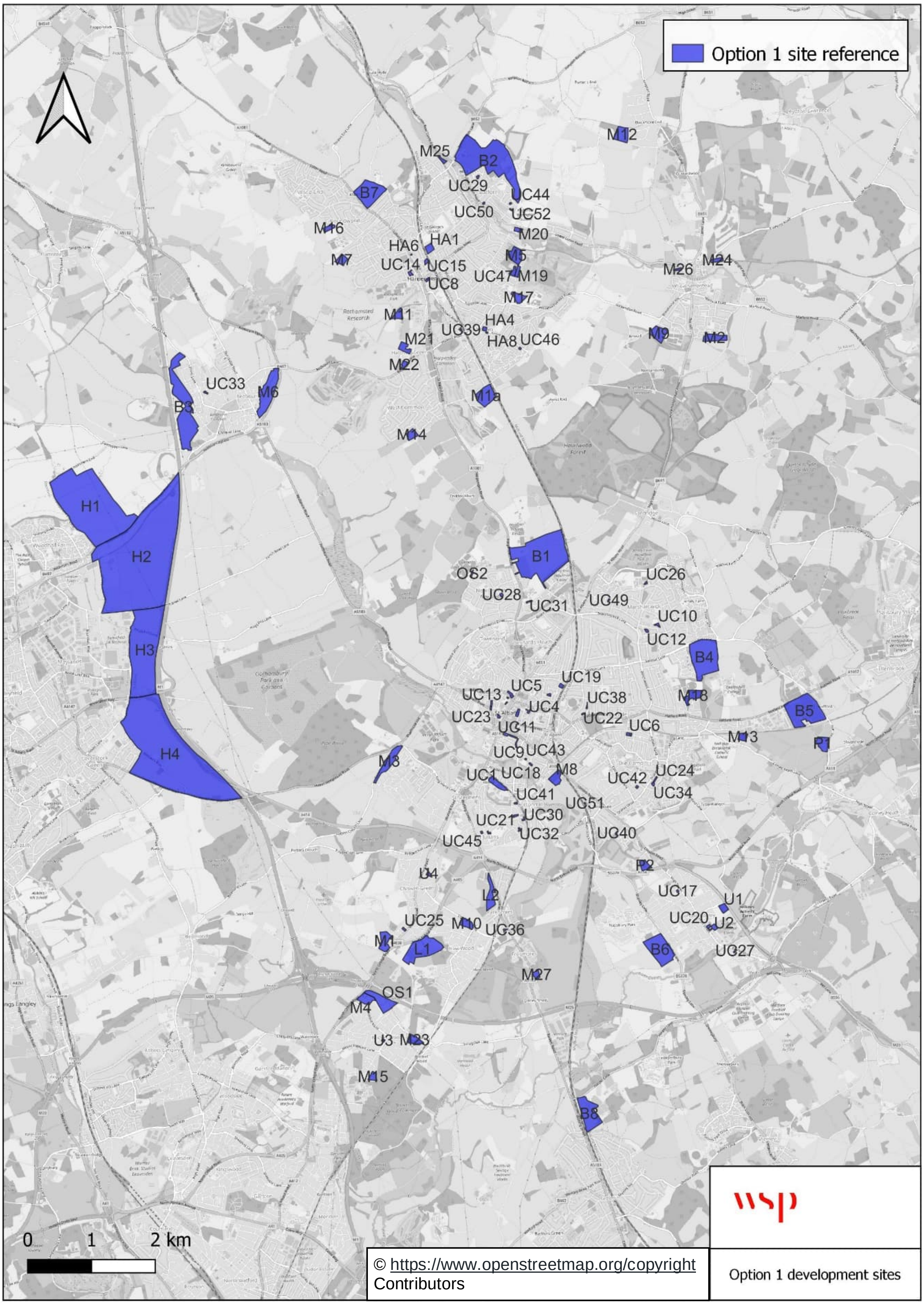

Figure 6-1: Location of Option 1 Local Plan Sites

6.3 Transport Infrastructure

6.3.1. The transport infrastructure changes remain broadly the same between Option 0 and Option 1. Additional transport infrastructure in Option 1 included new connections from the development sites to the highway network but no additional mitigation so can be considered a worst case. The East Hemel Spine Road was included as it provides access to the East Hemel development.

6.3.2. Figure 6-2 shows the proposed layout of the East Hemel spine road and indicates where the main development areas (sites H1-H4) have been connected within the model. The proposed improvement to the A414/Green Lane junction has not been included in Option 1.

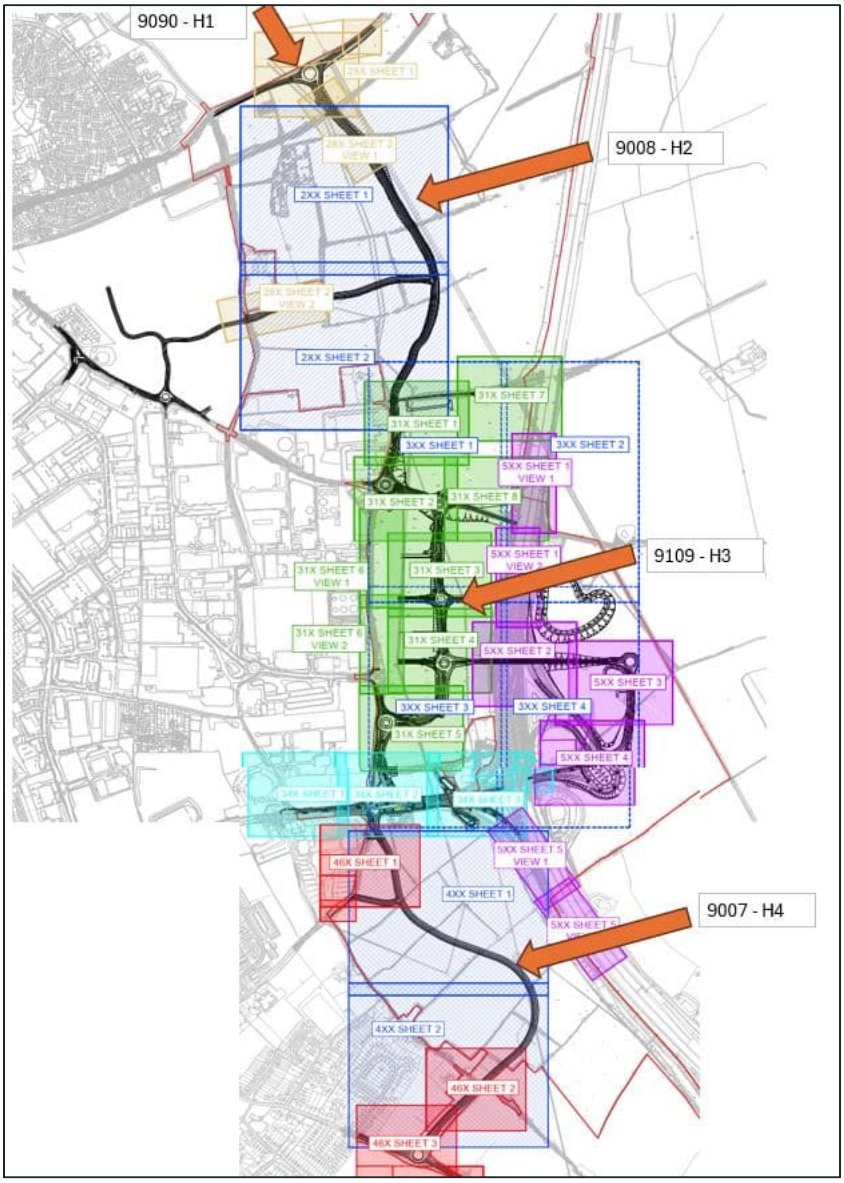

Figure 6-2: Proposed East Hemel Spine Road within the St Albans District Boundary

6.4 Zone Connectors

6.4.1. The largest Local Plan sites were modelled as separate zones and connected to the network at the location which are currently considered by SADC and HCC to the most likely access points at the time of undertaking the modelling.

6.4.2. In some cases, is has been possible to represent specific access arrangements where these are already known (for example the spine road within the Eats Hemel site as referred to above). In all cases care has been taken to ensure that there is sufficient capacity at the zone connection points and that all development traffic is able to load into the network within the modelled time periods.

6.5 Trip Generation Adjustment

6.5.1. The highway trip generation for Local Plan sites that the COMET model generated were reviewed and trip rates for proposed key Local Plan sites were deemed to be under-representing the highway trip generation. Following conversations with HCC, SADC and NH the highway trip generation was agreed to be uplifted to better reflect the projected traffic generation for the key Local Plan sites.

6.5.2. HCC provided WSP with a generic highway trip rate which was used for most of the key Local Plan sites alongside the latest trip generation reports for East Hemel Hempstead and North St Albans which contained specific trip rates which HCC were in agreement with. Table 6-1 provides details of the key Local Plan sites and the trip rate used. The trip generation reports can be made available upon request.

6.5.3. The highway trip generation adjustment is carried out with post COMET VDM highway matrix and the trip totals (tripends) for the required developments are uplifted accordingly. The assumed trip rate and the final trip generation for these developments are summarised in Table 6-2 and Table 6-3.

Table 6-1: Key Local Plan Sites

Development Name	Type	Households	Jobs	Trip Rate Source
East Hemel Hempstead South	Housing	2165	0	Trip Generation Report from developer
East Hemel Hempstead North	Housing	1335	0	
North St Albans	Housing	996	0	Trip Generation Report from developer
West of London Colney	Housing	405	0	Generic
North East Harpenden	Housing	762	0	Generic
East St Albans	Housing	522	0	Generic
North Hemel Hempstead	Housing	1250	0	Generic
Glinwell, Hatfield Road, St Albans	Housing	436	0	Generic
West Redbourn, Redbourn	Housing	593	0	Generic
North West Harpenden	Housing and Jobs	293	69	No change to trip generation made
Harper Lane	Housing	274	0	No change to trip generation made
East Hemel Hempstead (Central)	Employment	0	8000	Trip Generation Report from developer

Table 6-2: Adopted Car Trip Rate

Car Trips		AM Peak Hour		PM Peak Hour	
Development	Type	Departs	Arrivals	Departs	Arrivals
North St Albans	Households	0.394	0.191	0.221	0.313
East Hemel Hempstead South	Households	0.613	0.235	0.376	0.645
East Hemel Hempstead North	Households	0.613	0.235	0.376	0.645
East Hemel Hempstead (Central)	Employment	0.016	0.118	0.116	0.008
Generic	Households	0.347	0.119	0.221	0.363

Table 6-3: Assumed Trip Generation for Key Local Plan Sites

	Trip Generation (VDM)				Uplift Trip Generation				Difference (Uplifted – VDM)			
	AM		PM		AM		PM		AM		PM	
Development Name	Departs	Arrivals	Departs	Arrivals	Departs	Arrivals	Departs	Arrivals	Departs	Arrivals	Departs	Arrivals
East Hemel Hempstead South	252	177	186	235	1312	514	814	1404	1060	337	628	1169
East Hemel Hempstead North	151	101	106	138	809	326	515	880	658	225	409	742
North St Albans	140	87	90	117	393	192	223	314	253	105	132	197
West of London Colney	53	32	36	44	141	49	91	148	88	17	54	104
North East Harpenden	104	63	65	84	265	92	170	279	161	28	106	194
East St Albans	68	41	42	59	182	63	117	191	114	21	75	132
North Hemel Hempstead	150	103	105	135	441	159	299	475	292	56	194	340
Glinwell, Hatfield Road, St Albans	57	37	38	51	152	52	98	160	95	15	60	108
West Redbourn, Redbourn	73	48	50	65	209	75	141	224	136	26	91	159
East Hemel Hempstead (Central)	809	1414	1252	889	127	964	943	68	-682	-450	-310	-821

7 2041 Option 2 Assumptions

7.1 Overview

7.1.1. The Option 2 scenarios represents the future year of 2041 with the Local Plan in place but including the following additional elements:

- A number of transport schemes based on infrastructure proposals developed as part of the St Albans Infrastructure Delivery Plan (IDP).
- An assumption that there will be a 10% modal shift away from car across SADC as a result of sustainable transport measures that are envisaged.

7.2 Transport Infrastructure Schemes

7.2.1. Table 7-1 lists the transport schemes that have been modelled in Options 2 and 3 whilst the broad location of each scheme is shown in Figure 7-1. It is important to note that this is not the SADC full IDP schemes which can be found here https://www.stalbans.gov.uk/evidence-base.

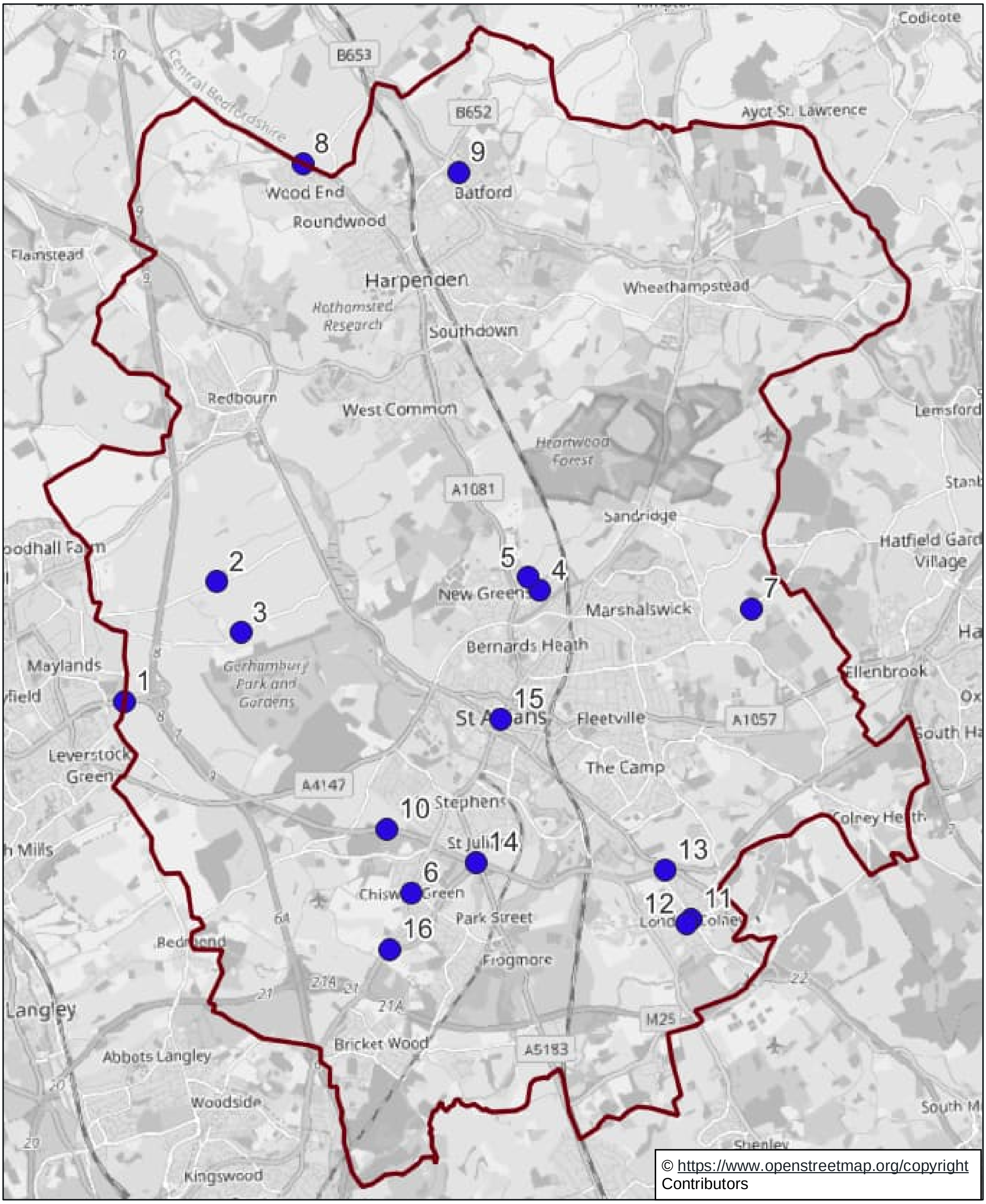

Figure 7-1: Location of Transport Schemes Modelled in Option 2 and 3

Table 7-1: Highway Schemes Modelled in Options 2 and 3

Map Id	HCC Ref	Name
Highway Schemes		
1	-	East Hemel - A414 Breakspear Way/Green Lane junction improvement – Introduction of signal junctions to replace existing roundabout
2	-	East Hemel - Closure/restriction of Punchbowl Lane
3	-	East Hemel - Closure/restriction of Hogg End Lane
4	-	Valley Rd Bus Gate
5	-	Sandridgebury Lane Bus Gate
6	CG-Acc	Chiswell Green - convert mini-roundabouts to signal junction
7	-	Coopers Green Lane Speed Limit Reduction
8	-	A1081 cycle corridor no changes made
9	-	B653 Lower Luton Road pedestrian and cycle crossing
10	SM179	A414 Smart Traffic Management - A review of traffic speed limits and measures required to improve compliance along the A414
11	PR193	London Colney High Street 20mph speed limit
12	PR194	London Colney Town wide 20mph speed limit
13	650534762_SADC_DWG_Site2 / SC SM176	A414/A1081 London Colney Roundabout upgrade
14	SM174	A414 Park Street Roundabout Improvements - signalisation of roundabout
15	PR140	St Albans City Centre 20mph zone expansion
16	SM201	A405/B4630 Watford Road junction - conversion to signal crossroads
	StAlb_14	Highway schemes associated with the North East Harpenden site
	N_STAD	Highway schemes associated with the North St Albans site
	10338_HL_07	Highway schemes associated with the North West Harpenden site
	10338_HL_07 & W_LCD	Highway schemes associated with the West of London Colney site
Public Transport Schemes		
-	-	High frequency bus corridor along A414
-	SL7 / SM152	Bus route connecting St Albans City and St Albans Abbey stations
-	-	Corby service on East Midlands franchise to call at St Albans

7.3 Traffic Signal Optimisation

7.3.1. Traffic signal timings have been optimised within Option 2 where signal junctions were forecast with high increase of delay (>30 seconds) between Option 1 and 2 in the AM or PM peak hours. This reflects available signal technology which adapts to the relative balance of flows and delays around a junction. The following list sets out the junctions where signal timings have been adjusted, their locations are presented in Figure 7-2.

- **Maylands Avenue / Wood End Lane** (node 2450) – this junction was found to be over-capacity in option 2 and was optimised.
- **A414 Breakspear Way / Green Lane** (nodes 2580 and 2461) – this is a key junction and the location of an improvement scheme in option 2 (scheme ref SM7_SW). The new layout was found to be over-capacity and was optimised, although it remains slightly over-capacity in the AM peak following optimisation.
- **A405 / Watford Road (**node 6295) – this is the location of an improvement scheme in option 2 (scheme ref SM201). The junction was signalised in Option 2 network thus the signal timings at this junction have been optimised to best suit the traffic flows.
- **Watford Road / Tippendell Lane** (node 6299/16850) – this is the location of an improvement scheme in option 2 (scheme ref CG_Acc). The new junction layout was forecast with increased delay on Tippendell Lane approach, thus the signal settings were optimised.
- **Ancient Britton** (node 6348) – this is a key junction in the network and is over-capacity in the future years. Signal optimisation was attempted here but it was not possible to improve the performance of the junction as all arms are over-capacity.
- **King William IV** (node 6372) – this is a key junction in the network and is over-capacity in the future years. Signal optimisation was attempted here but it was not possible to improve the performance of the junction as three out of four arms are over-capacity.
- **A414 / A1081** (node 6475/6482) – this is a key junction in the network which is the location of an improvement scheme in Option 1 whereby the existing roundabout becomes signalised (scheme ref 650534762_SADC_DWG_Site2 / SC SM176). The signal timings at this junction have been optimised to best suit the traffic flows for Option 2.
- **A1081 Luton Road/ Roundwood Lane** (node 6538), this is the signalised access node for North West Harpenden developments. (scheme ref 10338_HL_07) The new development access has increased traffic delay along Luton Road thus requires optimisation.

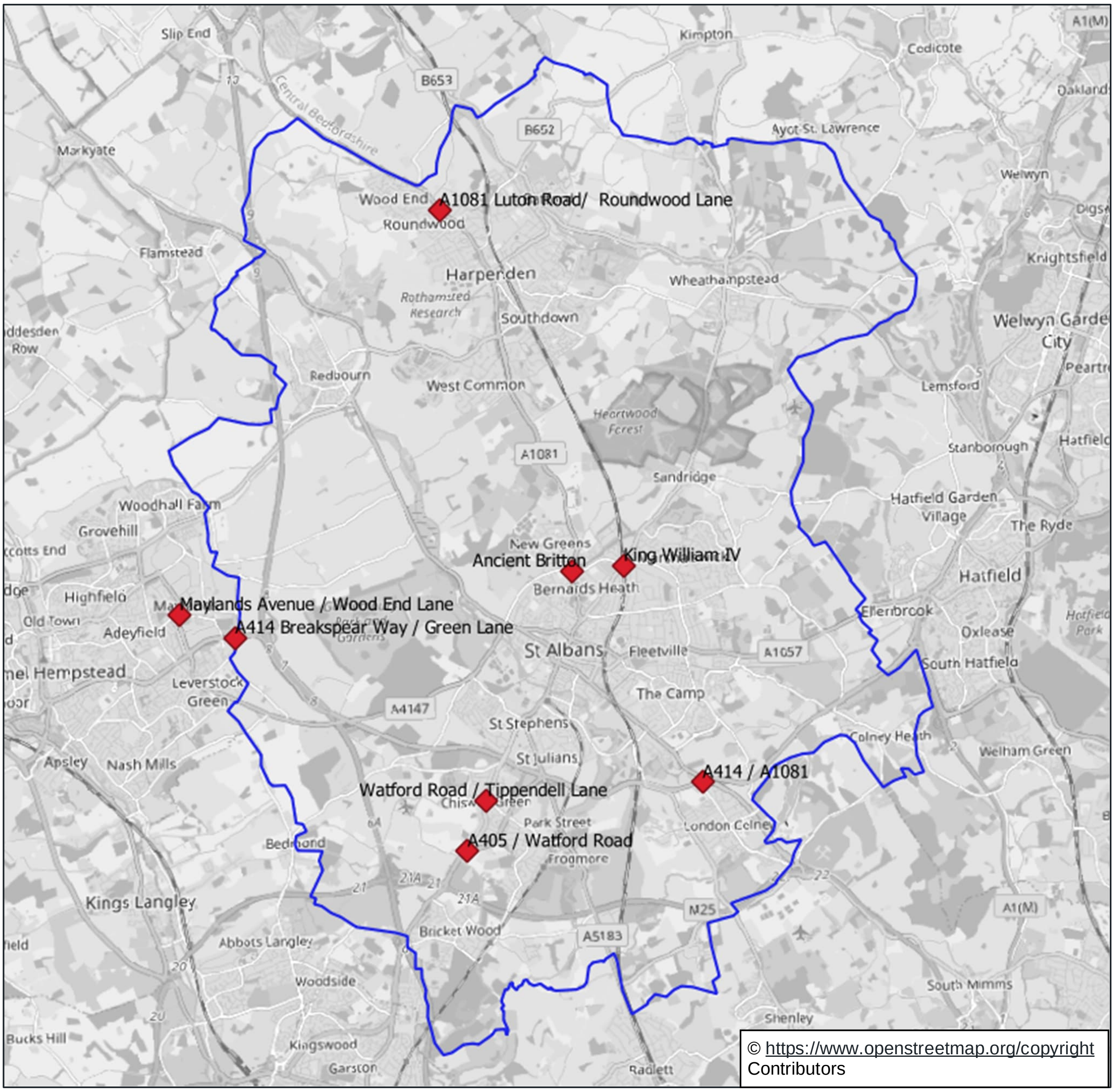

Figure 7-2: Signal Junctions with Traffic Signal Optimisation

7.4 Modal Shift

7.4.1. For Option 2 it was assumed that there would be a 10% shift away from car for all model zones within the St Albans district. This reflects the impacts that could include more improvements to the walking and cycling network that do not affect traffic capacity and therefore cannot be modelled such as improved travel information, bike hire schemes, car share schemes, promotional activities and travel planning. This assumption was applied uniformly to all zone pairs representing movements to, from or between the model zones representing St Albans, see Table 7-2 and Table 7-3. This therefore does not reflect any specific interventions or the propensity to switch modes based on the availability/accessibility of alternative modes or the distance of the journey. The adjustment was applied to all car trips, including those associated with future development sites.

7.4.2. As shown by Table 7-4, the 10% mode shift assumption has resulted in a reduction of around 4,000 car trips within the peak hours.

Table 7-2: AM Peak Hour Trip Reductions by Trip Movement

		AM Peak Hour			
From	**To**	**Car Trips Before**	**Car Trips After**	**Reduction**	**% Reduction**
St Albans District	St Albans District	12,281	11,053	-1,228	-10.0%
St Albans District	Elsewhere	14,179	12,761	-1,418	-10.0%
Elsewhere	St Albans District	11,816	10,634	-1,182	-10.0%
Total		38,276	34,448	-3,828	-10.0%

Table 7-3: PM Peak Hour Trip Reductions by Trip Movement

		PM Peak Hour			
From	**To**	**Car Trips Before**	**Car Trips After**	**Reduction**	**% Reduction**
St Albans District	St Albans District	11,753	10,577	-1,176	-10.0%
St Albans District	Elsewhere	12,440	11,196	-1,244	-10.0%
Elsewhere	St Albans District	14,266	12,839	-1,427	-10.0%
Total		38,459	34,612	-3,847	-10.0%

Table 7-4: Total Reduction in Peak Hour Car Trips due to 10% Mode Shift Assumption

Time Period	Total Car Trips to/from/within St Albans District – 2041 Future Year with Local Plan in place		
	No Mode Shift	10% Mode Shift	Reduction
AM Peak Hour	38,276	34,448	-3,828
PM Peak Hour	38,459	34,612	-3,847

8 2041 Option 3 Assumptions

8.1 Overview

8.1.1. Option 3 represents the future year of 2041 with the Local Plan in place, along with the same transport mitigation schemes as Option 2, but with alternative assumptions around mode shift away from car.

8.1.2. For this option, the WSP Opportunity to Shift Modes (OSM) tool has been used to develop specific assumptions regarding potential modal shift for different movements within the study area, based on journey distance, the availability of alternative modes and the propensity of residents to walk, cycle or use public transport in St Albans.

8.1.3. The report provided in Appendix D gives more information on the underlying study that was undertaken to determine the modal shift assumptions applied in this scenario.

8.1.4. The mode shift assumptions provided by the OSM tool were applied to the highway model demand matrices as a demand matrix adjustment after the normal variable demand modelling process within the COMET model.

8.2 Alternative Mode Shift Assumptions

8.2.1. Table 8-1 and Table 8-2 illustrate the degree of modal shift that was estimated by the OSM tool, based on the sustainable travel potential. This shows a relatively high reduction in car trips for journeys within St Albans, and a more modest reduction for trips from St Albans to other areas. As the OSM considers outbound trips only, there is no reduction in trips to St Albans from other areas, however it is possible that measures introduced to encourage modal shift may also impact on these trips. Additionally, it could be expected that some outbound trips made by non-car modes in the AM peak would similarly return by a non-car mode in other time periods, such as the PM peak. Therefore, in practice a higher level of mode shift may be achieved than has been modelled in this scenario.

Table 8-1: Reduction in Car Trips from OSM tool (AM Peak)

		AM Peak Hour			
From	**To**	**Car Trips Before**	**Car Trips After**	**Reduction**	**% Reduction**
St Albans District	St Albans District	12,281	9,356	-2,925	-23.8%
St Albans District	Elsewhere	14,179	13,496	-683	-4.8%
Elsewhere	St Albans District	11,816	11,816	0	0.0%
Total		38,276	34,668	-3,608	-9.4%

Table 8-2: Reduction in Car Trips from OSM tool (PM Peak)

		PM Peak Hour			
From	To	Car Trips Before	Car Trips After	Reduction	% Reduction
St Albans District	St Albans District	11,753	8,730	-3,023	-25.7%
St Albans District	Elsewhere	12,440	11,736	-704	-5.7%
Elsewhere	St Albans District	14,266	14,265	-1	0.0%
Total		38,459	34,731	-3,728	-9.7%

8.2.2. Table 8-3 shows the equivalent reduction in peak hour car trips to, from and within St Albans as a result of these mode shift assumptions. Similar to Option 2, the overall reduction in car trips is around 10%, however the distribution of the modal shift is more nuanced in this scenario.

Table 8-3: Reduction in Peak Hour Car Trips due to OSM mode Shift Assumption

Time Period	Total Car Trips to/from/within St Albans District – 2041 Future Year with Local Plan in place			
	No Mode Shift	With OSM Mode Shift	Reduction in Trips	% Reduction
AM Peak Hour	33,489	29,912	-3,577	-10.7%
PM Peak Hour	32,828	29,130	-3,698	-11.3%

9 Modelling Results

9.1 Overview

9.1.1. This chapter presents the results of the scenarios and within this section the transport modelling results are presented in a number of ways. In some cases results for each scenario are presented individually, whereas in other cases a series of comparisons has been drawn to show the incremental change between scenarios. These comparisons are as follows:

- **Option 0 vs Base Year**: This comparison shows the forecast changes between the model base year of 2014 and the future year of 2041 when all completed and consented transport schemes developments are built out.
- **Option 1 vs Option 0**: This comparison shows the impact of the Local Plan development allocations without any transport infrastructure mitigation measures.
- **Option 2 vs Option 1:** This comparison shows the impact of the transport infrastructure mitigation measures alongside the 10% modal shift away from car across SAD.
- **Option 3 vs Option 1**: This comparison also shows the impact of the proposed mitigation measures but with the alternative mode shift assumptions derived from the Opportunity to Shift Modes tool

9.1.2. The following metrics are presented:

- **Highway network performance** (section 9.2)
  - Highway network statistics for St Albans
  - Diagrams showing Volume / Capacity ratio (V/C%) for all links in the network – this indicates how close to capacity each link is.
  - Diagrams showing link delays.
- **Traffic flows** (section 9.3)
  - Diagrams showing forecast traffic flows to and from the key development allocations.
  - Diagrams showing the net change in traffic flow between the options, as described above.
  - Diagrams to show the impact to the SRN
- **Performance of junctions** (section 9.4)
  - Diagrams showing the changes in junction delay across St Albans district
  - Summary of total flow entering each key junction across each scenario

- Summary of average delay per vehicle at each key junction across each scenario

- **Journey times** (section 9.5)
  - Tabulation of journey times along a selection of routes through the network between each scenario.
  - Graphs showing travel time along each route in more detail.
  - Tabulation of average travel time between St Albans (areas of St Albans city, Redbourn and Harpenden) and neighbouring towns and districts.

9.1.3. All of the modelling results have been presented for the AM and PM peak hours.

9.2 Highway Network Performance

9.2.1. Table 9-1 and Table 9-2 show summary indicators of network performance for the St Albans District highway network. These have been derived by cordoning the St Albans network from the wider COMET model area and examining the network statistics within the SATURN highway assignment model.

9.2.2. These results show the following changes between scenarios:

Total Vehicle Trips

9.2.3. In both AM and PM peak total vehicle trips increases across St Albans between the base year and Option 0 and 1 as a result of the consented and proposed developments. In Option 2 and 3 as a result of the mode shift changes applied the number of trips in St Albans is lower compared to Option 1, with Option 3 being the lowest overall.

Total Time Travelled

9.2.4. In both AM and PM peak total time travelled increases across St Albans between the base year and Option 0 and 1 as a result of the consented and proposed developments. In Option 2 and 3 as a result of the mode shift changes and IDP schemes the total time travelled in St Albans is lower compared to Option 1.

Time on Links

9.2.5. In both AM and PM peak time on links increases across St Albans between the base year and Option 0 and 1 as a result of the consented and proposed developments. In Option 2 and 3 as a result of the mode shift changes and IDP schemes the time on links in St Albans is lower compared to Option 1.

Time at Junctions

9.2.6. In both AM and PM peak time at junctions increases across St Albans between the base year and Option 0 and 1 as a result of the consented and proposed developments. In Option 2 and 3 as a result of the mode shift changes and IDP schemes the time at junctions in St Albans is lower compared to Option 1.

Average Speed

9.2.7. The average speed in the AM and PM peak is highest in the base year and lowest in Option 1. Average speed increases in Option 2 and 3 compared to Option 1, as a result of the IDP infrastructure and mode shift changes. The average speed in Option 2 and 3 is only 0.2-0.6 mph slower compared to Option 0 when there is no Local Plan developments, IDP schemes or mode shift.

Table 9-1: Summary of St Albans Highway Network Performance (AM Peak Hour)

Indicator	Base 2014	Future 2041			
		Option 0	Option 1	Option 2	Option 3
		Committed Developments and Infrastructure	**With Local Plan allocations added**	**With Local Plan Allocations and IDP plus mode shift**	**With Local Plan Allocations and IDP plus alternative mode shift**
Total vehicle trips	58,598	69,189	74,664	72,054	71,876
Total Time Travelled (PCU.Hrs)	9,699	12,813	14,299	13,069	13,206
- Time on links (PCU.Hrs)	8,026	9,929	10,511	10,174	10,271
- Time at junctions (PCU.Hrs)	1,673	2,884	3,789	2,895	2,935
Average Speed (mph)	36.2	32.4	30.1	32.2	32.1

Table 9-2: Summary of St Albans Highway Network Performance (PM Peak Hour)

Indicator	Base 2014	Future 2041			
		Option 0	Option 1	Option 2	Option 3
		Committed Developments and Infrastructure	With Local Plan allocations added	With Local Plan Allocations and IDP plus mode shift	With Local Plan Allocations and IDP plus alternative mode shift
Total vehicle trips	58,095	65,905	71,604	69,133	68,595
Total Time Travelled (PCU.Hrs)	9,836	12,369	13,737	12,841	12,801
- Time on links (PCU.Hrs)	8,095	9,548	10,199	9,880	9,926
- Time at junctions (PCU.Hrs)	1,741	2,821	3,538	2,961	2,876
Average Speed (mph)	36.6	32.7	30.7	32.1	32.4

Link Capacity

9.2.8. The following figures show the Volume/Capacity (V/C) ratio for all links in the St Albans network. In these plots, yellow indicates where links are approaching capacity, 85%-100%, orange indicates where the link is just over capacity, 100-105% and red indicates that the link is over greater than 105%.

Key Roads in St Albans

9.2.9. Figure 9-1 shows the key roads in St Albans for the ease of the readers to identify the impacts shown in figures to follow.

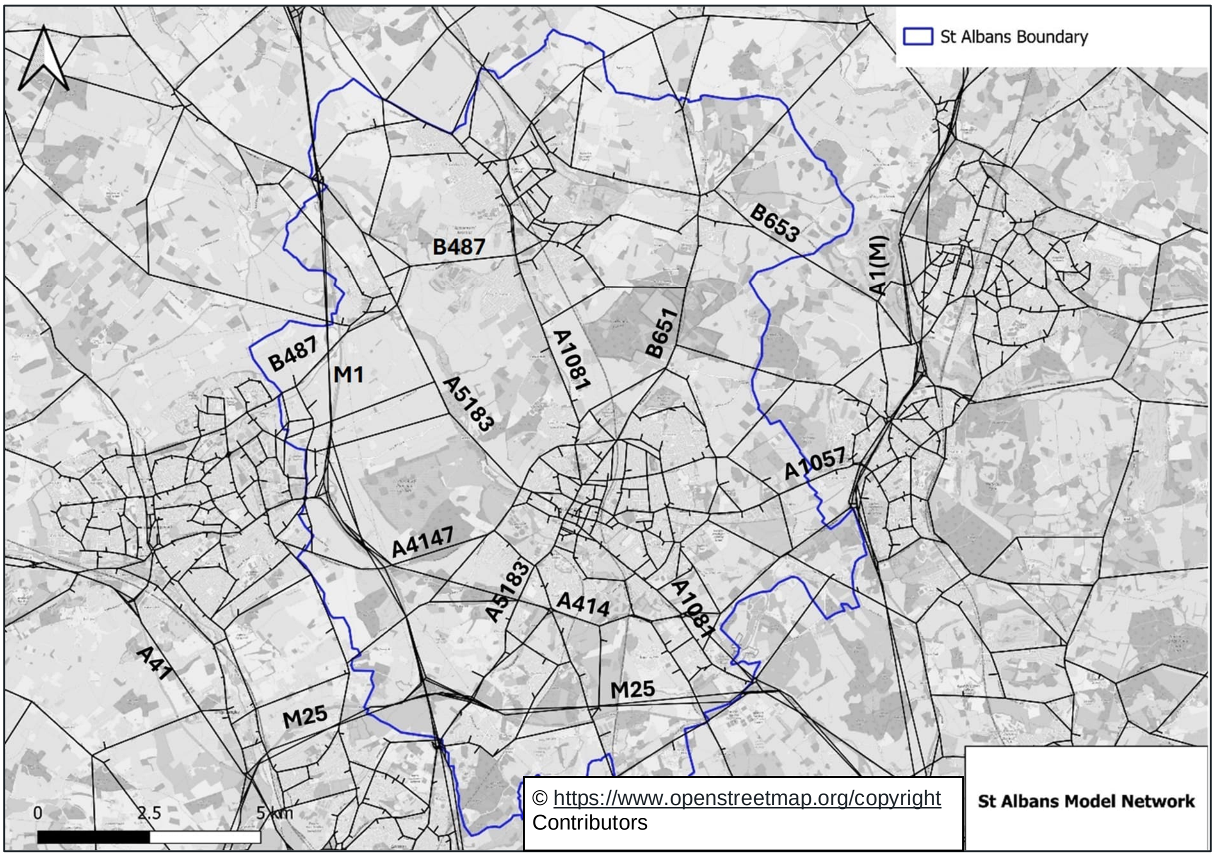

Figure 9-1: Key Roads in St Albans

Base Year

9.2.10. Figure 9-2 and Figure 9-3 show the base year V/C for St Albans in the AM and PM peaks. These show the majority of links are within capacity across the district with only a handful of locations where capacity of greater than 100%. Key locations where base year links are over capacity are roads approaching the SRN such as A405 approaching M1 junction 6, the A414 approaching M25 Junction 21A, the A414 around Colney Heath and the approach to A1(M) Junction 3.

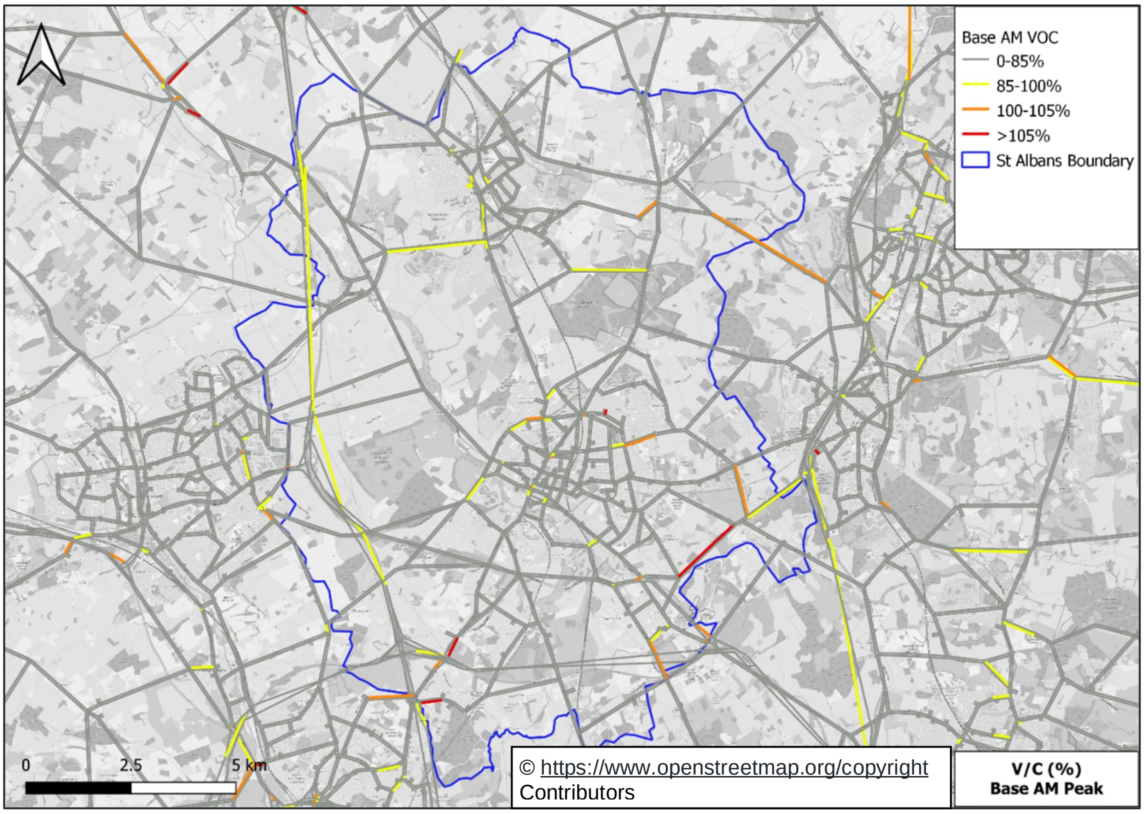

Figure 9-2: Base Year Link Volume/Capacity Ratio, AM Peak Hour

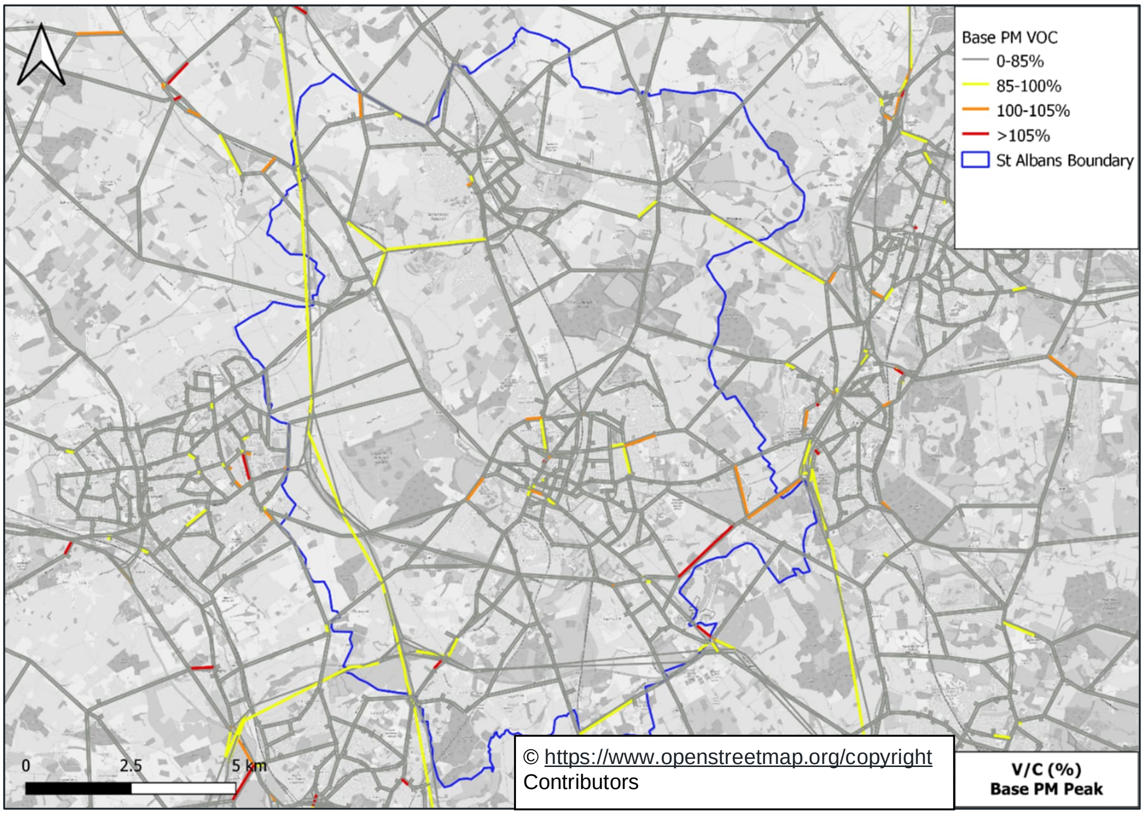

Figure 9-3: Base Year Link Volume/Capacity Ratio PM Peak Hour

Option 0

9.2.11. Figure 9-4 and Figure 9-5 show the 2041 Option 0 V/C for St Albans in the AM and PM peaks. As a result of the future increase in traffic and consented schemes there is a deterioration in V/C across the district. Key roads which experience increases in V/C in the AM peaks include A4147 to the west of St Albans, the A414 approaching A1(M) Junction 3, Church Street in Wheathampstead and Ferrers Lane approaching the B651. In the PM peak key roads which experience increases in V/C are the M25 Junction with the M1, the A4141, A1057 and A1(M) in the approach to A1(M) Junction 3 and B653 between Welwyn Garden City and Wheathampstead.

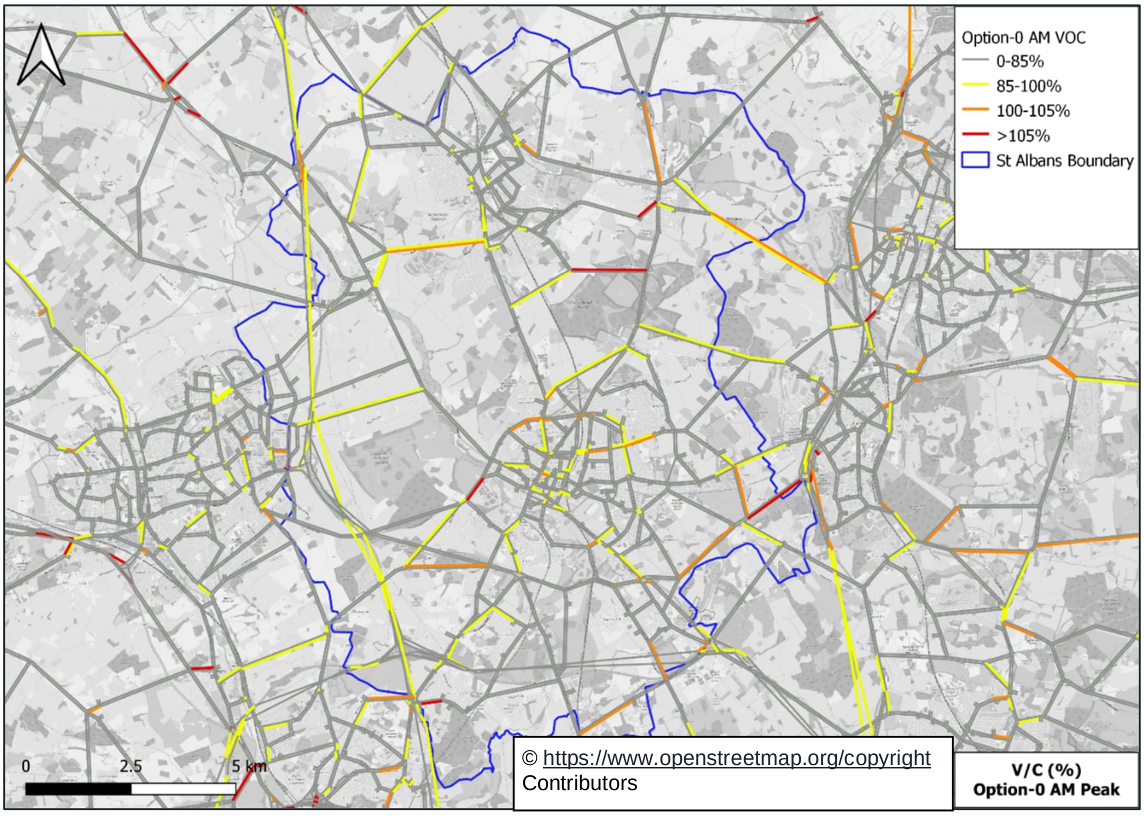

Figure 9-4: Option 0 Link Volume/Capacity Ratio, AM Peak Hour

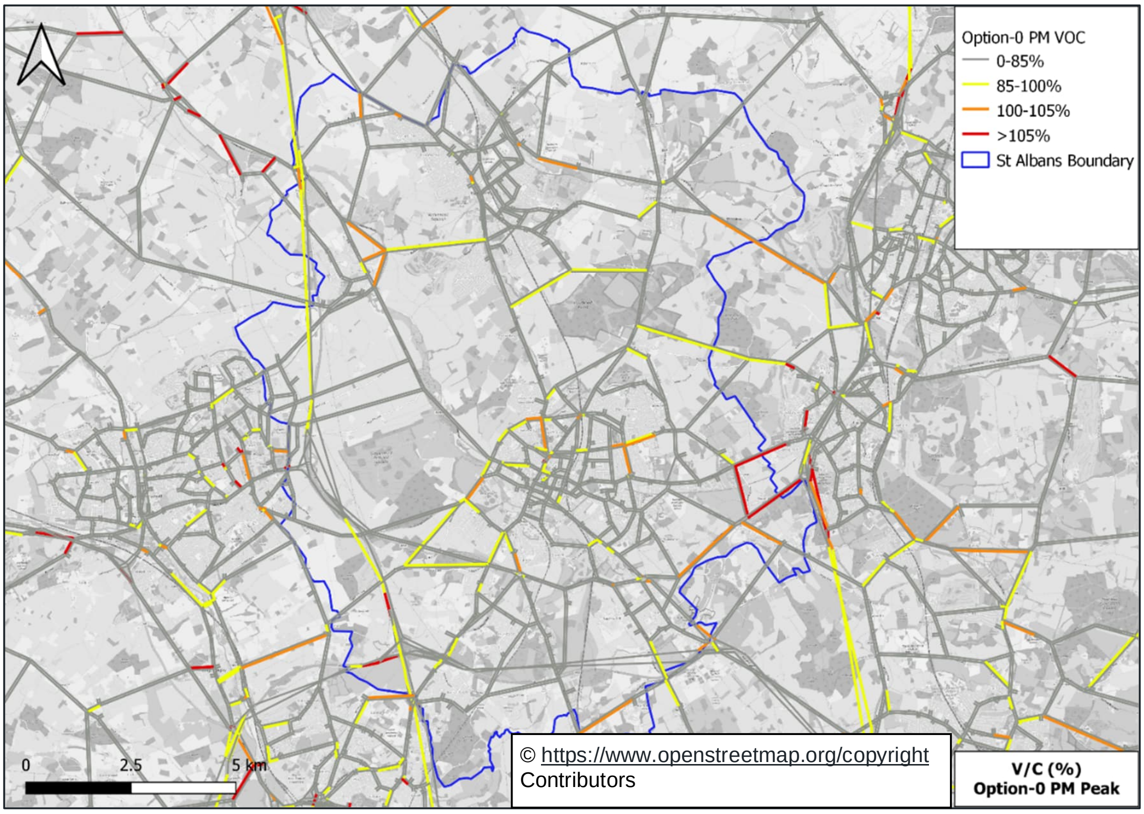

Figure 9-5: Option 0 Link Volume/Capacity Ratio, PM Peak Hour

Option 1

9.2.12. Figure 9-6 and Figure 9-7 show the 2041 Option 1 V/C for St Albans in the AM and PM peaks. As a result of the SADC Local Plan key roads which experience increases in V/C in the AM peak include A414 approaching A1(M) Junction 3, Potterscrouch Lane, Ragged Hall Lane, Chequers Lane, Sandridgbury Lane, B651 north of Wheathampstead as well as roads approaching the A414 Breakspear Way. In the PM peak key roads which experience increases in V/C are Potterscrouch Lane, Ragged Hall Lane, roads approaching the A414 Breakspear Way, Church Street in Wheathampstead and Ferrers Lane approaching the B651 and B651 north of Wheathampstead.

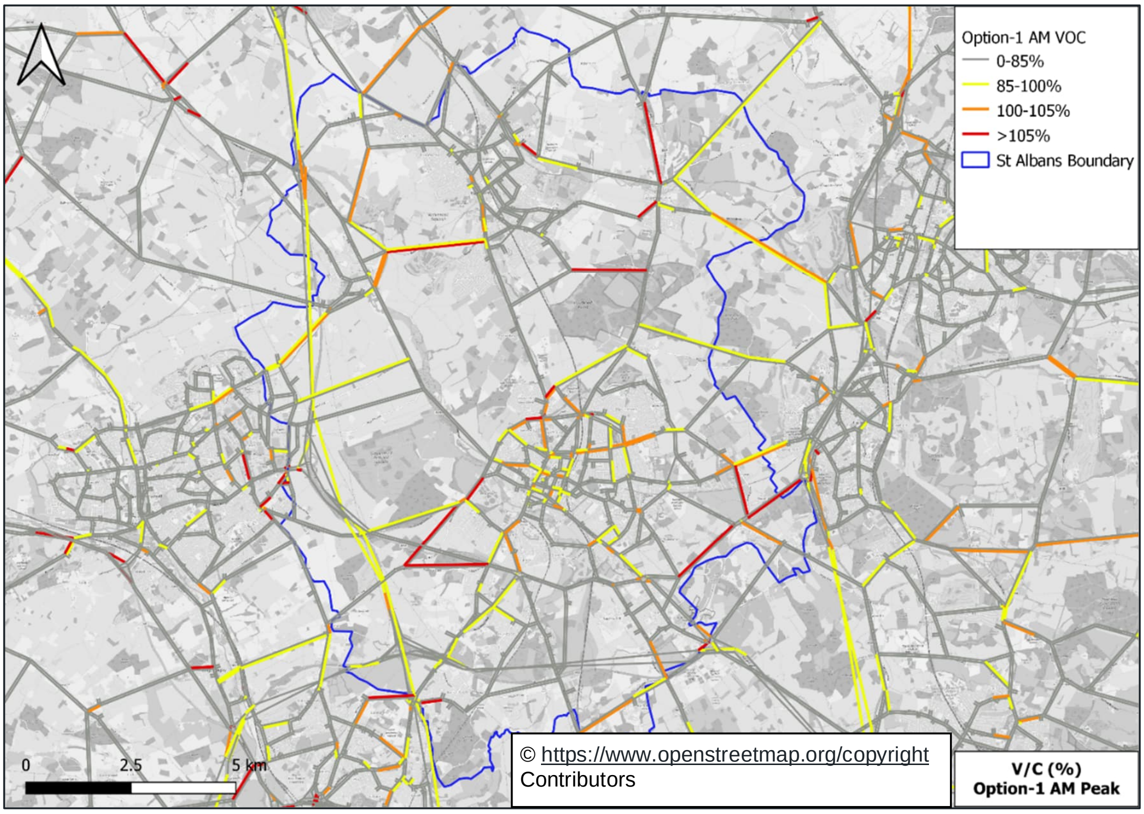

Figure 9-6: Option 1 Link Volume/Capacity Ratio, AM Peak Hour

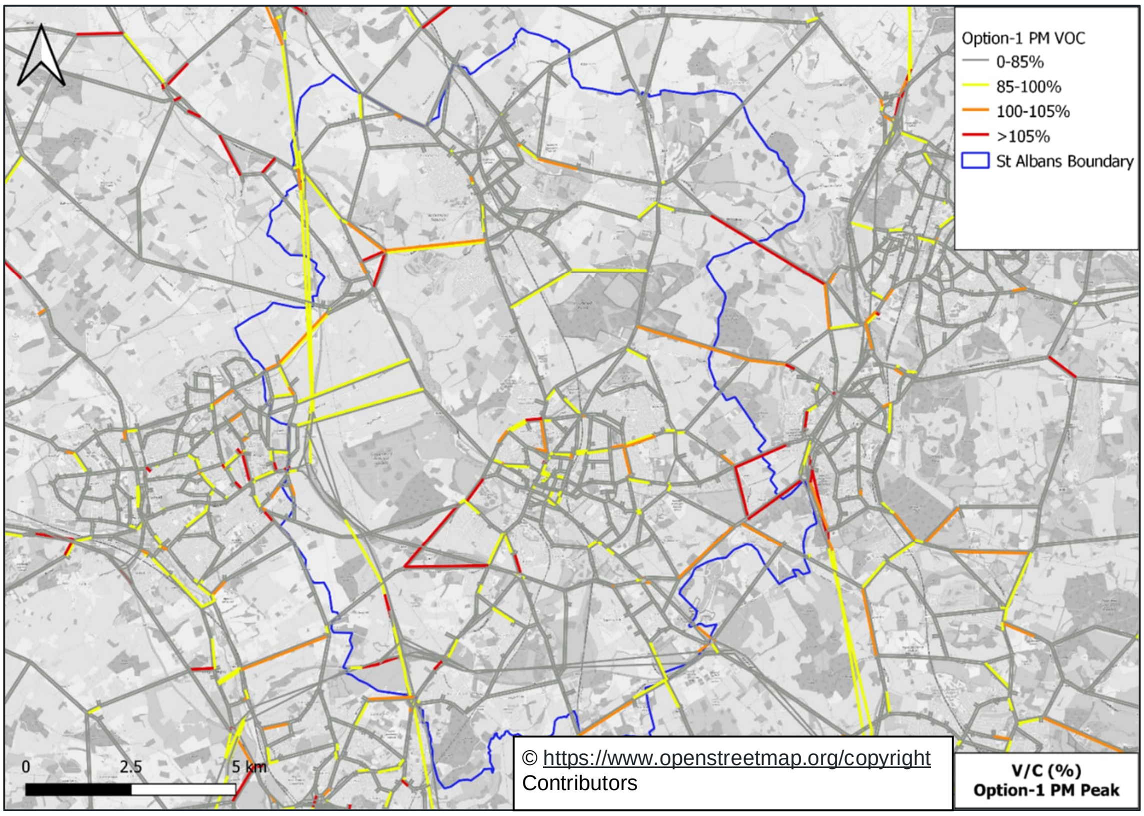

Figure 9-7: Option 1 Link Volume/Capacity Ratio, PM Peak Hour

Option 2

9.2.13. Figure 9-8 and Figure 9-9 show the 2041 Option 2 V/C for St Albans in the AM and PM peaks. As a result of the SADC IDP schemes and 10% mode shift there is a general improvement in V/C on some of the local roads such as Potterscrouch Lane, Ragged Hall Lane, Chequers Lane, Sandridgebury Lane and the roads approaching A414 Breakspear Way. On area of the highway network which does deteriorate is on B487 in the both peaks. Generally as a result of the IDP schemes and mode shift there is an improvement in capacity on local routes which suggests the improvements of the IDP schemes are reducing traffic rat running.

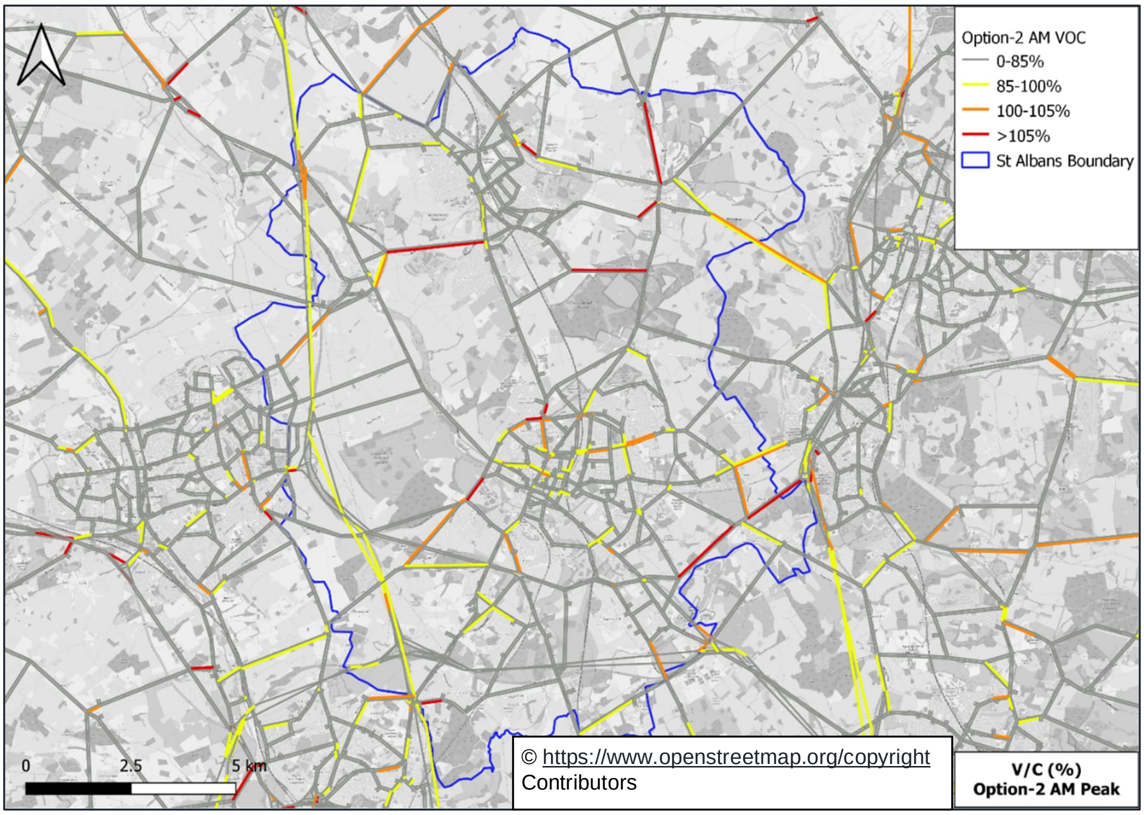

Figure 9-8: Option 2 Link Volume/Capacity Ratio, AM Peak Hour

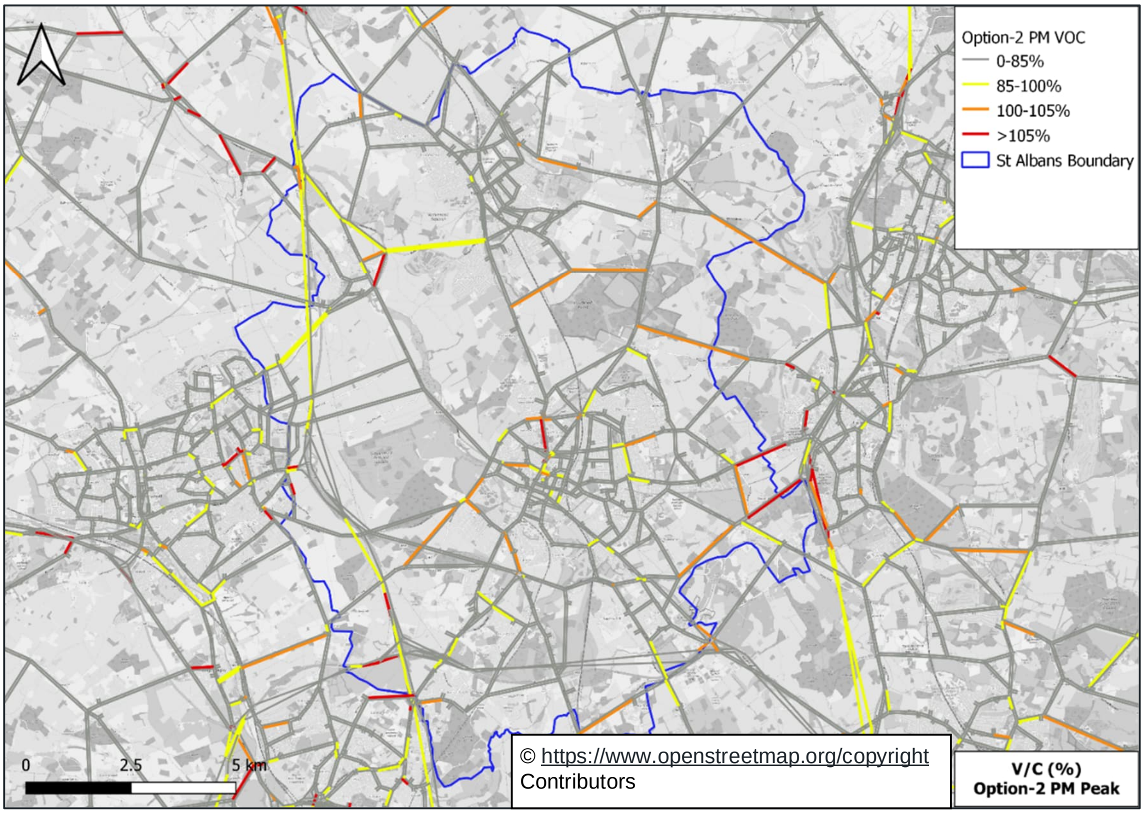

Figure 9-9: Option 2 Link Volume/Capacity Ratio, PM Peak Hour

Option 3

9.2.14. Figure 9-10 and Figure 9-11 show the 2041 Option 3 V/C for St Albans in the AM and PM peaks. As a result of the SADC IDP schemes and 10% OTS mode tool the V/C is very similar to Option 2 with a general improvement, compared to Option 1, in V/C on some of the local roads such as Potterscrouch Lane, Ragged Hall Lane, Chequers Lane, Sandridgebury Lane and the roads approaching A414 Breakspear Way. Parts of the highway network which do deteriorate are B487 in both peaks. In Option 3 the V/C of A1081 south of Batchwood Drive improves in the PM peak which is a result of the OTS mode tool impacting more urban trips within St Albans. Generally as a result of the IDP schemes and OTS mode tool there is an increase in traffic on key strategic roads and a reduction on local more rural routes.

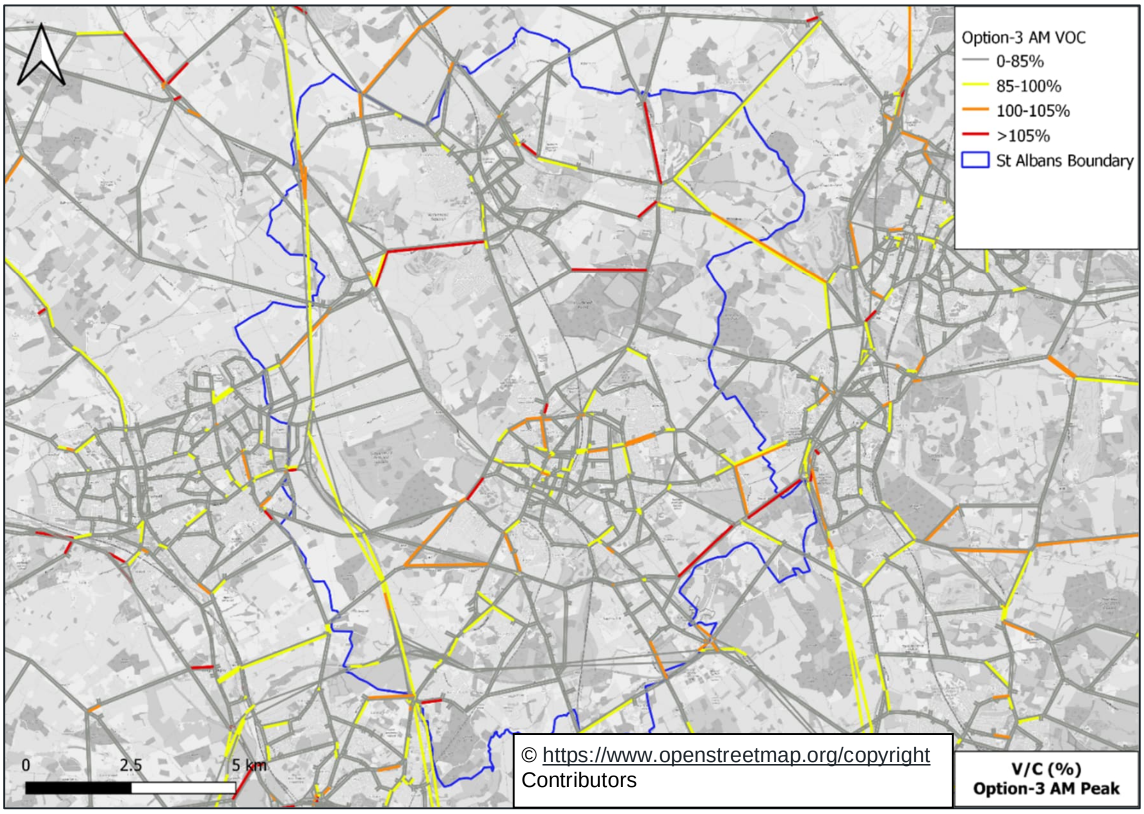

Figure 9-10: Option 3 Link Volume/Capacity Ratio, AM Peak Hour

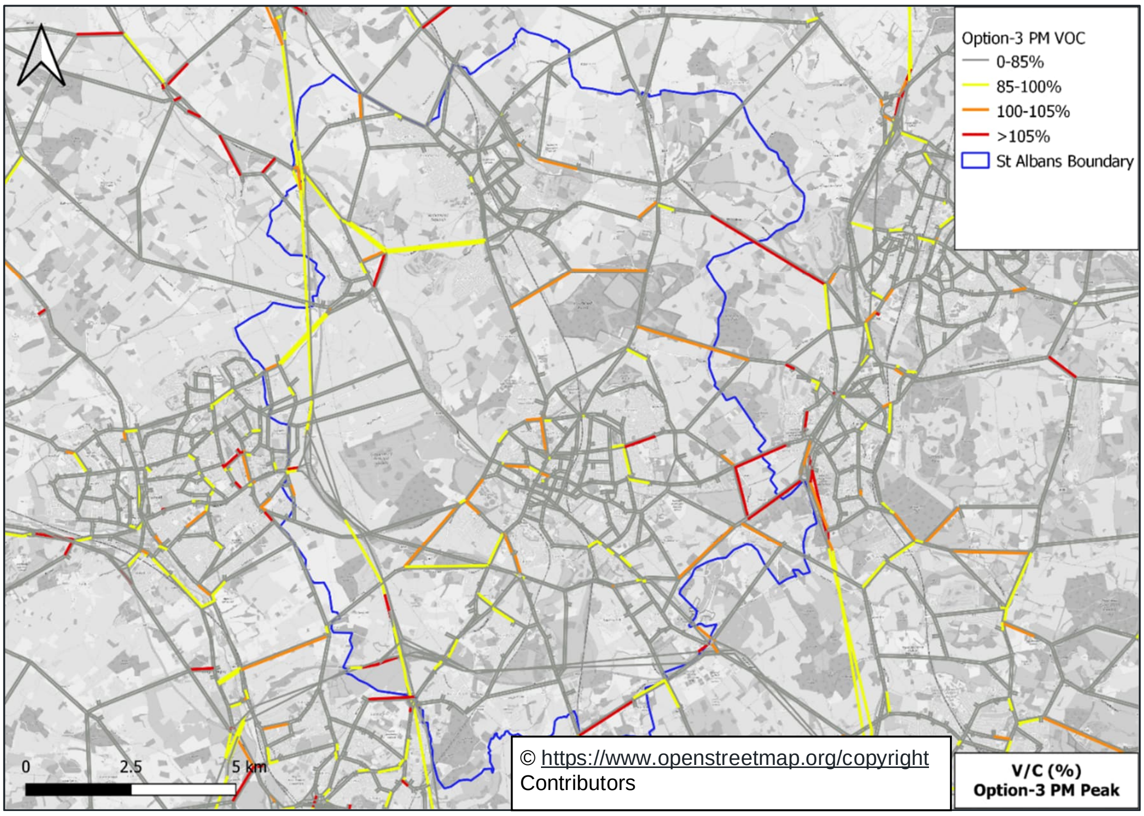

Figure 9-11: Option 3 Link Volume/Capacity Ratio, PM Peak Hour

Link Delay

9.2.15. The following figures show the link delay for all links in the St Albans network. In these plots:

- Dark green indicates a delay decrease of minutes or less
- Light green indicates a link delay of between 1-2 minutes
- Orange is a link increase of between 1-2 minutes
- Red is an increase in link delay of over 2 minutes.

9.2.16. It is important to note that the length of the line represents the length of the link rather than the severity of delay and link lengths tend to be shorter in urban areas.

Impact of Future Year Growth and Committed Developments

9.2.17. The impact of future year growth and committed developments on the link delays is presented in Figure 9-12 and Figure 9-13, which show the delay difference between Option 0 and the Base. Across St Albans there is generally increases in delay on primary key roads in the area such as A414, A4147, B487, Ferrers Lane, B651 and Church Lane in Wheathampstead. There are some links which do experience a reduction in delays which is a result of either junction improvements in the area or traffic re-routing.

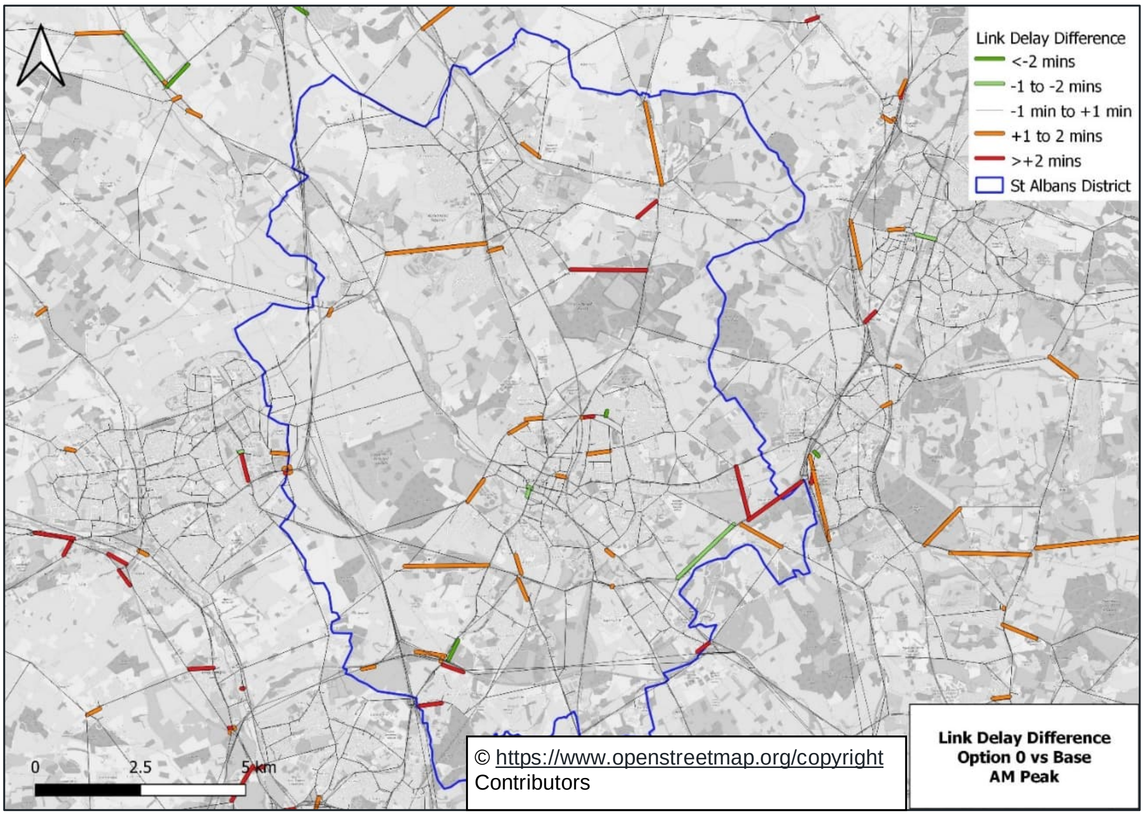

Figure 9-12: Link Delay Difference Option 0 vs Base AM Peak

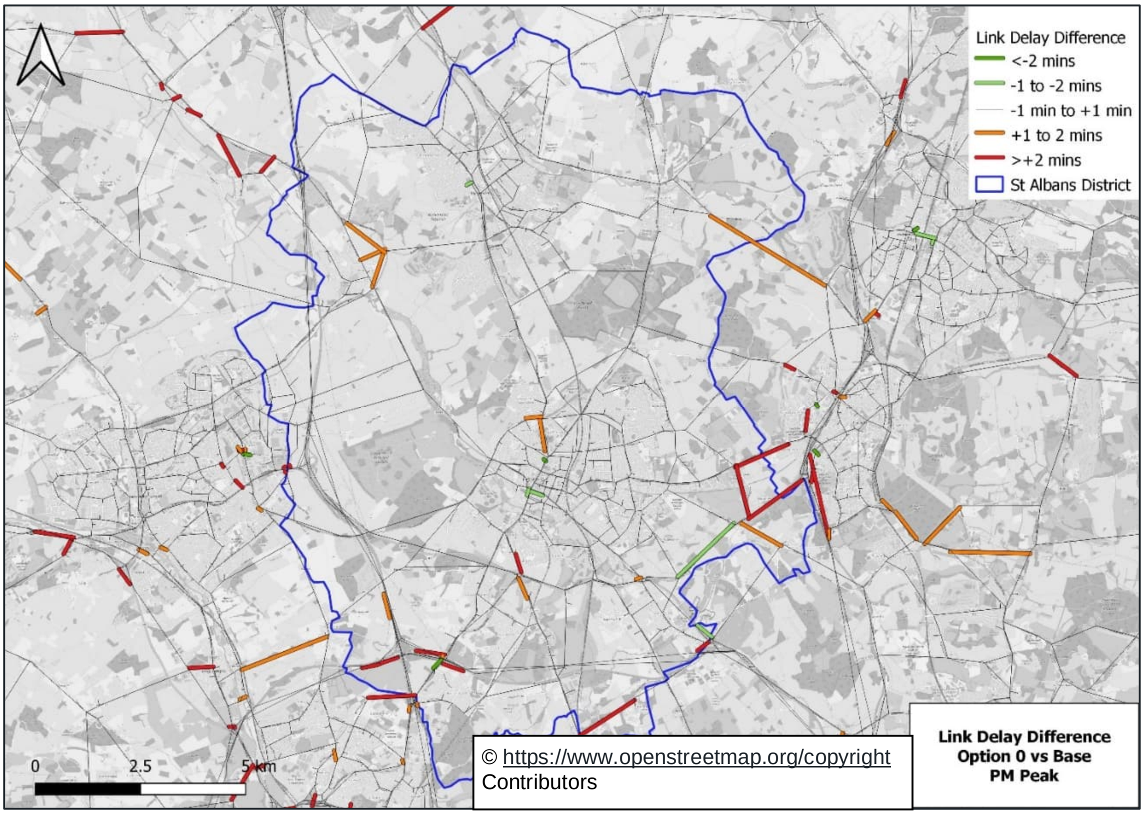

Figure 9-13: Link Delay Difference Option 0 vs Base PM Peak

Impact of Local Plan without Mitigation

9.2.18. The impact of the Local Plan without mitigation on the link delays is presented in Figure 9-14 and Figure 9-15, which show the delay difference between Option 1 and Option 0. These show increases in delay on links which experience an increase in V/C as outline earlier. Key links which experience increases in delay are, A414 approaching A1(M) Junction 3, Potterscrouch Lane, Ragged Hall Lane, Chequers Lane, Sandridgebury Lane, Punchbowl Lane, A414 Breakspear Way, Church Street in Wheathampstead and Ferrers Lane approaching the B651, A4147, B653 and B487.

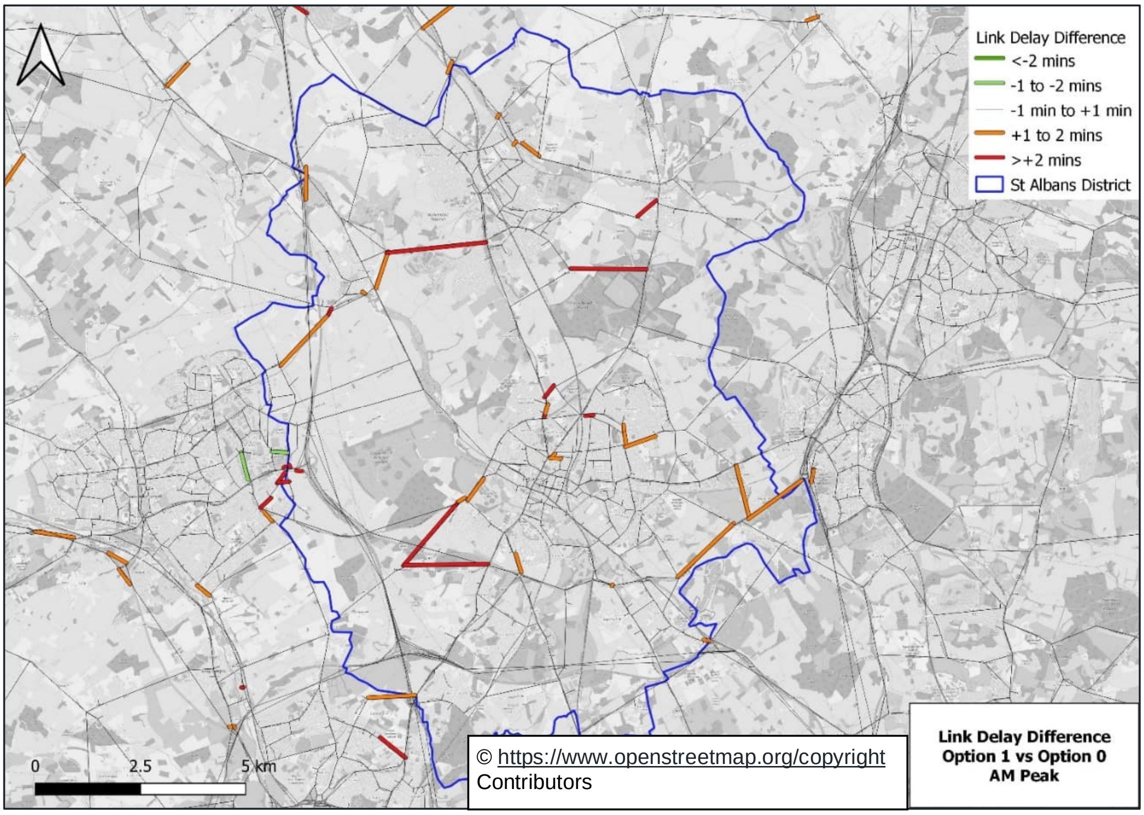

Figure 9-14: Link Delay Difference Option 1 vs Option 0 AM Peak

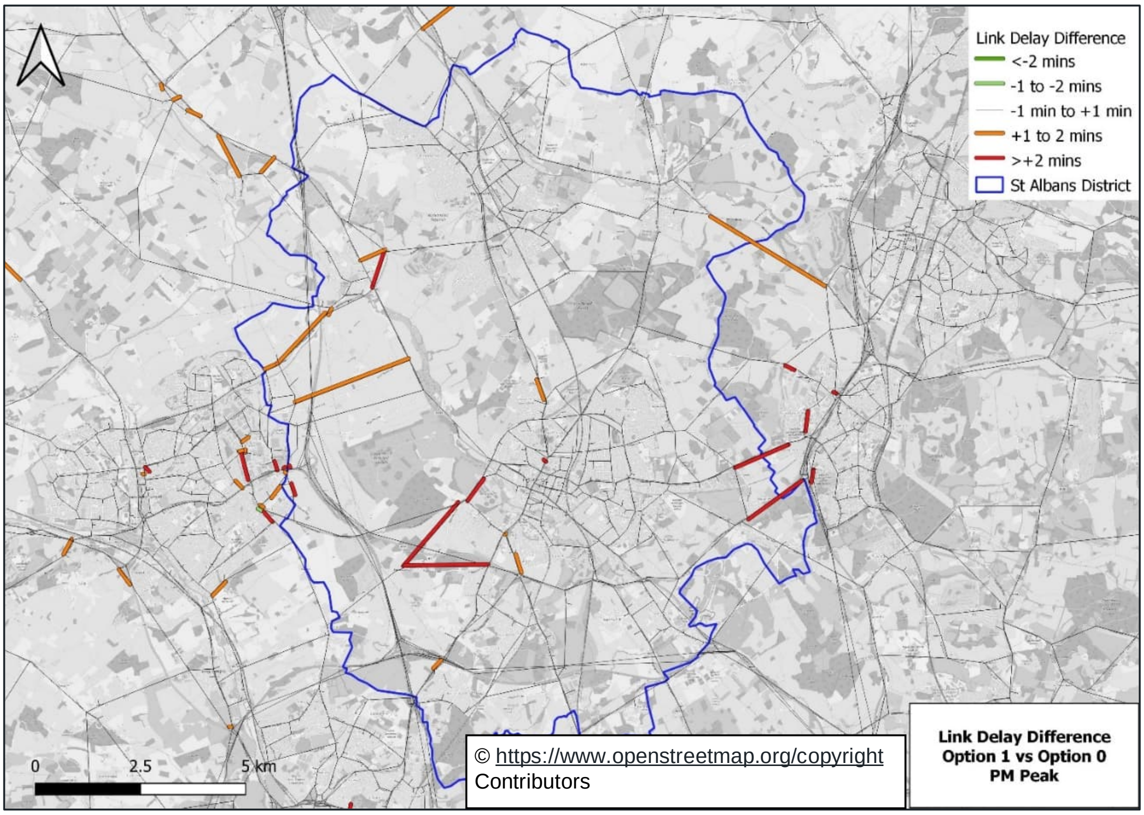

Figure 9-15: Link Delay Difference Option 1 vs Option 0 PM Peak

Impact of Mitigation (IDP and 10% Modal Shift)

9.2.19. The impact of the IDP mitigation and 10% Modal Shift on the link delays is presented in Figure 9-16 and Figure 9-17, which show the delay difference between Option 2 and Option 1. This shows that for the majority of links in St Albans as a result of the IDP schemes and 10% mode shift there is a reduction in link delays. This indicates the proposed improvements to the network and mode shift are generating a positive impact on the highway network. There are some links where delays increase which include A1081 southbound where increases in link delay, over 2 minutes, which are occurring as a result of Valley Road and Sandridgebury Lane being closed to traffic in Option 2. There are also smaller increases in delay on The Common north of Harpenden, Ferrers Lane approach to B651 and on Colney Heath Lane and A414 Tippendell Lane and some residential roads to the west of the East Hemel development. It is advised that further work could be undertaken at these locations to understand if any mitigation needs to be adopted to reduce the delays as part of the next stage of the Local Plan.

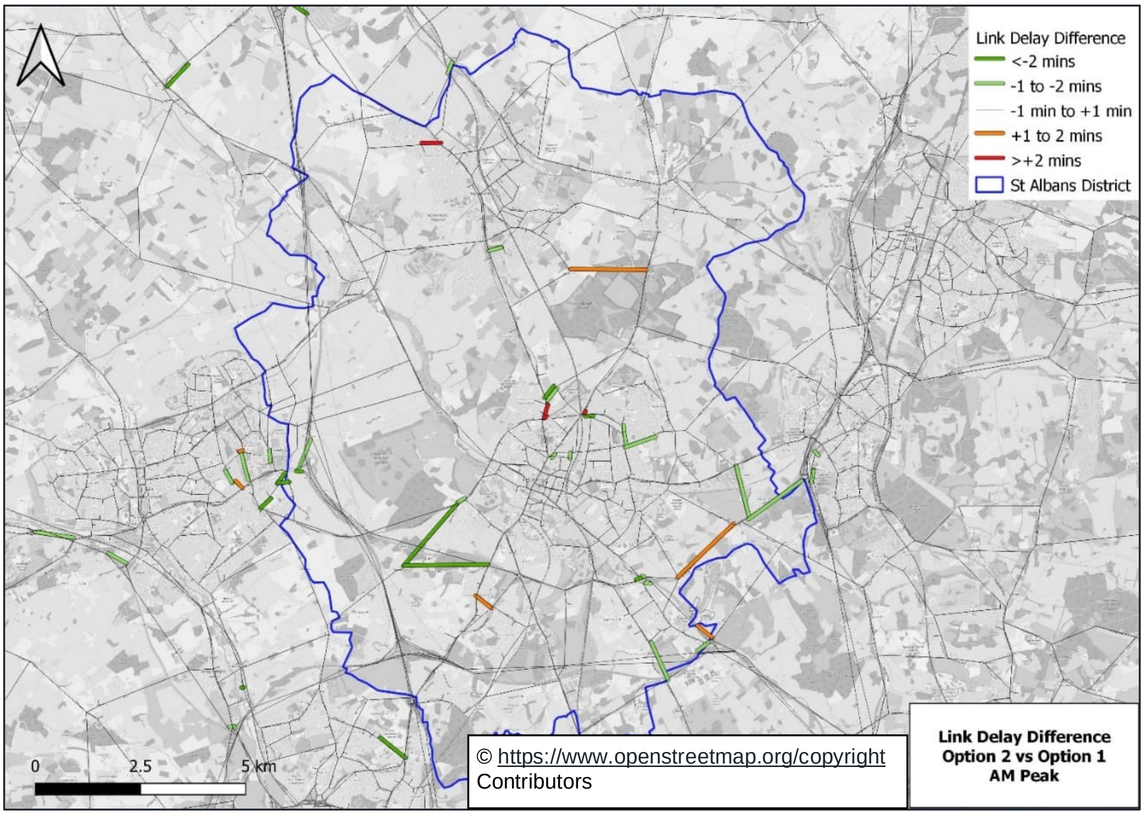

Figure 9-16: Link Delay Difference Option 2 vs Option 1 AM Peak

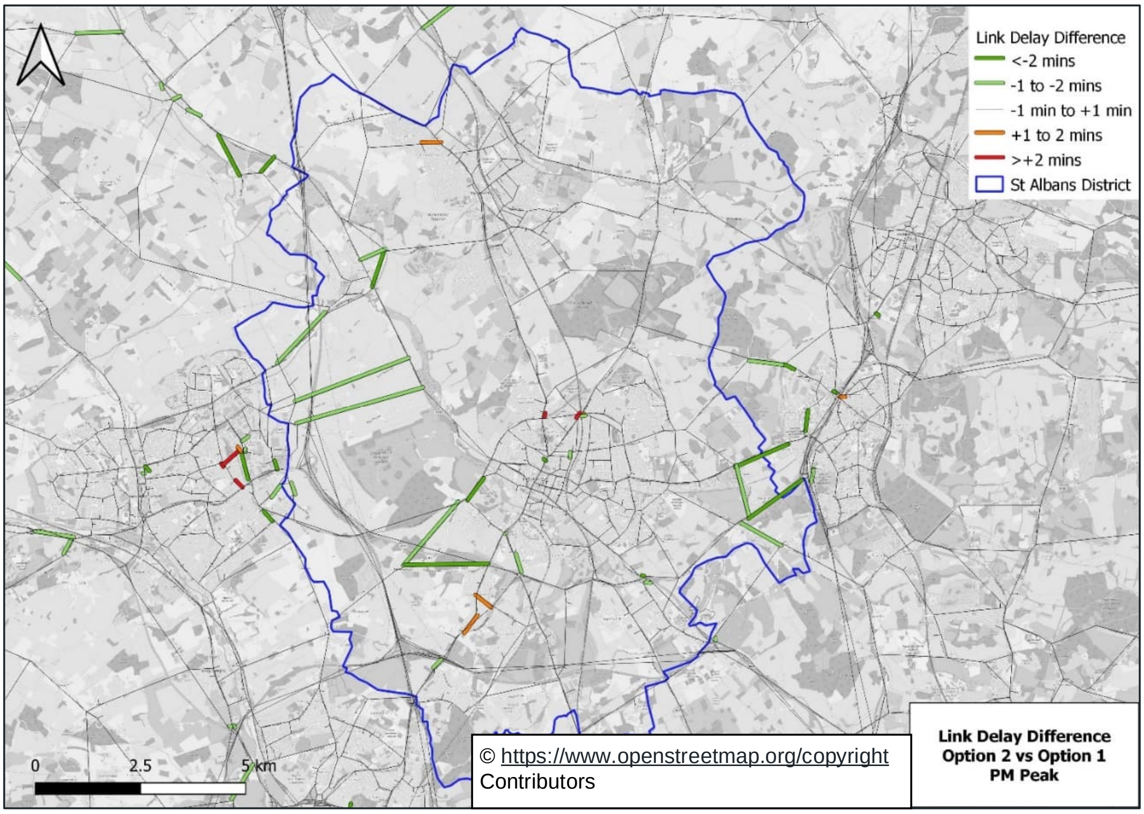

Figure 9-17: Link Delay Difference Option 2 vs Option 1 PM Peak

Impact of Mitigation (IDP and Alternative Modal Shift)

9.2.20. The impact of the IDP mitigation and the alternative modal shift on the link delays is presented in Figure 9-18 and Figure 9-19, which show the delay difference between Option 3 and Option 1. The locations where delay increases is broadly the same as the delay increases between Option 2 and 1. The only differences is an increase in delay at Ferrers Lane, delays at Church Street in Wheathampstead and an increase in delay on the M1 slip road at junction 8 in the AM peak.

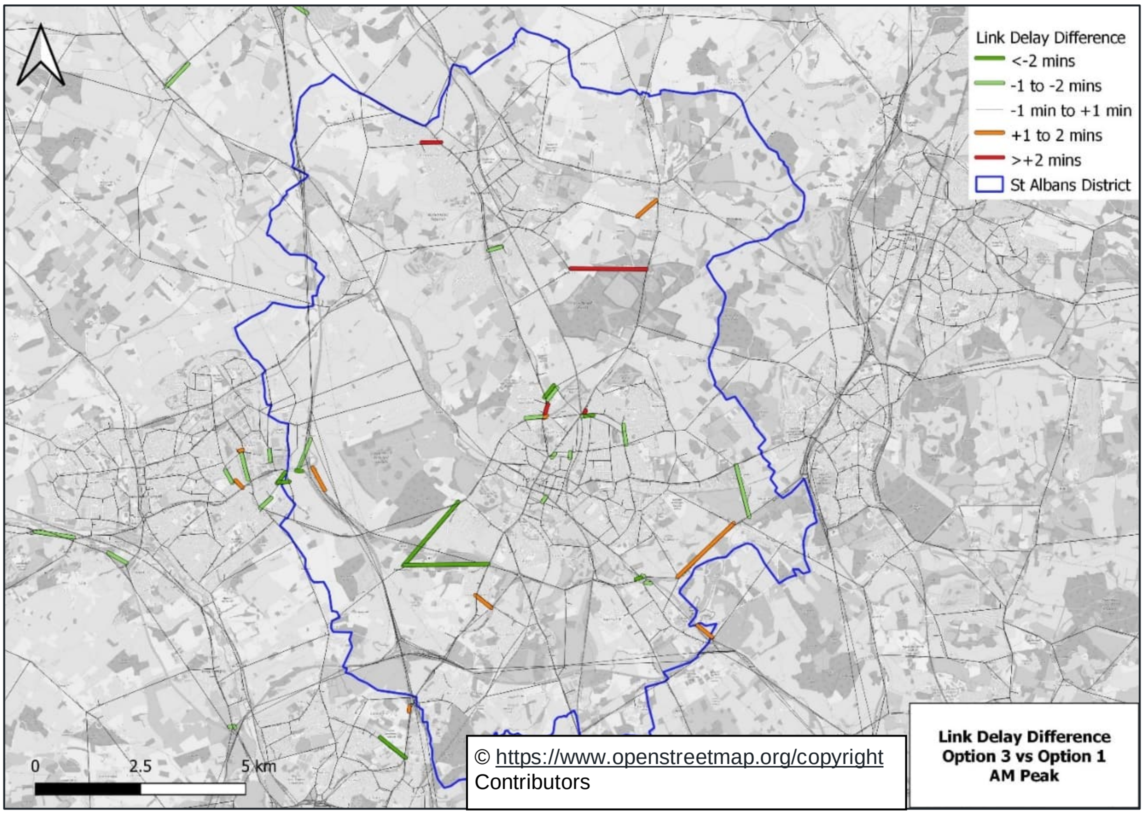

Figure 9-18: Link Delay Difference Option 3 vs Option 1 AM Peak

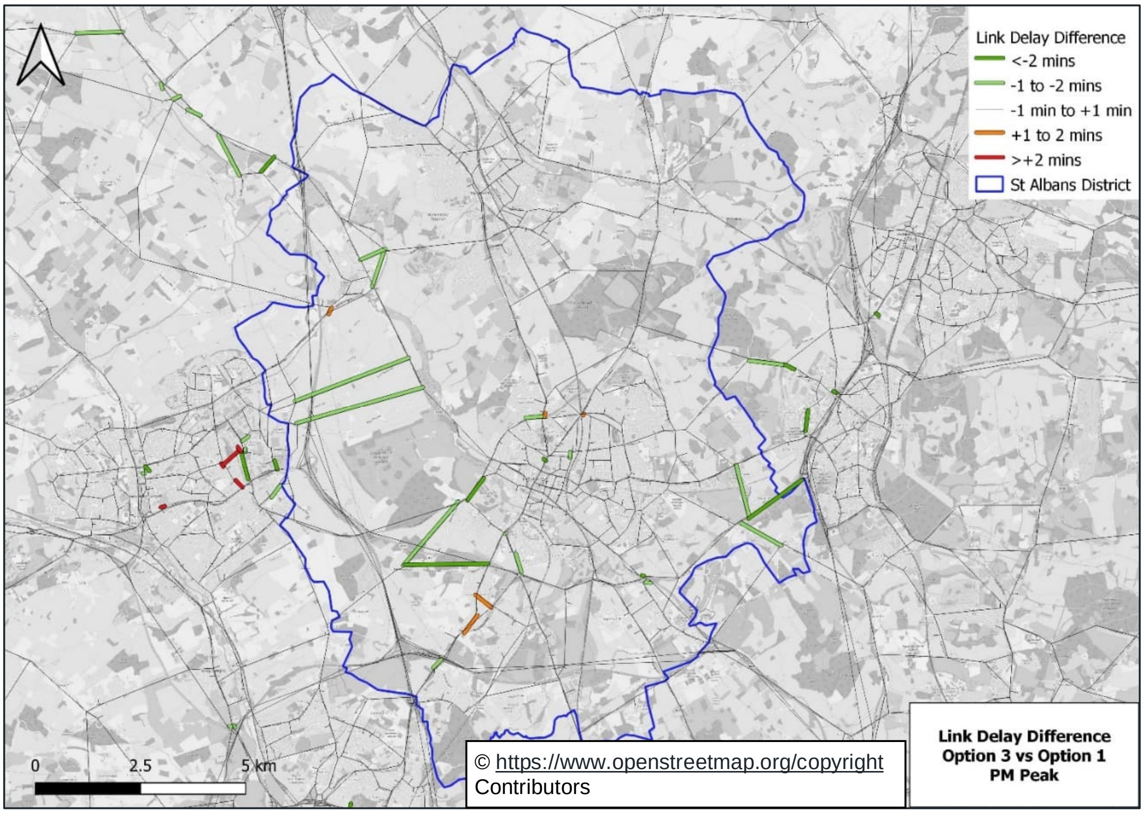

Figure 9-19: Link Delay Difference Option 3 vs Option 1 PM Peak

9.3 Traffic Flows

Development Traffic Flow Analysis

9.3.1. The diagrams in this section show the forecast traffic flows to and from each of the key development sites in the Local Plan. This gives an indication of the likely routes used by those living in the new developments. All results have been extracted from Option 1 and Option 3. It is important to note that the scale used for the traffic plots is the same for all developments to allow easy comparisons.

9.3.2. These plots show passenger car units (pcus), pcus are relative weight factor used to represent the impact of different types of vehicles. In the COMET model cars and light goods vehicles (LGV's) have a pcu factor of 1 and heavy good vehicles (HGV's) have a pcu factor of 2.2.

East Hemel Hempstead

9.3.3. Figure 9-20 and Figure 9-21 shows the combined traffic to and from the four individual sites comprising the East Hemel Garden Community development within the St Albans district in Option 1. In both figures it is clear the proposed development increases traffic flow on the nearby network significantly with increases in flow of over 500 pcus on the new spine road, A414 Breakspear Way and some sections of the M1 close to junction 8. Northbound traffic from the development in Option 1 is accessing the M1 via Redbourn Road and Junction 9 which is a result of delays at the unimproved A414/ Green Lanes junction. Given the scale of the development the traffic flow increases from the site are wide reaching with increases of up to 200 pcus reaching across Hemel Hempstead, to St Albans, London Colney on the A414 and increases on the M25 at the South Mimms interchange, junction 23. To the west of the site traffic flow increases of up to 500 pcus are experienced on the A414, B487 and Link Road. To the east of the site increases in traffic flow up to 500 pcus are experienced on the B487, the M1, A4147, A5183, M25. It is also important to note that there are increases on Punchbowl Lane and Hogg End Lane in both peaks with increases of up to 200pcus in the PM peak. These roads are narrow single lane roads and would not be able to cope with these increases in demand, hence their closure in Option 2.

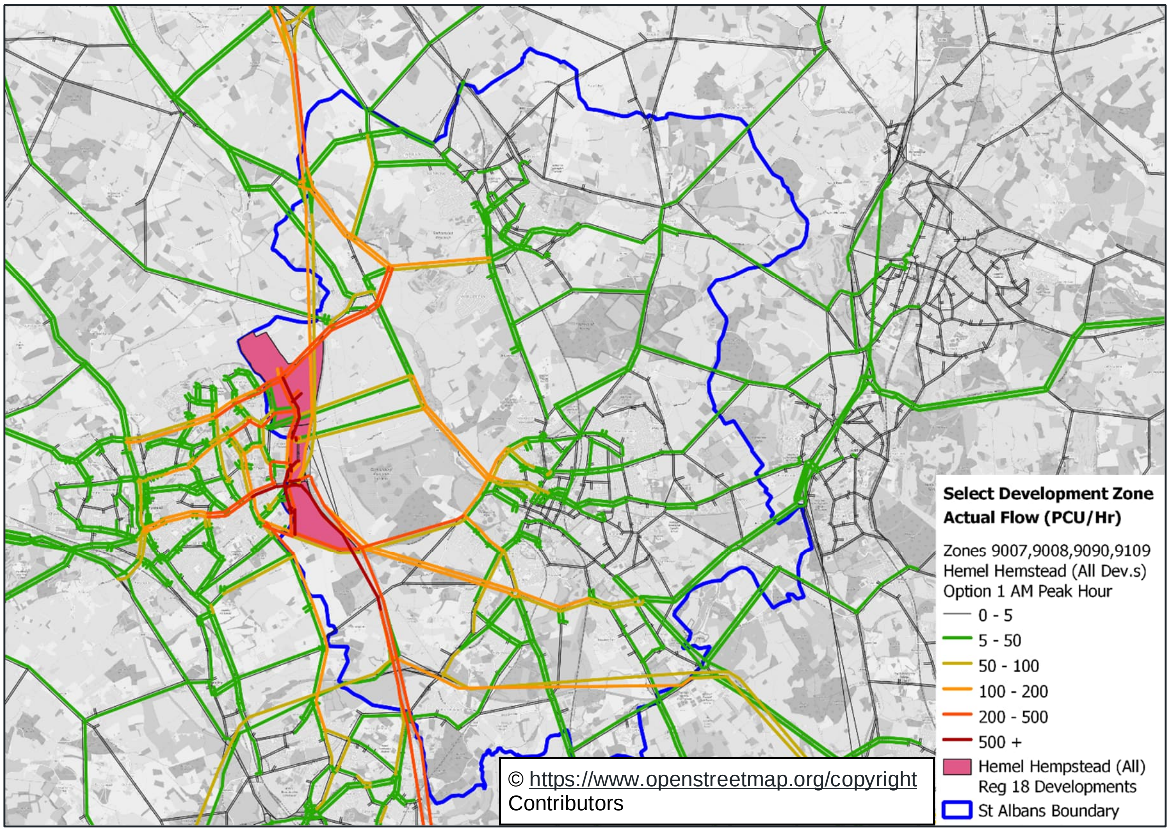

Figure 9-20: Traffic to and from East Hemel Development (AM Peak) Option 1

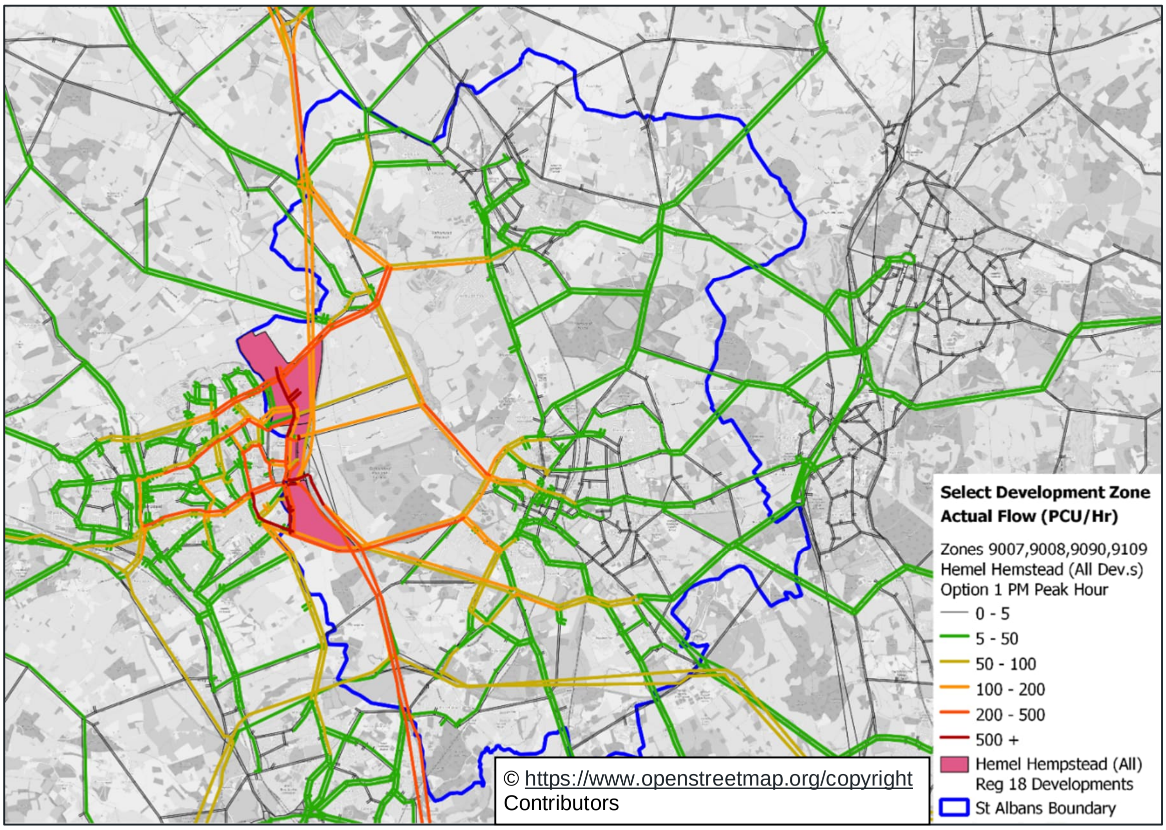

Figure 9-21: Traffic to and from East Hemel development (PM Peak) Option 1

9.3.4. Figure 9-22 and Figure 9-23 shows the combined traffic to and from the four individual sites comprising the East Hemel Garden Community development within the St Albans district in Option 3. The figures show very similar patterns of traffic flow distribution to those which were extracted from Option 1. The key differences is that no traffic flow is now travelling on Punchbowl Lane and Hogg End Lane. This results in reductions in traffic on the southern section of the A5183 in both peaks but increases in traffic flow on the northern section of A5183, this is a result of traffic now using the A5183 to travel to Redbourn instead of using Punchbowl Lane and Hogg End Lane as a route to travel south to St Albans. Another difference is that the volume of traffic travelling northbound to access M1 junction 9 reduces as a result of the A414/ Green Lane junction improvement. However, traffic from the site still does travel north to use M1 Junction 9.

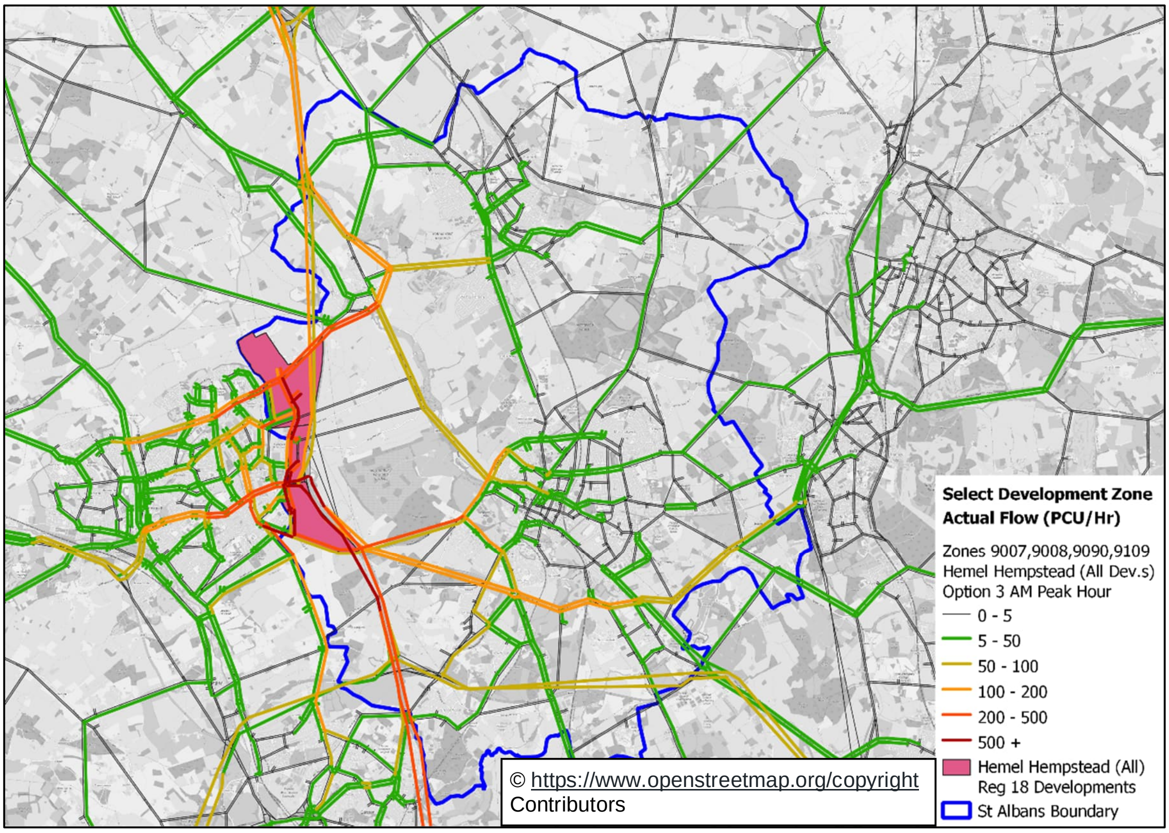

Figure 9-22: Traffic to and from East Hemel Development (AM Peak) Option 3

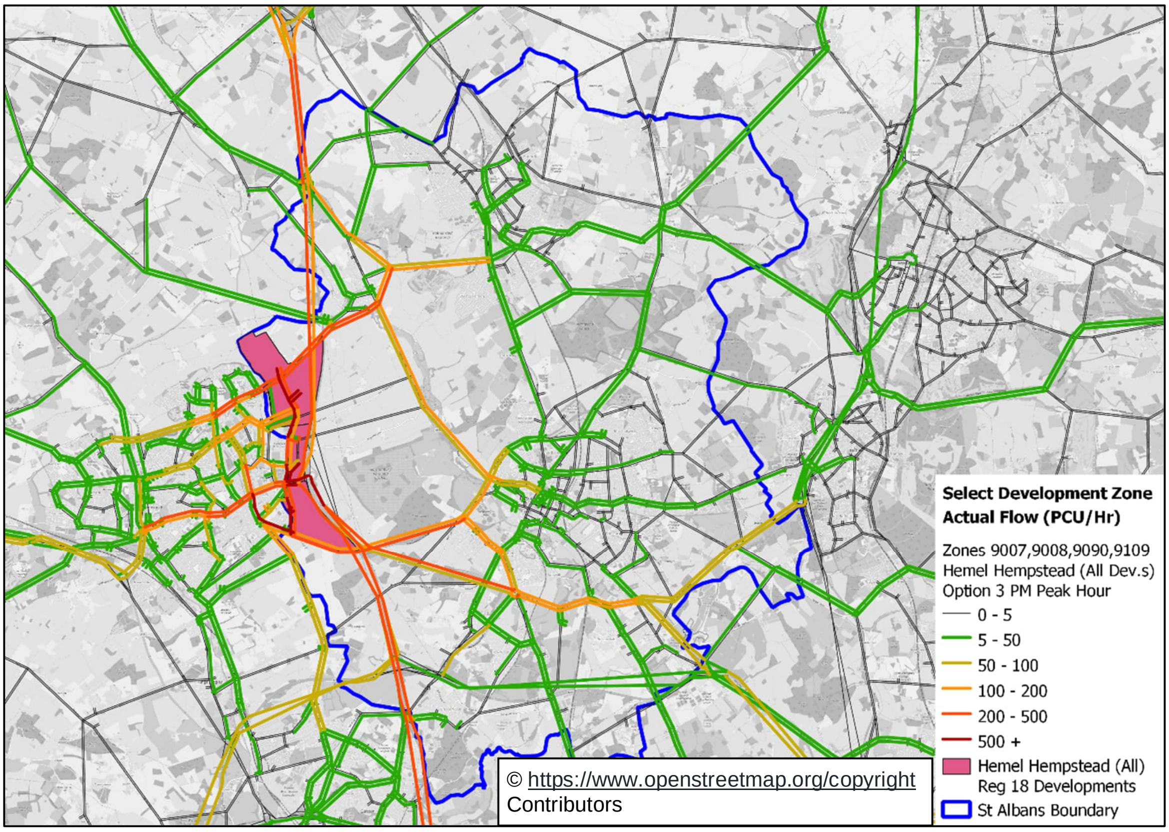

Figure 9-23: Traffic to and from East Hemel development (PM Peak) Option 3

North St Albans

9.3.5. Figure 9-24 and Figure 9-25 shows the traffic to and from the North of St Albans development within the St Albans district in Option 1. In both figures it is clear the proposed development increases traffic flow on the nearby network, predominantly A1081 Harpenden Road both north and south of the development with increases in flow of over 500 pcus. As a result of delays at the King William junction, traffic is diverting onto more minor roads, with increases in traffic experienced on Sandridgebury Lane and Valley Road of up to 200 pcus in both peaks. In the PM peak there are also increases along Ferrers Lane and Ayres End Lane of up to 200 pcus in the westbound direction, with only small increases of traffic on these roads in the AM peak.

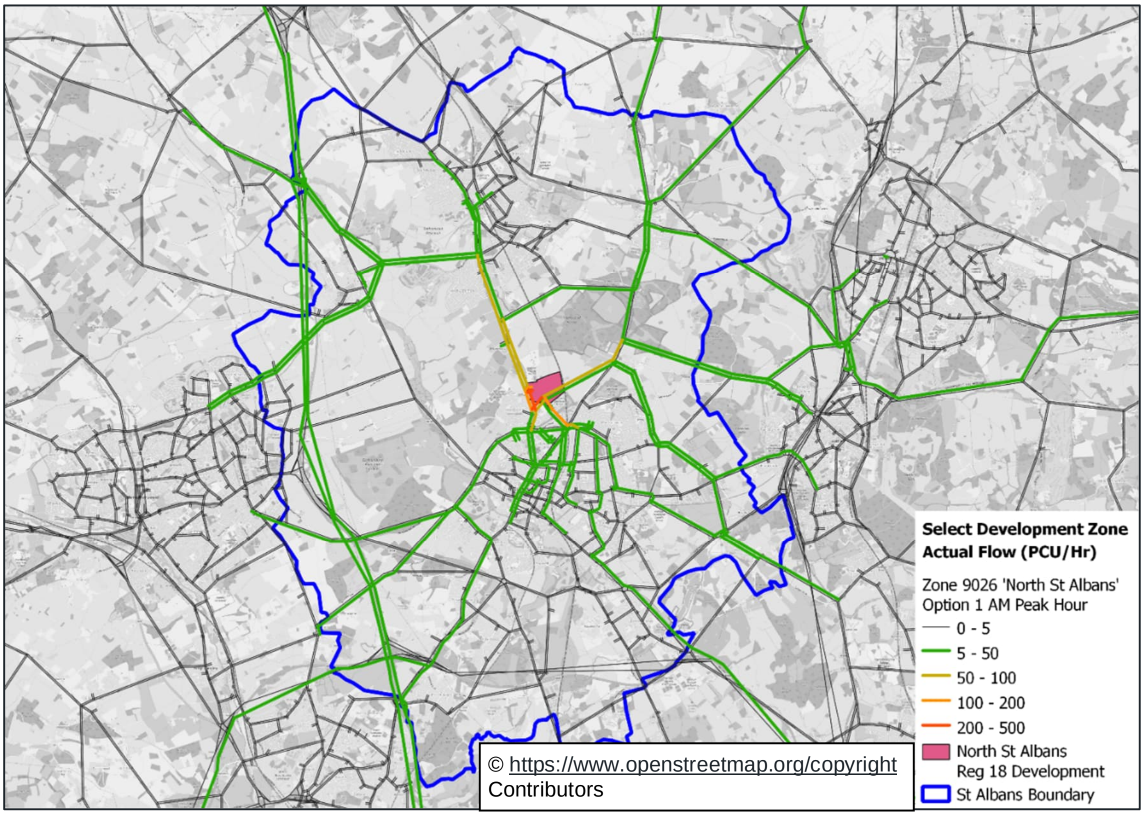

Figure 9-24: Traffic to and from North St Albans Development (AM Peak) Option 1

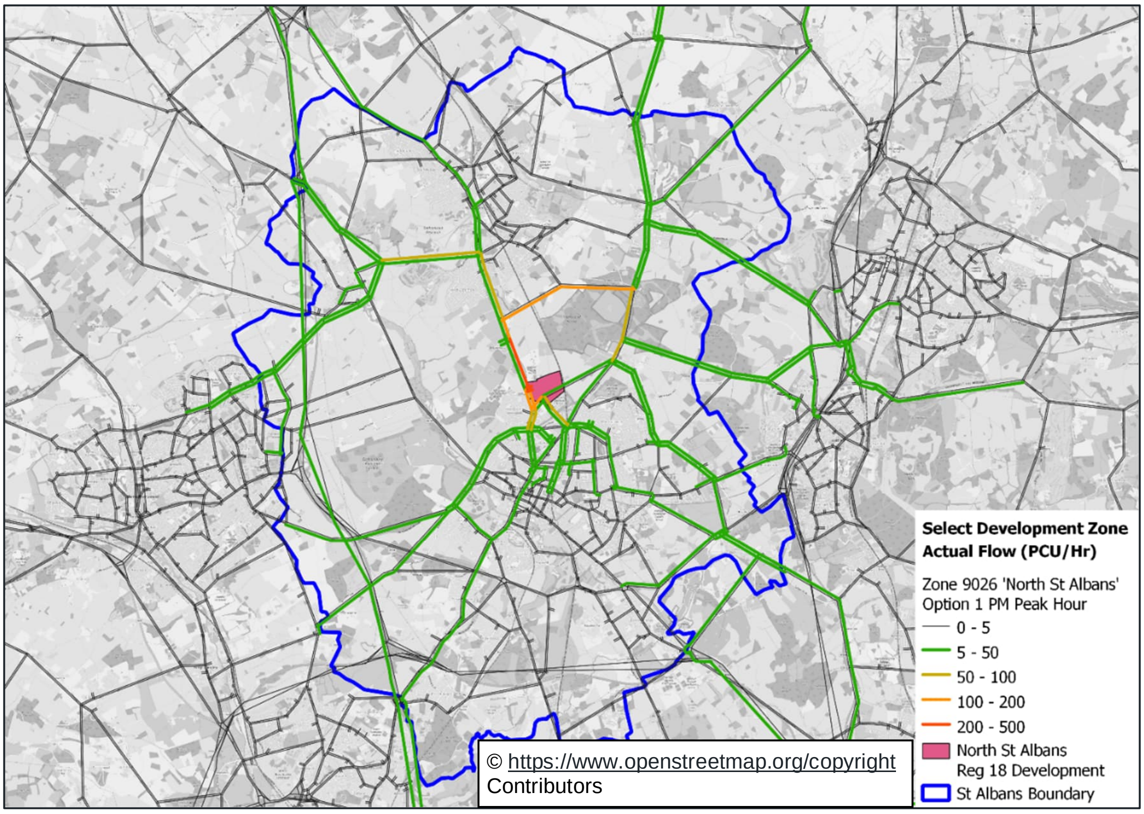

Figure 9-25: Traffic to and from North St Albans development (PM Peak) Option 1

9.3.6. Figure 9-26 and Figure 9-27 shows the traffic to and from the North of St Albans development within the St Albans district in Option 3. In both figures it is clear the proposed development increases traffic flow on the nearby network. The figures show very similar patterns of traffic flow distribution to those which were extracted from Option 1. The key differences is that no traffic flow is now travelling on Sandridgebury Lane and Valley Road which have been closed in Option 3 to through traffic.. This results in increased traffic on the A1081 both north and south of the development as well as increases on the B487 in the AM peak.

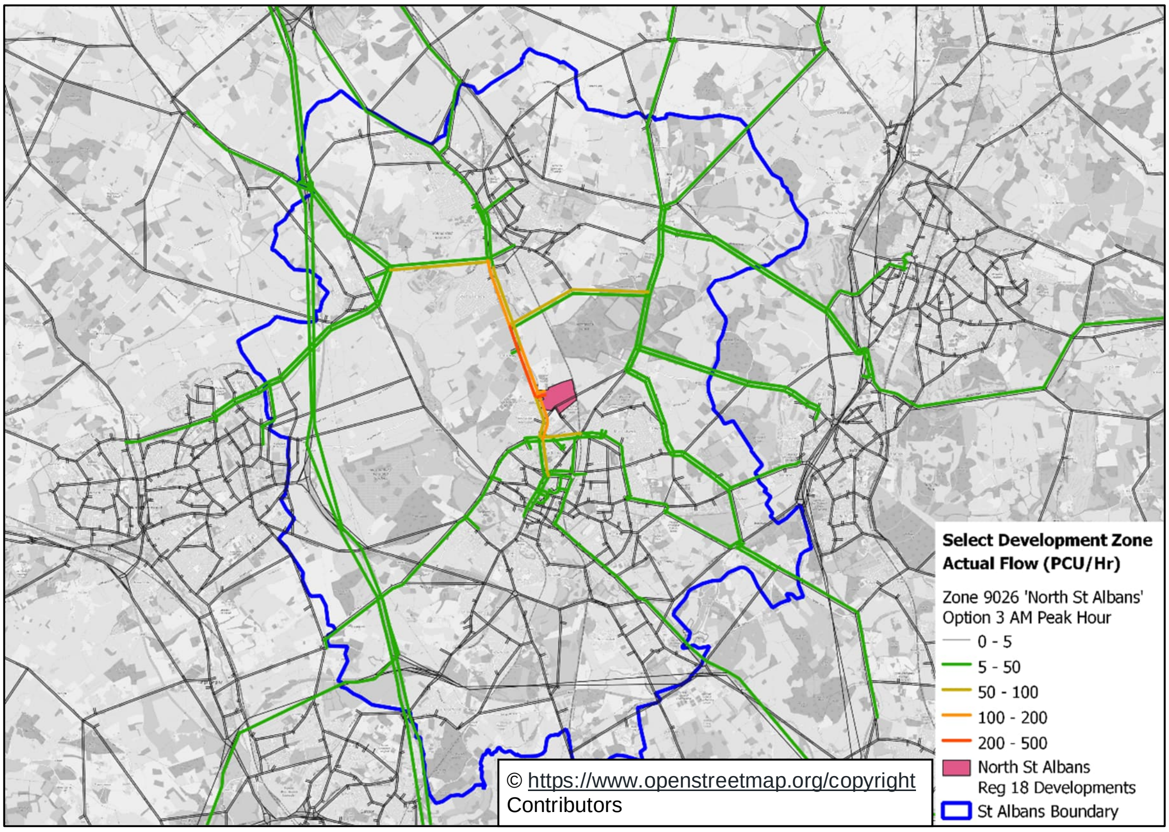

Figure 9-26: Traffic to and from North St Albans Development (AM Peak) Option 3

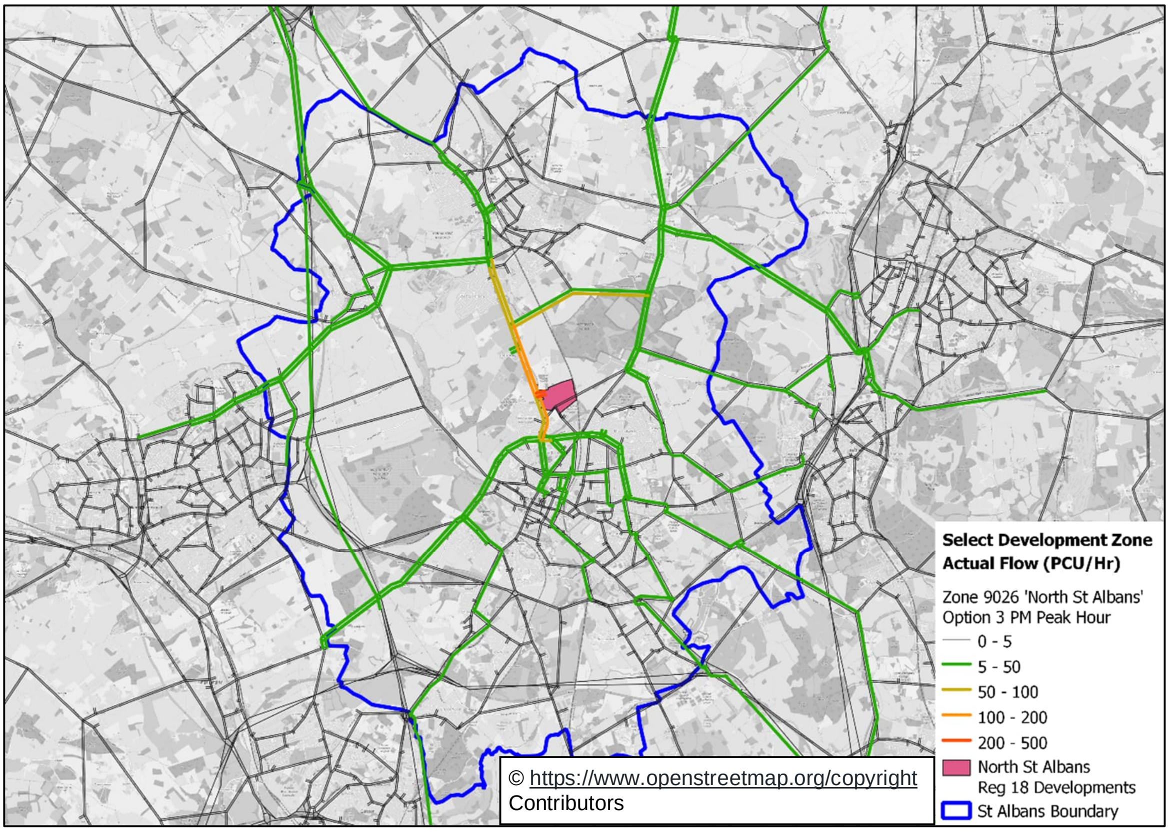

Figure 9-27: Traffic to and from North St Albans development (PM Peak) Option 3

West of London Colney

9.3.7. Figure 9-28 and Figure 9-29 shows the traffic to and from the West of London Colney development within the St Albans district in Option 1. In both figures it is clear the proposed development increases traffic flow on the nearby network, predominantly on B5378 between the A4141 and M25 with increases up to 100 pcus. All other increases on traffic on other roads are between 0-50 pcus impacting roads in the local area, but also M1, A414 and M25.

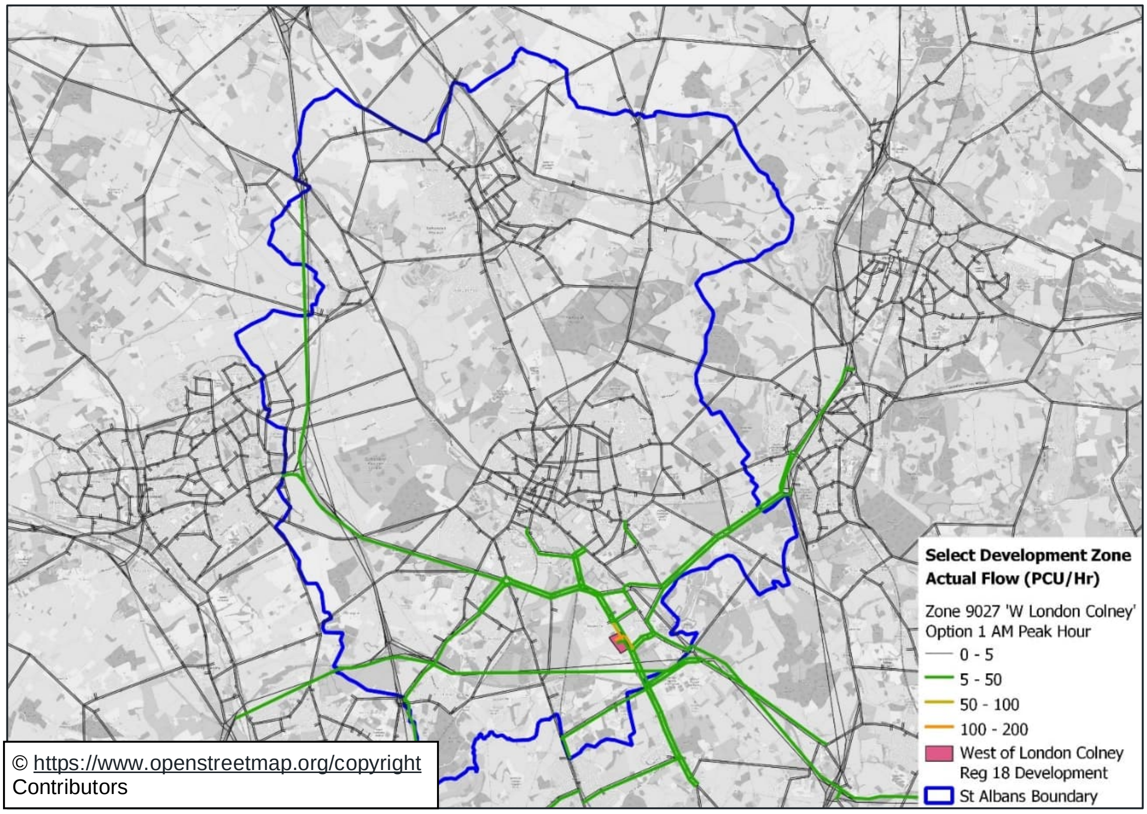

Figure 9-28: Traffic to and from West of London Colney Development (AM Peak) Option 1

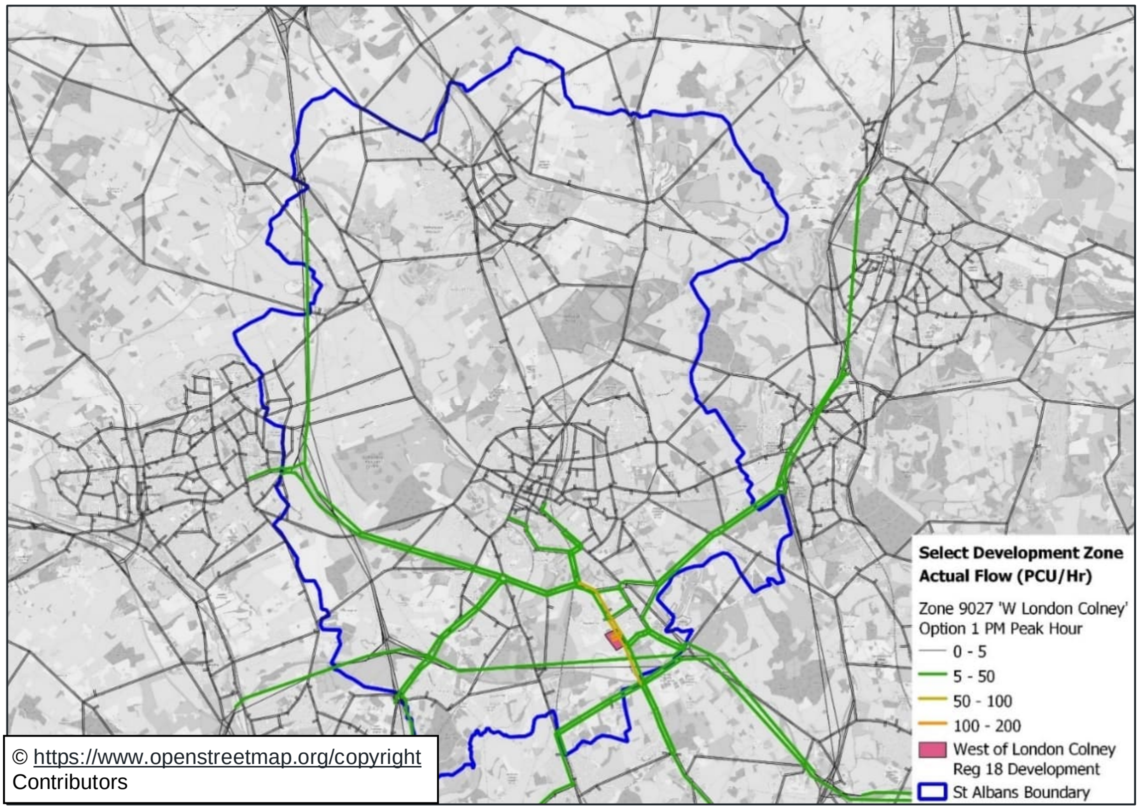

Figure 9-29: Traffic to and from West of London Colney Development (PM Peak) Option 1

9.3.8. Figure 9-30 and Figure 9-31 shows the traffic to and from the West of London Colney development within the St Albans district in Option 3. The figures show very similar patterns of traffic flow distribution to those which were extracted from Option 1 as there are no changes in the nearby network.

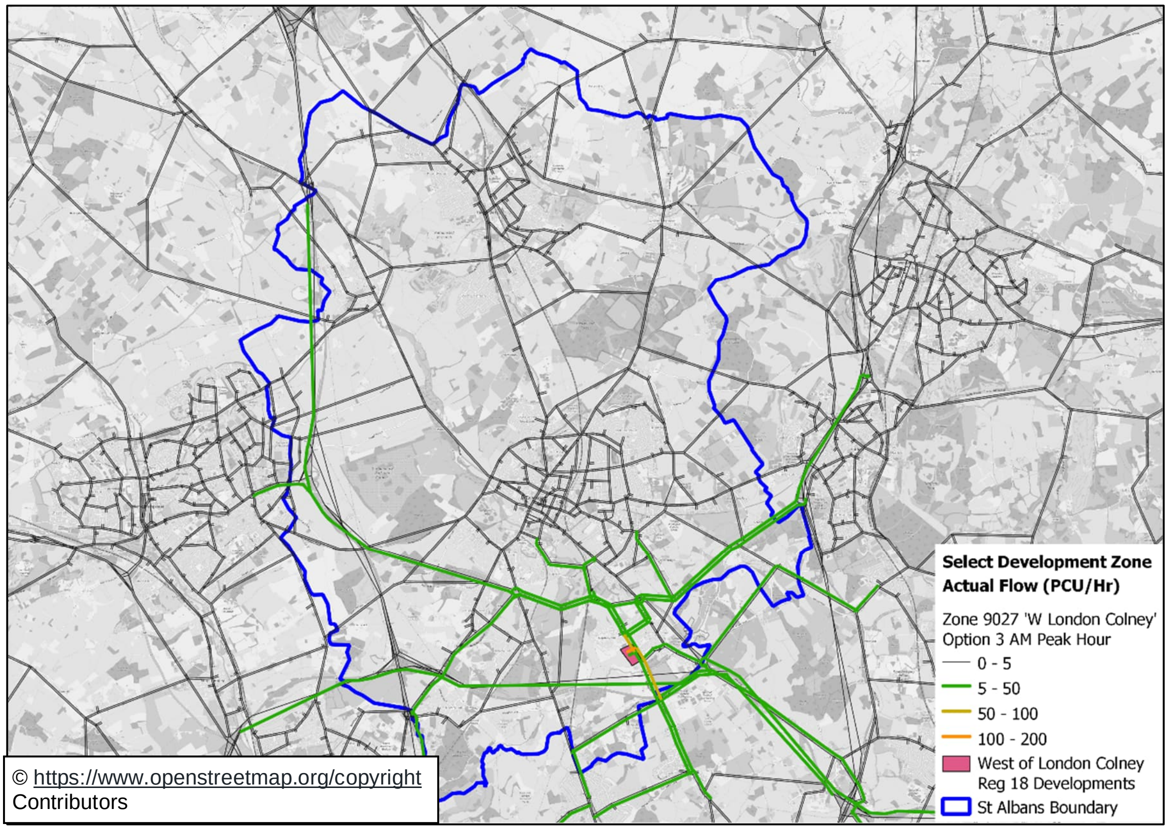

Figure 9-30: Traffic to and from West of London Colney Development (AM Peak) Option 3

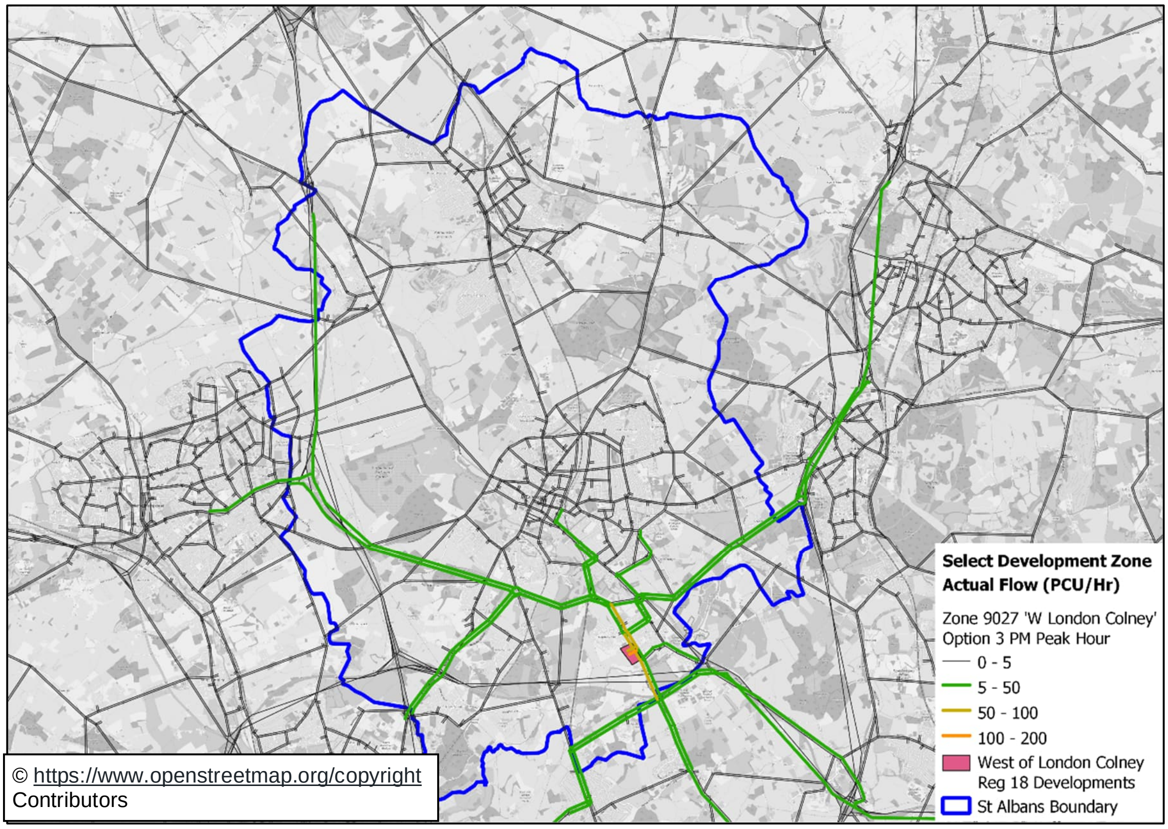

Figure 9-31: Traffic to and from West of London Colney Development (PM Peak) Option 3

North East Harpenden

9.3.9. Figure 9-32 and Figure 9-33 shows the traffic to and from the North East Harpenden development within the St Albans district. In both figures it is clear the proposed development increases traffic flow on the nearby network, predominantly on B653 and B652 with increases of up to 200 pcus. In the PM peak there are also increases of traffic of up to 100 pcus on Station Road heading back to the development, increases of traffic on Station Road in the AM peak are between 5 and 50pcus.

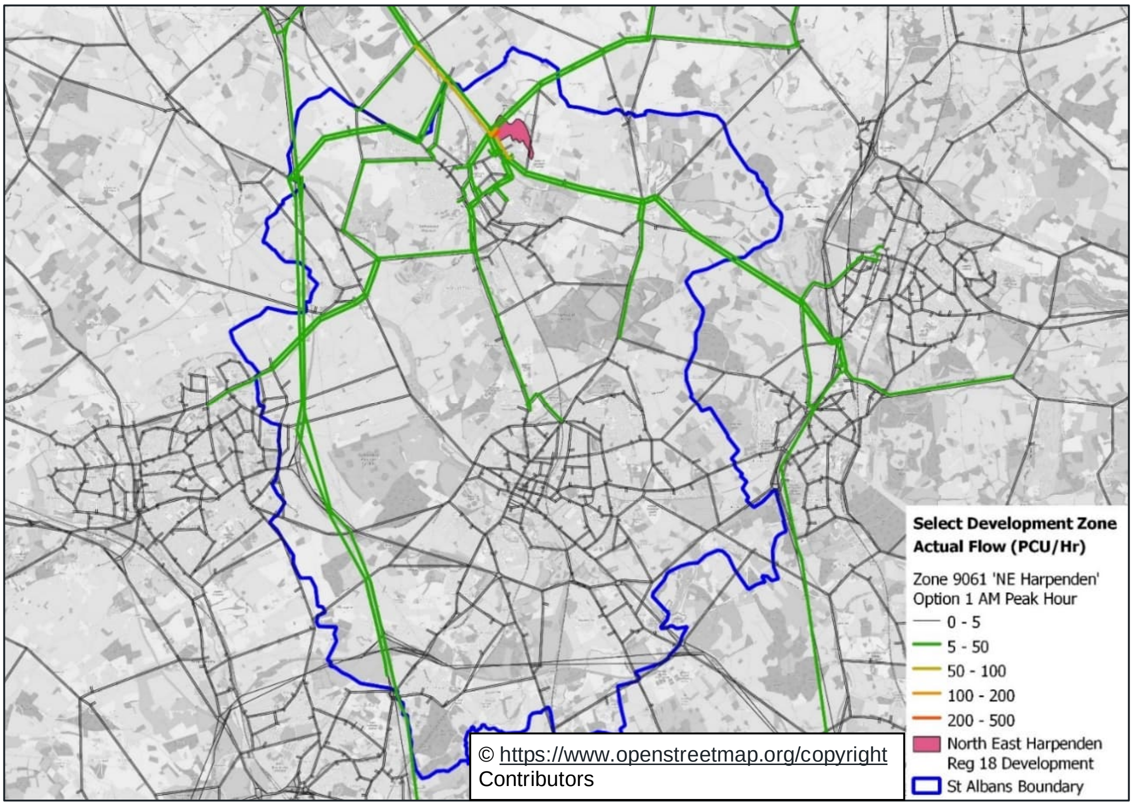

Figure 9-32: Traffic to and from North East Harpenden Development (AM Peak) Option 1

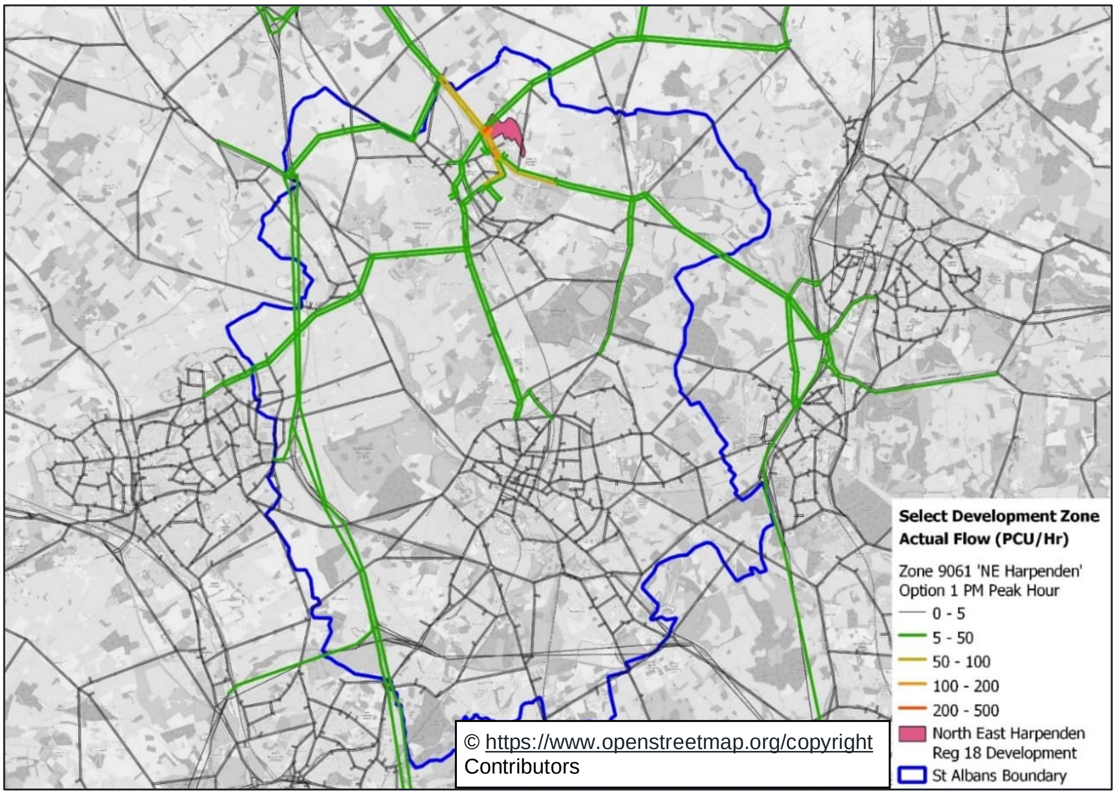

Figure 9-33: Traffic to and from North East Harpenden Development (PM Peak) Option 1

9.3.10. Figure 9-32 and Figure 9-33 shows the traffic to and from the North East Harpenden development within the St Albans district in Option 3. The figures show very similar patterns of traffic flow distribution to those which were extracted from Option 1 as there are no changes in the nearby network.

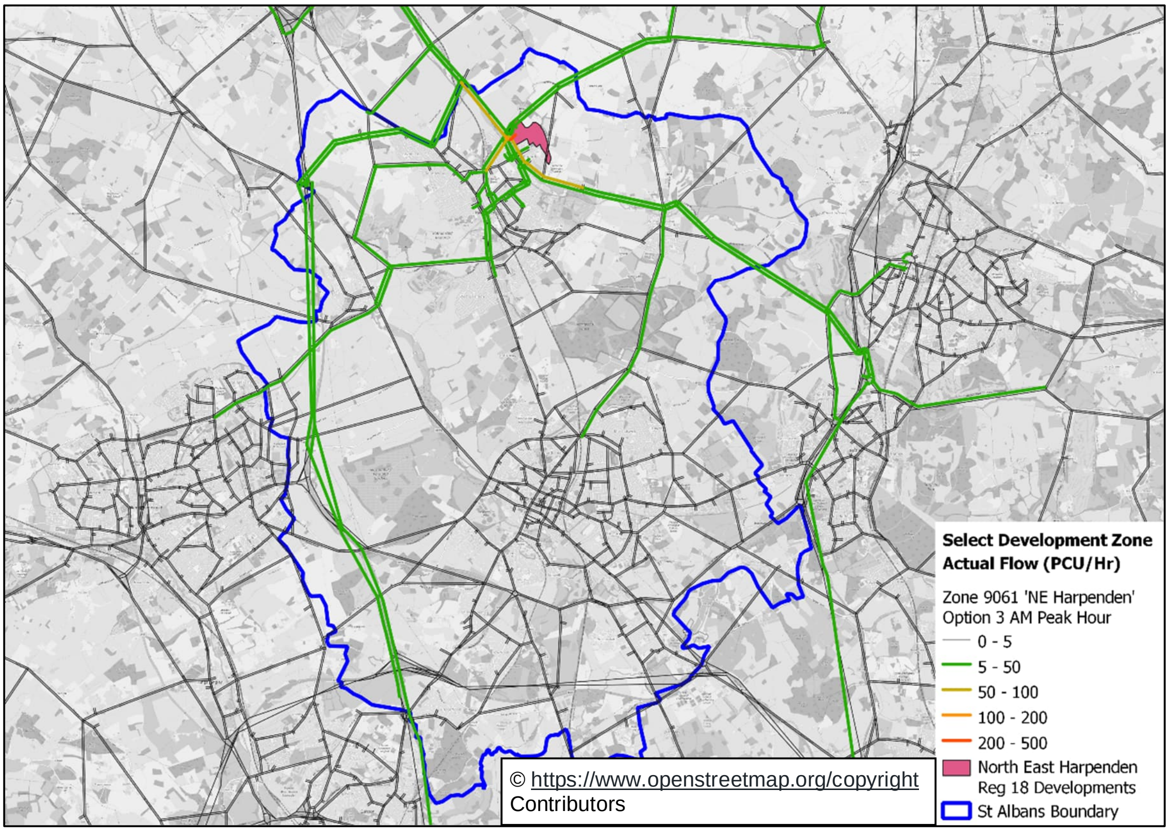

Figure 9-34: Traffic to and from North East Harpenden Development (AM Peak) Option 3

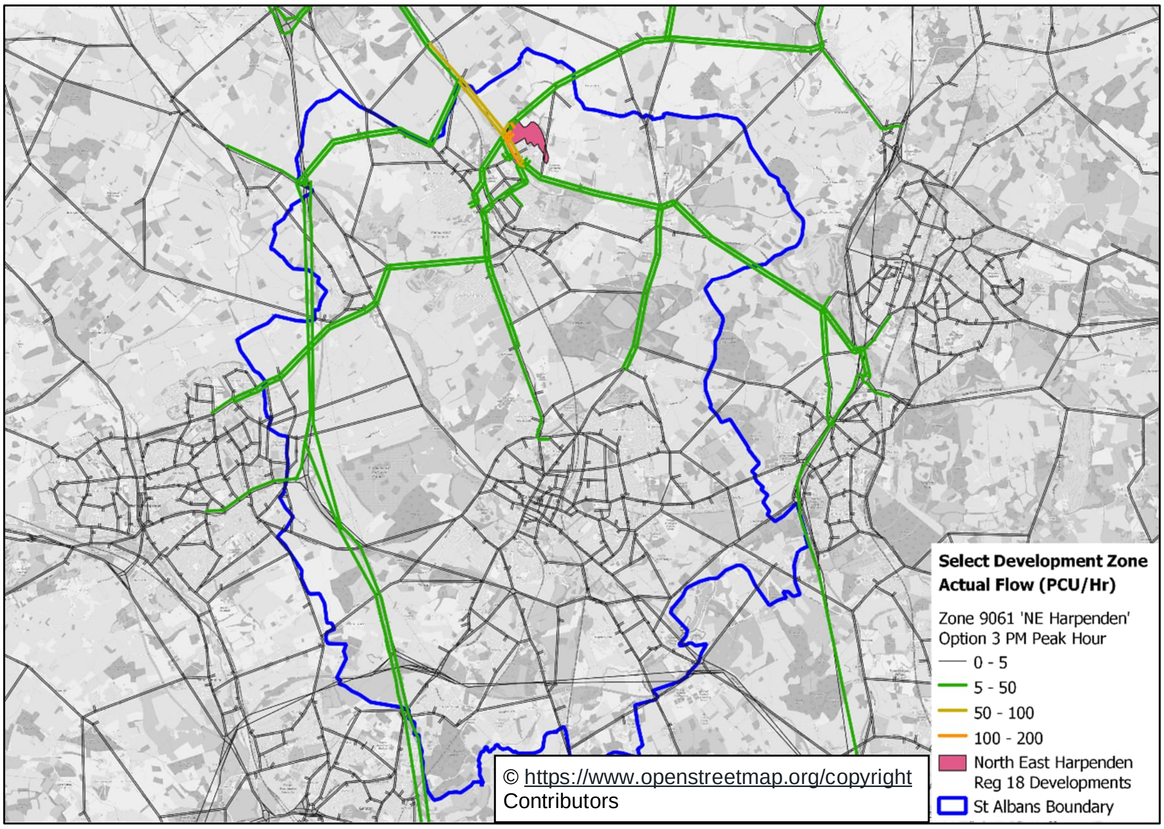

Figure 9-35: Traffic to and from North East Harpenden Development (PM Peak) Option 3

East St Albans

9.3.11. Figure 9-36 and Figure 9-37 shows the traffic to and from the East St Albans development within the St Albans district in Option 1. In both figures it is clear the proposed development increases traffic flow on the nearby network, predominantly on Sandpit Lane Oaklands Lane with increases of up to 200 pcus. All other increases in traffic flow are between 5 and 50 pcus and impact nearby roads including Station Road, House Lane and A1057.

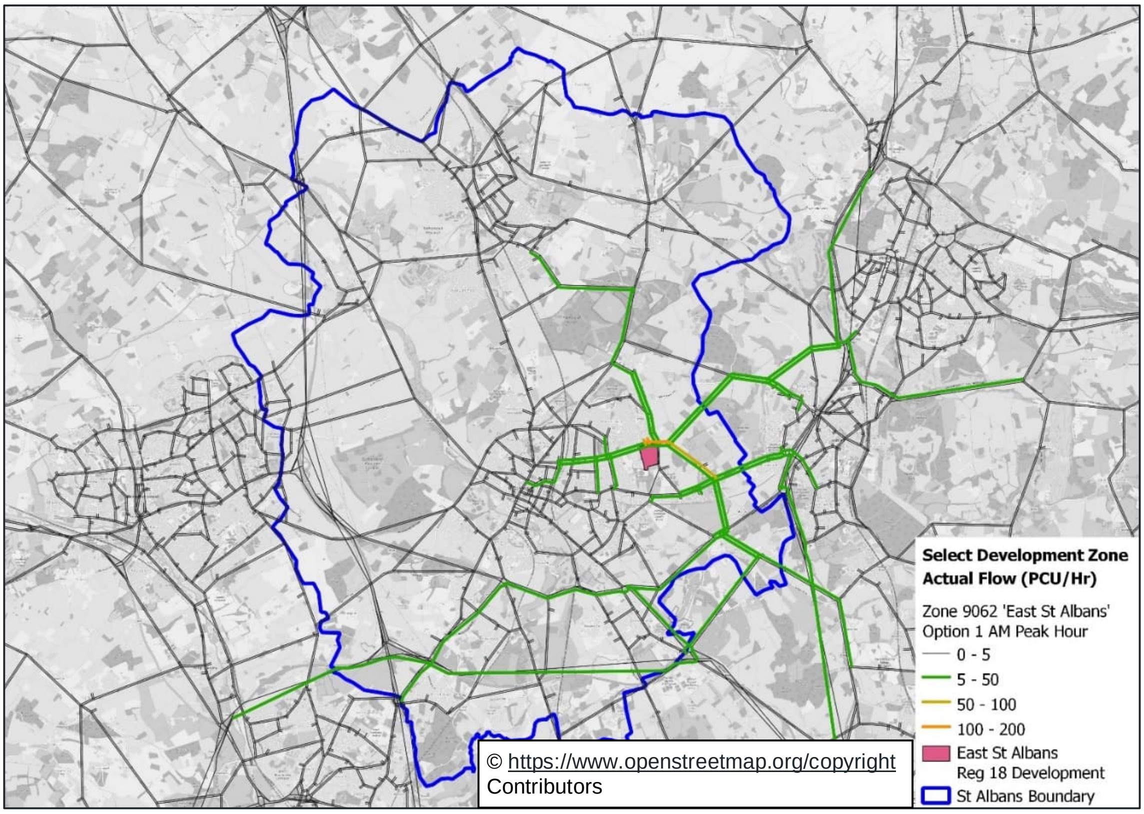

Figure 9-36: Traffic to and from East St Albans Development (AM Peak) Option 1

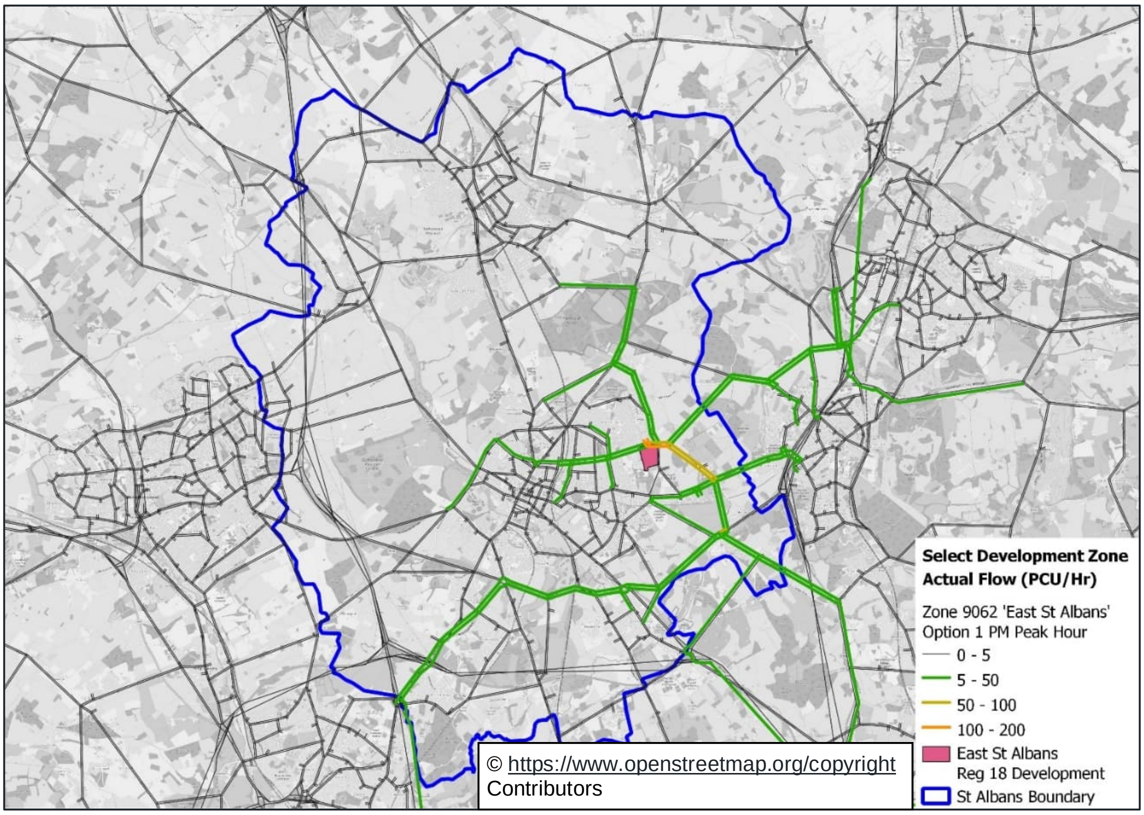

Figure 9-37: Traffic to and from East St Albans Development (PM Peak) Option 1

9.3.12. Figure 9-38 and Figure 9-39 shows the traffic to and from the East of St Albans development within the St Albans district in Option 3. The figures show very similar patterns of traffic flow distribution to those which were extracted from Option 1 as there are no changes in the nearby network.

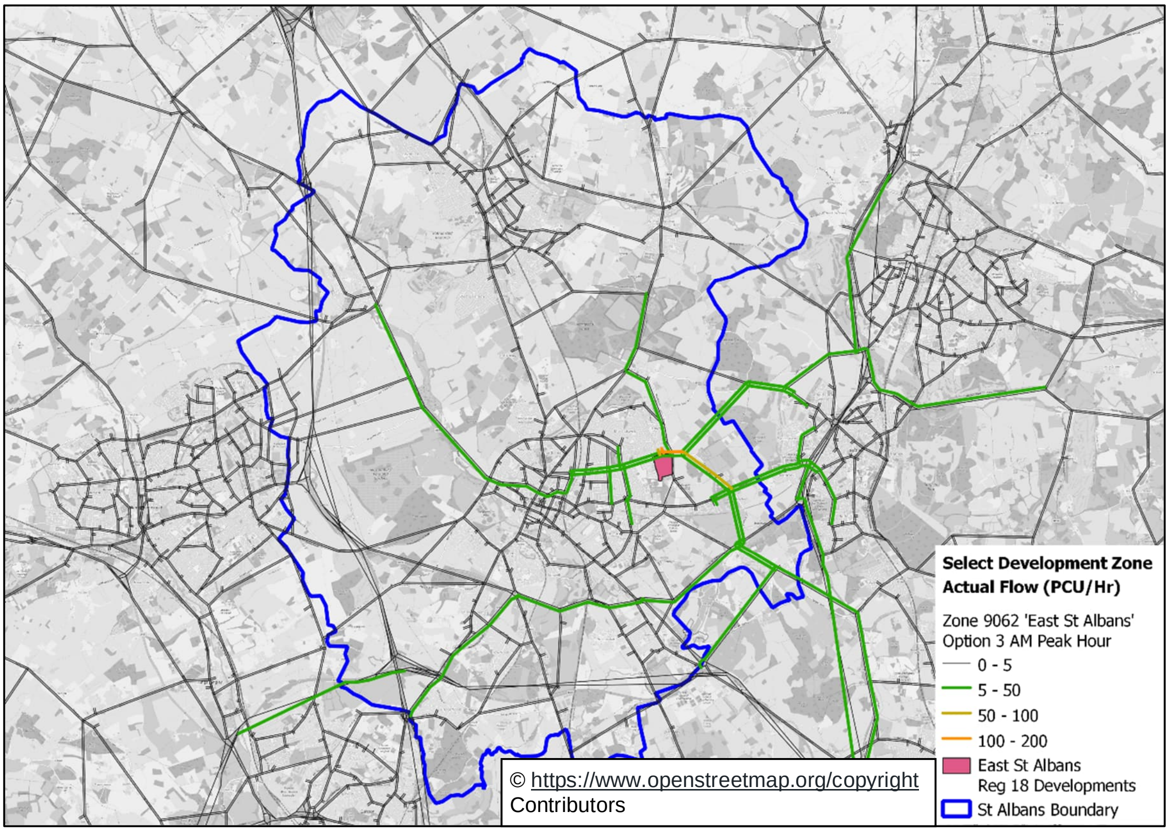

Figure 9-38: Traffic to and from East St Albans Development (AM Peak) Option 3

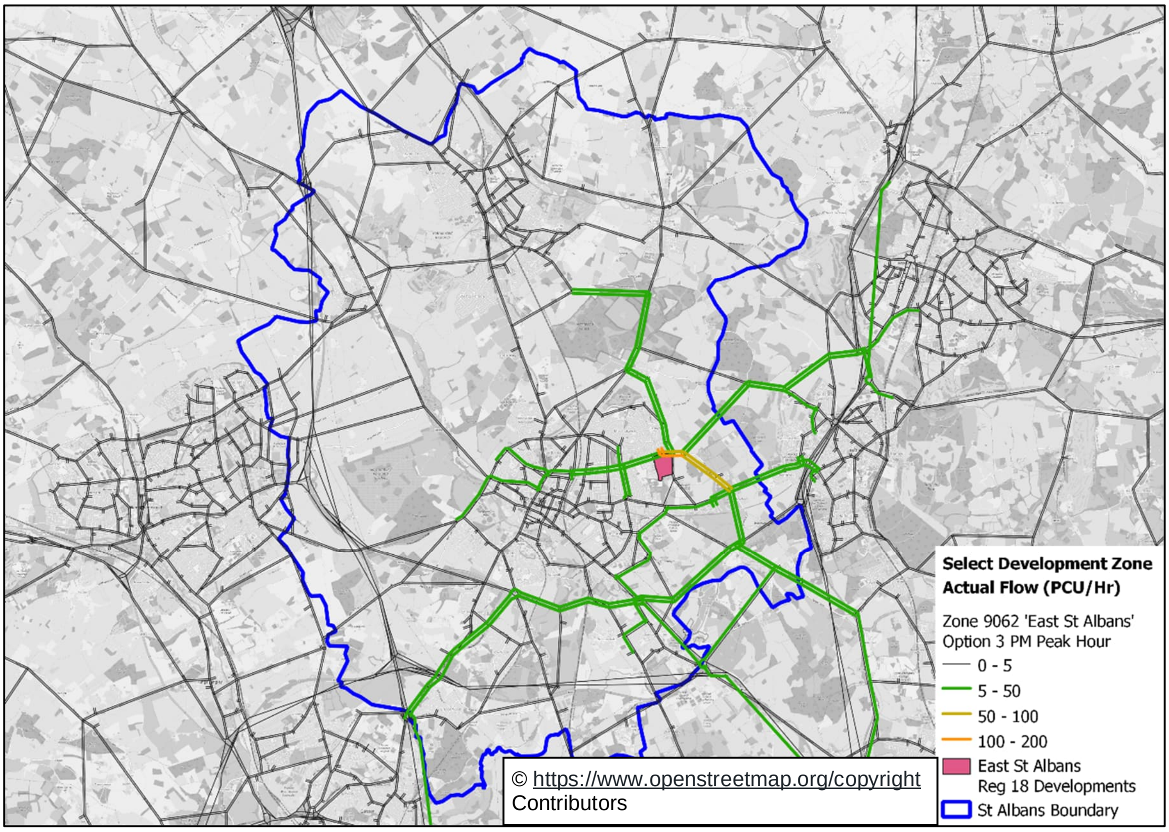

Figure 9-39: Traffic to and from East St Albans Development (PM Peak) Option 3

Glinwell, Hatfield Road

9.3.13. Figure 9-40 and Figure 9-41 shows the traffic to and from the Glinwell development within the St Albans district in Option 1. In both figures it is clear the proposed development increases traffic flow on the nearby network, predominantly on A1057 with increases of up to 200 pcus. All other increases in traffic flow are between 5 and 50 pcus and impact nearby roads including Oaklands Lane, Station Road and Colney Heath Lane.

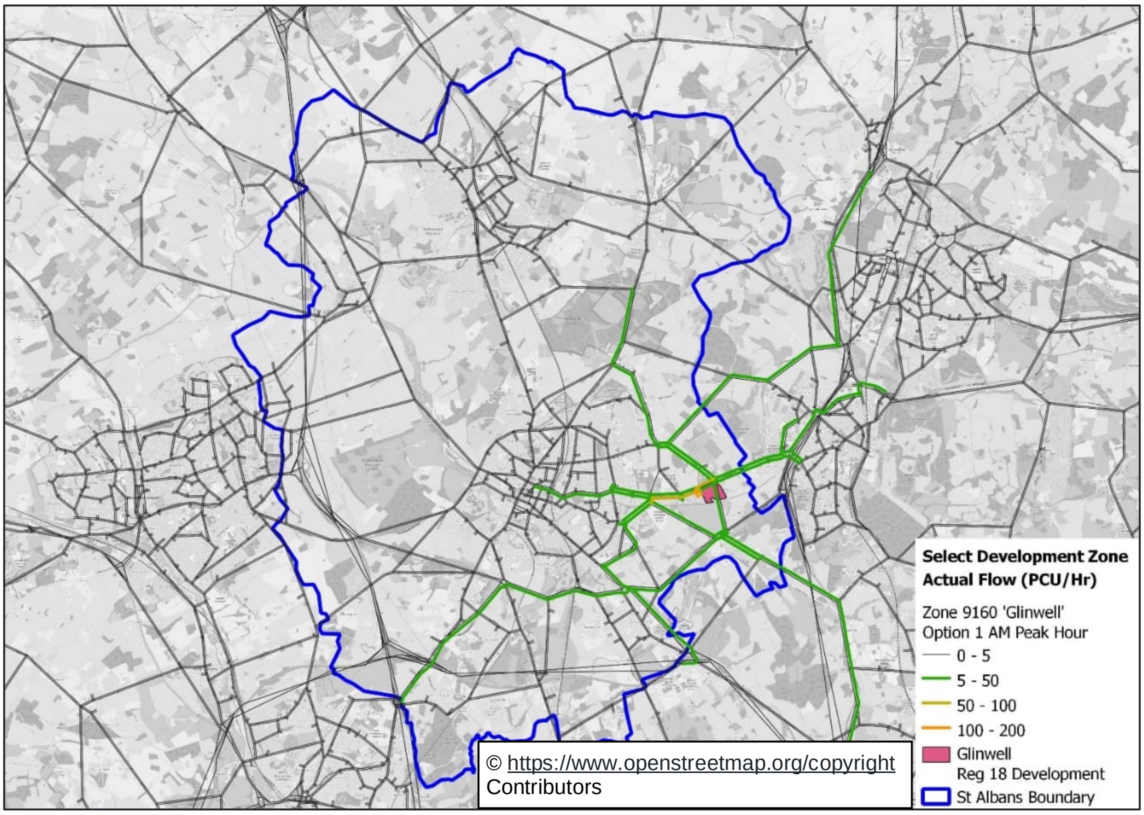

Figure 9-40: Traffic to and from Glinwell, Hatfield Road Development (AM Peak) Option 1

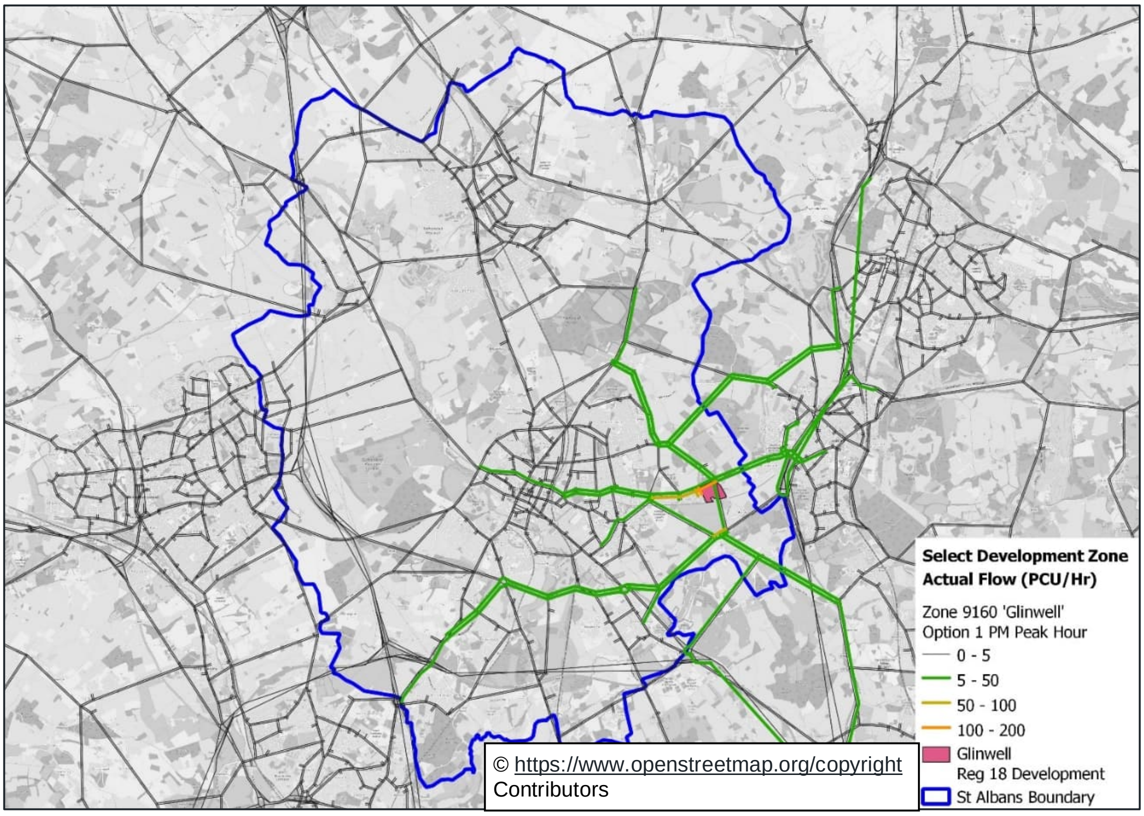

Figure 9-41: Traffic to and from Glinwell, Hatfield Road Development (PM Peak) Option 1

9.3.14. Figure 9-42 and Figure 9-43 shows the traffic to and from the Glinwell development within the St Albans district in Option 3. The figures show very similar patterns of traffic flow distribution to those which were extracted from Option 1 as there are no changes in the nearby network.

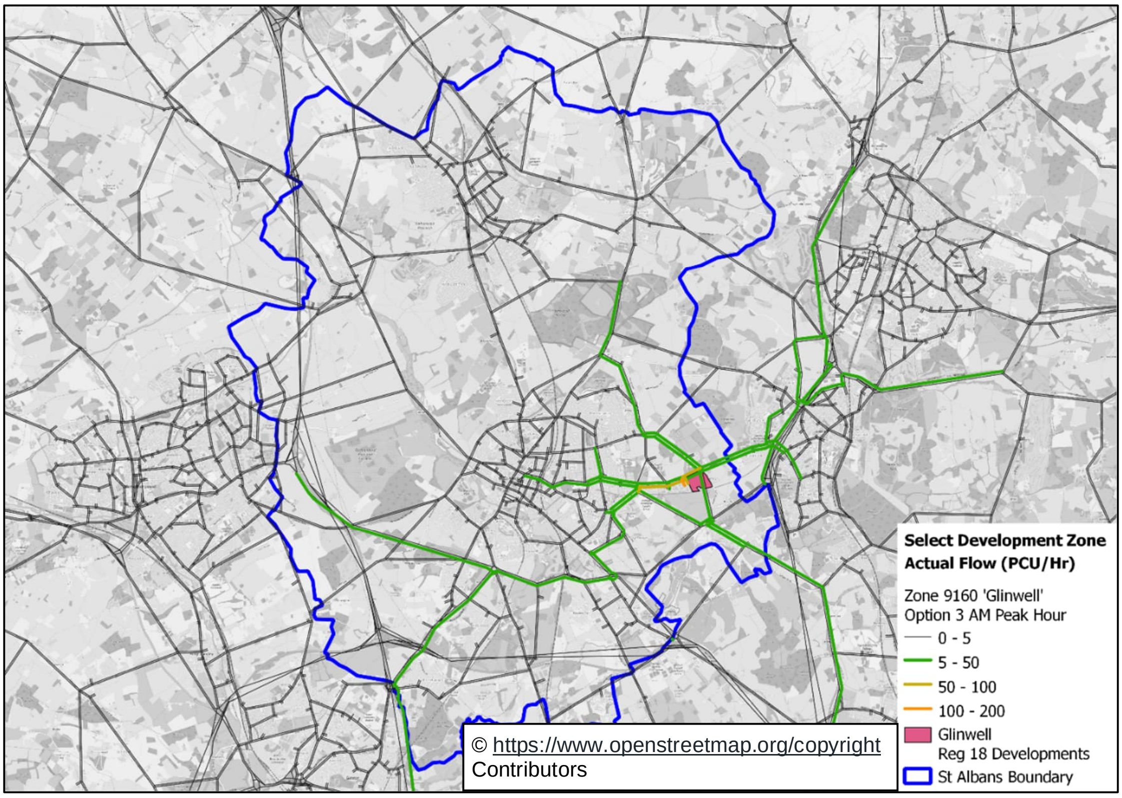

Figure 9-42: Traffic to and from Glinwell, Hatfield Road Development (AM Peak) Option 3

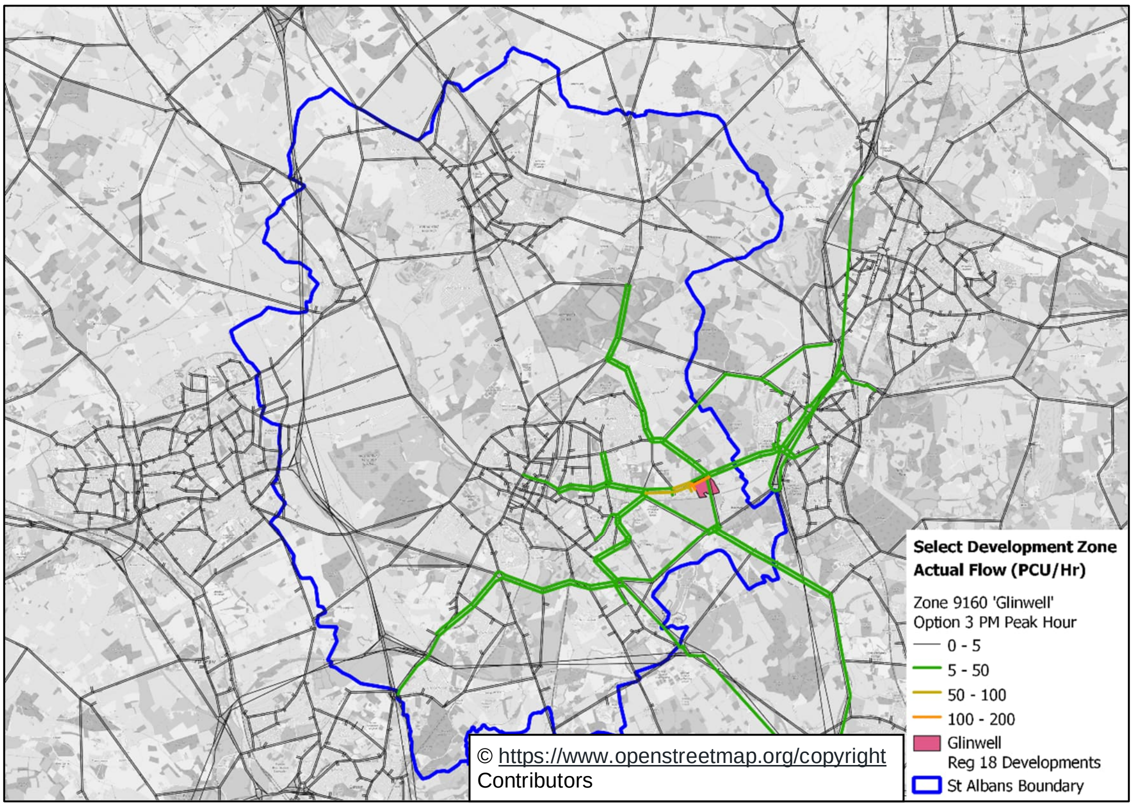

Figure 9-43: Traffic to and from Glinwell, Hatfield Road Development (PM Peak) Option 3

West Redbourn

9.3.15. Figure 9-44 and Figure 9-45 shows the traffic to and from the West Redbourn development within the St Albans district in Option 1. In both figures it is clear the proposed development increases traffic flow on the nearby network, predominantly on B487 and Hemel Hempstead Road within Redbourn with increases up to 200 pcus. All other increases in traffic flow are between 5 and 50 pcus and impact nearby roads including A5183, B487, Gaddesden Lane, Lybury Lane and the East Hemel Spine Road which development traffic uses to access destinations in Hemel.

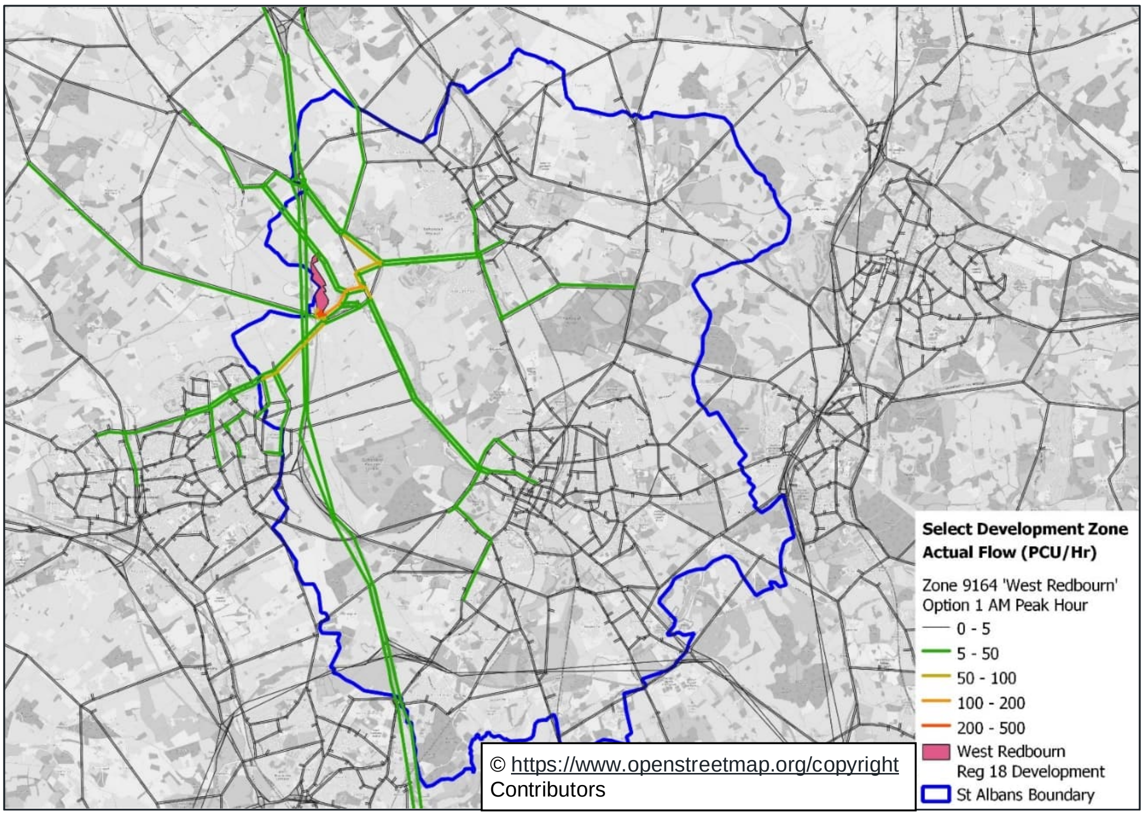

Figure 9-44: Traffic to and from West Redbourn Development (AM Peak) Option 1

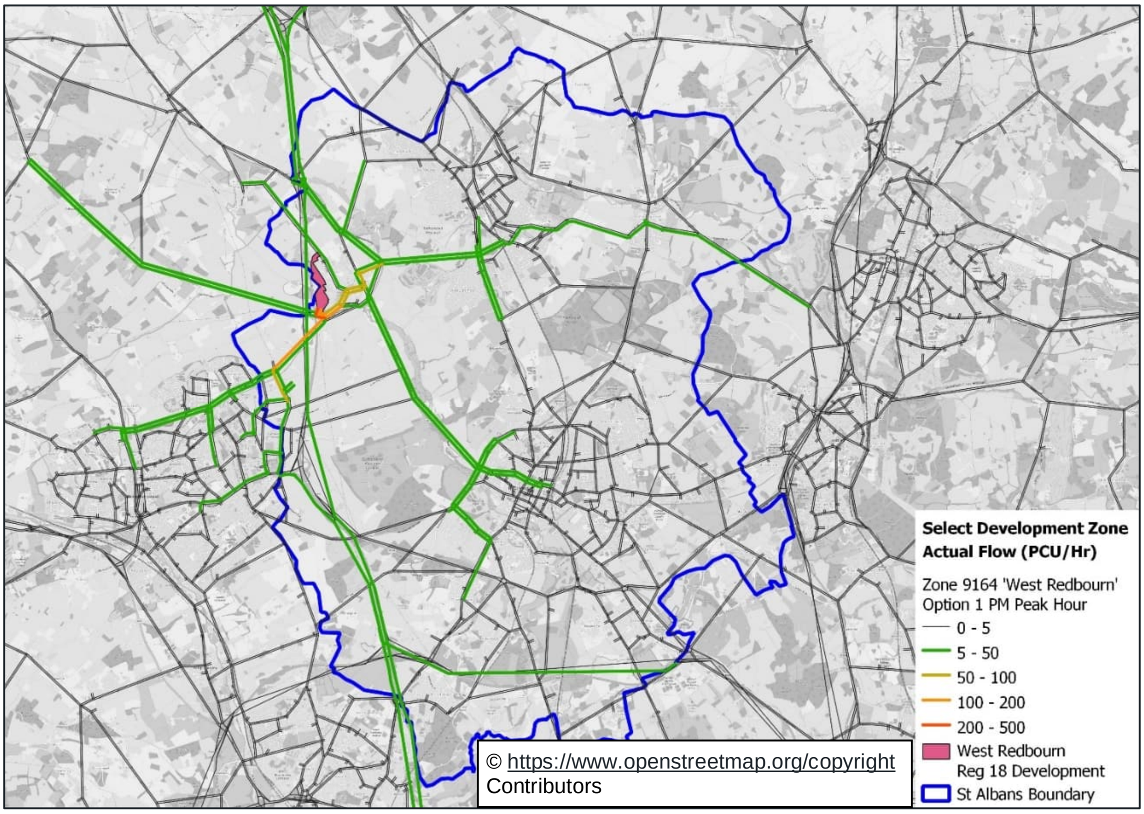

Figure 9-45: Traffic to and from West Redbourn Development (PM Peak) Option 1

9.3.16. Figure 9-46 and Figure 9-47 shows the traffic to and from the West Redbourn development within the St Albans district in Option 3. The figures show very similar patterns of traffic flow distribution to those which were extracted from Option 1 as there are no changes in the nearby network.

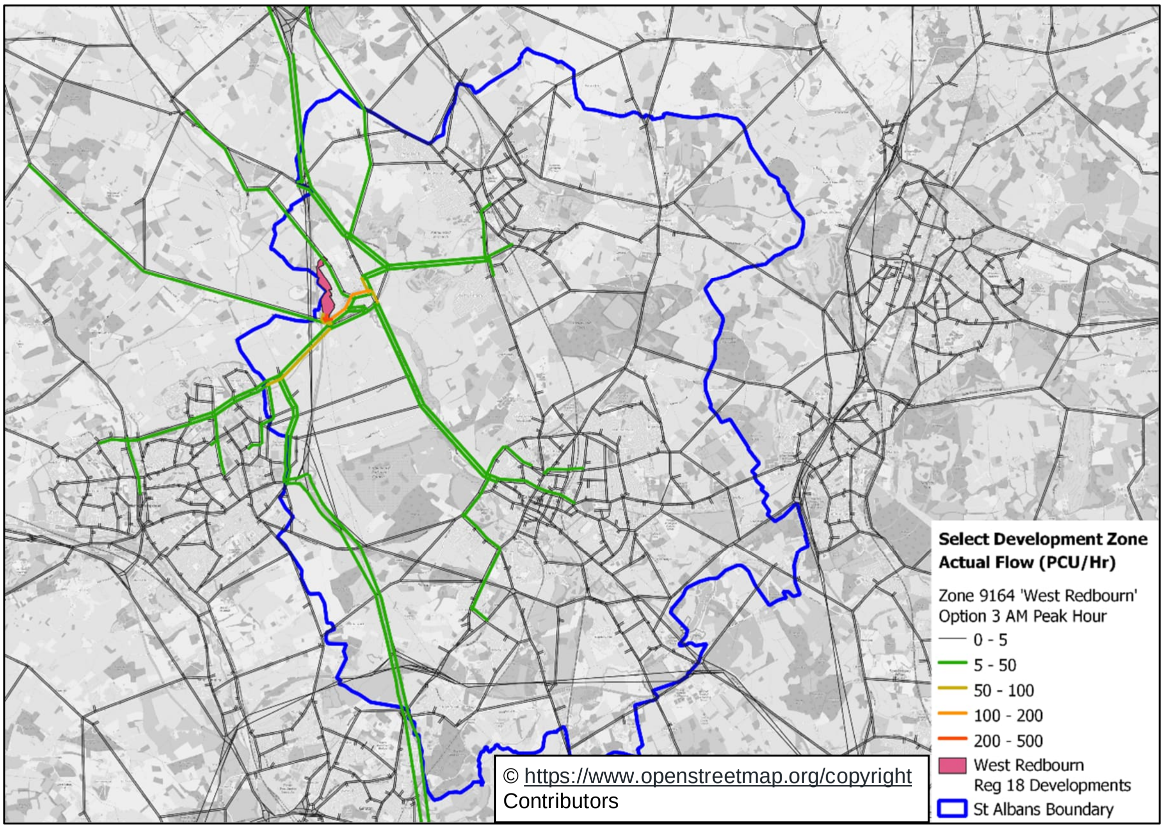

Figure 9-46: Traffic to and from West Redbourn Development (AM Peak) Option 3

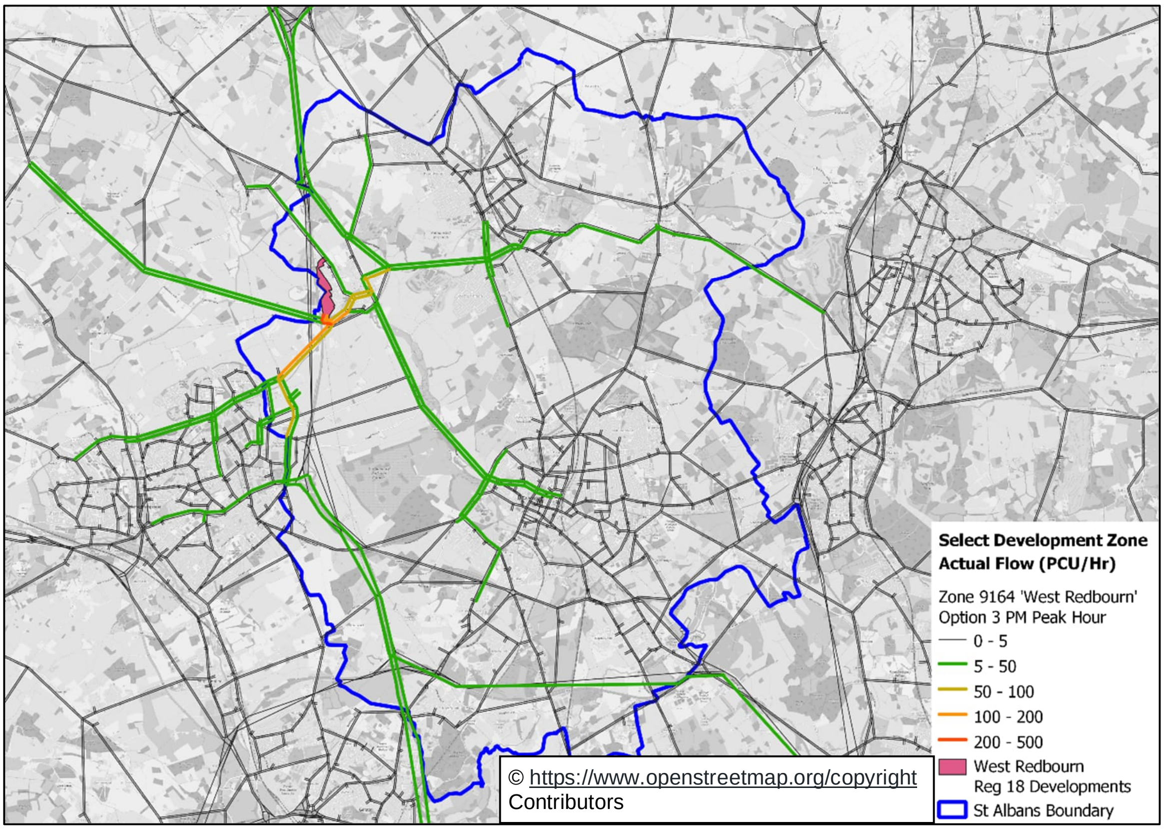

Figure 9-47: Traffic to and from West Redbourn Development (PM Peak) Option 3

Harper Lane

9.3.17. Figure 9-48 and Figure 9-49 shows the traffic to and from the Harper Lane development within the St Albans district in Option 1. In both figures it is clear the proposed development increases traffic flow on the nearby network, predominantly on A5183 and B556 with increases up to 50pcus.

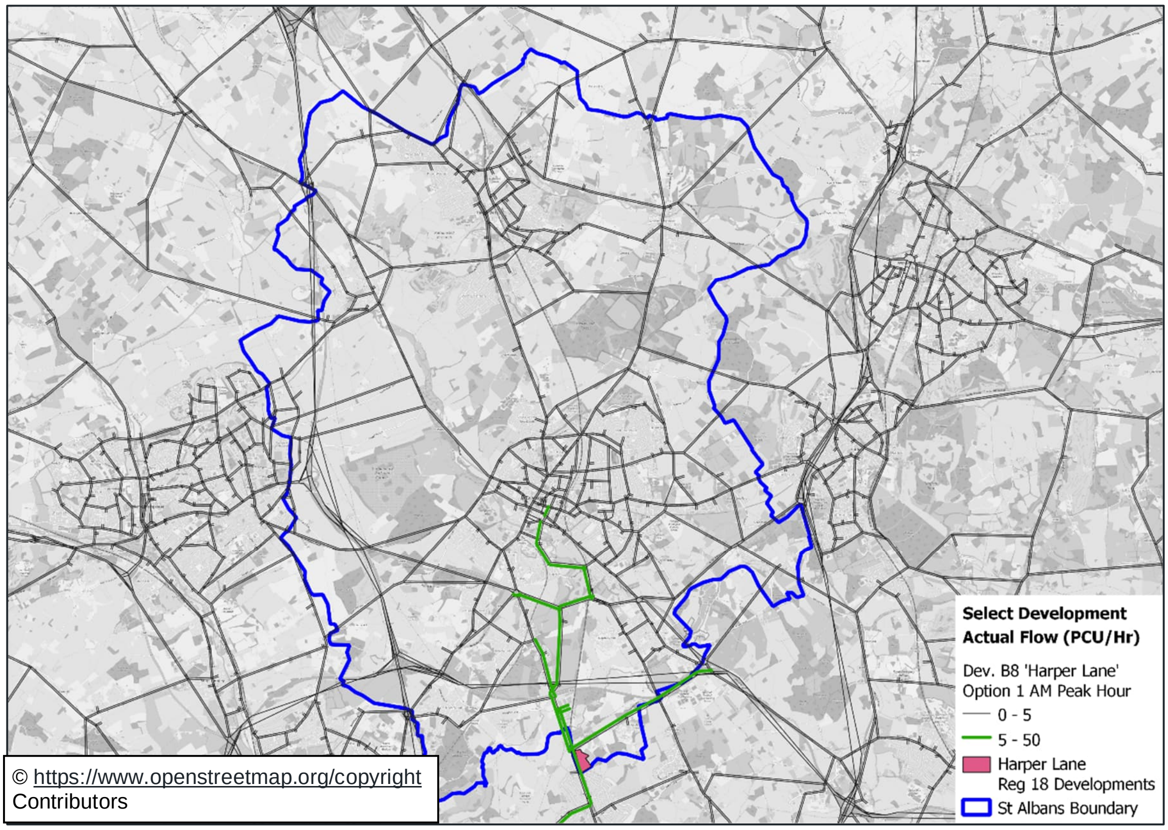

Figure 9-48: Traffic to and from Harper Lane Development (AM Peak) Option 1

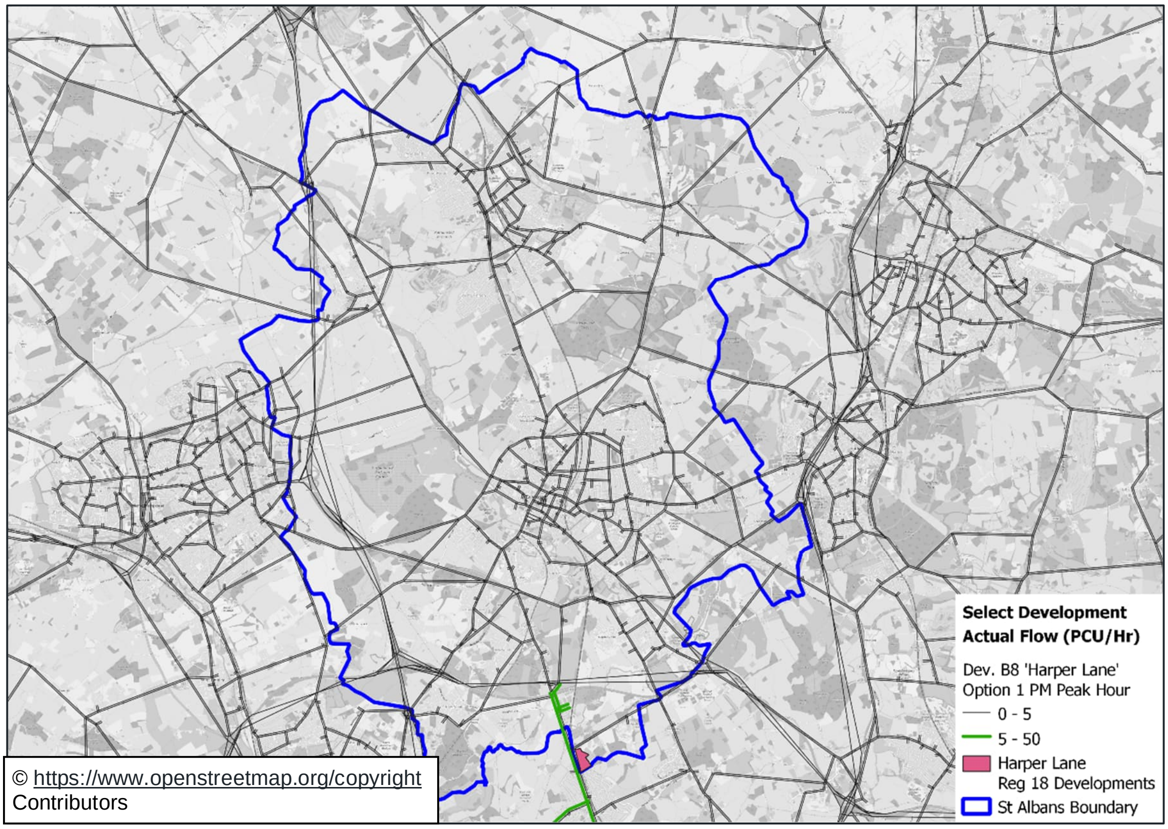

Figure 9-49: Traffic to and from Harper Lane Development (PM Peak) Option 1

9.3.18. Figure 9-50 and Figure 9-51 shows the traffic to and from the Harper Lane development within the St Albans district in Option 3. The figures show similar patterns of traffic flow distribution to those which were extracted from Option 1, as there are no changes in the nearby network.

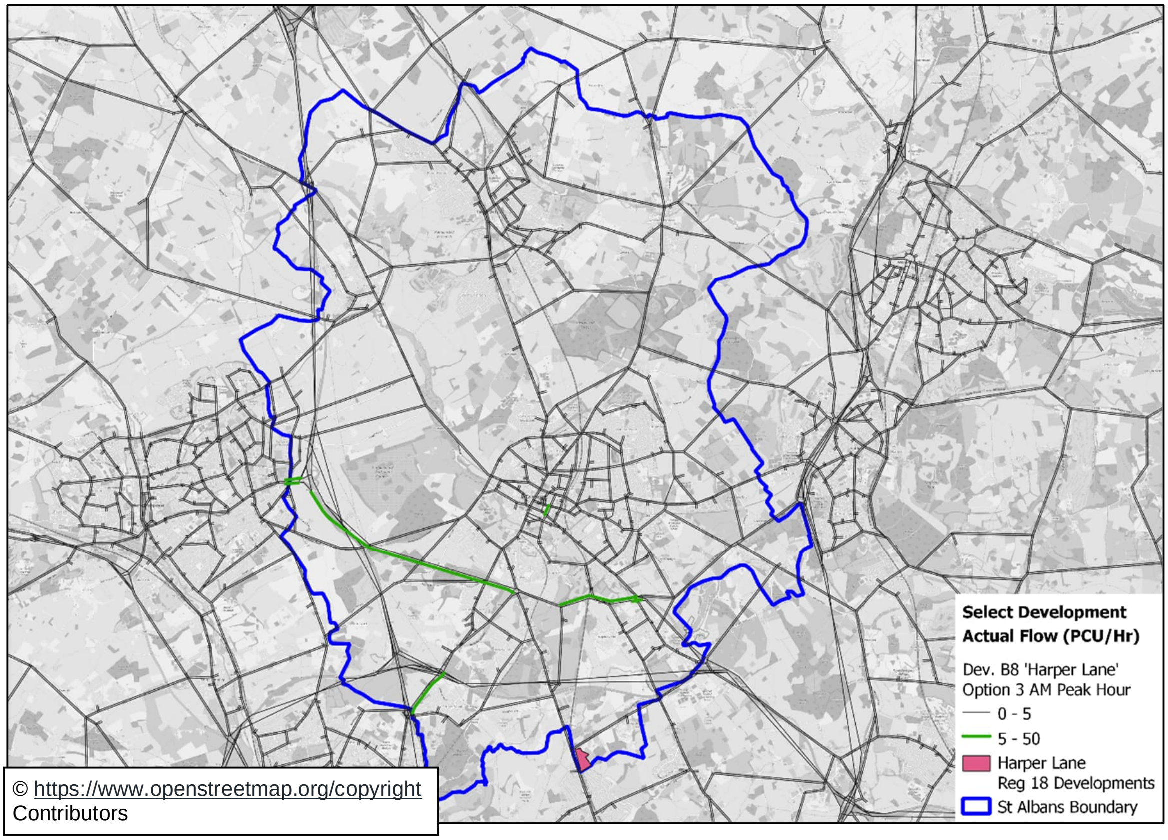

Figure 9-50: Traffic to and from Harper Lane Development (AM Peak) Option 3

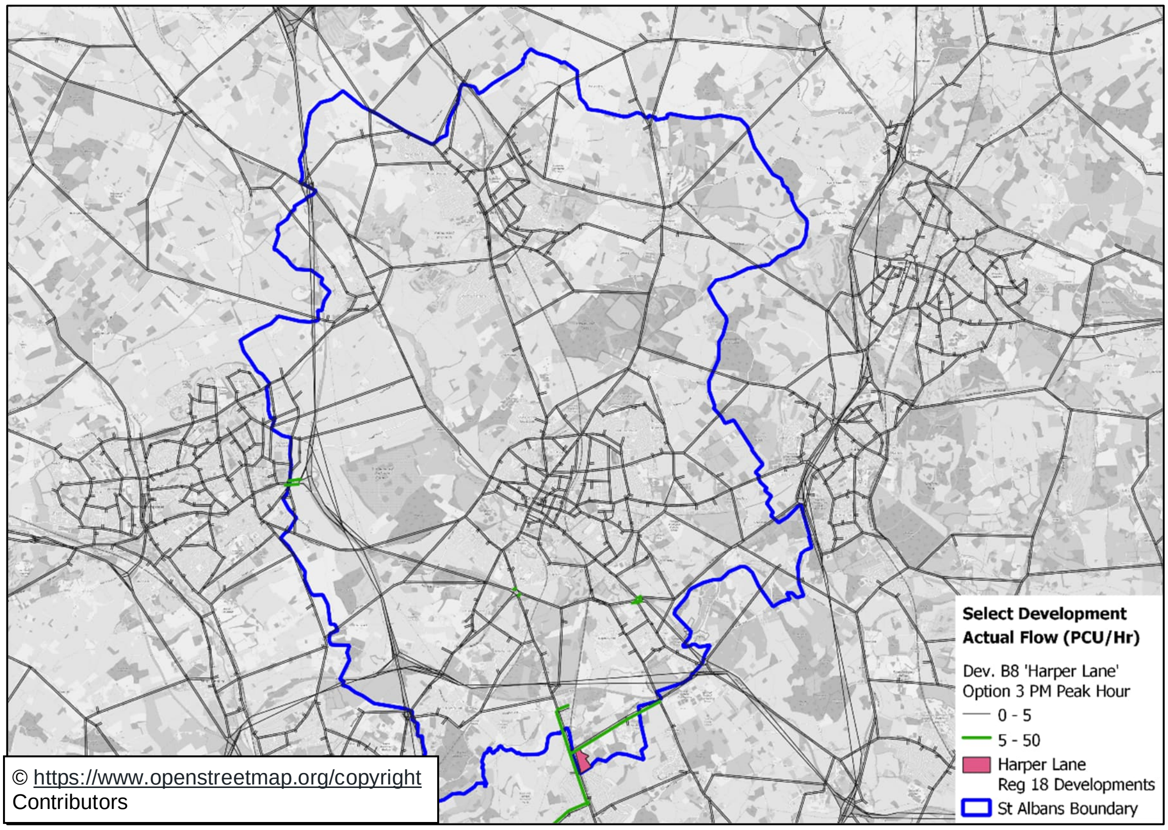

Figure 9-51: Traffic to and from Harper Lane Development (PM Peak) Option 3

North West Harpenden

9.3.19. Figure 9-52 and Figure 9-53 shows the traffic to and from the North West Harpenden development within the St Albans district in Option 1. In both figures it is clear the proposed development increases traffic flow on the nearby network, predominantly on A1081, B653 and some local roads in Harpenden increases up to 50pcus.

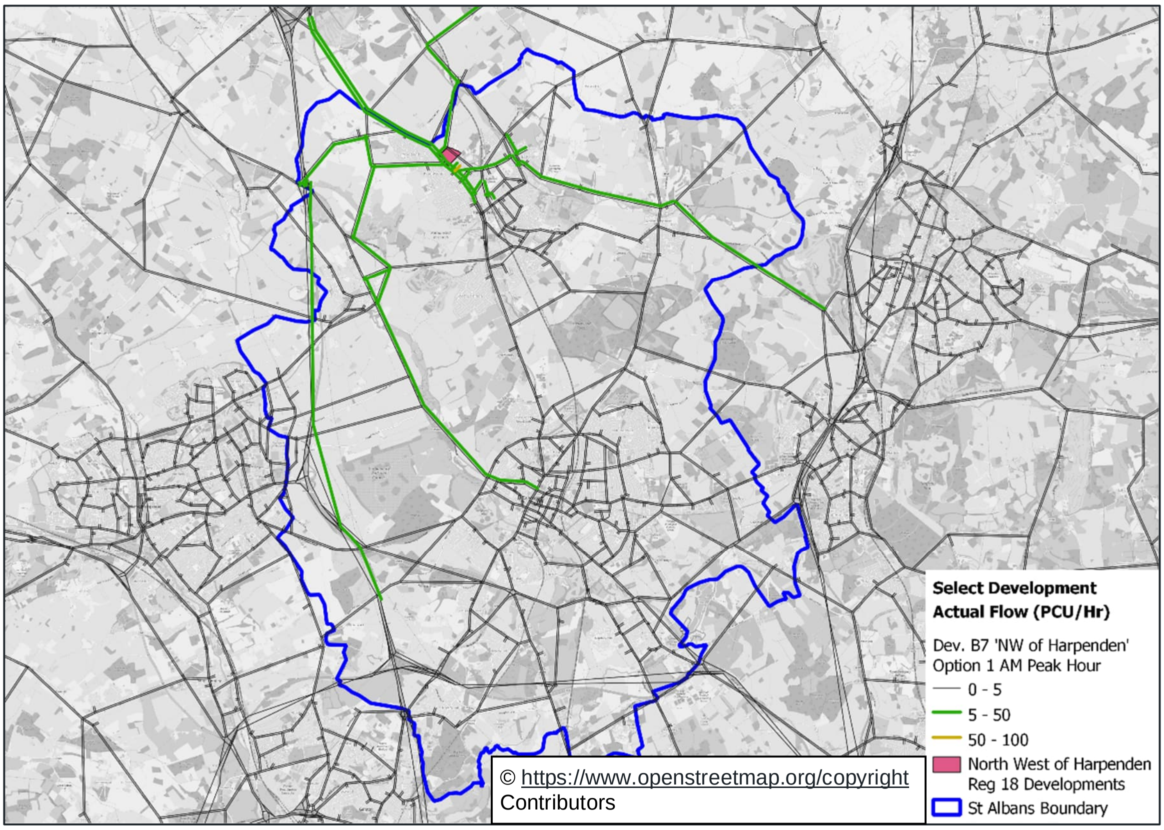

Figure 9-52: Traffic to and from North West Harpenden Development (AM Peak) Option 1

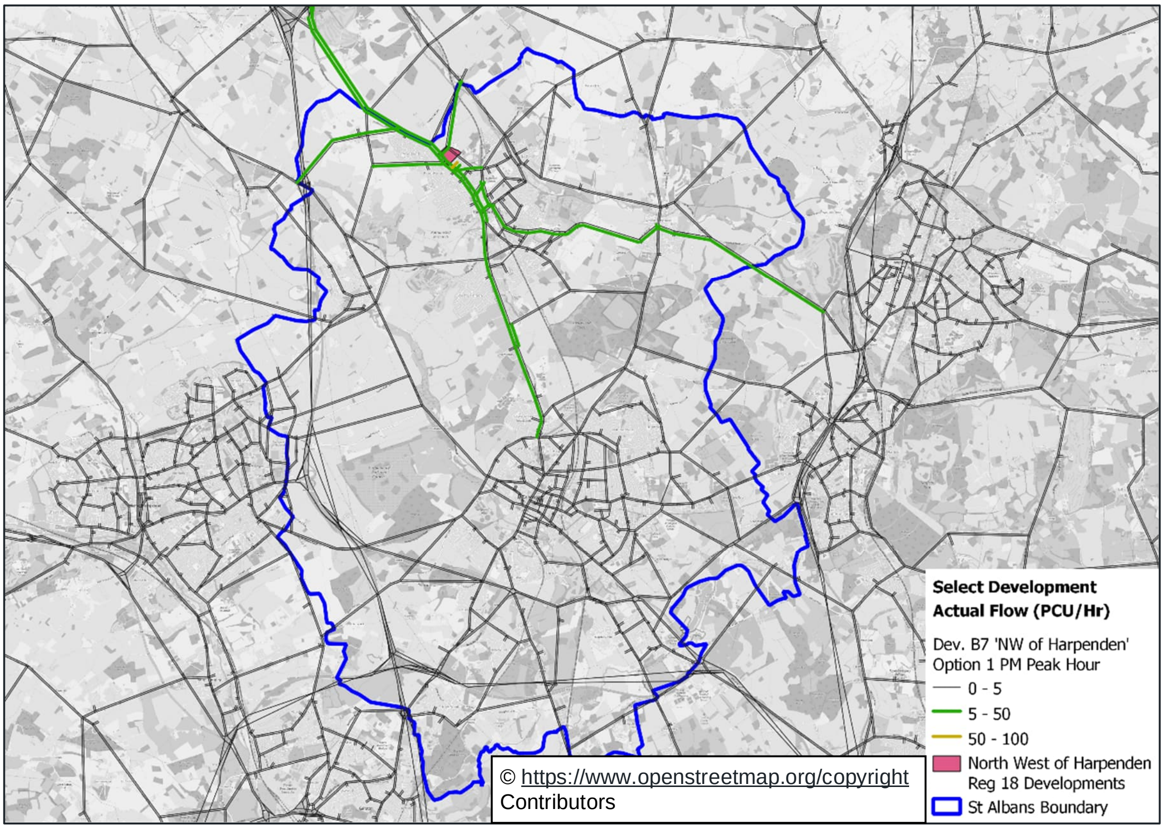

Figure 9-53: Traffic to and from North West Harpenden Development (PM Peak) Option 1

9.3.20. Figure 9-54 and Figure 9-55 shows the traffic to and from the North West Harpenden development within the St Albans district in Option 3. The figures show similar patterns of traffic flow distribution to those which were extracted from Option 1, as there are no changes in the nearby network.

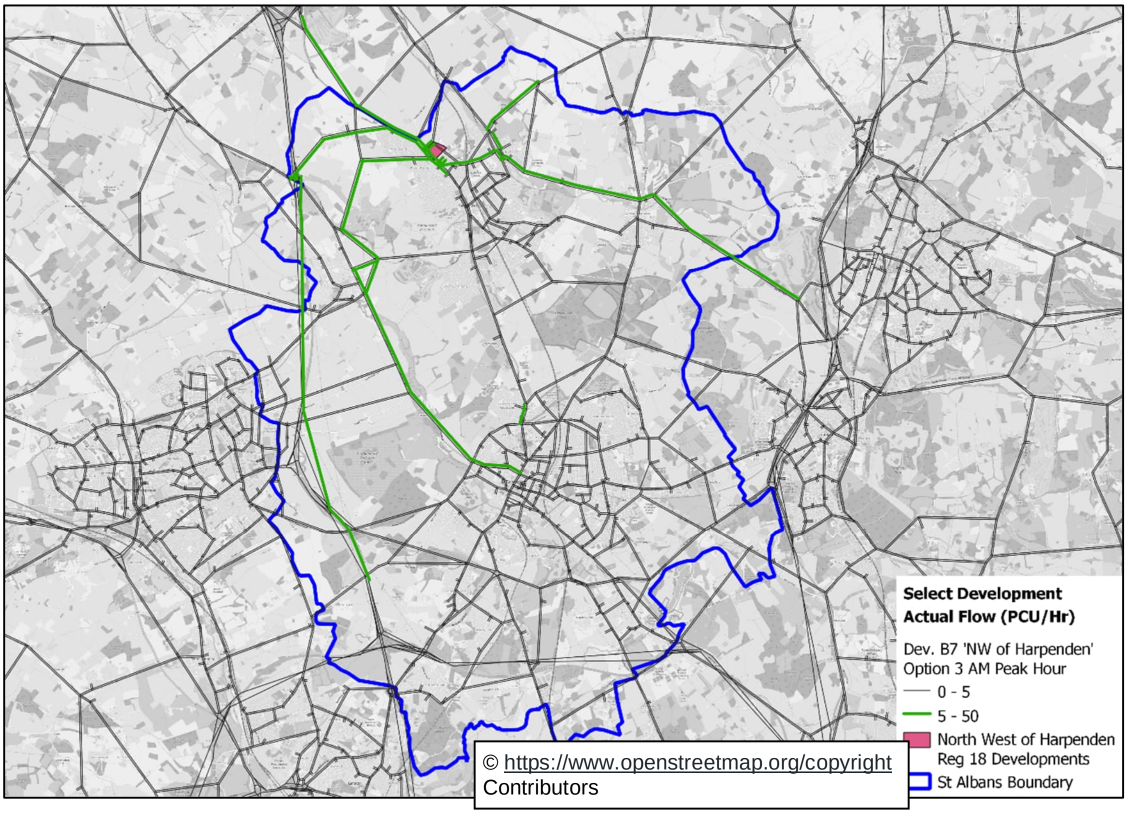

Figure 9-54: Traffic to and from North West Harpenden Development (AM Peak) Option 3

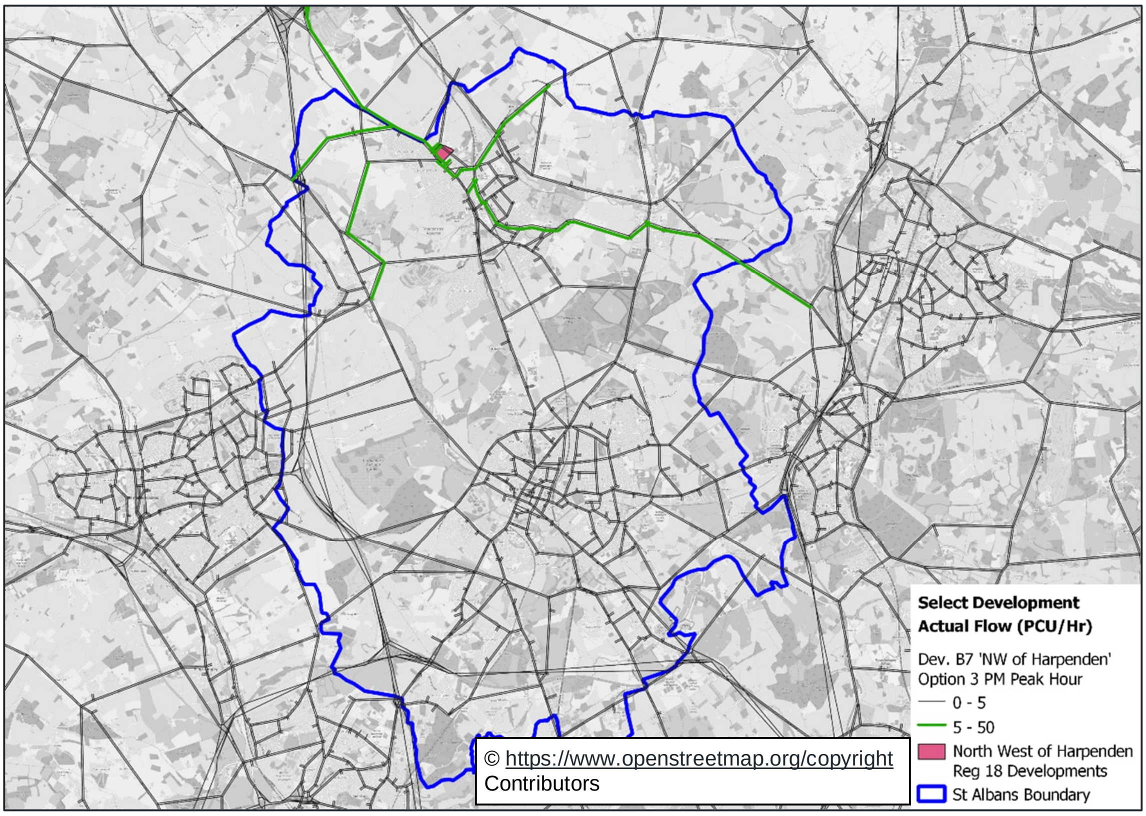

Figure 9-55: Traffic to and from North West Harpenden Development (PM Peak) Option 3

St Albans District Traffic Flow Changes

9.3.21. This section of the report provides details of the traffic flow changes across SAD between the following scenarios:

- **Option 0 vs Base Year**
  - Changes in traffic as a result of the predicted future year growth in traffic and the completed and committed developments
- **Option 1 vs Option 0**
  - Changes in traffic as a result of the SADC Local Plan developments
- **Option 2 vs Option 1**
  - Changes in traffic as a result of the IDP transport schemes and 10% mode shift assumption
- **Option 3 vs Option 1**
  - Changes in traffic as a result of the IDP transport schemes and Opportunity to Shift Modes tool

Impact of Future Year Growth and Committed Developments

9.3.22. Figure 9-56 and Figure 9-57 present the changes in traffic flow which occur as a result of the predicted future year growth in traffic and the completed and committed developments. Both figures show that across St Albans District there are increases in traffic flow with many roads showing increases of over 300 pcus, this causes local rerouting. There are some roads which experience a reduction in traffic flows which is a result of increased congestion occurring on the network.

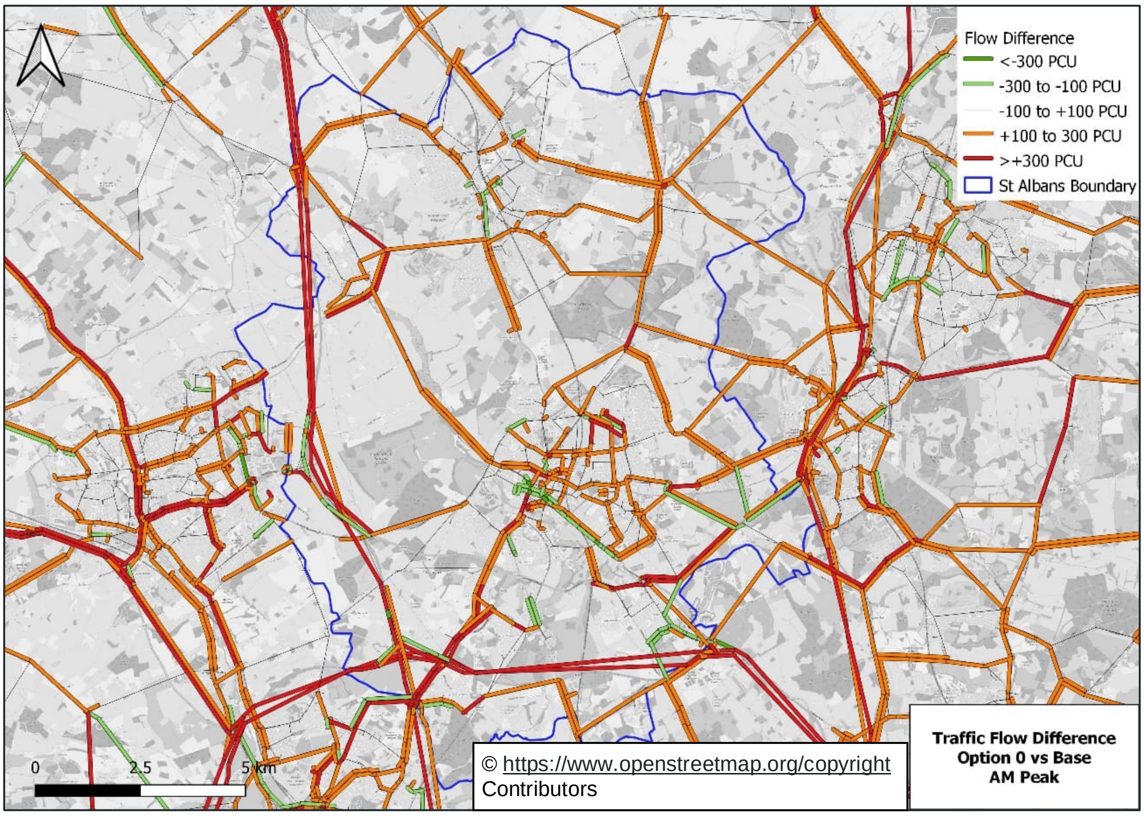

Figure 9-56: SAD Changes in Traffic Flow between Option 0 and Base Year (AM Peak)

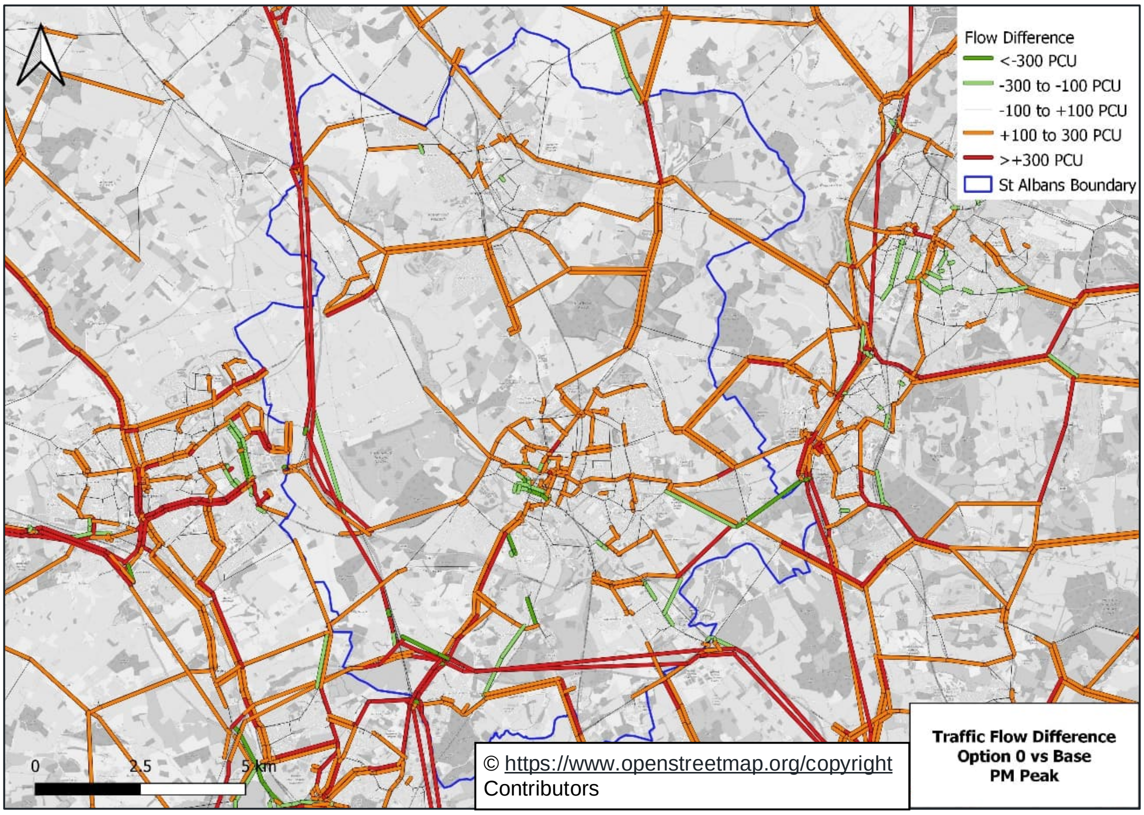

Figure 9-57: SAD Changes in Traffic Flow between Option 0 and Base Year (PM Peak)

Impact of Local Plan Developments without Mitigation

9.3.23. Figure 9-58 and Figure 9-59 present the changes in traffic flow which occur as a result of the SADC Local Plan developments. These show increases in traffic around the key Local Plan sites and with the biggest increases in traffic flow being around the East Hemel Hempstead site. The increases around this site are similar to the stand-alone development plot with the greatest increases occurring on A4147, A5183, B487, M1, Bedmond Road, Punchbowl Lane and Hogg End Lane. The plot shows reductions on A414 Breakspear Way which is a result of the additional delays and congestion which are being experienced in this area as a result of no transport improvements being introduced. The delays at A414/ Green Lane junction also leads to traffic re-routing to other east-west routes in Hemel which experiences increases. Increases in traffic around other Local Plan sites are between 100-300 pcus.

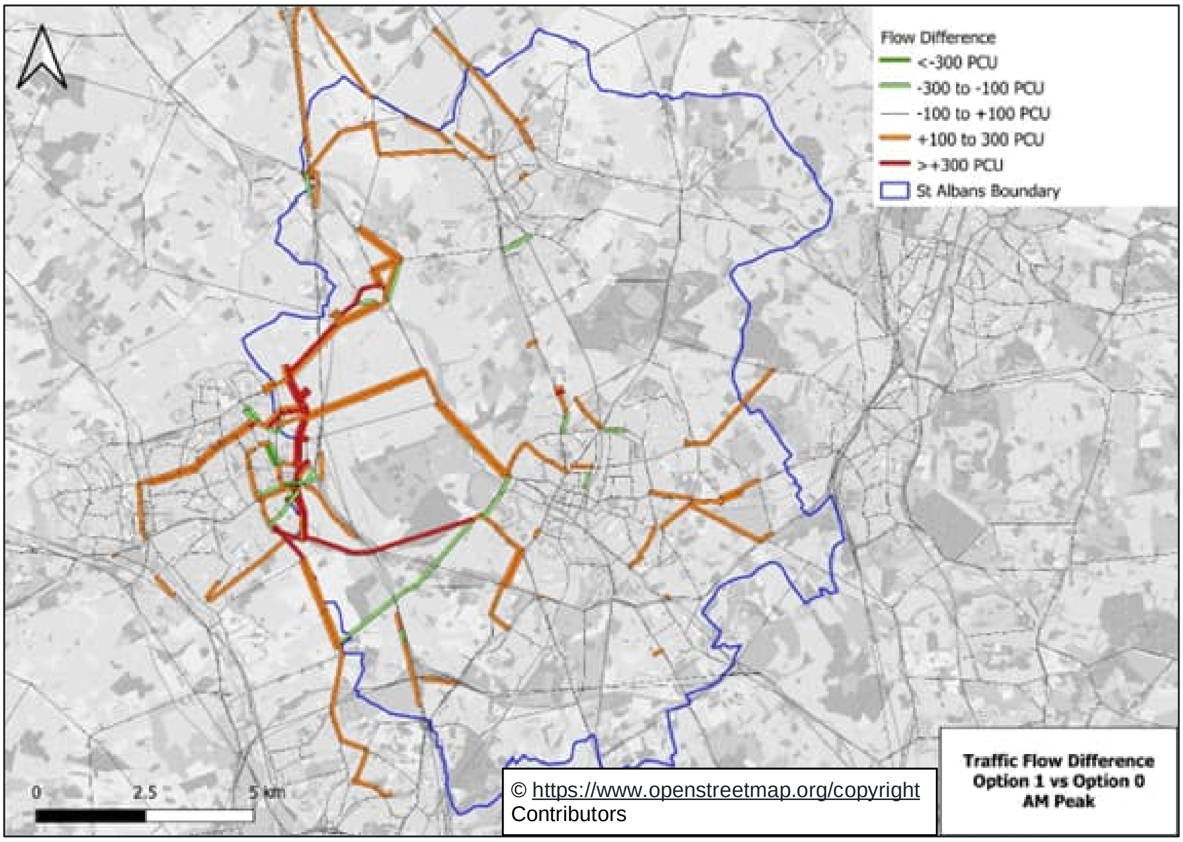

Figure 9-58: SAD Changes in Traffic Flow between Option 1 and Option 0 (AM Peak)

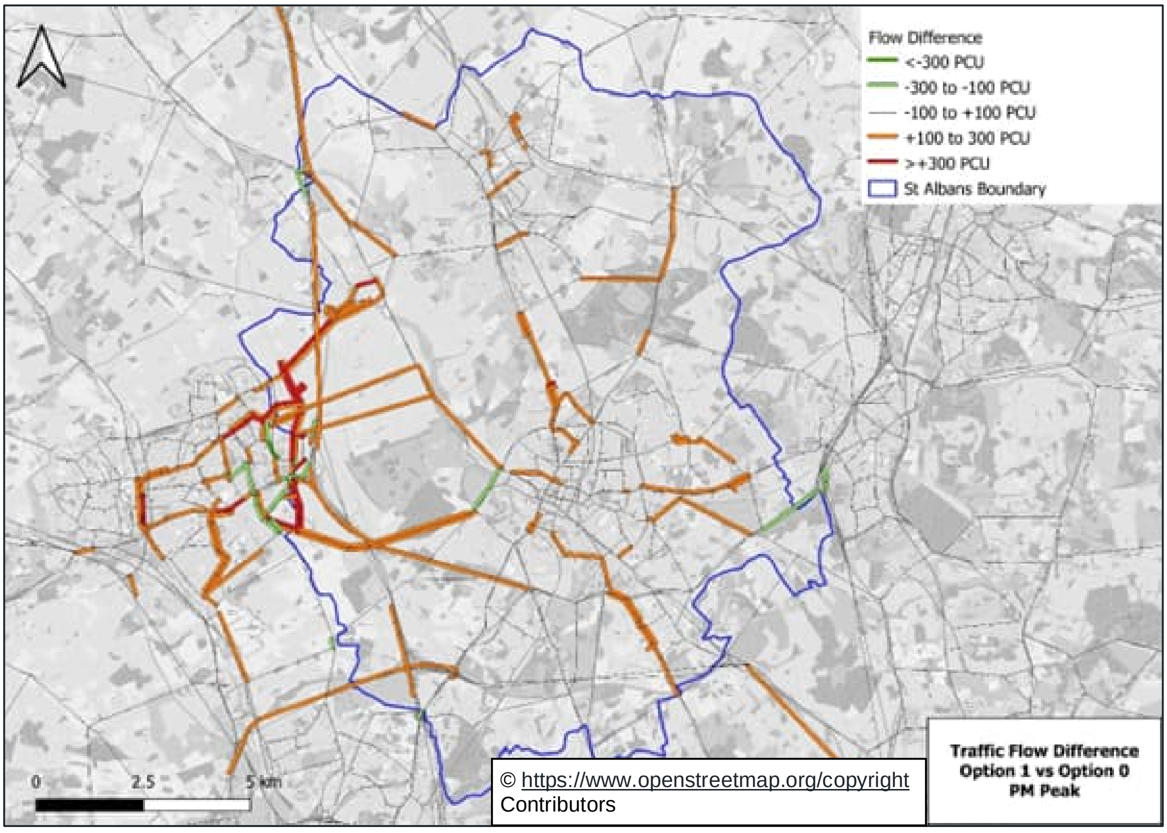

Figure 9-59: SAD Changes in Traffic Flow between Option 1 and Option 0 (PM Peak)

Impact of Mitigation (IDP and 10% Modal Shift)

9.3.24. Figure 9-60 and Figure 9-61 present the changes in traffic flow which occur as a result of the IDP schemes and 10% modal shift. Overall the changes show a mixture of both increases and decreases in traffic across the district. Around the East Hemel Hempstead site in both peaks there are increases in traffic on the A414 Breakspear Way which is a result of the introduction of the A414 Breakspear Way/ Green Lane improvement scheme which has reduced traffic delays along this corridor and made it more attractive for traffic to use. As a result of the reduction of delays on the A414 Breakspear Way there are reductions in traffic flow on other east-west corridors across Hemel Hempstead such as A4146, B487 and A4147. There are also increases in traffic flow onto the M1 which is a result of traffic flow in Option 1 being held up in congestion on A414 and being released as part of the A414 improvement scheme. There are traffic flow reductions on Punchbowl Lane, Hogg End Lane, Valley Road and Sandridge Valley Lane as a result of the closure of these roads which has been incorporated as part of mitigation measures associated with the Local Plan developments. The reductions in traffic across the district is a result of the mode shift assumptions which are incorporated into the scenario. There are increases in traffic on the A414 south of St Albans and reductions in traffic on the M25. This is a combination of the increase in traffic associated with East Hemel, which is now able to access the network, alongside the two A414 roundabout improvements which are part of the IDP improvements. There are increases on A1081 in the PM peak which is a result of the junction improvements between A1081/ A414. The IDP schemes are reducing delays and making the A414 route more attractive. The reduction on the M25 in the AM peak is between -166 pcus and -346 pcus which is a reduction of -2% to -6% of total flow.

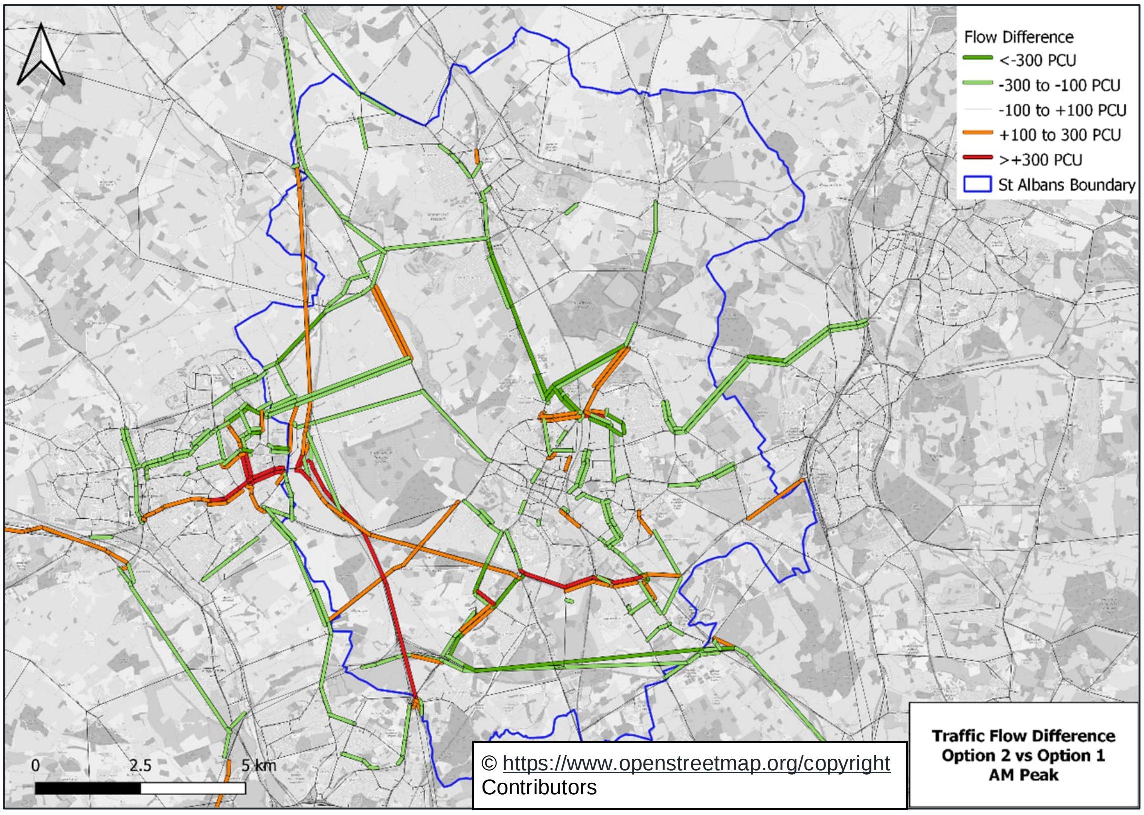

Figure 9-60: SAD Changes in Traffic Flow between Option 2 and Option 1 (AM Peak)

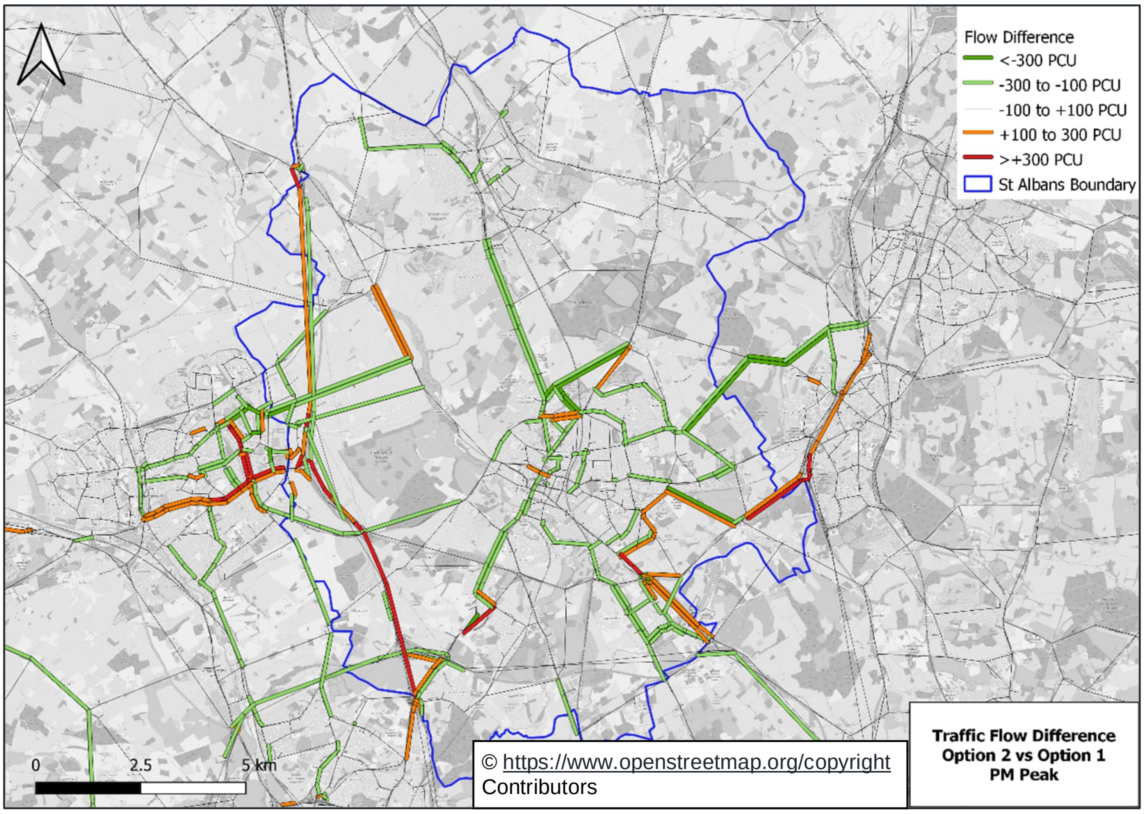

Figure 9-61: SAD Changes in Traffic Flow between Option 2 and Option 1 (PM Peak)

Impact of Mitigation (IDP and Alternative Modal Shift)

9.3.25. Figure 9-62 and Figure 9-63 present the changes in traffic flow which occur as a result of the IDP schemes and the OTS mode tool. Overall the changes are very similar to those presented between Option 2 and 1. However there are some interesting differences. The OTS mode tool targets short trips which are more likely to change mode and hence the shift away from car is more focussed on urban areas. This is why the Option 3 vs 1 difference plots show greater reductions in traffic flow in St Albans and in some instances greater increase in traffic on other roads such as A5183. Noting, that the plots will only show link flow differences if the traffic flow differences moves outside of the colour band.

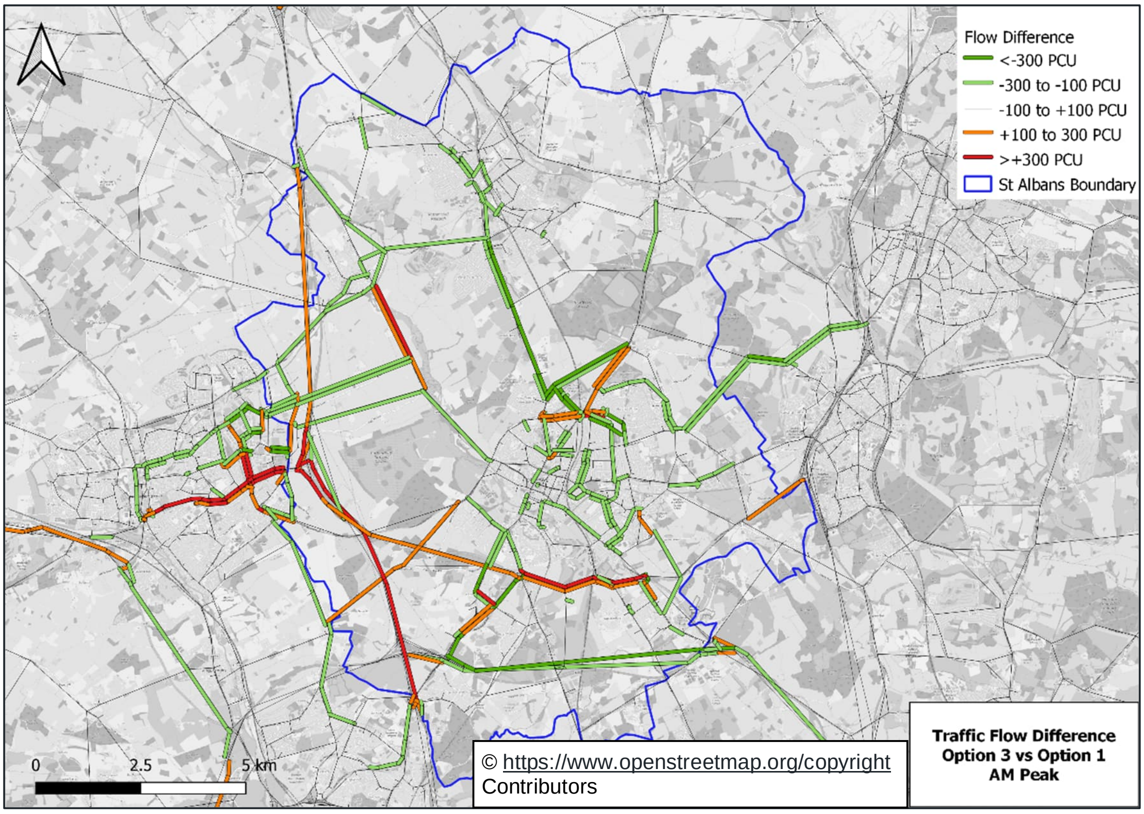

Figure 9-62: SAD Changes in Traffic Flow between Option 3 and Option 1 (AM Peak)

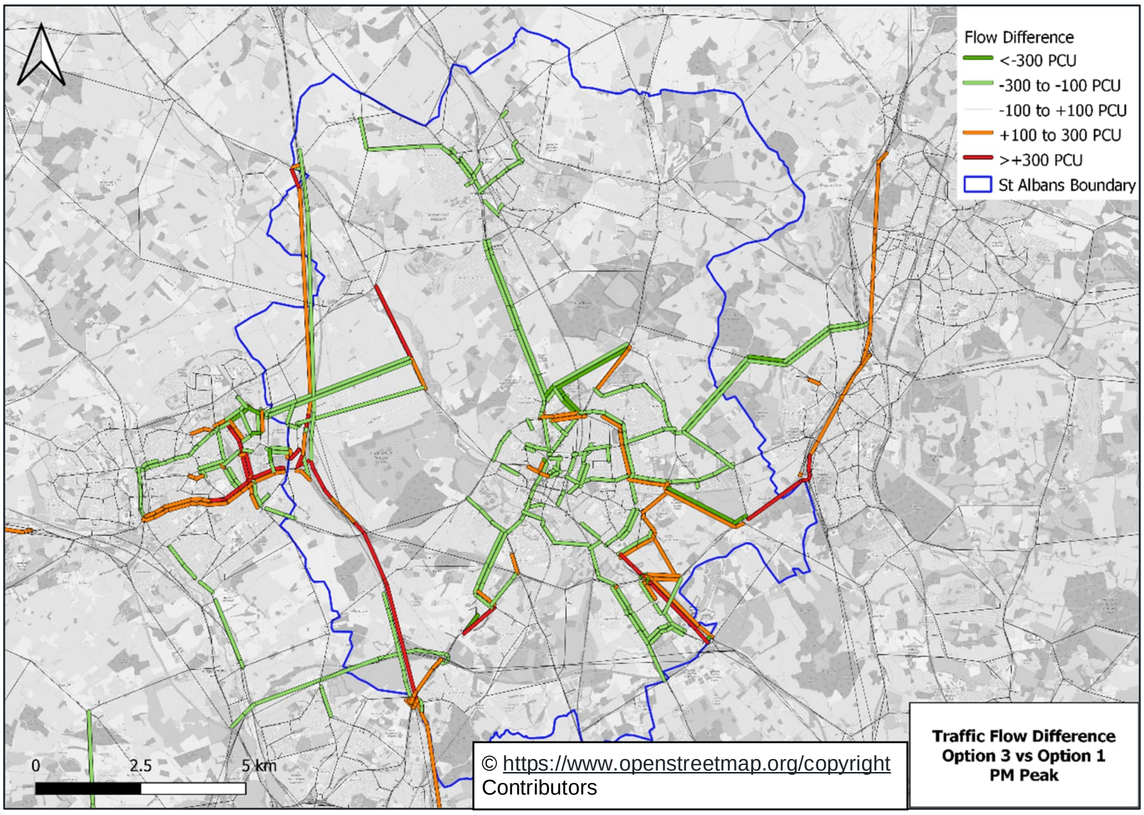

Figure 9-63: SAD Changes in Traffic Flow between Option 3 and Option 1 (PM Peak)

SRN Traffic Flow Changes

9.3.26. This section of the report provides details of the % traffic flow changes on the SRN between the scenarios as outlined in 9.3.21.

Impact of Future Year Growth and Committed Developments

9.3.27. Figure 9-64 and Figure 9-65 present the changes in SRN traffic flow which occur as a result of the predicted future year growth in traffic and the completed and committed developments. These figures show increases in traffic in excess of 20% expected to occur in both AM and PM peaks on the M1, M25 and A1(M) as a result of predicted future year traffic growth and consented developments. There are some decreases in traffic flows around M1 junction 8 which is a result of increased congestion in the area.

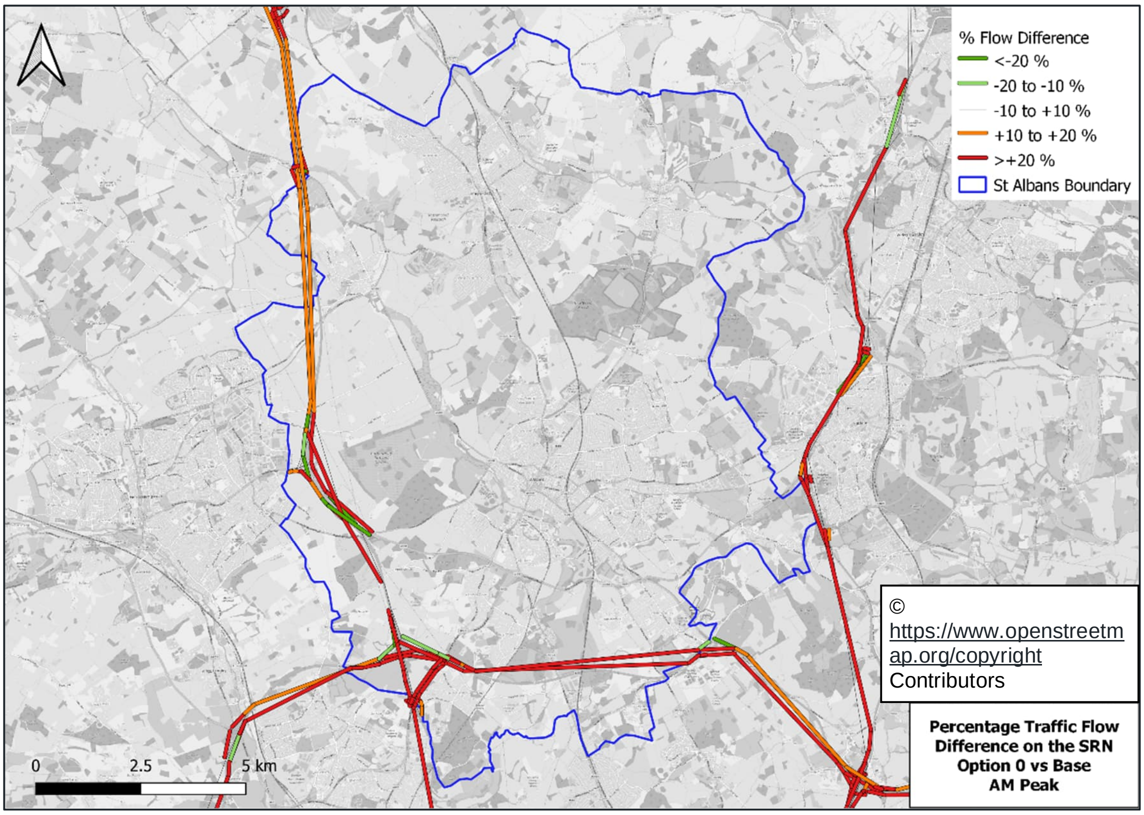

Figure 9-64: % Changes in Traffic Flow on SRN between Option 0 and Base Year (AM Peak)

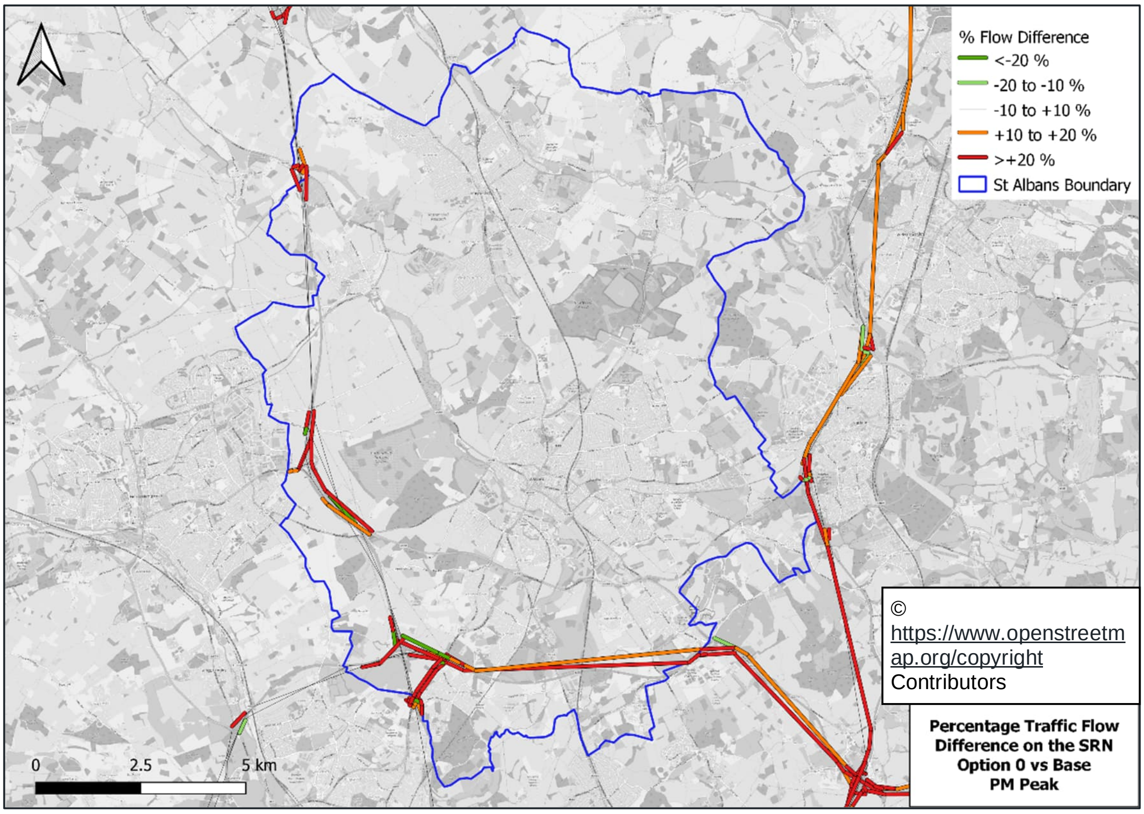

Figure 9-65: % Changes in Traffic Flow on SRN between Option 0 and Base Year (PM Peak)

Impact of Local Plan Developments without Mitigation

9.3.28. Figure 9-66 and Figure 9-67 present the changes in traffic flow which occur as a result of the SADC Local Plan developments (i.e. comparing Option 0 with Option 1). The figures show that the only significant percentage change in traffic flow occurs at M1 Junction 8, which is to be expected as a result of the East Hemel Hempstead development proposals. Noting there are some reduction in traffic flow which is a result of increased congestion in this area without the A414 Breakspear Way/ Green Lane improvement scheme. In both the AM and PM peak there are increases in traffic flow at M1 Junction 9 which is a result of the East Hemel traffic accessing the M1 at Junction 9 to travel north. These changes are associated with the on/off slips at the junction. There are some reductions in traffic in the PM peak on the M1 Junction 9 slip roads which is a result of congestion in the network reducing the traffic flow at this location. In the PM peak there are also some changes in traffic flow at the M1/ M25 junction with both increases and decreases in % traffic flow which are a result of the St Albans Local Plan development and traffic changing routes as a result of the increased demand and highway congestion.

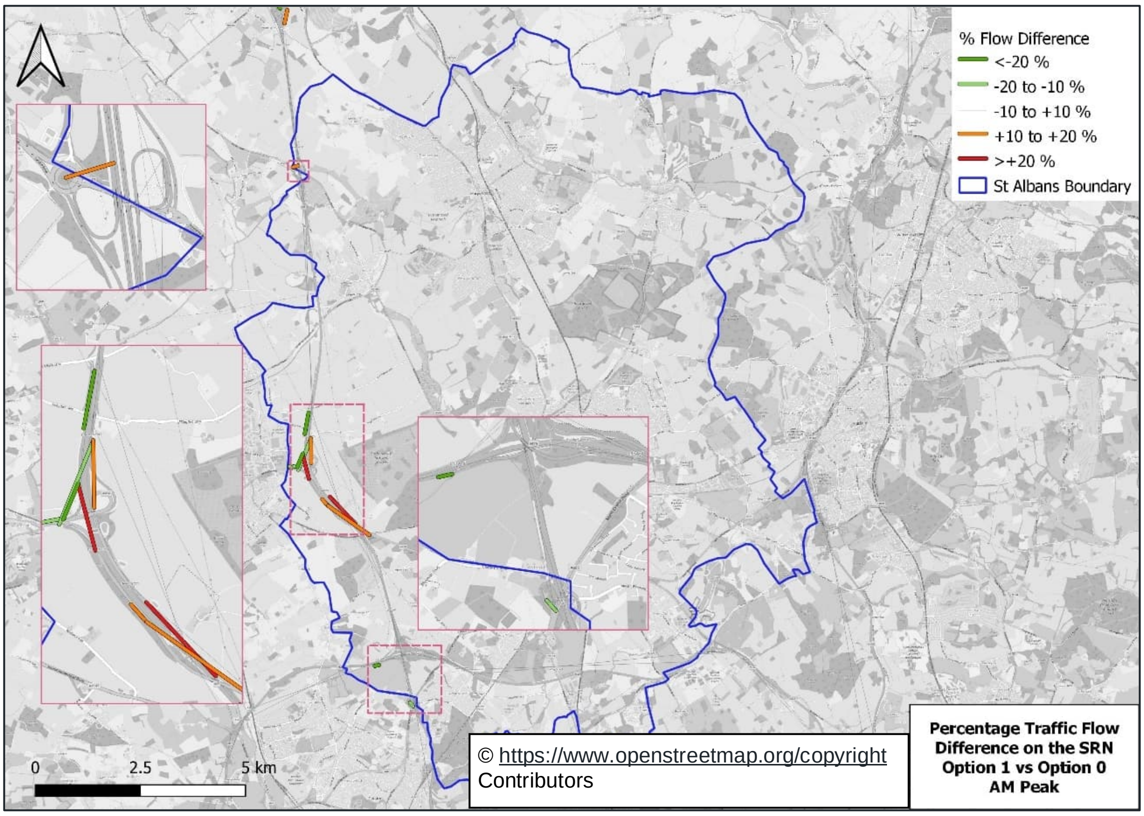

Figure 9-66: % Changes in Traffic Flow on SRN between Option 1 and Option 0 (AM Peak)

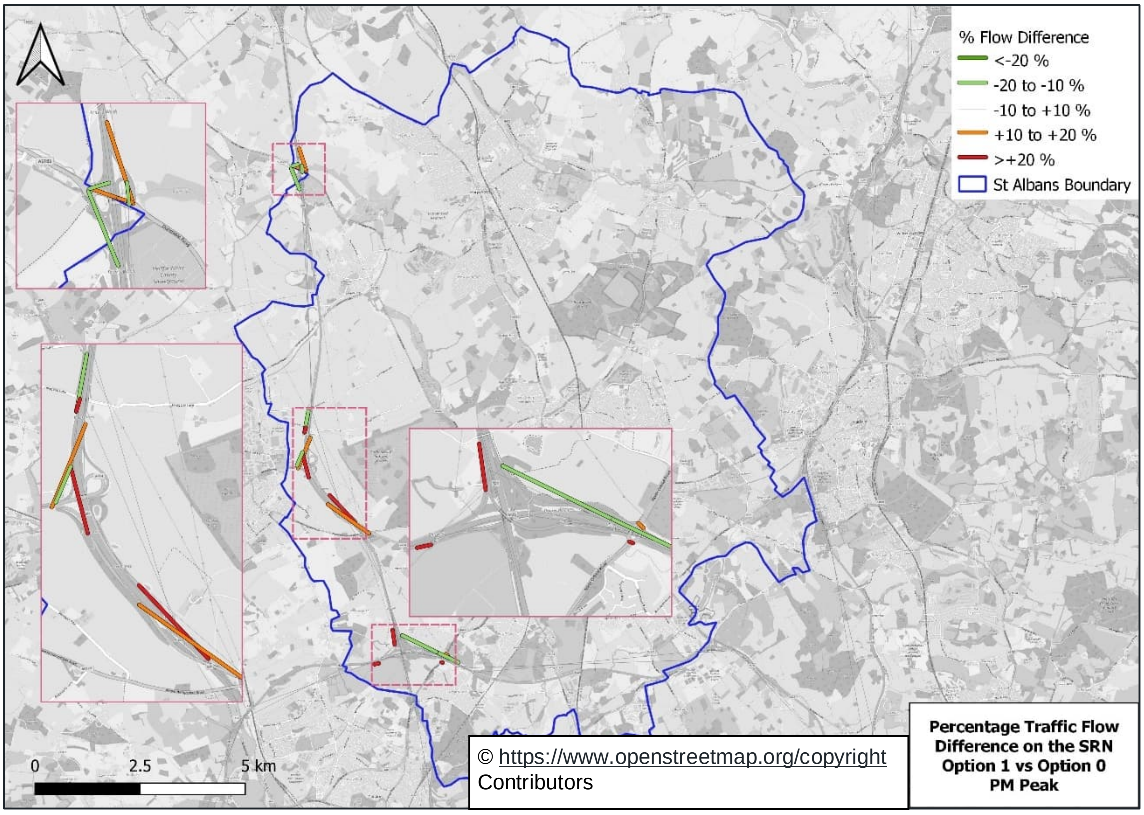

Figure 9-67: % Changes in Traffic Flow on SRN between Option 1 and Option 0 (PM Peak)

Impact of Mitigation (IDP and 10% Modal Shift)

9.3.29. Figure 9-68 and Figure 9-69 present the changes in traffic flow which occur as a result of the IDP schemes and 10% modal shift (i.e. comparing Option 1 with Option 2). These show an increase in the percentage increase in traffic at M1 Junction 8 which is a result of the A414 Breakspear Way/ Green Lane junction improvement reducing delay and making this route more attractive for traffic. In the AM peak there are reductions in traffic at M1 Junction 9 which is a result of some traffic at East Hemel using M1 Junction 8 now as a result of the improvements instead of Junction 9. However at M1 Junction 9 in the PM peak there are increases in traffic on the off slips which is a result of reduced congestion in the local network and more traffic able to use the slip road. For example, in Option 1 65 vehicles travelled along A414 Breakspear Way and used the M1 Junction 9 northbound off slip, in Option 2 this increases to 180 with the A414 improvement scheme in place. In the AM peak flow difference increases greater than 10% are also occurring at M25 Junctions 20 and 22 and M1 Junction 6 these are between 10-20%. In the PM peak there are increases in traffic flow at the M25/M1 junction greater than 20% and M25 Junction 20 between 10-20% and the A1(M) Junction 3 of 10-20%.

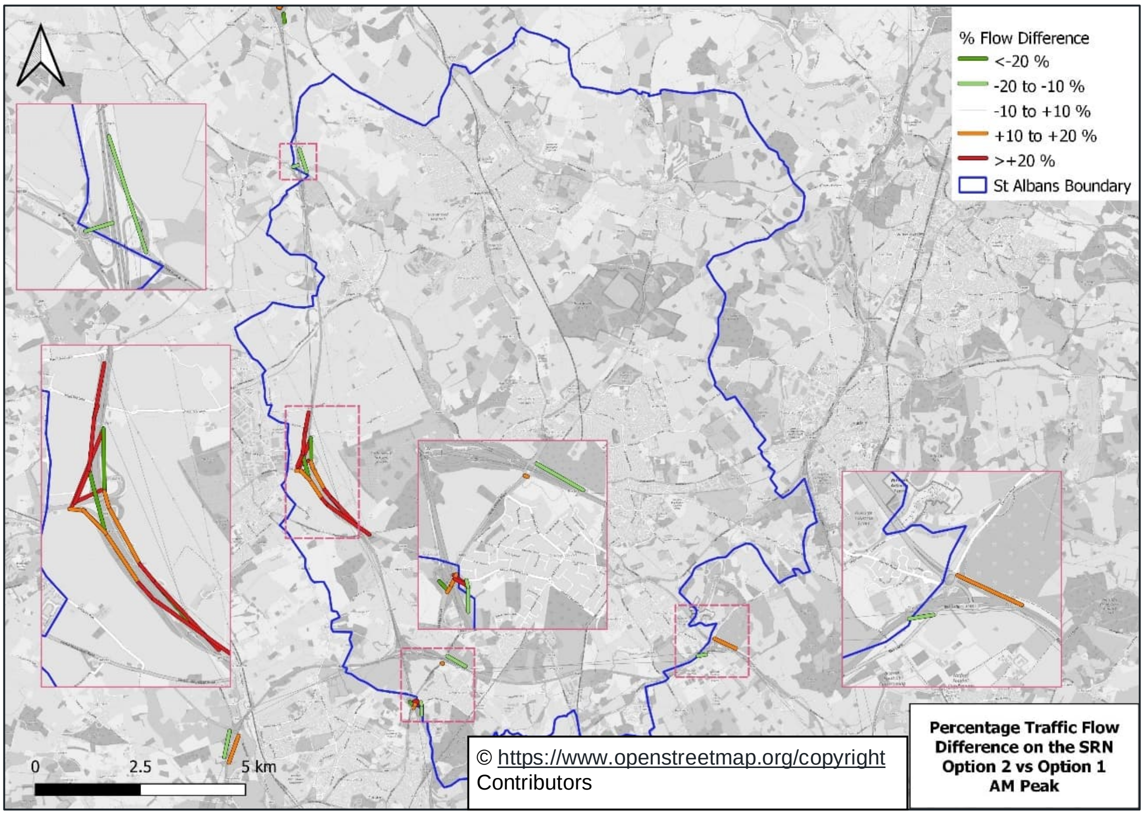

Figure 9-68: % Changes in Traffic Flow on SRN between Option 2 and Option 1 (AM Peak)

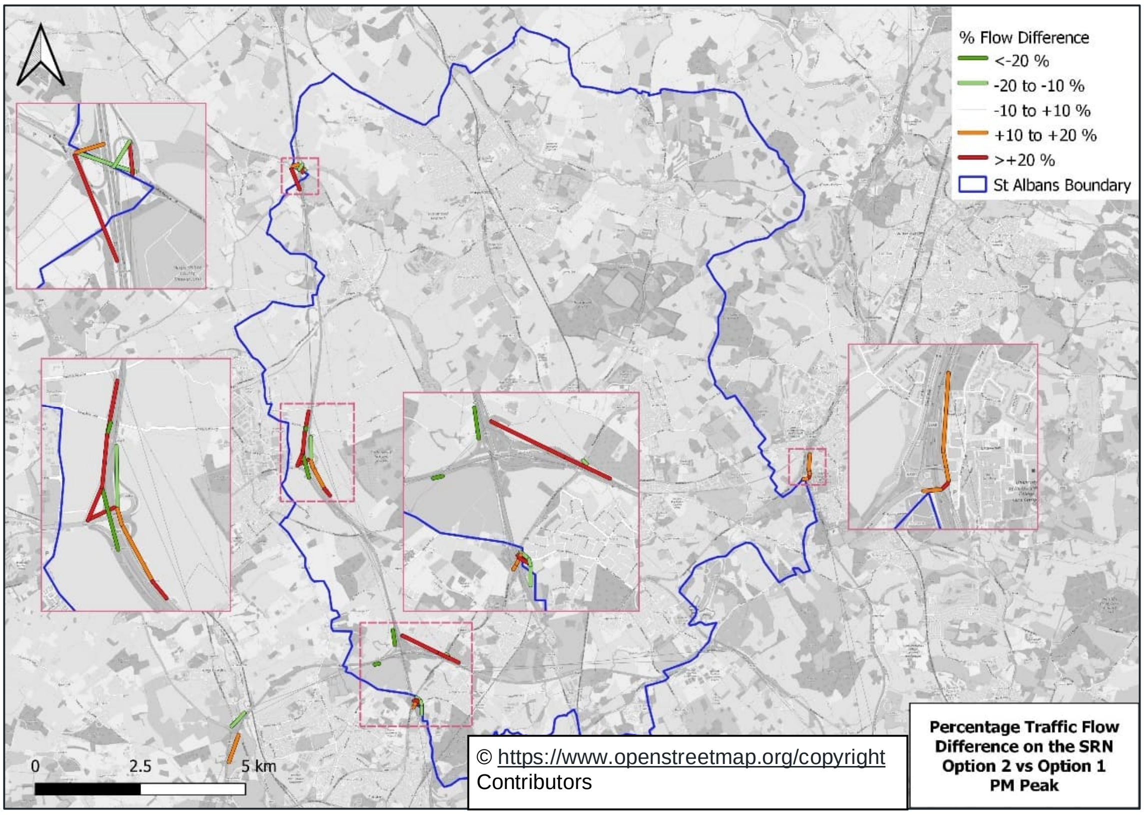

Figure 9-69: % Changes in Traffic Flow on SRN between Option 2 and Option 1 (PM Peak)

Impact of Mitigation (IDP and Alternative Modal Shift)

9.3.30. Figure 9-70 and Figure 9-71 present the changes in traffic flow which occur as a result of the IDP schemes and the OTS mode tool (i.e. comparing Option 1 with Option 3). These show very similar percentage increase in traffic flow on the SRN as the results for Option 2.

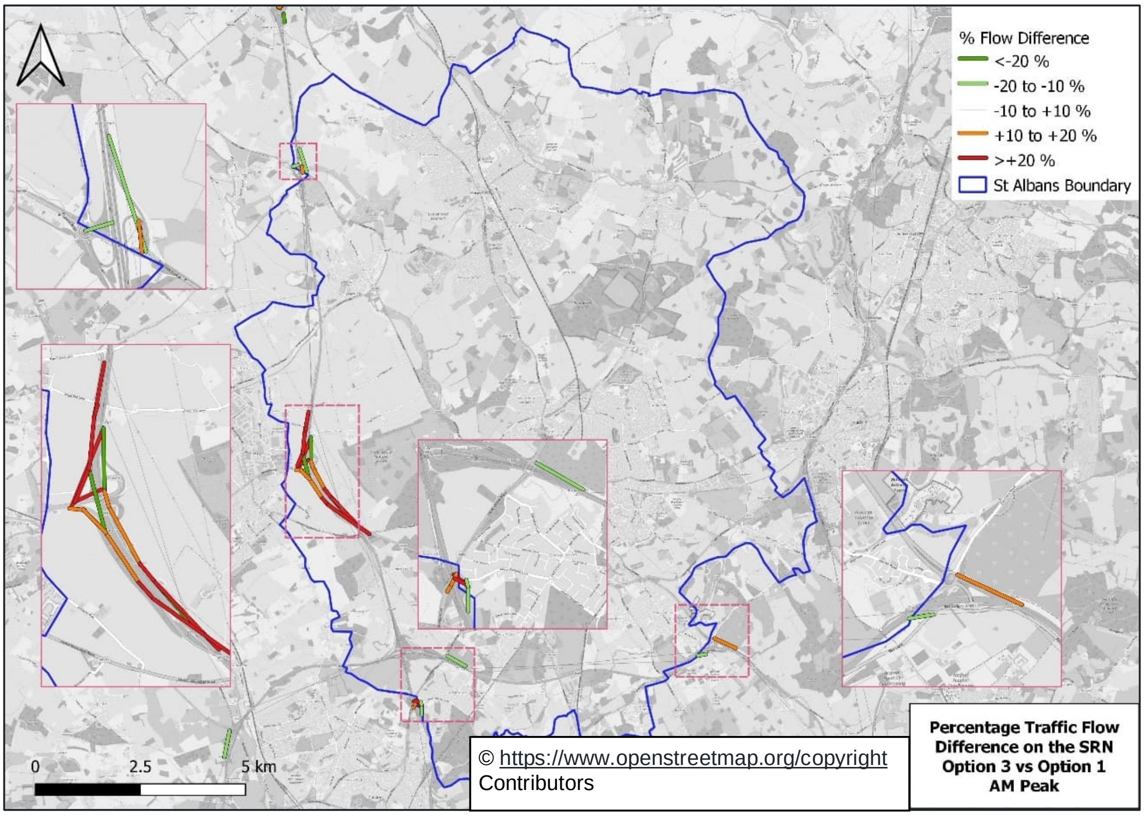

Figure 9-70: % Changes in Traffic Flow on SRN between Option 3 and Option 1 (AM Peak)

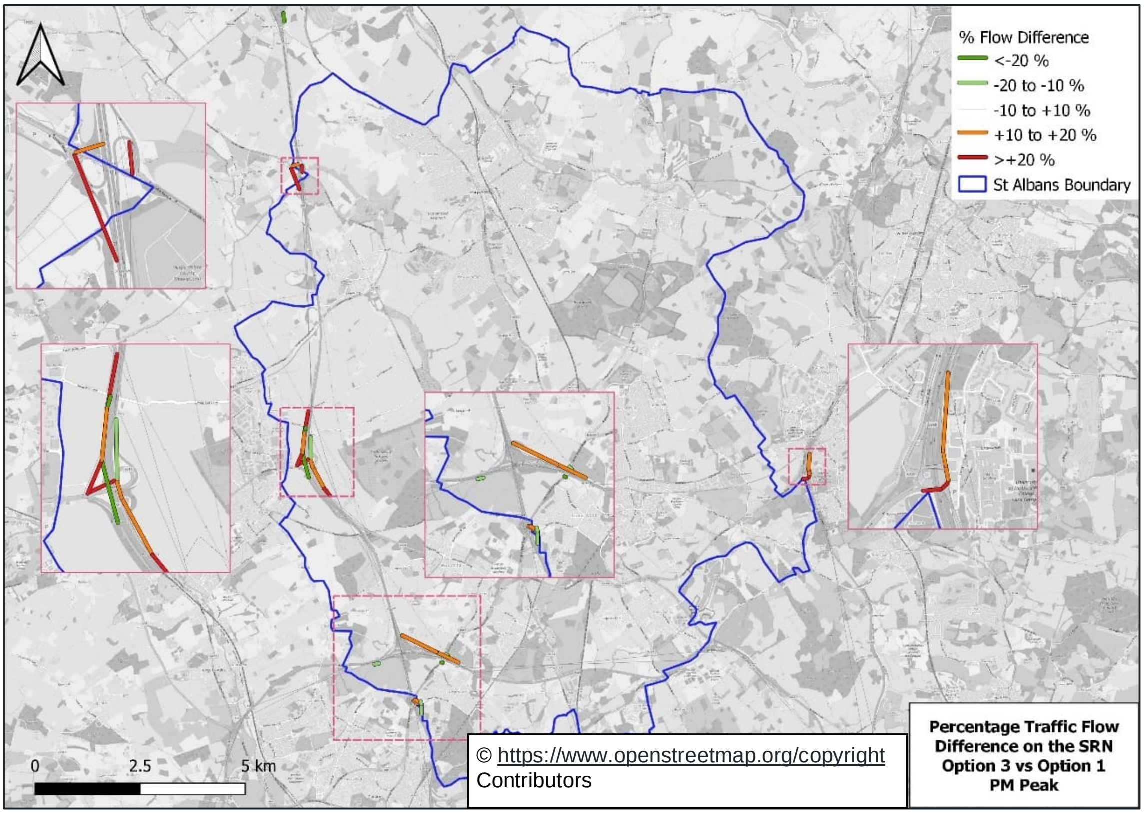

Figure 9-71: % Changes in Traffic Flow on SRN between Option 3 and Option 1 (PM Peak)

9.4 Junction Performance

Overview

9.4.1. Junction delay plots have been generated for all the junctions in St Albans district to illustrate the changes in delays which occur between scenarios as outlined in section 9.3.21.

Impact of Future Year Growth and Committed Developments

9.4.2. The impact of future year growth and committed developments on the junction delay is presented Figure 9-72 and Figure 9-73. This shows that across St Albans District there is a mixture of increases and decreases in junction delay. Key junctions which experience increases in delay are the A141 junction with Green Lane, A1(M) junction 3, A414 junction with the A1081, A414/ A1081 junction at Colney Heath (London Colney), along with some junctions in the north of St Albans area including A1081 with Beech Road (ancient Britton) and B651 with Beech Road (King William).

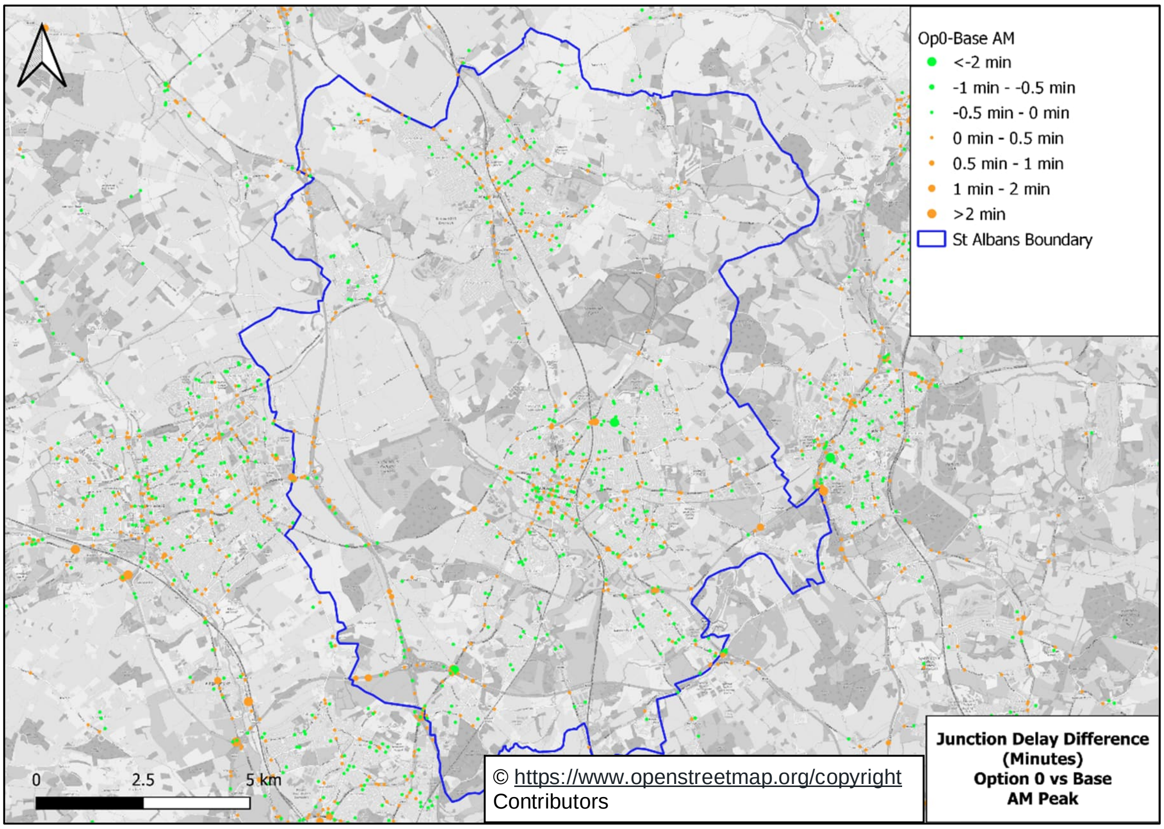

Figure 9-72: Node Delay Difference Option 0 vs Base AM Peak

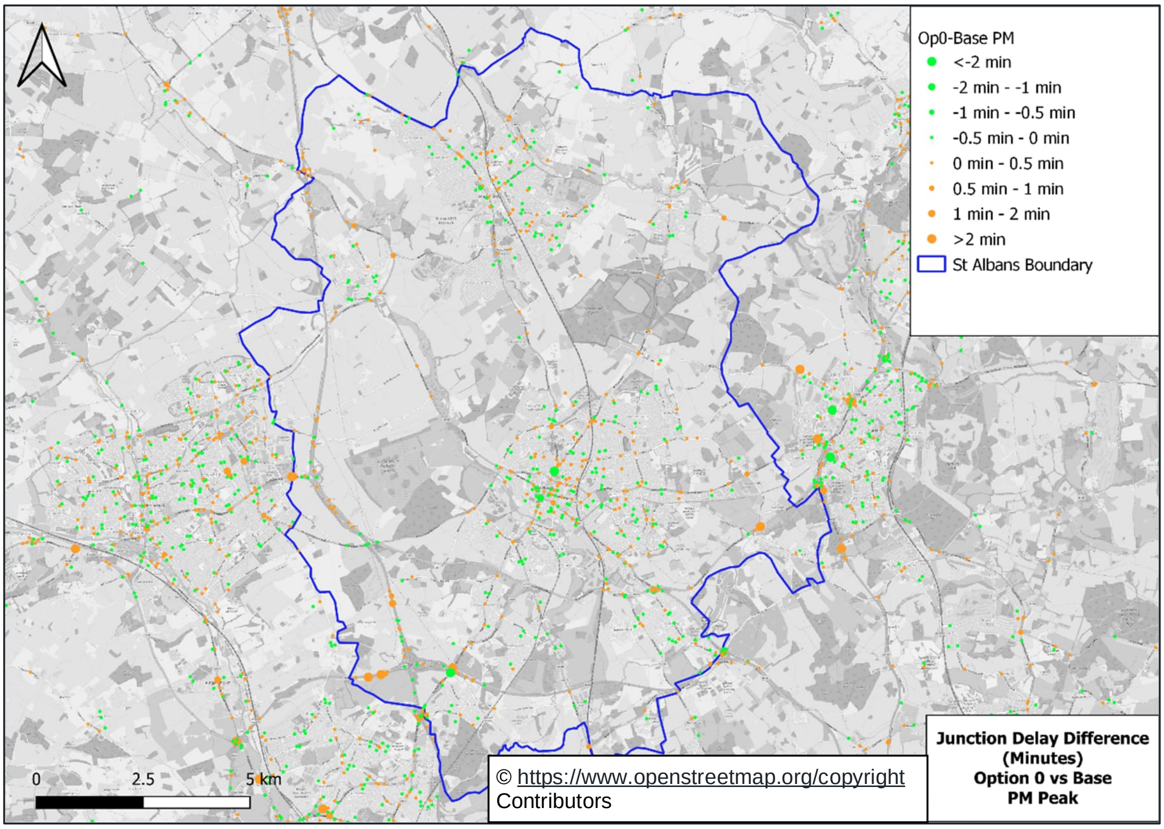

Figure 9-73: Node Delay Difference Option 0 vs Base PM Peak

Impact of Local Plan without Mitigation

9.4.3. The impact of the Local Plan without mitigation on the junction delays is presented in Figure 9-74 and Figure 9-75. The key areas where junction delays increase, as to be expected are close to Local Plan development sites, for example the A414 junction with Green Lane near the East Hemel development site, junctions on A1081 and local roads near the North of St Albans site, delays at junction east of St Albans on A4147 as a result of the Bedmond Lane development and A5183 junction with B487 near Redbourn and the development sites in that area.

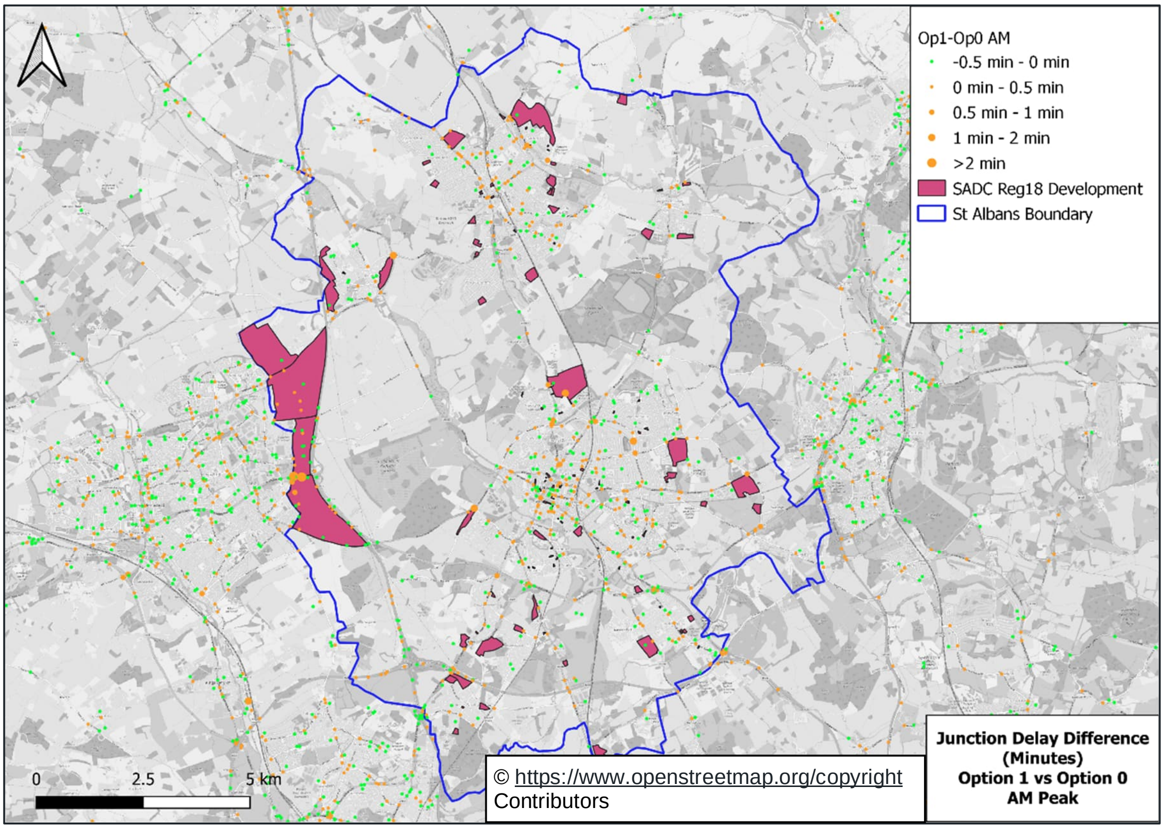

Figure 9-74: Node Delay Difference Option 1 vs Option 0 AM Peak

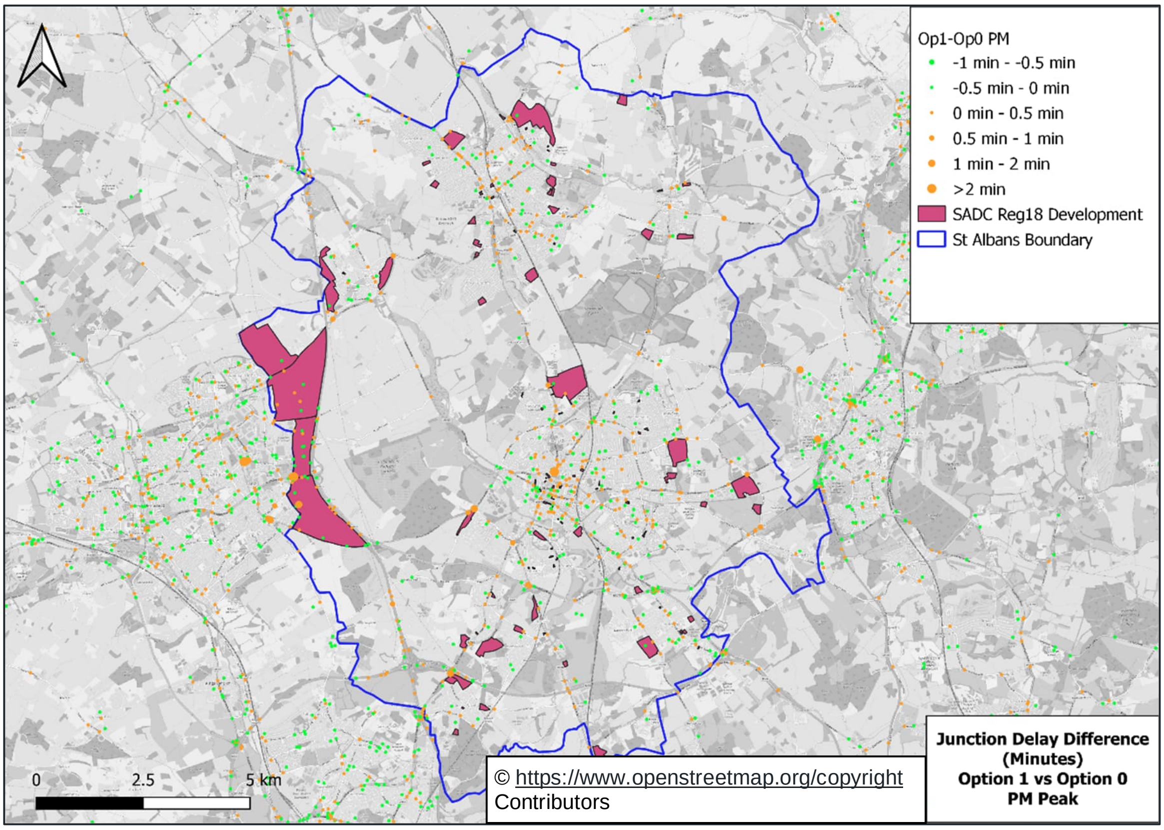

Figure 9-75: Node Delay Difference Option 1 vs Option 0 PM Peak

Impact of Mitigation (IDP and 10% Modal Shift)

9.4.4. The impact of the IDP mitigation and 10% Modal Shift on the junctions delays is presented in Figure 9-76 and Figure 9-77. The figures show that between Option 2 and 1 there is a general reduction in junction delays across St Albans district which is a result of both the IDP infrastructure and the 10% mode shift. There are some increases in delays in the north of St Albans area, the junction between A1081 with Beech Road which is a result of the closure of Valley Road and Sandridgebury Lane which have been closed in Option 2 and 3. It is advised that further work could be undertaken at these locations to understand if any mitigation needs to be adopted to reduce the delays as part of the next stage of the Local Plan.

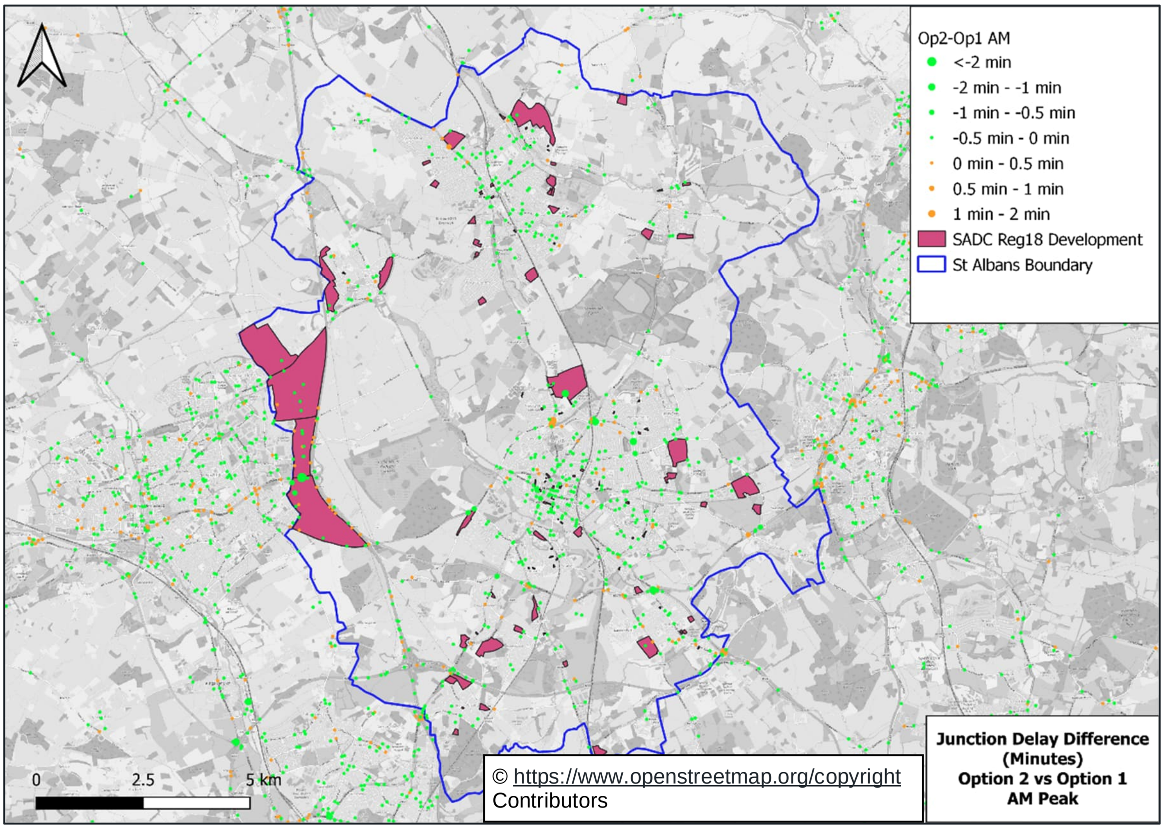

Figure 9-76: Node Delay Difference Option 2 vs Option 1 AM Peak

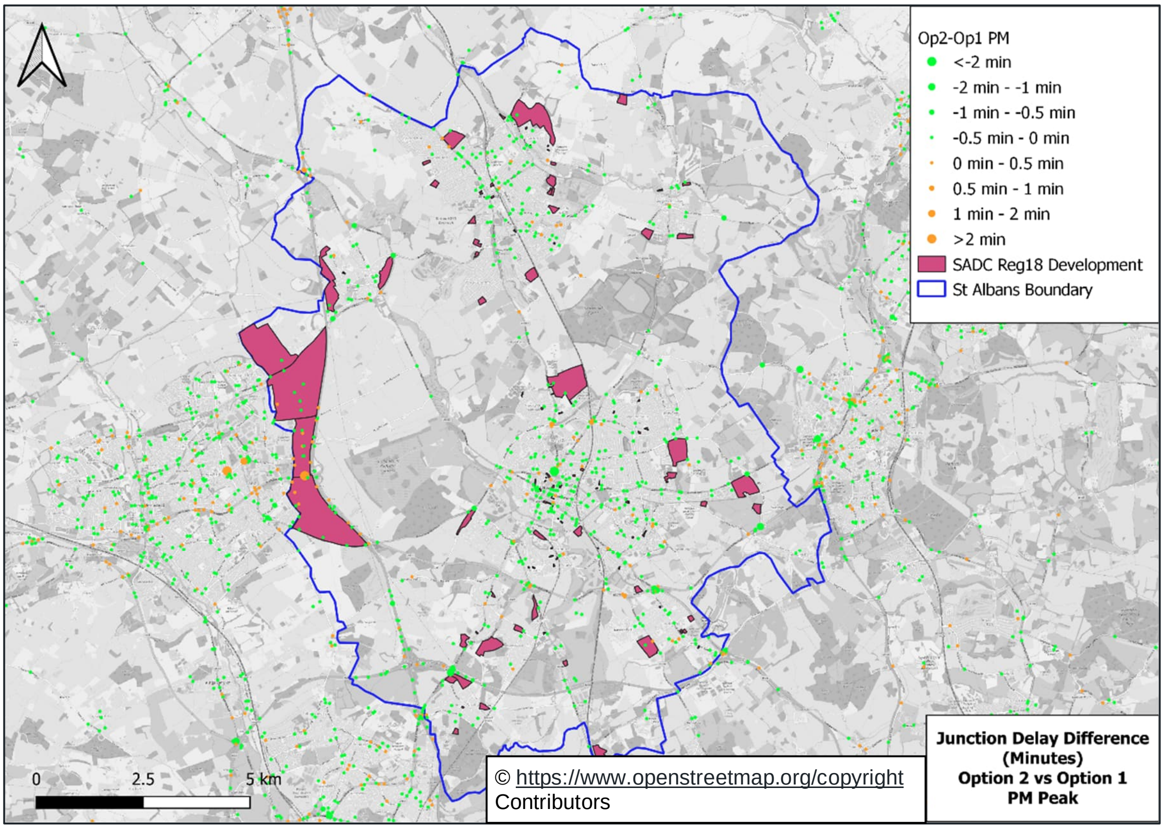

Figure 9-77: Node Delay Difference Option 2 vs Option 1 PM Peak

Impact of Mitigation (IDP and Alternative Modal Shift)

9.4.5. The impact of the IDP mitigation and the alternative modal shift (Option 3 compared to Option 1) on the junction delays is presented in Figure 9-78 and Figure 9-79. The changes are similar to those shown between Option 2 and 1 which is to be expected given the similarities between Option 2 and 3.

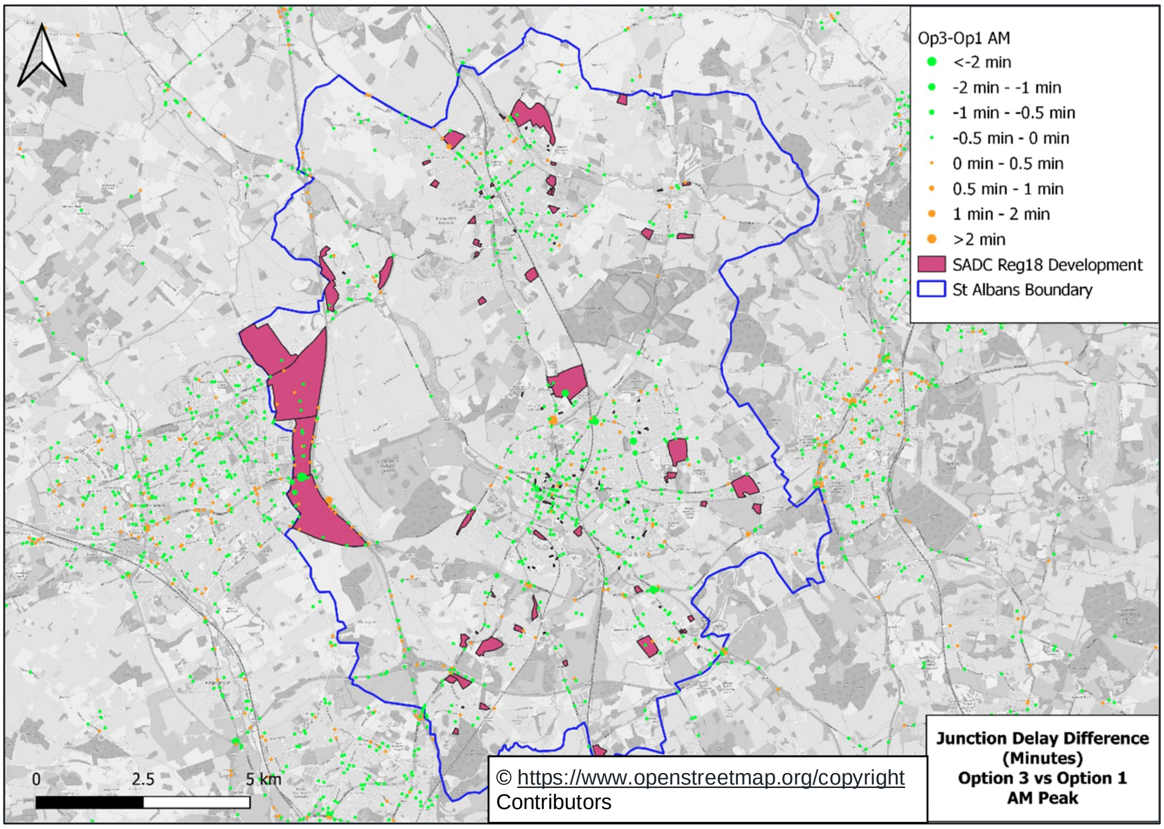

Figure 9-78: Node Delay Difference Option 3 vs Option 1 AM Peak

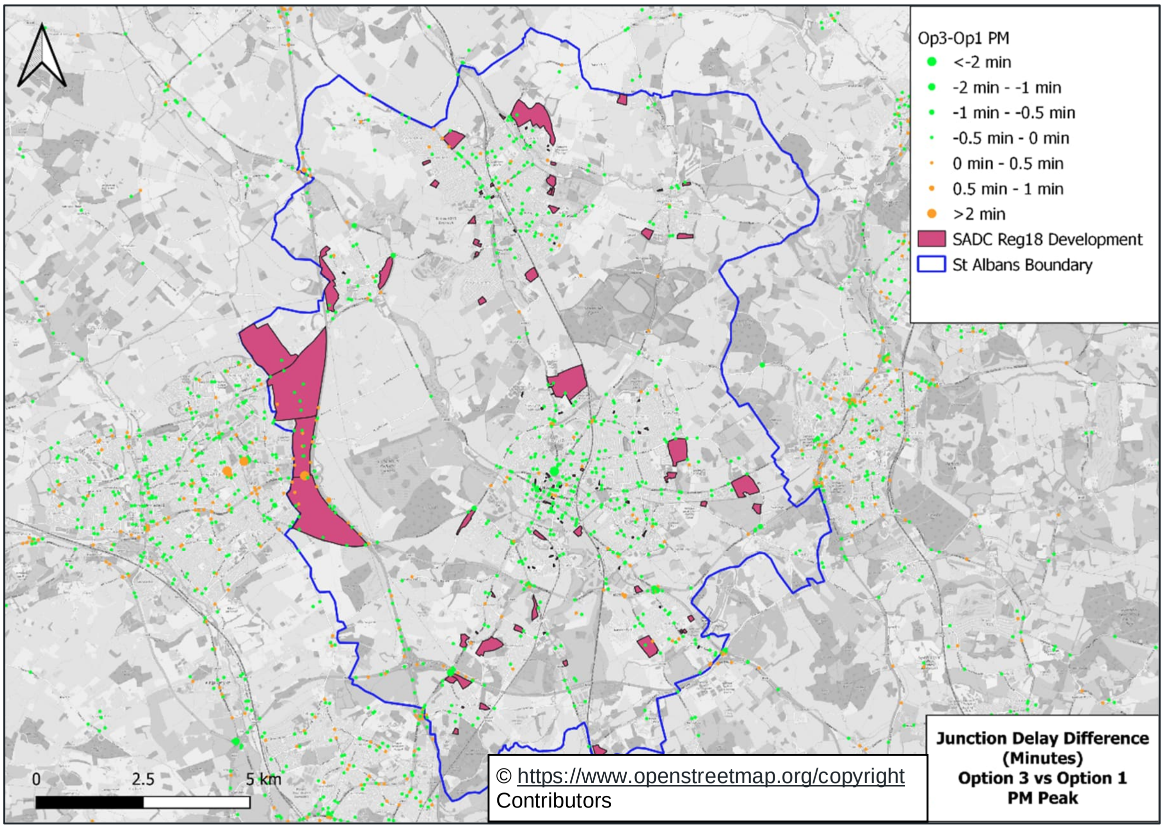

Figure 9-79: Node Delay Difference Option 3 vs Option 1 PM Peak

Performance of Key Junctions

Overview

9.4.6. Twenty-seven key junctions were identified by SADC in the St Albans district as shown in Figure 9-80. For these junctions more detailed information has been extracted from the strategic transport model to understand the differences which occur within the scenarios. It is important to note COMET is a strategic model and detailed junction modelling is required to understand the performance of the junctions more precisely.

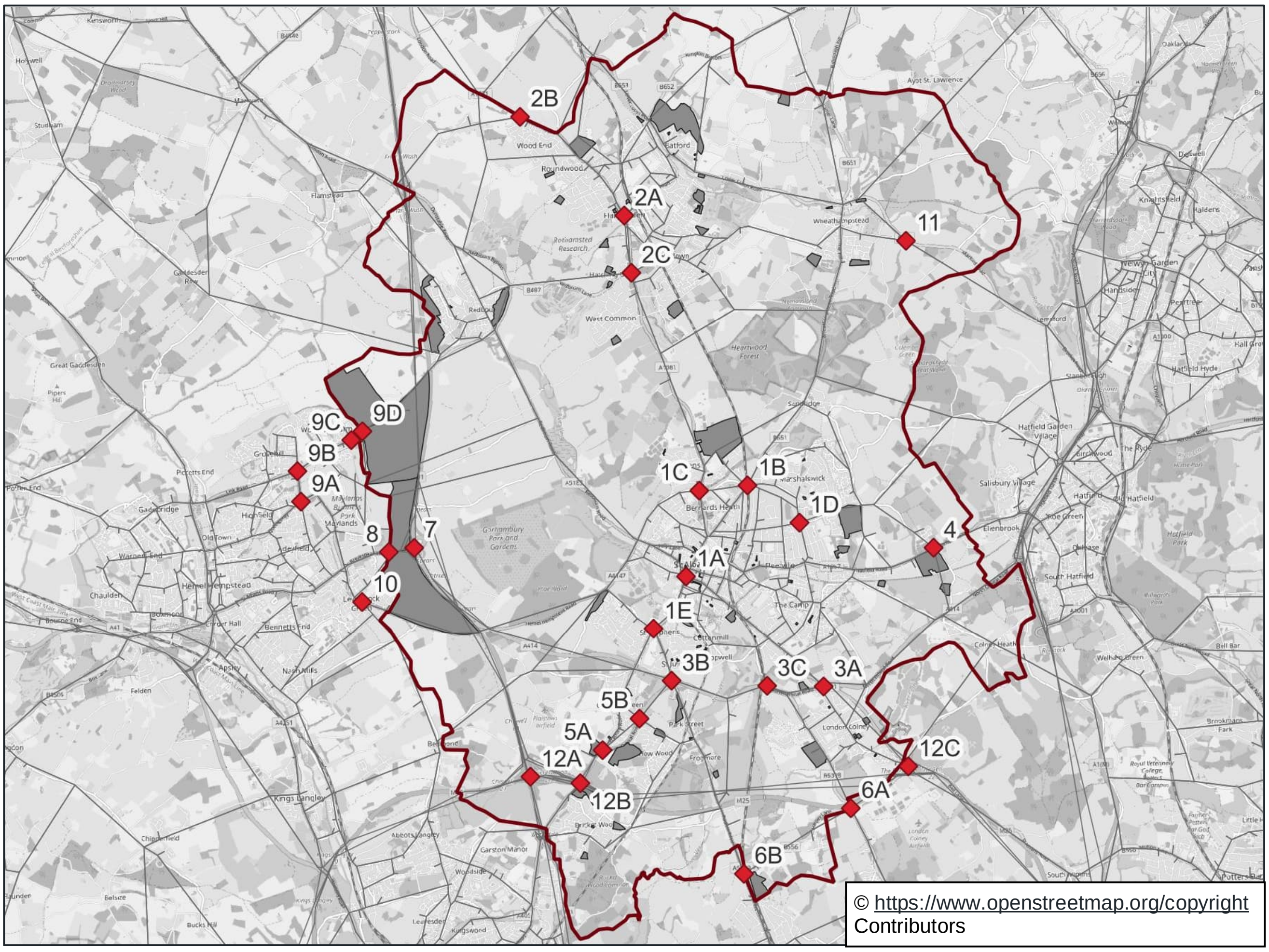

Figure 9-80: Key Junctions in St Albans

Summary of Flows at Key Junctions

9.4.7. Table 9-3 and Table 9-4 summarises the change in total entry flow at each of the key junctions across each of the scenarios. The changes in total flow have been analysed by comparing the following scenarios:

- Option 0 vs Base Year
- Option 1 vs Option 0
- Option 2 vs Option 1
- Option 3 vs Option 1

9.4.8. If the traffic flow change between the options was an increase the cell in the table is orange, if there is a reduction the cell in the table is green.

9.4.9. Table 9-3 and Table 9-4 shows that the general pattern of changes in traffic flow at junctions are:

- Increases in traffic between Option and base year as a result of committed developments
- Increases in traffic Option 1 and Option 0 as a result of the Local Plan developments
- Decreases in traffic between Options 2 and 1 as a result of the local plan IDP schemes and modal shift
- Decreases in traffic between Options 3 and 1 as a result of the local plan IDP schemes and opportunity to shift mode change

9.4.10. However there are junctions which do not follow this patterns, for example at the Ancient Britton junction (ref 1C) the increase is due to rerouted traffic caused by the IDP bus gate schemes on Valley Road and Sandridgebury Lane. Along the A414 the IDP highway schemes reduce delays and make the route more attractive, hence the increases at the A414 junctions with A1081 London Colney (ref 3A) and A405 (ref 3B) as well as at the junction of A405/Tippendell Lane (ref 5B) and M25 Junction 22 (ref 12C). The IDP schemes at A414/Green Lane increases the capacity of the junction, thus allowing increased traffic flow through it (ref 8) as well as affecting A414/M1 Junction 8 (ref 7).

Table 9-3: Summary of Total Entry flow at Key Junctions by scenario (AM Peak Hour)

Ref	Junction Name	Total Entry Flow (PCU)				
		Base	Option 0	Option 1	Option 2	Option 3
1A	Peahen	1,537	1,121	1,222	1,078	1,050
1B	King William IV	1,956	2,108	2,233	2,068	2,061
1C	Ancient Britton	2,230	2,233	2,272	2,469	2,460
1D	Sandpit Lane/Beechwood Avenue	1,972	2,233	2,174	2,181	2,133
1E	King Harry	2,413	2,758	2,980	2,615	2,625
2A	A1081 Luton Road/Station Road	1,688	1,692	1,689	1,507	1,476
2B	A1081/The Common	1,722	1,858	2,023	1,875	1,918
2C	A1081 Luton Road/Redbourn Road	3,646	4,089	3,980	3,504	3,495
3A	A414/A1081 London Colney	5,114	5,813	5,808	6,378	6,422
3B	A414/A405	5,194	5,730	5,755	5,992	5,981
3C	A414/Shenley Lane,Napsbury	1,218	1,469	1,531	1,472	1,544
4	A1057 Hatfield Road/Station Road	2,067	2,626	2,806	2,683	2,664
5A	A405/Watford Road (the Noke)	2,451	4,433	4,548	4,254	4,289
5B	A405/Tippendell Lane	2,361	4,064	4,238	4,269	4,247
6A	Harper Lane/Shenley Road	2,138	2,631	2,658	2,540	2,601
6B	Harper Lane/Watling Street	1,541	1,947	2,016	1,908	1,945
7	A414/M1 Junction 8	5,453	6,232	6,013	7,482	7,509
8	A414/Green Lanes	4,554	4,921	5,090	7,136	7,201
9A	Redbourn Road/Queensway	1,982	2,455	2,751	2,561	2,658
9B	Redbourn Road/Link Road	3,242	3,956	4,138	3,958	4,020
9C	Redbourn Road/Shenley Road	1,774	2,373	2,622	2,408	2,438
9D	Redbourn Road/Cherry Tree Lane	1,738	2,364	2,649	2,489	2,520
10	Leverstock Green Road/Bedmond Road	1,761	1,835	2,268	2,151	2,256
11	B653 Cory Wright Way/Marford Road	2,325	2,613	2,662	2,619	2,670
12A	M25 Junction 21					
12B	M25 Junction 21a	12,028	16,079	16,186	15,606	15,678
12C	M25 Junction 22	12,789	15,600	15,791	15,322	15,473

Table 9-4: Summary of Total Entry Flow at Key Junctions by Scenario (PM Peak Hour)

Ref	Junction Name	Total Entry Flow (PCU)				
		Base	Option 0	Option 1	Option 2	Option 3
1A	Peahen	1,439	891	1,034	828	857
1B	King William IV	1,776	2,097	2,268	1,920	1,864
1C	Ancient Britton	2,025	2,158	2,288	2,297	2,316
1D	Sandpit Lane/Beechwood Avenue	2,054	2,201	2,232	2,094	2,100
1E	King Harry	2,439	2,587	2,753	2,504	2,566
2A	A1081 Luton Road/Station Road	1,707	1,655	1,820	1,683	1,638
2B	A1081/The Common	1,687	1,844	1,936	1,841	1,882
2C	A1081 Luton Road/Redbourn Road	3,571	4,020	4,224	4,007	3,987
3A	A414/A1081 London Colney	5,899	6,164	6,166	6,799	6,884
3B	A414/A405	6,232	6,144	6,139	6,355	6,253
3C	A414/Shenley Lane,Napsbury	1,301	1,507	1,742	1,440	1,477
4	A1057 Hatfield Road/Station Road	2,046	2,500	2,717	2,546	2,534
5A	A405/Watford Road (the Noke)	3,539	4,303	4,349	4,291	4,313
5B	A405/Tippendell Lane	3,205	4,021	4,195	4,388	4,359
6A	Harper Lane/Shenley Road	2,101	2,539	2,640	2,470	2,541
6B	Harper Lane/Watling Street	1,680	2,189	2,255	2,161	2,206
7	A414/M1 Junction 8	6,164	6,832	6,805	8,111	8,052
8	A414/Green Lanes	4,854	5,013	5,232	6,944	6,940
9A	Redbourn Road/Queensway	2,232	2,452	2,874	2,637	2,740
9B	Redbourn Road/Link Road	3,319	3,984	4,090	4,027	4,084
9C	Redbourn Road/Shenley Road	1,794	2,438	2,675	2,617	2,647
9D	Redbourn Road/Cherry Tree Lane	1,671	2,338	2,537	2,555	2,574
10	Leverstock Green Road/Bedmond Road	1,689	1,794	2,126	2,036	2,075
11	B653 Cory Wright Way/Marford Road	2,098	2,430	2,440	2,443	2,470
12A	M25 Junction 21					
12B	M25 Junction 21a	12,155	14,590	14,586	14,535	14,624
12C	M25 Junction 22	12,533	14,724	14,832	14,980	15,186

Summary of Delays at Key Junctions

9.4.11. Table 9-5 to Table 9-6 summarise the performance of the key junctions in each of the scenarios assessed in the AM and PM peak hours. The delays shown are the average delay per vehicle across all movements at each junction. The table show that there is an increase in the proportion of junctions with over 60 seconds delay in Option 0 and Option 1 in the AM and PM peak compared to the base year and in the PM peak a reduction in the proportion of junctions with delays over 60 seconds in Option 2 and 3. Whereas in the AM peak the proportion remains the same, 22%. However, in both AM and PM peak in Option 2 and 3 the proportion of junctions with 0-30 seconds of delay increases indicating the changes in these scenarios is reducing delays.

Table 9-5: Summary of Average Delay at Key Junctions (AM Peak Hour)

Average Delay per Vehicle	Rating	Proportion of Key Junctions				
		Base	Option 0	Option 1	Option 2	Option 3
0 – 30 sec	Green	67%	70%	56%	67%	63%
30 – 60 sec	Amber	15%	7%	22%	11%	15%
> 60 sec	Red	19%	22%	22%	22%	22%

Table 9-6: Summary of Average Delay at Key Junctions (PM Peak Hour)

Average Delay per Vehicle	Rating	Proportion of Key Junctions				
		Base	Option 0	Option 1	Option 2	Option 3
0 – 30 sec	Green	78%	52%	44%	59%	59%
30 – 60 sec	Amber	11%	26%	22%	19%	19%
> 60 sec	Red	11%	22%	33%	22%	22%

9.4.12. Table 9-7 and Table 9-9 present the percentage increase in delays at each of the key junctions from delays base to Option 0 for the AM and PM peak. Table 9-8 and Table 9-10 the present the change in delays which occurrs as a result of Option 1, 2 and 3 at each of the key junctions. The cells are coloured in the same way as explained in 9.4.7.

9.4.13. On the whole, the tables show that the IDP schemes and modal shift in Options 2 and 3 reduces delays at the key junctions. There is an increase in delay at A405/Watford Road (the Noke) which is due to the IDP scheme changing the junction from a roundabout to a signalised junction and the increased traffic flow through the junction. The introduction of signals naturally increases delays at any junction but the increase is not excessive. At the M1 Junction 8 (ref 7) in the PM peak, there is an increase in delay due to the additional traffic flow through the junction, caused by the IDP scheme at the nearby A A414/Green Lanes junction, but again the increase is not excessive. There is also a high percentage increase occurring at M25 Junction 21 in both peaks which is a result of the increase in average delay being relatively low in the base year, a couple of seconds, to 5 seconds and 47 seconds in Option 0. The increase in delay is experienced on merges with M1 northbound and M25 westbound.

Table 9-7: Percentage Delay Change Between Option 0 and Base Year at Key Junctions by Scenario (AM Peak Hour)

Ref	Junction Name	% Change
		Option 0 vs Base
1A	Peahen	-28%
1B	King William IV	67%
1C	Ancient Britton	24%
1D	Sandpit Lane/Beechwood Avenue	27%
1E	King Harry	142%
2A	A1081 Luton Road/Station Road	17%
2B	A1081/The Common	15%
2C	A1081 Luton Road/Redbourn Road	43%
3A	A414/A1081 London Colney	31%
3B	A414/A405	-8%
3C	A414/Shenley Lane,Napsbury	8%
4	A1057 Hatfield Road/Station Road	91%
5A	A405/Watford Road (the Noke)	18%
5B	A405/Tippendell Lane	33%
6A	Harper Lane/Shenley Road	-9%
6B	Harper Lane/Watling Street	188%
7	A414/M1 Junction 8	150%
8	A414/Green Lanes	183%
9A	Redbourn Road/Queensway	0%
9B	Redbourn Road/Link Road	50%
9C	Redbourn Road/Shenley Road	0%
9D	Redbourn Road/Cherry Tree Lane	100%
10	Leverstock Green Road/Bedmond Road	22%
11	B653 Cory Wright Way/Marford Road	27%
12A	M25 Junction 21	400%
12B	M25 Junction 21a	-12%
12C	M25 Junction 22	27%

Table 9-8: Change in Delay at Key Junctions by Scenario (AM Peak Hour)

Ref	Junction Name	Increase in Average Delay Per Vehicle (s)		
		Option 1 vs Option 0	Option 2 vs Option 1	Option 3 vs Option 1
1A	Peahen	30	-37	-40
1B	King William IV	-1	3	-7
1C	Ancient Britton	27	-5	-4
1D	Sandpit Lane/Beechwood Avenue	52	-58	-54
1E	King Harry	16	-3	-7
2A	A1081 Luton Road/Station Road	2	-1	-2
2B	A1081/The Common	23	-8	-5
2C	A1081 Luton Road/Redbourn Road	-2	-3	-4
3A	A414/A1081 London Colney	2	-26	-26
3B	A414/A405	2	1	1
3C	A414/Shenley Lane,Napsbury	-1	-6	-5
4	A1057 Hatfield Road/Station Road	30	-23	-11
5A	A405/Watford Road (the Noke)	1	12	11
5B	A405/Tippendell Lane	1	1	2
6A	Harper Lane/Shenley Road	11	-17	-14
6B	Harper Lane/Watling Street	0	-5	-2
7	A414/M1 Junction 8	5	-1	0
8	A414/Green Lanes	61	-79	-71
9A	Redbourn Road/Queensway	0	1	1
9B	Redbourn Road/Link Road	8	-10	-9
9C	Redbourn Road/Shenley Road	3	-2	-2
9D	Redbourn Road/Cherry Tree Lane	1	-2	-2
10	Leverstock Green Road/Bedmond Road	0	-23	-25
11	B653 Cory Wright Way/Marford Road	1	-1	0
12A	M25 Junction 21	5	-1	-1
12B	M25 Junction 21a	6	-6	0
12C	M25 Junction 22	4	3	6

Table 9-9: Percentage Delay Change Between Option 0 and Base Year at Key Junctions by Scenario (PM Peak Hour)

Ref	Junction Name	Average Delay Per Vehicle (s)			
		Option 0	Option 1	Option 2	Option 3
1A	Peahen	57	67	55	55
1B	King William IV	61	57	104	82
1C	Ancient Britton	159	176	206	175
1D	Sandpit Lane/Beechwood Avenue	110	132	110	121
1E	King Harry	16	39	21	23
2A	A1081 Luton Road/Station Road	12	12	12	12
2B	A1081/The Common	38	44	34	32
2C	A1081 Luton Road/Redbourn Road	18	30	18	18
3A	A414/A1081 London Colney	36	37	21	21
3B	A414/A405	16	18	18	17
3C	A414/Shenley Lane,Napsbury	5	5	4	4
4	A1057 Hatfield Road/Station Road	60	109	65	98
5A	A405/Watford Road (the Noke)	12	13	11	13
5B	A405/Tippendell Lane	15	16	19	20
6A	Harper Lane/Shenley Road	16	21	16	17
6B	Harper Lane/Watling Street	48	48	45	46
7	A414/M1 Junction 8	4	4	14	16
8	A414/Green Lanes	77	149	24	27
9A	Redbourn Road/Queensway	14	15	14	14
9B	Redbourn Road/Link Road	19	38	20	22
9C	Redbourn Road/Shenley Road	8	12	12	13
9D	Redbourn Road/Cherry Tree Lane	6	5	5	5
10	Leverstock Green Road/Bedmond Road	76	139	131	133
11	B653 Cory Wright Way/Marford Road	70	110	77	99
12A	M25 Junction 21	47	60	50	54
12B	M25 Junction 21a	59	76	49	56
12C	M25 Junction 22	19	20	19	22

Table 9-10: Change in Delay at Key Junctions by Scenario (PM Peak Hour)

Ref	Junction Name	Increase in Average Delay Per Vehicle (s)		
		Option 1 vs Option 0	Option 2 vs Option 1	Option 3 vs Option 1
1A	Peahen	10	-12	-12
1B	King William IV	-4	47	25
1C	Ancient Britton	17	30	-1
1D	Sandpit Lane/Beechwood Avenue	22	-22	-11
1E	King Harry	23	-18	-16
2A	A1081 Luton Road/Station Road	0	0	0
2B	A1081/The Common	6	-10	-12
2C	A1081 Luton Road/Redbourn Road	12	-12	-12
3A	A414/A1081 London Colney	1	-16	-16
3B	A414/A405	2	0	-1
3C	A414/Shenley Lane,Napsbury	0	-1	-1
4	A1057 Hatfield Road/Station Road	49	-44	-11
5A	A405/Watford Road (the Noke)	1	-2	0
5B	A405/Tippendell Lane	1	3	4
6A	Harper Lane/Shenley Road	5	-5	-4
6B	Harper Lane/Watling Street	0	-3	-2
7	A414/M1 Junction 8	0	10	12
8	A414/Green Lanes	72	-125	-122
9A	Redbourn Road/Queensway	1	-1	-1
9B	Redbourn Road/Link Road	19	-18	-16
9C	Redbourn Road/Shenley Road	4	0	1
9D	Redbourn Road/Cherry Tree Lane	-1	0	0
10	Leverstock Green Road/Bedmond Road	63	-8	-6
11	B653 Cory Wright Way/Marford Road	40	-33	-11
12A	M25 Junction 21	13	-10	-6
12B	M25 Junction 21a	17	-27	-20
12C	M25 Junction 22	1	-1	2

9.5 Highway Journey Times

Routes

9.5.1. Twenty-one journey time routes within the St Albans network have been examined, as shown in Figure 9-81. These routes and cover all of the main corridors in the network.

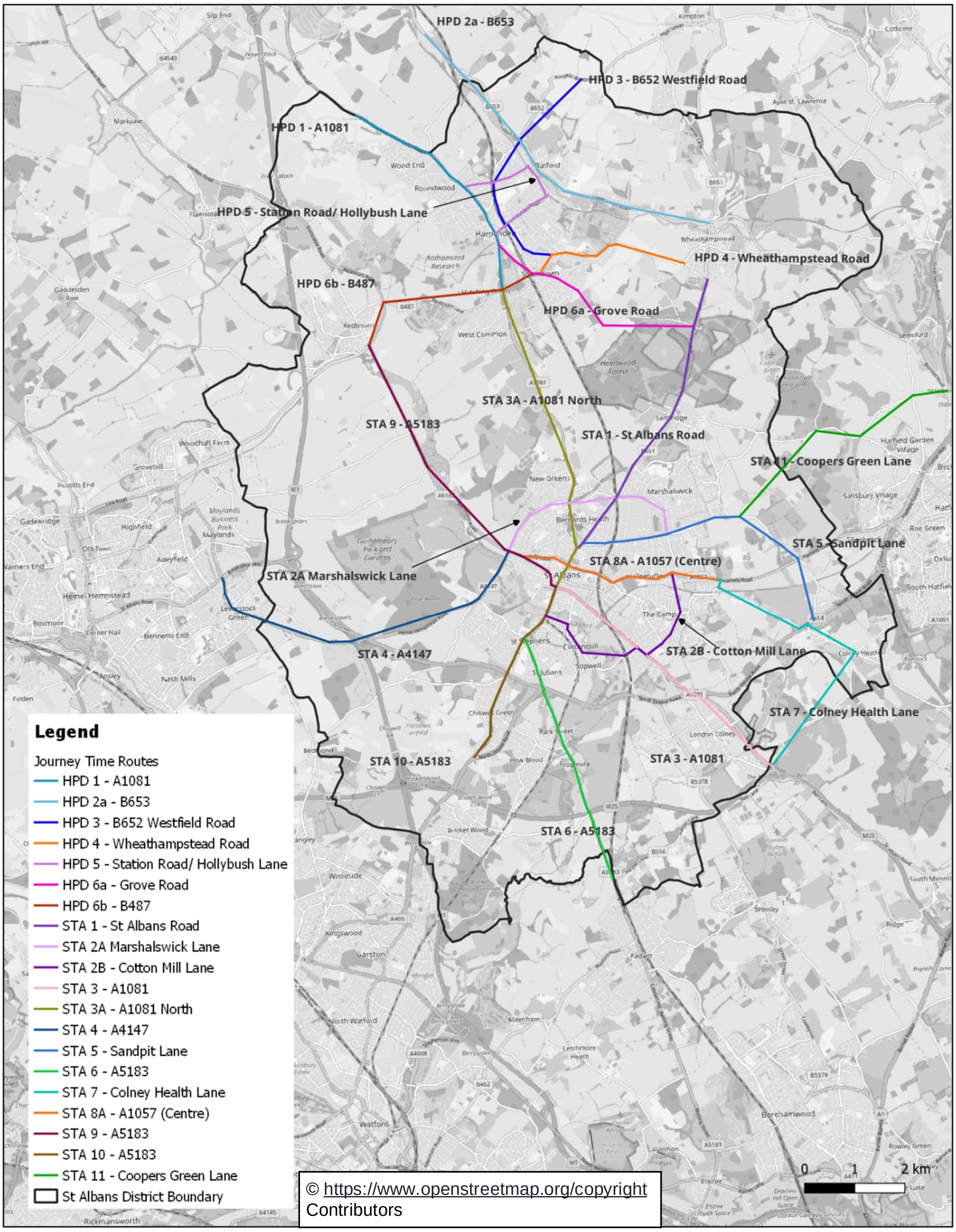

Figure 9-81: Journey Time Routes

Route Times

9.5.2. Figure 9-82 to Figure 9-83 give an indication of the overall variation in journey time between each of the scenarios (where the vertical axis indicates the total journey time on each route). This shows that for some routes, journey times vary little between the options and in some cases are similar to the base year. However, for many routes, journey times tend to be higher in Option 1, and fall for Options 2 and 3 which is intuitive. In some cases, journey times are higher in Option 2 and 3 than Option 1 and these are examined further below.

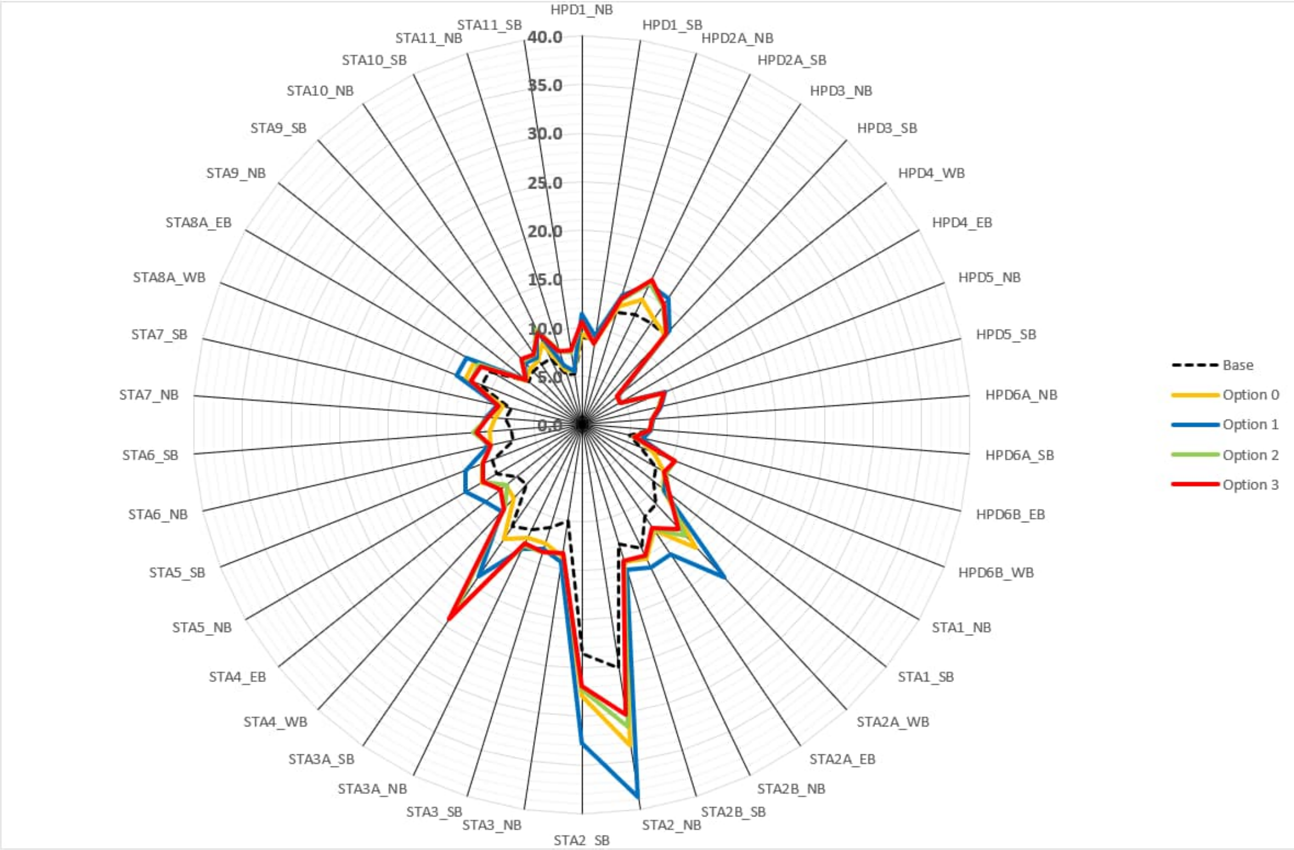

Figure 9-82: AM Peak Journey Time Route Summary

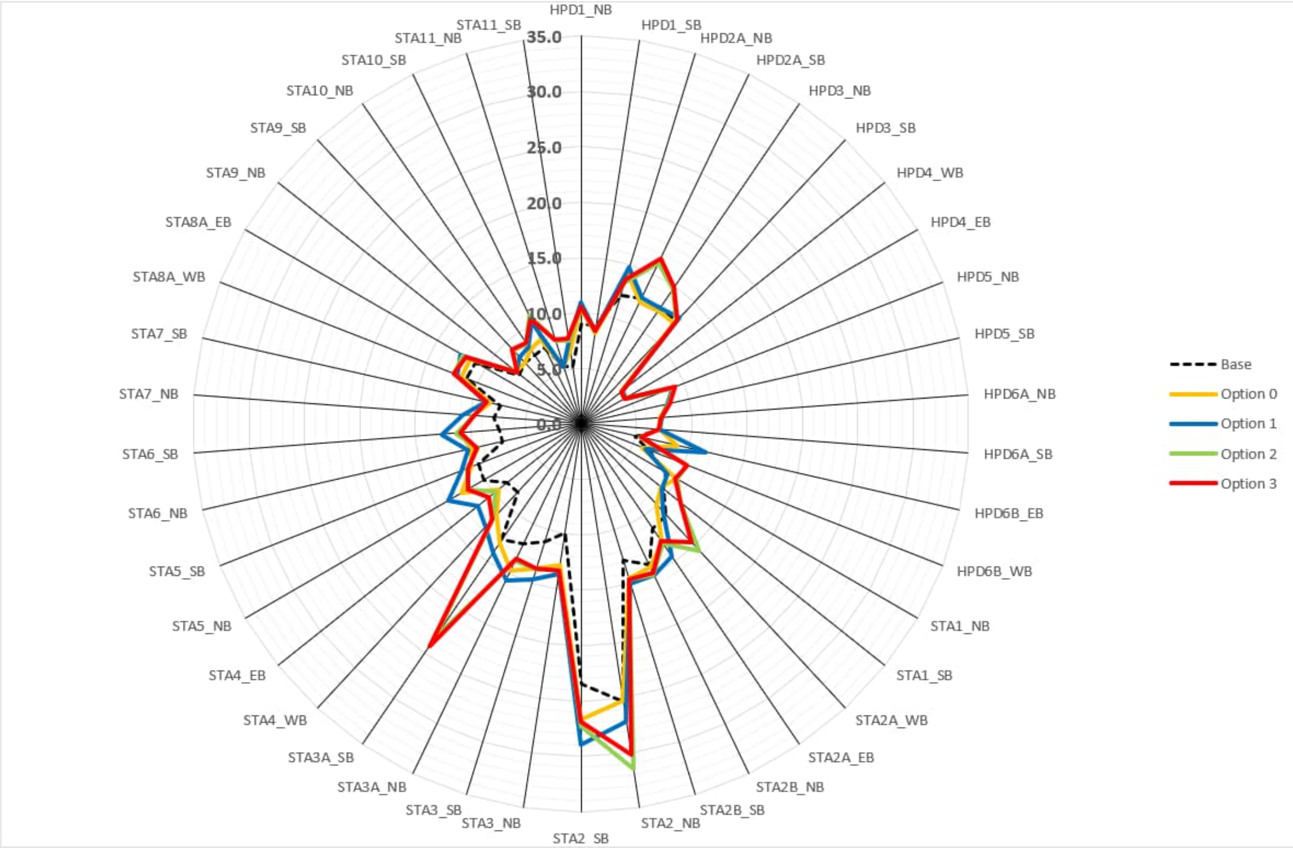

Figure 9-83: PM Peak Journey Time Route Summary

9.5.3. Table 9-11 and Table 9-12 provide details of each journey time route, the time taken to travel in each time scenario and time period. These tables have been coloured to show where journey times are higher (orange) or lower (green) between scenarios, for example:

- For Option 1 column, cells are orange where times in Option 1 are greater than Option 0.
- For Option 2 column, cells are orange where times in Option 2 are greater than Option 1.
- For Option 3 column, cells are orange where times in Option 3 are greater than Option 1.

9.5.4. It is important to note that the base year journey times are from a 2014 COMET model and that the COMET model has not been validated against observed data for these journey time routes.

9.5.5. As noted above, many of the routes follow a similar pattern whereby the journey times are greater than base in Option 0, at their highest in Option 1, and then similar or lower in Options 2 and 3. This pattern is intuitive given the growth and mitigation measures included in each scenario (for example, Option 1 includes all of the Local Plan development but no mitigation measures so it is more likely that journey times would be highest in this scenario due to greater change of delay and congestion in the network).

9.5.6. It is useful to look in more detail at routes which do not fit this pattern. For example, the routes which have particularly large increases in journey time between Option 0 and 1 are as follows:

- Route HPD1_NB (AM peak) – increase of around 2 minutes
- Route HPD3_NB (AM peak) – increase of around 2.5 minutes
- Route STA2A_WB (AM peak) – increase of around 4 minutes
- Route STA2A_EB (AM peak) – increase of around 3 minutes
- Route STA2_NB (both peaks) – increase of around 5 minutes in AM and 2 minutes in PM
- Route STA2_SB (both peak) – increase of around 5 minutes in AM and 2 minutes in PM
- Route STA3A_SB (AM peak) – increase of around 4.5 minutes
- Route HPD6B_EB (PM peak) – increase of around 2.5 minutes

9.5.7. There are some routes where the journey times in Option 2 or 3 are higher than Option 1, despite the inclusion of mitigation measures in these options. The most significant instances where this occurs are as follows:

- STA3A_SB (AM peak) – increase of around 4.5 minutes
- STA11_NB (both peaks) – increase of 1.5 minutes AM Peak and 2 minutes in PM peak
- STA11_SB (both peaks) – increase of 2 minutes AM Peak and 1 minute in PM peak
- STA1_NB (PM peak) – increase of 2 minutes
- STA1_SB (PM peak) – increase of 2 minutes
- STA3A_SB (PM peak) – increase of 2 minutes

9.5.8. Table 9-13 and Table 9-14 presents the percentage changes in journey times between the scenarios. They have also been colour coded in a similar way as Table 9-11 and Table 9-12, with journey times increases shown in orange and decreases in green for Option 2 and Option 3 against Option 1.

Table 9-11: Summary of Journey Times by Route and Scenario (AM peak hour)

Route	Route Name	Journey Time (mins:secs)				
		Base	Option 0	Option 1	Option 2	Option 3
HPD1_NB	A1081	09:00	09:22	11:24	10:31	10:36
HPD1_SB		08:58	08:41	09:13	08:28	08:29
HPD2A_NB	B653	12:07	12:49	13:55	13:21	13:37
HPD2A_SB		12:36	14:16	16:00	16:08	16:32
HPD3_NB	B652 Westfield Road	12:42	13:10	15:46	14:46	14:57
HPD3_SB		12:37	12:39	13:16	12:40	12:47
HPD4_WB	Wheathampstead Road	04:37	04:42	04:41	04:38	04:38
HPD4_EB		04:35	04:36	04:36	04:36	04:35
HPD5_NB	Station Road/Hollybush Lane	08:50	09:02	09:11	09:02	09:03
HPD5_SB		08:00	08:06	08:16	08:07	08:09
HPD6A_NB	Grove Road	07:08	07:20	07:18	07:13	07:12
HPD6A_SB		07:03	07:04	07:04	07:02	07:02
HPD6B_EB	B487	05:01	05:53	06:21	05:25	05:33
HPD6B_WB		06:27	07:56	10:07	10:15	10:13
STA1_NB	St Albans Road	08:46	09:42	10:00	09:58	09:48
STA1_SB		09:29	10:38	10:51	11:26	11:29
STA2A_WB	Marshalswick Lane	11:12	17:15	21:28	15:35	14:37
STA2A_EB		11:26	13:08	16:10	13:03	12:49
STA2B_NB	Cotton Mill Lane	14:05	15:18	16:17	15:05	14:57
STA2B_SB		12:52	14:43	15:33	14:40	14:39
STA2_NB	Ring Road	25:20	33:17	38:39	31:25	30:10
STA2_SB		23:29	27:51	32:46	27:14	26:52
STA3_NB	A1081	09:58	13:40	14:17	13:18	13:23
STA3_SB		11:04	12:46	13:23	13:44	13:39
STA3A_NB	A1081 North	11:58	12:52	14:08	13:43	13:29
STA3A_SB		12:40	14:17	18:47	23:22	24:13
STA4_WB	A4147	08:22	10:19	12:13	11:37	11:47
STA4_EB		08:32	09:59	12:44	09:53	10:39
STA5_NB	Sandpit Lane	10:08	11:52	13:49	11:47	11:49
STA5_SB		09:56	11:02	12:53	11:05	10:57
STA6_NB	A5183 (south)	07:19	09:39	09:51	09:35	09:38
STA6_SB		07:22	09:32	10:56	11:17	10:52
STA7_NB	Colney Heath Lane	07:51	08:55	09:51	09:42	09:42
STA7_SB		07:29	08:25	08:55	08:43	08:46
STA8A_WB	A1057 (centre)	11:05	12:52	13:48	12:18	12:19
STA8A_EB		10:59	12:47	13:43	12:18	11:59
STA9_NB	A5183 (north)	07:06	07:20	07:27	07:24	07:24
STA9_SB		07:27	07:53	08:38	08:59	09:11
STA10_NB	A5183 (west)	07:28	07:58	08:21	08:43	08:48
STA10_SB		07:35	09:20	10:45	10:51	10:29
STA11_NB	Coopers Green Lane	05:23	05:56	06:23	07:51	07:58
STA11_SB		05:17	05:32	05:34	07:35	07:47

Table 9-12: Summary of Journey Times by Route and Scenario (PM peak hour)

Route	Route Name	Journey Time (mins)				
		Base	Option 0	Option 1	Option 2	Option 3
HPD1_NB	A1081	09:24	10:30	10:57	10:06	09:57
HPD1_SB		08:14	08:18	08:29	08:22	08:27
HPD2A_NB	B653	12:16	14:12	14:45	14:19	14:16
HPD2A_SB		11:48	12:11	12:38	12:23	12:30
HPD3_NB	B652 Westfield Road	12:09	12:21	12:37	12:26	12:25
HPD3_SB		11:57	12:22	13:06	12:27	12:31
HPD4_WB	Wheathampstead Road	04:36	04:42	04:46	04:43	04:44
HPD4_EB		04:36	04:37	04:37	04:37	04:37
HPD5_NB	Station Road/Hollybush Lane	08:48	08:51	08:53	08:47	08:47
HPD5_SB		07:55	07:56	07:58	07:57	07:57
HPD6A_NB	Grove Road	07:02	07:09	07:16	07:18	07:16
HPD6A_SB		07:03	07:05	07:05	07:05	07:04
HPD6B_EB	B487	06:22	08:54	11:29	08:48	09:01
HPD6B_WB		05:08	05:53	06:16	06:40	06:37
STA1_NB	St Albans Road	08:44	09:52	09:02	11:31	09:02
STA1_SB		09:12	09:14	09:19	11:30	11:33
STA2A_WB	Marshalswick Lane	08:43	09:56	10:47	10:23	09:52
STA2A_EB		11:19	12:52	14:28	12:47	12:15
STA2B_NB	Cotton Mill Lane	12:56	14:24	15:09	14:30	14:37
STA2B_SB		12:46	14:32	15:03	14:15	14:07
STA2_NB	Ring Road	21:59	25:17	27:12	25:41	25:09
STA2_SB		23:16	26:41	28:55	26:15	25:34
STA3_NB	A1081	10:14	12:51	13:41	11:42	11:45
STA3_SB		15:09	13:39	14:40	12:52	12:40
STA3A_NB	A1081 North	12:47	14:41	15:37	15:30	14:18
STA3A_SB		12:08	13:03	14:08	16:19	16:02
STA4_WB	A4147	08:49	11:11	12:44	10:21	10:26
STA4_EB		08:13	09:27	11:57	10:25	11:17
STA5_NB	Sandpit Lane	11:14	12:29	13:47	12:41	13:16
STA5_SB		09:37	10:40	11:37	10:28	10:38
STA6_NB	A5183 (south)	07:36	10:06	10:30	10:38	10:38
STA6_SB		07:15	10:53	12:37	10:48	10:54
STA7_NB	Colney Heath Lane	07:52	09:50	10:44	09:31	09:42
STA7_SB		07:30	08:28	08:50	08:20	08:18
STA8A_WB	A1057 (centre)	11:00	11:32	12:00	11:42	11:28
STA8A_EB		10:49	11:34	12:31	11:12	11:04
STA9_NB	A5183 (north)	07:29	07:32	07:31	07:34	07:31
STA9_SB		07:08	07:29	08:13	07:48	08:01
STA10_NB	A5183 (west)	07:30	08:05	08:25	08:45	08:55
STA10_SB		07:28	08:27	10:12	09:13	09:10
STA11_NB	Coopers Green Lane	05:19	05:22	05:24	07:27	07:27
STA11_SB		05:18	06:36	07:31	08:16	08:38

Table 9-13: Percentage Changes in Journey Times by Route and Scenario (AM peak hour)

Route	Route Name	% Changes in Journey Times (AM Peak hour)			
		Option 0 vs BY	Option 1 vs Option 0	Option 2 vs Option 1	Option 3 vs Option 1
HPD1_NB	A1081	4.1%	21.6%	-7.7%	-6.9%
HPD1_SB		-3.2%	6.1%	-8.1%	-7.9%
HPD2A_NB	B653	5.7%	8.6%	-4.1%	-2.2%
HPD2A_SB		13.3%	12.1%	0.8%	3.3%
HPD3_NB	B652 Westfield Road	3.7%	19.7%	-6.4%	-5.2%
HPD3_SB		0.3%	4.9%	-4.5%	-3.7%
HPD4_WB	Wheathampstead Road	1.8%	-0.4%	-1.1%	-1.0%
HPD4_EB		0.2%	0.0%	-0.1%	-0.1%
HPD5_NB	Station Road/Hollybush Lane	2.1%	1.7%	-1.5%	-1.3%
HPD5_SB		1.3%	1.9%	-1.8%	-1.3%
HPD6A_NB	Grove Road	2.9%	-0.4%	-1.2%	-1.5%
HPD6A_SB		0.4%	-0.1%	-0.4%	-0.5%
HPD6B_EB	B487	17.3%	8.1%	-14.8%	-12.8%
HPD6B_WB		22.8%	27.5%	1.3%	1.1%
STA1_NB	St Albans Road	10.5%	3.2%	-0.4%	-2.1%
STA1_SB		12.3%	1.9%	5.3%	5.8%
STA2A_WB	Marshalswick Lane	54.0%	24.5%	-27.4%	-32.0%
STA2A_EB		14.9%	23.0%	-19.3%	-20.7%
STA2B_NB	Cotton Mill Lane	8.6%	6.4%	-7.4%	-8.2%
STA2B_SB		14.4%	5.6%	-5.6%	-5.8%
STA2_NB	Ring Road	31.4%	16.1%	-18.7%	-21.9%
STA2_SB		18.6%	17.7%	-16.9%	-18.0%
STA3_NB	A1081	37.2%	4.5%	-6.9%	-6.3%
STA3_SB		15.3%	4.8%	2.6%	2.0%
STA3A_NB	A1081 North	7.5%	10.0%	-2.9%	-4.7%
STA3A_SB		12.7%	31.6%	24.4%	28.9%
STA4_WB	A4147	23.3%	18.3%	-4.8%	-3.5%
STA4_EB		16.9%	27.7%	-22.4%	-16.4%
STA5_NB	Sandpit Lane	17.2%	16.3%	-14.7%	-14.5%
STA5_SB		11.1%	16.8%	-13.9%	-14.9%
STA6_NB	A5183 (south)	31.9%	2.1%	-2.7%	-2.3%
STA6_SB		29.5%	14.7%	3.2%	-0.6%
STA7_NB	Colney Heath Lane	13.7%	10.3%	-1.5%	-1.5%
STA7_SB		12.5%	5.9%	-2.2%	-1.6%
STA8A_WB	A1057 (centre)	16.1%	7.2%	-10.8%	-10.7%
STA8A_EB		16.3%	7.4%	-10.3%	-12.7%
STA9_NB	A5183 (north)	3.1%	1.6%	-0.6%	-0.5%
STA9_SB		5.9%	9.5%	4.0%	6.4%
STA10_NB	A5183 (west)	6.9%	4.8%	4.3%	5.4%
STA10_SB		23.1%	15.1%	1.0%	-2.5%
STA11_NB	Coopers Green Lane	10.5%	7.6%	22.9%	24.5%
STA11_SB		4.9%	0.4%	36.3%	40.1%

Table 9-14: Percentage Changes in Journey Times by Route and Scenario (PM peak hour)

Route	Route Name	% Changes in Journey Times (PM Peak Hour)			
		Option 0 vs BY	Option 1 vs Option 0	Option 2 vs Option 1	Option 3 vs Option 1
HPD1_NB	A1081	11.7%	4.3%	-7.8%	-9.2%
HPD1_SB		0.7%	2.3%	-1.4%	-0.5%
HPD2A_NB	B653	15.9%	3.9%	-3.0%	-3.3%
HPD2A_SB		3.3%	3.6%	-2.0%	-1.0%
HPD3_NB	B652 Westfield Road	1.5%	2.2%	-1.4%	-1.5%
HPD3_SB		3.5%	6.0%	-5.0%	-4.4%
HPD4_WB	Wheathampstead Road	2.3%	1.4%	-1.1%	-0.8%
HPD4_EB		0.2%	0.0%	0.1%	0.0%
HPD5_NB	Station Road/Hollybush Lane	0.5%	0.4%	-1.1%	-1.2%
HPD5_SB		0.2%	0.4%	-0.3%	-0.3%
HPD6A_NB	Grove Road	1.6%	1.7%	0.4%	0.0%
HPD6A_SB		0.4%	0.1%	-0.1%	-0.2%
HPD6B_EB	B487	39.9%	29.0%	-23.3%	-21.4%
HPD6B_WB		14.4%	6.5%	6.3%	5.7%
STA1_NB	St Albans Road	13.1%	-8.5%	27.5%	0.0%
STA1_SB		0.3%	1.0%	23.4%	23.9%
STA2A_WB	Marshalswick Lane	14.0%	8.6%	-3.7%	-8.6%
STA2A_EB		13.6%	12.4%	-11.6%	-15.3%
STA2B_NB	Cotton Mill Lane	11.4%	5.2%	-4.4%	-3.6%
STA2B_SB		13.9%	3.6%	-5.4%	-6.2%
STA2_NB	Ring Road	15.0%	7.6%	-5.5%	-7.5%
STA2_SB		14.7%	8.4%	-9.2%	-11.6%
STA3_NB	A1081	25.4%	6.5%	-14.5%	-14.1%
STA3_SB		-9.9%	7.5%	-12.3%	-13.7%
STA3A_NB	A1081 North	14.9%	6.4%	-0.8%	-8.5%
STA3A_SB		7.6%	8.2%	15.5%	13.4%
STA4_WB	A4147	26.8%	13.9%	-18.8%	-18.1%
STA4_EB		15.1%	26.4%	-12.8%	-5.6%
STA5_NB	Sandpit Lane	11.2%	10.4%	-7.9%	-3.7%
STA5_SB		11.0%	8.8%	-9.9%	-8.4%
STA6_NB	A5183 (south)	32.9%	3.9%	1.3%	1.3%
STA6_SB		50.1%	15.9%	-14.5%	-13.6%
STA7_NB	Colney Heath Lane	25.0%	9.3%	-11.4%	-9.7%
STA7_SB		13.0%	4.2%	-5.7%	-5.9%
STA8A_WB	A1057 (centre)	4.9%	4.0%	-2.5%	-4.5%
STA8A_EB		6.9%	8.2%	-10.5%	-11.6%
STA9_NB	A5183 (north)	0.7%	-0.4%	0.6%	0.1%
STA9_SB		5.0%	9.6%	-5.0%	-2.4%
STA10_NB	A5183 (west)	7.7%	4.1%	4.0%	5.9%
STA10_SB		13.1%	20.6%	-9.6%	-10.2%
STA11_NB	Coopers Green Lane	0.9%	0.6%	38.0%	38.0%
STA11_SB		24.5%	13.7%	10.0%	15.0%

Journey Time Graphs

9.5.9. Appendix E contains journey time graphs comparing the journey time and speed along each route. This shows each route in detail and provides a comparison between all of the scenarios.

Travel Times between St Albans and Neighbouring Areas

9.5.10. The following tables examine the variation in journey time between each of the key areas in St Albans and neighbouring towns outside the district. These journey times reflect the average time across all modelled zones within each area. In general, the pattern shown here is similar to the journey times on routes within the St Albans district, i.e. travel times in each of the future year 'option' scenarios are greater than the base year and typically are greatest in Option 1 where all of the Local Plan growth is included without any mitigation.

Trips to/from St Albans City

9.5.11. Table 9-15 and Table 9-16 show the AM peak journey times to and from St Albans City by scenario. They show that journey times increase between Option 0 and Base and Option 1 and Option 0 with reductions occurring between Option 2 and 1 and Option 3 and 1. The only exception to this is the journey time from Harpenden to St Albans which increases slightly in Option 2 and Option 3 which is a result of the closure of Valley Road and Sandridgebury Lane which have increased traffic flow and delays along A1081 and the junction with Beech Road.

9.5.12. It is important to note that the base year journey times are from a 2014 COMET model and that the average time has been used across all modelled zones within each area noting that COMET model has not been validated against observed data between these areas.

Table 9-15: Travel times to St Albans City by Scenario (AM Peak)

From	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:51	0:58	0:59	0:59	0:59
Cheshunt	0:28	0:35	0:36	0:36	0:36
Borehamwood	0:19	0:22	0:22	0:22	0:22
Rickmansworth	0:27	0:35	0:36	0:35	0:36
Watford	0:22	0:28	0:29	0:28	0:29
Hertford	0:25	0:31	0:32	0:32	0:32
Welwyn Garden City	0:19	0:23	0:24	0:24	0:25
Stevenage	0:32	0:37	0:38	0:37	0:38
Hitchin	0:34	0:38	0:40	0:39	0:40
Hemel Hempstead	0:19	0:22	0:26	0:22	0:23
East Hemel	0:14	0:18	0:19	0:17	0:17
Redbourn	0:14	0:16	0:18	0:17	0:18
Harpenden	0:18	0:20	0:24	0:26	0:27
Wheathampstead	0:15	0:18	0:20	0:20	0:20

Table 9-16: Travel times from St Albans City by Scenario (AM Peak)

To	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:52	0:56	0:58	0:57	0:58
Cheshunt	0:29	0:36	0:37	0:37	0:37
Borehamwood	0:21	0:22	0:24	0:23	0:23
Rickmansworth	0:27	0:32	0:34	0:33	0:33
Watford	0:28	0:31	0:33	0:32	0:32
Hertford	0:26	0:30	0:32	0:31	0:32
Welwyn Garden City	0:21	0:25	0:27	0:26	0:26
Stevenage	0:28	0:35	0:37	0:37	0:37
Hitchin	0:32	0:37	0:39	0:39	0:39
Hemel Hempstead	0:18	0:22	0:25	0:23	0:24
East Hemel	0:14	0:17	0:19	0:19	0:19
Redbourn	0:09	0:16	0:17	0:16	0:16
Harpenden	0:14	0:19	0:21	0:20	0:20
Wheathampstead	0:15	0:16	0:18	0:17	0:17

9.5.13. Table 9-17 and Table 9-18 show the PM peak journey times to and from St Albans City by scenario. They show that journey times increase between Option 0 and Base and Option 1 and Option 0 with reductions occurring between Option 2 and 1 and Option 3 and 1. The only exception to this is the journey time from Harpenden and Wheathampstead to St Albans which increases slightly in Option 2 and Option 3 by 1 minute which is a result of the closure of Valley Road and Sandridgebury Lane which have increased traffic flow and delays along A1081 and the junction between Beech Road.

Table 9-17: Travel times to St Albans City by Scenario (PM Peak)

From	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:51	0:57	0:58	0:57	0:58
Cheshunt	0:29	0:36	0:37	0:36	0:36
Borehamwood	0:19	0:22	0:23	0:22	0:22
Rickmansworth	0:28	0:40	0:42	0:40	0:41
Watford	0:30	0:37	0:40	0:37	0:39
Hertford	0:26	0:32	0:34	0:32	0:33
Welwyn Garden City	0:20	0:25	0:27	0:26	0:27
Stevenage	0:28	0:35	0:37	0:36	0:36
Hitchin	0:31	0:36	0:37	0:37	0:37
Hemel Hempstead	0:18	0:22	0:27	0:24	0:25
East Hemel	0:14	0:17	0:20	0:17	0:17
Redbourn	0:14	0:15	0:17	0:16	0:16
Harpenden	0:17	0:18	0:19	0:20	0:20
Wheathampstead	0:14	0:15	0:16	0:17	0:17

Table 9-18: Travel times from St Albans City by Scenario (PM Peak)

To	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:52	0:58	0:59	0:58	0:58
Cheshunt	0:31	0:37	0:38	0:37	0:37
Borehamwood	0:20	0:21	0:22	0:22	0:22
Rickmansworth	0:26	0:36	0:38	0:36	0:36
Watford	0:22	0:27	0:28	0:27	0:28
Hertford	0:26	0:30	0:30	0:30	0:30
Welwyn Garden City	0:20	0:22	0:23	0:23	0:23
Stevenage	0:33	0:36	0:37	0:37	0:36
Hitchin	0:34	0:37	0:37	0:37	0:36
Hemel Hempstead	0:18	0:21	0:23	0:22	0:22
East Hemel	0:14	0:16	0:17	0:17	0:17
Redbourn	0:09	0:09	0:10	0:10	0:10
Harpenden	0:14	0:15	0:16	0:16	0:16
Wheathampstead	0:15	0:16	0:17	0:17	0:16

Trips to/from Redbourn

9.5.14. Table 9-19 and Table 9-20 show the AM peak journey times to and from Redbourn by scenario. They show that journey times increase between Option 0 and Base and Option 1 and Option 0 with reductions occurring between Option 2 and 1 and Option 3 and 1. There are exceptions to this in the table below however where there are increases in delay they are only very minor, a minute.

Table 9-19: Travel times to Redbourn by Scenario (AM Peak)

From	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	1:00	1:07	1:09	1:09	1:10
Cheshunt	0:35	0:44	0:45	0:45	0:45
Borehamwood	0:26	0:31	0:32	0:31	0:32
Rickmansworth	0:28	0:36	0:36	0:36	0:36
Watford	0:23	0:28	0:29	0:29	0:29
Hertford	0:35	0:40	0:42	0:42	0:43
Welwyn Garden City	0:27	0:29	0:32	0:32	0:33
Stevenage	0:34	0:36	0:37	0:36	0:37
Hitchin	0:29	0:32	0:32	0:32	0:32
Hemel Hempstead	0:11	0:12	0:13	0:12	0:12
East Hemel	0:07	0:08	0:08	0:07	0:07
St Albans City	0:14	0:16	0:17	0:16	0:16
Harpenden	0:10	0:12	0:14	0:14	0:15
Wheathampstead	0:14	0:16	0:19	0:19	0:19

Table 9-20: Travel times from Redbourn by Scenario (AM Peak)

To	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:59	1:08	1:12	1:12	1:12
Cheshunt	0:39	0:47	0:50	0:49	0:50
Borehamwood	0:29	0:33	0:36	0:34	0:35
Rickmansworth	0:28	0:37	0:39	0:38	0:39
Watford	0:28	0:32	0:34	0:34	0:34
Hertford	0:33	0:41	0:45	0:45	0:46
Welwyn Garden City	0:27	0:34	0:38	0:38	0:39
Stevenage	0:33	0:39	0:42	0:42	0:42
Hitchin	0:30	0:35	0:38	0:37	0:38
Hemel Hempstead	0:10	0:13	0:17	0:15	0:16
East Hemel	0:07	0:09	0:11	0:10	0:10
St Albans City	0:14	0:16	0:18	0:17	0:18
Harpenden	0:09	0:10	0:11	0:10	0:10
Wheathampstead	0:13	0:16	0:18	0:19	0:20

9.5.15. Table 9-21 and Table 9-22 show the PM peak journey times to and from Redbourn by scenario. They show that journey times increase between Option 0 and Base and Option 1 and Option 0 with reductions occurring between Option 2 and 1 and Option 3 and 1.

Table 9-21: Travel times to Redbourn by Scenario (PM Peak)

From	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	1:00	1:05	1:07	1:06	1:06
Cheshunt	0:37	0:46	0:48	0:46	0:47
Borehamwood	0:27	0:32	0:34	0:33	0:33
Rickmansworth	0:31	0:41	0:43	0:40	0:42
Watford	0:27	0:38	0:41	0:39	0:41
Hertford	0:35	0:38	0:40	0:39	0:40
Welwyn Garden City	0:27	0:30	0:32	0:31	0:32
Stevenage	0:34	0:37	0:39	0:38	0:39
Hitchin	0:29	0:34	0:35	0:34	0:35
Hemel Hempstead	0:11	0:12	0:16	0:14	0:15
East Hemel	0:08	0:08	0:09	0:07	0:08
St Albans City	0:14	0:15	0:16	0:16	0:16
Harpenden	0:09	0:10	0:11	0:11	0:11
Wheathampstead	0:13	0:14	0:15	0:15	0:15

Table 9-22: Travel times from Redbourn by scenario (PM Peak)

To	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	1:00	1:07	1:10	1:08	1:08
Cheshunt	0:39	0:47	0:51	0:48	0:49
Borehamwood	0:27	0:31	0:35	0:31	0:31
Rickmansworth	0:30	0:40	0:43	0:40	0:41
Watford	0:24	0:30	0:32	0:30	0:31
Hertford	0:33	0:38	0:41	0:39	0:40
Welwyn Garden City	0:26	0:28	0:31	0:29	0:30
Stevenage	0:35	0:38	0:41	0:39	0:39
Hitchin	0:33	0:36	0:39	0:36	0:37
Hemel Hempstead	0:11	0:13	0:15	0:14	0:14
East Hemel	0:07	0:09	0:09	0:09	0:09
St Albans City	0:14	0:15	0:17	0:16	0:16
Harpenden	0:10	0:13	0:15	0:13	0:13
Wheathampstead	0:14	0:16	0:19	0:17	0:17

Trips to/from Harpenden

9.5.16. Table 9-23 and Table 9-24 show the AM peak journey times to and from Harpenden by scenario. They show that journey times increase between Option 0 and Base and Option 1 and Option 0 with reductions occurring between Option 2 and 1 and Option 3 and 1. There are exceptions to this in the table below however where there are increases in delay, they are only very minor, a minute.

Table 9-23: Travel times to Harpenden by scenario (AM Peak)

From	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:56	1:01	1:01	1:01	1:00
Cheshunt	0:38	0:45	0:46	0:45	0:45
Borehamwood	0:29	0:33	0:34	0:33	0:33
Rickmansworth	0:32	0:40	0:41	0:40	0:41
Watford	0:27	0:33	0:34	0:33	0:34
Hertford	0:30	0:33	0:33	0:32	0:33
Welwyn Garden City	0:21	0:22	0:23	0:22	0:22
Stevenage	0:28	0:30	0:30	0:30	0:30
Hitchin	0:27	0:29	0:30	0:29	0:29
Hemel Hempstead	0:18	0:20	0:23	0:20	0:21
East Hemel	0:14	0:16	0:18	0:15	0:16
St Albans City	0:18	0:19	0:21	0:20	0:20
Redbourn	0:09	0:10	0:11	0:10	0:10
Wheathampstead	0:09	0:09	0:10	0:09	0:10

Table 9-24: Travel times from Harpenden by scenario (AM Peak)

To	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:57	1:03	1:06	1:06	1:07
Cheshunt	0:41	0:49	0:53	0:52	0:53
Borehamwood	0:34	0:38	0:42	0:41	0:42
Rickmansworth	0:36	0:43	0:46	0:46	0:46
Watford	0:33	0:38	0:42	0:41	0:42
Hertford	0:30	0:36	0:40	0:39	0:41
Welwyn Garden City	0:24	0:29	0:32	0:32	0:33
Stevenage	0:28	0:33	0:36	0:36	0:36
Hitchin	0:27	0:31	0:34	0:34	0:34
Hemel Hempstead	0:19	0:23	0:28	0:27	0:28
East Hemel	0:15	0:17	0:22	0:22	0:22
St Albans City	0:18	0:20	0:24	0:26	0:27
Redbourn	0:10	0:12	0:14	0:14	0:15
Wheathampstead	0:09	0:11	0:13	0:14	0:14

9.5.17. Table 9-25 and Table 9-26 show the PM peak journey times to and from Harpenden by scenario. They show that journey times increase between Option 0 and Base and Option 1 and Option 0 with reductions occurring between Option 2 and 1 and Option 3 and 1. There are exceptions to this in the tables below however where there are increases in delay, they are low, no longer than a minute.

Table 9-25: Travel times to Harpenden by scenario (PM Peak)

From	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:56	0:59	1:00	0:59	1:00
Cheshunt	0:39	0:46	0:47	0:46	0:47
Borehamwood	0:30	0:35	0:37	0:36	0:36
Rickmansworth	0:36	0:46	0:49	0:47	0:48
Watford	0:32	0:44	0:46	0:45	0:47
Hertford	0:30	0:34	0:35	0:34	0:35
Welwyn Garden City	0:23	0:25	0:27	0:26	0:27
Stevenage	0:29	0:31	0:32	0:31	0:32
Hitchin	0:27	0:29	0:30	0:29	0:30
Hemel Hempstead	0:19	0:24	0:30	0:25	0:20
East Hemel	0:15	0:19	0:22	0:19	0:26
St Albans City	0:18	0:19	0:21	0:20	0:20
Redbourn	0:10	0:13	0:15	0:13	0:13
Wheathampstead	0:09	0:10	0:10	0:10	0:10

Table 9-26: Travel times from Harpenden by scenario (PM Peak)

To	Travel Time (hh:mm)				
	Base	Option 0	Option 1	Option 2	Option 3
Bishop's Stortford	0:55	0:59	1:00	1:00	1:00
Cheshunt	0:40	0:46	0:47	0:47	0:47
Borehamwood	0:31	0:35	0:36	0:35	0:35
Rickmansworth	0:36	0:43	0:44	0:44	0:44
Watford	0:28	0:33	0:33	0:33	0:34
Hertford	0:28	0:31	0:31	0:31	0:31
Welwyn Garden City	0:20	0:21	0:21	0:22	0:22
Stevenage	0:28	0:29	0:30	0:30	0:30
Hitchin	0:27	0:28	0:28	0:28	0:28
Hemel Hempstead	0:18	0:20	0:23	0:22	0:22
East Hemel	0:14	0:16	0:17	0:17	0:17
St Albans City	0:17	0:18	0:19	0:20	0:20
Redbourn	0:09	0:10	0:11	0:11	0:11
Wheathampstead	0:09	0:09	0:09	0:10	0:10

10 Conclusions

10.1.1. WSP were commissioned by SADC to undertake forecast transport modelling required to assess the Local Plan proposals. The assessment of the proposed allocations provides evidence of the impacts that the Local Plan sites will have on the existing highway network and specific junctions and the impacts that the IDP schemes have alongside the mode shift assumptions.

10.2 Findings

10.2.1. Overall, this report has presented the results of the base year and four 2041 future year scenarios Option 0 to 3. These are explained below:

- **2014 Base Year**
- **2041 Option 0**
  - All committed and consented developments and transport schemes
- **2041 Option 1**
  - Option 0 plus the SADC Local Plan allocations
- **2041 Option 2**
  - Option 1 plus the SADC Infrastructure Delivery Plan (IDP) schemes and 10% mode shift
- **2041 Option 3**
  - Option 1 plus the SADC IDP schemes and Opportunity to Shift Mode Tool impacts

10.2.2. In summary as a result of background growth in vehicles and committed developments these are the impacts which occur acros St Albans district:

- **Option 0,** in SAD there is an increase in vehicles of between 13%-18% in the peak hours which results in an average speed reduction of around 10% in the peak hours.
- **Option 1**, the number of vehicles increases by a further 8% and average speeds reduce by 6%-7%.
- **Option 2,** compared to Option 1 across SAD there is a reduction of around 4% of vehicles and increases in speeds of between 5%-7% in the peak hours.
- **Option 3**, compared to Option 1, across SAD there is a reduction of around 4% of vehicles and increases in speeds of between 6%-7% in the peak hours

10.2.3. It is clear from the results that as part of the Local Plan growth improvements in infrastructure and modal shift are required to mitigate against the impact of the proposed developments to ensure the highway network operates effectively. Overall, in Option 2 and 3 the highway network operates satisfactory however there are parts of the highway network which experience increases in delays, on links and junctions, of over 2 minutes in

Option 2 and 3 compared to Option 1. However, it is envisaged that these impacts could be mitigated against subject to further investigation.

10.2.4. In general journey times across SAD increase between Base year, Option 0 and Option 1, with reductions in Option 2 and 3 compared to Option 1. However, there are some journey times where there are increases in Option 2 and 3 and further investigation could be considered alongside potential mitigation measures to look to reduce delays.

10.2.5. There are critical pieces of infrastructure that are needed to support key developments, such as the A414/ Green Lane junction improvement close to the East Hemel site. These are needed to improve congestion and delays and to prevent traffic diverting to less suitable roads in the area. It is also necessary to close some minor roads to through traffic in the East Hemel and north of St Albans area to prevent unsuitable volumes of traffic using narrow minor roads such as Punchbowl Lane, Hogg End Lane, Sandridgebury Lane and Valley Road.

10.2.6. There are increases in traffic flow on the Strategic Road Network as a result of the Local Plan proposals. The key percentage increases which occur are on slip roads to access the SRN whereas percentages increases on the main carriage way remain within -/+ 10%. There are increases in delay at some access points onto the SRN further investigation could be considered alongside potential mitigation measures to look to reduce delays.

Appendix A

Option 0 Sites with Development Zones

Zone Number	Planning Reference	Site Name	District	Number of dwellings	Number of jobs
9009	07/18/0461/O	Land at Delamare Road, Cheshunt	Broxbourne	1303	
9018	4/02539/16/MOA	SPENCERS PARK PHASE 2, LAND BETWEEN, THREE CHERRY TREES LANE AND CHERRY TREE LANE,, HEMEL HEMPSTEAD	Dacorum	357	
9024	17/00862/OPM	Land to N of Stevenage, Weston Road, Stevenage, SG1 4DE	Stevenage	557	
9030	6/2018/0171/MAJ	Former Shredded Wheat Factory, Welwyn Garden City, AL8 6UN	Welwyn Hatfield	1454	
9034	4/03266/18/MFA	LA3, Land At West Hemel Hempstead, Hemel Hempstead	Dacorum	1145	
9044	3/15/0300/OUT	Former Sainsburys Distribution Depot, London Road, Buntingford, SG9 9JR	East Hertfordshire	316	
9045	3/13/0804/OP	Land At Bishops Stortford North, Bishops Stortford	East Hertfordshire	1606	
9046	3/17/2588/OUT	Bishops Stortford Goods Yard, Station Road, Bishops Stortford, CM23 3BL	East Hertfordshire	617	
9049	EOS1	East of Gresley Way, Stevenage	East Hertfordshire	453	
9063	5/22/0927	Land South of Chiswell Green Lane	St Albans	391	67

Zone Number	Planning Reference	Site Name	District	Number of dwellings	Number of jobs
9064	5/2013/2589	Oaklands College, Smallford Campus, St Albans, AL4 0JA	St Albans	385	
9065	14/00559/OPM	Matalan Retail Park, Danestrete, Stevenage, SG1 1XB	Stevenage	526	
9078	17/01511/FULM	Land To The South Of, Thomas Sawyer Way, Comprising The Waterside Area And Forming Part Of The Watford Riverwell Development (formerly Known , Watford	Watford	407	
9079	18/00703/NONMAT	Land To The East Of, Ascot Road, Watford	Watford	486	
9082	MU05	Land and Buildings at 94-98 St. Albans Road	Watford	1265	
9087	6/2018/0873/OUTLINE	Land to North East of Welwyn Garden City Panshanger Welwyn Garden City AL7 2QJ	Welwyn Hatfield	656	
9098	6/2015/2043/OUTLINE	Plots 4100, 5000, 5600, 6000,, Hatfield Business Park, Hatfield, AL10 9UH	Welwyn Hatfield		825
9100	PP1	Park Plaza West - Release of Green Belt Land to meet medium and long term employment needs	Broxbourne		4000
9104	CH1b	Delamare Road/Cheshunt Lakeside	Broxbourne		1152

Zone Number	Planning Reference	Site Name	District	Number of dwellings	Number of jobs
9105	3/13/0804/OP	Land At Bishops Stortford North, Bishops Stortford	East Hertfordshire		1000
9110	5/2016/3006	Proposed Rail Freight, North Orbital Road, Chiswell Green	St Albans		4095
9112	07/00810/OP	Town Centre, Stevenage	Stevenage		2917
9113	20/00726/NMA	Airbus Defence And Space, Gunnels Wood Road, Stevenage, SG1 2DB	Stevenage		1127
9115	18/00935/FULM	Gresham House 53, Clarendon Road, Watford, WD17 1LA	Watford		830
9116	16/00076/VAR	Charter Place, Watford, WD17 2RN	Watford		2687
9118	17/00558/FULM	Land at 64 &, 73-77 Clarendon Road, Watford, WD17 1DS	Watford		2451
9119	21/00934/VARM	Hanny House, 37 And 39 Clarendon Road, Watford, WD17 1JA	Watford		1276
9123	MFW	Maxwells Farm West & Rush Meadow (500 new jobs)	Broxbourne		500
9126	4/00064/17/MFA	MAYLANDS GATEWAY, MAYLANDS AVENUE, HEMEL HEMPSTEAD, HP2 4FQ	Dacorum		504
9127	4/03355/14/MFA	LIBRARY AND ADJACENT LAND, COMBE STREET, HEMEL HEMPSTEAD	Dacorum		644

Zone Number	Planning Reference	Site Name	District	Number of dwellings	Number of jobs
9136	5/2016/0264	St Albans Retail Park, Griffiths Way, St Albans, AL1 2RJ	St Albans		631
9141	15/1427/FUL	Building 1 & 2, Marlins Meadow, Watford	Three Rivers		724
9146	07/17/0352/O	Land North and South of Andrew's Lane and, South of Peakes Way, Cheshunt, EN7 6SP	Broxbourne	366	
9150	19/00474/FPM	Land To The West Of, Lytton Way, Stevenage, SG1 1AG	Stevenage	576	
9151	19/2133/FUL	Demolition of existing buildings and provision of 345 residential units (Use Class C3) in 2 buildings ranging from 3-7 storeys including a 1 and 2 storey podium; 621sqm of flexible commercial floor space (Use Class A1-A5, B1, D1/D2); 1,754sqm retail floorspace (Use Class A1) podium and surface level car and cycle parking; landscaping; and associated works.	Three Rivers	345	
9159	07/22/0287/F	Theobalds Park Farm, Great Cambridge Road, Goffs Oak, EN8 8EU	Broxbourne		2653
9161	6/2021/2125/MAJ	Hertfordshire Constabulary, Stanborough Road, Weleyn Garden City, AL8 6XF	Welwyn Hatfield		1317

Zone Number	Planning Reference	Site Name	District	Number of dwellings	Number of jobs
9162	18/00416/FPM	Bank House, Primett Road, Stevenage, SG1 3EE	Stevenage		1055
9163	21/04352/MFA	Unit 4 The Hub, Paradise, Hemel Hempstead, HP2 4TF	Dacorum		718
9166	5/2020/1773	Civic Centre Opportunity Site (South), Victoria Street, St Albans	St Albans		620
9167	12/0646/FUL	Unit B Imagination Technologies, Home Park Industrial Estate, Station Road, Kings Langley, Kings Langley, WD4 8LZ	Three Rivers		501
9168	6/2019/1411/MAJ	Plot 5100, Mosquito Way, Hatfield Business Park, Hatfield, AL10 9WN	Welwyn Hatfield		655
9171	07/18/1181/O	Outline application for construction of a high-tech employment development in a parkland setting together with associated infrastructure comprising: 1) A data centre facility (upto 65,000 sq.m) and associated ancillary plant storage and office space 2) Business space (upto 36,400 sq.m) reserved for B1/B2/B8 use 3) Open space, landscaping and flood mitigation 4)	Broxbourne		1371

Zone Number	Planning Reference	Site Name	District	Number of dwellings	Number of jobs
		Associated vehicular access from the A10 (Great Cambridge Road) and Lieutenant Ellis Way 5) Electricity sub-station			

Appendix B

Residential Development Sites included in Option 1

Reference	Address	Number of dwellings	Zone Number
H1	North Hemel Hempstead, AL3 7AU	1,250	9090
H2	East Hemel Hempstead (North), HP2 7HT	1,335	9008
H4	East Hemel Hempstead (South), HP2 4PA4	2,165	9007
B2	North East Harpenden, AL5 5EG	762	9061
B5	Glinwell, Hatfield Road, St Albans, AL4 0HE	436	9160
B7	North West of Harpenden, AL5 3NP	293	3603
B8	Harper Lane, north of Radlett, WD7 7HU	274	3608
B3	West Redbourn, Redbourn, AL3 7HZ	593	9164
B1	North St Albans, AL3 6DD	996	9026
B4	East St Albans, AL4 9JJ	522	9062
B6	West of London Colney, AL2 1LN	405	9027
L2	West of Watling Street, Park Street, AL2 2PZ	104	3518
L1	Burston Nurseries, North Orbital Road, St Albans, AL2 2DS	36	3517
P2	Land at North Orbital Road, AL2 1DL	64	3536
P1	Smallford Works, Smallford Lane, AL4 0SA	80	3609
M25	Baulk Close, Harpenden, AL5 4LY	8	3605

Reference	Address	Number of dwellings	Zone Number
M16	Falconers Field, Harpenden, AL5 3ES	39	3593
M7	Townsend Lane, Harpenden, AL5 2RH	65	3590
M22	Wood End, Hatching Green, Harpenden, AL5 2JT	14	3584
M21	Rothamsted Lodge, Hatching Green, AL5 2GT	20	3589
M1a	Cross Lane, Harpenden, AL5 1BX	95	3583
M5	Sewage Treatment Works, Piggottshill Lane, Harpenden, AL5 5UN	70	3596
M19	Piggottshill Lane, Harpenden, AL5 5UN	29	3596
M24	South of Codicote Road, Wheathampstead, AL4 8GD	12	3606
M2	Hill Dyke Road, Wheathampstead, AL4 8TR	85	3573
M26	Highway Chipping Depot, Lower Luton Road, AL4 8JJ	7	3606
M17	North of Wheathampstead Road, Harpenden, AL5 1AB	38	3588
M20	Lower Luton Road, Harpenden, AL5 5AF	25	3597
M4	North of Oakwood Road, Bricket Wood, AL2 3PT	74	3521
M15	Bucknalls Drive, Bricket Wood, AL2 3YT	44	3524
M1	East and West of Miriam Lane, Chiswell Green, AL2 3NY	98	3516

Reference	Address	Number of dwellings	Zone Number
M3	Bedmond Lane, St Albans, AL3 4AH	78	3502
M23	Ashdale Lye Lane, Bricket Wood, AL2 3LQ	14	3523
M10	Tippendell Lane and Orchard Drive, How Wood, AL2 2HJ	51	3518
M27	Frogmore Vicarage, Frogmore, AL2 2JU	5	3526
M13	North of Boissy Close, Colney Heath, AL4 0UE	49	3609
M18	East of Kay Walk, St Albans, AL4 0XH	37	3535
M8	Verulam Golf Club, St Albans, AL1 1JG	65	3611
M14	Beesonend Lane, Harpenden, AL5 2AB	43	3583
M9	Amwell Top Field, Wheathampstead, AL4 8DZ	60	3573
M12	North of The Slype, Gustard Wood, AL4 8SA	49	3572
M11	Rothamsted Research, Harpenden Campus, AL5 2JQ	55	3584
M6	South of Harpenden Lane, Redbourn, AL3 7RQ	68	3503
U1	East of Morris Recreation Ground, adjacent to A1081 and White Horse Lane	53	3616
U3	Former Bricket Wood United Reformed Church, AL2 3QR	10	3522
U4	Greenwood United Reformed Church, AL2 3HG	5	3515

Reference	Address	Number of dwellings	Zone Number
U2	Land South West of London Colney Allotments, AL2 1RG	25	3616
UC28	New Greens Residents Association, 2 High Oaks, St Albans, AL3 6DL	8	3560
UC40	Land Rear of New House Park Shops, St Albans, AL1 1UJ	6	3536
UC4	Car Park to rear of 32-34 Upper Marlborough Road, St Albans, AL1 3UU	35	3564
UC25	318 Watford Road, Chiswell Green, AL2 3DP	10	3517
UC10	Garage Block rear of 109-179 Hughenden Road, St Albans, AL4 9QW	24	3565
UC12	Garage Block Between Hughenden Road and The Ridgeway, St Albans, AL4 9RH	20	3617
UC14	Car Park to rear of 3 Church Green (Waitrose), Harpenden, AL5 2TJ	19	3590
UC7	5 Spencer Street, St Albans, AL3 5EH	28	3564
UC51	Garage Block to south of Abbots Park Abbots Park, St Albans, AL1 1TW	5	3626
UC27	Berkeley House, Barnet Road, London Colney, AL2 1BG	9	3528
UC39	Garage Block to east of 8 Heath Close, Harpenden, AL5 1QN	6	3586
UC16	Garage Block west of Thirlestane, St Albans, AL1 3PE	17	3510

Reference	Address	Number of dwellings	Zone Number
UC52	Garage Block off Tallents Crescent, Harpenden, AL5 5BS	5	3597
UC43	Garage block to west of 32-46 Riverside Road, St Albans, AL1 1SD	6	3542
UC18	Garage block to front of 94-142 Riverside Road, Riverside Road, St Albans, AL1 1SE	14	3542
UC38	Garage block to rear of 27-32 St Pauls Place, St Pauls Place, St Albans, AL1 4JW	6	3624
UC44	Garage Block off Millford Hill, Harpenden, AL5 5BN	6	3597
UC23	Garage Site adj. Verulam House, Verulam Road, St Albans, AL3 5EN	11	3506
UC17	Garage Block off Cotlandswick, London Colney, AL2 1ED	15	3531
UC32	Garages off Creighton Avenue, St Albans, AL1 2LZ	8	3537
UC45	Garages off Watling View (West), St Albans, AL1 2PA	6	3612
UC30	Garages Between Abbotts Avenue West and Abbey Line, St Albans, AL1 2JH	8	3537
UC42	Garages off Thirlmere Drive, St Albans, AL1 5QS	6	3544
UC29	Garage Block off Noke Shot, Harpenden, AL5 5HS	8	3604
UC33	Land Rear of 53 Snatchup, Redbourn, AL3 7HF	7	3579

Reference	Address	Number of dwellings	Zone Number
UC26	Garage Block to Malvern Close, St Albans, AL4 9SZ	10	3566
UC21	Garages off Chapel Place, St Albans, AL1 2JZ	12	3537
UC41	Garages at Grindcobbe, St Albans, AL1 2ED	6	3537
UC34	Garages Rear of Hill End Lane (South), St Albans, AL4 0AE	7	3545
UC24	Garages Rear of Hill End Lane (North), St Albans, AL4 0AE	10	3545
UC31	Garages rear of Tudor Road, St Albans, AL3 6AY	8	3562
UC36	Garages off Park Street Lane, Park Street, AL2 2ND	7	3518
UC49	Garage Block rear of 18-30 Furse Avenue, St Albans, AL4 9NE	5	3566
UC37	Garages off Watling View (East), St Albans, AL1 2NT	7	3612
UC22	Car Park to rear of 77-101 Hatfield Road, Hatfield Road, St Albans, AL1 4JL	12	3624
UC15	Bowers Way East Car Park Bowers Way, Harpenden, AL5 4EQ	18	3602
UC2	Civic Close Car Park Bricket Road, St Albans, AL1 3JX	57	3564
UC35	Market Depot, Drovers Way, St Albans, AL3 5FA	7	3506
UC9	Keyfield Terrace Car Park, Keyfield Terrace, St Albans, AL1 1PD	25	3555

Reference	Address	Number of dwellings	Zone Number
UC8	Public Hall, 6 Southdown Road, Harpenden, AL5 1TE	26	3590
UC13	Car Park adjacent to Verulam House, Verulam Road, St Albans, AL3 5EN	19	3506
UC3	London Road Car Park, London Road, St Albans, AL1 1NG	36	3555
UC50	Southview Car Park, Lower Luton Road, Harpenden, AL5 5AW	5	3597
UC1	Sainsbury's Supermarket, Everard Close, St Albans AL1 2QU	92	3538
UC47	Crabtree Fields / Land at Waldegrave Park, Harpenden, AL5 5SA	5	3596
UC46	Garage Blocks adj. to 76 Oakley Road and 151 Grove Road, Harpenden, AL5 1HJ	6	3587
UC11	50 Victoria Street St Albans, AL1 3HZ	10	3555
UC19	54 Lemsford Road St Albans, AL1 3PR	14	3511
UC20	104 High Street London Colney, AL2 1QL	13	3616
UC5	18- 20 Catherine Street St Albans, AL3 5BY	31	3507
UC6	13-19 Sutton Road & 5-11a Pickford Road St Albans, AL1 5JH	29	3548
UC48	Car Park adj. to 42-46 Adelaide Street, St Albans, AL3 5BH	5	3564

Reference	Address	Number of dwellings	Zone Number
HA8	Land and Garages at Longfield Road, Harpenden	4	3585
HA1	Harpenden Memorial Hospital, Harpenden	34	3599
HA4	Jewsons, Grove Road, Harpenden	14	3587
HA6	Land at 63 High Street, Harpenden	5	3602
Windfall	St Albans	1,758	
Windfall	Harpenden	432	
Windfall	Chiswell Green	29	
Windfall	How Wood	29	
Windfall	London Colney	88	
Windfall	Park Street/Frogmore	29	
Windfall	Redbourn	59	
Windfall	Wheathampstead	29	
Windfall	Sandridge	29	
Windfall	Metropolitan Green Belt	398	
	Total	**14,417**	

Appendix C

Employment Development Sites included in Option 1

Reference	Location	Description	Number of jobs	Zone Number
EHHN.2	East Hemel Hempstead (North) BL	New neighbourhood centre and local centre	13	3503
EHHN.3	East Hemel Hempstead (North) BL	Other community facilities, including health provision	5	3503
EHHS.2	East Hemel Hempstead (South) BL	New neighbourhood centre and local centre	19	3501
EHHS.3	East Hemel Hempstead (South) BL	Other community facilities, including health provision	8	3501
NHH.2	North Hemel Hempstead BL	New neighbourhood centre and local centre	12	3503
NHH.3	North Hemel Hempstead BL	Other community facilities, including health provision	5	3503
ESA.2	East St Albans BL	New neighbourhood centre	10	3617
ESA.3	East St Albans BL	Other community facilities, including health provision	4	3617
NSA.2	North St Albans BL	New neighbourhood centre	9	3562
NSA.3	North St Albans BL	Other community facilities, including health provision	4	3562
NEH.2	North East Harpenden BL	Other community facilities, including health provision	2	3604
NWH.2	North West Harpenden BL	Other community facilities, including health provision	2	3603

Reference	Location	Description	Number of jobs	Zone Number
WLC.2	West of London Colney BL	Other community facilities, including health provision	1	3527
LOLR	Former Ariston Works (Land off London Road)	School allocation (1 x 2 form entry primary)	67	3561
Maylands_East H3	East Hemel Hempstead (Central) BL	Employment (Offices, R and D, Light Industrial, Logistics)	8000	9109
ROTH	Rothamsted Research Institute	Employment (R and D)	85	3589
BRE	Building Research Institute	Employment (R and D)	43	3524
EHHN.1	East Hemel Hempstead (North) BL	School allocation (1 x 3 form entry primary and 1 x 8-10 form entry secondary)	266	3503
EHHS.1	East Hemel Hempstead (South) BL	School allocation (1 x 3 form entry primary and 1 x 2 form entry primary)	170	3501
NHH.1	North Hemel Hempstead BL	School allocation (1 x 3 form entry primary)	103	3503
ESA.1	East St Albans BL	School allocation (1 x 3 form entry primary and 1 x 6-8 form entry secondary)	205	3617
NSA.1	North St Albans BL	School allocation (1 x 2 form entry primary)	67	3562
NEH.1	North East Harpenden BL	School allocation (1 x 2 form entry primary)	67	3604
NWH.1	North West Harpenden BL	School allocation (1 x 2 form entry primary)	67	3603

Reference	Location	Description	Number of jobs	Zone Number
WLC.1	West of London Colney BL	School allocation (1 x 2 form entry primary and 1 x 6-8 form entry secondary)	219	3527
OS1	Land to the North of Bricket Wood, bounded by the M25 and A405 North Orbital	Community Facilities	1	3522
OS2	Toulmin Drive / Highelms, St Albans, AL3 6DX	Community Facility	1	3503
	South of HGC Secondary School	An 8FE secondary school to serve the new and existing communities	135	3503
		Total	**9,589**	

Appendix D

Opportunity to Shift Modes Report

Confidential

March 2024

Hertfordshire County Council

70120547

St Albans Modal Shift Study

Final draft report

INTRODUCTION & EXECUTIVE SUMMARY

PART 1
SUSTAINABLE TRAVEL POTENTIAL FOR EXISTING COMMUNITIES

PART 2
SUSTAINABLE TRAVEL POTENTIAL FOR NEW DEVELOPMENTS

APPENDIX A
BREAKDOWN OF SUSTAINABLE TRAVEL OPPORTUNITY FOR EXISTING COMMUNITIES

APPENDIX B
RANGE OF TRIPS BY COMMUNITIES WITH THE OPPORTUNITY TO SHIFT BY MODE

APPENDIX C
BREAKDOWN OF SUSTAINABLE TRAVEL PROPENSITY FOR EXISTING COMMUNITIES

APPENDIX D
BREAKDOWN OF SUSTAINABLE TRAVEL POTENTIAL FOR EXISTING COMMUNITIES

Document Control

Issue / revision	Draft	Final draft	Final
Date	28/02/2024	25/03/24	18/07/24
Prepared by	STJ	TA	TA
Checked by	TA	DQ	DQ
Authorised by	DQ	DQ	DQ

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INTRODUCTION

Project overview and executive summary

Introduction

Overview

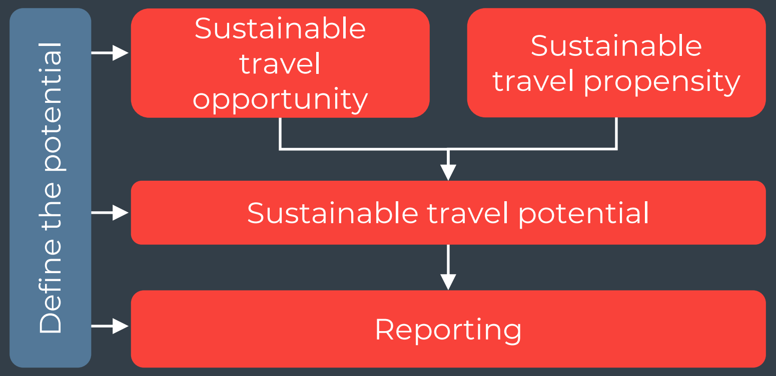
WSP have been commissioned by Hertfordshire County Council (HCC) to undertake a modal shift study for the existing and future communities in St Albans district.

The County Council's Local Transport Plan 2018-2031 (LTP4) seeks to achieve a modal shift away from car use to more sustainable modes such as public transport, walking and cycling.

WSP's sustainable travel analysis provides an evidence-led approach to estimating potential modal shift that can be used in the local plan process.

The final report

This report summarises the key findings on the opportunity and propensity to shift existing car trips to sustainable travel, and the resulting sustainable travel potential for the existing communities and new developments in St Albans district (see Figure 1).



Project aims

The aim of this project is to estimate sustainable travel opportunity, propensity and potential for:

- Task 1 - the existing communities in St Albans district.
- Task 2 - the specified new developments in St Albans district.

Report structure

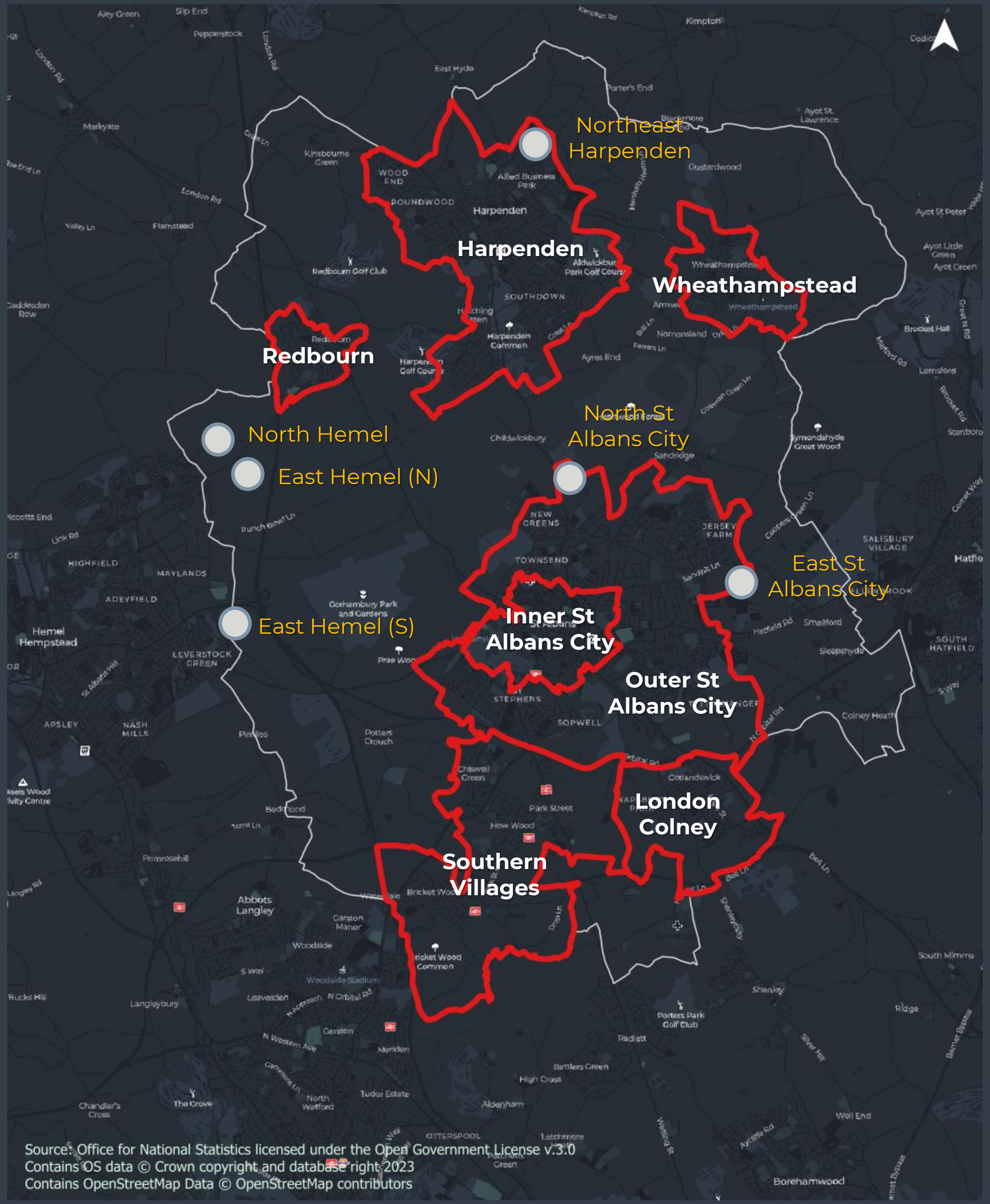
The report is structured as follows:

- Part 1 – Sustainable travel potential for existing communities
- Part 2 – Sustainable travel potential for new developments

Both parts follow the structure of:

- A-Sustainable travel opportunity summarising the number of car trips that could be made by walking, cycling and public transport
- B-Sustainable travel propensity calculating the propensity (or likelihood) of residents to walk, cycle or use public transport
- C-Sustainable travel potential estimates which car trips are likely to switch to walk, cycle or public transport based on the opportunity and propensity.

Figure 1 Study area



The study covers St Albans district and its existing communities, as well as the following new developments: East Hemel (north and south), North Hemel, Northeast Harpenden, North St Albans City, and East St Albans City.

Methodology

Opportunity

What is it?

The sustainable travel opportunity estimates the number of modelled car trips that can switch to sustainable modes (walking, cycling or public transport). It is considered the 'best-case scenario' and does not consider individual travel behaviours – this is covered in propensity.

What did we do?

Existing car journeys were extracted from the 2031 Countywide model (COMET) and alternative route options were provided using the Google API.

Routes for walking, cycling and public transport were compared to the existing driving journey using high and lower mode shift scenarios:

- The high mode shift scenario aims to align to targets set out in the DfT's Gear change (cycling and walking vision), i.e. two miles for walking, five miles for cycling and a maximum public transport journey time of 2.4x the driving alternative.
- The lower mode shift scenario is more conservative and aims for a 15–20 minute neighbourhood – one mile for walking, three miles for cycling and a maximum public transport journey time of 1.5x the driving alternative.

Part 1A and 2A of this report summarises the findings of the **sustainable travel opportunity** analysis for existing communities and new developments.

Propensity

What is it?

The sustainable travel propensity is the likelihood that a resident or household will take a given mode (walking, cycling, bus or rail). It is benchmarked against the England average which is set at 100.

What did we do?

WSP's Mobility Insights survey response bank was used to derive propensities for walking, cycling, public transport (bus and rail), and driving by grouping survey results to the Dominant Experian Mosaic Group.

Responses were categorised into different variables (such as owning a car) and socio-demographic groups (derived from Experian Mosaic), then compared to the England average response.

A weighted average of relevant variables for each mode was calculated to determine propensity and is presented at a model zone level and based on the mix of the Mosaic Groups in that zone.

Part 1B and 2B of this report summarises the findings of the **sustainable travel propensity** analysis for existing communities and new developments.

Potential

What is it?

The sustainable travel potential estimates which car trips are likely to shift to sustainable modes – considering the opportunity and propensity findings.

It is intended to provide a more 'realistic' scenario for estimating the total number of switchable trips.

What did we do?

Outputs from the **opportunity** analysis and the **propensity** analysis were combined to determine **sustainable travel potential**.

For active travel – the Gear Change target of 50% was used as the baseline mode shift for walking and cycling trips for the England average. If propensity was 100 (England average) then 50% of the opportunity trips would shift – with a higher proportion switching if propensity was greater than 100, and the inverse for propensity scores below 100.

Public transport trips were adjusted by comparing the propensity to take public transport to that of driving.

Part 1C and 2C of this report summarises the findings of the **sustainable travel potential** analysis for existing communities and new developments.

Key findings

Existing communities

Up to 33% of existing car trips in St Albans district have the potential to switch to sustainable modes based on existing active and public transport networks / services, and the current socio-demographics / travel behaviour of residents).

- Cycling provides the highest opportunity for mode shift (up to 37% across St Albans district) and is also likely to provide the highest potential for mode shift (once propensities are taken account of) - up to 17% of existing car trips across St Albans district have the potential to switch to cycling.
- Walking has a slightly lower opportunity for mode shift than cycling (up to 35% across St Albans district), but similar potential for mode shift - up to 17% of existing car trips across the district have the potential to switch to walking.
- Public transport has the lowest opportunity (up to 6%) and potential for mode shift - up to 3% of existing car trips in St Albans district have the potential to switch to public transport.

Based on existing socio-demographics and compared to the England average, existing St Albans district residents generally have below average propensities for walking, cycling and bus, but above average propensity for rail and drive. However, Inner St Albans City residents are the exception and have a higher propensity for using sustainable modes.

New developments

Up to 27% of modelled car trips across the assessed St Albans district development zones have the potential to switch to sustainable modes (based on existing active and public transport networks / services, and the likely socio-demographics / travel behaviour of new residents).

- Cycling provides the highest opportunity for mode shift (up to 40% across the development zones) and the highest potential for mode shift - up to 16% of existing car trips across the development zones have the potential to switch to cycling.
- Walking has a lower opportunity for mode shift than cycling (up to 27% across the development zones) and potential for mode shift - up to 11% of existing car trips across the development zones have the potential to switch to walking.
- Public transport has the lowest opportunity and potential for mode shift - less than 1% of existing car trips across the development zones have the potential to switch to public transport. However, this is a worst-case scenario as it is unlikely that the new developments wouldn't have additional public transport provision.

Based on the expected socio-demographics of the new development zones in St Albans district, the new residents will have below average propensities for walking, cycling, bus and rail, but above average propensity to drive, compared to the England average. However, propensities could change if sustainable transport provision is improved.

Next steps

The findings of this study provide an evidence base for identifying and prioritising sustainable travel interventions in St Albans district, both for existing and future communities. The study also highlights the areas and modes where there is a gap between the opportunity and the potential for mode shift, suggesting the need for further improvements in the active and public transport networks, as well as behaviour change initiatives to encourage the use of sustainable modes.

The next steps for HCC and its partners are to:

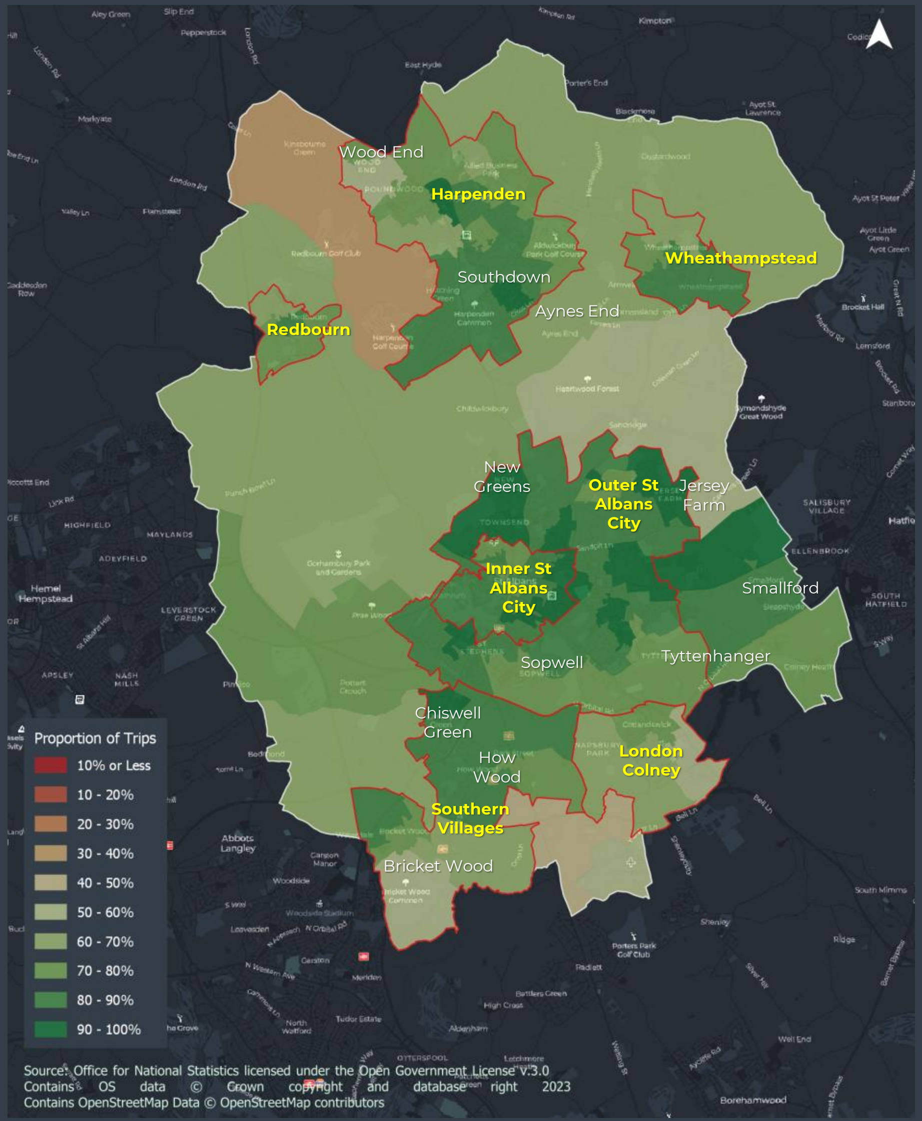
- Review the findings of this study and consider the implications for the local plan process and the LTP delivery.
- Identify and appraise the potential sustainable travel interventions that could increase the opportunity and propensity for mode shift in St Albans district, such as enhanced walking, cycling, bus and rail networks, demand management measures, travel planning and marketing campaigns.
- Engage with the relevant stakeholders, including the local authorities, developers, transport operators and community groups, to secure the support and funding for the delivery of sustainable travel interventions.
- Monitor and evaluate the impact of the sustainable travel interventions on the travel behaviour and outcomes of the existing and future residents in St Albans district.

EXECUTIVE SUMMARY

Sustainable travel potential for existing communities

SUSTAINABLE TRAVEL POTENTIAL FOR EXISTING COMMUNITIES

Sustainable travel opportunity



We calculated that:

- Up to 68% of existing car trips across the St Albans district have the opportunity to switch to sustainable modes.
- Outer St Albans City has the highest opportunity - up to 79% of existing car trips have the opportunity to switch, followed by Inner St Albans City (up to 68%), Harpenden (up to 67%), Wheathampstead (up to 66%), Southern Villages (up to 63%), Redbourn (up to 62%) and London Colney (up to 54%).

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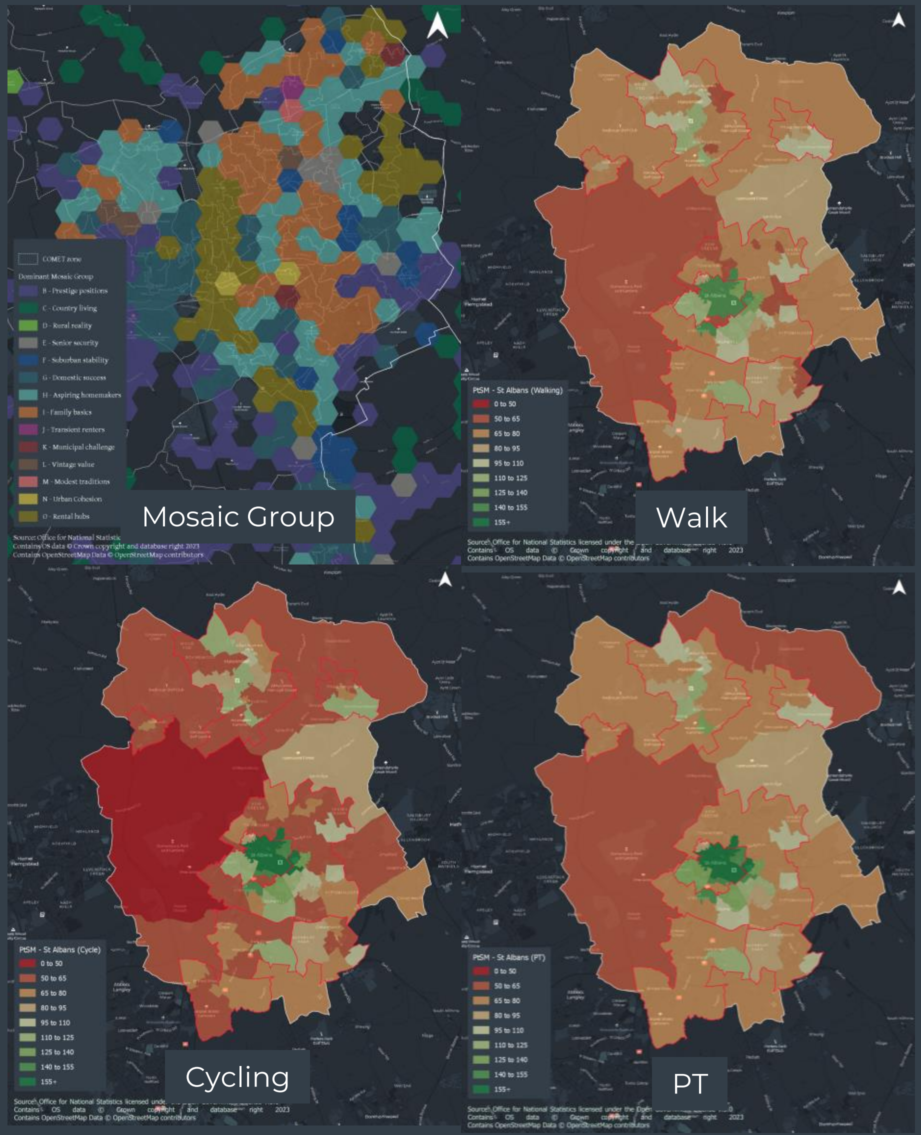
Sustainable travel propensity



What did we find:

Based on existing socio-demographics, existing St Albans district residents have below average propensities for walking, cycling and bus but above average propensity to use rail and drive. However, Inner St Albans City residents have a high propensity for using sustainable modes. As new development areas are developed, the propensity to use sustainable modes could increase with new residents.

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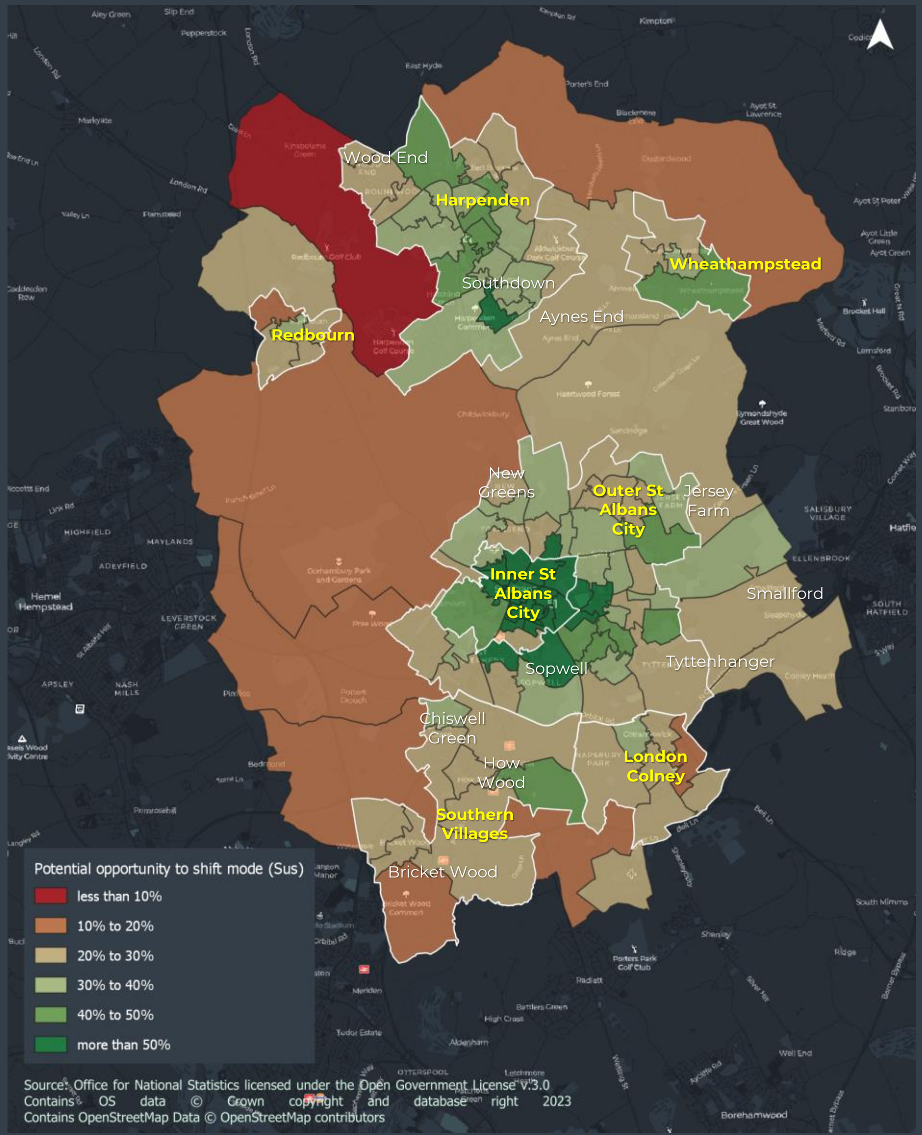
Sustainable travel potential

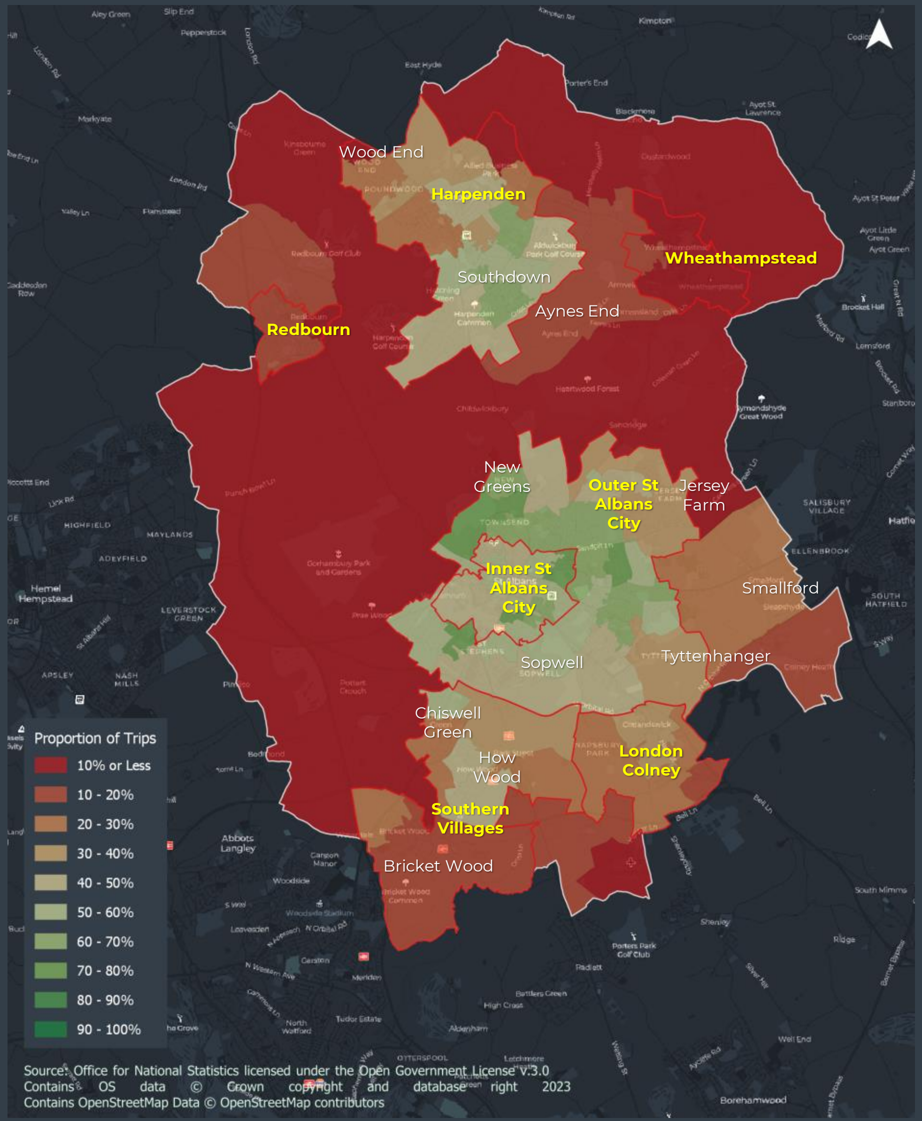


We calculated that:

- Up to 32% of existing car trips across the St Albans district have the potential to switch to sustainable modes.
- Inner St Albans City has the highest potential - up to 47% of existing car trips have the potential to switch, followed by Outer St Albans City (up to 33%), Harpenden (up to 30%), Wheathampstead (up to 27%), Southern Villages (up to 24%), London Colney (up to 22%) and Redbourn (up to 21%).

WALKING POTENTIAL FOR EXISTING COMMUNITIES

Opportunity to walk



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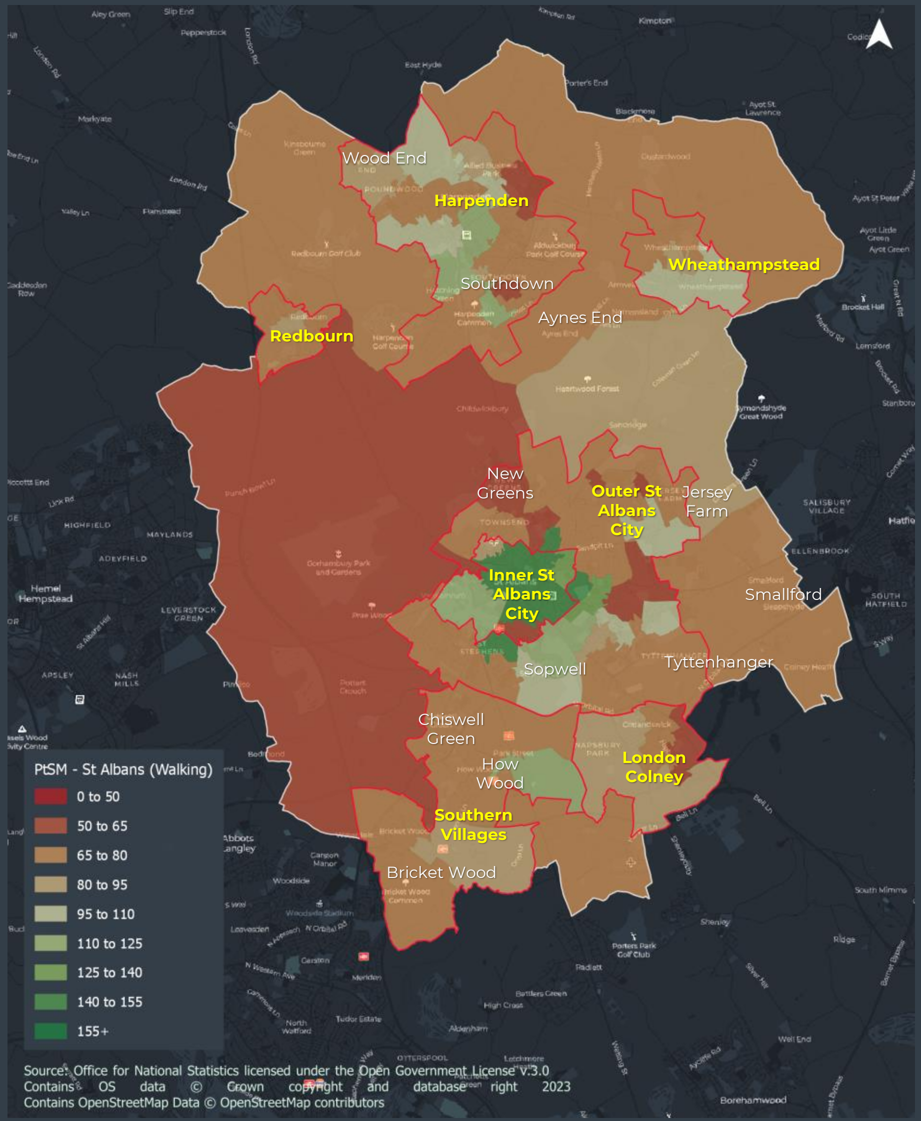
Propensity to walk



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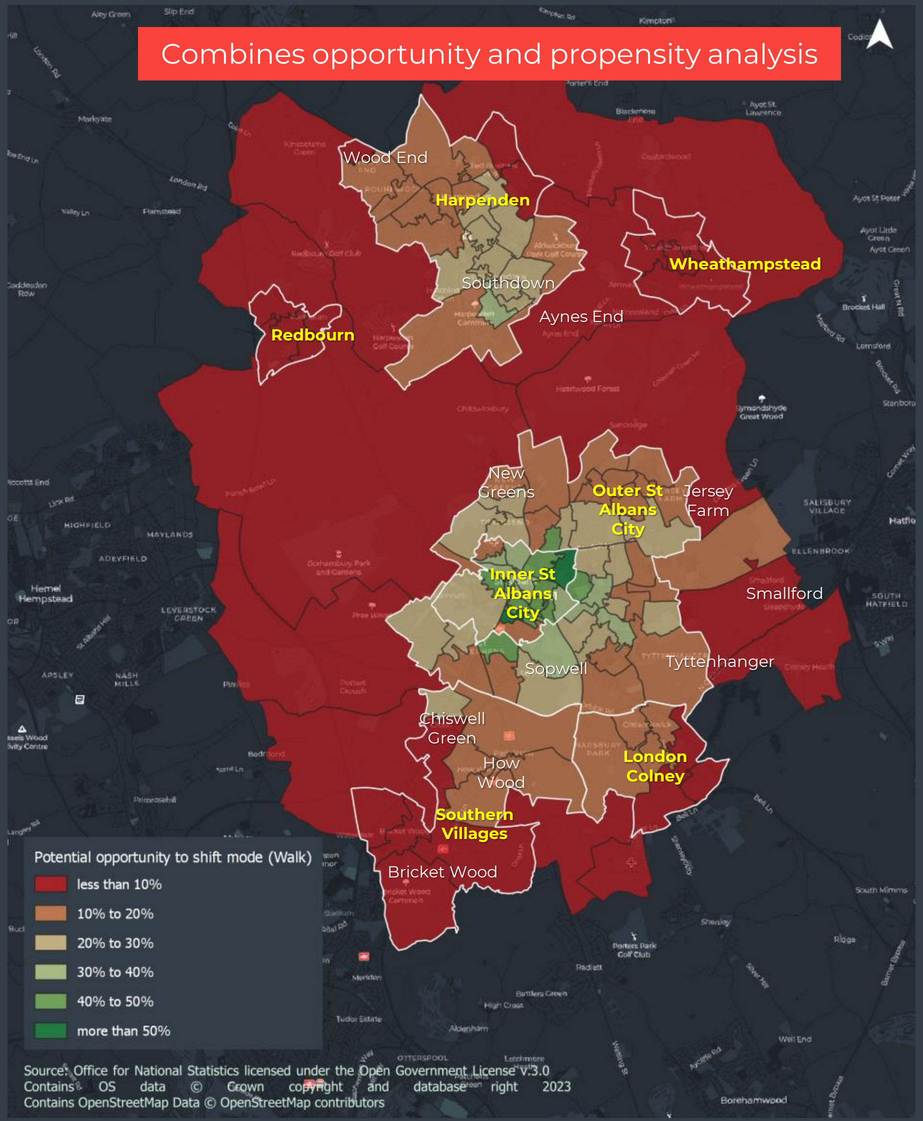
Walking potential



We calculated that:

- Up to 35% of existing car trips across the St Albans district have the opportunity to switch to walking.
- Outer St Albans City has the highest opportunity - up to 49% of existing car trips have the opportunity to switch to walking, followed by Inner St Albans City (up to 42%), Harpenden (up to 34%), London Colney (up to 21%), Southern Villages (up to 21%), Redbourn (up to 10%) and Wheathampstead (up to 7%).

What did we find:

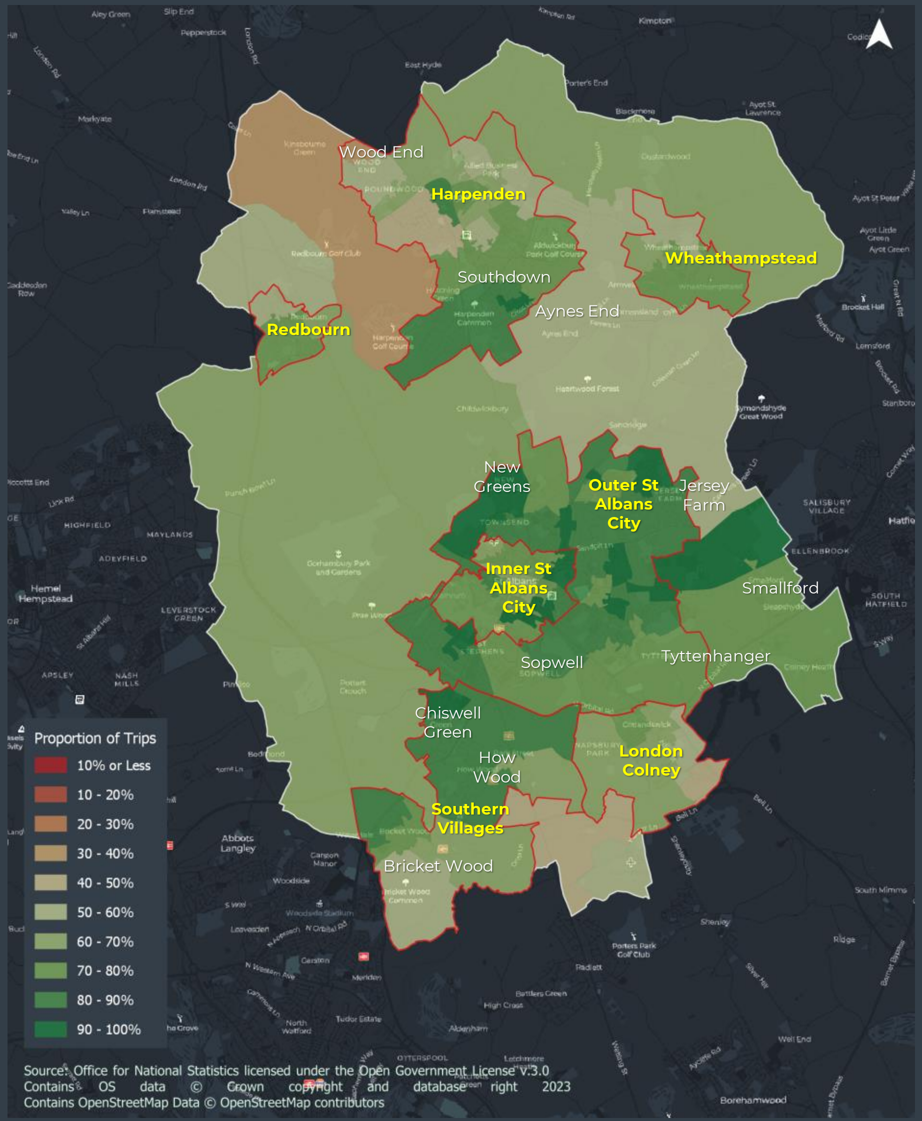
Propensity to walk varies across St Albans district, including the characteristics of the residents and the local infrastructure. The Inner St Albans City has a higher-than-average propensity to walk. These areas may have a higher proportion of residents who prioritise active lifestyles and are more inclined to engage in walking activities for leisure or commuting purposes.

We calculated that:

- Up to 17% of existing car trips across the St Albans district have the potential to switch to walking.
- Inner St Albans City has the highest potential - up to 29% of existing car trips have the potential to switch to walking, followed by Outer St Albans City (up to 21%), Harpenden (up to 15%), Southern Villages and London Colney (both up to 8%), Redbourn (up to 4%) and Wheathampstead (up to 3%).

Cycling potential for existing communities

Opportunity to cycle



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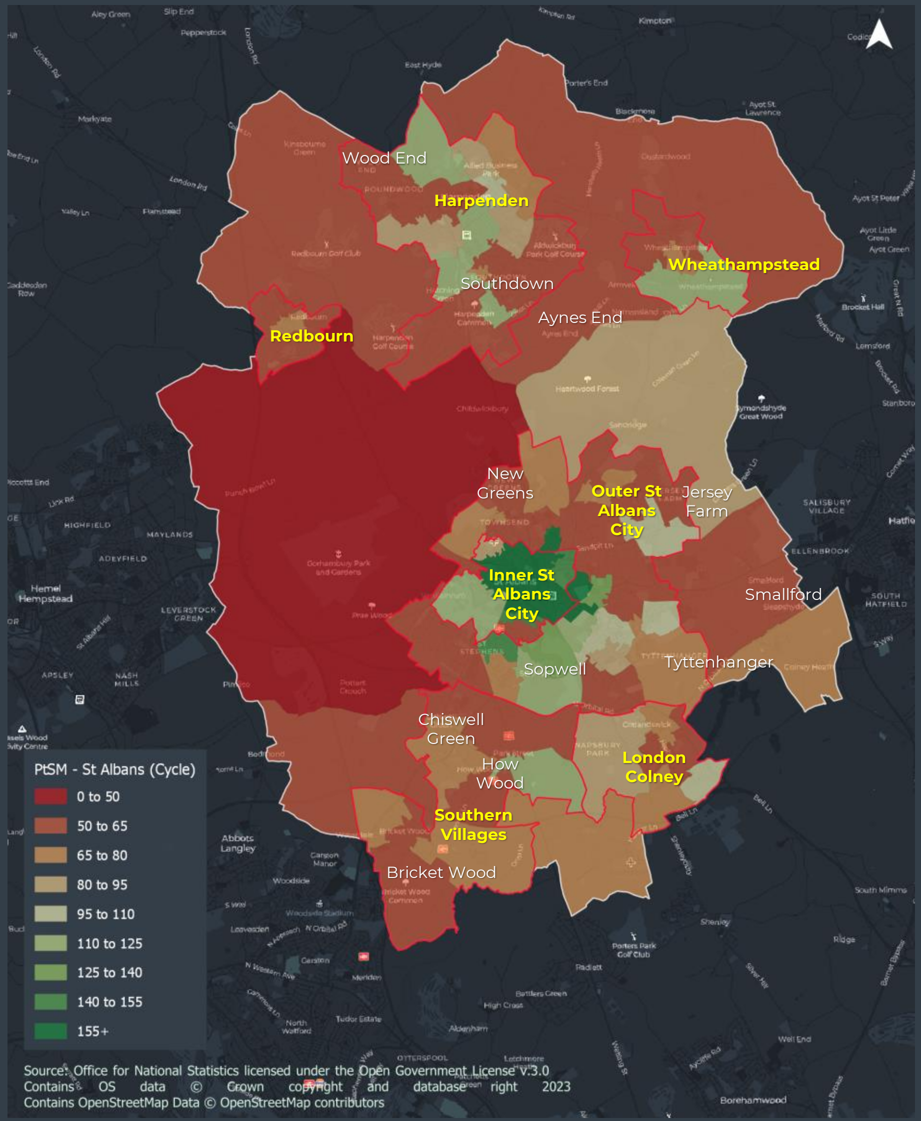
Propensity to cycle



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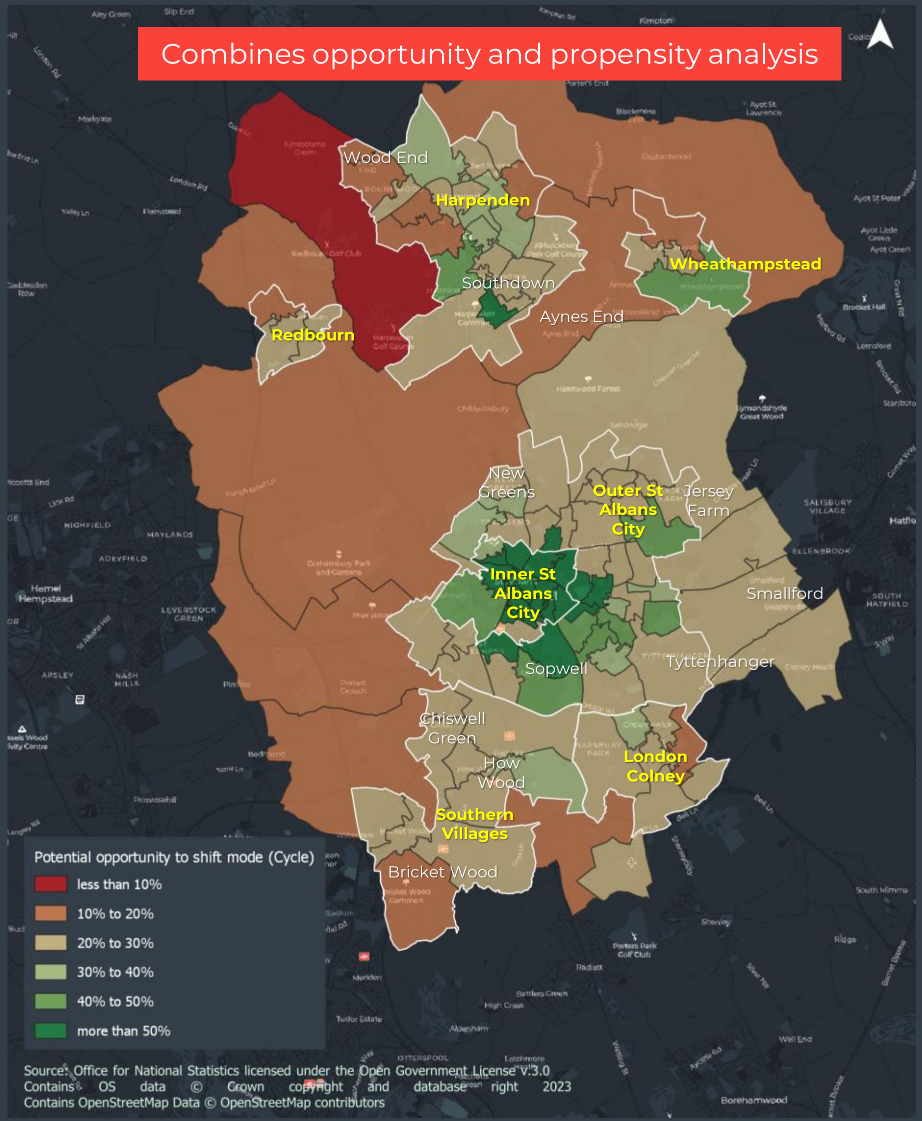
Cycling potential



We calculated that:

- Up to 37% of existing car trips across the St Albans district have the opportunity to switch to cycling.
- Outer St Albans City has the highest opportunity - up to 52% of existing car trips have the opportunity to switch to cycling, followed by Wheathampstead (up to 50%), Redbourn (up to 45%), Southern Villages (up to 40%), Inner St Albans City and Harpenden (both up to 33%), and London Colney (up to 29%).

What did we find:

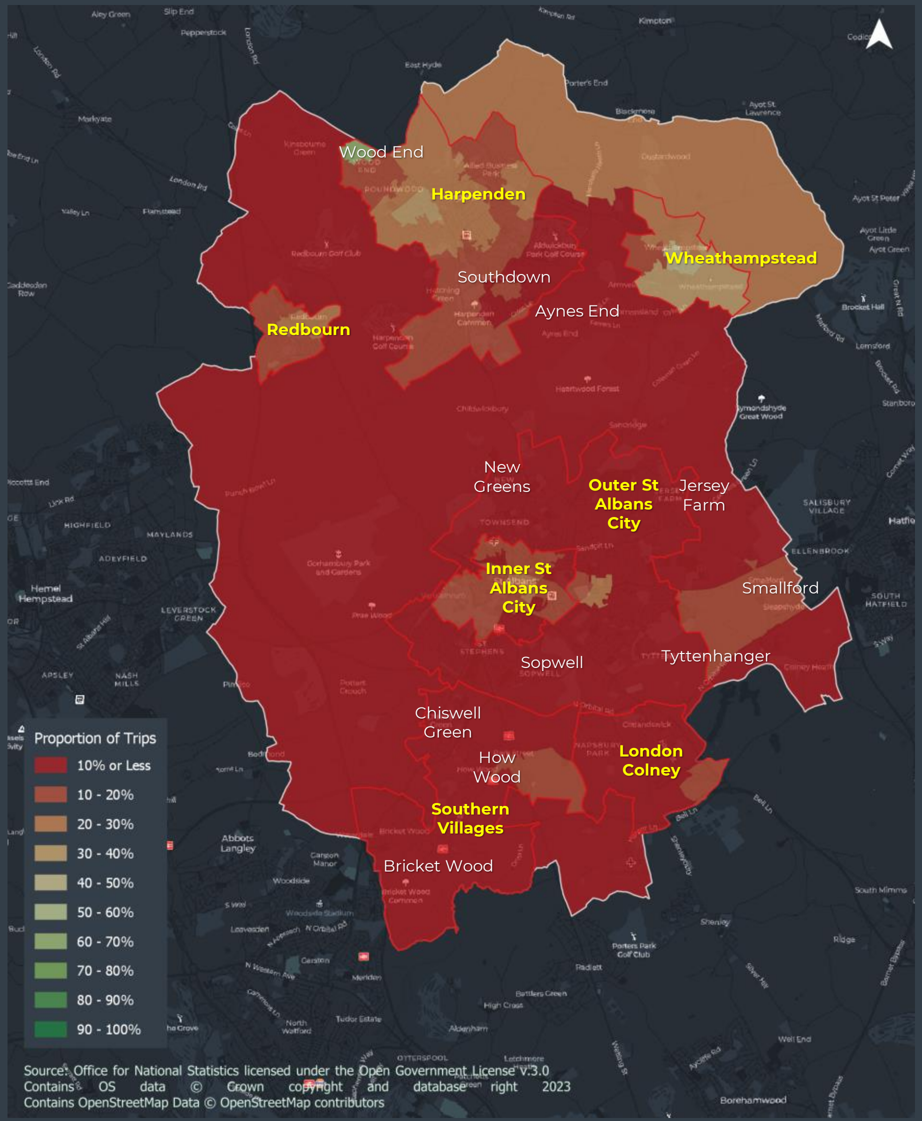
Propensity to cycle varies across St Albans district, including the characteristics of the residents and the local infrastructure. The Inner St Albans City has a higher-than-average propensity to cycle. These areas may have a higher proportion of residents who prioritise active lifestyles, prefer cycling, or find it a convenient means of getting around.

We calculated that:

- Up to 17% of existing car trips across the St Albans district have the potential to switch to cycling.
- Inner St Albans City has the highest potential - up to 24% of existing car trips have the potential to switch to cycling, followed by Outer St Albans City (up to 21%), Wheathampstead (up to 20%), Redbourn and Southern Villages (both up to 14%), Harpenden (up to 13%) and London Colney (up to 12%).

PUBLIC TRANSPORT POTENTIAL FOR EXISTING COMMUNITIES

Opportunity to use public transport



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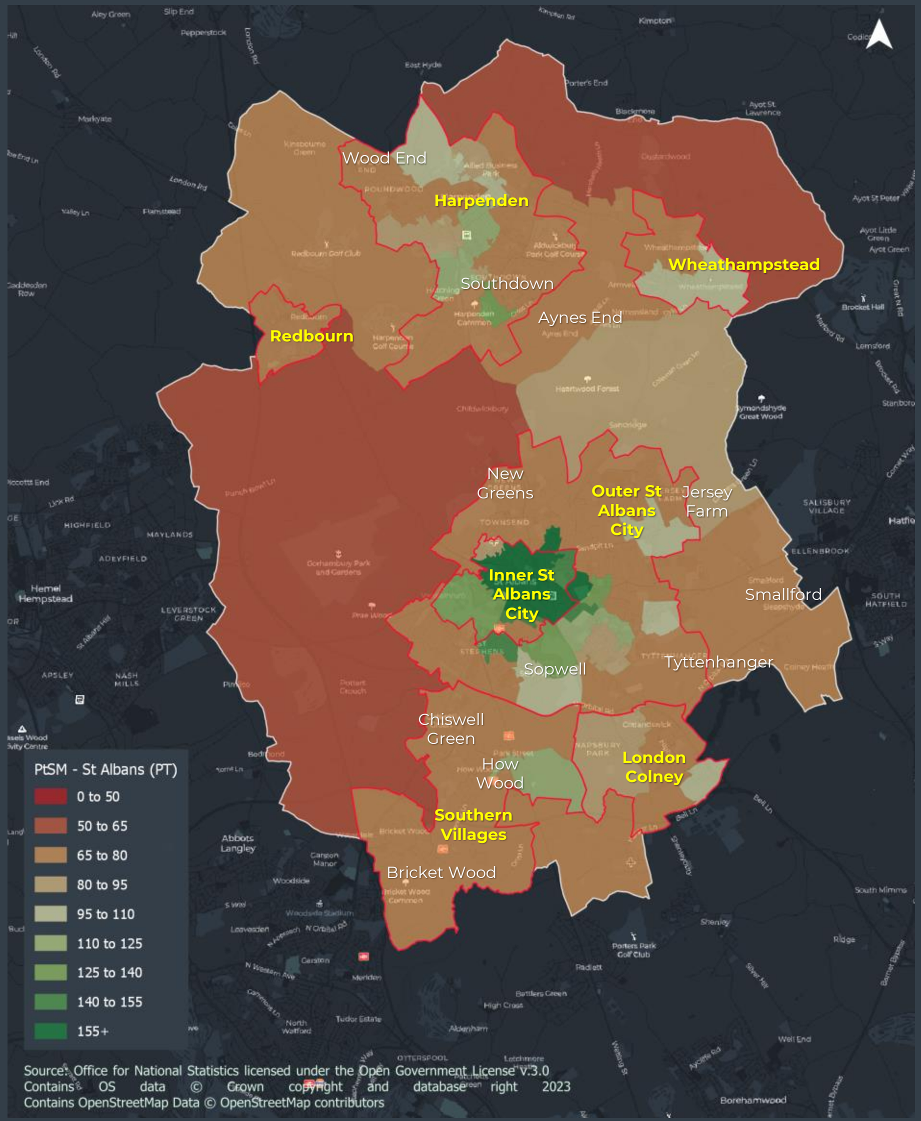
Propensity to use public transport



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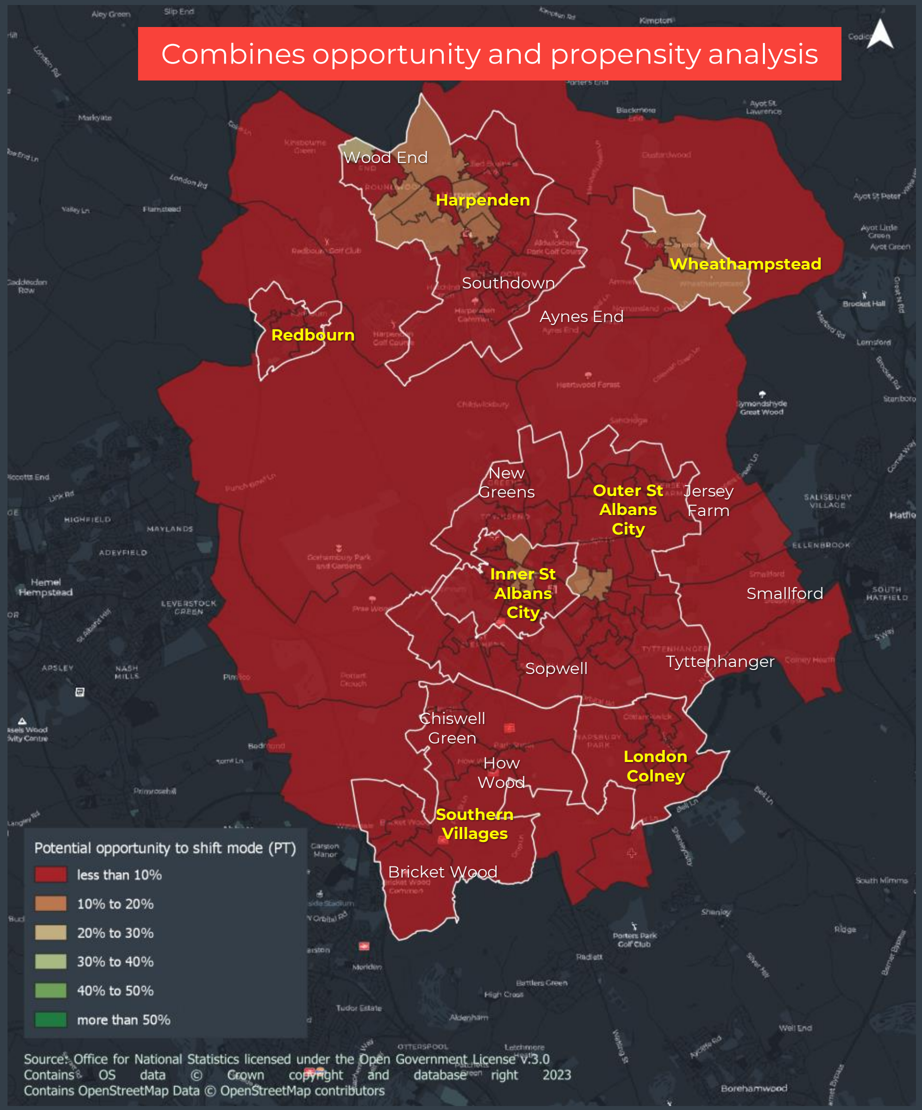
Public transport potential



We calculated that:

- Up to 6% of existing car trips across the St Albans district have the opportunity to switch to public transport.
- Harpenden has the highest opportunity - up to 13% of existing car trips have the opportunity to switch to public transport, followed by Wheathampstead (up to 8%), Inner St Albans City and Redbourn (both up to 7%), London Colney (up to 3%), Outer St Albans City (up to 2%) and Southern Villages (up to 1%).

What did we find:

Propensity to use public transport (which is an average of bus and rail) varies across St Albans district, including the characteristics of the residents and the local transport infrastructure. The Inner St Albans City have a higher-than-average propensity to use public transport. These areas may have a higher proportion of residents who prioritise sustainable transport methods due to personal preferences and/or environmental consciousness.

We calculated that:

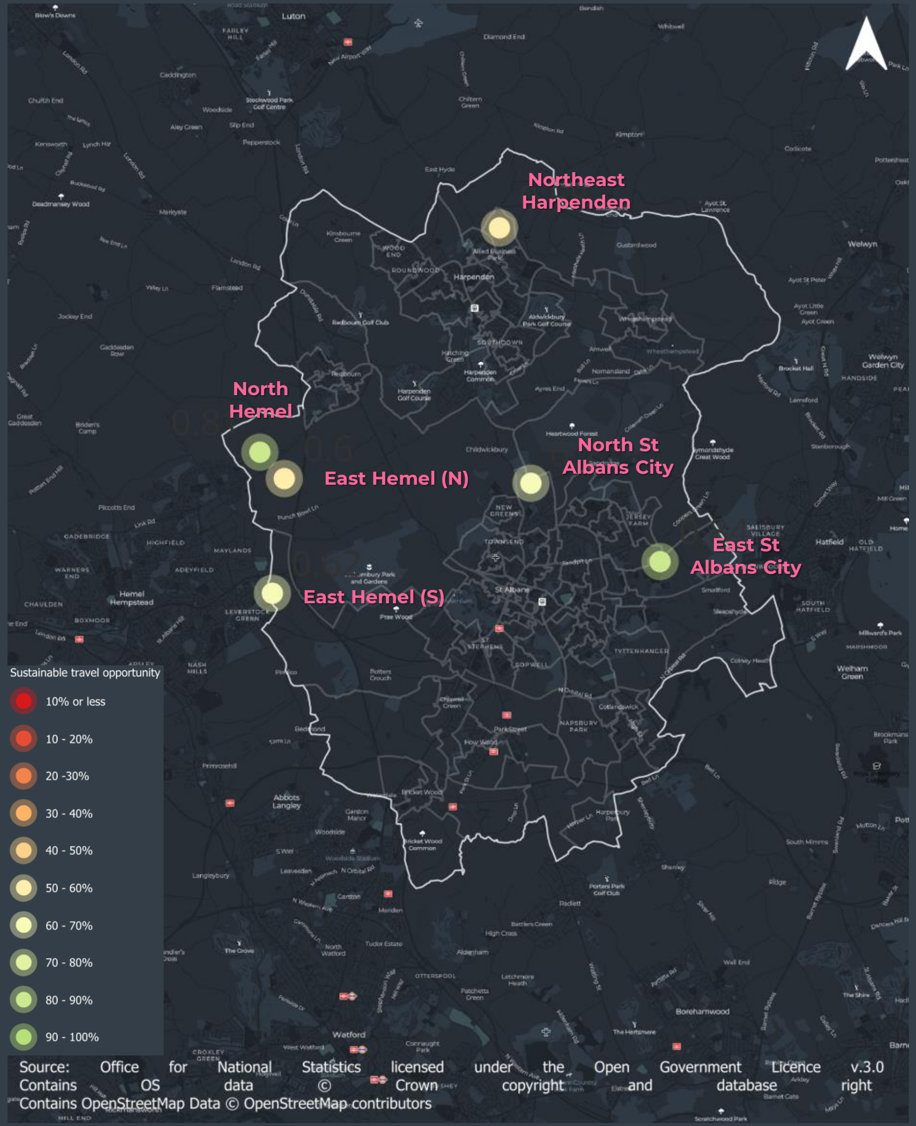
- Up to 3% of existing car trips across the St Albans district have the potential to switch to public transport.
- Harpenden has the highest opportunity - up to 13% of existing car trips have the opportunity to switch to public transport, followed by Inner St Albans City (up to 5%), Wheathampstead (up to 4%), Redbourn (up to 3%) and Outer St Albans City, Southern Villages and London Colney (all up to 1%).

EXECUTIVE SUMMARY

Sustainable travel potential for new developments

SUSTAINABLE TRAVEL POTENTIAL FOR NEW DEVELOPMENTS

Sustainable travel opportunity



We calculated that:

- Up to 65% of modelled car trips across the assessed development zones in St Albans district have the opportunity to switch to sustainable modes.
- East St Albans City has the highest opportunity - up to 84% of modelled car trips have the opportunity to switch, followed by North Hemel (up to 81%), North St Albans City (up to 70%), East Hemel (S) (up to 62%), East Hemel (N) (up to 60%) and Northeast Harpenden (up to 58%).

X

Sustainable travel propensity

	Mosaic Group	New developments
B	Prestige Positions	**10%**
G	Domestic Success	**60%**
H	Aspiring Homemakers	**15%**
O	Rental Hubs	**15%**

What did we find:

Based on expected socio-demographics of the St Albans district development zones, new residents will have below average propensities for walking, cycling, bus and rail but above average propensity to drive. The Mosaic profile is based on the existing development of Oaklands in St Albans district, proposed housing types (e.g. affordable, social and rental) and validated using similar developments in the wider region. These propensities could change if sustainable travel provision is improved.

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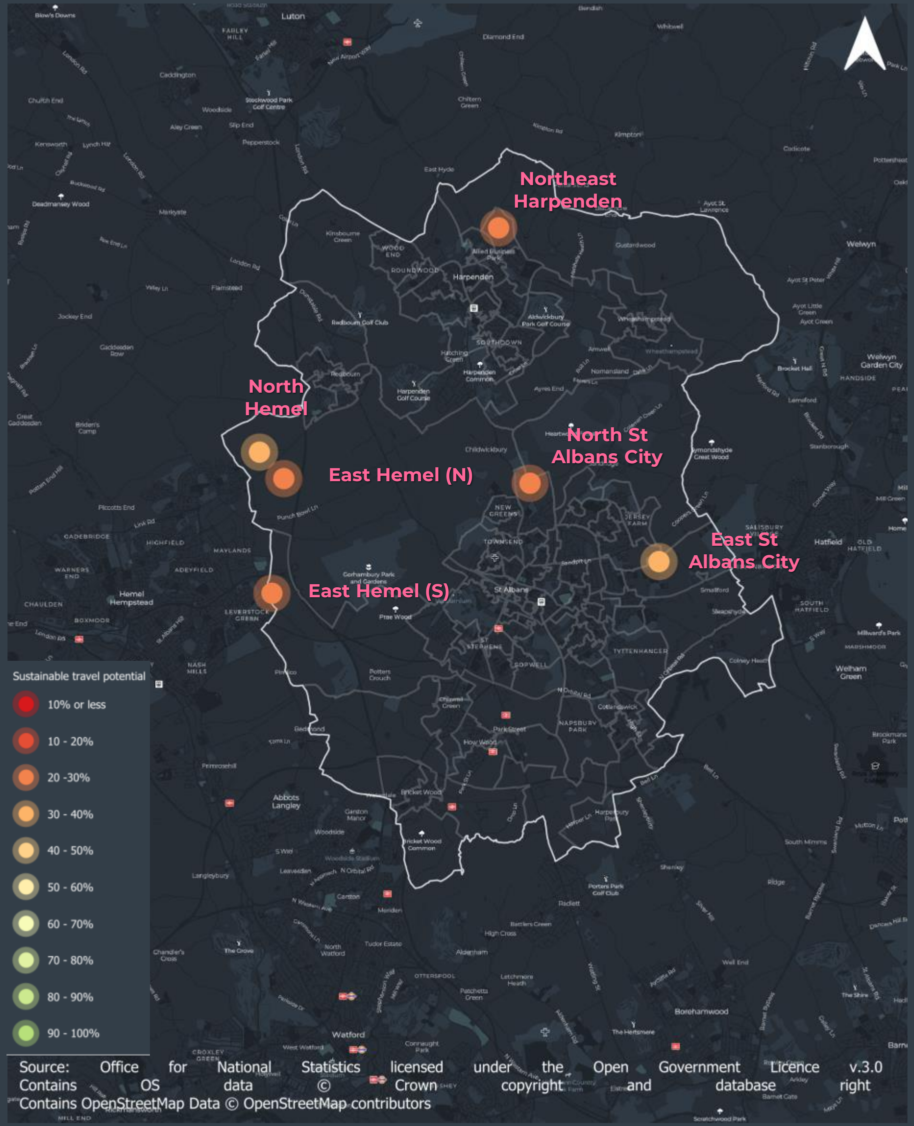
Sustainable travel potential

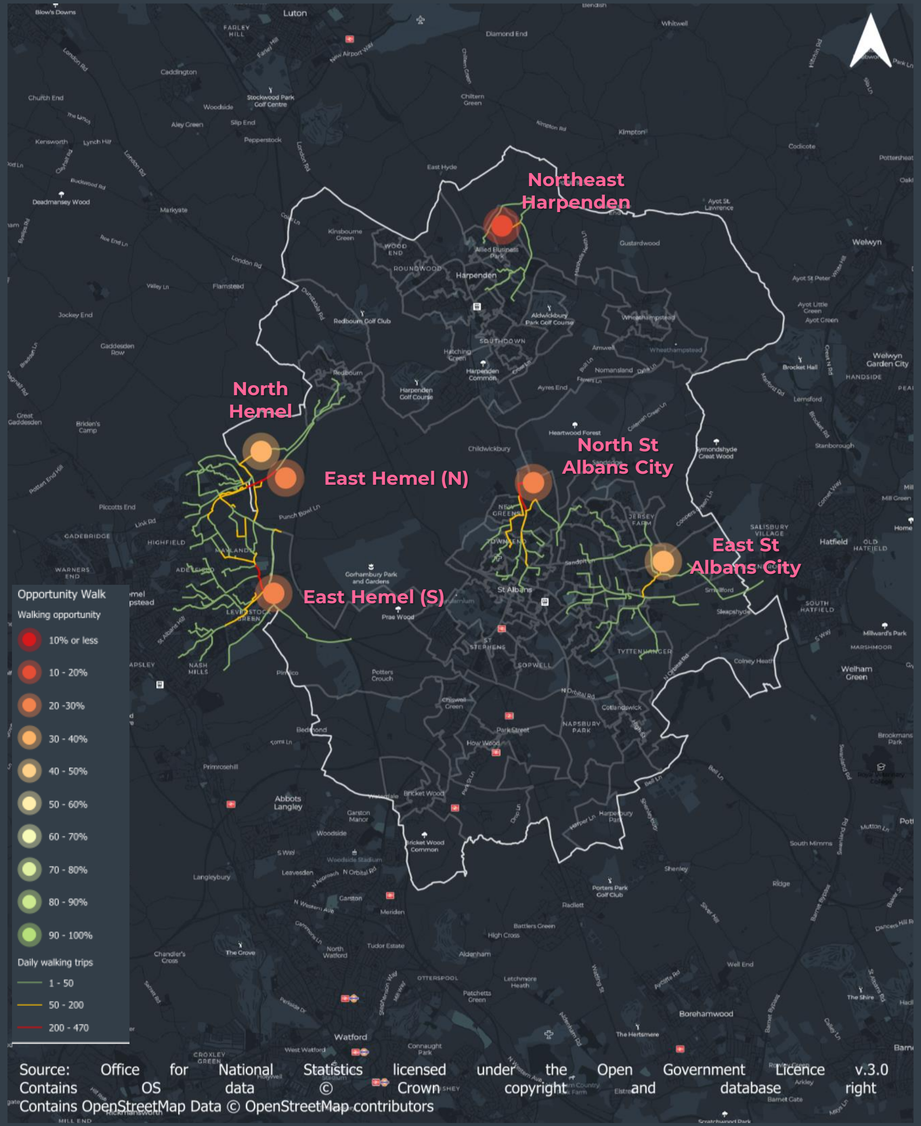


We calculated that:

- Up to 27% of modelled car trips across the assessed development zones in St Albans district have the potential to switch to sustainable modes.
- East St Albans City has the highest potential - up to 34% of modelled car trips have the potential to switch, followed by North Hemel (up to 32%), North St Albans City and East Hemel (N) (both up to 28%), East Hemel (S) (up to 25%) and Northeast Harpenden (up to 23%).

Walking potential FOR NEW DEVELOPMENTS

Opportunity to walk



We calculated that:

- Up to 27% of modelled car trips across the assessed development zones in St Albans district have the opportunity to switch to walking.
- North Hemel has the highest opportunity - up to 35% of modelled car trips have the opportunity to switch, followed by East St Albans City (up to 32%), East Hemel (S) (up to 30%), North St Albans City (up to 27%), East Hemel (N) (up to 25%) and Northeast Harpenden (up to 18%).

Propensity to walk

Mosaic Group		New developments
B	Prestige Positions	10%
G	Domestic Success	60%
H	Aspiring Homemakers	15%
O	Rental Hubs	15%

X

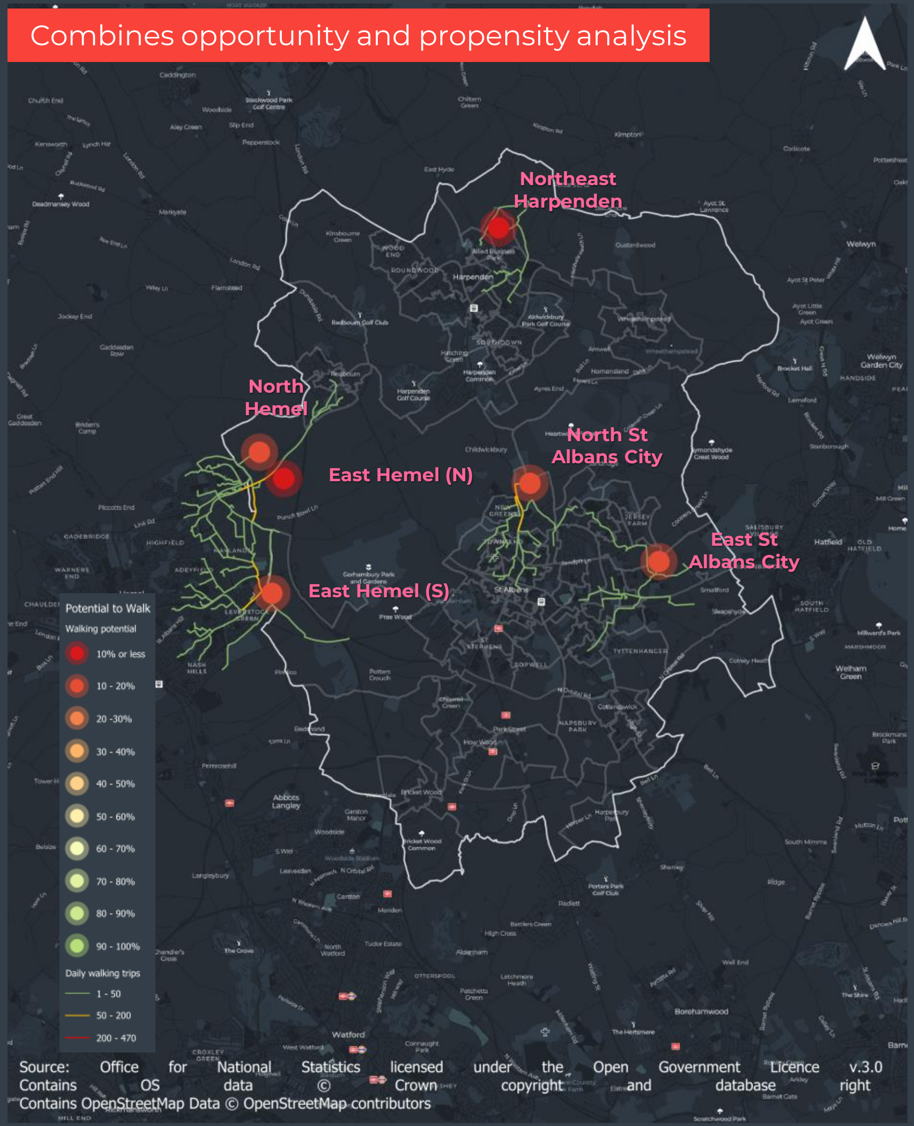
	Propensity
Walk	80

=

What did we find:

Propensity to walk in the new developments is lower than the England average due to the projected high proportion of the Domestic success mosaic group, who are more likely to be car dependant as they have larger dwellings and higher levels of car ownership. It is worth noting that these propensities could change if walking provision is improved.

Walking potential

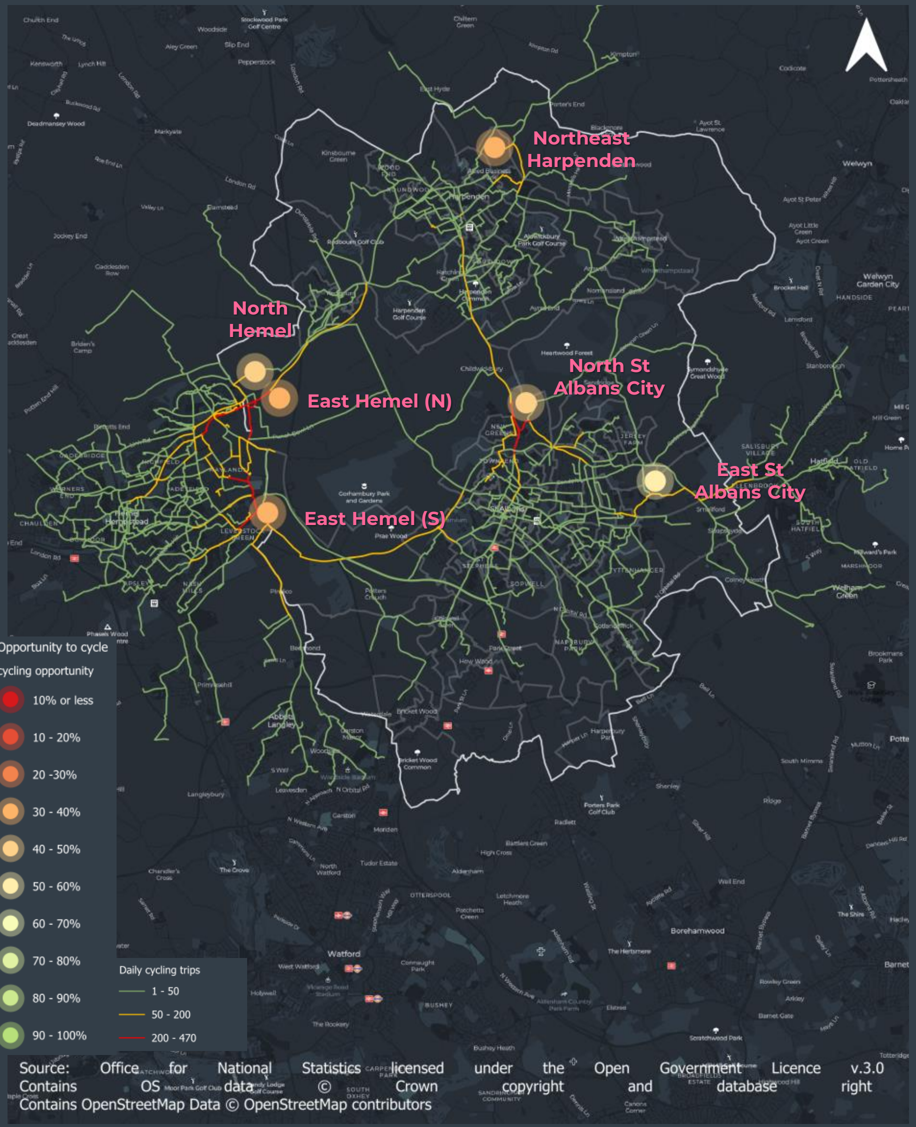


We calculated that:

- Up to 11% of modelled car trips across the assessed development zones in St Albans district have the potential to switch to walking
- North Hemel has the highest potential - up to 14% of modelled car trips have the opportunity to switch, followed by East St Albans City (up to 13%), East Hemel (S) (up to 12%), North St Albans City (up to 11%), East Hemel (N) (up to 10%) and Northeast Harpenden (up to 7%).

CYCLING POTENTIAL FOR NEW DEVELOPMENTS

Opportunity to cycle



Propensity to cycle

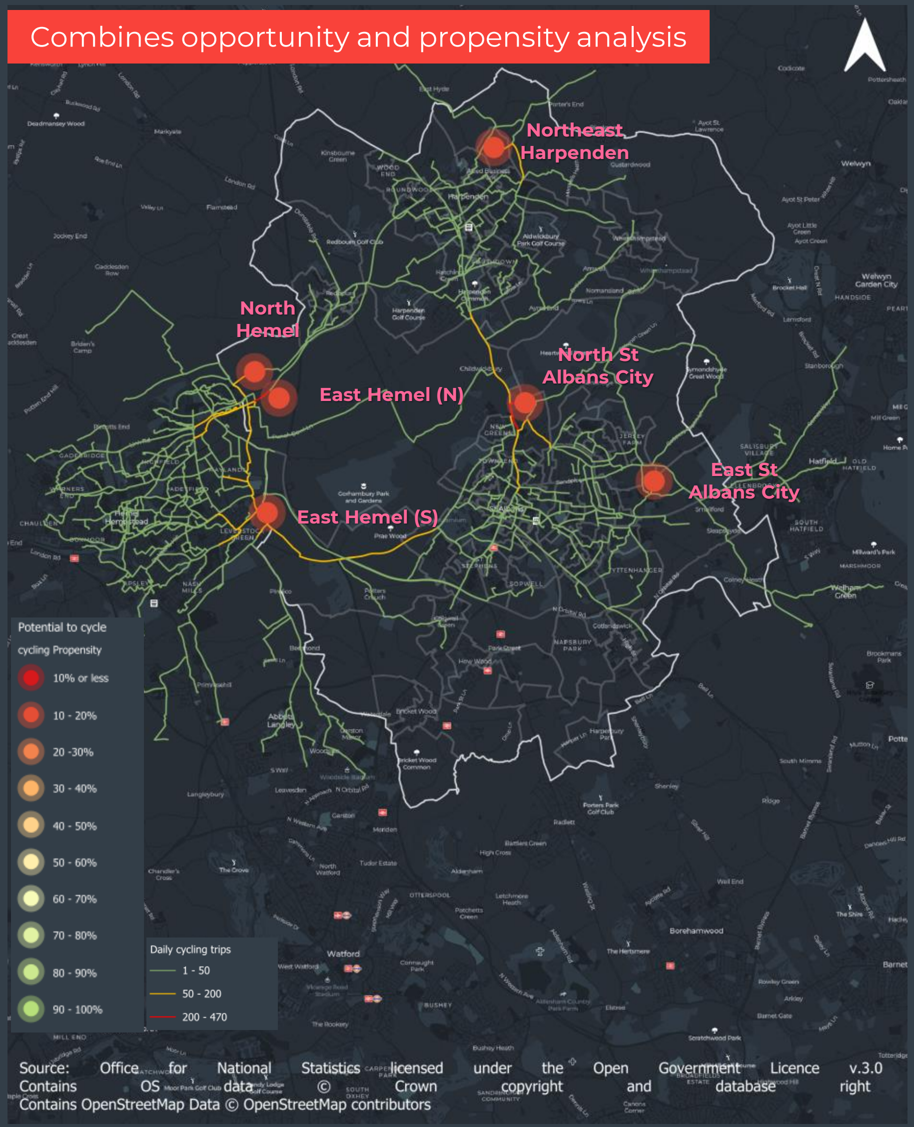
X

	Mosaic Group	New developments
B	Prestige Positions	10%
G	Domestic Success	60%
H	Aspiring Homemakers	15%
O	Rental Hubs	15%

	Propensity
Cycle	80

=

Cycling potential



We calculated that:

- Up to 40% of modelled car trips across the assessed development zones in St Albans district have the opportunity to switch to cycling.
- East St Albans City has the highest opportunity - up to 63% of modelled car trips have the opportunity to switch, followed by North Hemel (up to 60%), Northeast Harpenden (up to 45%), North St Albans City (up to 42%), East Hemel (N) (up to 41%) and East Hemel (S) (up to 32%).

What did we find:

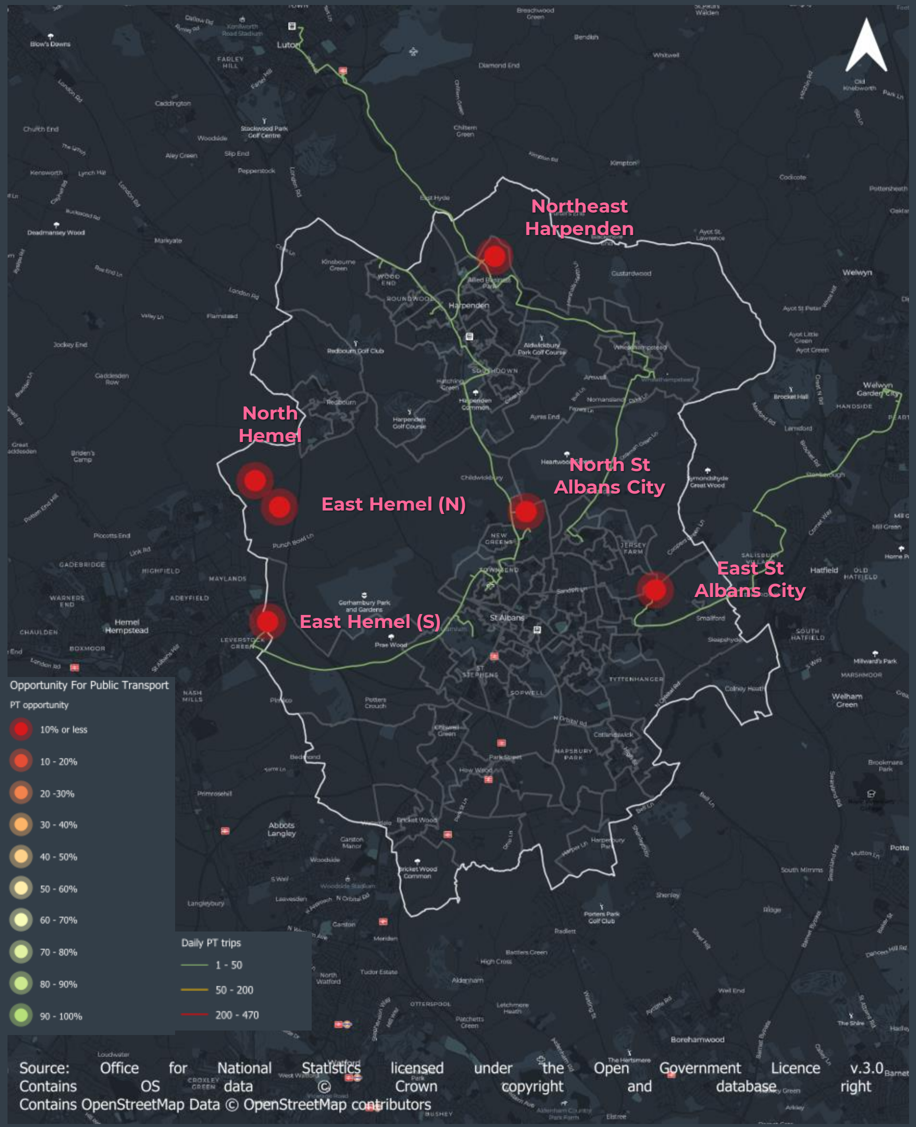
Propensity to cycle in the new developments is lower than the England average due to the projected high percentage of the Domestic success mosaic group, who are more likely to be car dependant as they have larger dwellings and higher levels of car ownership. It is worth noting that these propensities could change if cycling provision is improved.

We calculated that:

- Up to 16% of modelled car trips across the assessed development zones in St Albans district have the potential to switch to cycling.
- East St Albans City has the highest opportunity - up to 25% of modelled car trips have the opportunity to switch, followed by North Hemel (up to 24%), Northeast Harpenden (up to 18%), North St Albans City (up to 17%), East Hemel (N) (up to 15%) and East Hemel (S) (up to 13%).

PUBLIC TRANSPORT POTENTIAL FOR NEW DEVELOPMENTS

Opportunity to use public transport



We calculated that:

- Less than 1% of modelled car trips across the assessed development zones in St Albans district have the opportunity to switch to public transport.
- Most of the new development zones have less than 1% opportunity, only East St Albans City (up to 2%) and Northeast Harpenden (up to 6%) has more.
- This is based on existing public transport provision.

Propensity to use public transport

	Mosaic Group	New developments
B	Prestige Positions	10%
G	Domestic Success	60%
H	Aspiring Homemakers	15%
O	Rental Hubs	15%

X

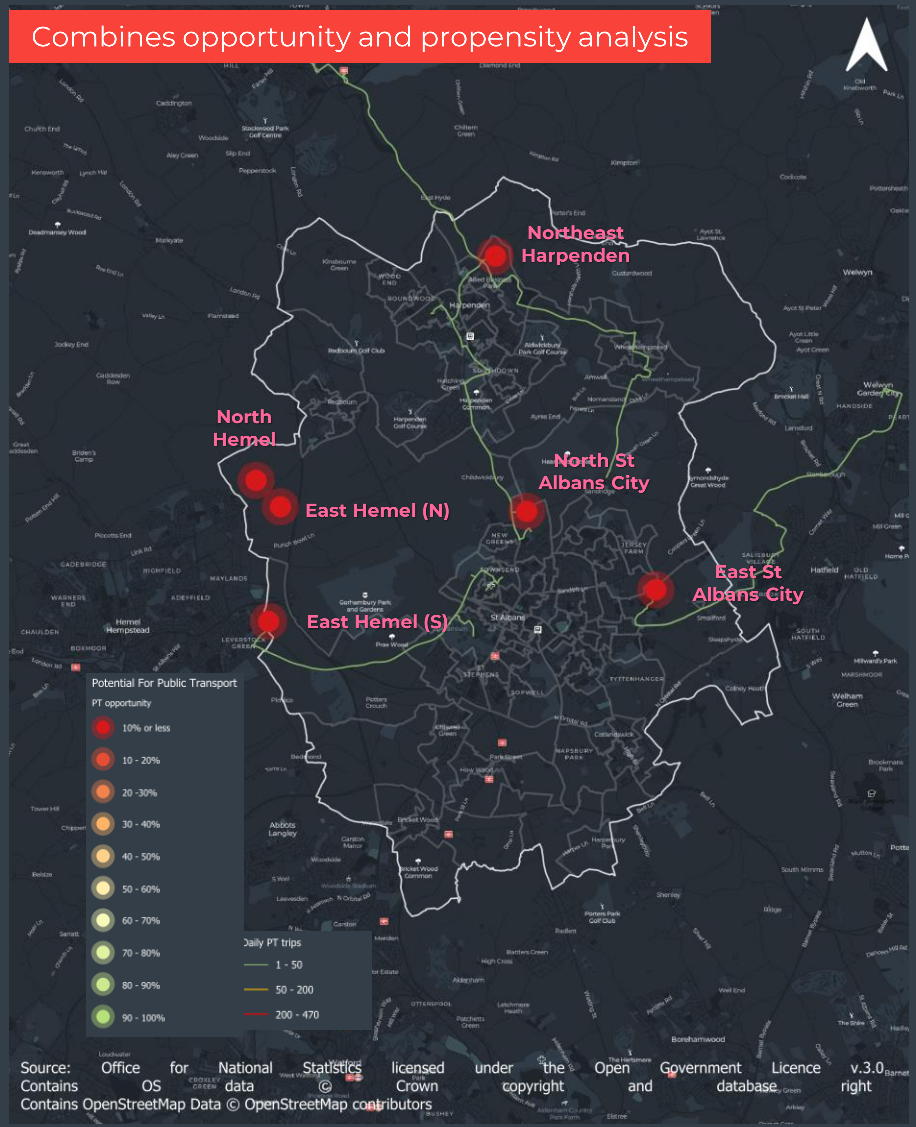
	Propensity
Bus	72
Rail	87

=

What did we find:

Propensity to use public transport (which is an average of bus and rail) in the new developments is lower than the England average due to the projected high percentage of the Domestic success mosaic and preference to use personal vehicles over public transport due to their higher levels of car ownership. It is worth noting that these propensities could change if public transport provision is improved.

Public transport potential



We calculated that:

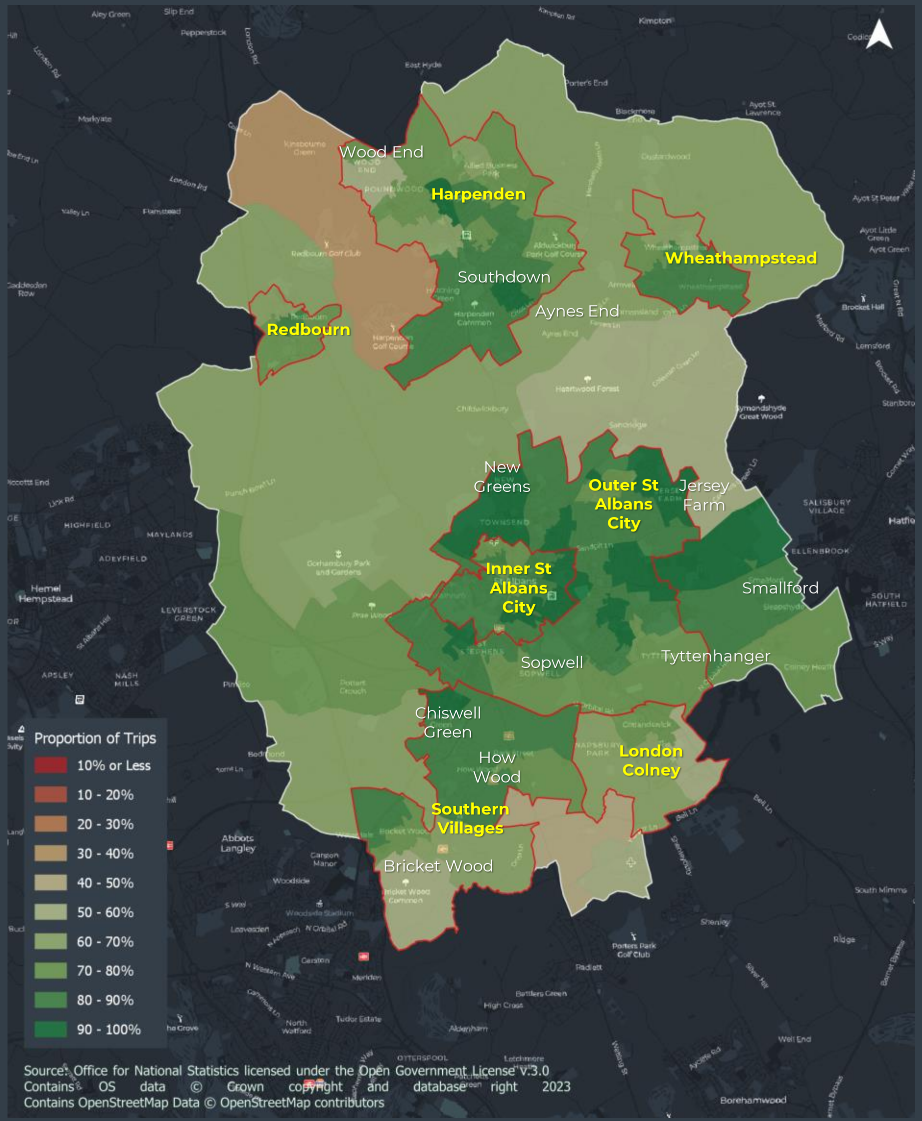
- Less than 1% of modelled car trips across the assessed development zones in St Albans district have the potential to switch to public transport.
- Most of the new development zones have less than 1% potential, only East St Albans City (up to 1%) and Northeast Harpenden (up to 2%) has more.
- This is a worst-case scenario as it assumes that the developments have no new public transport provision.

PART 1

Sustainable travel potential for existing communities

SUSTAINABLE TRAVEL POTENTIAL FOR EXISTING COMMUNITIES

Sustainable travel opportunity

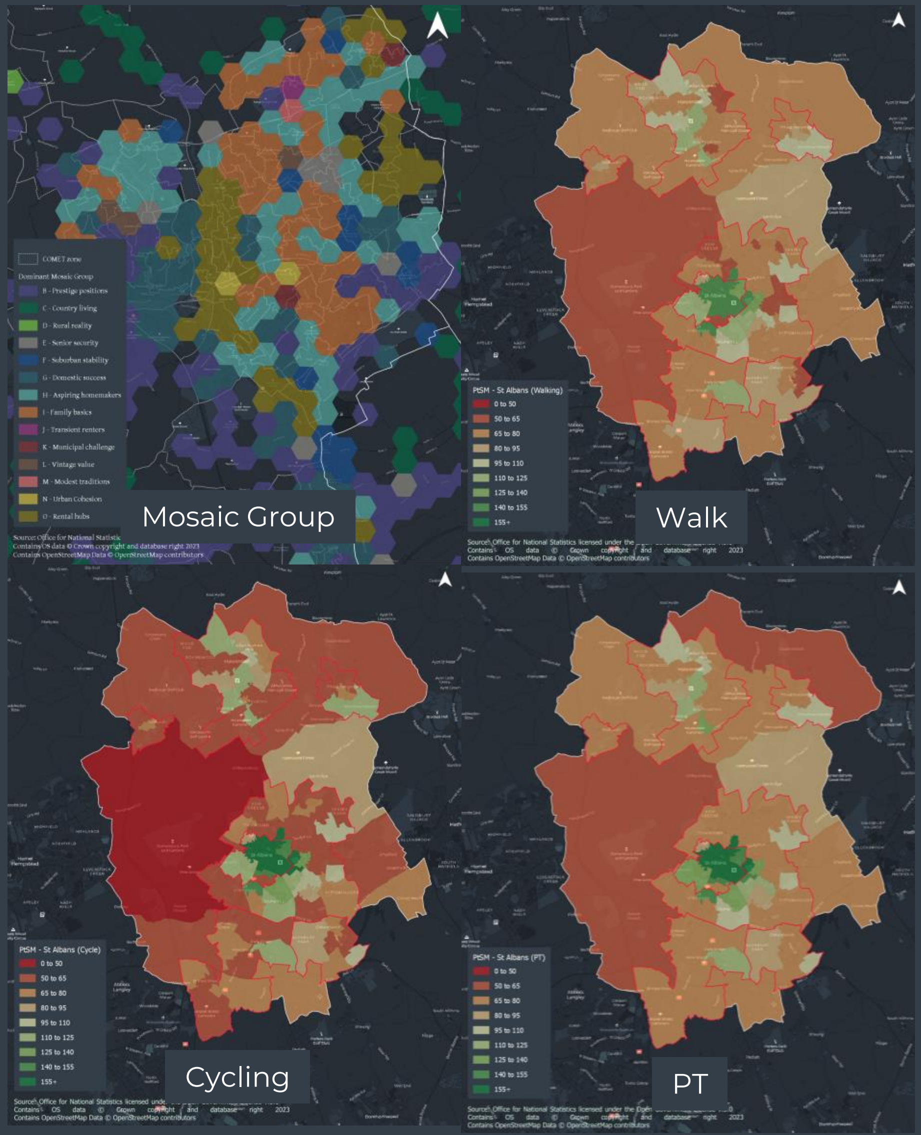


We calculated that:

- Up to 68% of existing car trips across the St Albans district have the opportunity to switch to sustainable modes.
- Outer St Albans City has the highest opportunity - up to 79% of existing car trips have the opportunity to switch, followed by Inner St Albans City (up to 68%), Harpenden (up to 67%), Wheathampstead (up to 66%), Southern Villages (up to 63%), Redbourn (up to 62%) and London Colney (up to 54%).

X

Sustainable travel propensity



What did we find:

Based on existing socio-demographics, existing St Albans district residents have below average propensities for walking, cycling and bus but above average propensity to use rail and drive. However, Inner St Albans City residents have a high propensity for using sustainable modes. As new development areas are developed, the propensity to use sustainable modes could increase with new residents.

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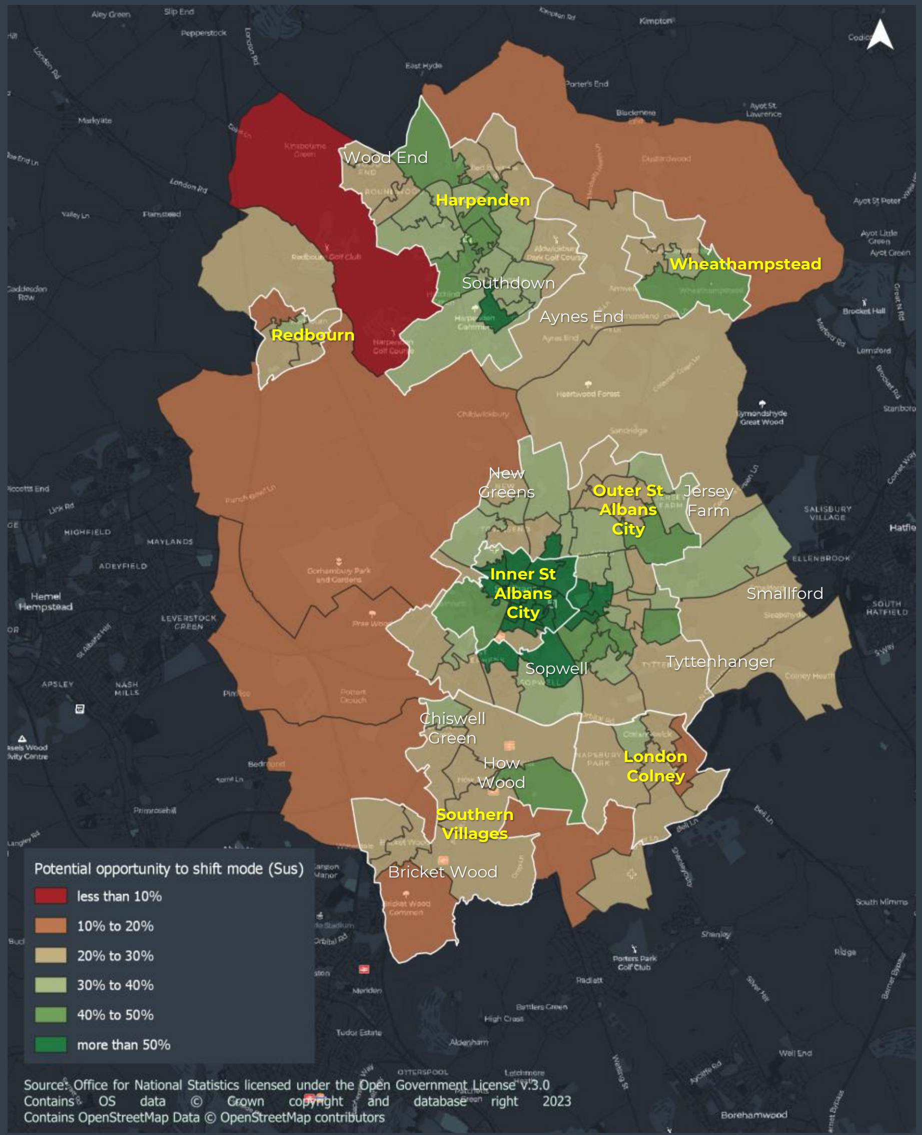
Sustainable travel potential



We calculated that:

- Up to 32% of existing car trips across the St Albans district have the potential to switch to sustainable modes.
- Inner St Albans City has the highest potential - up to 47% of existing car trips have the potential to switch, followed by Outer St Albans City (up to 33%), Harpenden (up to 30%), Wheathampstead (up to 27%), Southern Villages (up to 24%), London Colney (up to 22%) and Redbourn (up to 21%).

PART 1A

Sustainable travel opportunity for existing communities

Sustainable travel opportunity

How many car trips in St Albans district could be made by sustainable modes?

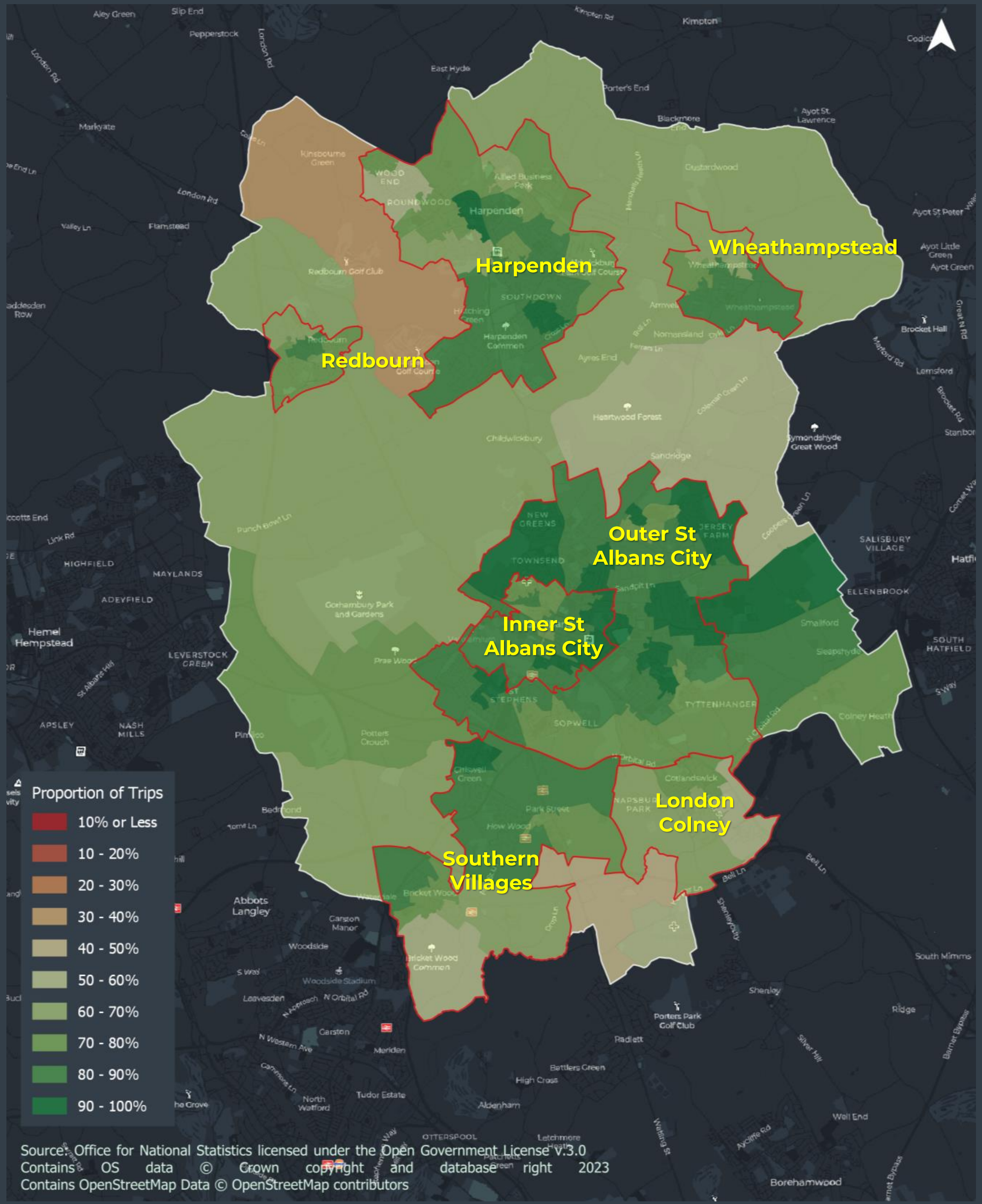
Figure 1.1 shows where in St Albans district there is the largest opportunity for sustainable travel (high scenario), such as Harpenden and Inner / Outer St Albans City and where there may be slightly less opportunity for sustainable travel, such as Redbourn, London Colney and more rural areas. A high and lower scenarios for sustainable travel opportunity have been estimated based on distance and time (see methodology note).

Key findings include:

- 48-68% of existing car trips in St Albans district have the opportunity to shift to sustainable modes. Cycling provides the highest opportunity with 27-37% of car trips able to switch to cycling. 10-35% of car trips could switch to walking and 1-6% to public transport.
- Outer St Albans City has the highest opportunity for car trips to shift to sustainable modes, with 64-79% of trips able to shift.
- Inner St Albans City has the second highest opportunity, with 51-68% of car trips able to shift to sustainable modes. Harpenden has the third highest opportunity with 44-67%
- The more rural areas have a lower sustainable travel opportunity. Wheathampstead has 22-66%, Southern Villages has 38-63%, London Colney has 33-54% and Redbourn has 22-62%.

The following pages break down the sustainable travel opportunity for each existing community by high and lower sustainable travel opportunity scenarios (trips and vehicle kilometres travelled (VKT)).

Figure 1.1 Sustainable travel opportunity in St Albans district (high scenario)



SUSTAINABLE TRAVEL OPPORTUNITY

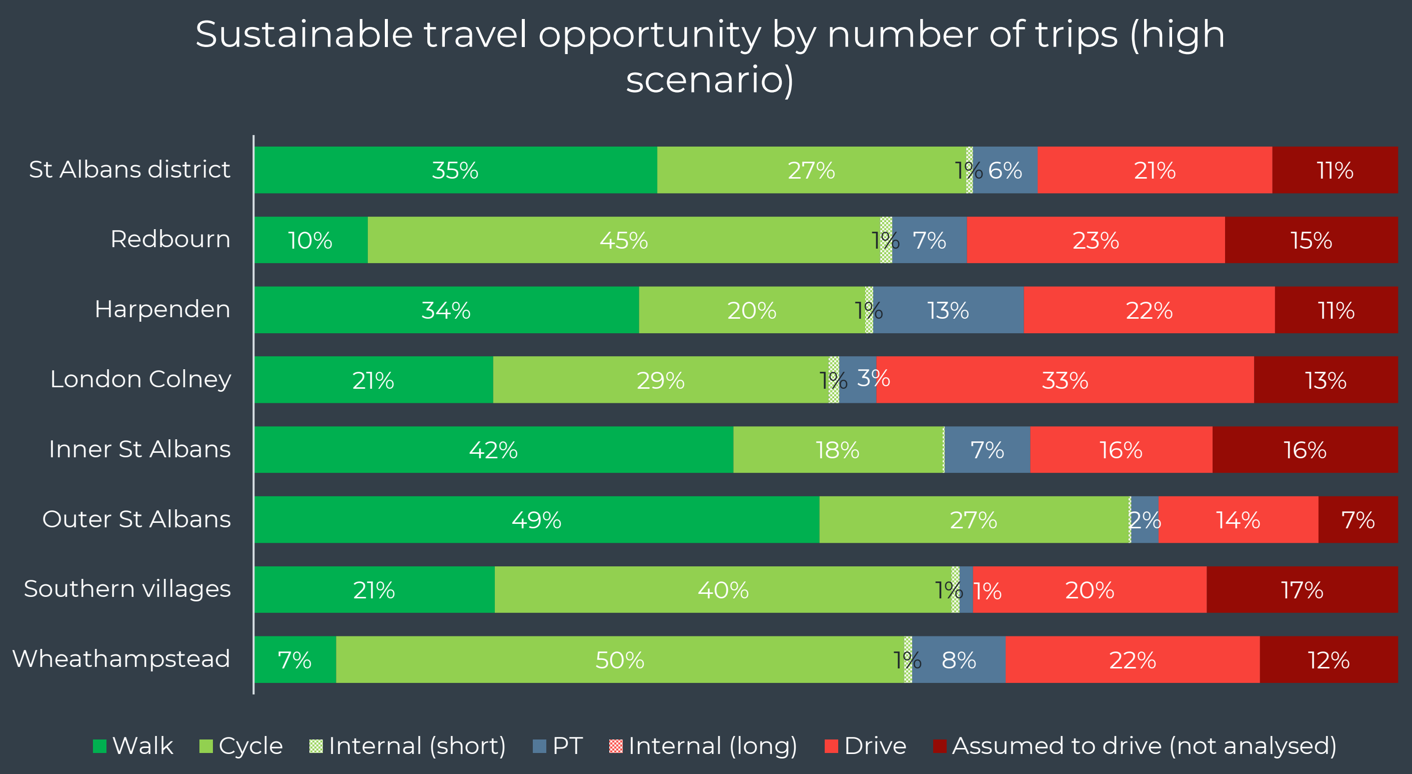
How many car trips in St Albans district could be made by sustainable modes?

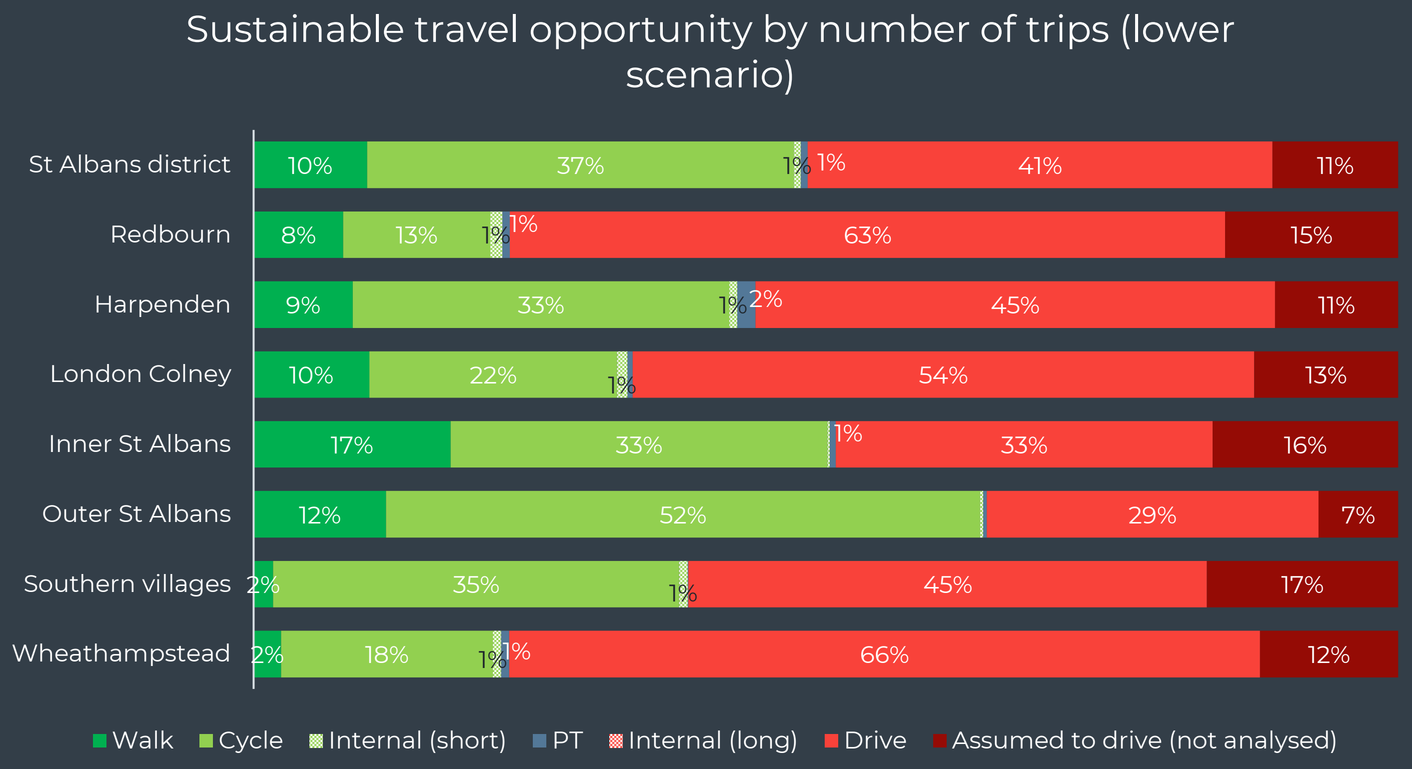
Figure 1.2 shows sustainable travel opportunity by trips (high and lower scenarios) for St Albans district as a whole and the existing communities of Redbourn, Harpenden, London Colney, Inner St Albans City, Outer St Albans City, Southern villages and Wheathampstead. These areas are aligned to COMET zones and the trips are based on the 2031 COMET O-D matrix which includes assumed future growth and development, but with the existing active travel and public transport networks. The intention is to provide a baseline on the number of future trips that could be made by walking, cycling and public transport – in the absence of any new transport network improvements.

- **St Albans district** – opportunity is between 49-68%, with walking being 10-35%, cycling 27-37% and public transport 1-6%. This results in 32-52% of car trips that could not switch (including not analysed trips assumed to be driven).
- **Inner St Albans City** – opportunity is between 51-67%, with walking being 17-42%, cycling 18-33% and public transport being 1-7%. This results in 32-49% of car trips that could not switch (including not analysed trips assumed to be driven).
- **Outer St Albans City** – opportunity is between 64-78%, with walking being 12-49%, cycling 27-52% and public transport being 0-2%. About 21-36% of car trips that could not switch (including not analysed trips assumed to be driven).

Outer St Albans City has a higher opportunity than Inner St Albans City because Outer St Albans City has a higher proportion of shorter trips than Inner St Albans City (54% of trips from Inner are considered 'short', whereas 65% of trips from Outer are considered short) and more densely modelled urban areas are within the cycle range for the outer regions of St Albans (e.g. Hatfield).

Figure 1.2 Mode shift split (trips) by community (high scenario is top and lower scenario is bottom)





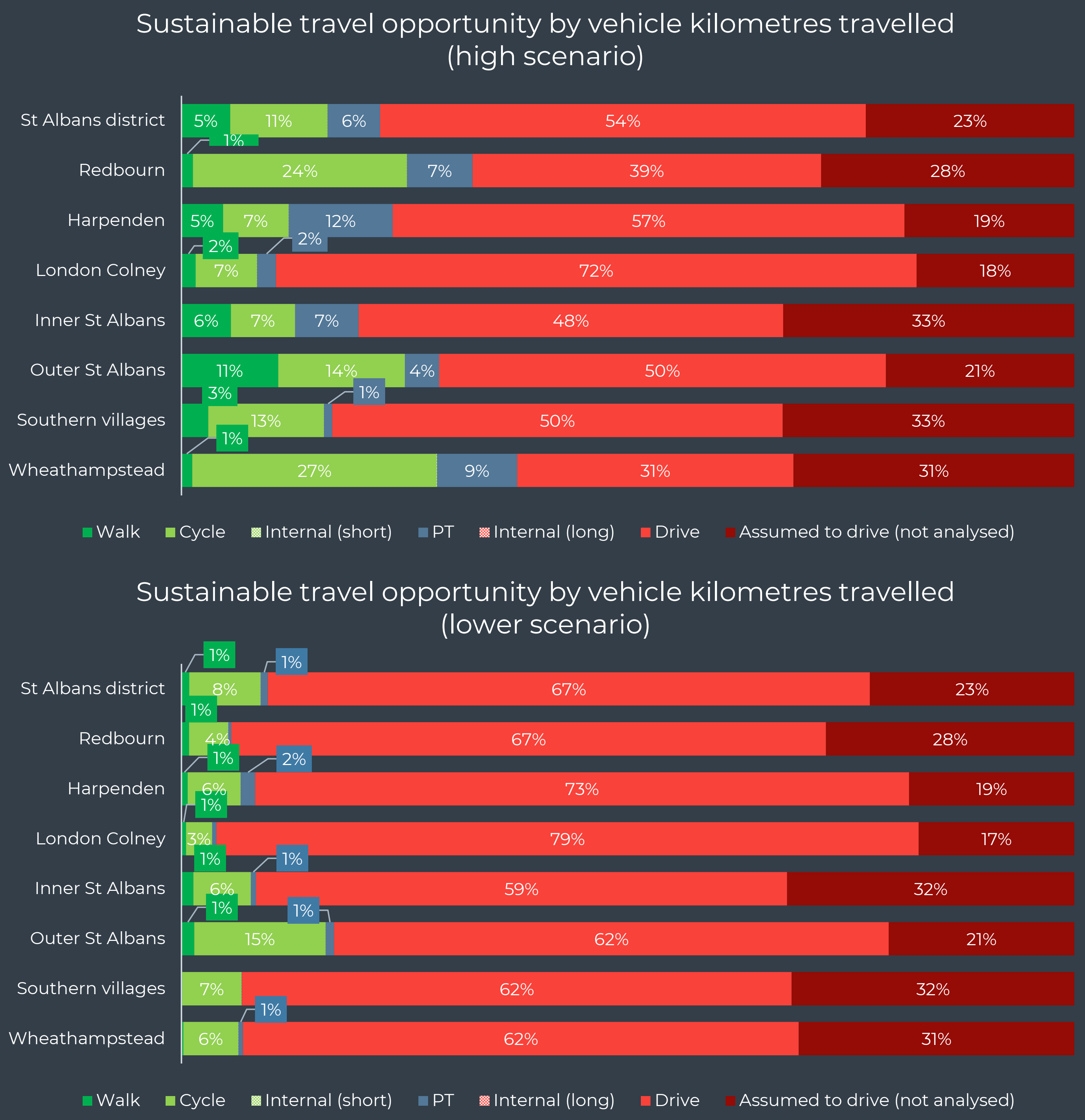
Sustainable travel opportunity

What is the sustainable travel opportunity by vehicle kilometres travelled (VKT)?

Figure 1.3 shows high and lower sustainable travel opportunity based on distance travelled. VKT (or people km) is important to consider as it highlights longer distance journeys, which typically have fewer trips, but can have a large effect on carbon emissions.

- **St Albans district** – opportunity is between 10-22%, with walking being 1-5%, cycling 8-11% and public transport being 1-6%. This results in 78-90% of car kilometres that would need to be driven (including not analysed trips assumed to be driven).
- **Inner St Albans City** – opportunity is between 8-20%, with walking being 1-6%, cycling 6-7% and public transport being 1-7%. This results in 80-92% of car kilometres that would need to be driven (including not analysed trips assumed to be driven).
- **Outer St Albans City** – opportunity is between 17-29%, with walking being 1-11%, cycling 14-15% and public transport being 1-4%. About 71-83% of car kilometres will need to be driven (including not analysed trips assumed to be driven).
- **Other communities** – highest opportunity is in Wheathampstead (7-38%), followed by Redbourn (6-33%), Harpenden (8-24%), Southern Villages (7-17%) and London Colney (4-11%).

Figure 1.3 Mode shift split (VKT) by community (high scenario is top and lower scenario is bottom)



Sustainable travel opportunity

Walking, cycling and public transport opportunity in St Albans district

Figure 1.4 shows the number of trips that could be walked, cycled or taken by public transport while Figure 1.6, 1.7 and 1.8 shows the proportion of trips that could be taken by each mode across the district.

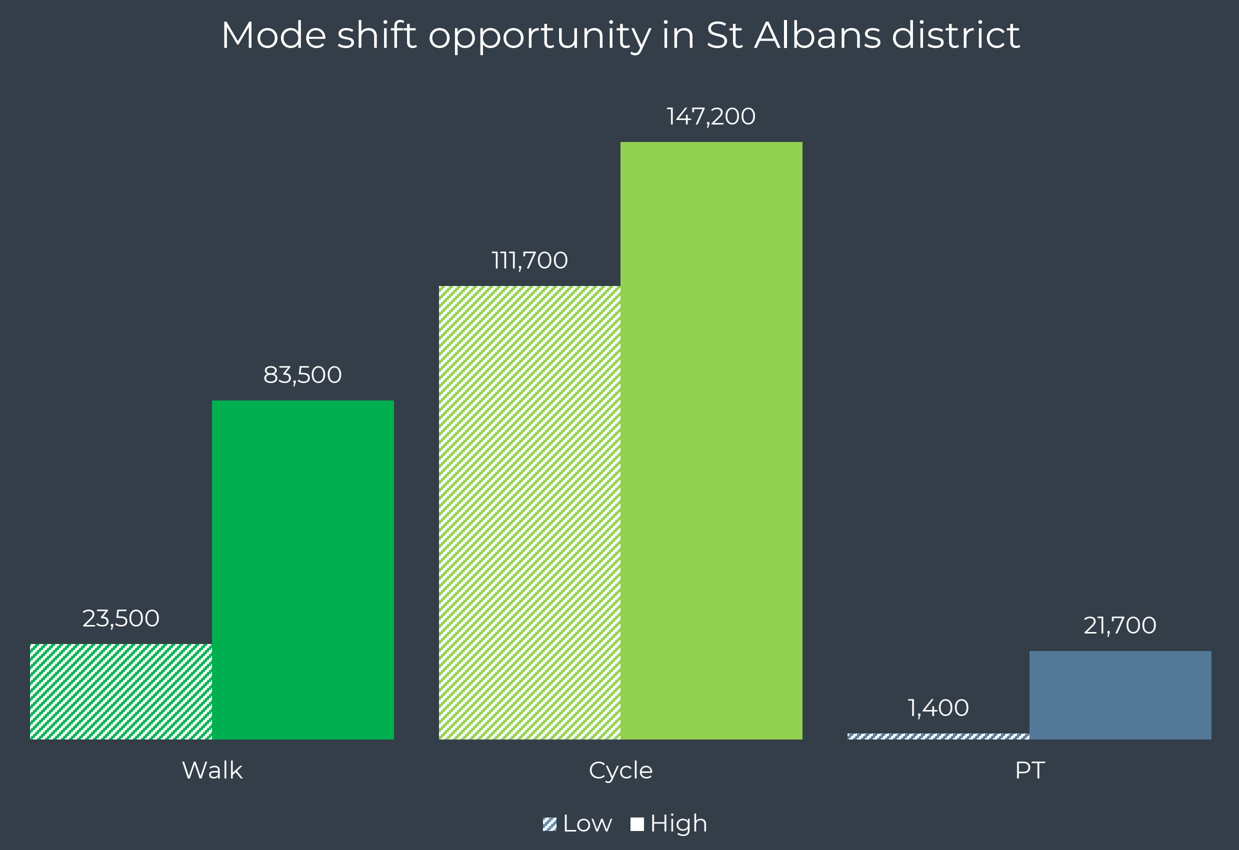
Key findings include:

- Cycling presents the greatest opportunity for mode shift with a range of 111,700 – 147,200 car trips able to be cycled across the district. Generally, cycling opportunity is evenly distributed across the district, though Outer St Albans City sees the largest opportunity with 51,000 – 61,400 cyclable trips.
- Walking opportunity is concentrated more towards the urban areas (such as St Albans and Harpenden), where journeys are likely to be of a smaller distance to nearby zones, with a range of 23,500 – 83,500 trips able to be walked.
- The sustainable travel opportunity for public transport is relatively low across the district, with a range of only 1,400 – 21,700 trips. Most of the study zones show less than 10% opportunity, with zones in Harpenden showing a marginally higher opportunity of 10-20% in comparison with other zones. This is likely to be capturing journeys to nearby Luton.

Figure 1.5 (overleaf) shows the number of trips able to be walked, cycled or taken by public transport across the communities in St Albans district.

A full breakdown of sustainable travel opportunity figures can be found in Appendix A and a detailed list of range of trips with the opportunity to shift by mode table can be found in Appendix B (Table B1).

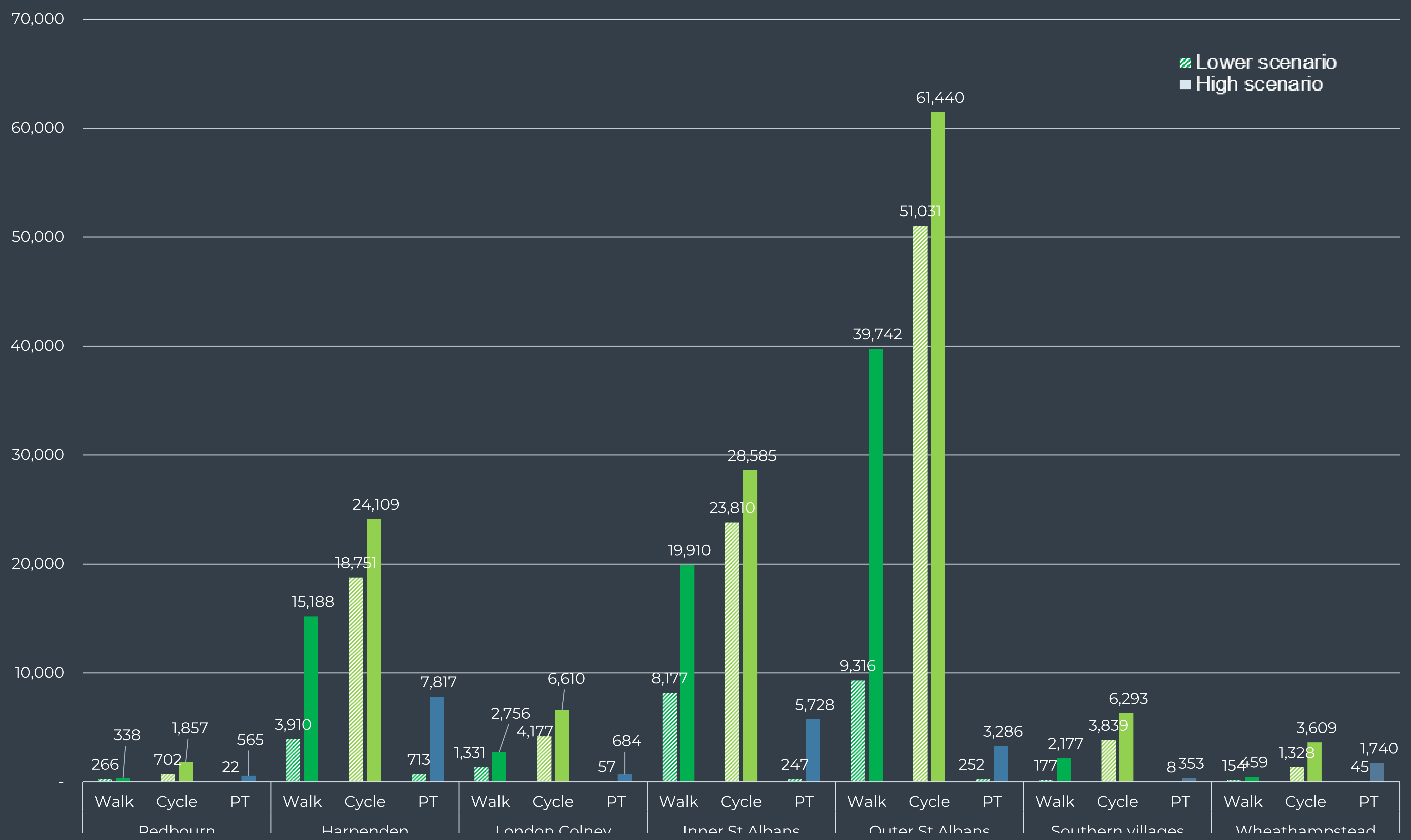
Figure 1.4 Range of trips with the opportunity to shift by mode (St Albans)



	Walking opportunity		Cycling opportunity		PT opportunity
	Main mode	First and last mile*	Main mode	First and last mile*	Main mode
Daily trips	23,500 - 83,500	1,400 – 21,700	111,700 – 147,200	1,400 – 21,700	1,400 – 21,700
Daily people km	27,300 - 169,400	27,400 – 240,200	279,500 – 506,800	27,400 – 240,200	25,000 – 237,400

* Linked to public transport trips

Figure 1.5 Mode shift split (trips) in existing communities under high and lower sustainable travel opportunity scenarios



Sustainable travel opportunity

Walking opportunity in St Albans

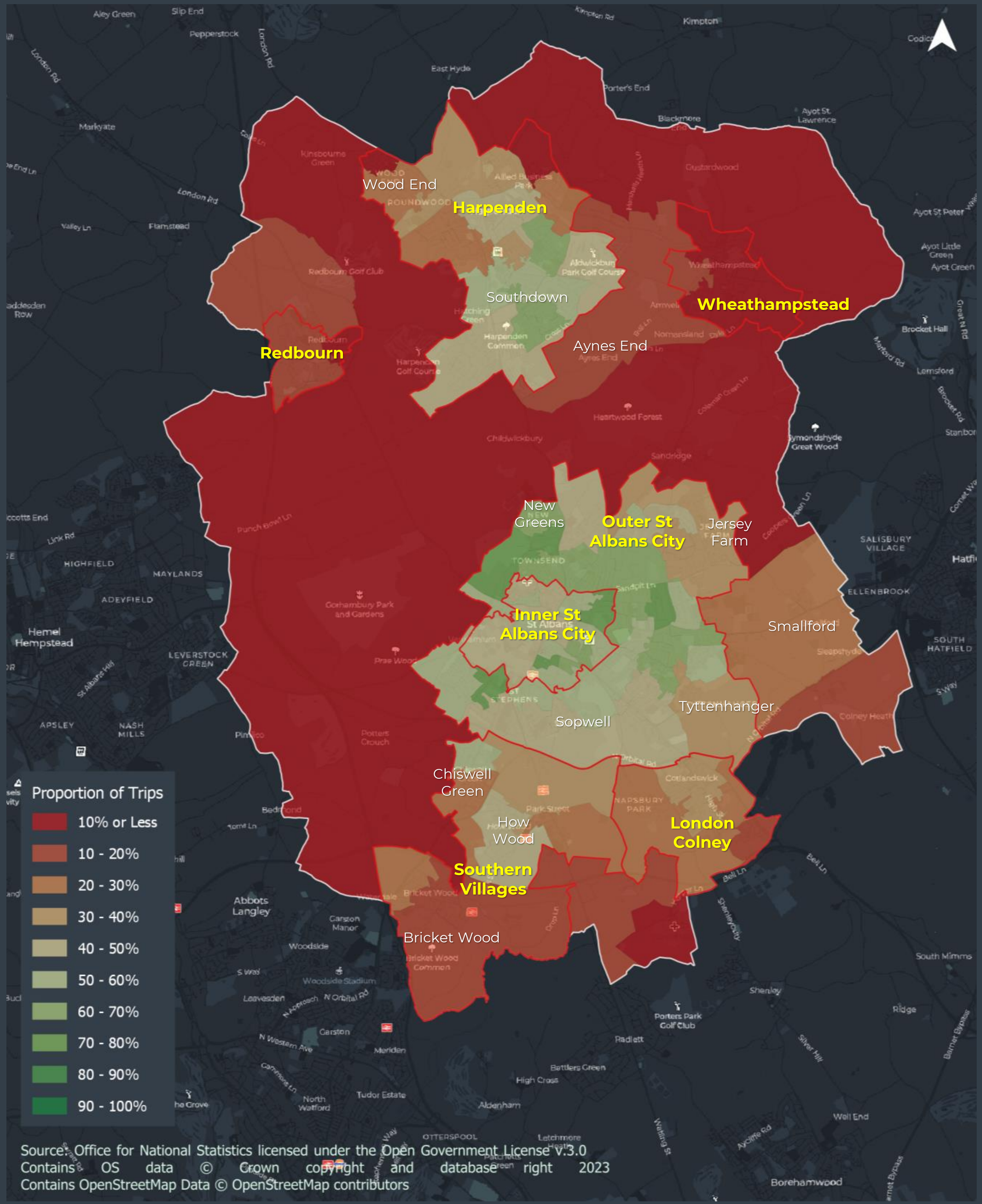
Figure 1.6 sets out the opportunity to walk for St Albans district (high scenario).

Overall, the opportunity for trips to be walked in St Albans district appears inconsistent, with the map being split into large sections of high or low opportunity for walked trips.

Areas of higher opportunity to walk tend to be concentrated in more urban areas such as Inner St Albans City, New Greens in Outer St Albans City and Southdown in Harpenden. This will be because denser areas like these will have a lot more reason for shorter trips to occur as points of interest will all be closer together than in more rural areas.

Generally, the rural areas and villages – particularly Redbourn and Wheathampstead - in St Albans district have very low opportunity for car trips to switch to walking, as shown by the red areas in the map. This is likely due to the areas not being within walking distance to other areas or attractions.

Figure 1.6 Walking opportunity in St Albans (high scenario)



Sustainable travel opportunity

Cycling opportunity in St Albans

Figure 1.7 sets out the opportunity to cycle for St Albans district (high scenario).

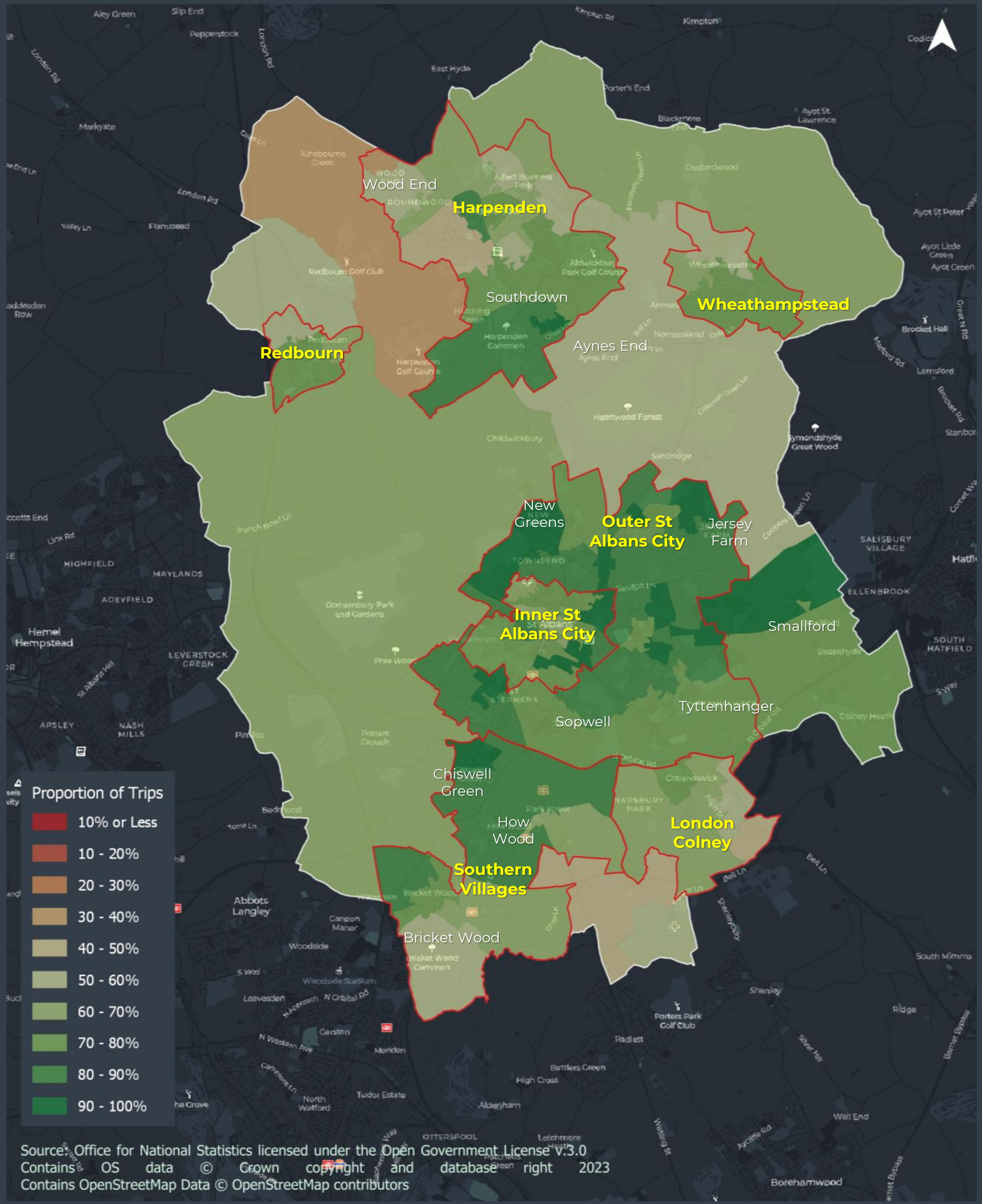
The opportunity to cycle is relatively high in St Albans district with the highest opportunities generally concentrated around denser areas such as zones in Inner St Albans City, Outer St Albans City and Harpenden. This is likely due to them being within a short cycle from the town centres or other attractions.

Rural areas that have a relatively high opportunity to cycle include Smallford to the east of St Albans City, Chiswell Green and How Wood in the Southern Villages, and Wheathampstead. This is likely due to the proximity of these areas to more dense areas (e.g. within a reasonable cyclable distance).

Areas that have a moderate opportunity to cycle include London Colney and Bricket Wood. The rural area between Wood End in Harpenden and Redbourn shows lower opportunity than other rural areas due to limited (and smaller) destinations within a reasonable range for cycling. Furthermore, there is a golf club in this area which may restrict the public right of way.

Outer St Albans City has areas with higher opportunity to cycle than areas in Inner St Albans City. This is likely due to there being a higher proportion of shorter trips in Outer than Inner (54% of trips from Inner are considered 'short', whereas 65% of trips from Outer are considered short) as other denser areas such as Hatfield and Harpenden will be within a reasonable cyclable range to areas in Outer St Albans City, but not to areas in Inner St Albans City. Furthermore, there is less building density in Outer St Albans City.

Figure 1.7 Cycling opportunity in St Albans (high scenario)



Sustainable travel opportunity

Public transport opportunity in St Albans

Figure 1.8 sets out the opportunity to use public transport for St Albans district (high scenario).

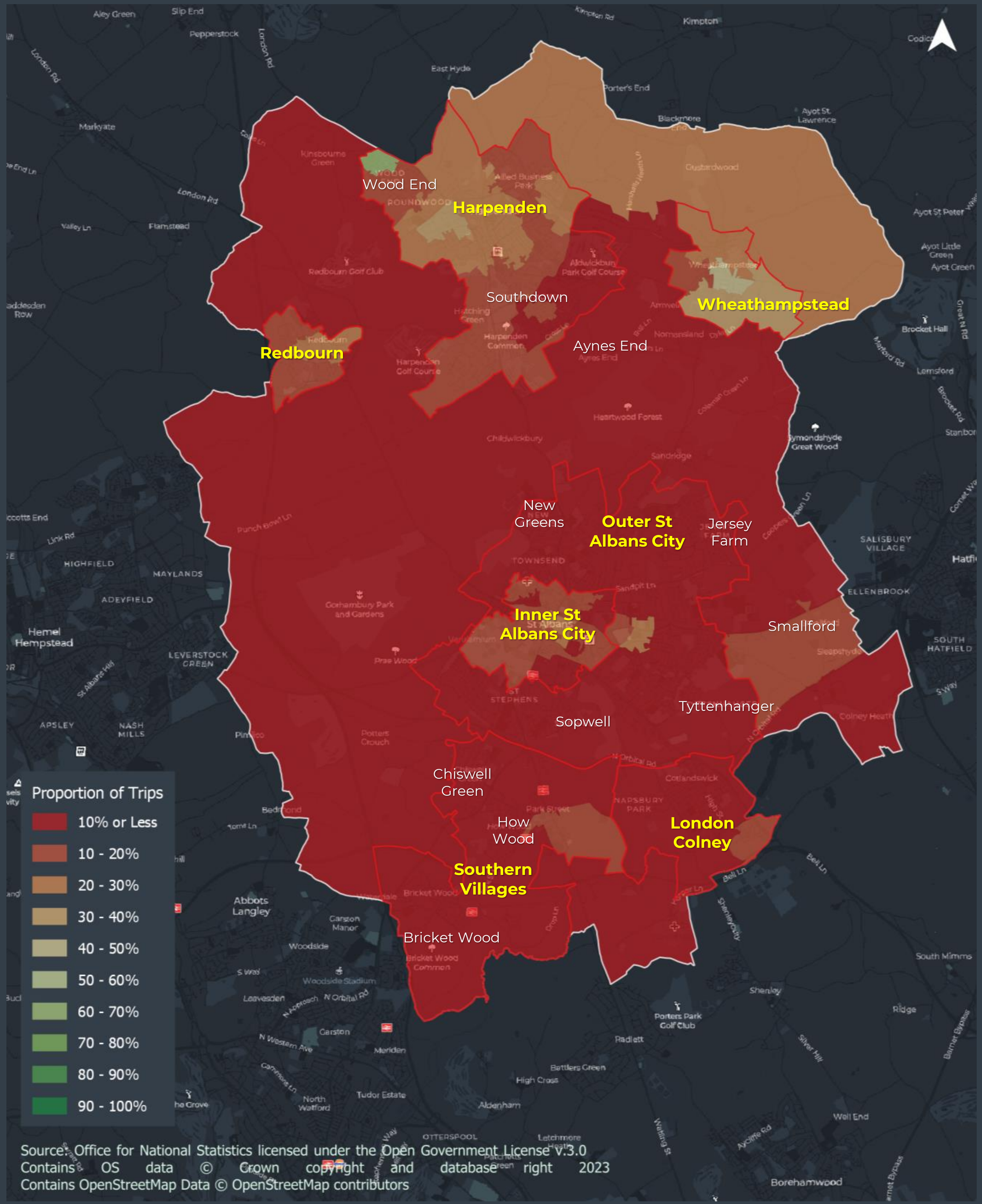
Overall, public transport has lower opportunity than walking and cycling. Most of the study area has 10% or less opportunity for mode shift to public transport.

The main reason that public transport opportunity is not higher in St Albans City (and other more urban areas with public transport options) is because a lot of trips in these areas are dominated by shorter trips and therefore more attractive to cycling or walking. For this reason, we did not run any of the shorter trips through the Google API for the Hemel Hempstead study and therefore they are also not included in this study. For longer trips, where there was public transport analysis, the proportion is higher.

The areas in St Albans district with a slightly higher opportunity for public transport trips relative to the study area include Wheathampstead. This is likely due to the coach and bus services that link it to Luton and the surrounding urban areas.

For the zone in north Harpenden, the higher opportunity for public transport is likely due to there being only a small number of OD pairs in this area, so any small absolute change could result in a larger percentage change.

Figure 1.8 Public transport opportunity in St Albans (high scenario)



PART 1B

Sustainable travel propensity for existing communities

Sustainable travel propensity

Proportion of household

Table 1.1 sets out the proportion of households for St Albans district and its communities compared to the England average.

This analysis highlights the differences in existing demographics and lifestyles between St Albans district and its communities, and the England average across various categories.

In England, the proportions of households in each Mosaic Group are relatively evenly spread, with Aspiring Homemakers having the highest proportion with 11% and Modest Traditions having the lowest at 4%.

In St Albans district, the proportions of households in each Mosaic Group are less evenly spread. Some Mosaic Groups have little to no households in St Albans district (e.g. Municipal Challenge and Modest Traditions) while a few Mosaic Groups represent a large proportion of households (e.g. Prestige Positions, Domestic Success and City Prosperity account for 76% of households).

The dominant Mosaic Group in St Albans district is Prestige Positions, representing 33% of households. Prestige Positions is also the dominant Mosaic Group of Redbourn (56% of households), Harpenden (57% of households), and Wheathampstead (65% of households).

The overwhelming dominant Mosaic Group in Inner St Albans City is City Prosperity (69% of households), whereas there is more of a mix of Mosaic Groups in London Colney (Domestic Success is the marginal dominant Mosaic Group with 37% of households).

On the next page, **Figure 1.9** and **Figure 1.10** show the dominant Mosaic Group across St Albans district and Inner / Outer St Albans City at hex level.

Table 1.1 Proportion of households in each Mosaic Group in St Albans, its communities and England

	Mosaic Group	St Albans district	Redbourn	Harpenden	London Colney	Southern Villages	Wheathampstead	Inner St Albans City	Outer St Albans City	England average
A	City Prosperity	**14%**	0%	5%	0%	0%	0%	69%	7%	**5%**
B	Prestige Positions	**33%**	56%	57%	10%	51%	65%	6%	25%	**7%**
C	Country Living	**1%**	0%	0%	0%	0%	0%	0%	0%	**7%**
D	Rural Reality	**0%**	0%	0%	0%	0%	0%	0%	0%	**6%**
E	Senior Security	**4%**	19%	0%	5%	17%	0%	0%	2%	**8%**
F	Suburban Stability	**1%**	12%	0%	11%	0%	0%	0%	0%	**5%**
G	Domestic Success	**29%**	2%	24%	37%	21%	4%	8%	48%	**9%**
H	Aspiring Homemakers	**5%**	11%	1%	19%	9%	10%	2%	2%	**11%**
I	Family Basics	**4%**	0%	0%	16%	0%	20%	2%	5%	**9%**
J	Transient Renters	**0%**	0%	0%	0%	0%	0%	0%	0%	**6%**
K	Municipal Challenge	**0%**	0%	0%	0%	0%	0%	0%	0%	**6%**
L	Vintage Value	**1%**	0%	3%	0%	1%	0%	0%	0%	**6%**
M	Modest Traditions	**0%**	0%	0%	0%	0%	0%	0%	0%	**4%**
N	Urban Cohesion	**1%**	0%	0%	0%	0%	0%	0%	3%	**6%**
O	Rental Hubs	**7%**	0%	8%	3%	3%	0%	12%	7%	**8%**

Figure 1.9 Dominant Mosaic Group for St Albans district

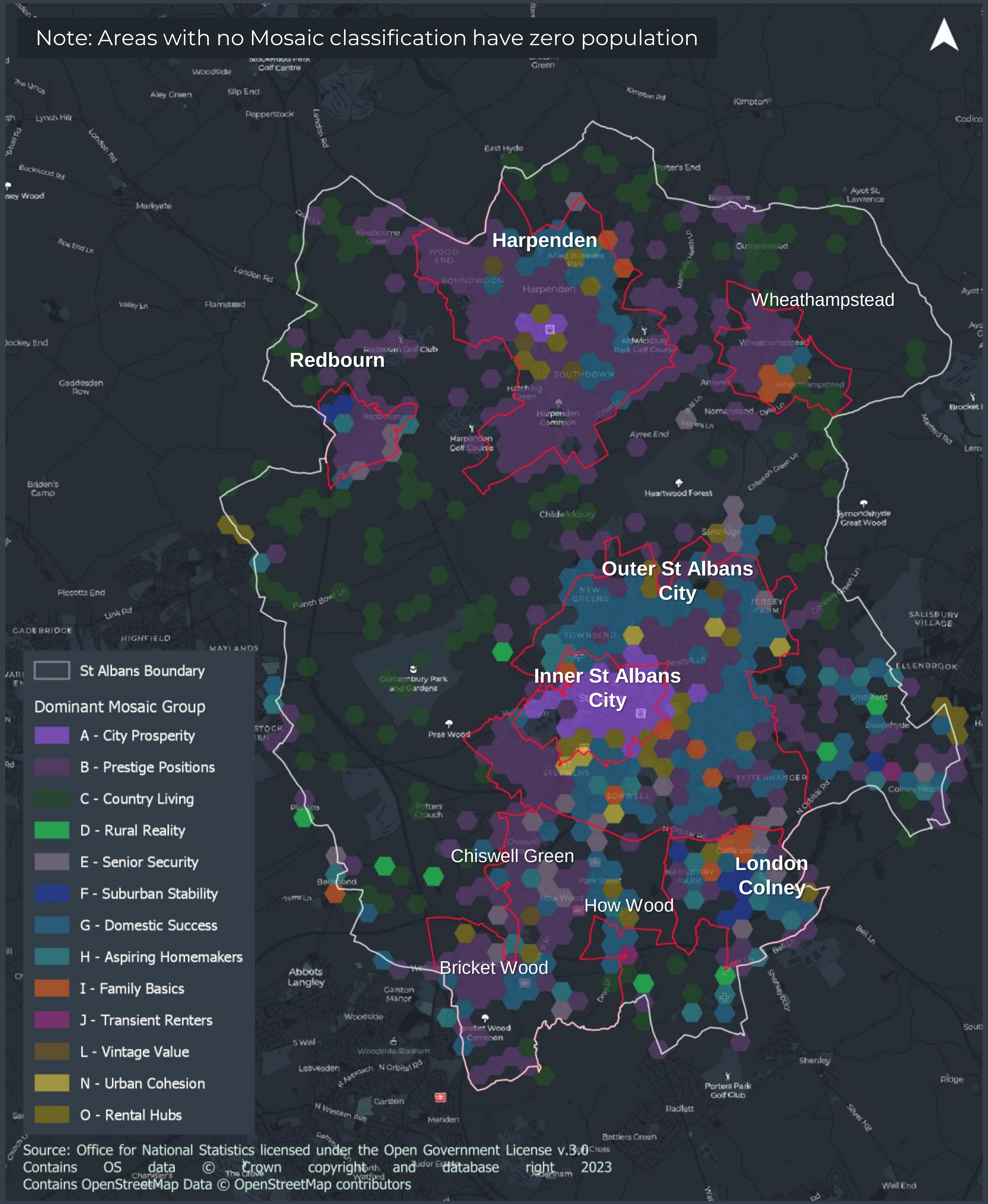
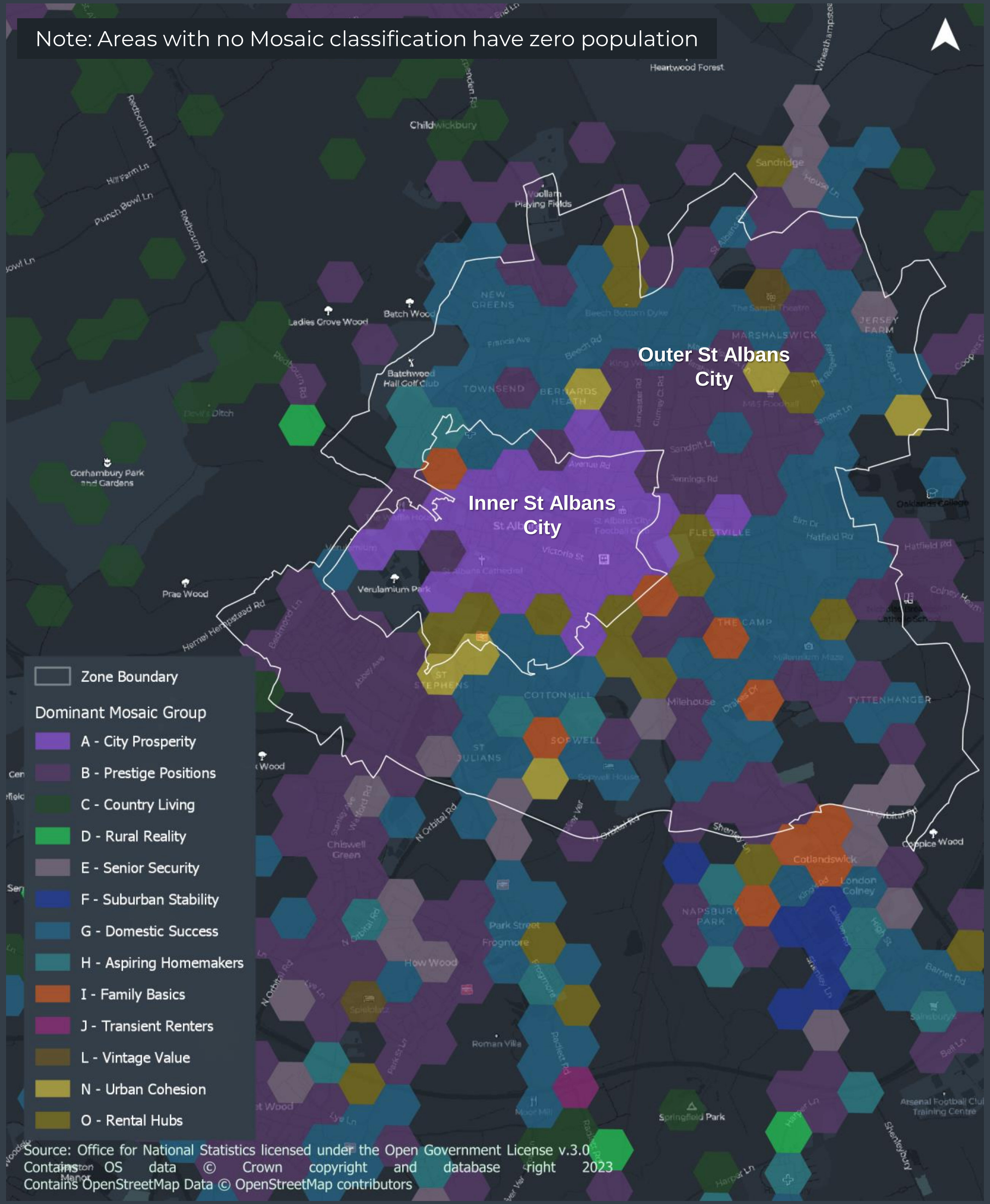


Figure 1.10 Dominant Mosaic Group for Inner and Outer St Albans City



Sustainable travel propensity

Average mode propensity

Table 1.2 sets out the average mode propensity (i.e. average of all trip types) based on the socio-demographics for St Albans district and its communities compared to the England average (which is 100). A score greater than 100 suggests a higher than England average propensity to use that mode, while a value below 100 suggests the opposite.

In general, due to the people living there, **St Albans district is relatively car dependent**, with most communities matching or being greater than the England average of 100, and propensities to take sustainable modes being less than average.

The propensity to take sustainable modes in St Albans district is mostly below the English average with all corresponding propensity scores being below 100 besides the score for rail:

- Walking – 91
- Cycling – 88
- Bus – 85
- Rail – 106

Inner St Albans City is the only community to go against this trend – with propensity to walk (139), cycle (148), take bus (148) or rail (174) all being well above the England average. Those living in Inner St Albans City are also less likely to drive than the England average, with a propensity of 87.

The following pages show the propensity to walk, cycle, use bus, use rail and drive across the St Albans district. Appendix C provides the same analysis but for each existing community zoomed in.

More information on Mosaic Groups and Mobility Insights survey and how they feed into propensities can be found in the methodology note

Table 1.2 Average propensity for walking, cycling, using bus, using rail and driving (all journey purposes)

Propensity	England average	St Albans district	Redbourn	Harpenden	London Colney	Southern Villages	Wheathampstead	Inner St Albans City	Outer St Albans City
Walk	100	91	75	86	80	80	89	139	85
Cycle	100	88	64	79	79	71	85	148	84
Bus	100	85	63	75	76	67	76	148	78
Rail	100	106	85	98	81	90	87	174	99
Drive	100	100	104	100	109	102	105	87	101

Sustainable travel propensity

Propensity to walk in St Albans

Figure 1.11 sets out the propensity to walk for St Albans compared to the England average at COMET model zone level.

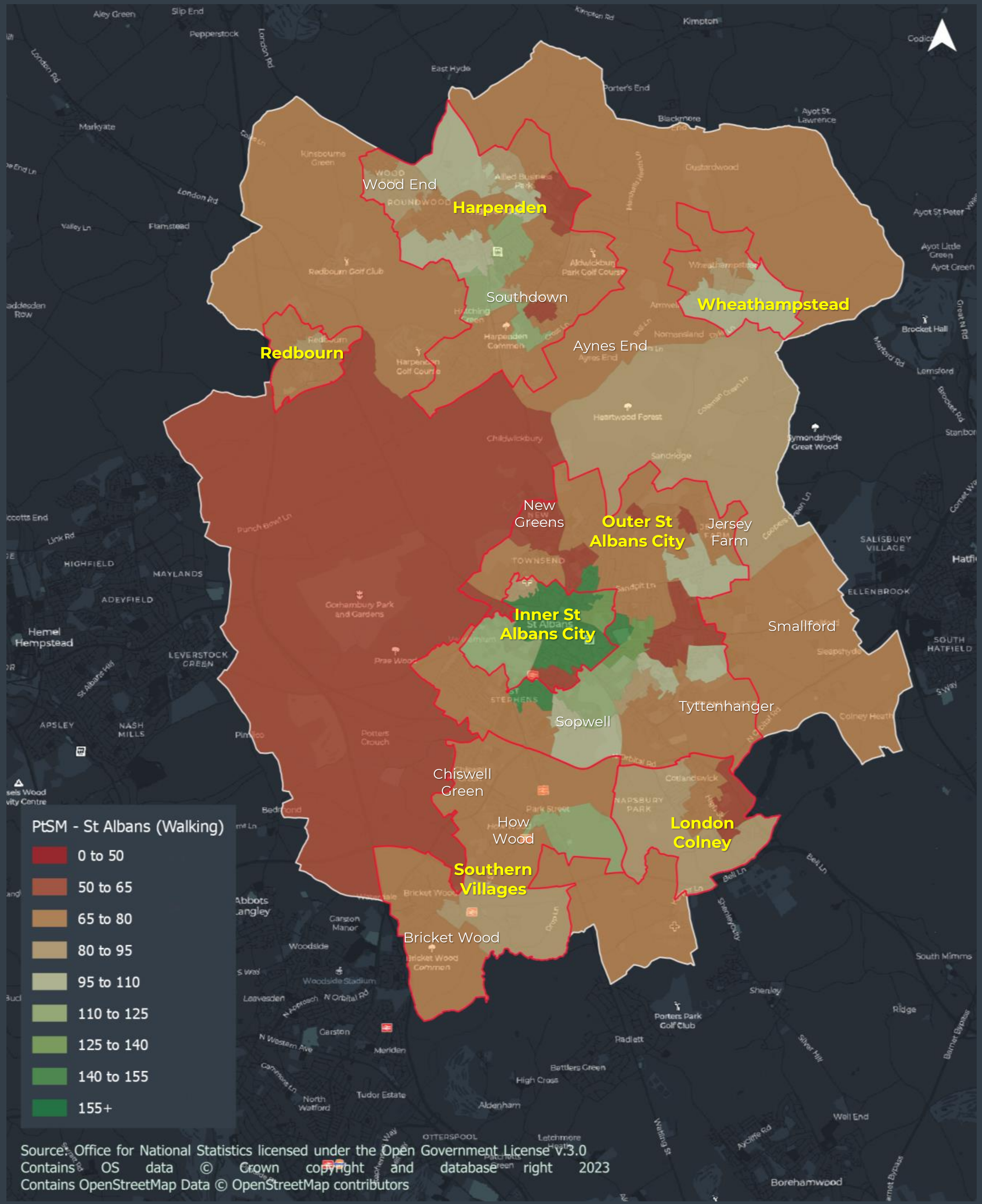
The area with the highest propensity to walk is in Inner St Albans City, with areas such as Harpenden, How Wood and Outer St Albans City also having higher propensities for walking.

Generally, in St Albans district, propensity to walk is 91% of the England average. This indicates that other modes may be preferred within St Albans as a whole. However, as noted in the map, some urban areas such as Inner St Albans have a higher propensity for walking than the England average.

Comparing these regions to the opportunity map, most areas in St Albans that have a higher propensity to walk also have relatively high opportunity for walked trips.

The similarity in areas with higher opportunity and higher propensity for walking could be because having the opportunity available would make people more likely to use this option.

Figure 1.11 Propensity to walk in St Albans



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Sustainable travel propensity

Propensity to cycle in St Albans

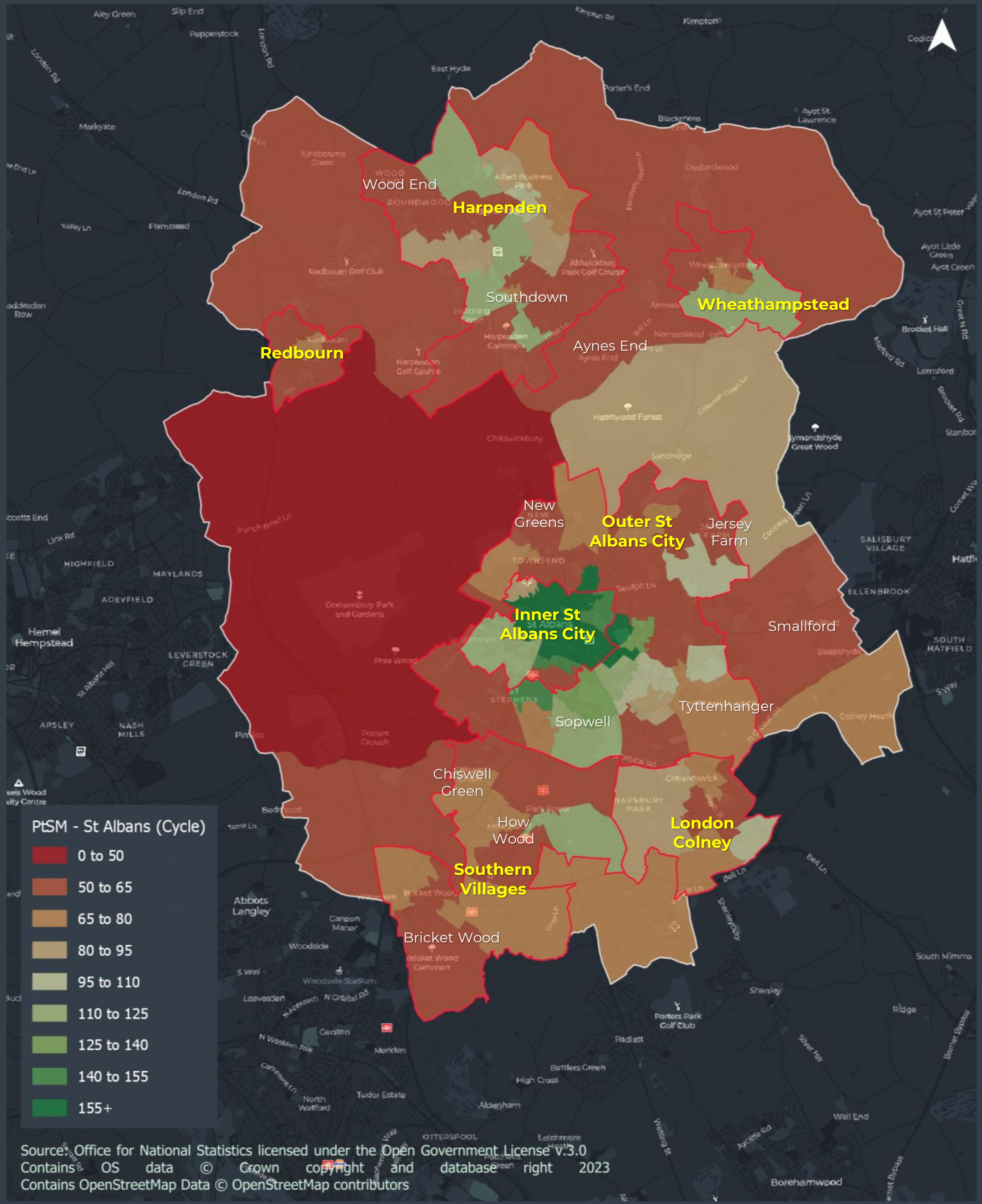
Figure 1.12 sets out the propensity to cycle for St Albans compared to the England average – the average propensity for cycling across St Albans is 88%. In general, cycling has a lower propensity than walking.

The propensities to cycle in major areas of St Albans district are lower than the England average - with the exception of Inner St Albans City which has a significantly higher propensity than the England average. It appears that most of the areas with lower propensities for cycling are the rural areas of St Albans, it's anticipated that most of these areas would be less likely to favour cycling due to the longer distance trips and therefore have more of a preference for driving.

In urban areas such as Inner St Albans City, Wheathampstead, and parts of Outer St Albans City, the propensity to cycle is closer to or above the England average. It's likely that in these areas' destinations such as community facilities, shops and education establishments may be within a shorter distance. These trips are easier to be completed by more active modes such as cycling and therefore would make people more likely to cycle.

The areas in St Albans district with high propensity for cycling match up well with the areas with high opportunity for cycling, meaning a lot of the trips with the opportunity to be cycled would also have the potential to be cycled.

Figure 1.12 Propensity to cycle in St Albans



Sustainable travel propensity

Propensity to use bus in St Albans

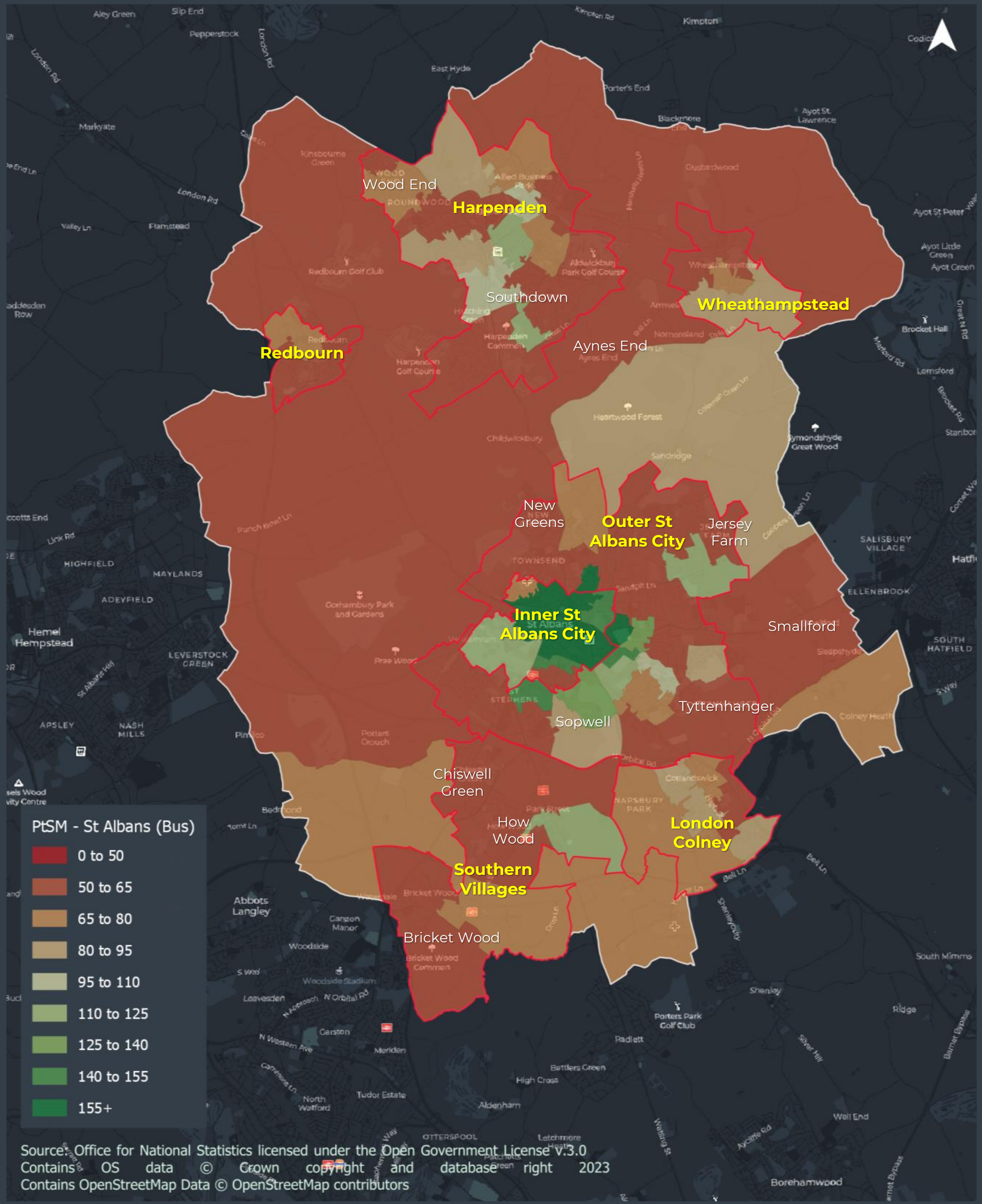
Figure 1.13 sets out the propensity to use bus for St Albans – which is about 85% of the England average.

Within St Albans, the overall propensity to travel by bus is lower than the England average, with most areas having propensity in the range of 50 to 80. This is with the exception of Inner St Albans City which has an average propensity of 148% to use buses.

These figures are supported by the limited opportunity to use public transport at present in St Albans, (with the exception of Inner St Albans City) highlighting an opportunity to increase bus services to better cater to the needs of users.

In a similar pattern to walking and cycling propensity, there is a greater willingness to travel by bus in the more urban areas within St Albans (such as in St Albans City and Harpenden).

Figure 1.13 Propensity to use bus in St Albans



Sustainable travel propensity

Propensity to use rail in St Albans

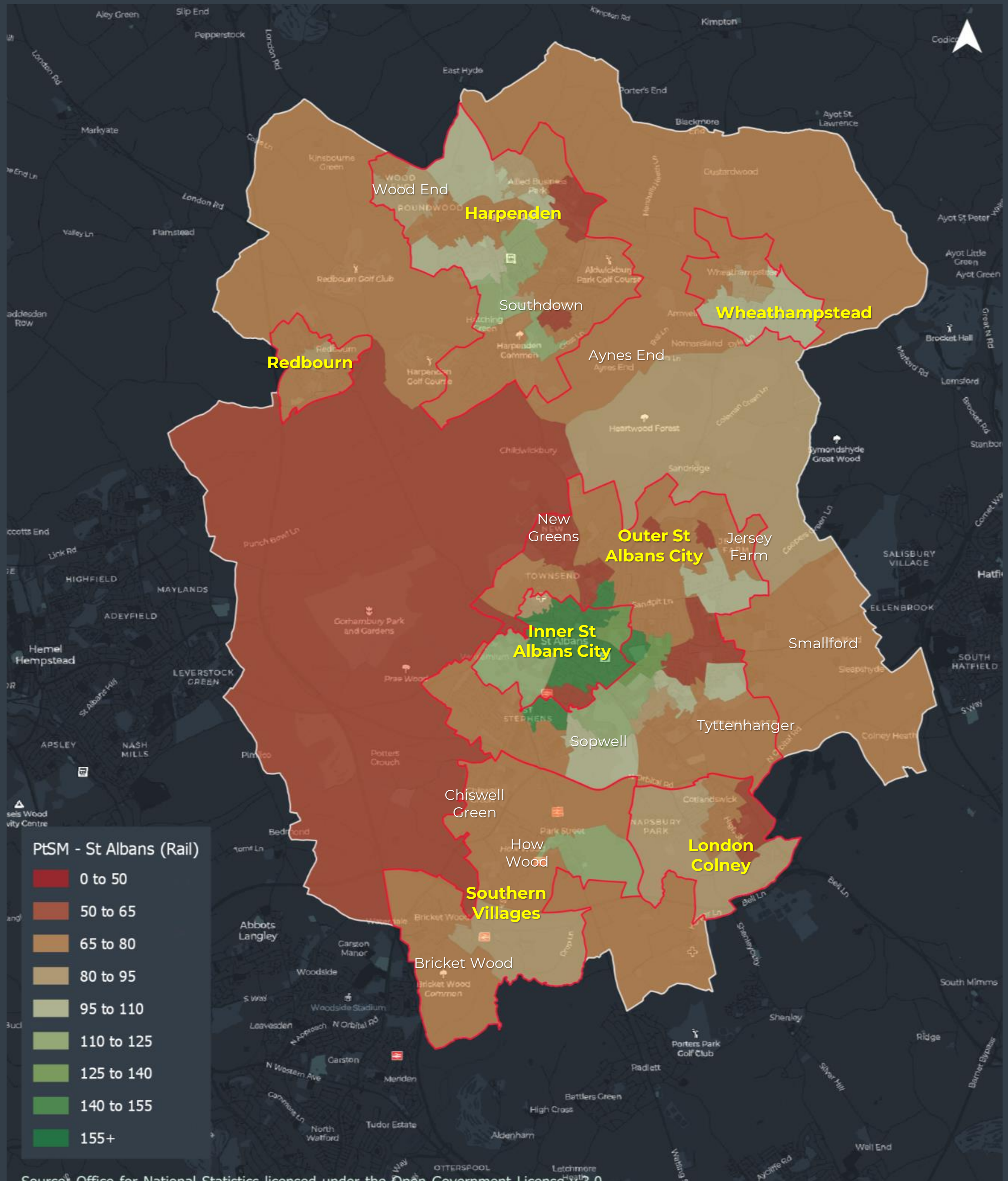
Figure 1.14 sets out the propensity to use rail for St Albans – which is above the England average at about 106% of the England average. This is the mode with the highest average propensity in St Albans. In general, rail has a higher propensity than bus.

Propensity to travel by rail is varied across St Albans district. While most areas have a high propensity for rail travel there is still a large section of St Albans district to the west of St Albans City with lower propensity for rail travel compared with the England average. A lack of rail provision in this area is likely to play a part in the lower propensity, as well as existing demographics and perceptions.

The areas where rail propensity is highest tend to align with the location of the rail stations in these settlements, suggesting that residents do not need to travel far to reach the rail stations. However, many areas without rail stations such as Redbourn, Wheathampstead, and London Colney still have fairly high propensities for rail travel (80% - 90% of the England average).

This data indicates limited potential to use public transport, suggesting that the current public transport network needs to be improved to ensure that the existing communities are better served by public transport.

Figure 1.14 Propensity to use rail in St Albans



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Sustainable travel propensity

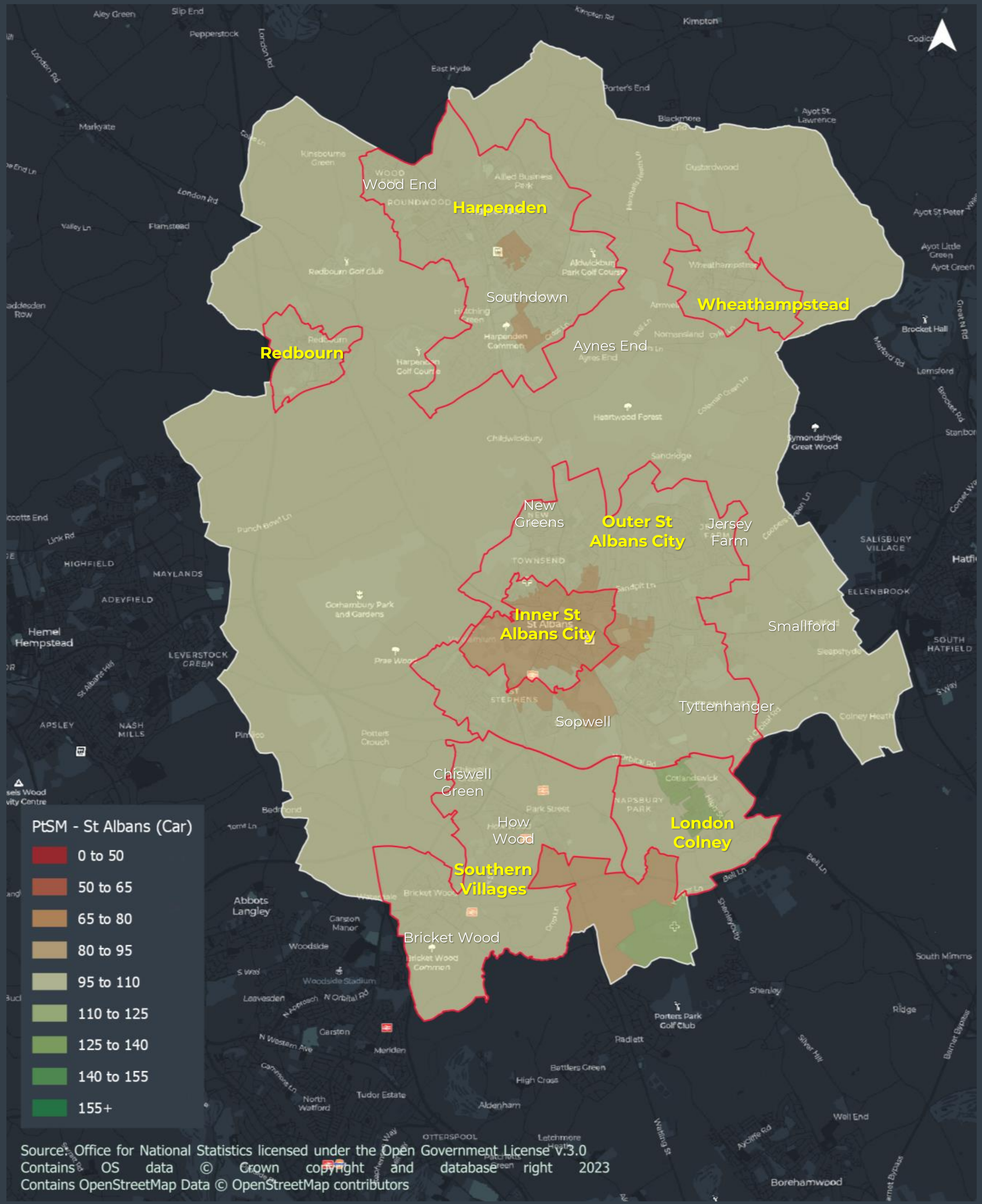
Propensity to use car in St Albans

Figure 1.15 sets out the propensity for car use across St Albans compared to the England average.

Across most of the region, the propensity for driving is roughly equal to the England average – with all major areas besides, Inner St Albans City being slightly above the England average. This highlights the car dependency at present. This could be due to the lack of public transport connectivity or frequency in these areas discouraging people from taking the bus or train instead of driving.

There are pockets of lower-than-average driving propensity in the region, namely in Inner St Albans City. This supports the idea that lack of alternatives to driving could be the cause for the higher propensities towards driving in most areas since Inner St Albans City seems to have the most opportunity to use public transport and make shorter trips that can be walked/cycled.

Figure 1.15 Propensity to use car in St Albans



PART 1C

Sustainable travel potential for existing communities

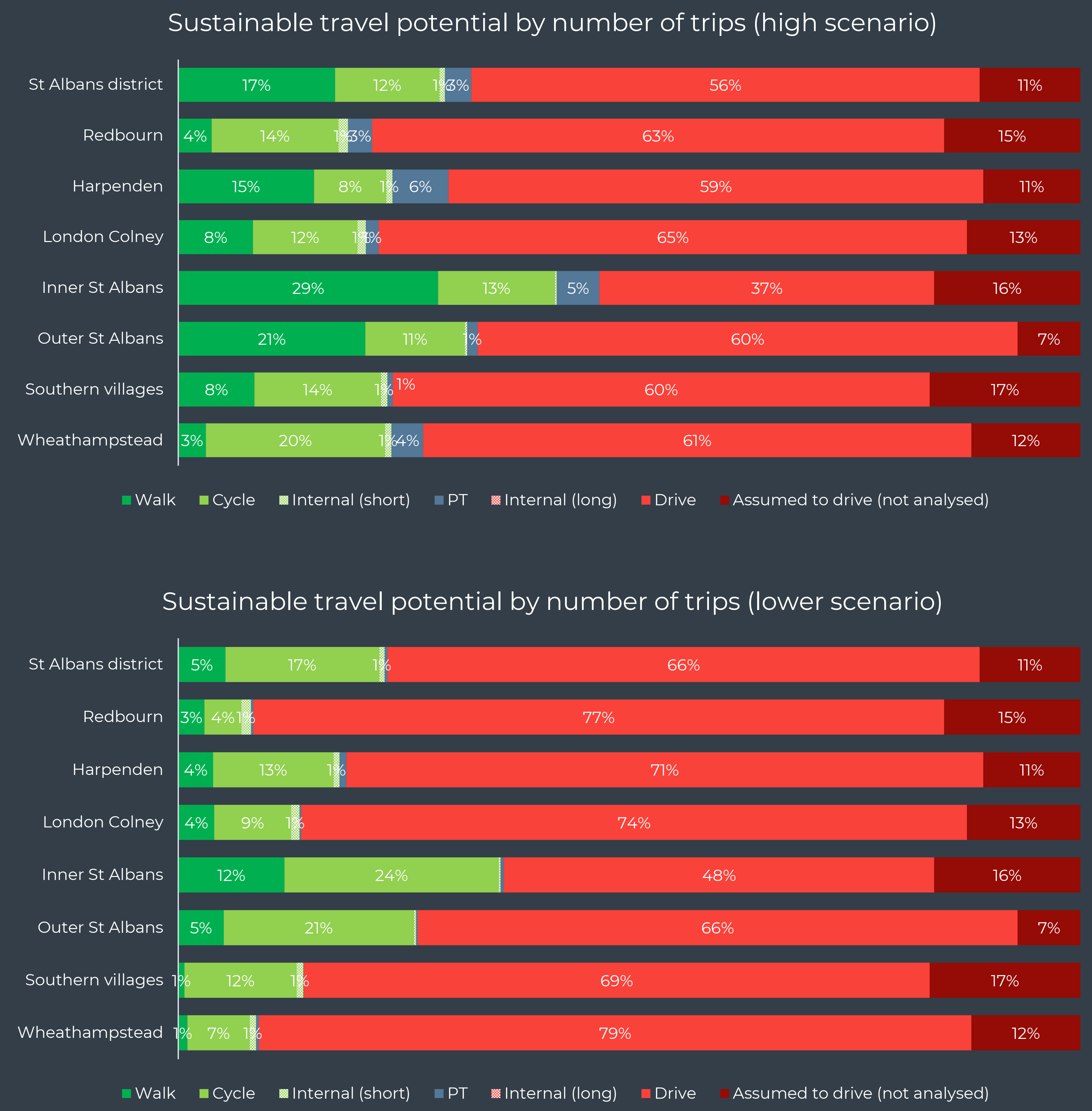
Sustainable travel potential

What is the likely sustainable travel potential for existing communities?

Figure 1.16 shows high and lower sustainable travel potential for trips:

- St Albans district– potential is between 23-32%, with walking being 5-17%, cycling 12-17% (including short internal trips) and public transport up to 3%. Around 68-77% of trips will be driven (including not analysed trips assumed to be driven).
- Inner St Albans City – potential is between 36-47%, with walking being 12-29%, cycling 13-24% (including short internal trips) and public transport up to 5%. Around 53-64% of trips will be driven (including not analysed trips assumed to be driven).
- Outer St Albans City – potential is between 27-33%, with walking being 5-21%, cycling 11-21% (including short internal trips) and public transport up to 1%. Around 67-73% of trips will be driven (including not analysed trips assumed to be driven).

Figure 1.16 Sustainable travel potential by number trips for high (top) and lower (bottom) scenarios



Walking potential

Up to **17%** of trips across St Albans district, **29%** in the Inner St Albans City and **21%** in the Outer St Albans City could be made by walking as the main mode

Redbourn	Main mode	First and last mile*
Daily trips	Around 100	0 - 200
Daily people km	100 - 200	0 - 1,200

Harpenden	Main mode	First and last mile*
Daily trips	1,700 - 6,800	300 - 3,600
Daily people km	2,200 - 14,000	6,100 - 49,400

London Colney	Main mode	First and last mile*
Daily trips	500 – 1,100	0 - 300
Daily people km	600 - 2,000	500 - 1,900

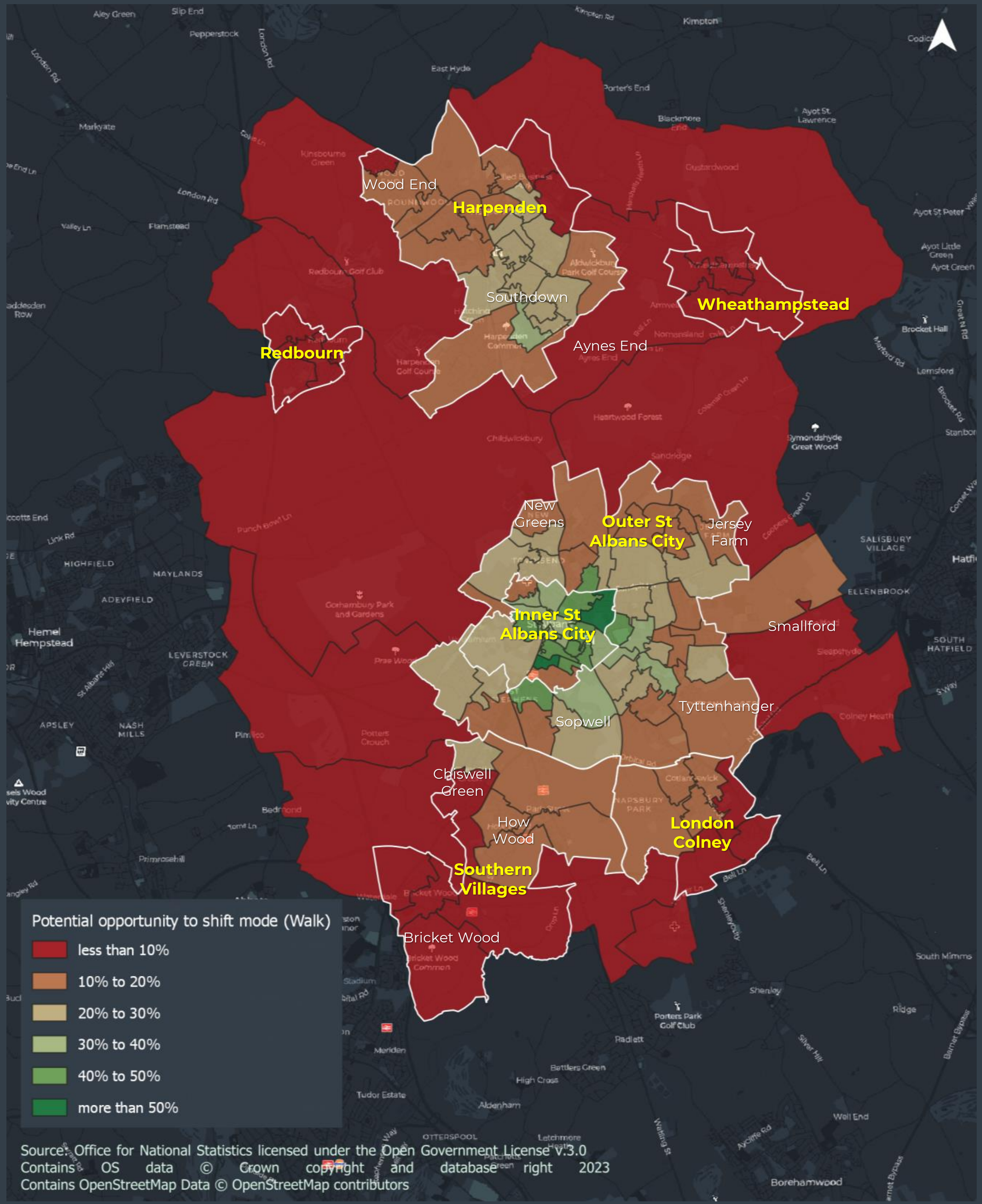
Inner St Albans	Main mode	First and last mile*
Daily trips	5,600 - 13,700	200 - 3,700
Daily people km	6,000 - 25,000	3,800 - 41,400

Outer St Albans	Main mode	First and last mile*
Daily trips	4,000 - 16,700	100 – 1,600
Daily people km	4,900 - 34,700	3,900 - 18,600

Southern villages	Main mode	First and last mile*
Daily trips	100 - 900	0 - 200
Daily people km	100 - 2,000	0 - 2,200

Wheathampstead	Main mode	First and last mile*
Daily trips	100 - 200	0 - 800
Daily people km	100 - 300	100 - 3,400

Figure 1.17 Walking potential in St Albans district (high scenario)



Cycling potential

Up to **12%** of trips across St Albans district, **13%** in the Inner St Albans City and **11%** in the Outer St Albans City could be made by cycling as the main mode

Redbourn	Main mode	First and last mile*
Daily trips	200 - 600	0 - 200
Daily people km	600 - 2,900	0 - 1,200

Harpenden	Main mode	First and last mile*
Daily trips	7,600 - 9,800	300 - 3,600
Daily people km	18,500 - 33,000	6,100 - 49,400

London Colney	Main mode	First and last mile*
Daily trips	1,600 - 2,600	0 - 300
Daily people km	4,200 - 10,300	500 - 1,900

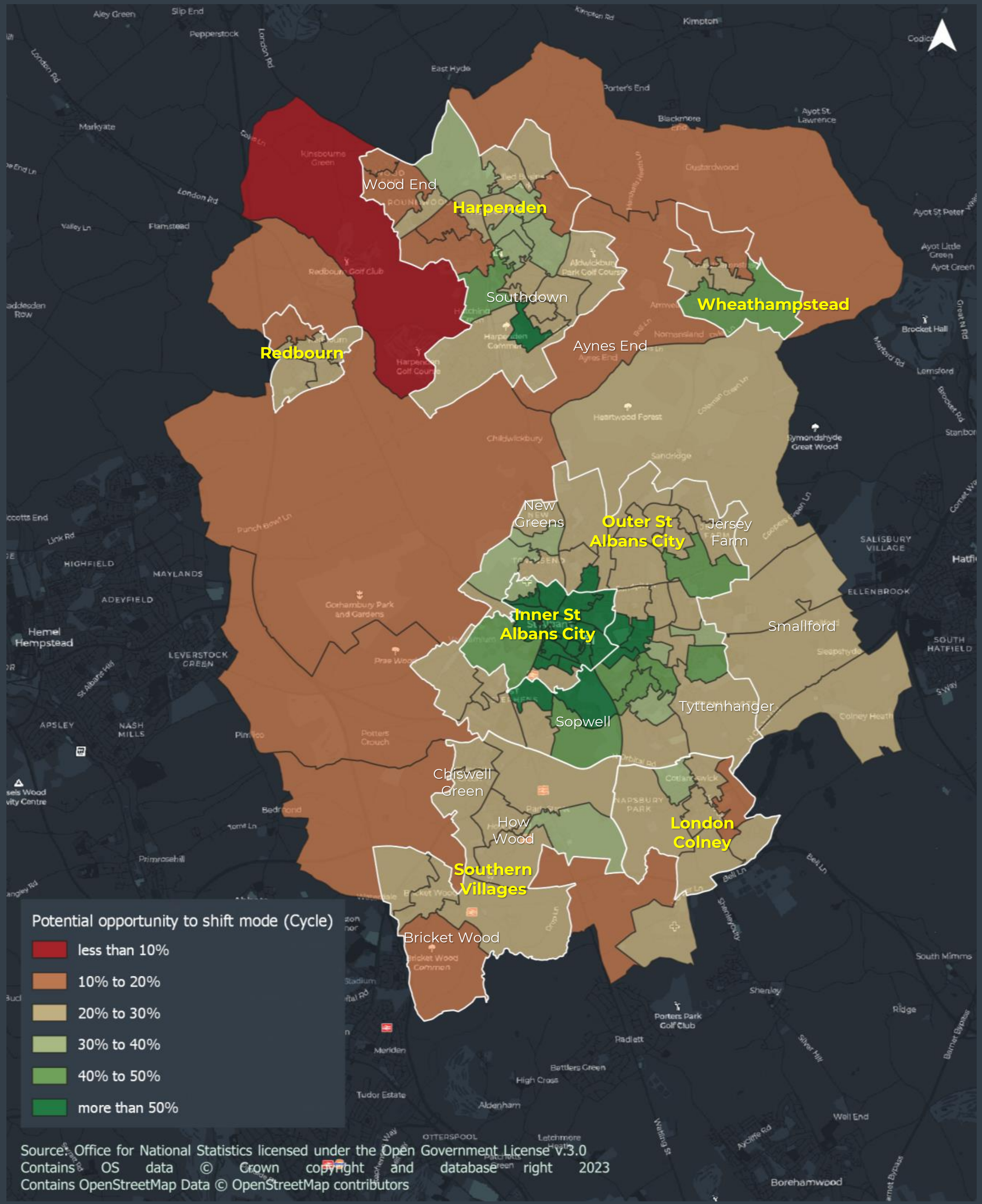
Inner St Albans	Main mode	First and last mile*
Daily trips	17,200 - 20,600	200 - 3,700
Daily people km	37,100 - 60,300	3,800 - 41,400

Outer St Albans	Main mode	First and last mile*
Daily trips	21,000 - 25,300	100 – 1,600
Daily people km	51,500 - 78,800	3,900 - 18,600

Southern villages	Main mode	First and last mile*
Daily trips	1,300 - 2,200	0 - 200
Daily people km	4,200 - 9,500	0 - 2,200

Wheathampstead	Main mode	First and last mile*
Daily trips	500 – 1,400	0 - 800
Daily people km	1,600 - 7,700	100 - 3,400

Figure 1.18 Cycling potential in St Albans (high scenario)



Public transport potential

Up to **3%** of trips across St Albans district, **5%** in the Inner St Albans City and **1%** in the Outer St Albans City could be made by public transport as the main mode

Redbourn	Main mode
Daily trips	0 - 200
Daily people km	100 - 2,100

Harpenden	Main mode
Daily trips	300 - 3,600
Daily people km	5,600 - 43,400

London Colney	Main mode
Daily trips	0 - 300
Daily people km	700 - 3,700

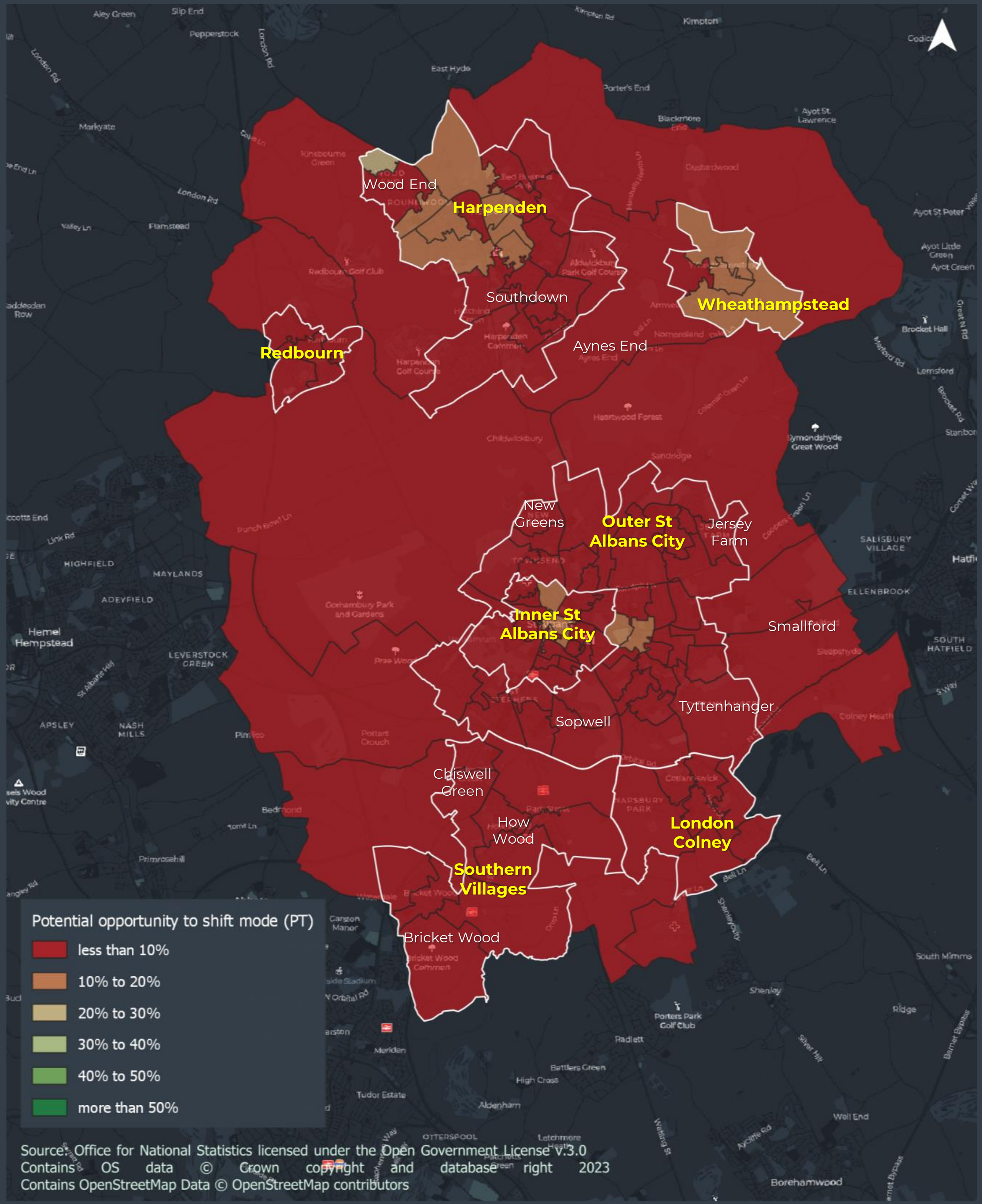
Inner St Albans	Main mode
Daily trips	200 - 3,700
Daily people km	2,700 - 39,300

Outer St Albans	Main mode
Daily trips	100 – 1,600
Daily people km	3,600 - 18,400

Southern villages	Main mode
Daily trips	0 - 200
Daily people km	0 - 1,300

Wheathampstead	Main mode
Daily trips	0 - 800
Daily people km	100 - 6,200

Figure 1.19 Public transport potential in St Albans (high scenario)



Summary and next steps

Findings

This part of the report focuses on understanding the sustainable travel opportunity, propensity and potential for St Albans district to understand its modal shift.

Sustainable travel opportunity

The assessment indicates that based on modelled origin-destination matrices for 2031, current active travel networks and available public transport services – up to 68% of existing car trips in the St Albans district, 68% in the Inner St Albans City and 79% in the Outer St Albans City could be made by sustainable methods - predominantly by active modes.

The walking and cycling opportunity provides detail around where to focus active travel improvements to unlock additional trips and could be used to support the Local Cycling and Walking Infrastructure Plan being developed for St Albans district.

Only about 6% of car trips could reasonably use public transport based on existing services – which suggests an opportunity to improve the network to better match the origins-destinations of users (coverage and frequency) and be more time competitive with driving (speed) – focussed on commuting, education, shopping and personal business trips.

Sustainable travel propensity

This work which is benchmarked to the England average and based on current socio-demographics of the area, shows that while propensity is mixed across St Albans district – there are areas with a higher likelihood to walk, cycle and use public transport. These areas should be prioritised for active and public transport interventions to unlock the potential.

Sustainable travel potential

Based on the findings on the opportunity and propensity work, it is estimated that up to 32% of car trips in the St Albans district, 47% in the Inner St Albans City and 33% in the Outer St Albans City would use sustainable modes. It is noted that this is a worst-case scenario – based on the existing active and public transport options available, as well as the propensities of the current population.

Measures to increase sustainable travel opportunity such as enhanced walking, cycling, bus and rail networks could increase the number of trips that could be made.

Demographic change in existing communities and new developments could increase the propensity to use active and public transport.

Next part

Part 2 of this report will summarise the findings from Task 2 – sustainable travel opportunity, propensity, and potential for specified new developments in St Albans district. The new developments (with projected number of households) assessed were:

- East Hemel (north) – 1,600 households
- East Hemel (south) – 1,835 households
- North Hemel – 325 households
- Northeast Harpenden – 610 households
- North St Albans City – 1,100 households
- East St Albans City – 511 households

As with Part 1, an average across the assessed new developments will also be set out.

Part 2 follows the same structure as Part 1:

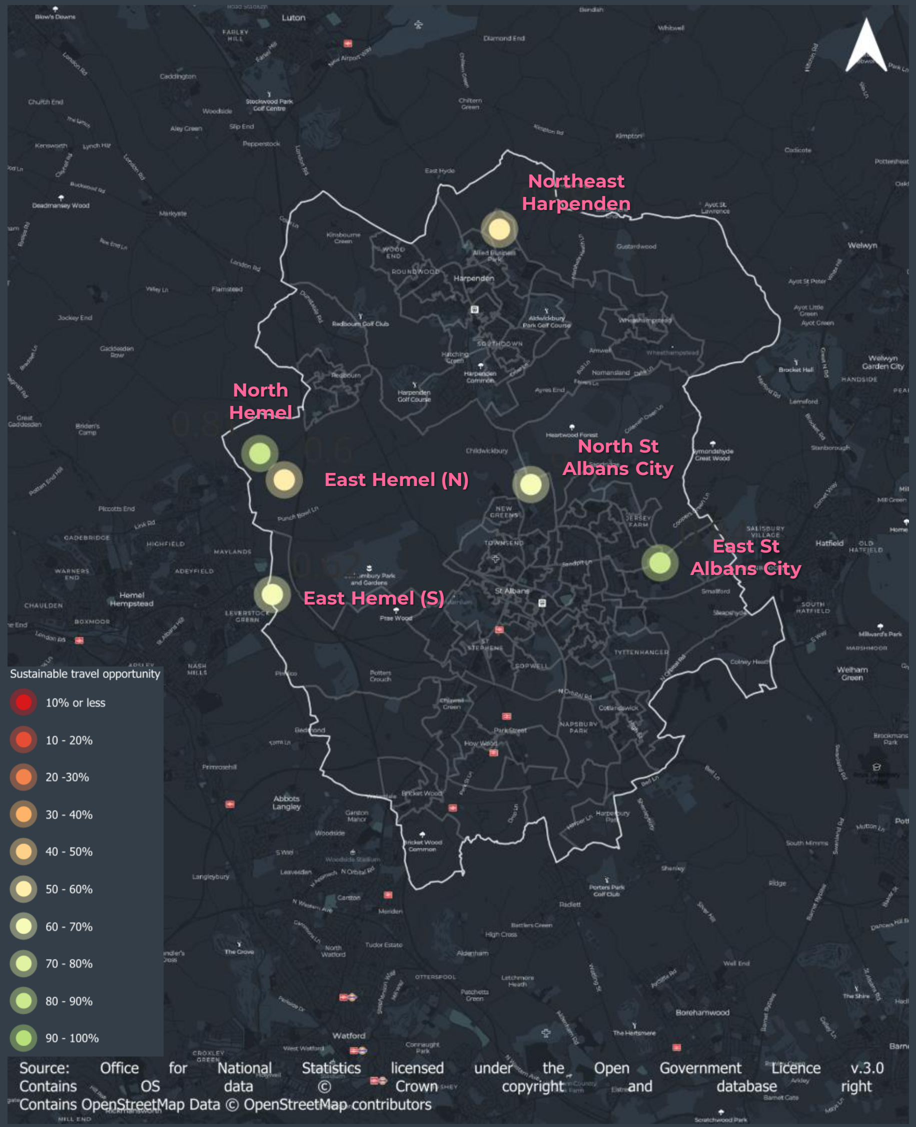
- Part 2A: Sustainable travel opportunity for new developments
- Part 2B: Sustainable travel propensity for new developments
- Part 2C: Sustainable travel potential for new developments

PART 2

Sustainable travel potential for new developments

SUSTAINABLE TRAVEL POTENTIAL FOR NEW DEVELOPMENTS

Sustainable travel opportunity



We calculated that:

- Up to 65% of modelled car trips across the assessed development zones in St Albans district have the opportunity to switch to sustainable modes.
- East St Albans City has the highest opportunity - up to 84% of modelled car trips have the opportunity to switch, followed by North Hemel (up to 81%), North St Albans City (up to 70%), East Hemel (S) (up to 62%), East Hemel (N) (up to 60%) and Northeast Harpenden (up to 58%).

X

Sustainable travel propensity

	Mosaic Group	New developments
B	Prestige Positions	10%
G	Domestic Success	60%
H	Aspiring Homemakers	15%
O	Rental Hubs	15%

What did we find:

Based on expected socio-demographics of the St Albans district development zones, new residents will have below average propensities for walking, cycling, bus and rail but above average propensity to drive. The Mosaic profile is based on the existing development of Oaklands in St Albans district, proposed housing types (e.g. affordable, social and rental) and validated using similar developments in the wider region. These propensities could change if sustainable travel provision is improved.

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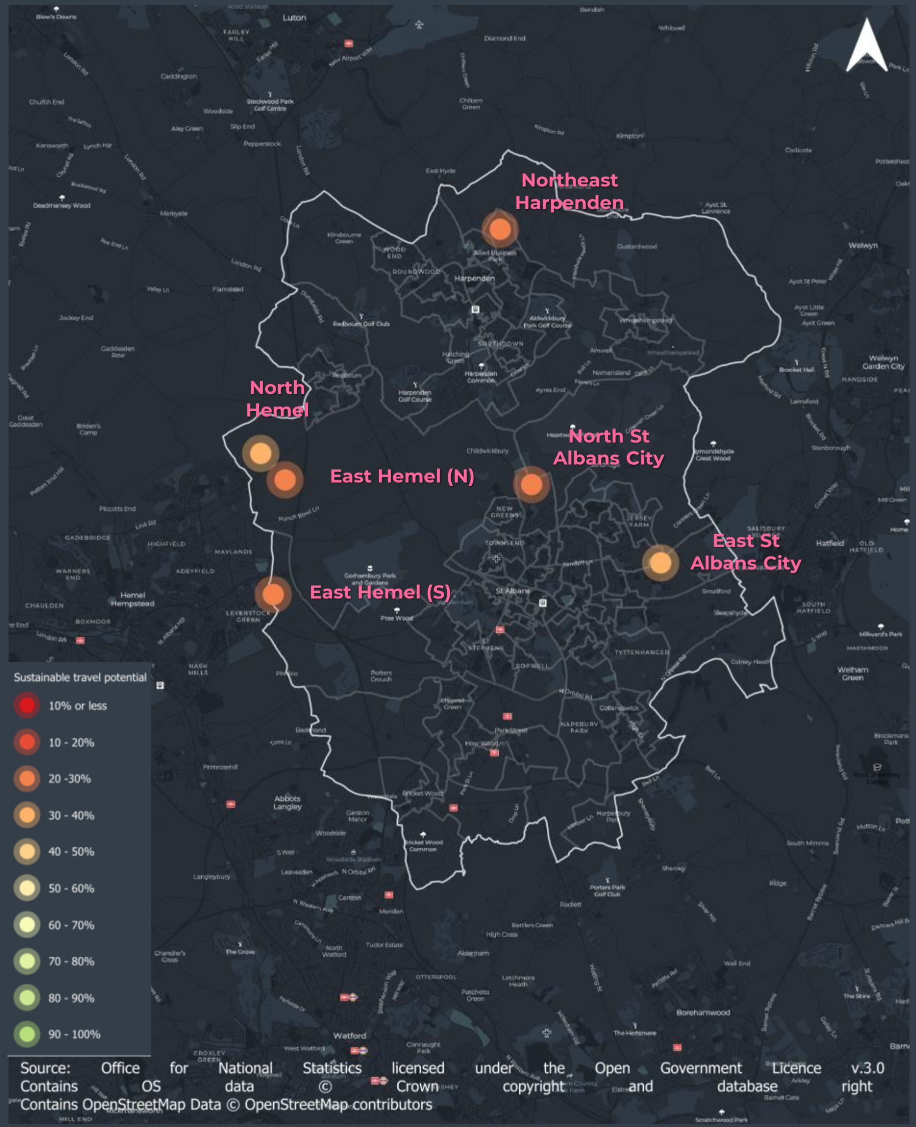
Sustainable travel potential



We calculated that:

- Up to 27% of modelled car trips across the assessed development zones in St Albans district have the potential to switch to sustainable modes.
- East St Albans City has the highest potential - up to 34% of modelled car trips have the potential to switch, followed by North Hemel (up to 32%), North St Albans City and East Hemel (N) (both up to 28%), East Hemel (S) (up to 25%) and Northeast Harpenden (up to 23%).

PART 2A

Sustainable travel opportunity for new developments

Sustainable travel opportunity

How many car trips in St Albans development zones could be made by sustainable modes?

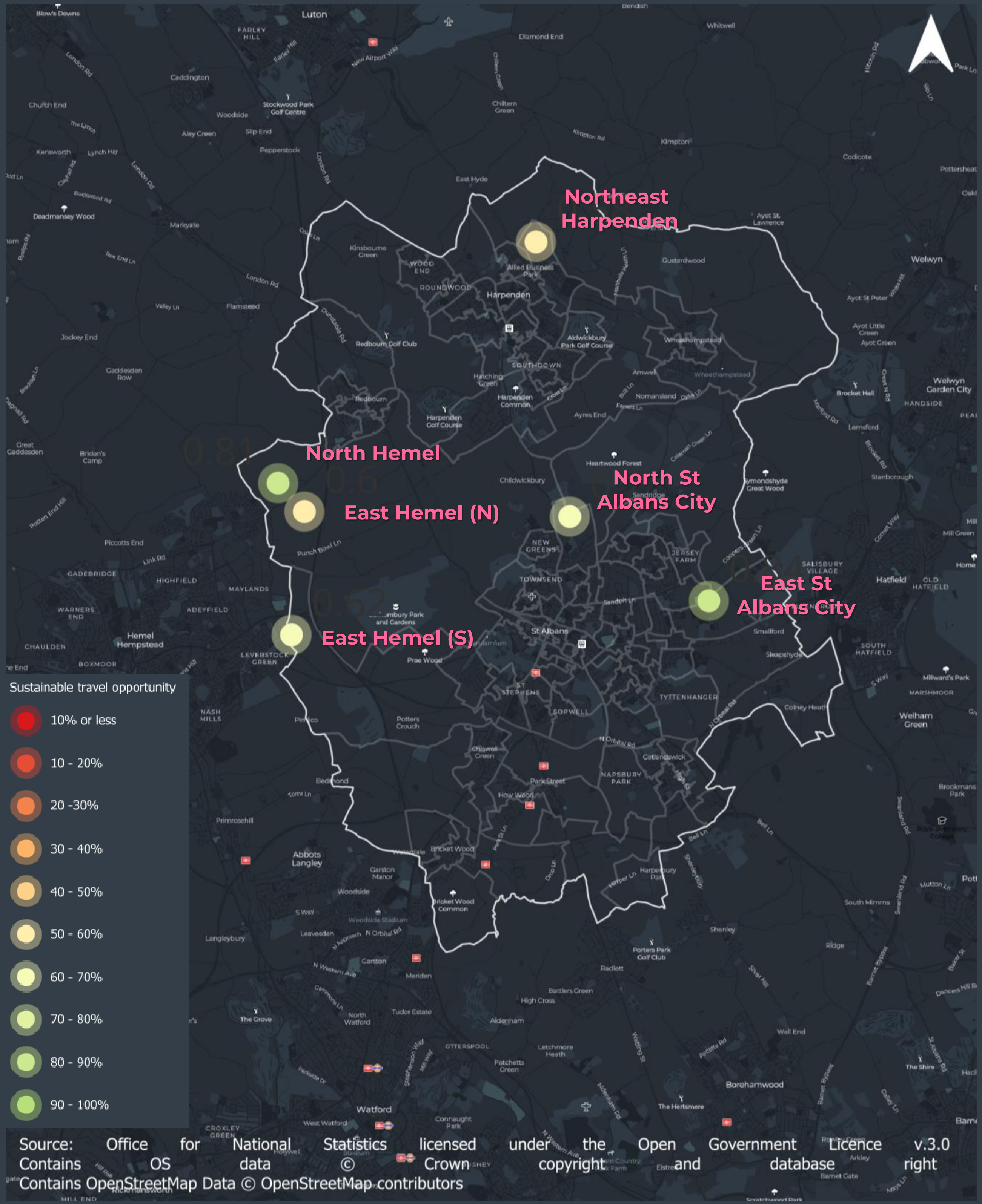
Figure 2.1 shows where the opportunity for modelled car trips to switch to sustainable modes across the different St Albans district development zones (high scenario). East St Albans City and North Hemel have the largest opportunity and Northeast Harpenden has the lowest. A high and lower scenarios for sustainable travel opportunities have been estimated based on distance and time (see methodology note). It is worth noting that these outputs assume no new sustainable transport provision, which is unlikely in reality – and therefore can be seen as a baseline level of opportunity.

Key findings include:

- 46-65% of modelled car trips in the new developments have the opportunity to shift to sustainable modes. Cycling provides the highest opportunity with 37-40% of car trips able to switch to cycling. 6-27% of car trips could switch to walking and less than 1% to public transport
- East St Albans City has the highest opportunity for car trips to shift to sustainable modes, with 67-84% of trips able to shift.
- North Hemel has the second highest opportunity, with 62-81% of car trips able to shift to sustainable modes, and North St Albans city has the third highest with 50-70% opportunity.
- The two East Hemel developments have similar opportunity – the southern development has 41-62% and the northern has 43-60%.
- Northeast Harpenden has the lowest sustainable travel opportunity, with 45-58% of car trips able to switch.

The following pages break down the sustainable travel opportunity for each existing community by high and lower sustainable travel opportunity scenarios (trips and vehicle kilometres travelled (VKT)).

Figure 2.1 Sustainable travel opportunity in St Albans development zones (high scenario)



Sustainable travel opportunity

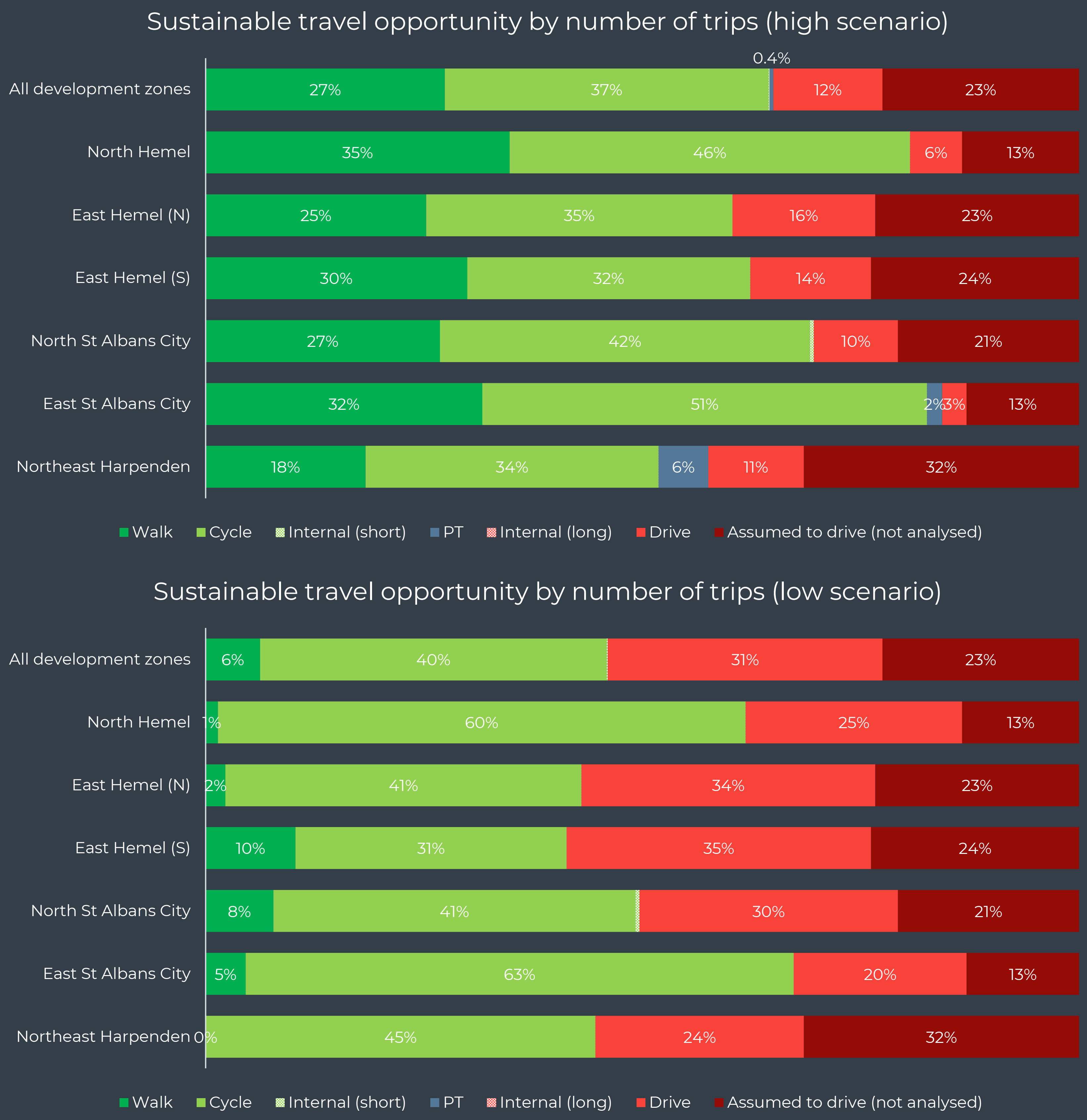
How many car trips in St Albans development zones could be made by sustainable modes?

Figure 2.2 shows the total sustainable travel opportunity by trips (high and lower scenarios) for the assessed developments across St Albans district and individually for each zone. Generally, the development zones with higher opportunity are the ones in closer proximity to more denser areas like Hemel Hempstead and St Albans City.

- All assessed development zones – opportunity is between 46-65%, with walking between 6-27%, cycling 37-40% and public transport less than 1%. This results in 35-54% of car trips that could not switch (including not analysed trips assumed to be driven).
- East St Albans City – opportunity is between 67-85% with walking being 5-32%, cycling 51-63% and public transport being up to 2%.
- North St Albans City – opportunity is between 50-70% with walking being 8-27%, cycling 41-42% and public transport less than 1%
- North Hemel – opportunity is between 62-81%, with walking 1-35%, cycling 46-60% and less than 1% for public transport.
- East Hemel – the northern development has 43-60% opportunity, with walking 2-25%, cycling 35-41% and less than 1% public transport. The southern development has 41-62% opportunity, with walking 10-30%, cycling 31-32% and less than 1% for public transport.
- Northeast Harpenden – opportunity is between 45-58%, with walking up to 18%, cycling 34-45% and up to 6% for public transport.

These areas are aligned to COMET zones and the trips are based on the 2031 O-D matrix which includes assumed future growth and development, but with existing sustainable transport provision. The intention is to provide a baseline on the number of future trips that could be made by sustainable modes – in the absence of any new provision.

Figure 2.2 Mode shift split (trips) by development (high scenario is top and lower scenario is bottom)



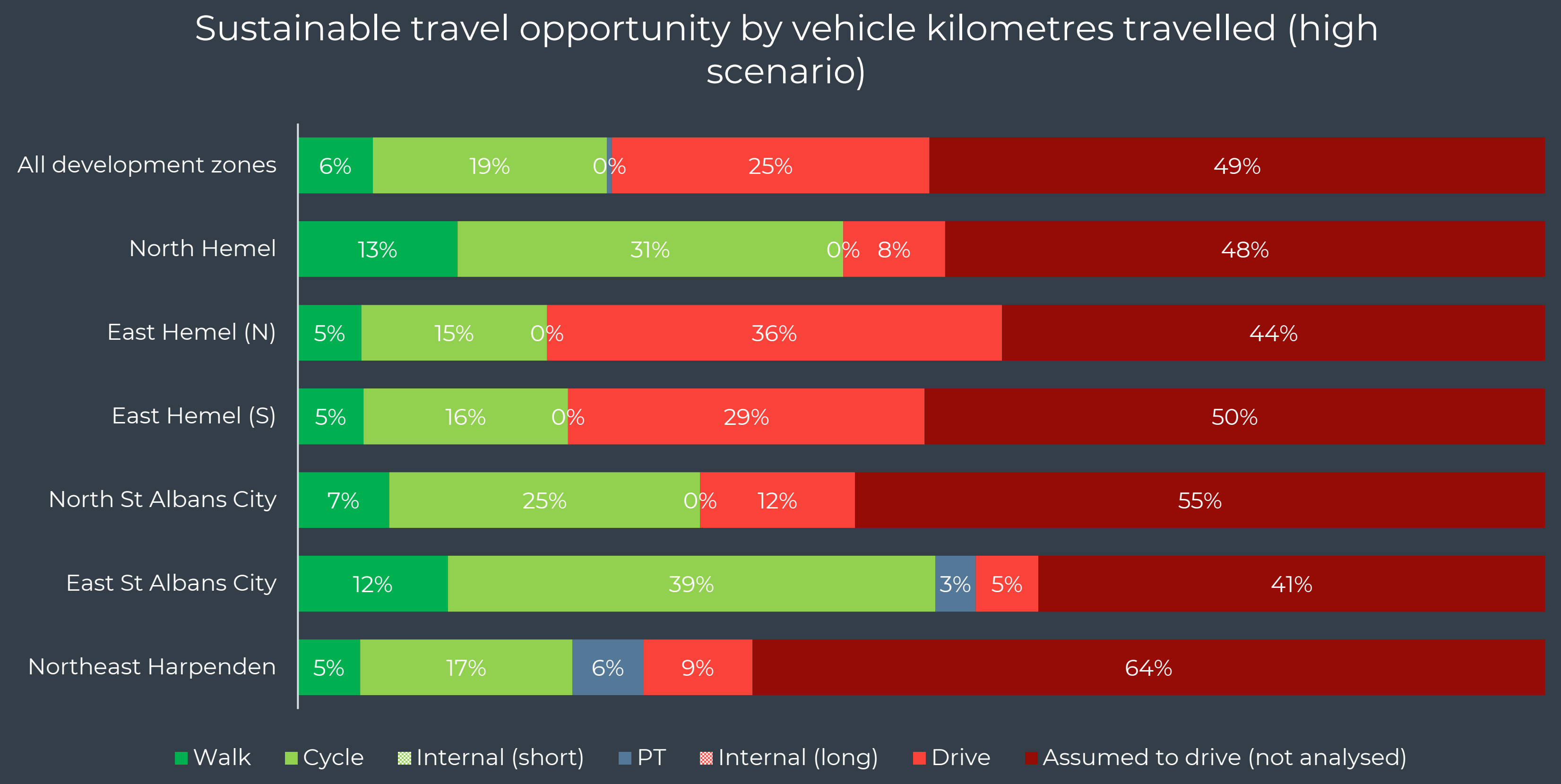
Sustainable travel opportunity

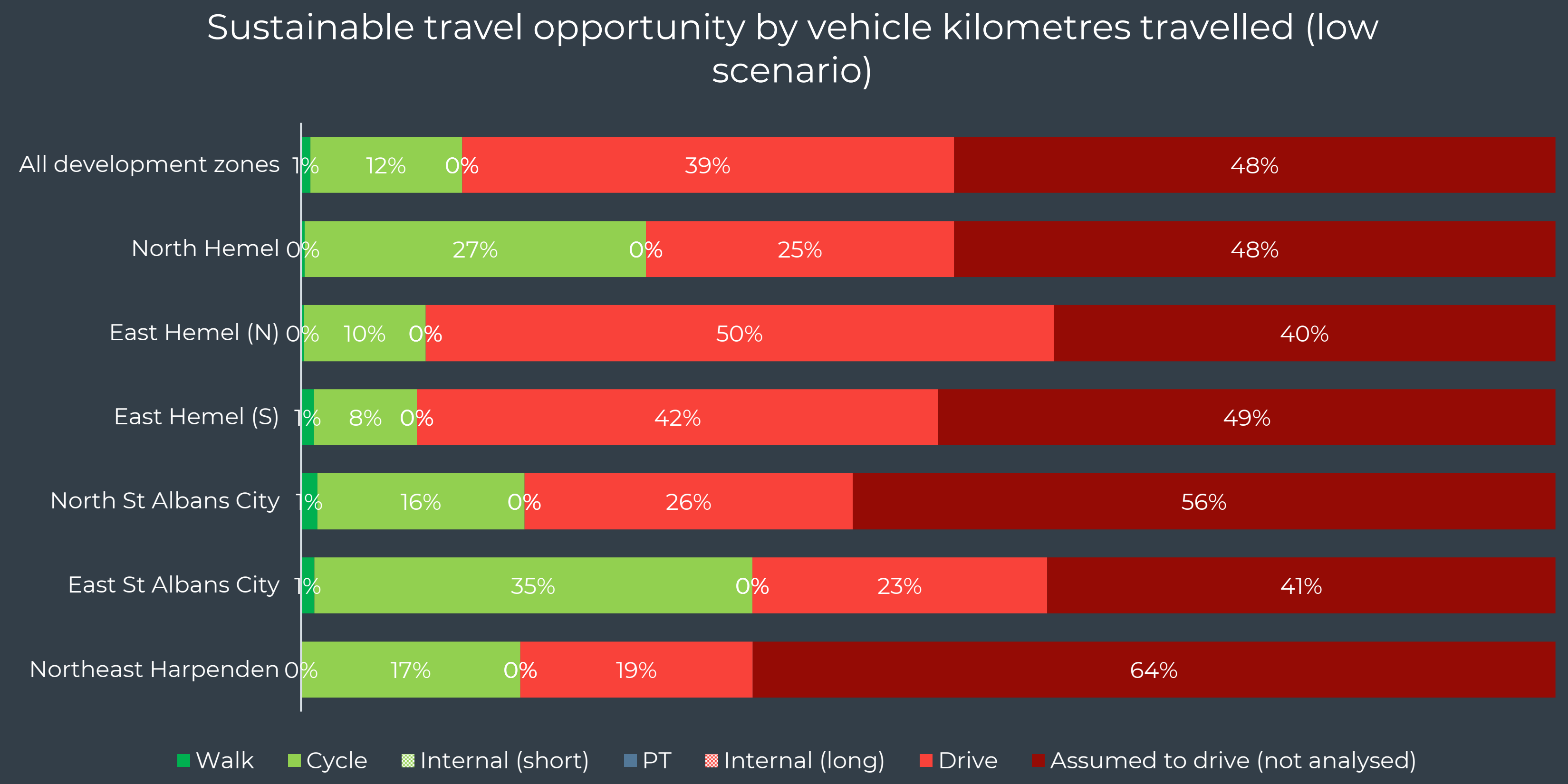
What is the sustainable travel opportunity by vehicle kilometres travelled (VKT)?

Figure 2.3 shows high and lower sustainable travel opportunity based on distance travelled. VKT (or people km) is important to consider as it highlights longer distance journeys, which typically have fewer trips, but can have a large effect on carbon emissions.

- All assessed development zones opportunity is between 13-25%, with walking being 1-6%, cycling 12-19% and public transport less than 1%. This results in 75-87% of car kilometres that could not switch (including not analysed trips assumed to be driven).
- East St Albans City opportunity is between 36-54% with walking at 1-12%, cycling at 35-39% and public transport up to 3%.
- North St Albans City – opportunity is between 18-32% with walking being 1-7%, cycling 16-25% and public transport less than 1%
- North Hemel opportunity is between 27-44% with walking up to 13%, cycling at 27-31% and less than 1% public transport.
- Northeast Harpenden opportunity is between 17-28% with walking up to 5%, cycling around 17% and up to 6% public transport.
- East Hemel (S) opportunity is between 9-22% with walking at 1-5%, cycling at 8-16% and less than 1% for public transport
- East Hemel (N) opportunity is between 10-20% with walking at up to 5%, cycling at 10-15% and less than 1% for public transport

Figure 2.3 Mode shift split (VKT) by new development (high scenario is top and lower scenario is bottom)





Sustainable travel opportunity

Walking, cycling and public transport opportunity in St Albans development zones

Figure 2.4 shows the number of trips that could be walked, cycled or taken by public transport while **Figure 2.6, 2.7 and 2.8** shows the proportion of trips that could be taken by each mode across the district.

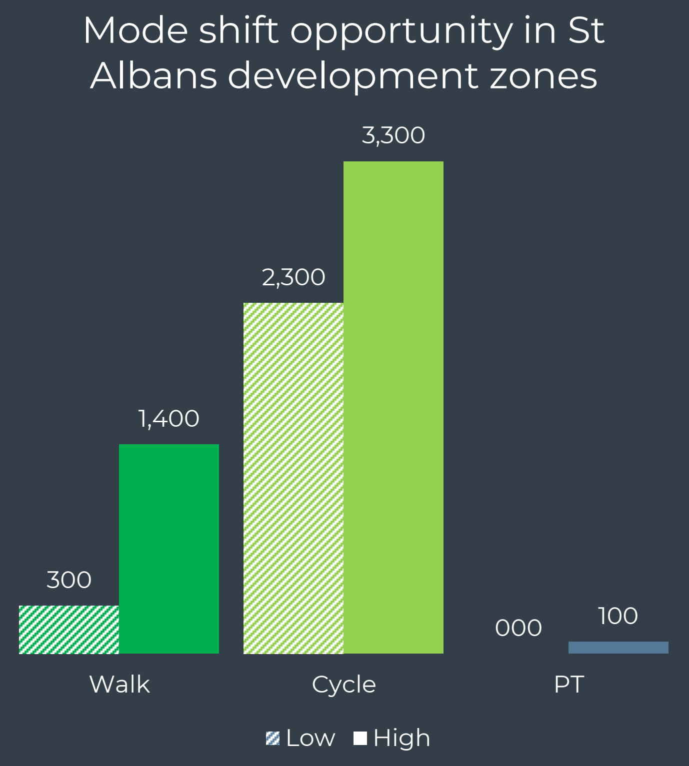
Key findings include:

- **Cycling** presents the greatest opportunity for mode shift with a range of 2,300 - 3,300 modelled car trips able to be cycled across the development zones. Generally, cycling opportunity is evenly distributed across the zones with no zone showing below 30% opportunity.
- **Walking** opportunity is higher is the zones closer to Hemel Hempstead such as North Hemel and East Hemel, followed by zones closer to St Albans such as North and East St Albans where journeys are likely to be smaller distances to nearby urban centres. 300-1,400 such trips are able to be walked.
- **Public transport** opportunity is less than 1% in most zones except East St Albans and Northeast Harpenden with 2% and 6 opportunity, respectively. In terms of daily trips this is between 0 - 100. However, this is based on existing public transport provision.

Figure 2.5 (overleaf) shows the number of trips able to be walked, cycled or taken by public transport across the St Albans development zones.

A detailed list of the range of trips with the opportunity to shift by mode table can be found in **Appendix B (Table B2)**.

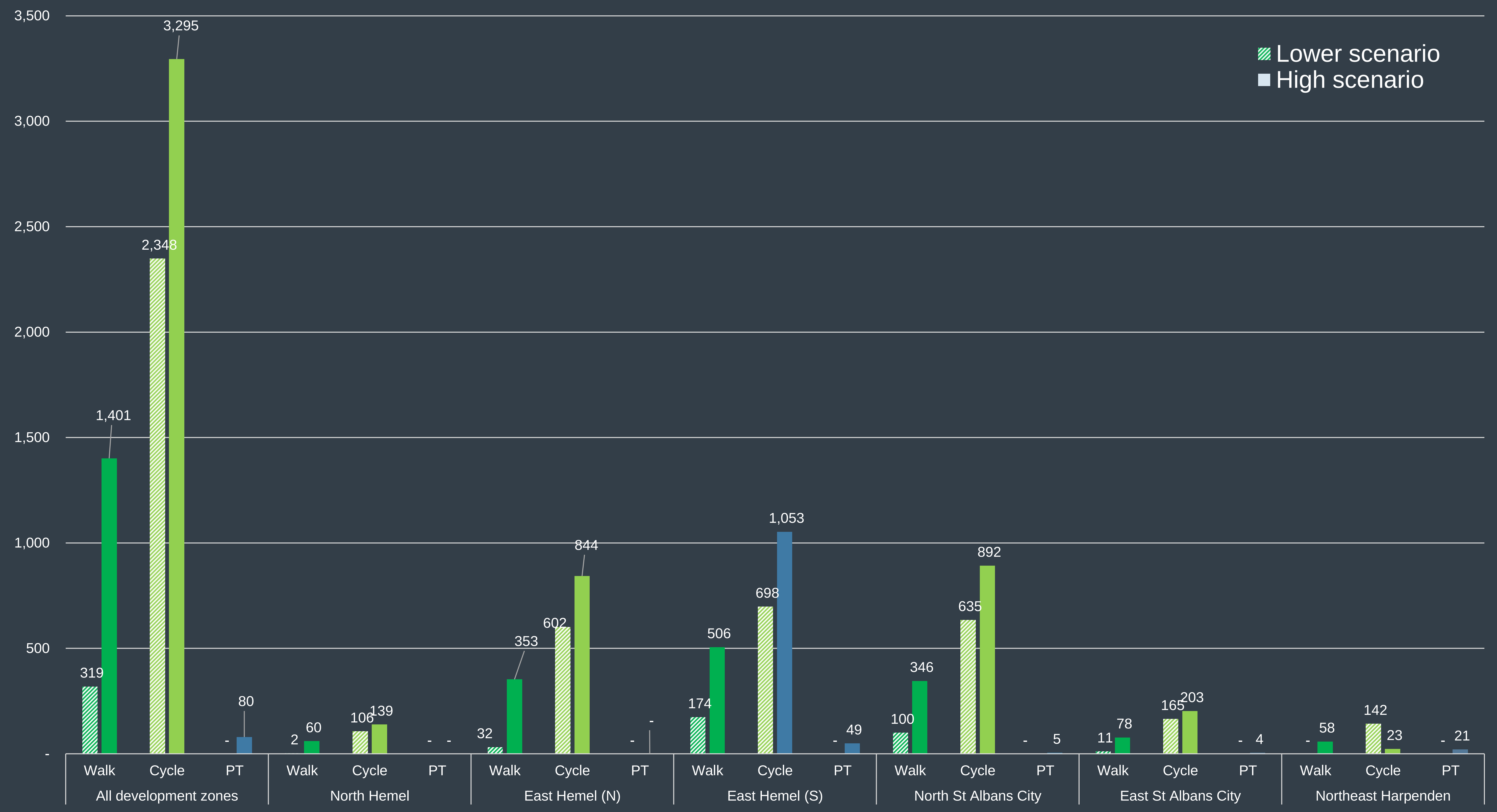
Figure 2.4 Range of trips with the opportunity to shift by mode (St Albans)



	Walking opportunity		Cycling opportunity		PT opportunity
	Main mode	First and last mile*	Main mode	First and last mile*	Main mode
Daily trips	300 - 1,400	0 - 100	2,300 - 3,300	0 - 100	0 - 100
Daily people km	400 - 3,000	0 - 100	6,700 - 12,600	0 - 100	0 - 600

* Linked to public transport trips

Figure 2.5 Mode shift split (trips) in new development zones under high and lower sustainable travel opportunity scenarios



Sustainable travel opportunity

Walking opportunity in St Albans development zones

Figure 2.6 sets out the opportunity to walk for the new development zones in St Albans district (high scenario).

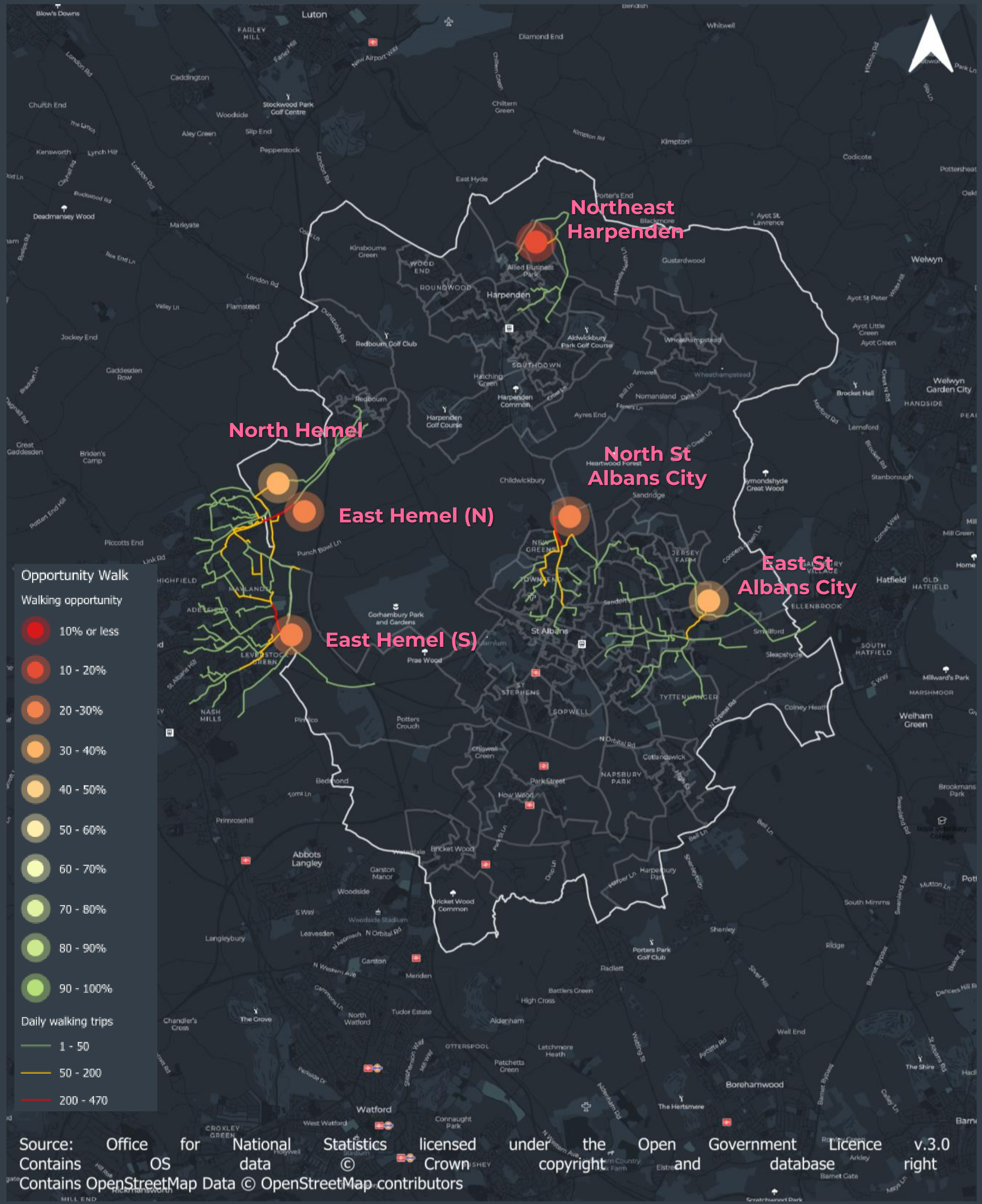
Walking opportunity varies across the six developments, with zones closer to Hemel Hempstead and St Albans City showing higher opportunity.

In the high scenario, walking opportunity is highest in North Hemel with 35% opportunity and routes connecting to Hemel Hempstead having a high trip opportunity between 50-470 trips. Some walking opportunity is also observed from North Hemel to Redbourn with up to 50 trips. However, in the lower scenario – walking opportunity is only 1% which shows that most of the car trips that could switch to walking are between 1-2 miles and only a small number of trips from this zone under 1 mile.

Northeast Harpenden (0-18%) and East Hemel (N) (2-25%) also have a large range for walking opportunity, and a particularly low opportunity for walking in the lower scenario, showing that there are limited number of modelled car trips under 1 mile.

East St Albans City (5-32%), North St Albans City (8-27%) and East Hemel (S) (10-30%) have a higher proportion of modelled car trips under 1 mile, due to their proximity to denser areas such as St Albans City and Hemel Hempstead.

Figure 2.6 Walking opportunity in St Albans (high scenario)



Sustainable travel opportunity

Cycling opportunity in St Albans development zones

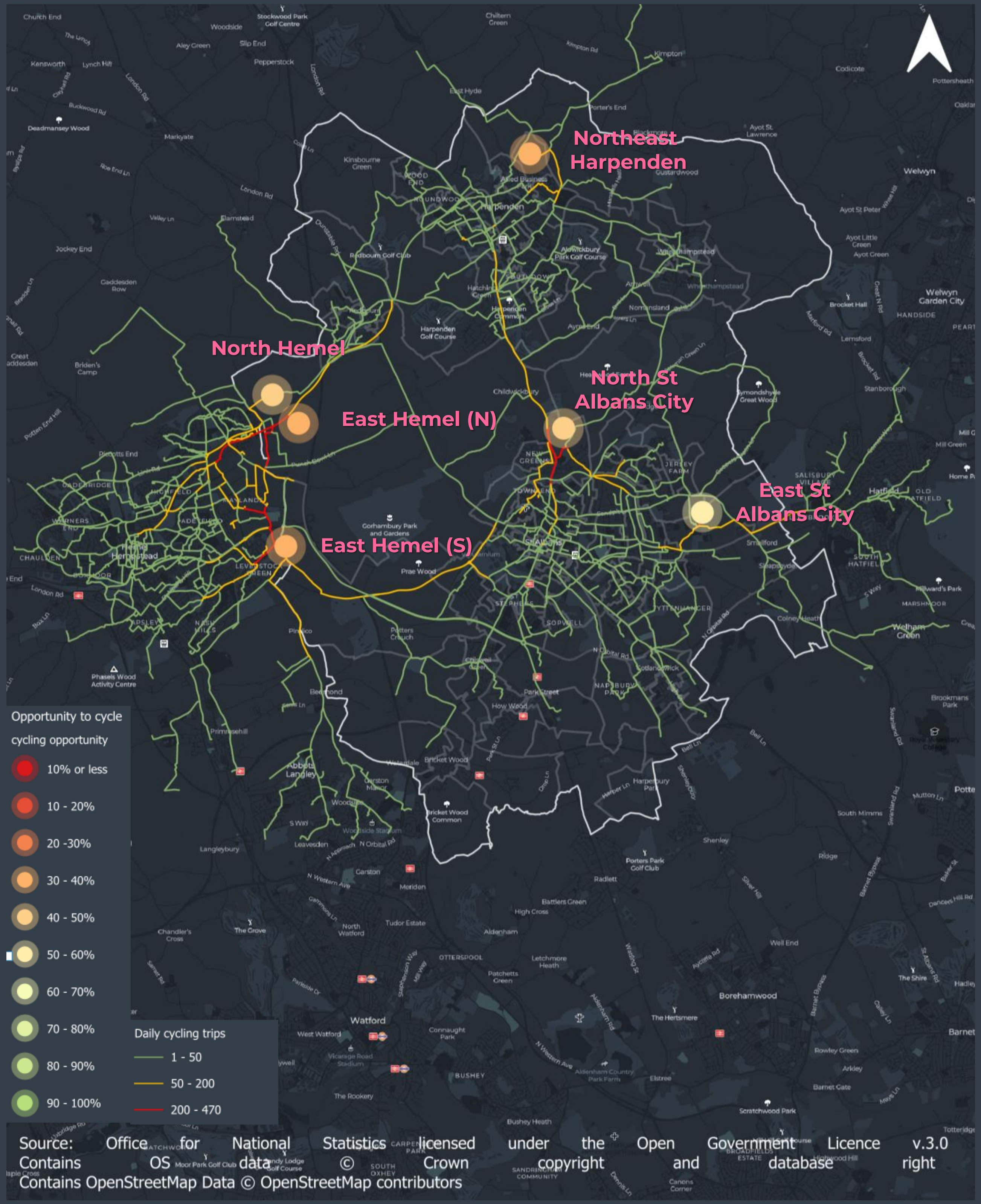
Figure 2.7 sets out the opportunity to cycle for the new development zones in St Albans district (high scenario).

Cycling opportunities across the six developments are higher than walking. The highest opportunity exists in North Hemel, with 46-60% of modelled car trips that could switch to cycling. Perhaps unintuitively, the higher end of the range relates to the lower mode shift scenario here. This is due to trip distance thresholds between walking and cycling, with car trips more than 1 mile not able to switch to walking in the lower scenario, but still able to be cycled. Whereas, in the high scenario, car trips up to 2 miles can be walked – subsequently, reducing the cycling opportunity. This also happens for East Hemel (N), East St Albans City and Northeast Harpenden.

East St Albans City has the second highest cycling opportunity with 51-63% of car trips that could switch to cycling. East Hemel (S) has the lowest opportunity with 31-32%.

Cycling opportunities extend beyond the town centres with 50-200 car trips that could switch to cycling on routes connecting the three denser areas of St Albans City, Hemel Hempstead and Harpenden).

Figure 2.7 Cycling opportunity in St Albans (high scenario)



Sustainable travel opportunity

Public transport opportunity in St Albans development zones

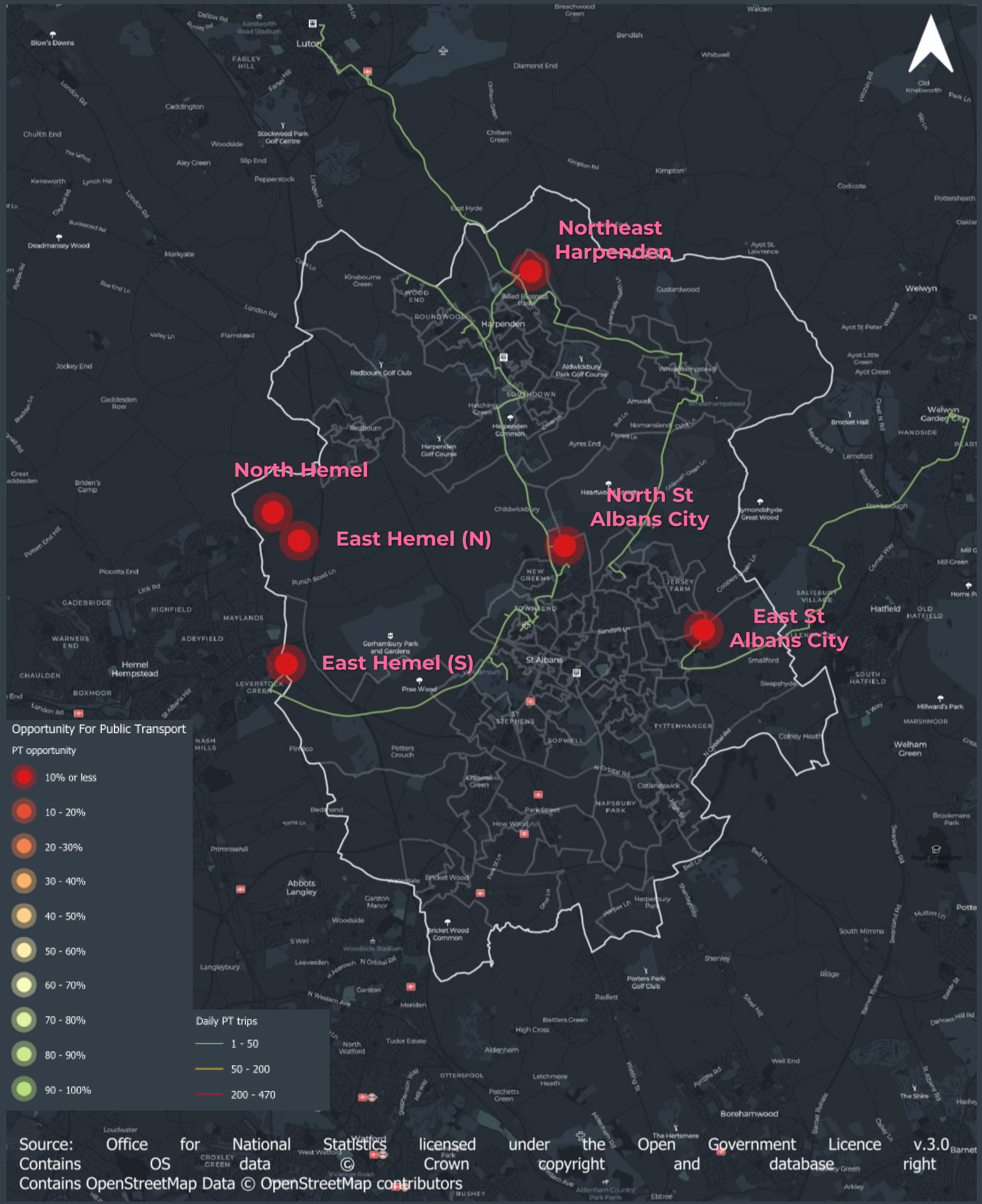
Figure 2.8 sets out the opportunity to use public transport for the new development zones in the St Albans district (high scenario).

Public transport opportunity is very low across the development zones. Northeast Harpenden has some public transport opportunities (up to 6%) with routes to St Albans City (via trains and buses along the A1081) and Luton. East St Albans City also has some opportunities (up to 2%) in public transport opportunity due to connectivity with Welwyn Garden City.

North and East Hemel (N) do not currently have any public transport opportunities and lack connections to Hemel Hempstead. There is an observed public transport connection to St Albans City from East Hemel (South), but very limited opportunity (less than 1%).

However, it should be stressed that this analysis is based on current public transport provision and does not assume any additional infrastructure or services which in reality is unlikely.

Figure 2.8 Public transport opportunity in St Albans (high scenario)



PART 2B

Sustainable travel propensity for new developments

Sustainable travel propensity

Proportion of household

Table 2.1 sets out the proportion of households for St Albans district and the new developments compared to the England average.

This analysis highlights the differences in existing demographics and lifestyles between St Albans district and the new developments, and the England average across various categories.

In England, the proportions of households in each Mosaic Group are relatively evenly spread, with Aspiring Homemakers having the highest proportion at 11% and Modest Traditions having the lowest at 4%.

In St Albans development zones, the proportions of households in each Mosaic Group are different, as they are expected to attract more Aspiring Homemakers, Domestic Success and Rental Hubs households. The Mosaic profiles are based on the existing development of Oaklands in St Albans district, proposed housing types (e.g. affordable, social and rental) and validated using similar developments in the wider region.

The dominant Mosaic Group within the new development zones is assumed to be Domestic Success, representing 60% of households. These households typically have a greater propensity to drive and lower propensity to use sustainable modes than the England average, due to higher incomes, larger dwellings and higher levels of car ownership. Aspiring Homemakers make up 15% of households and have similar propensities to Domestic Success.

Rental Hubs make up 15% of households which typically have a greater propensity to use sustainable modes and a lower propensity to drive than the England average. Prestige Positions make up 10% and these households have a lower propensity to travel in general, with rail and driving propensity just under the England average and lower propensities for walk, cycle and bus.

Table 2.1 Proportion of households in each Mosaic Group in St Albans, its new developments and England

Mosaic Group		St Albans district	New developments	Hemel Hempstead	England average
A	City Prosperity	14%	-	0%	5%
B	Prestige Positions	33%	10%	7%	7%
C	Country Living	1%	-	0%	7%
D	Rural Reality	0%	-	0%	6%
E	Senior Security	4%	-	4%	8%
F	Suburban Stability	1%	-	7%	5%
G	Domestic Success	29%	60%	13%	9%
H	Aspiring Homemakers	5%	15%	21%	11%
I	Family Basics	4%	-	17%	9%
J	Transient Renters	0%	-	4%	6%
K	Municipal Challenge	0%	-	2%	6%
L	Vintage Value	1%	-	6%	6%
M	Modest Traditions	0%	-	3%	4%
N	Urban Cohesion	1%	-	3%	6%
O	Rental Hubs	7%	15%	14%	8%

Sustainable travel propensity

Average mode propensity

Table 2.2 sets out the average mode propensity (i.e. average of all trip types) based on expected socio-demographics for St Albans district development zones compared to the England average (which is 100). A score greater than 100 suggests a higher than England average propensity to use that mode, while a value below 100 suggests the opposite.

In general, based on the expected socio-demographics of new residents, the **St Albans development zones are relatively car-dependent**, with the zones having greater than the England average drive propensity of 100, and propensities to take sustainable modes being less than average.

The propensity to take sustainable modes in St Albans development zones is below the English average with all corresponding propensity scores being below 100 :

- Walking – 80
- Cycling – 80
- Bus – 72
- Rail – 87

More information on Mosaic Groups and Mobility Insights survey and how this feeds into propensities can be found in the methodology note.

Table 2.2 Average propensity for walking, cycling, using bus, using rail and driving (all journey purposes)

Propensity	England average	Hemel Hempstead	St Albans district	New developments
Walk	100	95	91	80
Cycle	100	98	88	80
Bus	100	91	85	72
Rail	100	91	106	87
Drive	100	105	100	104

PART 2C

Sustainable travel potential for new developments

Sustainable travel potential

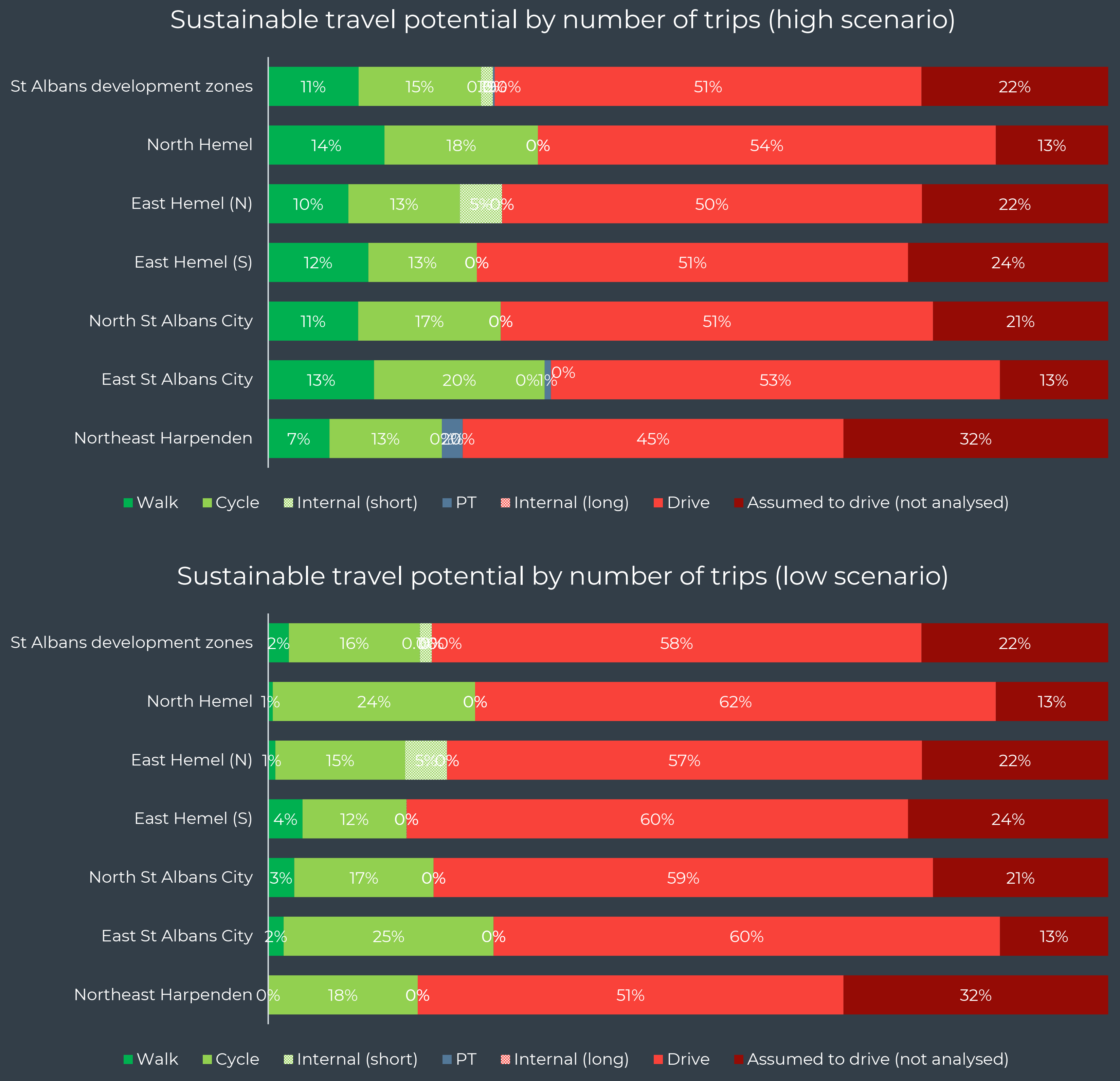
What is the likely sustainable travel potential for the new developments?

Figure 2.9 shows high and lower sustainable travel potential for trips, based on existing provision and expected socio-demographics:

- St Albans development zones – potential is between 19-27% with walking being 2-11%, cycling 15-16% (including short internal trips) and public transport less than 1%. About 73-81% of car trips would not switch (including not analysed trips assumed to be driven)
- East St Albans & North St Albans – potential is highest in East St Albans City at 27-34%, walking being 2-13%, cycling at 20-25% and public transport up to 1%. In North St Albans City, the potential is between 20-28% with 3-11% walking and cycling around 17%. Public transport potential is less than 1%.
- North Hemel & East Hemel – potential is between 25-32% in North Hemel, with walking being 1-14% and cycling at 18-24%. In East Hemel, potential is higher in the northern development with between 21-28% (1-10% walking and 13-15% cycling), compared to 16-25% (4-12% walking and 12-13$ cycling) in the southern development. All Hemel developments have less than 1% potential for public transport.
- Northeast Harpenden – potential is lowest at 18-23%, with walking up to 7%, cycling 13-18% and public transport up to 2%.

This data indicates limited potential to use public transport, suggesting that the current public transport network needs to be improved to ensure that the new developments are better served by public transport.

Figure 2.9 Sustainable travel potential by number trips for high (top) and lower (bottom) scenarios



Walking potential

Up to **11%** of trips across the new developments could be made by walking as the main mode.

North Hemel	Main mode
Daily trips	Less than 50
Daily people km	Up to 100

East Hemel (North)	Main mode
Daily trips	Up to 100
Daily people km	100 - 300

East Hemel (South)	Main mode
Daily trips	100 – 200
Daily people km	100 - 400

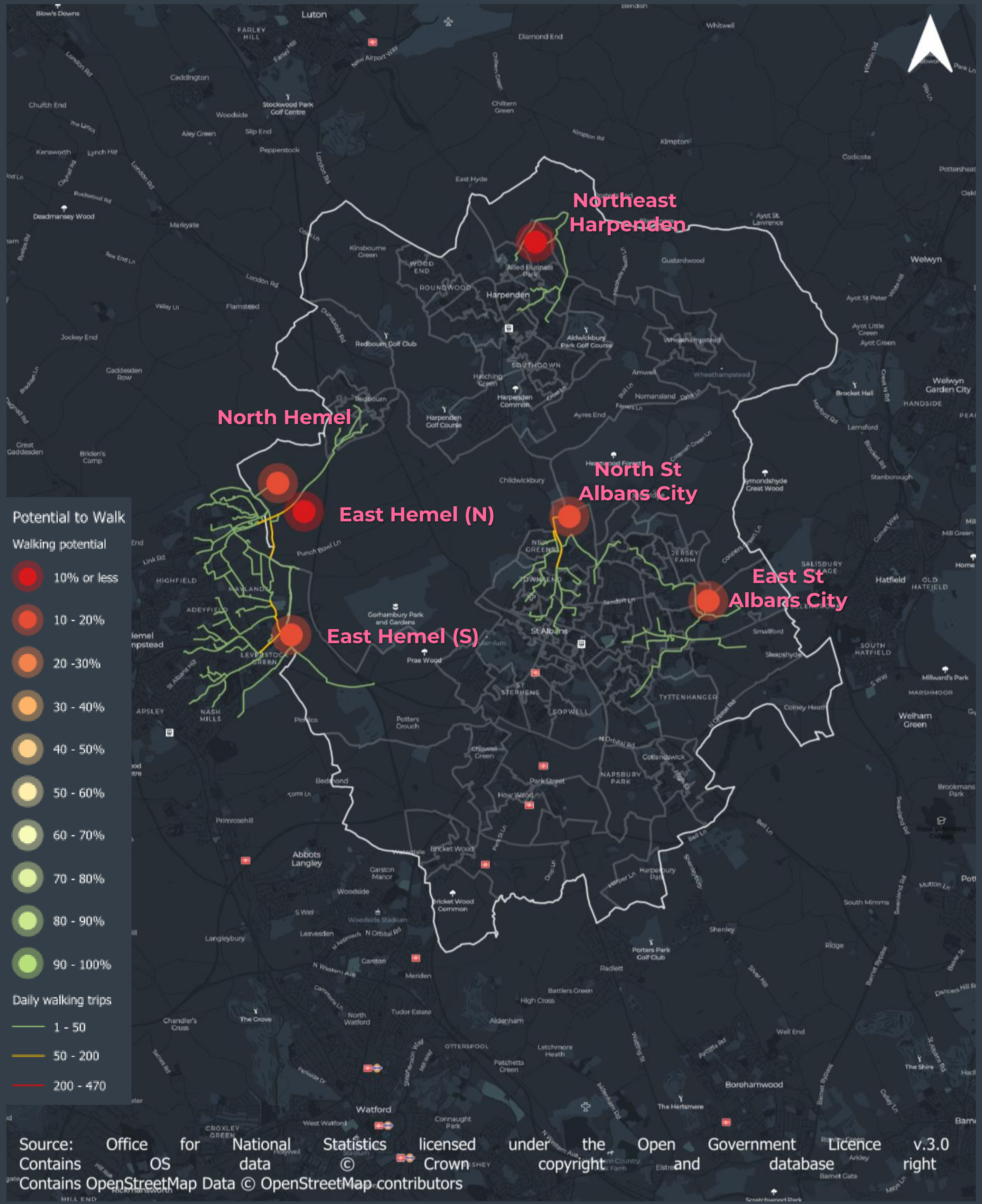
North St Albans City	Main mode
Daily trips	Up to 100
Daily people km	100 - 300

East St Albans City	Main mode
Daily trips	Less than 50
Daily people km	Up to 100

Northeast Harpenden	Main mode
Daily trips	Less than 50
Daily people km	Up to 100

Note – given the limited public transport potential, there is limited potential for additional walk trips through first/last mile to public transport stops.

Figure 2.10 Walking potential in St Albans district (high scenario)



Cycling potential

Up to **16%** of trips across the new developments could be made by cycling as the main mode

North Hemel	Main mode
Daily trips	Up to 100
Daily people km	100 - 200

East Hemel (North)	Main mode
Daily trips	200 – 300
Daily people km	700 – 1,300

East Hemel (South)	Main mode
Daily trips	300 – 400
Daily people km	700 – 1,600

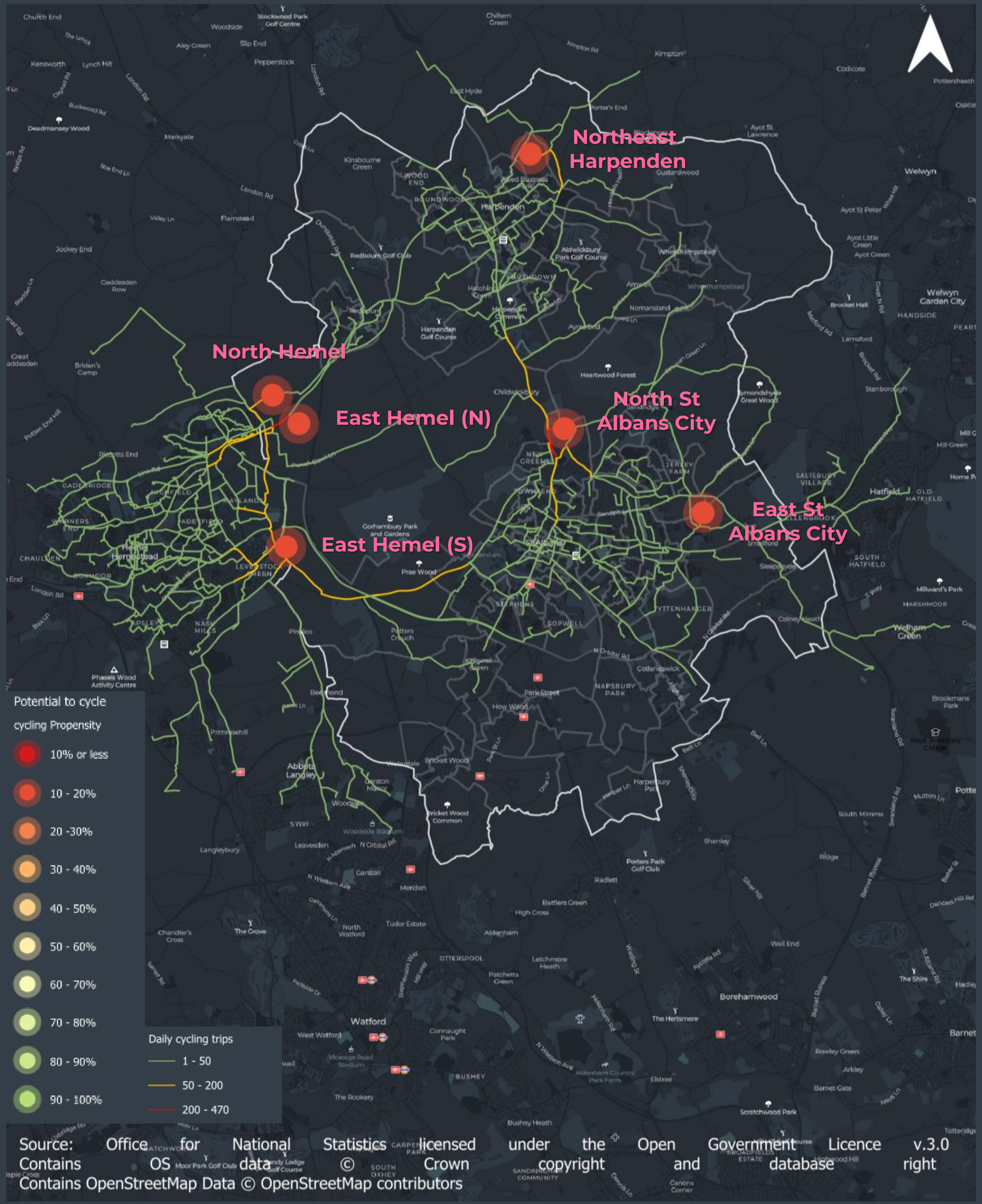
North St Albans City	Main mode
Daily trips	300 - 400
Daily people km	700 – 1,400

East St Albans City	Main mode
Daily trips	Around 100
Daily people km	200 – 300

Northeast Harpenden	Main mode
Daily trips	Around 100
Daily people km	Around 200

Note – given the limited public transport potential, there is limited potential for additional cycle trips through first/last mile to public transport stops.

Figure 2.11 Cycling potential in St Albans (high scenario)



Public transport potential

Less than **1%** of trips across the new developments, 2% in Northeast Harpenden and 1% in East St Albans could be made by public transport as the main mode (based on existing provision)

North Hemel	Main mode
Daily trips	Less than 50
Daily people km	Less than 50

East Hemel (North)	Main mode
Daily trips	Less than 50
Daily people km	Less than 50

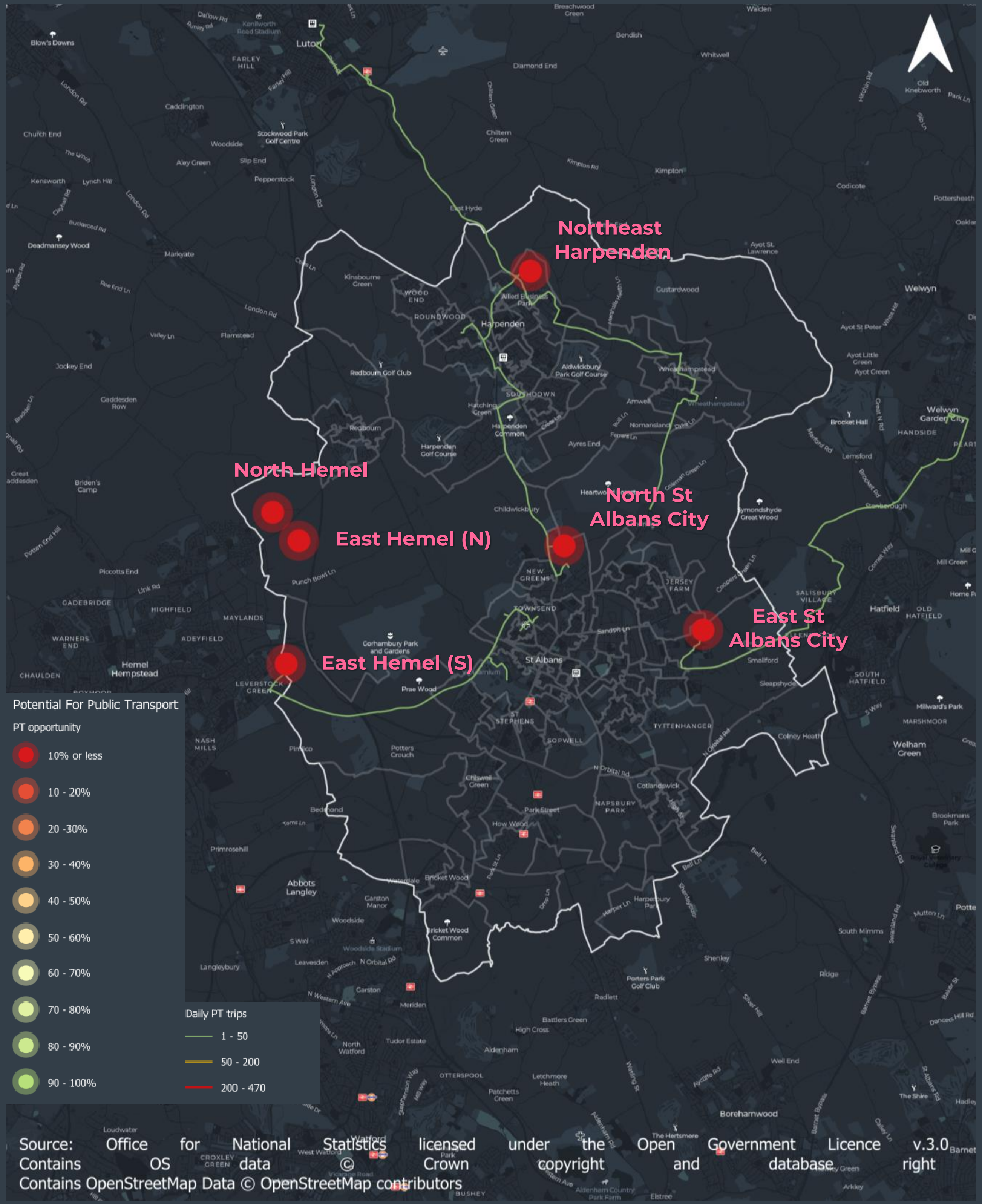
East Hemel (South)	Main mode
Daily trips	Less than 50
Daily people km	Up to 100

North St Albans City	Main mode
Daily trips	Less than 50
Daily people km	Less than 50

East St Albans City	Main mode
Daily trips	Less than 50
Daily people km	Less than 50

Northeast Harpenden	Main mode
Daily trips	Less than 50
Daily people km	Up to 100

Figure 2.12 Public transport potential in St Albans (high scenario)



Summary

Sustainable travel opportunity

Sustainable travel opportunity is the proportion of car trips that could be switched to walking, cycling or public transport based on distance and time criteria.

Based on assumed growth but existing active travel and public transport networks and services:

- Up to 65% of modelled car trips across the assessed St Albans district development zones have the opportunity to switch to sustainable modes.
- Cycling provides the highest opportunity, with up to 40% of car trips able to be cycled across the development zones.
- Up to 27% of modelled car trips could switch to walking
- Less than 1% could switch to public transport.

Sustainable travel propensity

Sustainable travel propensity is the likelihood of using a mode based on the projected socio-demographics and lifestyles of the new development residents.

Based on existing developments, and likely housing proportions, it is expected that St Albans development zone residents will have below average propensities for walking, cycling and bus, but above average propensity for rail and drive, compared to the England average.

The projected dominant Mosaic Group within the new development zones is Domestic Success, representing 60% of the households. This group is more likely to be car-dependent, as they have higher incomes, larger dwellings and more car ownership.

The propensities for walking, cycling, bus and rail in the new development zones are 80, 80, 72 and 87 respectively, while the propensity for drive is 104, based on a scale where the England average is 100.

It is worth noting that propensities can change if sustainable travel options are improved.

Sustainable travel potential

Sustainable travel potential is the combination of opportunity and propensity, indicating the realistic mode shift potential for the new development zones.

Based on assumed growth but existing active travel and public transport networks and services, and expected socio-demographics and travel behaviours:

- Up to 27% of modelled car trips across the assessed St Albans district development zones have the potential to switch to sustainable modes.
- Cycling provides the highest potential, with up to 24% of car trips that have the potential to be cycled across the development zones.
- Up to 14% of modelled car trips have the potential to switch to walking
- Less than 1% would switch to public transport.

Note – not all new developments in St Albans district have been assessed but the findings here can be used to estimate the likely opportunity and potential in other development areas.

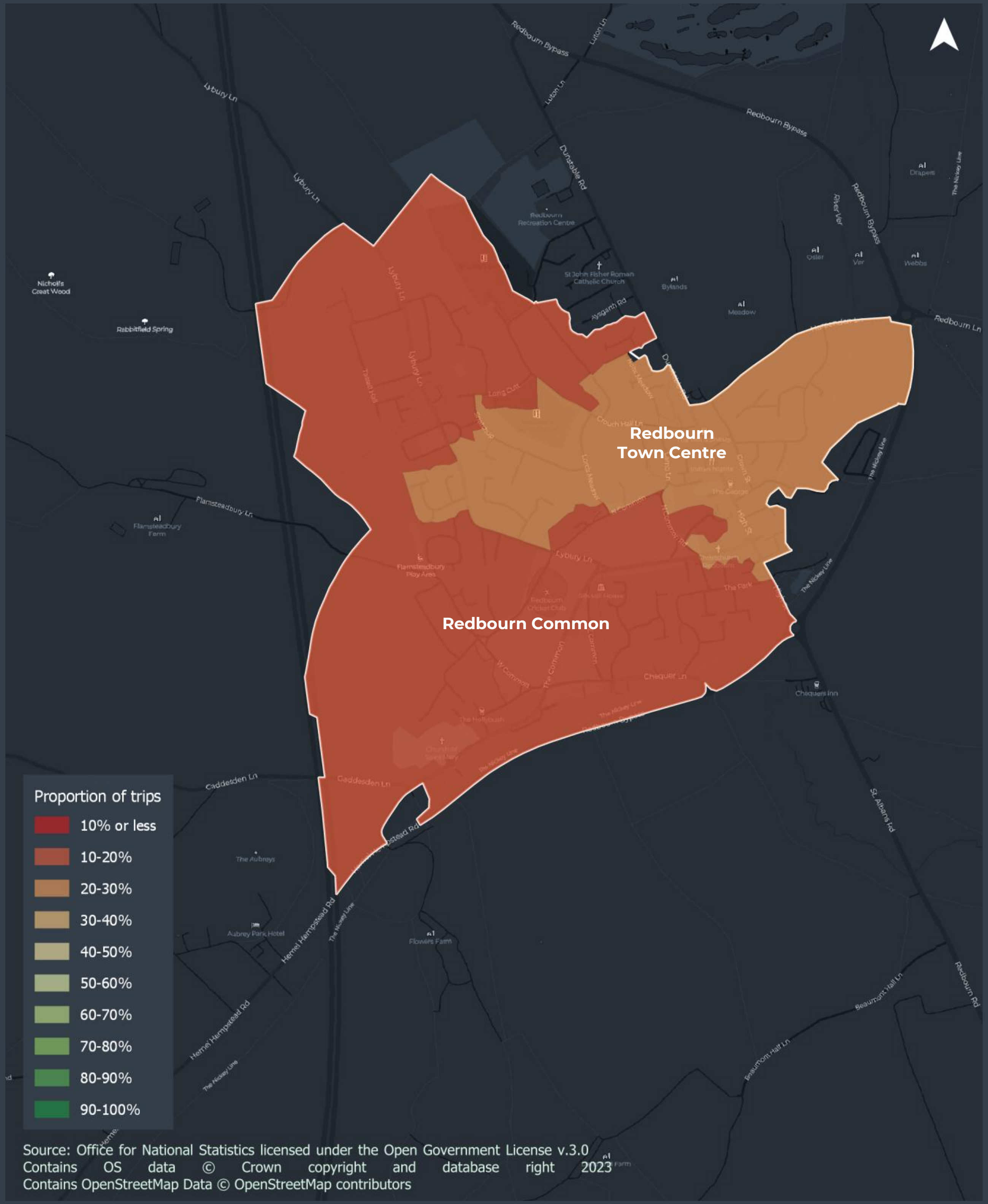
For example, for the new development proposed in West Redbourn – it is likely that this development would have lower mode shift opportunity and potential given it is further away from denser areas such as St Albans City, Hemel Hempstead and Harpenden.

APPENDIX A

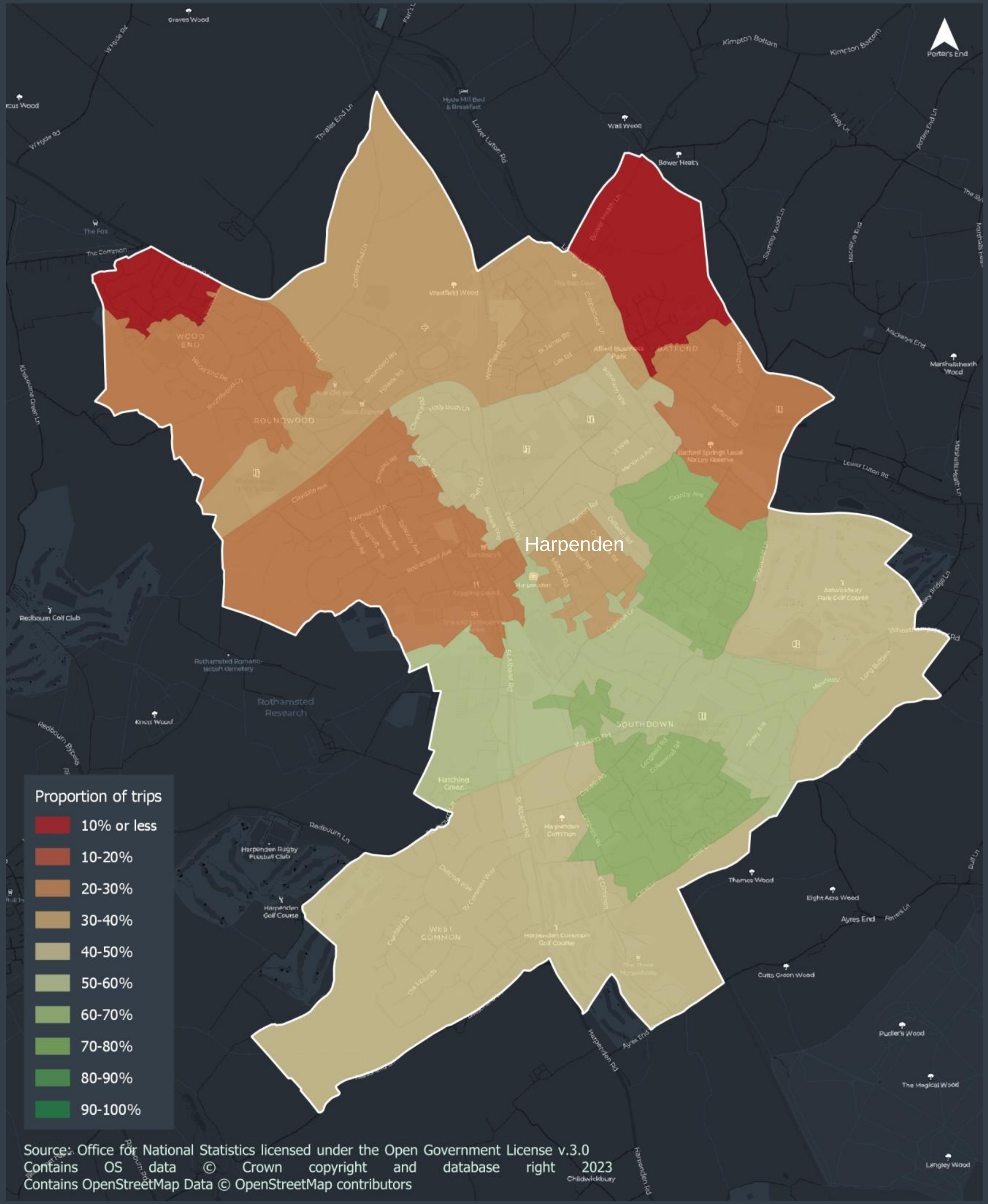
Breakdown of sustainable travel opportunity for existing communities

Walking opportunity

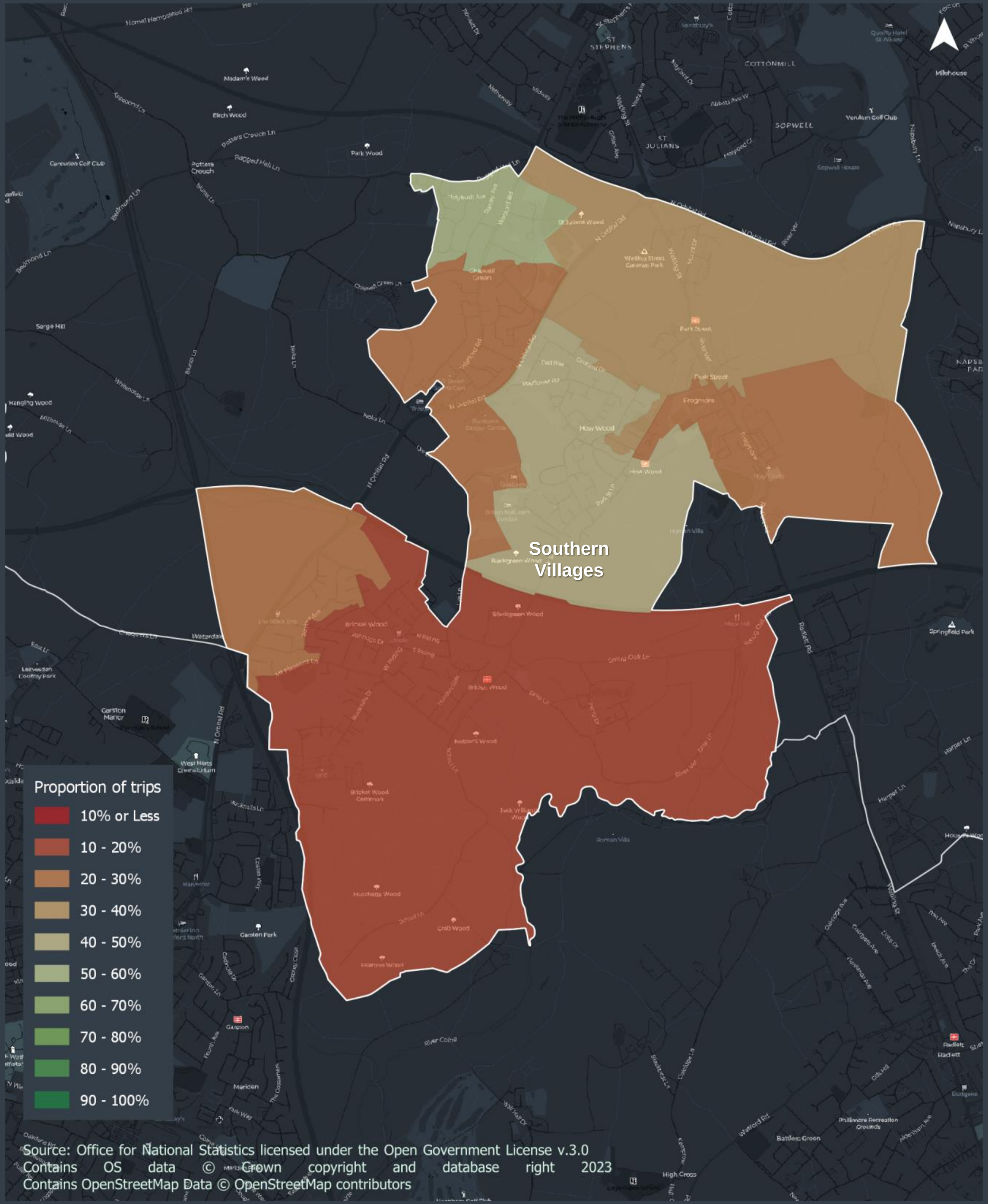
Appendix A1 Walking opportunity in Redbourn



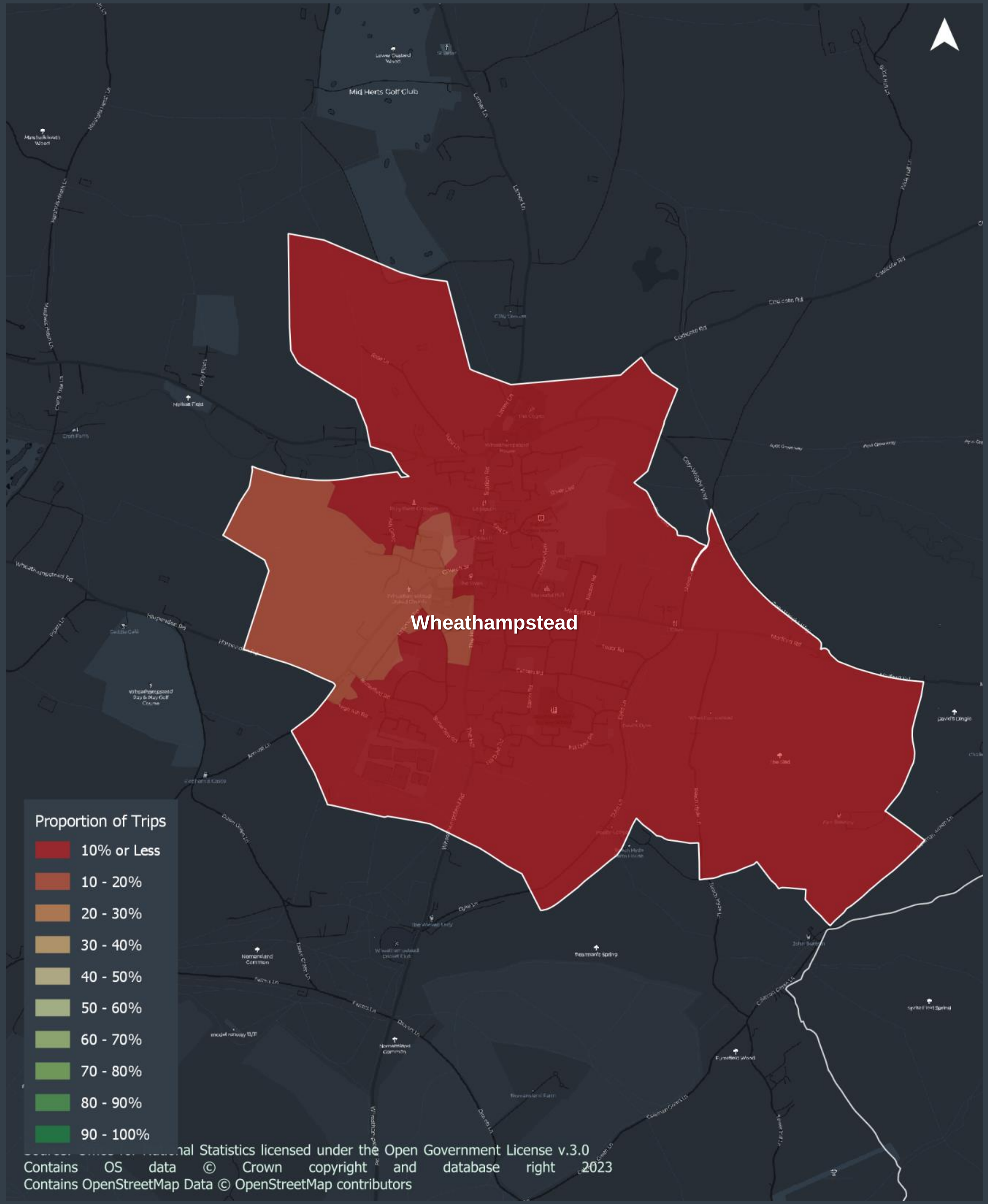
Appendix A2 Walking opportunity in Harpenden



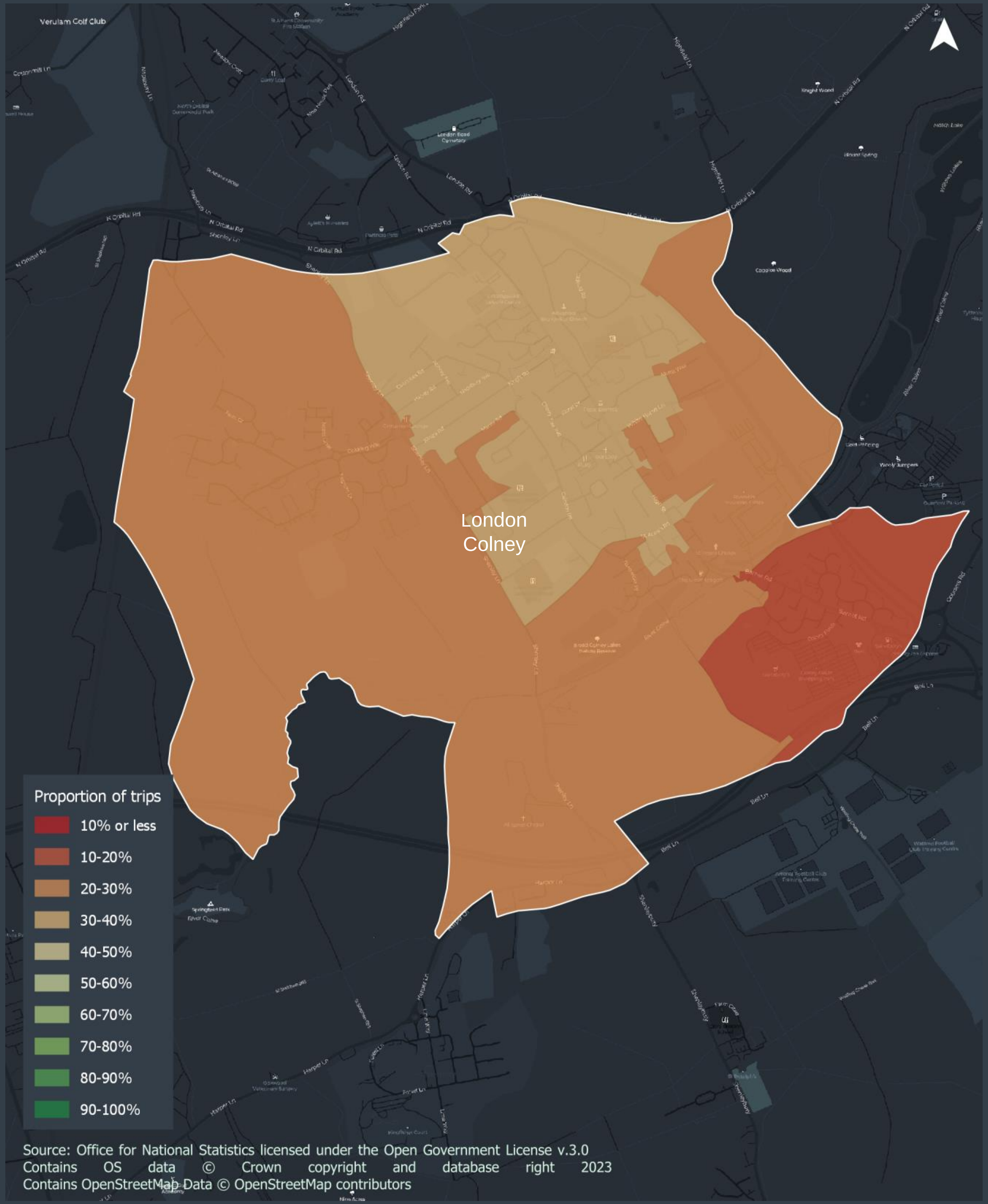
Appendix A3 Walking opportunity in Southern Villages



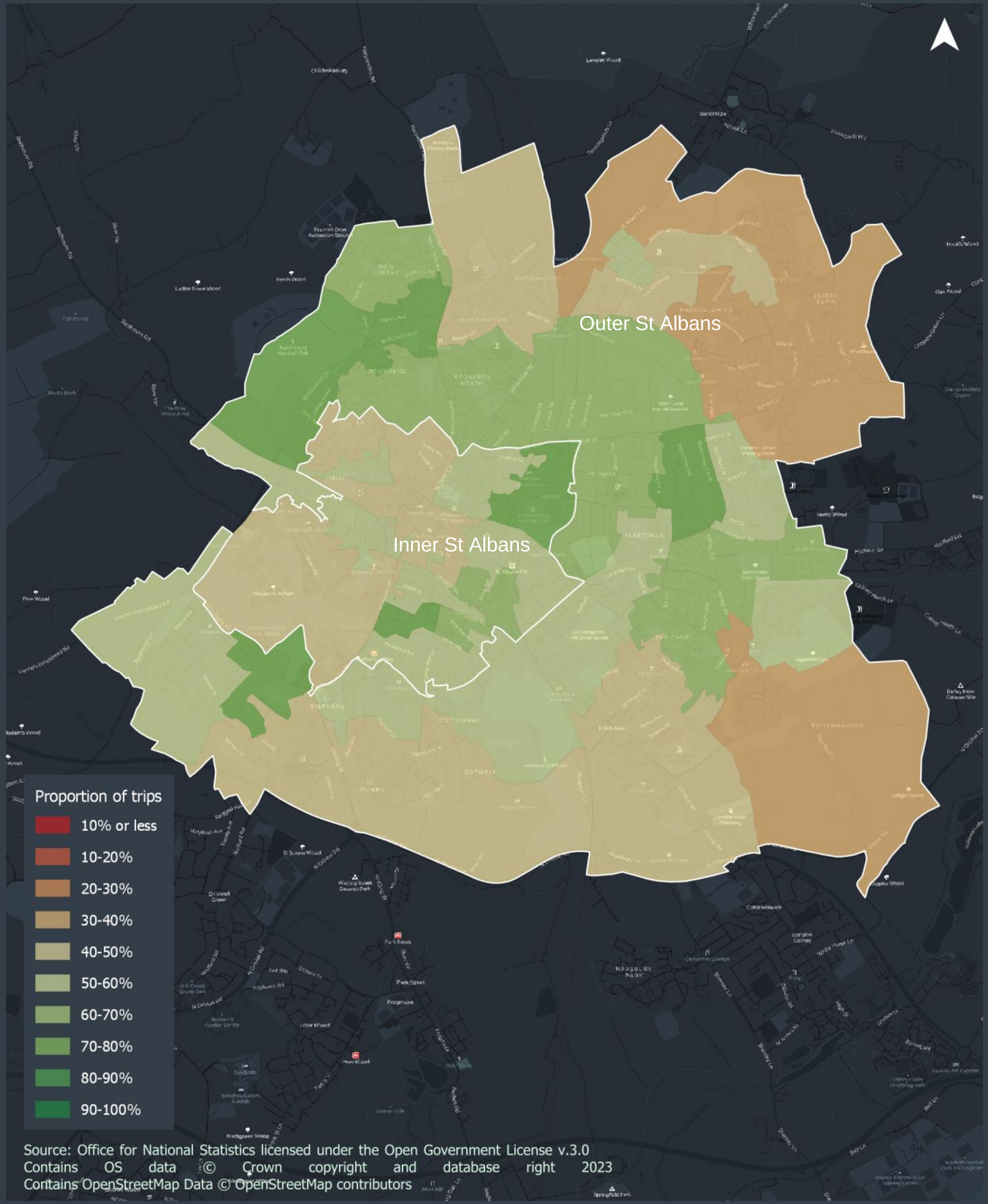
Appendix A4 Walking opportunity in Wheathampstead



Appendix A5 Walking opportunity in London Colney

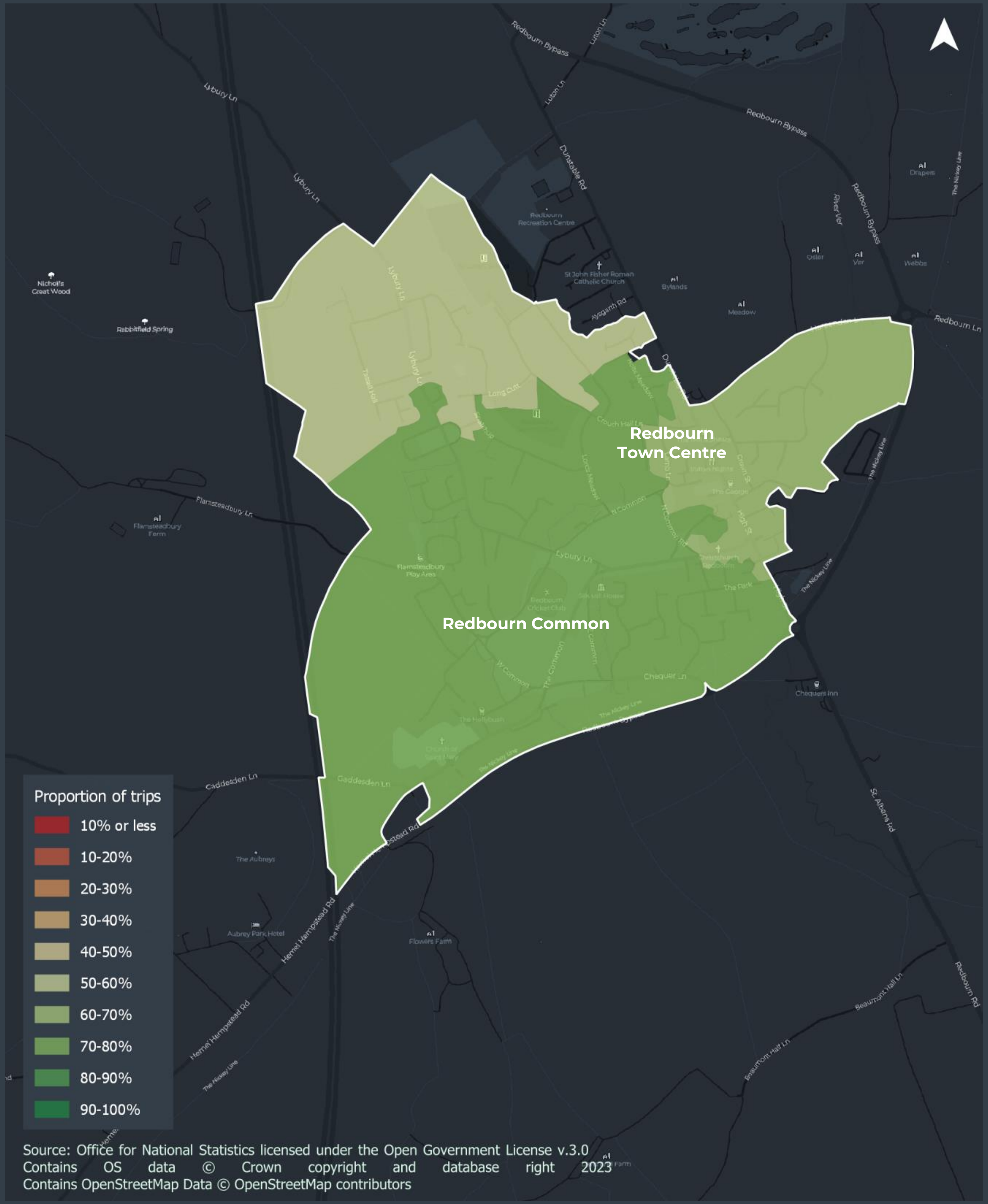


Appendix A6 Walking opportunity in Inner & Outer St Albans

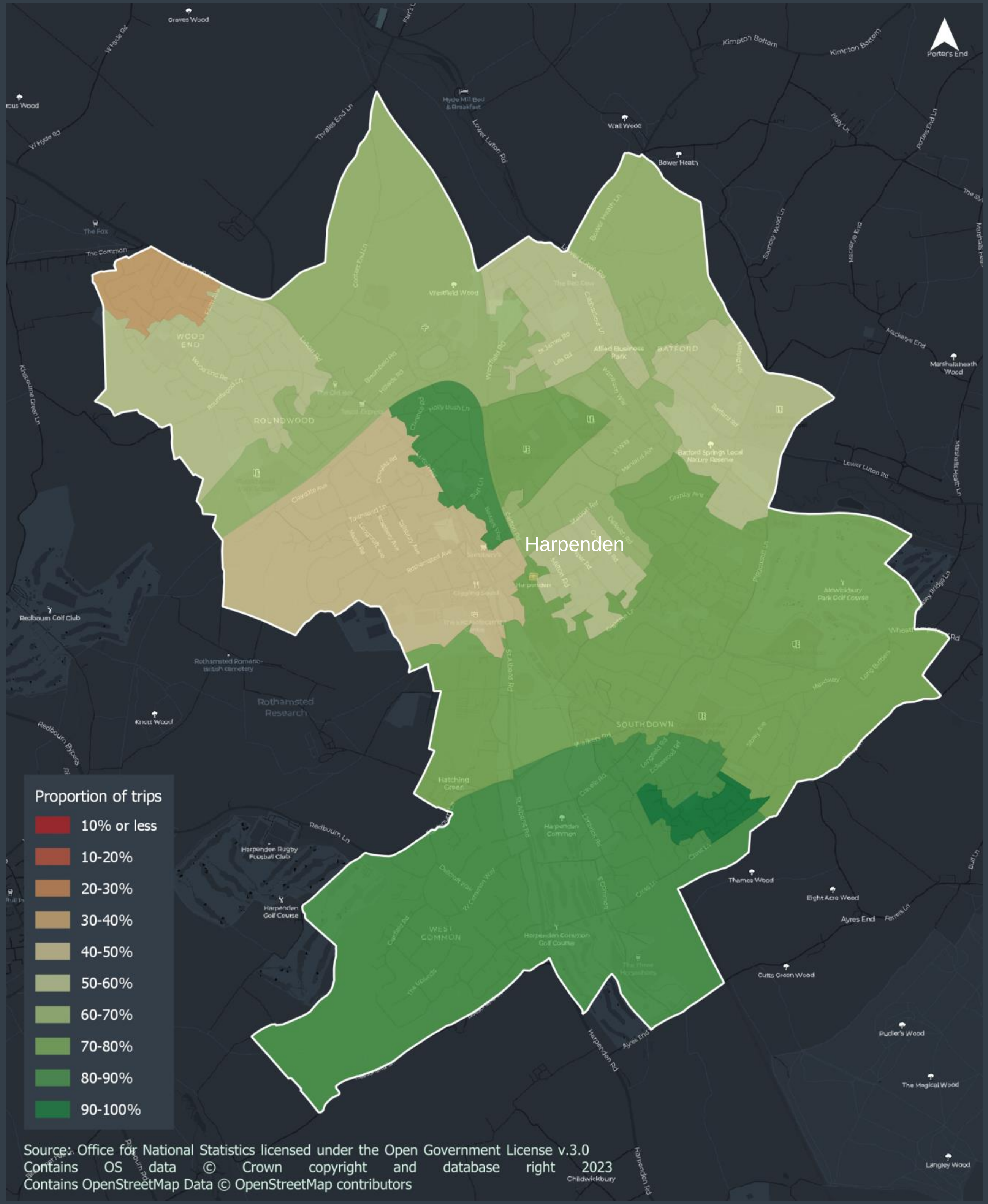


Cycling opportunity

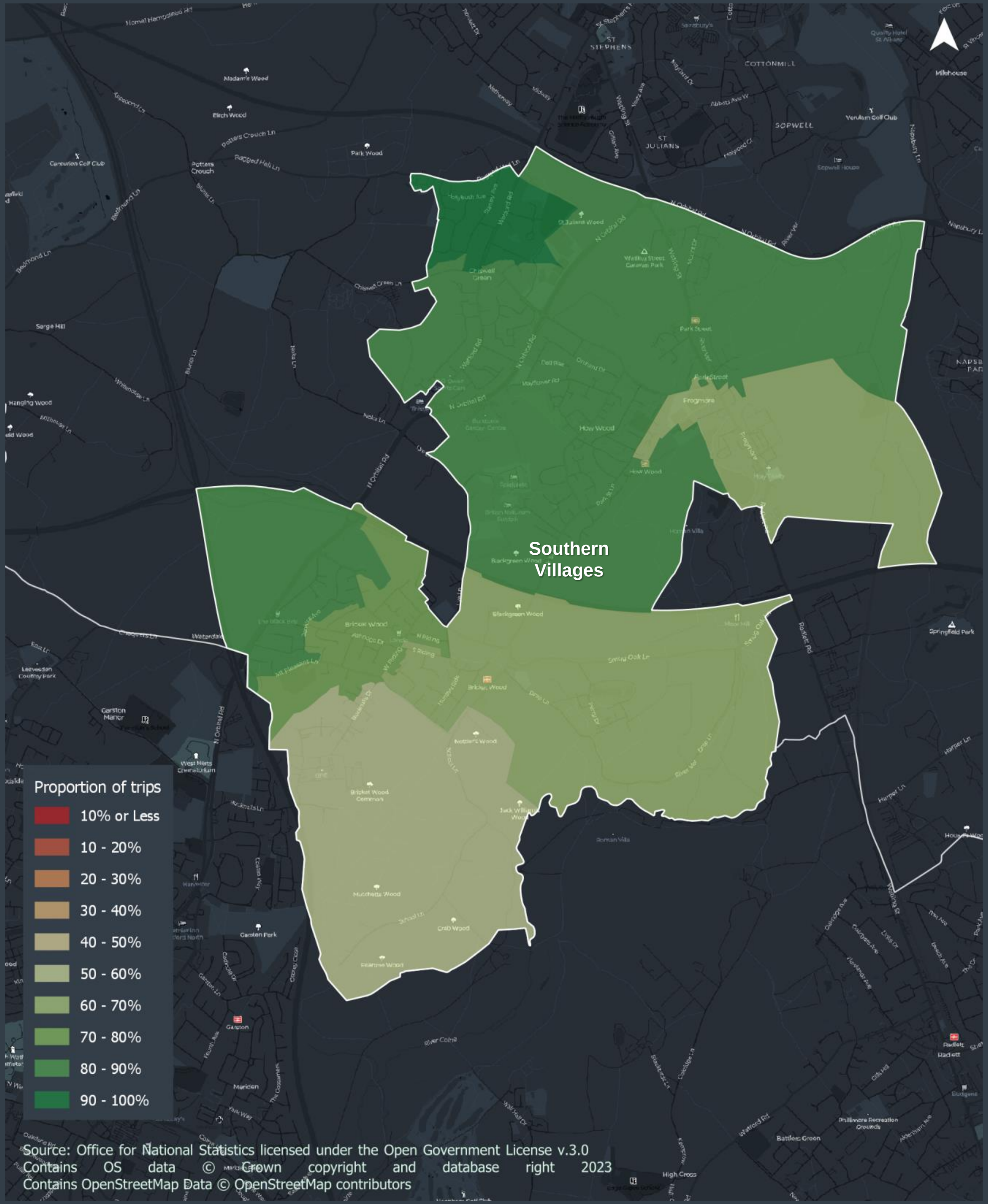
Appendix A7 Cycling opportunity in Redbourn



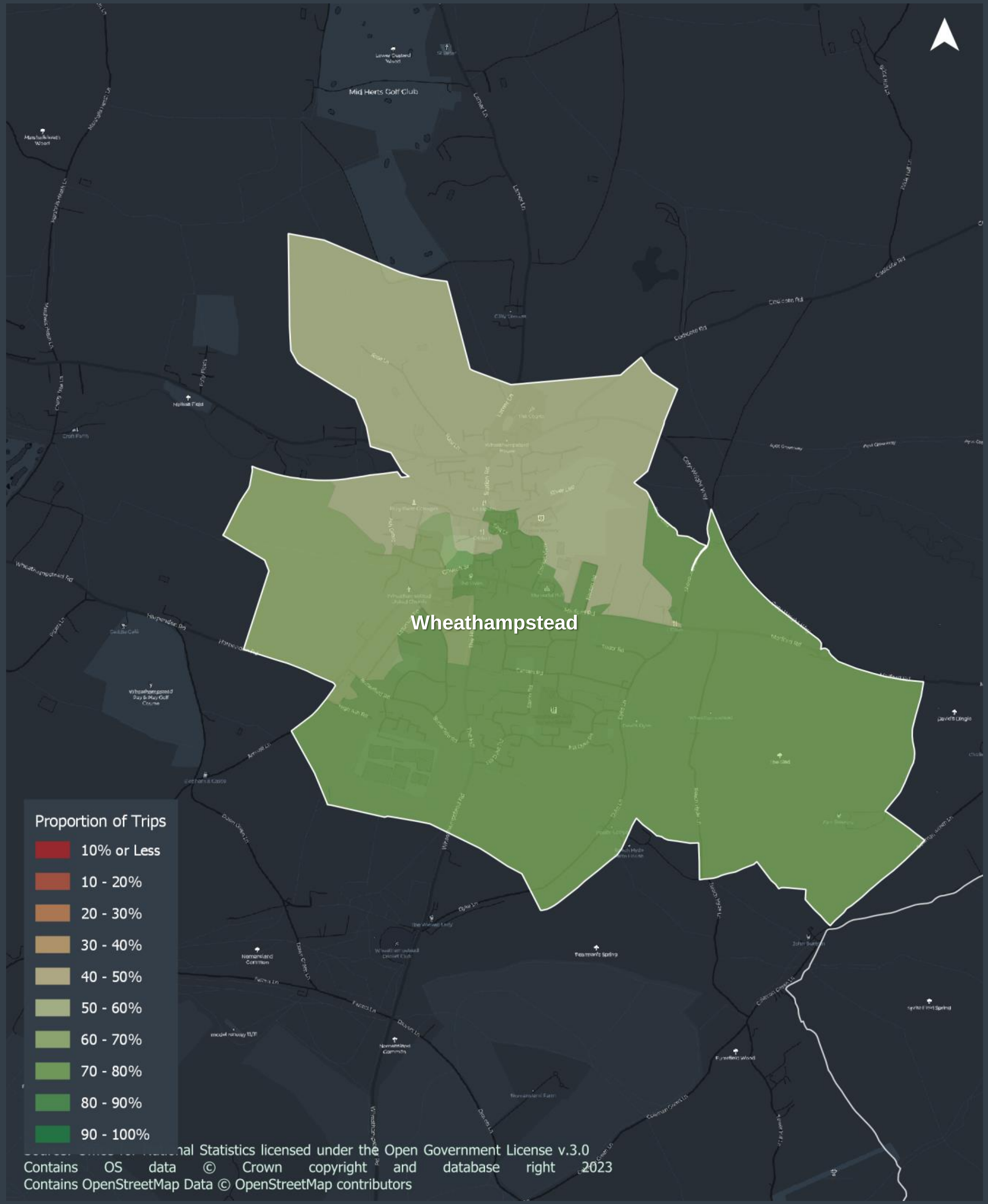
Appendix A8 Cycling opportunity in Harpenden



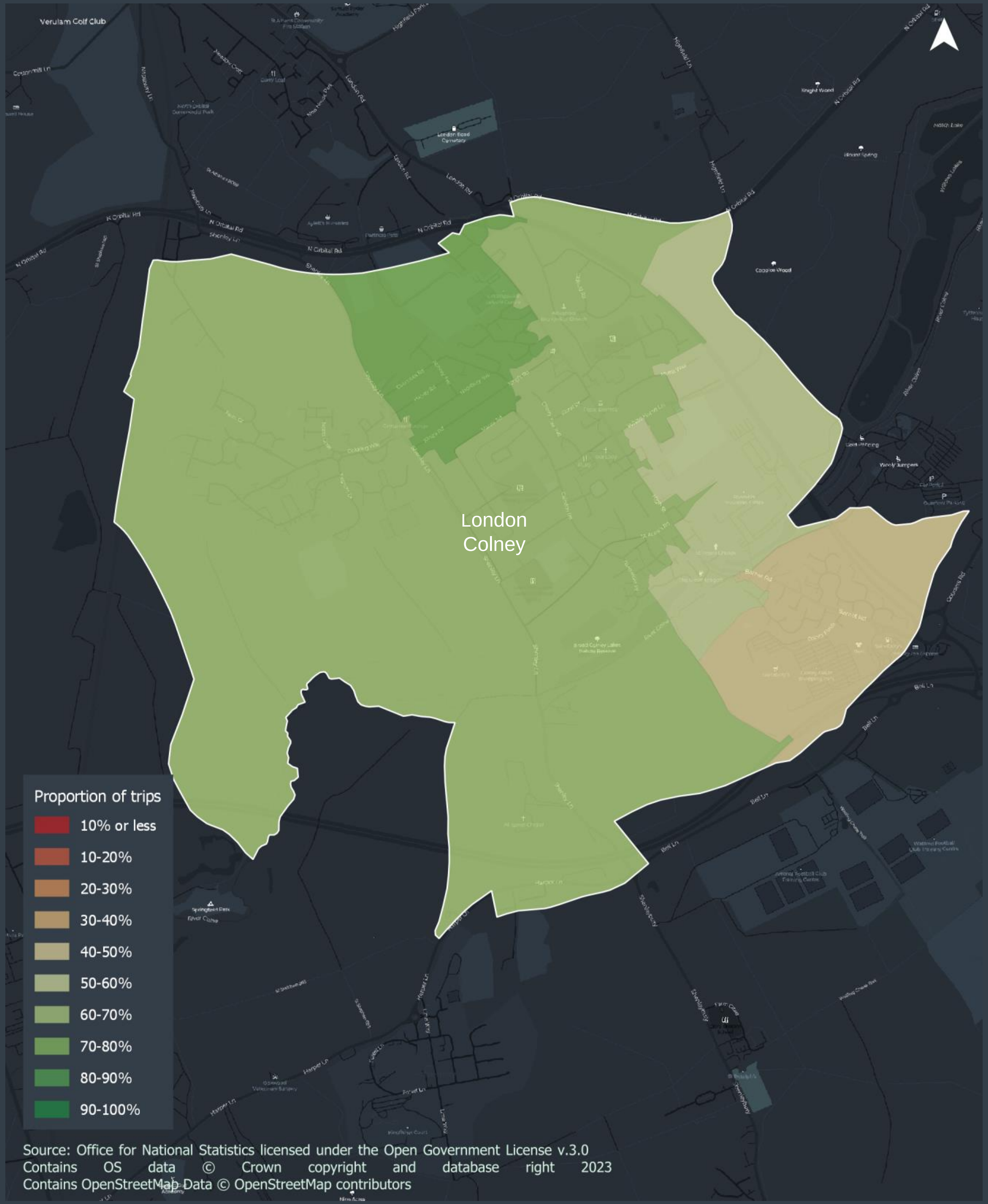
Appendix A9 Cycling opportunity in Southern Villages



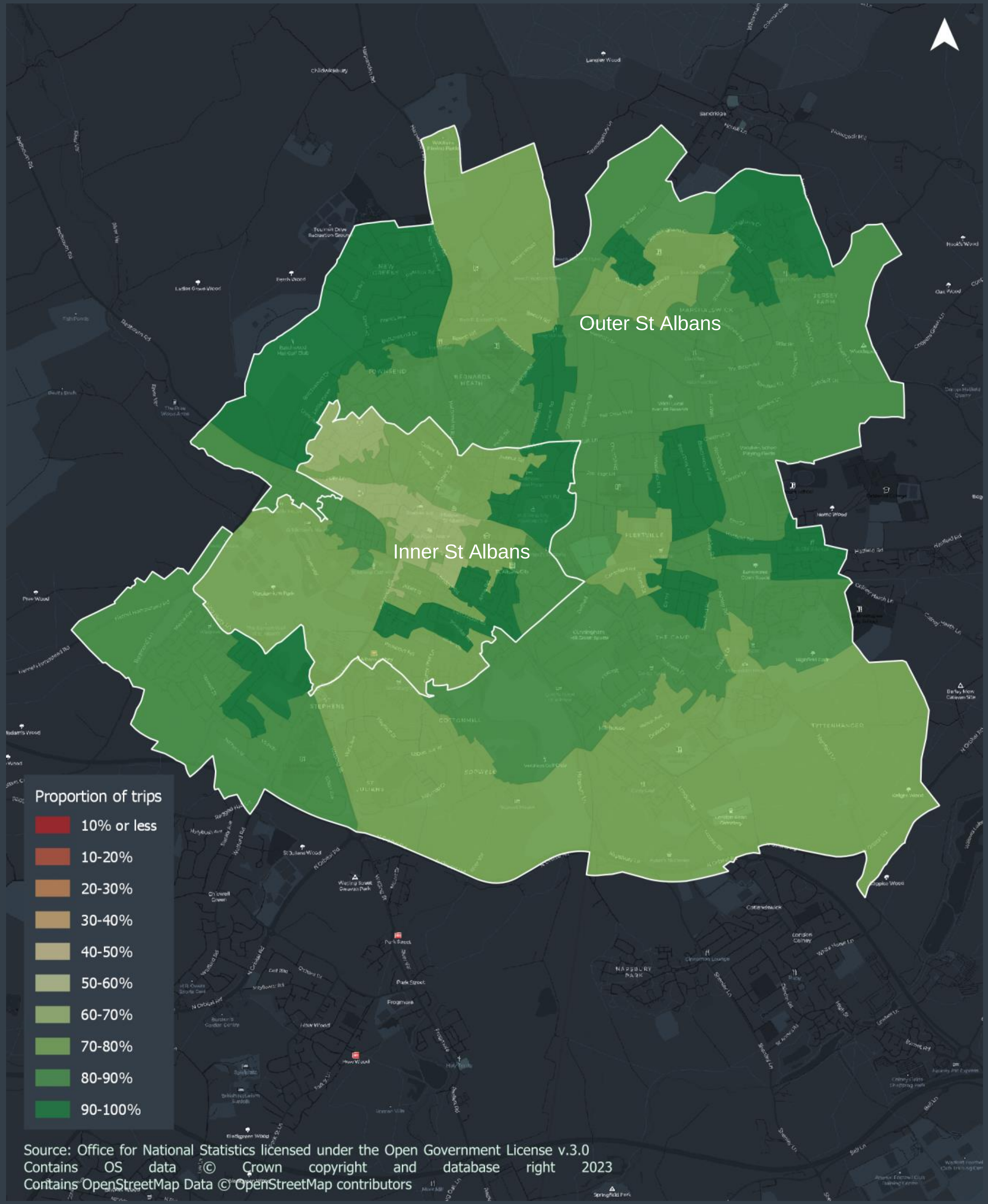
Appendix A10 Cycling opportunity in Wheathampstead



Appendix A11 Cycling opportunity in London Colney

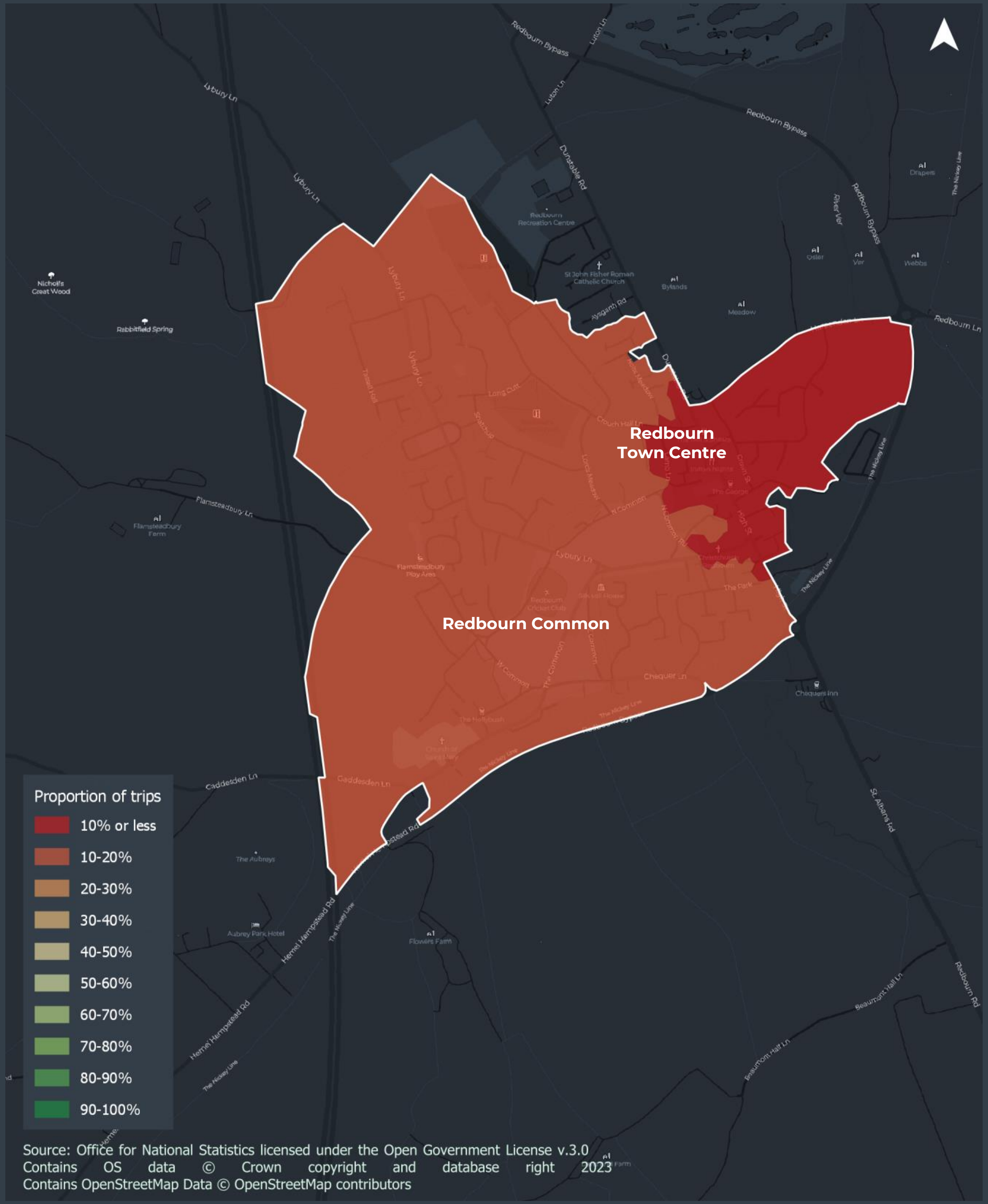


Appendix A12 Cycling opportunity in Inner & Outer St Albans

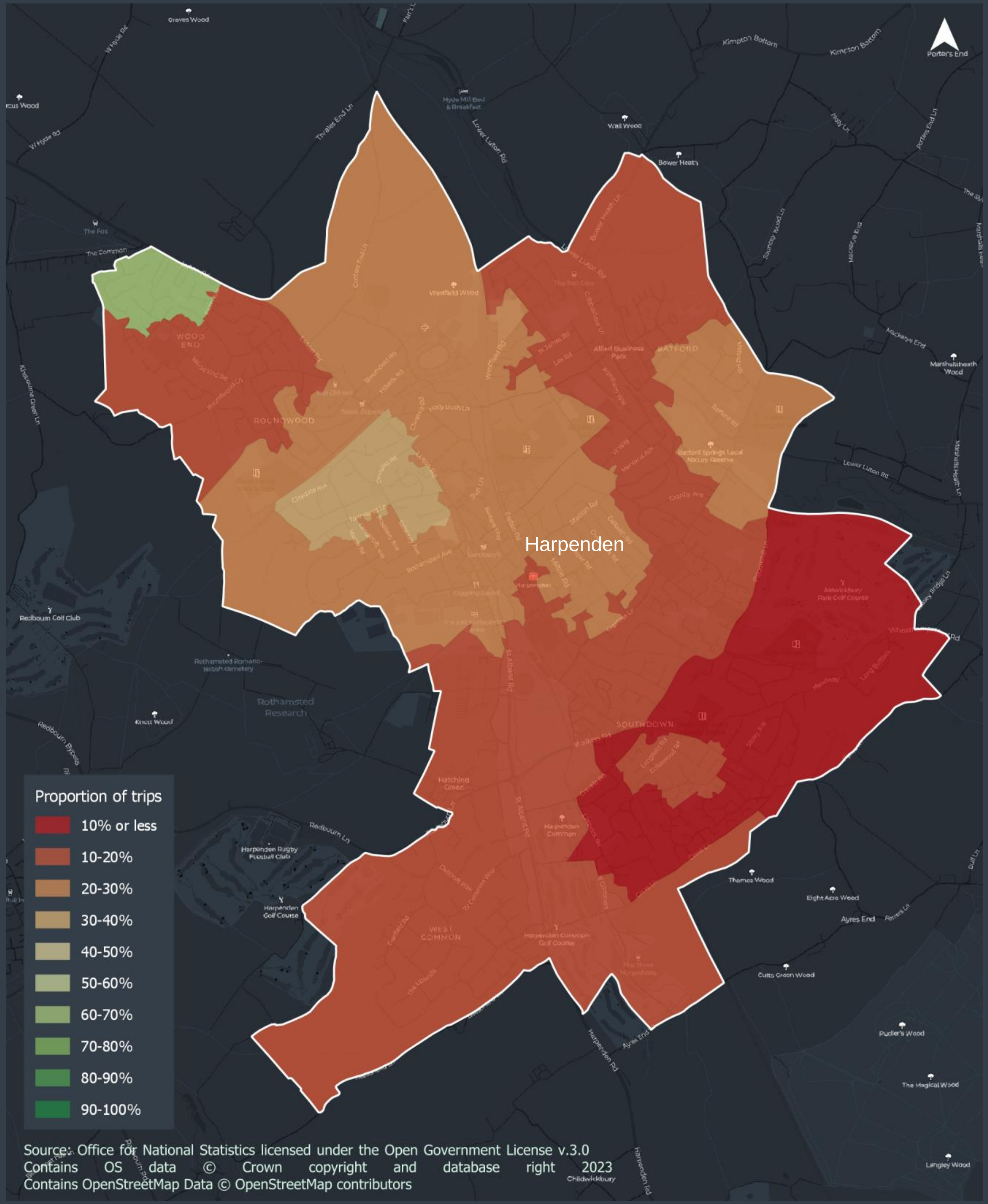


PT opportunity

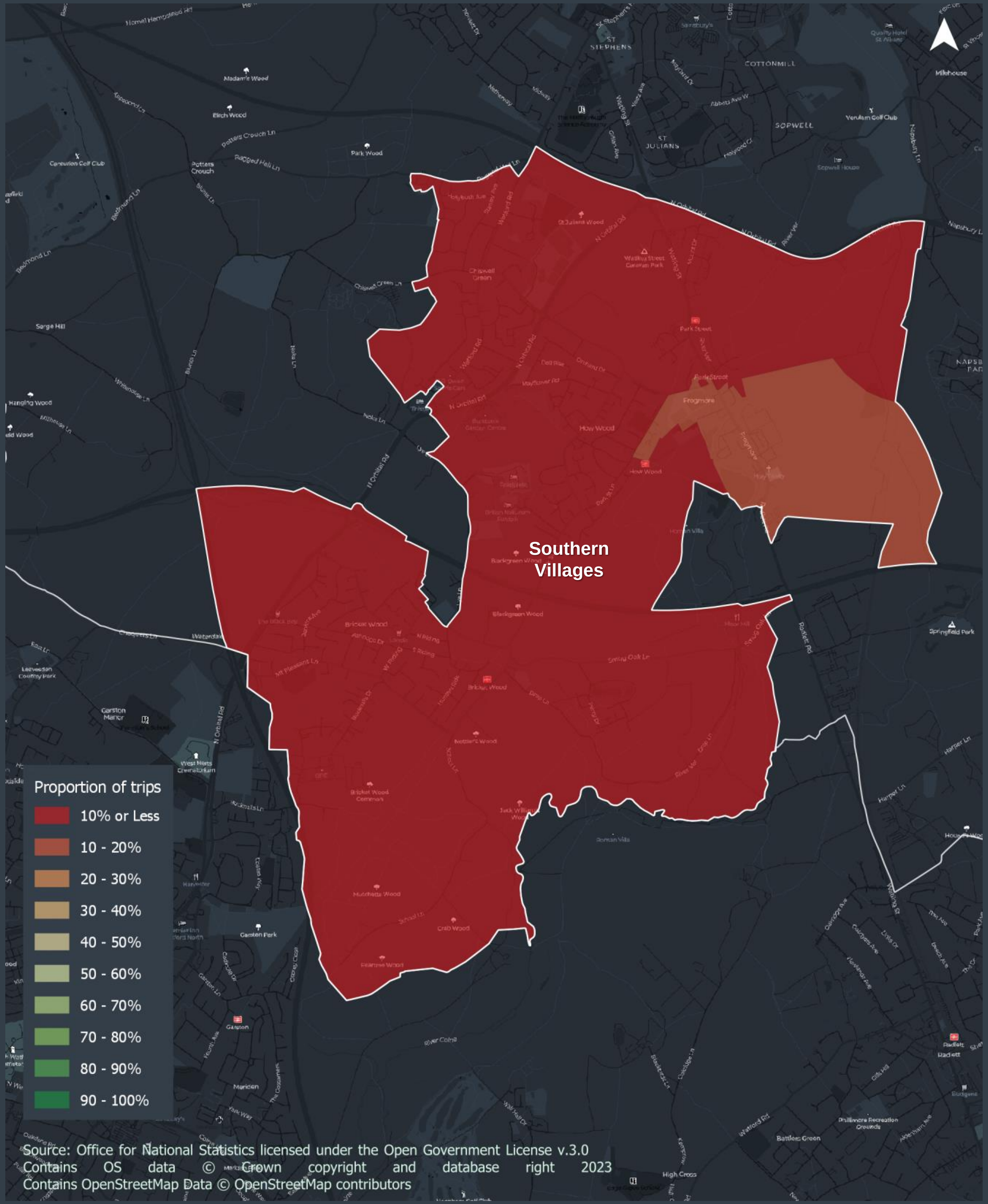
Appendix A13 Public transport opportunity in Redbourn



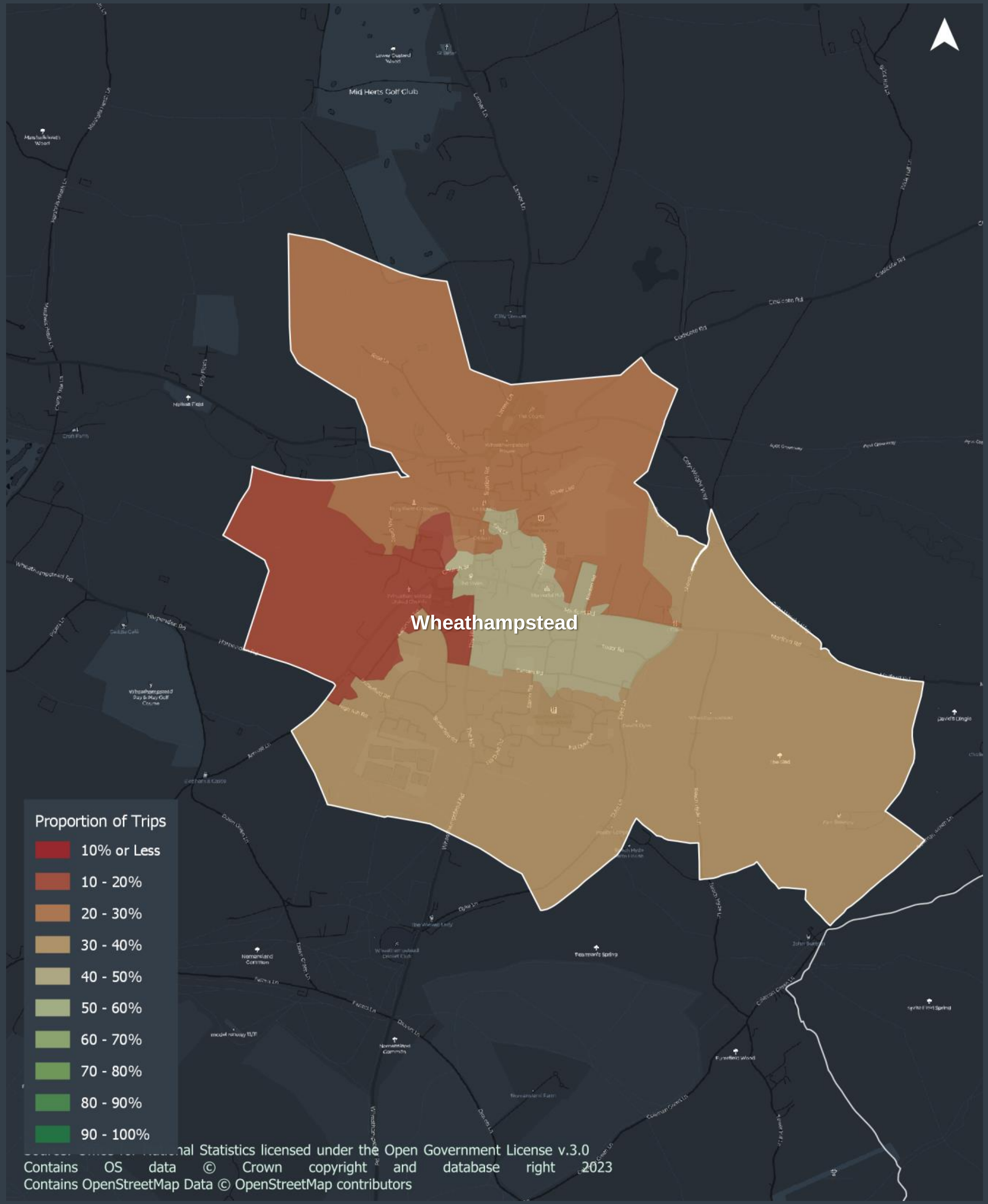
Appendix A14 Public transport opportunity in Harpenden



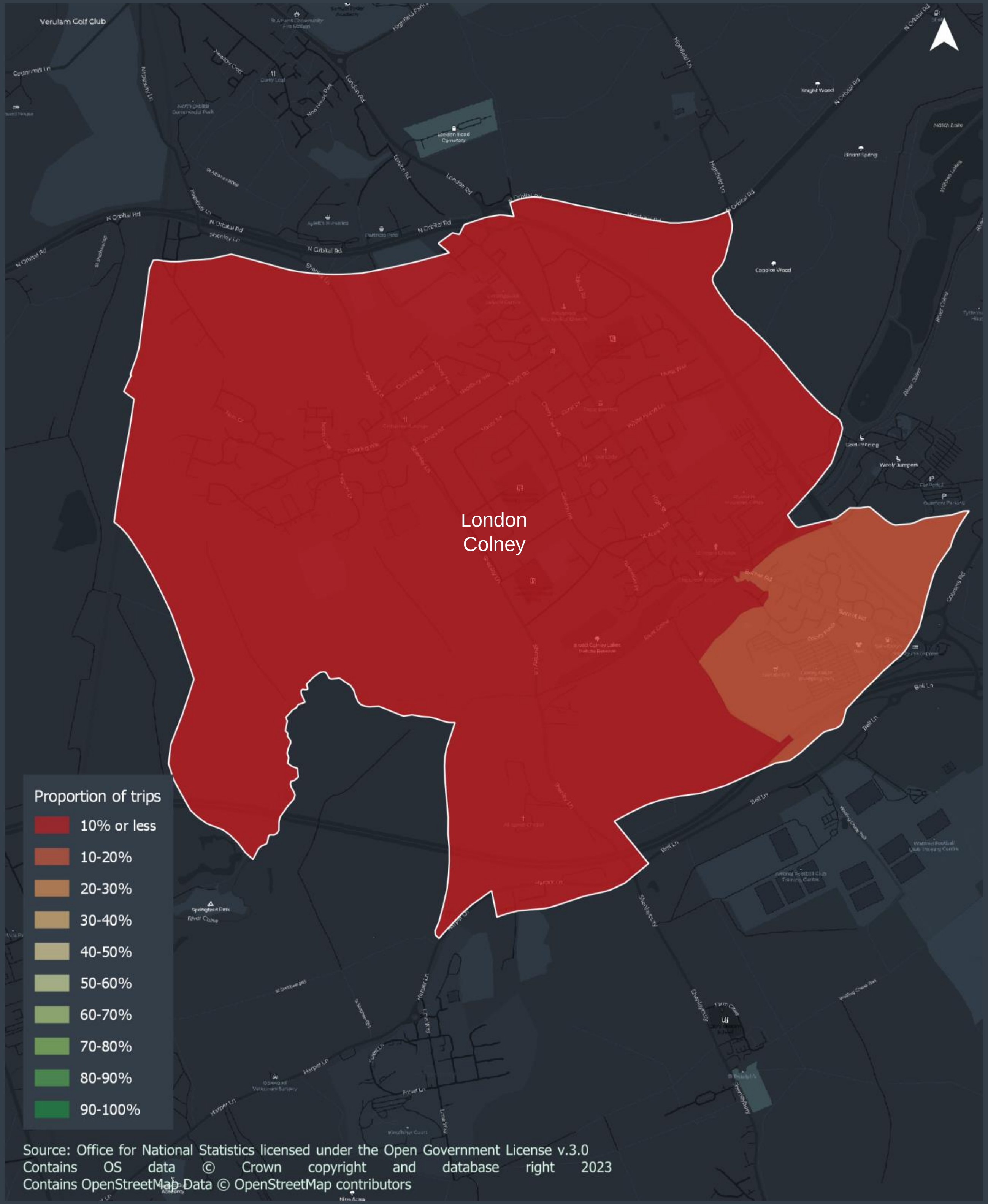
Appendix A15 Public transport opportunity in Southern Villages



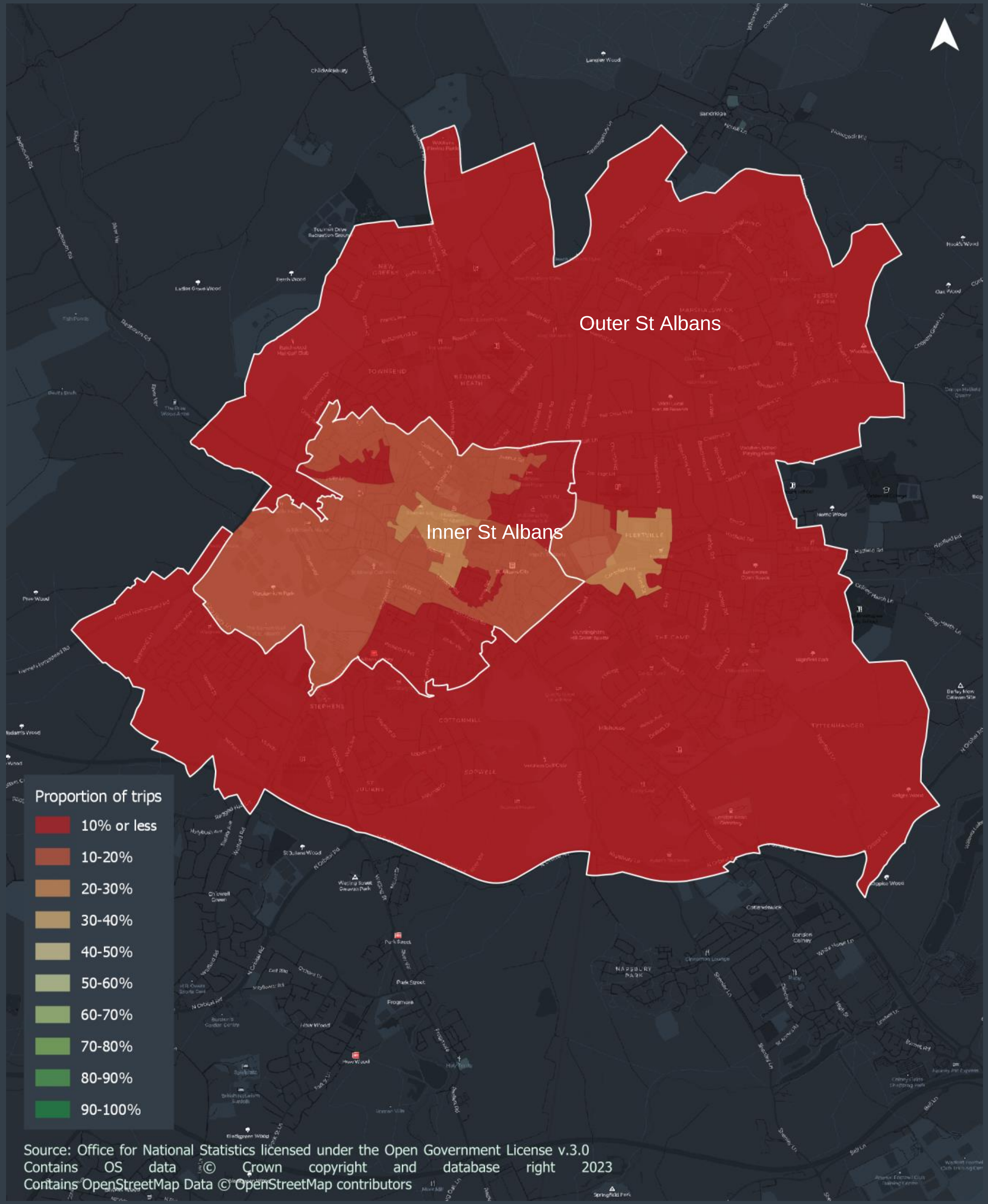
Appendix A16 Public transport opportunity in Wheathampstead



Appendix A17 Public transport opportunity in London Colney



Appendix A18 Public transport opportunity in Inner & Outer St Albans



APPENDIX B

Range of trips by communities and developments with the opportunity to shift by mode

Appendix B1 Range of trips by communities with the opportunity to shift by mode

	Walking opportunity		Cycling opportunity		PT opportunity
	Main mode	First and last mile*	Main mode	First and last mile*	Main mode
St Albans district					
Daily trips	23,500 - 83,500	1,400 - 21,700	111,700 - 147,200	1,400 - 21,700	1,400 - 21,700
Daily people km	27,300 - 169,400	27,400 - 240,200	279,500 - 506,800	27,400 - 240,200	25,000 - 237,400
Redbourn					
Daily trips	300	0 - 600	700 - 1,900	0 - 600	0 - 600
Daily people km	300 - 500	100 - 2,900	2,000 - 9,400	100 - 2,900	100 - 5,100
Harpenden					
Daily trips	3,900 - 15,200	700 - 7,800	18,800 - 24,100	700 - 7,800	700 - 7,800
Daily people km	4,800 - 31,500	12,100 - 102,500	45,900 - 80,900	12,100 - 102,500	11,200 - 91,600
London Colney					
Daily trips	1,300 - 2,800	100 - 700	4,200 - 6,600	100 - 700	100 - 700
Daily people km	1,600 - 4,900	1,200 - 4,500	10,700 - 26,100	1,200 - 4,500	1,500 - 8,400
Inner St Albans					
Daily trips	8,200 - 19,900	200 - 5,700	23,800 - 28,600	200 - 5,700	200 - 5,700
Daily people km	8,900 - 36,400	5,600 - 65,300	51,600 - 83,500	5,600 - 65,300	4,000 - 61,100
Outer St Albans					
Daily trips	9,300 - 39,700	300 - 3,300	51,000 - 61,400	300 - 3,300	300 - 3,300
Daily people km	11,200 - 83,200	7,900 - 38,700	125,700 - 191,800	7,900 - 38,700	7,300 - 37,900
Southern villages					
Daily trips	200 - 2,200	0 - 400	3,800 - 6,300	0 - 400	0 - 400
Daily people km	200 - 5,100	100 - 4,800	11,800 - 27,200	100 - 4,800	0 - 2,900
Wheathampstead					
Daily trips	200 - 500	0 - 1,700	1,300 - 3,600	0 - 1,700	0 - 1,700
Daily people km	100 - 800	100 - 7,700	4,300 - 19,000	100 - 7,700	300 - 14,200

* Linked to public transport trips

Appendix B2 Range of trips by developments with the opportunity to shift by mode

	Walking opportunity		Cycling opportunity		PT opportunity
	Main mode	First and last mile*	Main mode	First and last mile*	Main mode
St Albans development zones					
Daily trips	300 - 1,400	0 - 100	2,300 - 3,300	0 - 100	0 - 100
Daily people km	400 - 3,000	0 - 100	6,700 - 12,600	0 - 100	0 - 600
North Hemel					
Daily trips	0 - 100	0	100 - 100	0	0
Daily people km	0 - 200	0	300 - 500	0	0
East Hemel (North)					
Daily trips	0 – 400	0	600 – 800	0	0
Daily people km	0 – 800	0	1,800 – 3,200	0	0
East Hemel (South)					
Daily trips	200 – 500	0	700 – 1,100	0	0
Daily people km	200 – 1,000	0-100	1,700 – 4,000	0 - 100	0 - 300
North St Albans City					
Daily trips	100 - 300	0	600 - 900	0	0
Daily people km	100 - 800	0	1,900 - 3,400	0	0
East St Albans City					
Daily trips	0 - 100	0	200 - 200	0	0
Daily people km	0 - 200	0	500 - 800	0	0
Northeast Harpenden					
Daily trips	0 - 100	0	100 - 200	0	0
Daily people km	0 - 100	0	500 - 600	0	0 - 200

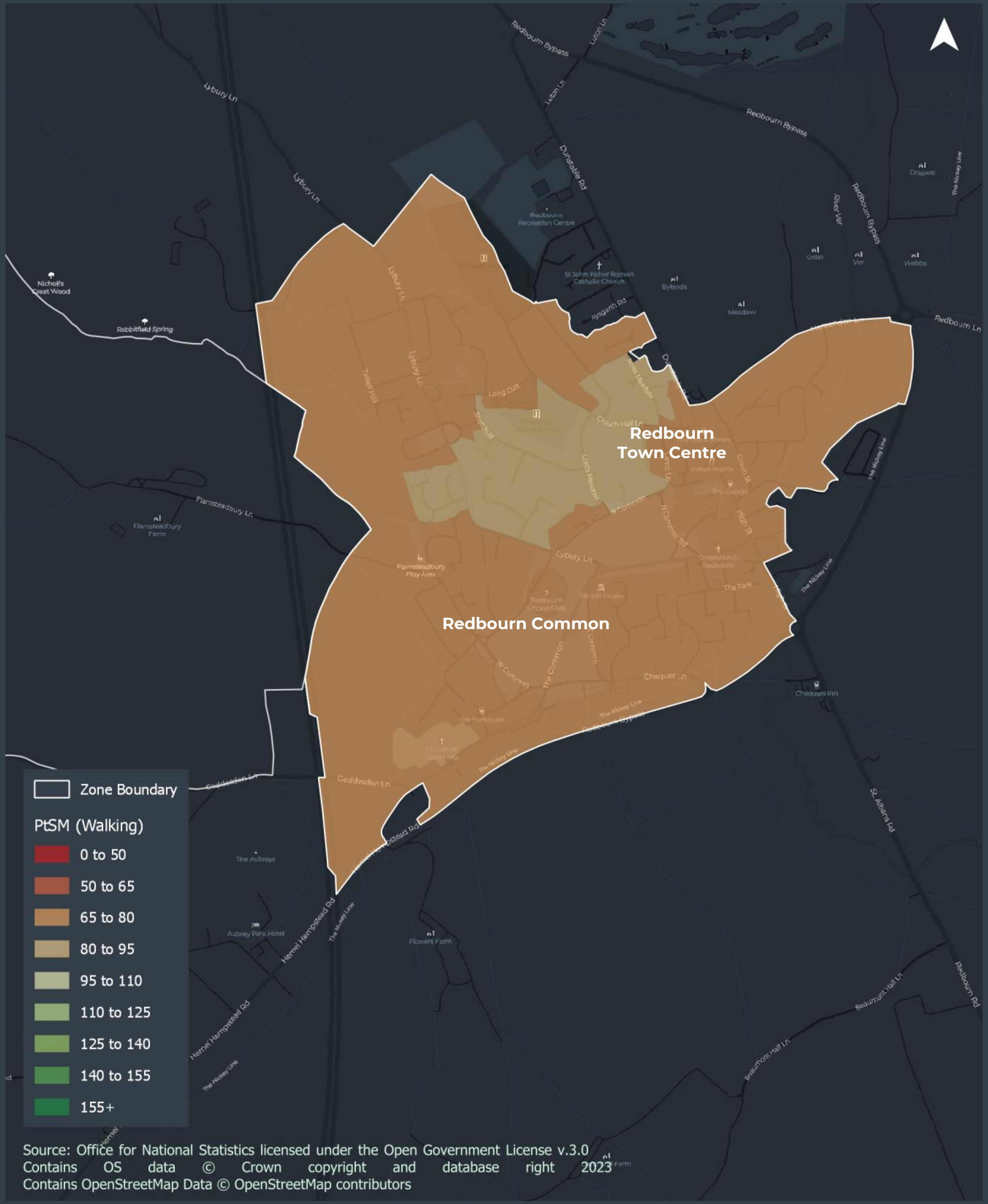
* Linked to public transport trips

APPENDIX C

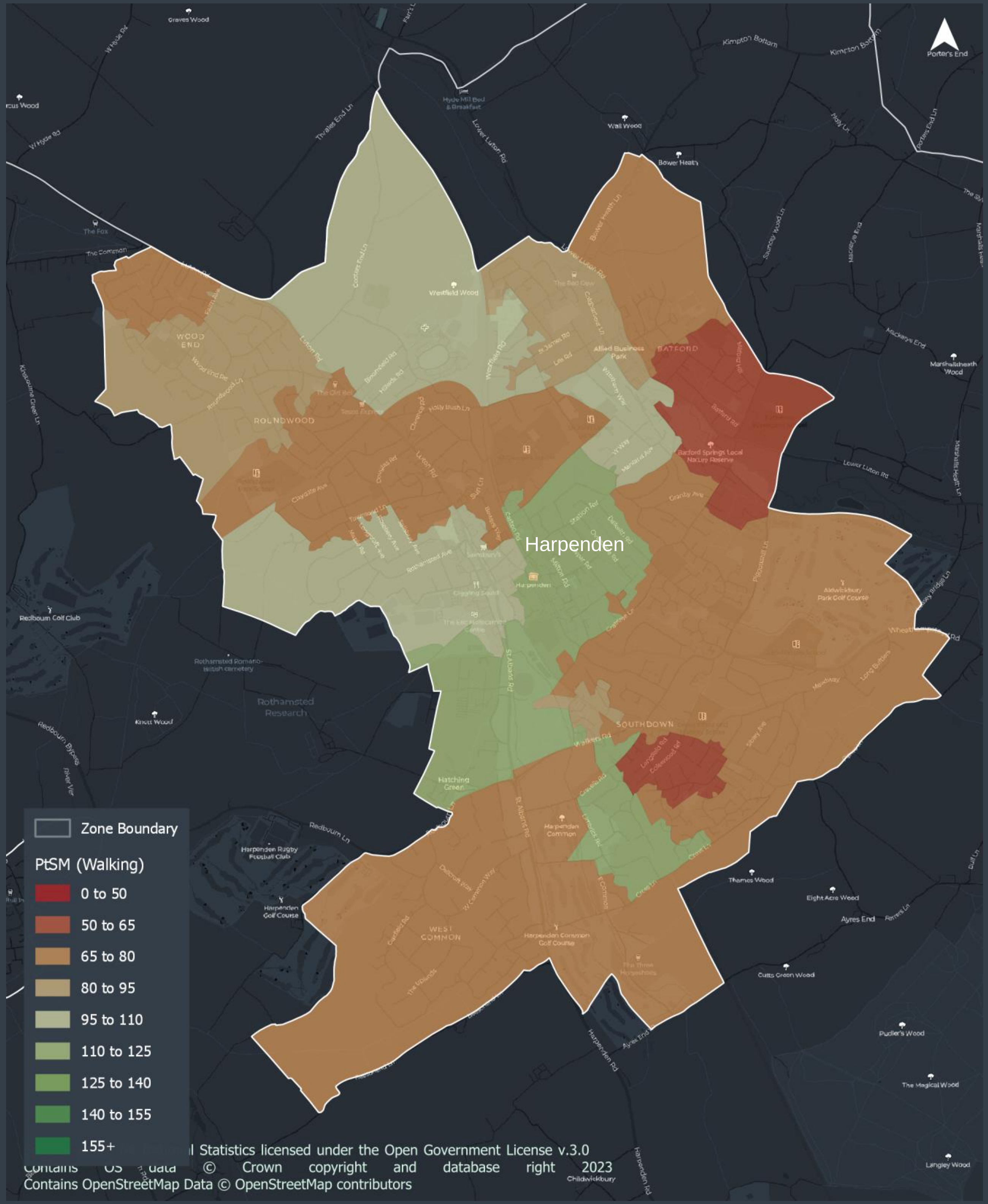
Breakdown of sustainable travel propensity for existing communities

Walking propensity

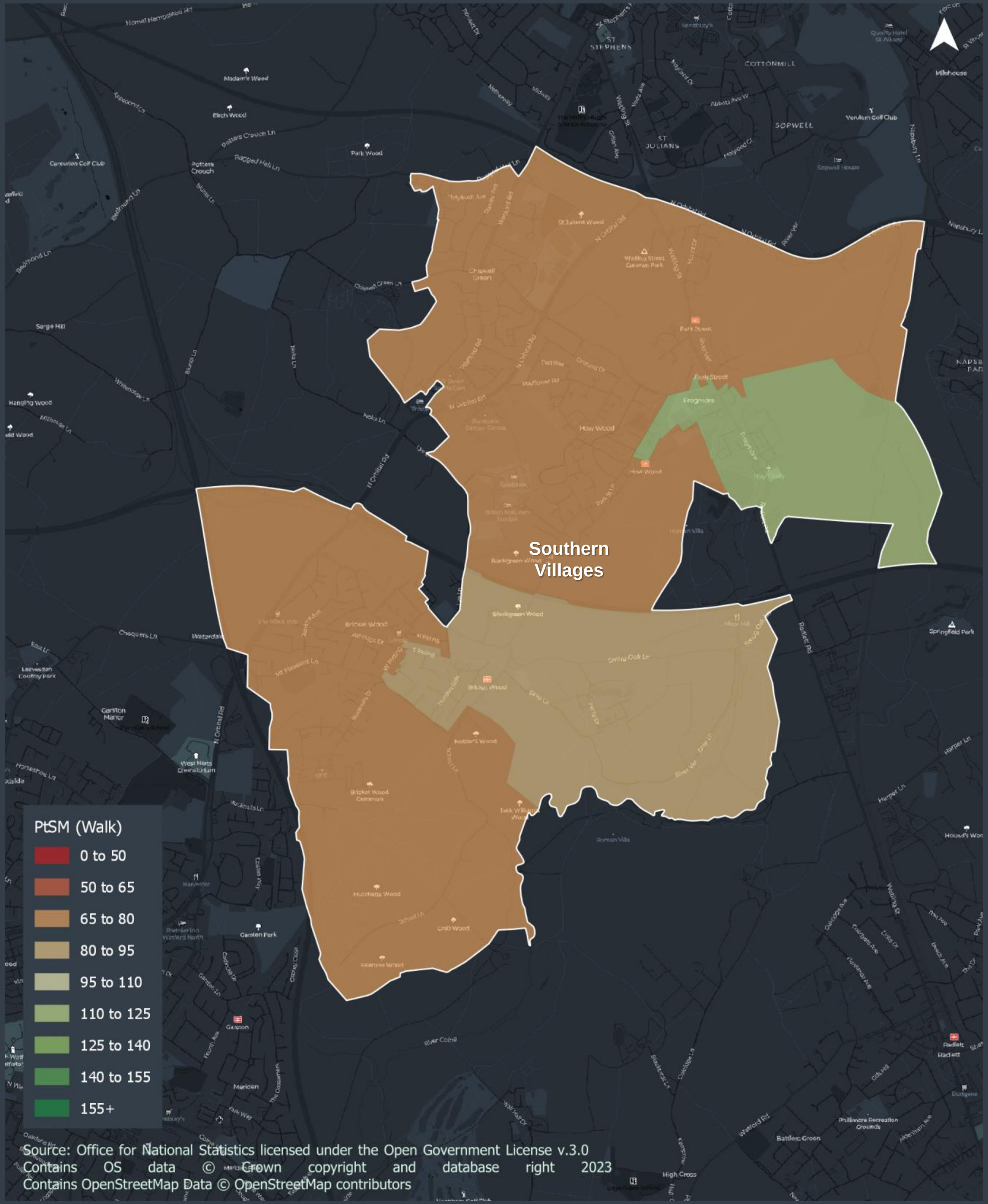
Appendix C1 Walking propensity in Redbourn



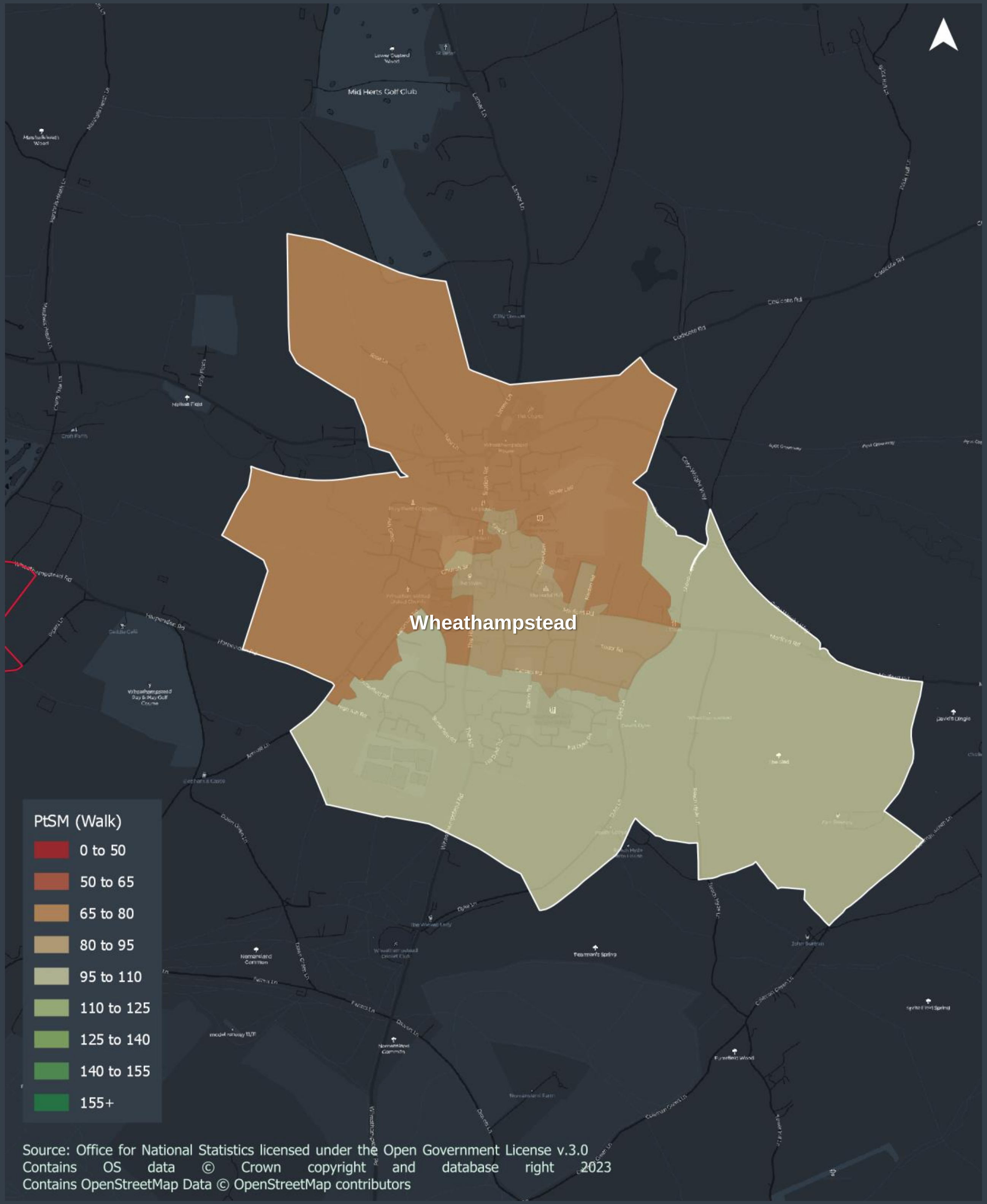
Appendix C2 Walking propensity in Harpenden



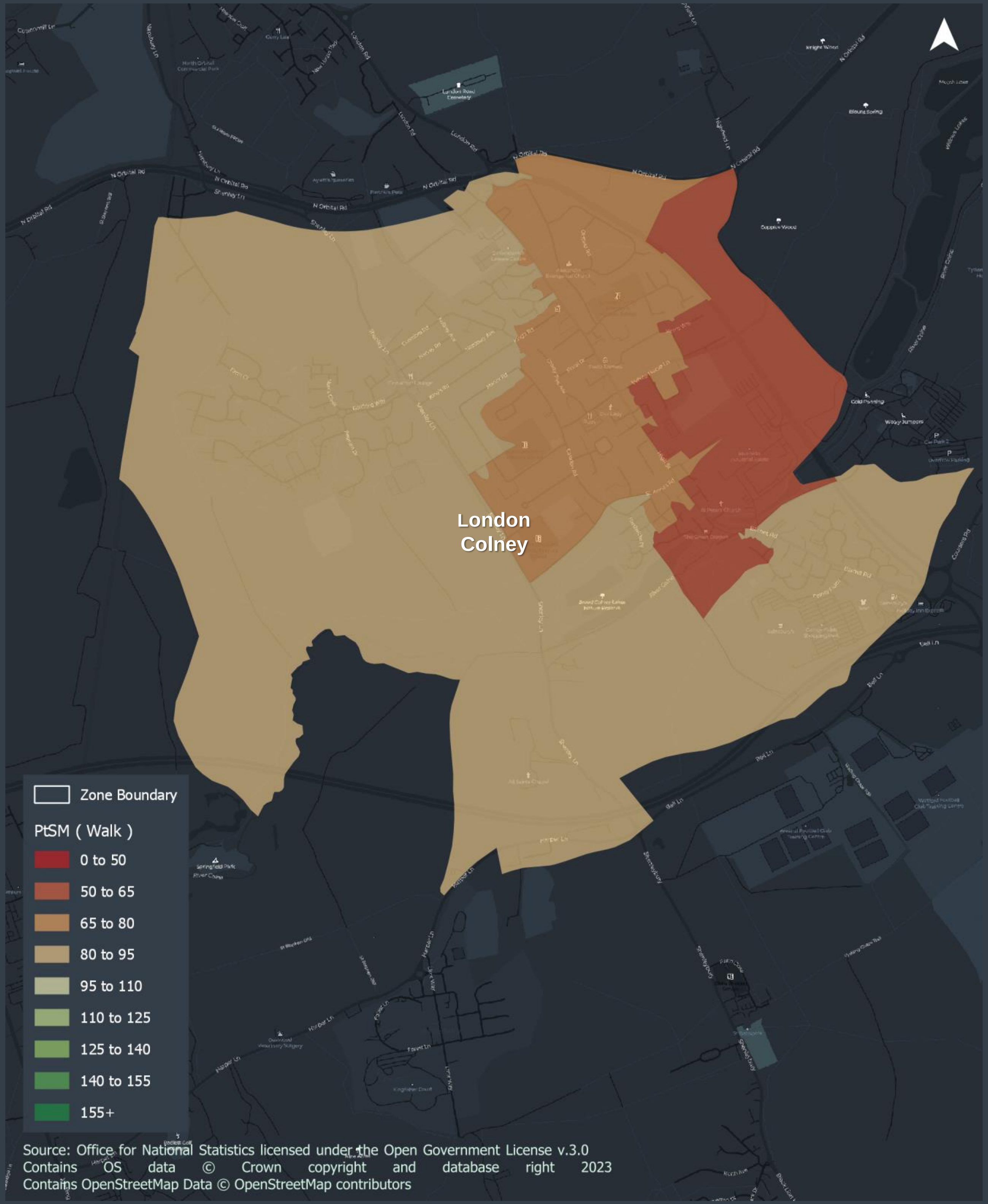
Appendix C3 Walking propensity in Southern Villages



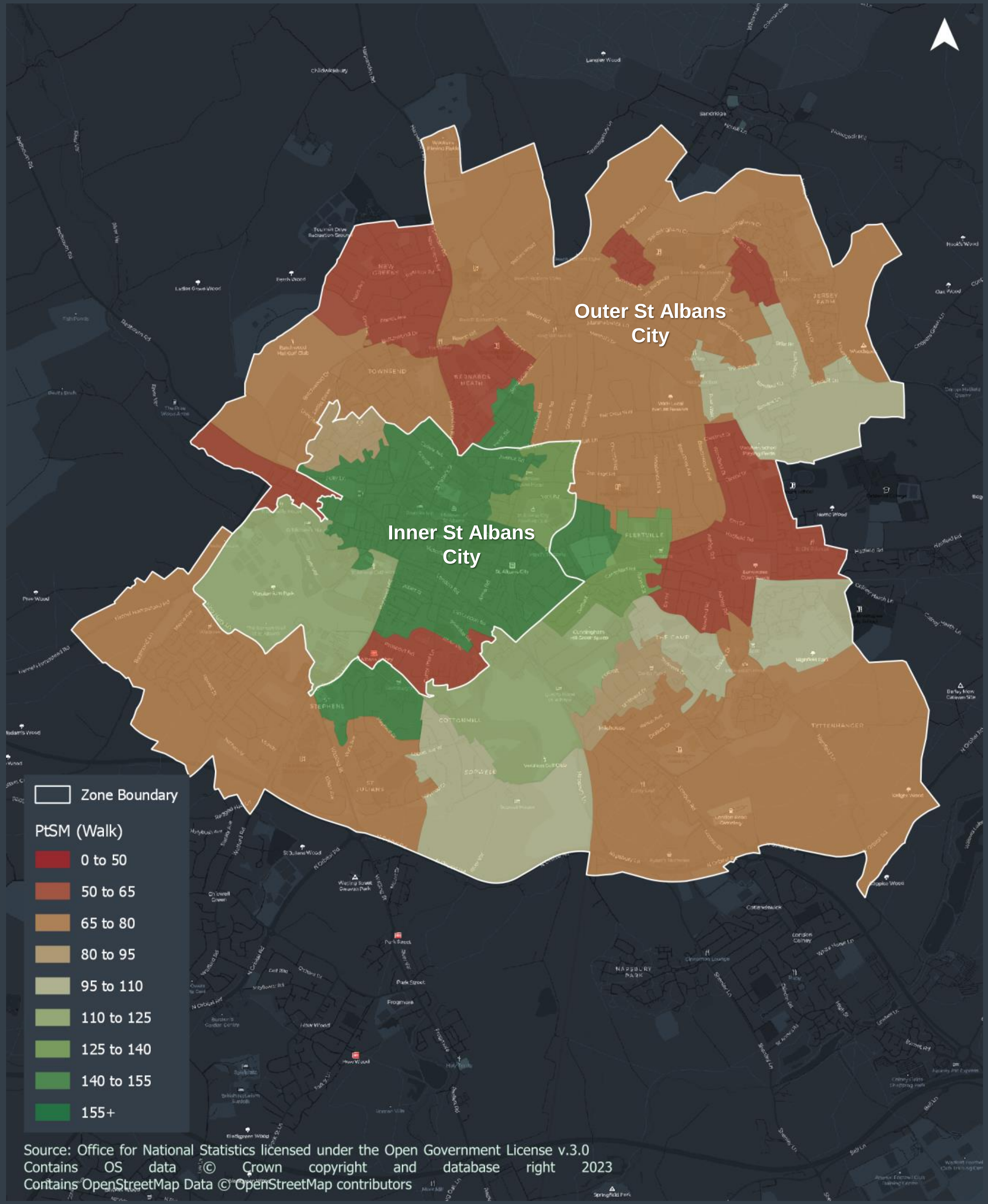
Appendix C4 Walking propensity in Wheathampstead



Appendix C5 Walking propensity in London Colney

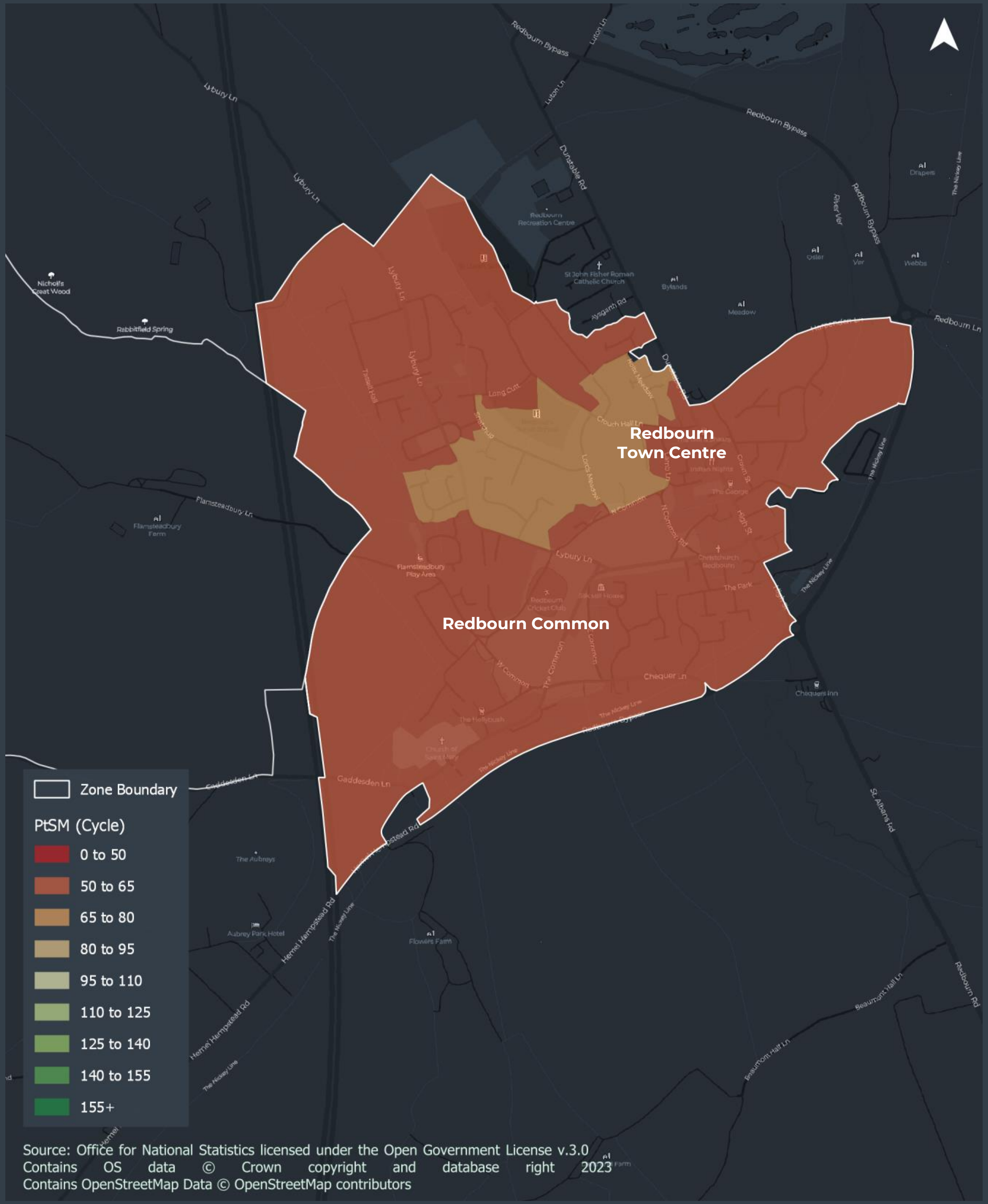


Appendix C6 Walking propensity in Inner & Outer St Albans

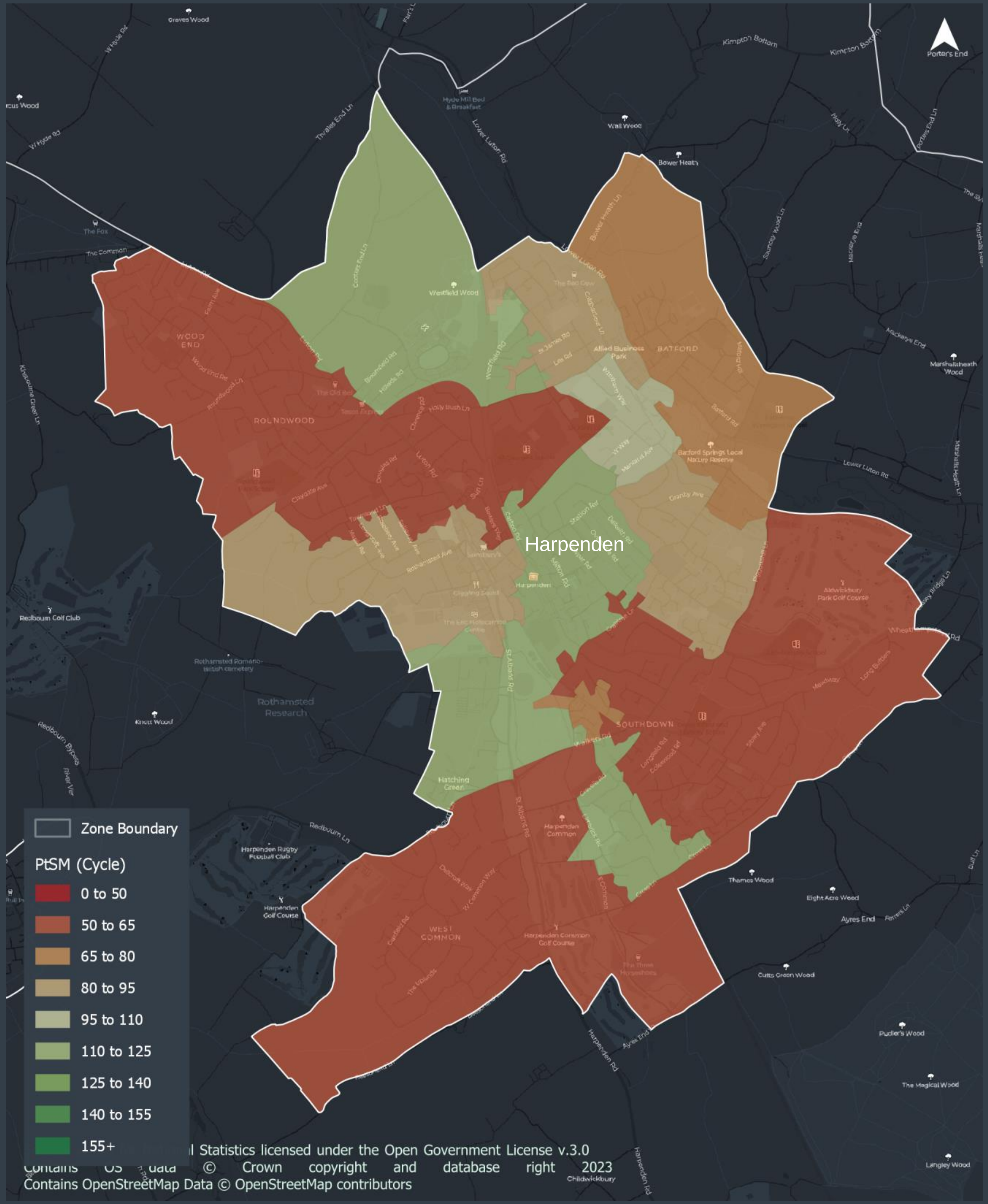


Cycling propensity

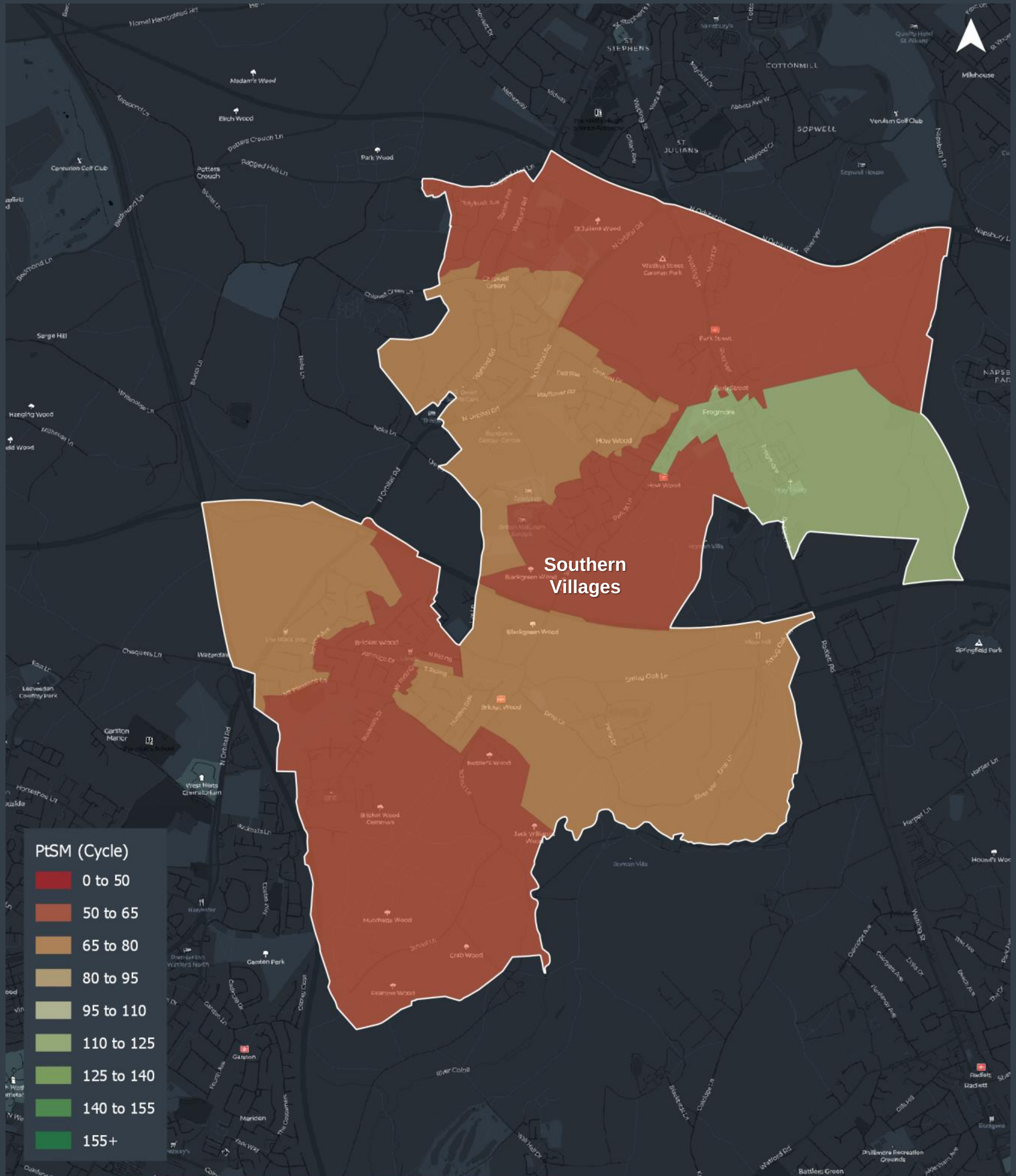
Appendix C7 Cycling propensity in Redbourn



Appendix C8 Cycling propensity in Harpenden



Appendix C9 Cycling propensity in Southern Villages



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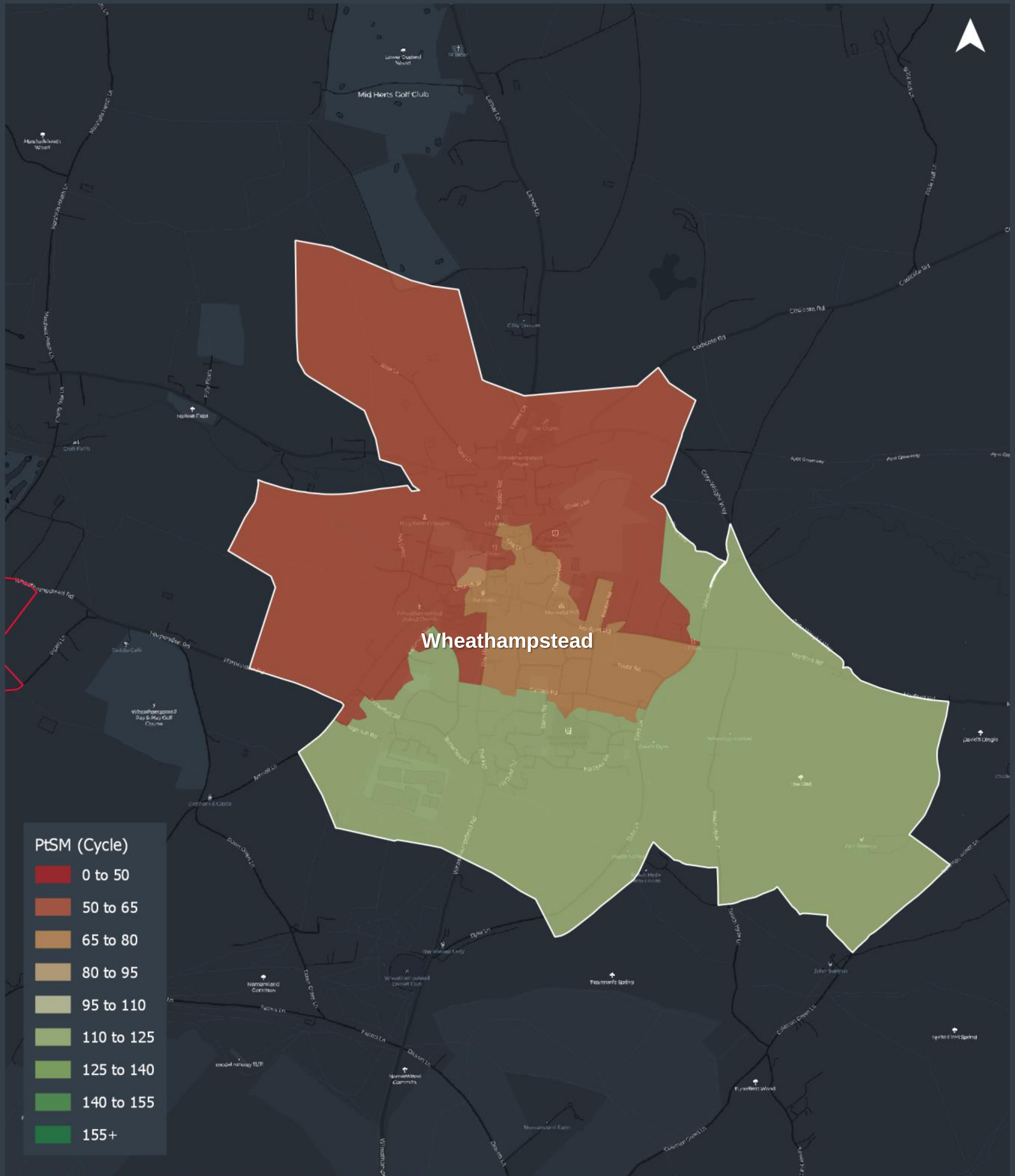
Appendix C10 Cycling propensity in Wheathampstead



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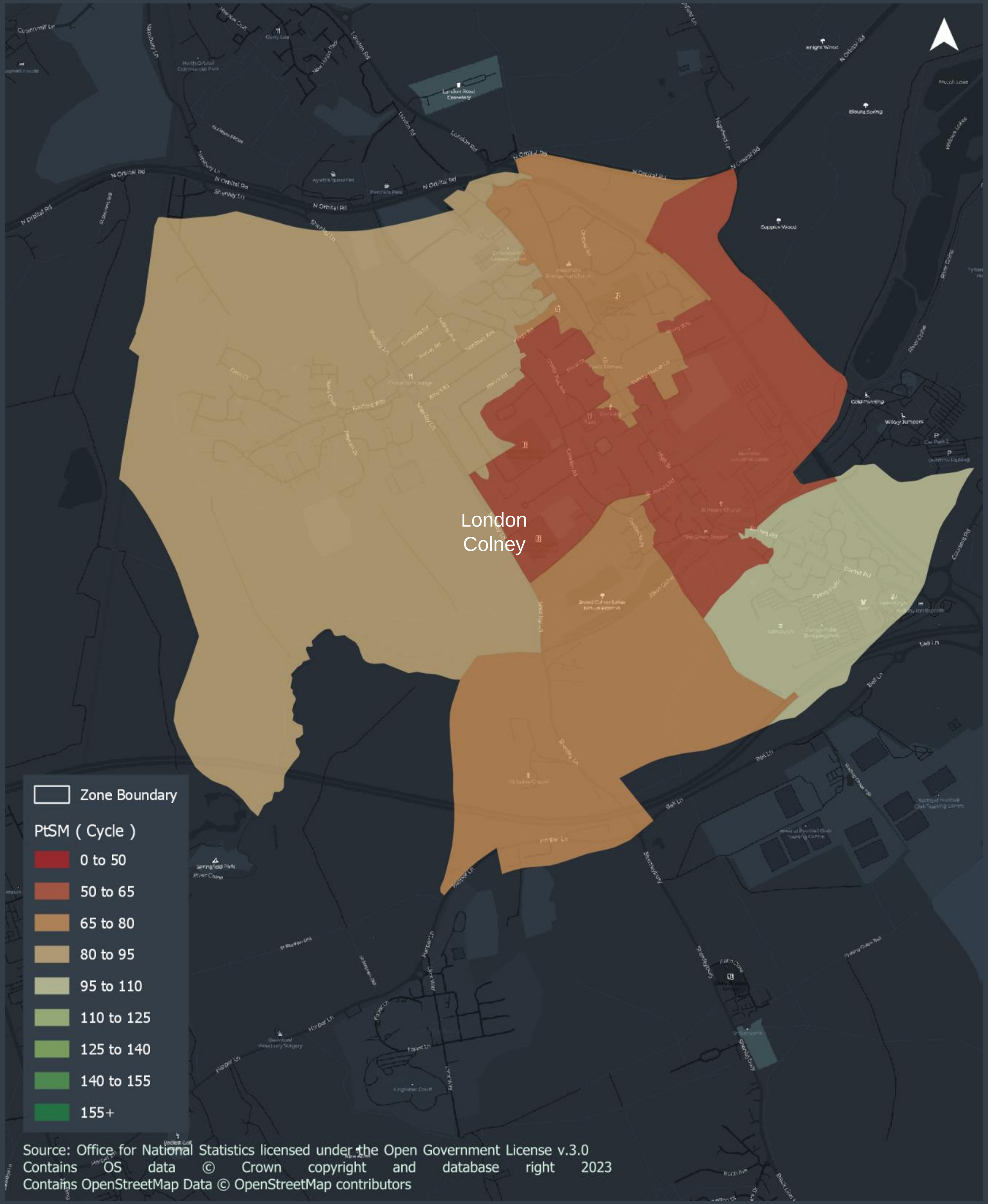
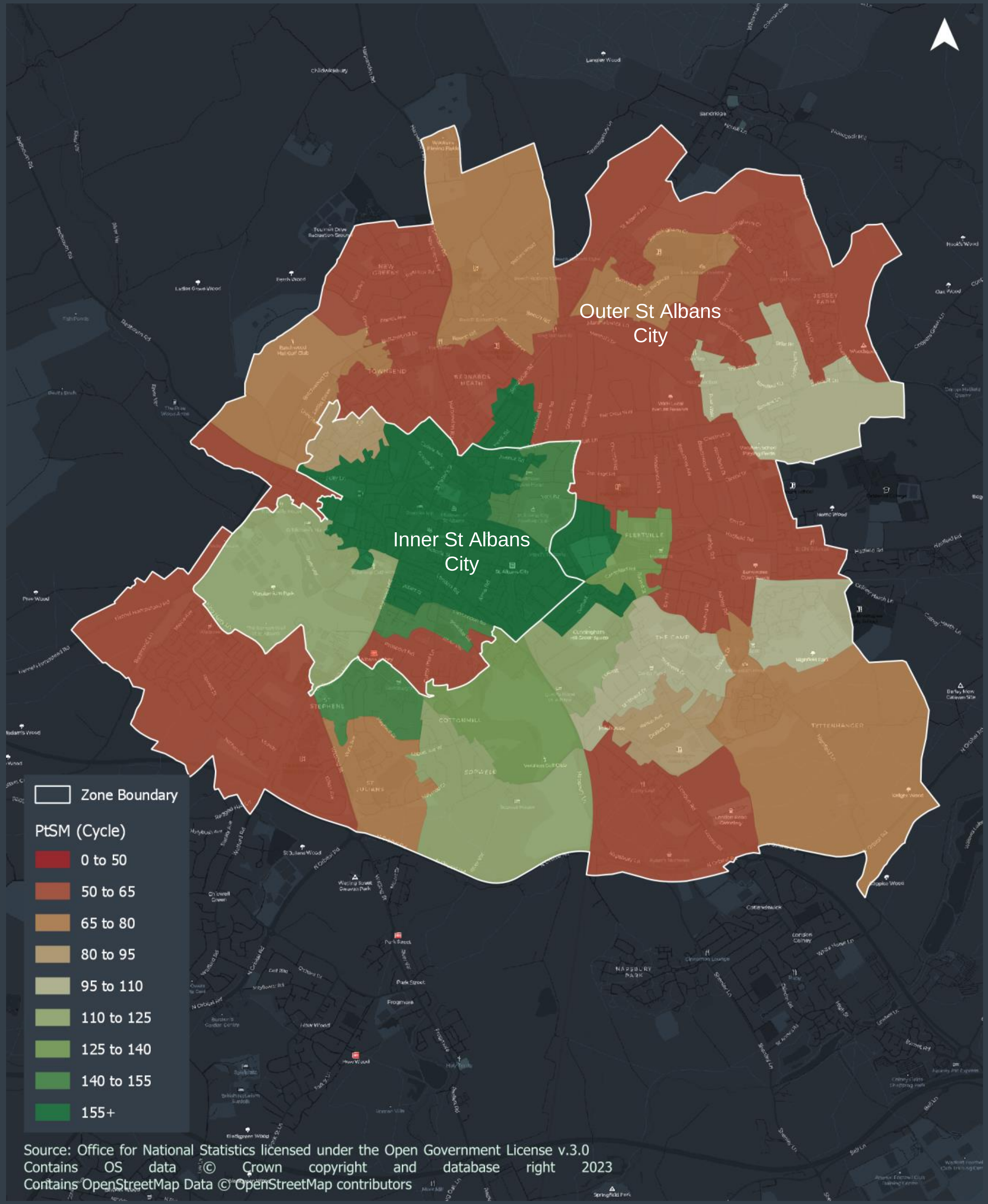
Appendix C11 Cycling propensity in London Colney

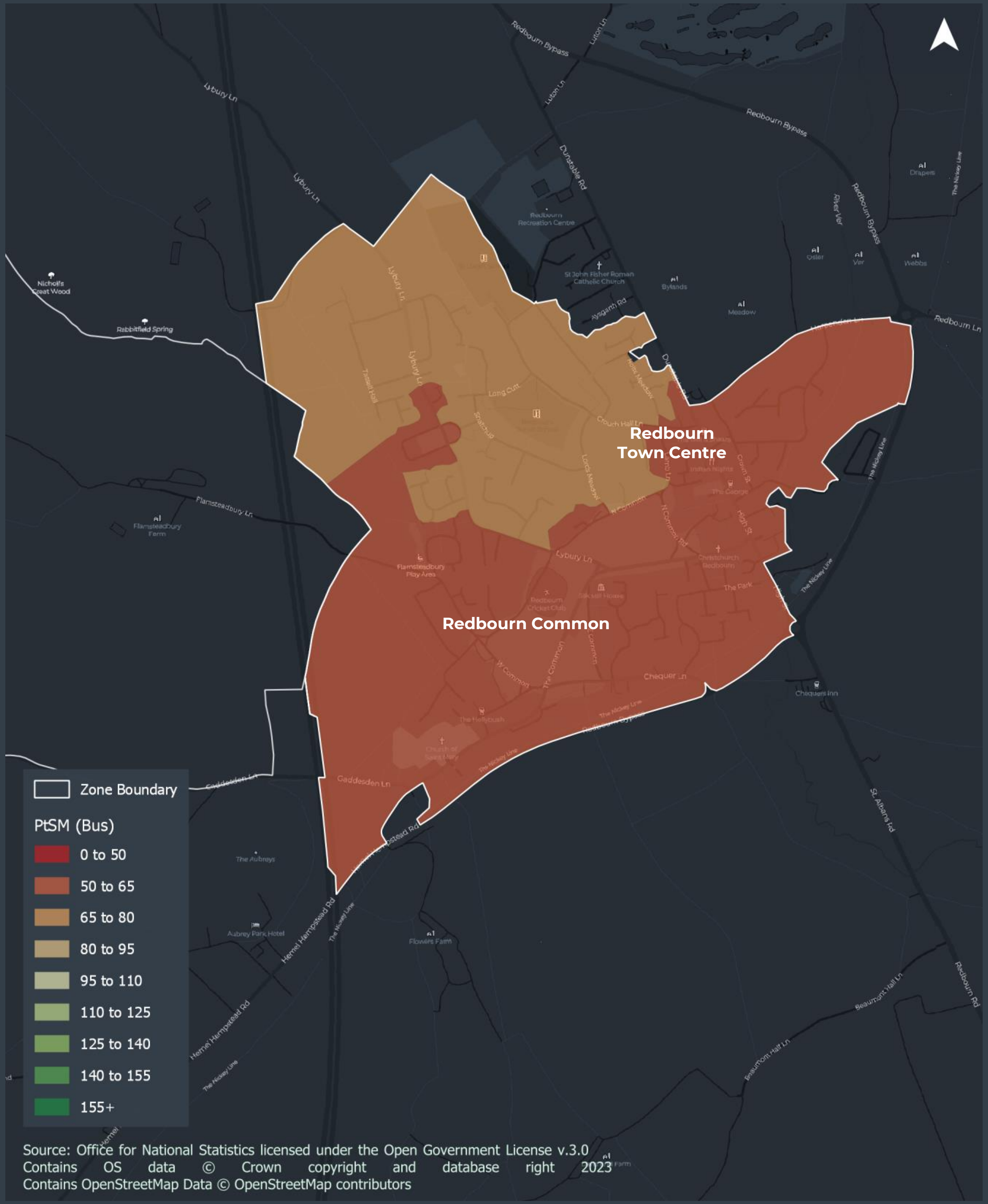


Appendix C12 Cycling propensity in Inner & Outer St Albans

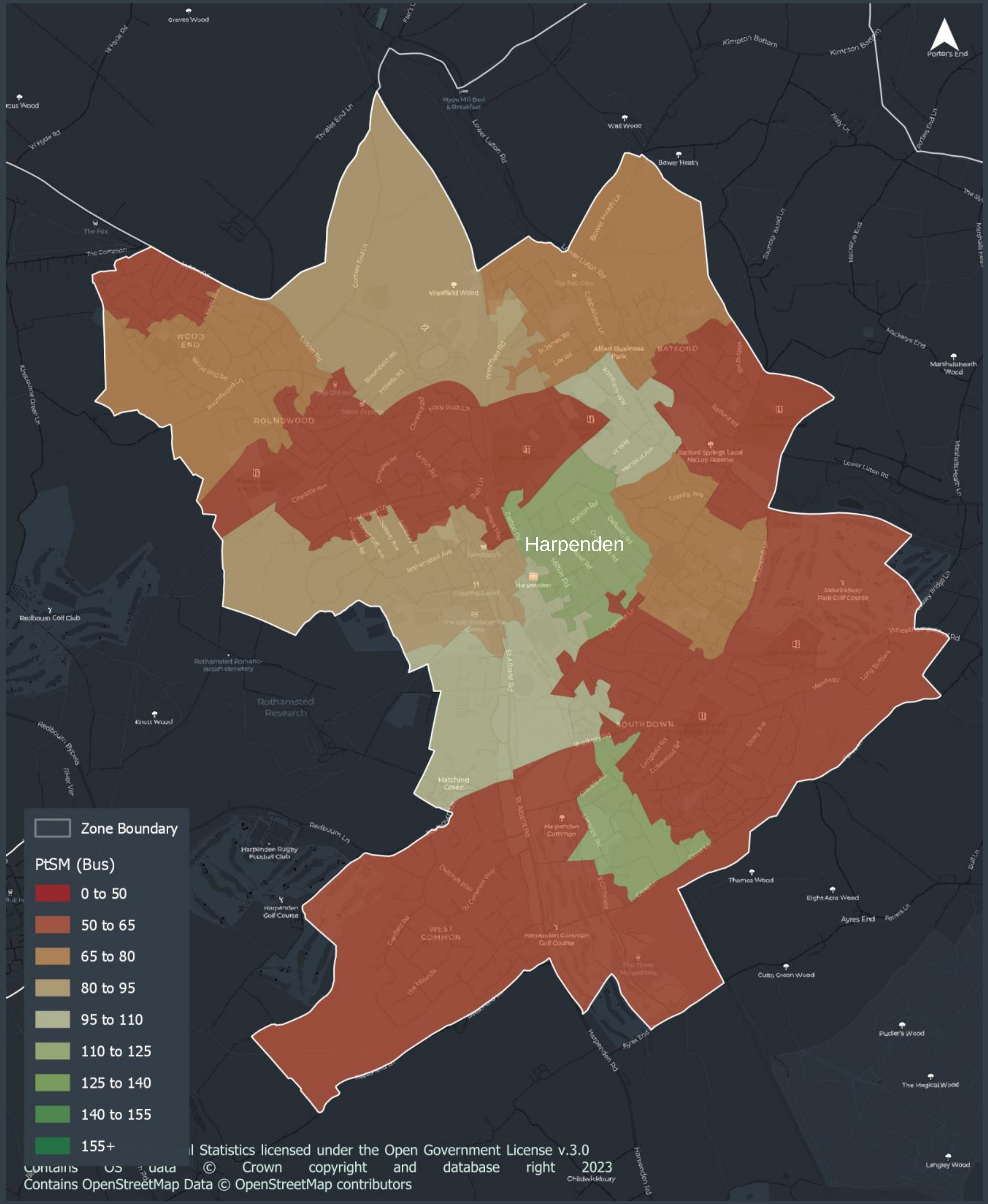


Bus propensity

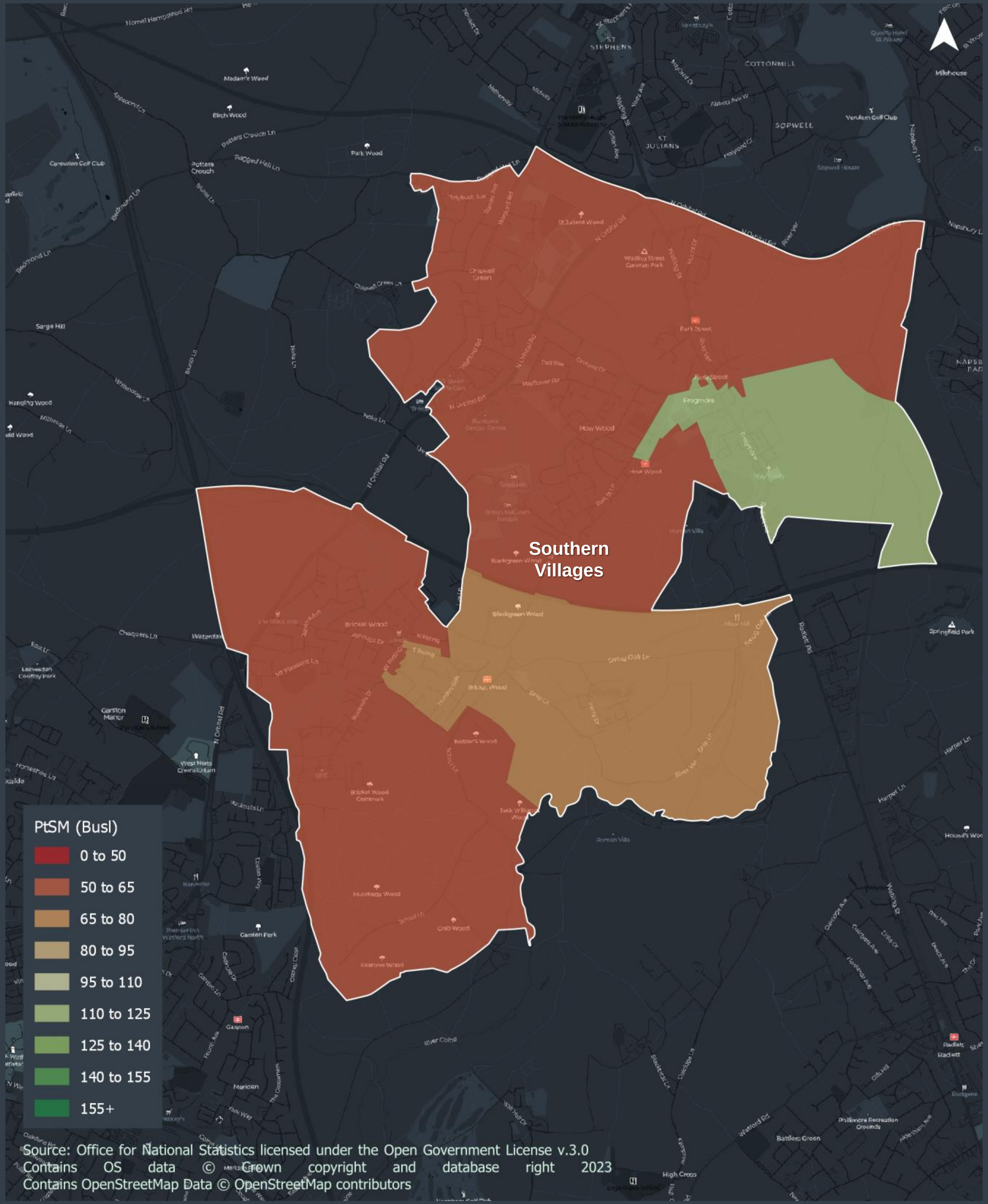
Appendix C13 Bus propensity in Redbourn



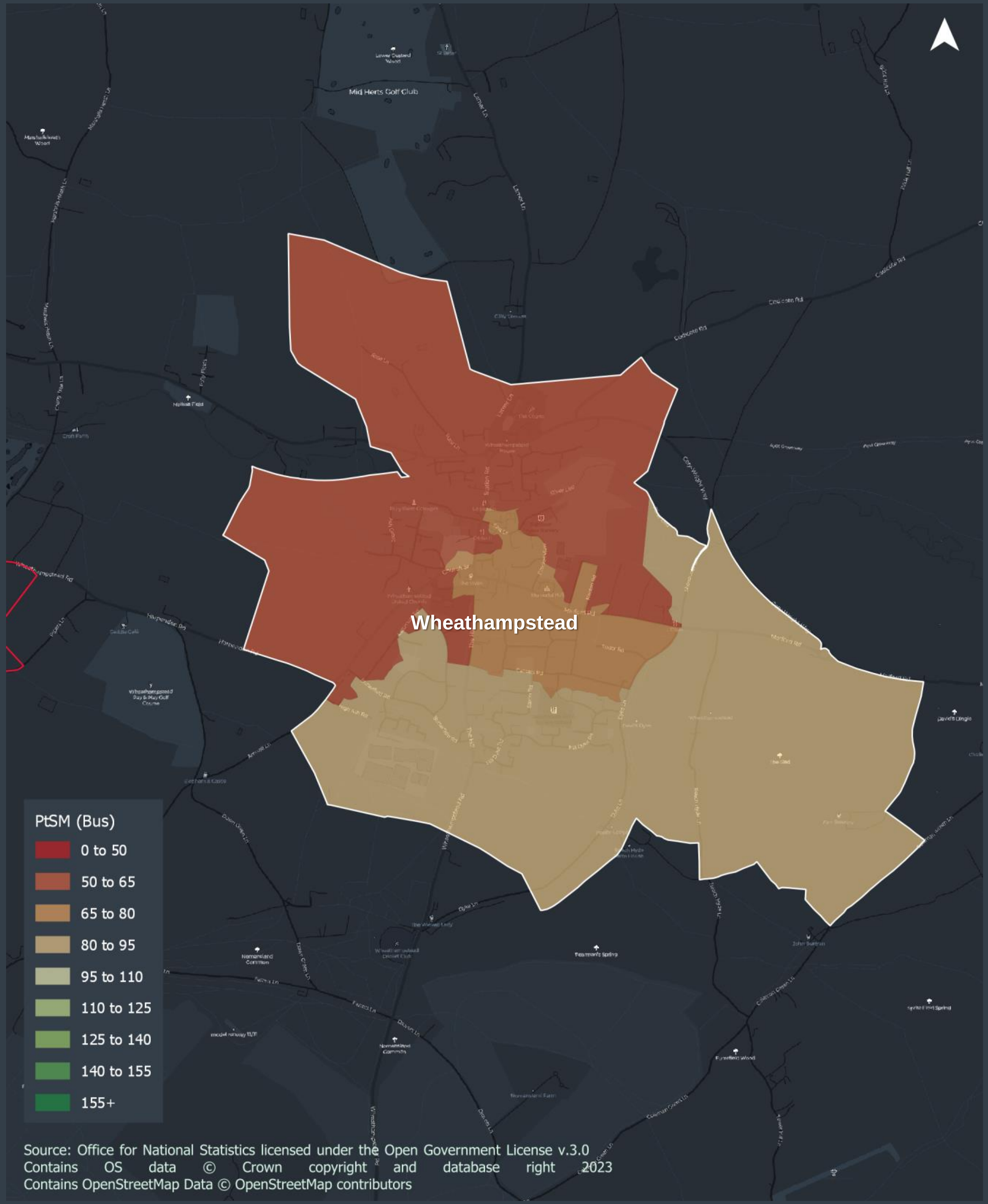
Appendix C14 Bus propensity in Harpenden



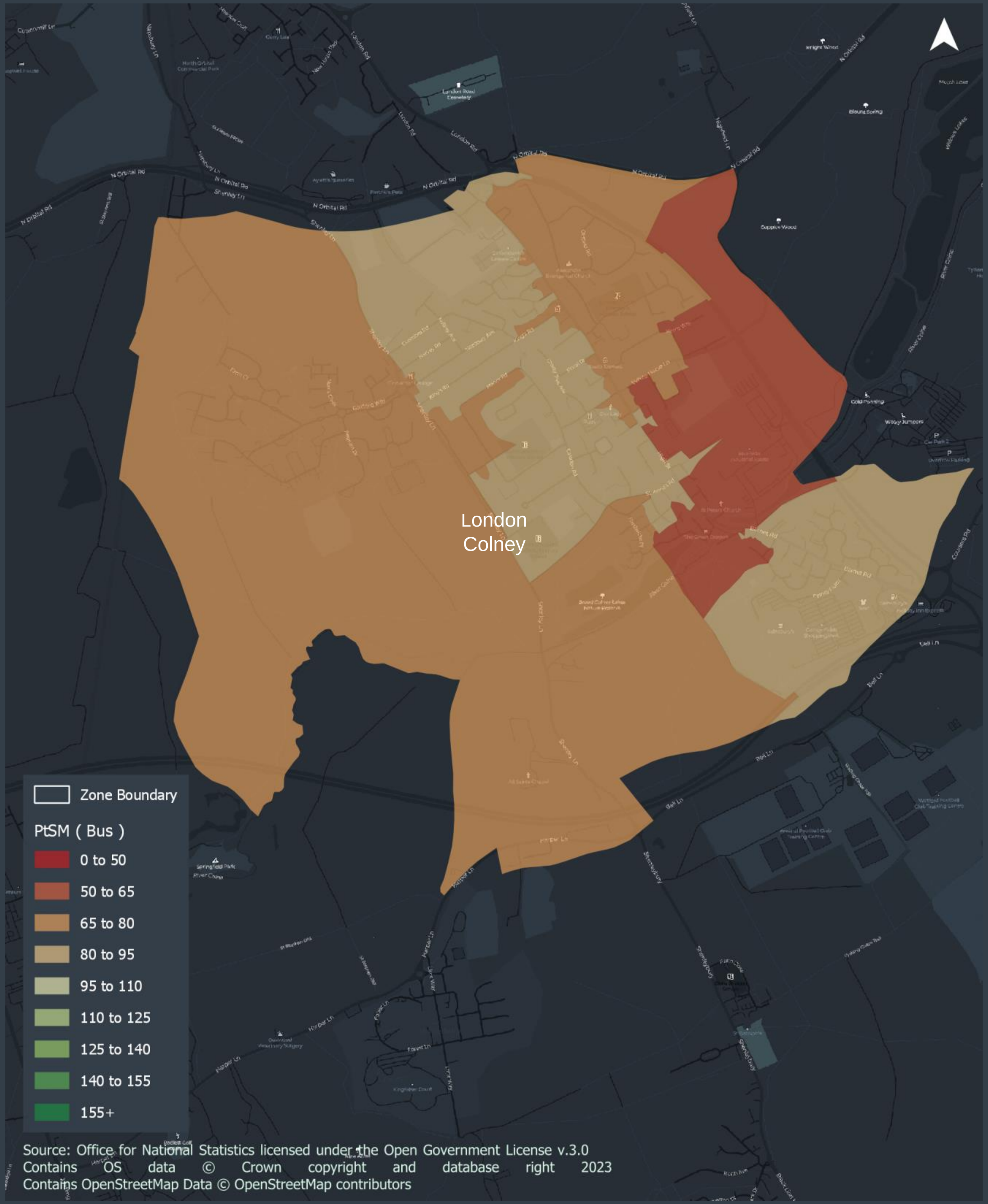
Appendix C15 Bus propensity in Southern Villages



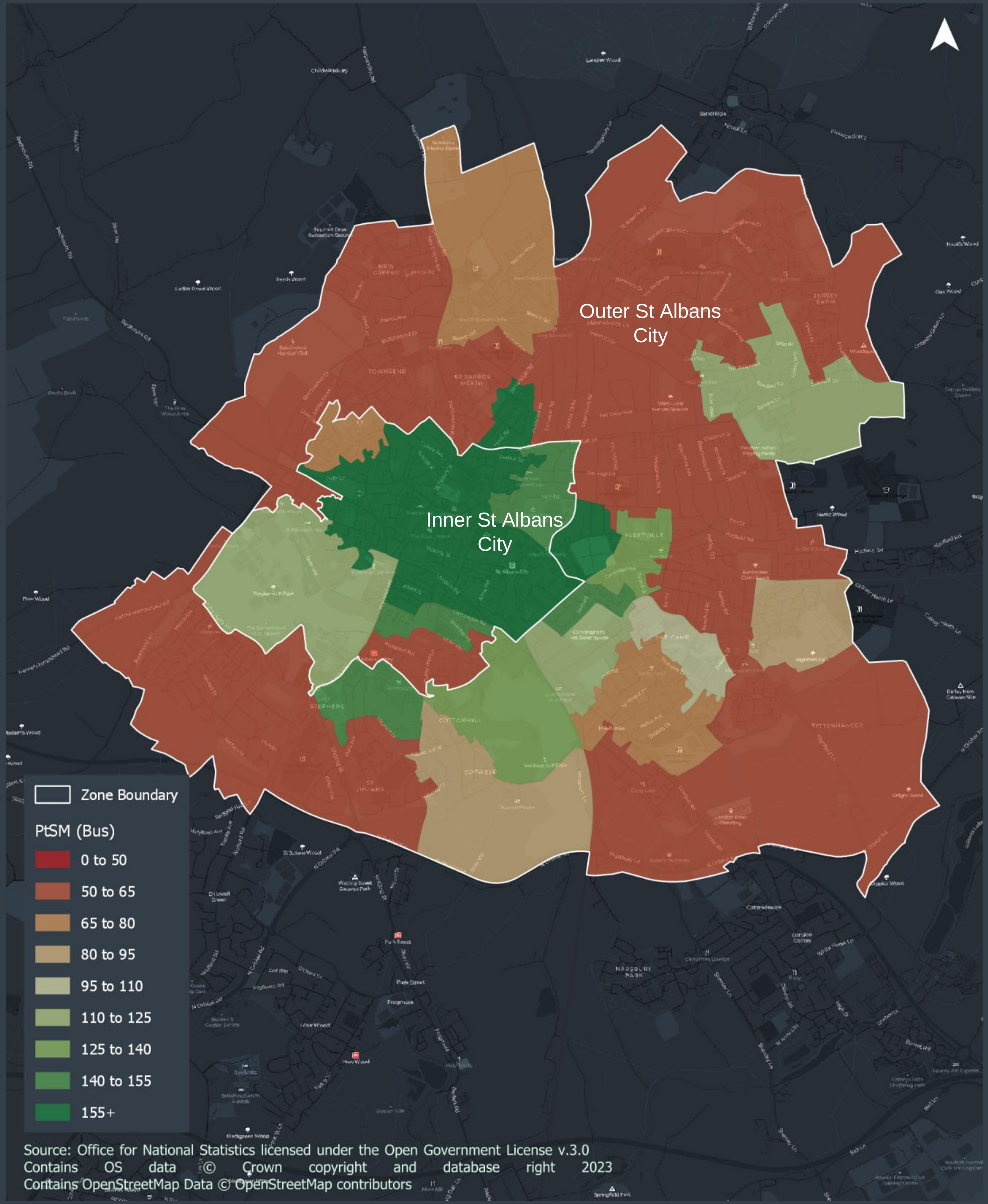
Appendix C16 Bus propensity in Wheathampstead



Appendix C17 Bus propensity in London Colney

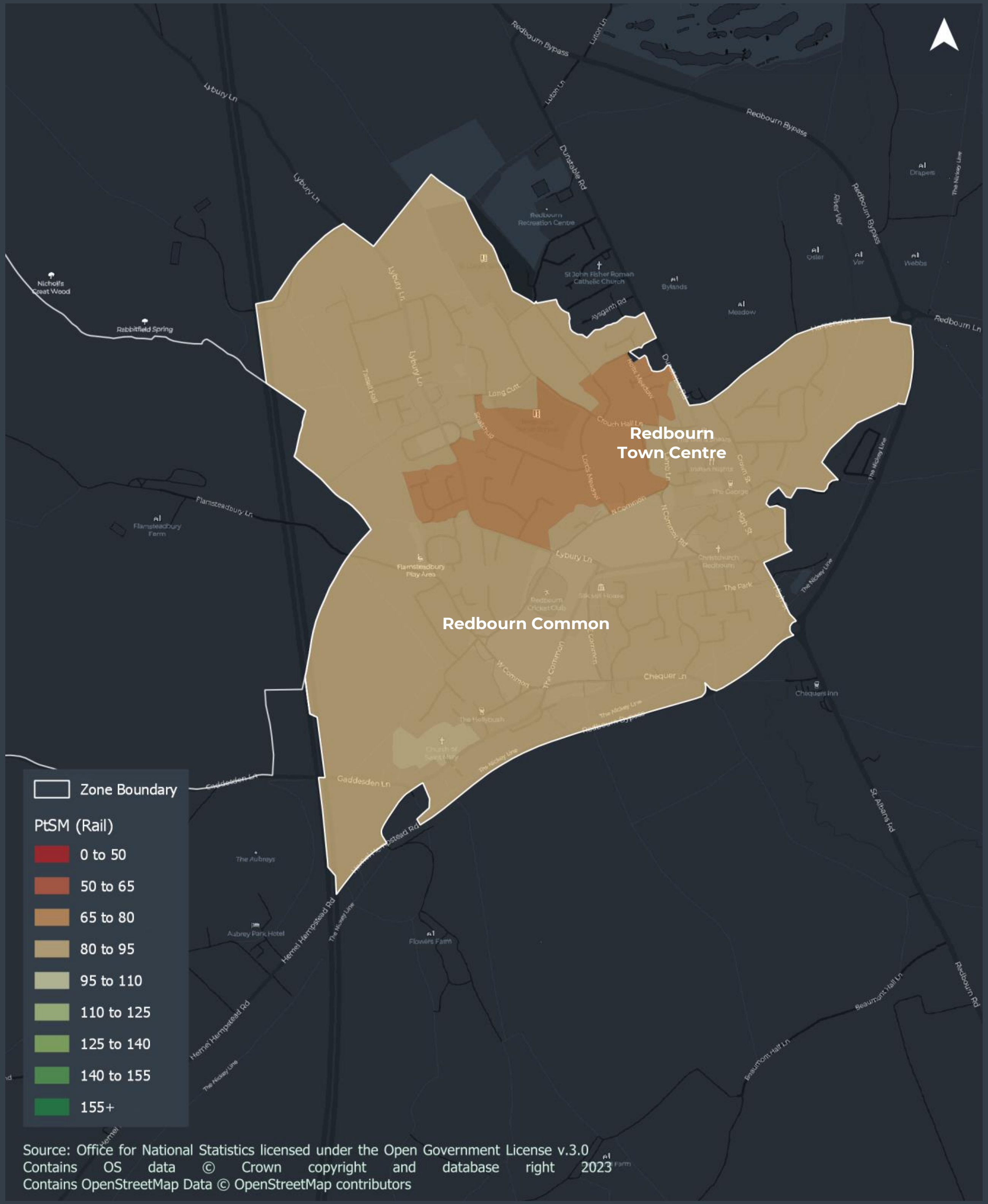


Appendix C18 Bus propensity in Inner & Outer St Albans

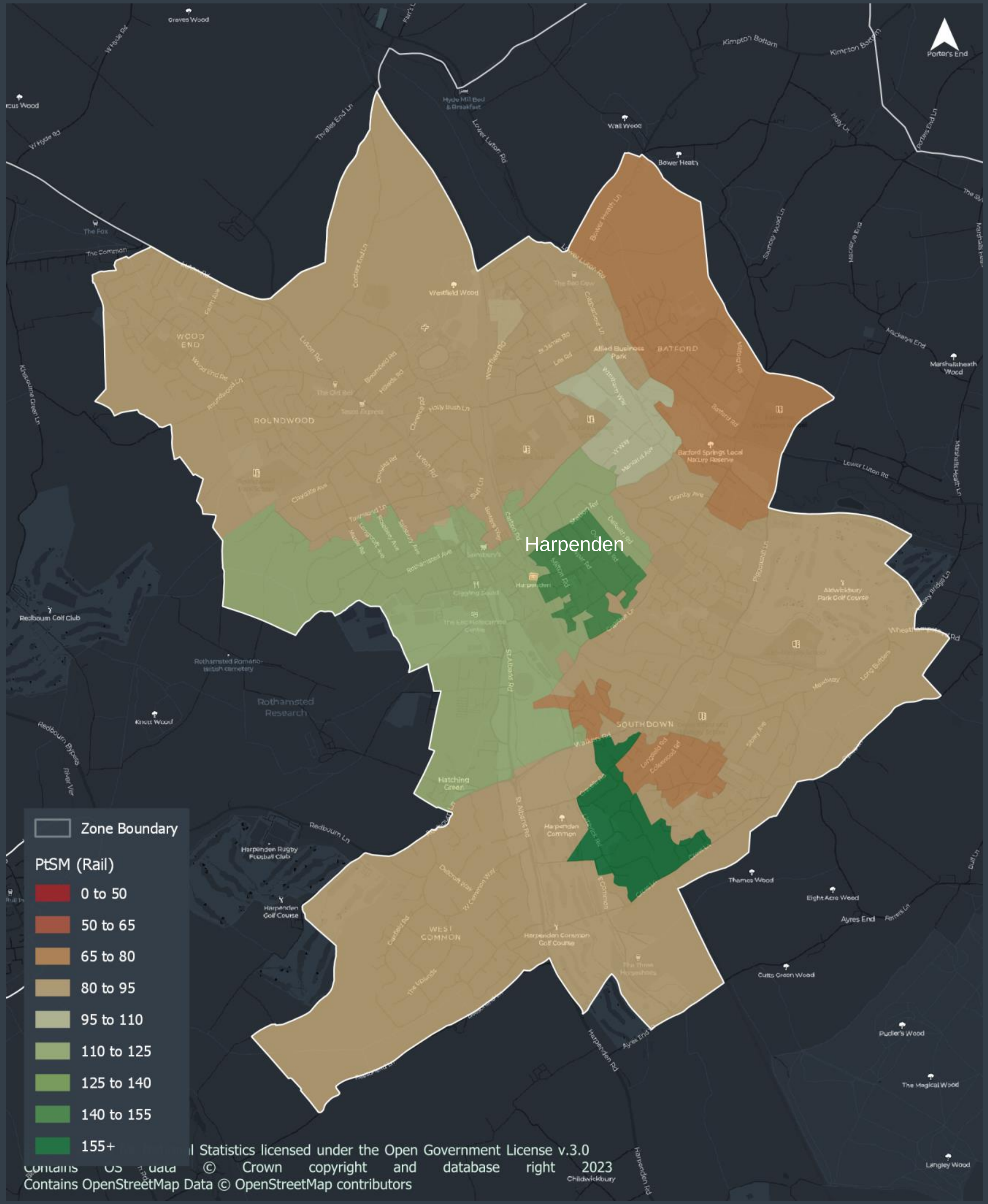


Rail propensity

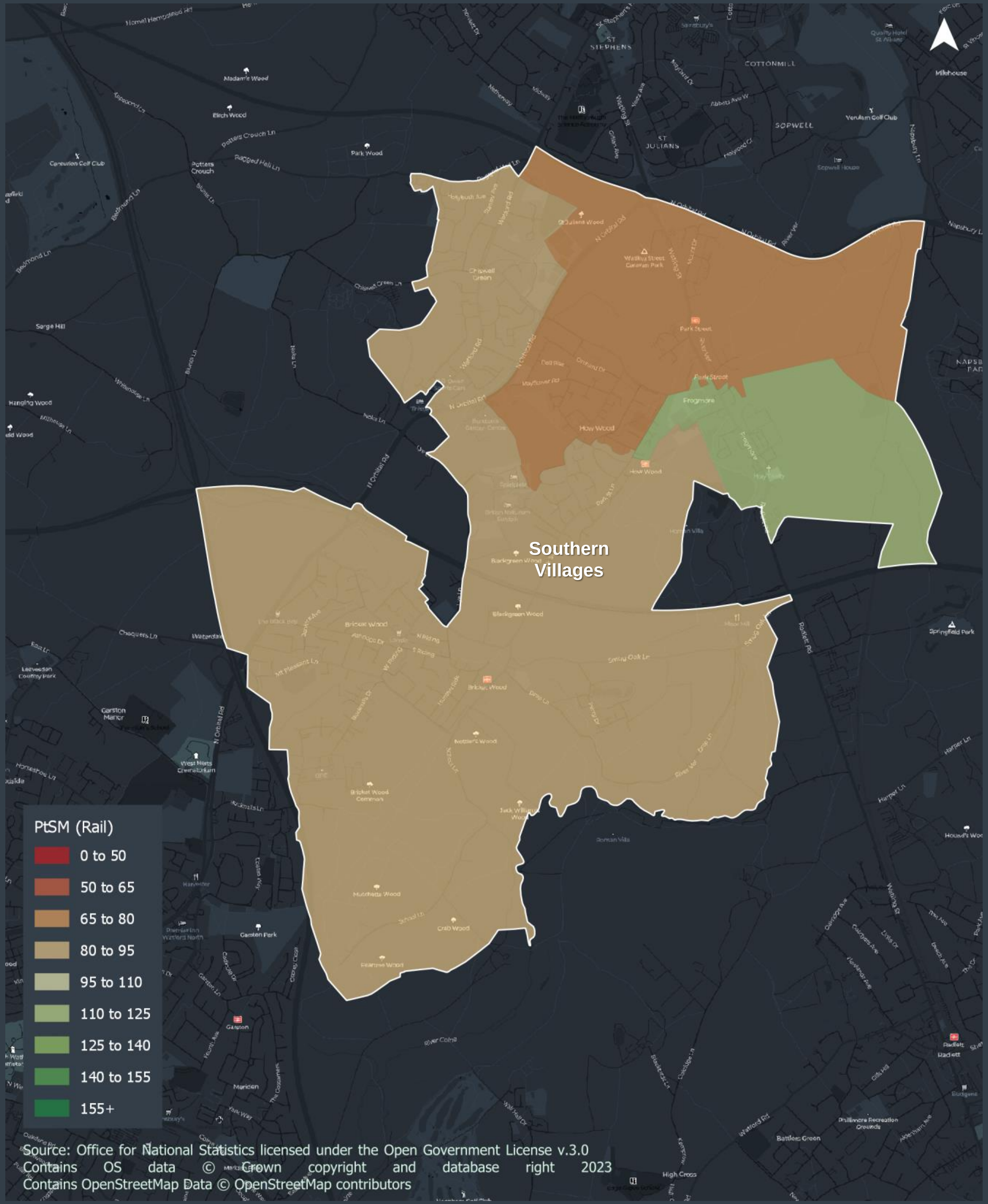
Appendix C19 Rail propensity in Redbourn



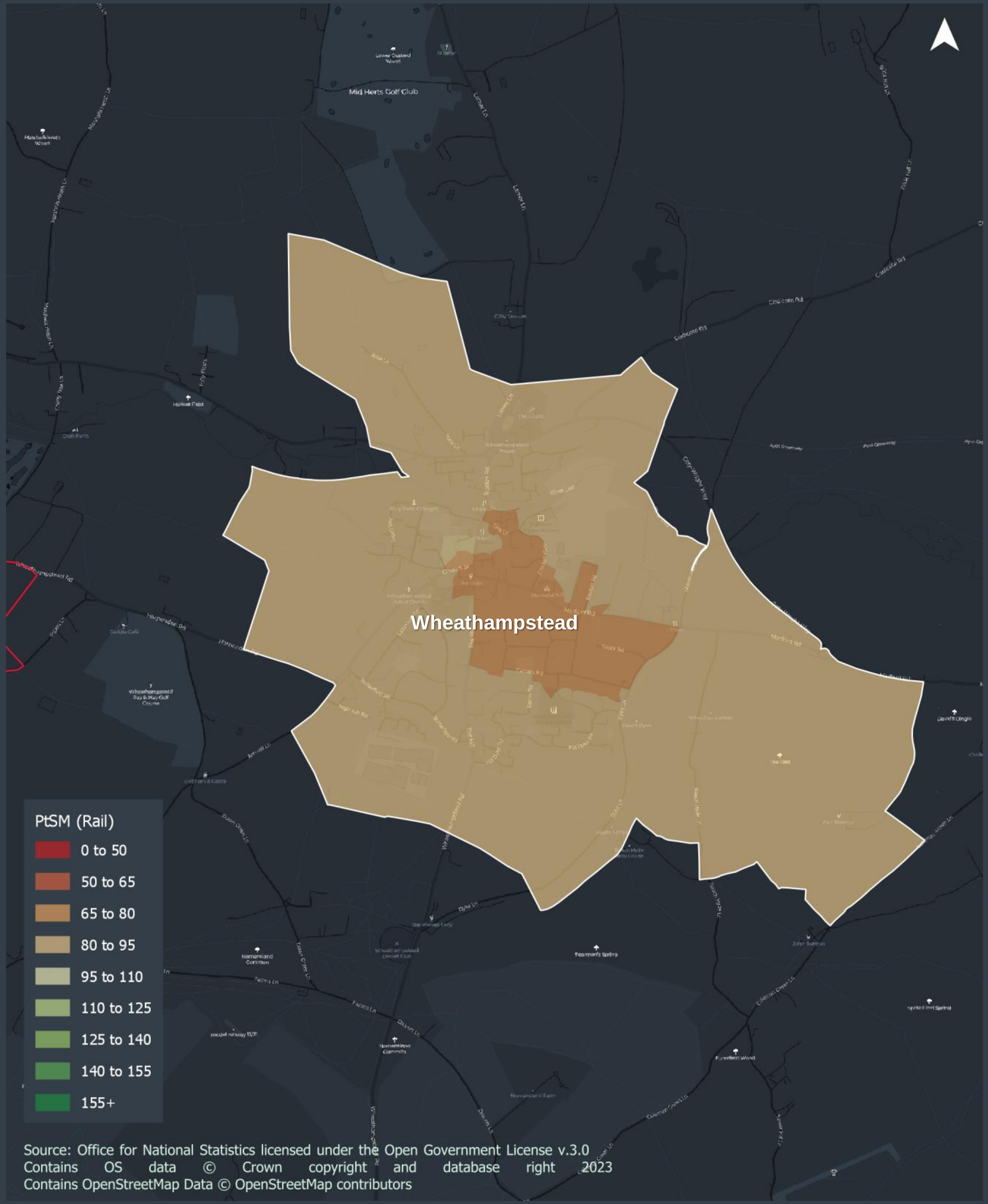
Appendix C20 Rail propensity in Harpenden



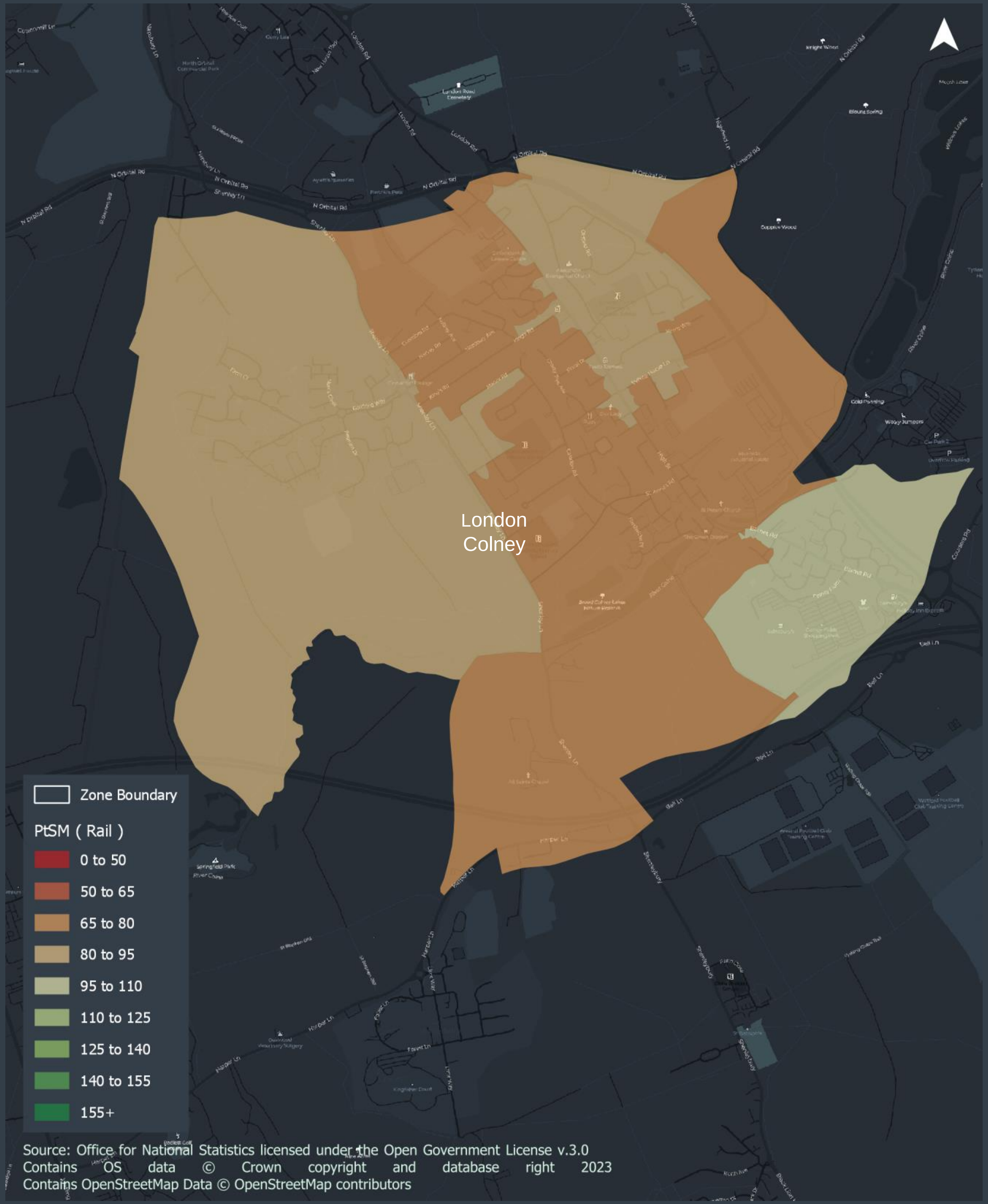
Appendix C21 Rail propensity in Southern Villages



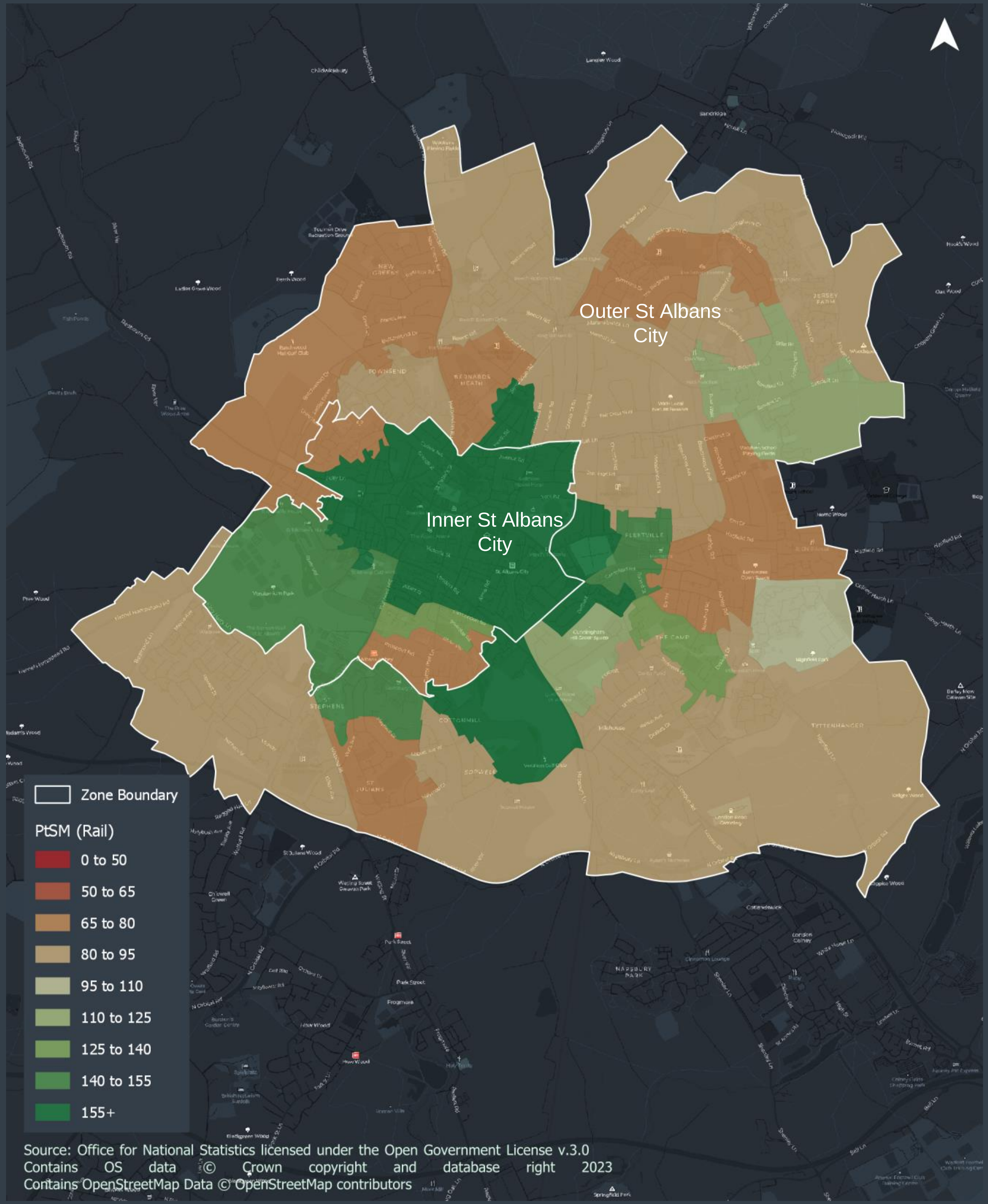
Appendix C22 Rail propensity in Wheathampstead



Appendix C23 Rail propensity in London Colney

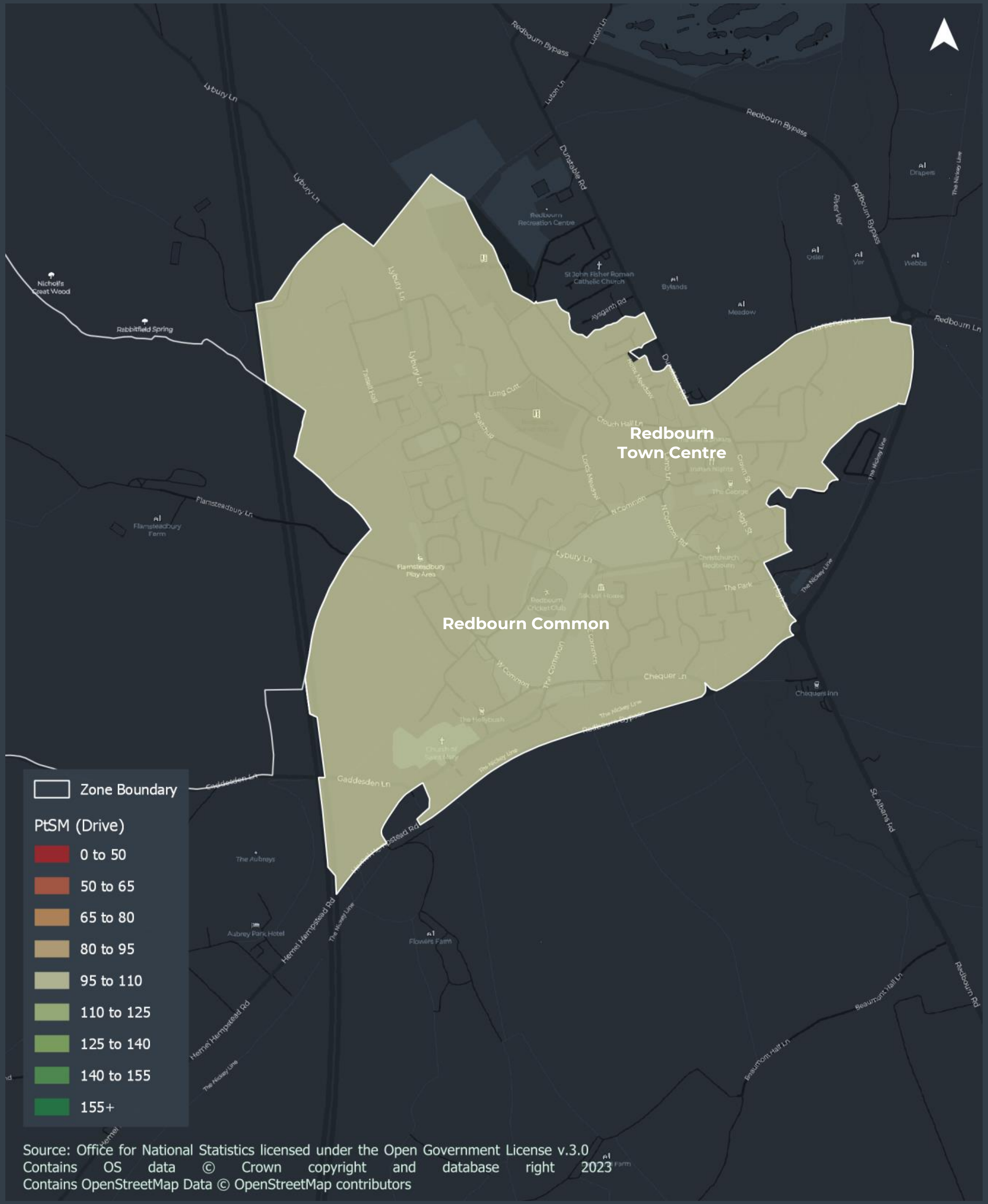


Appendix C24 Rail propensity in Inner & Outer St Albans

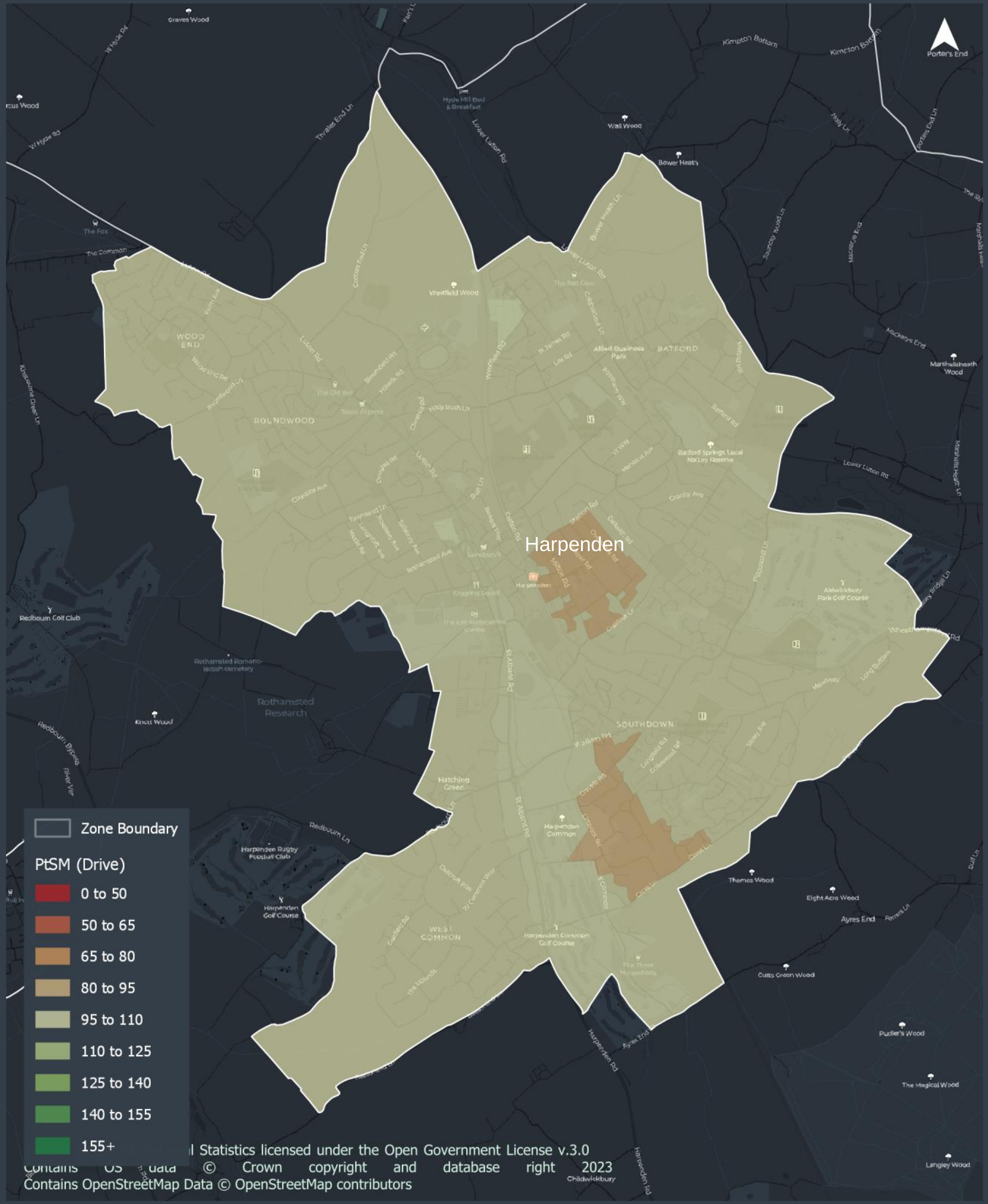


Driving propensity

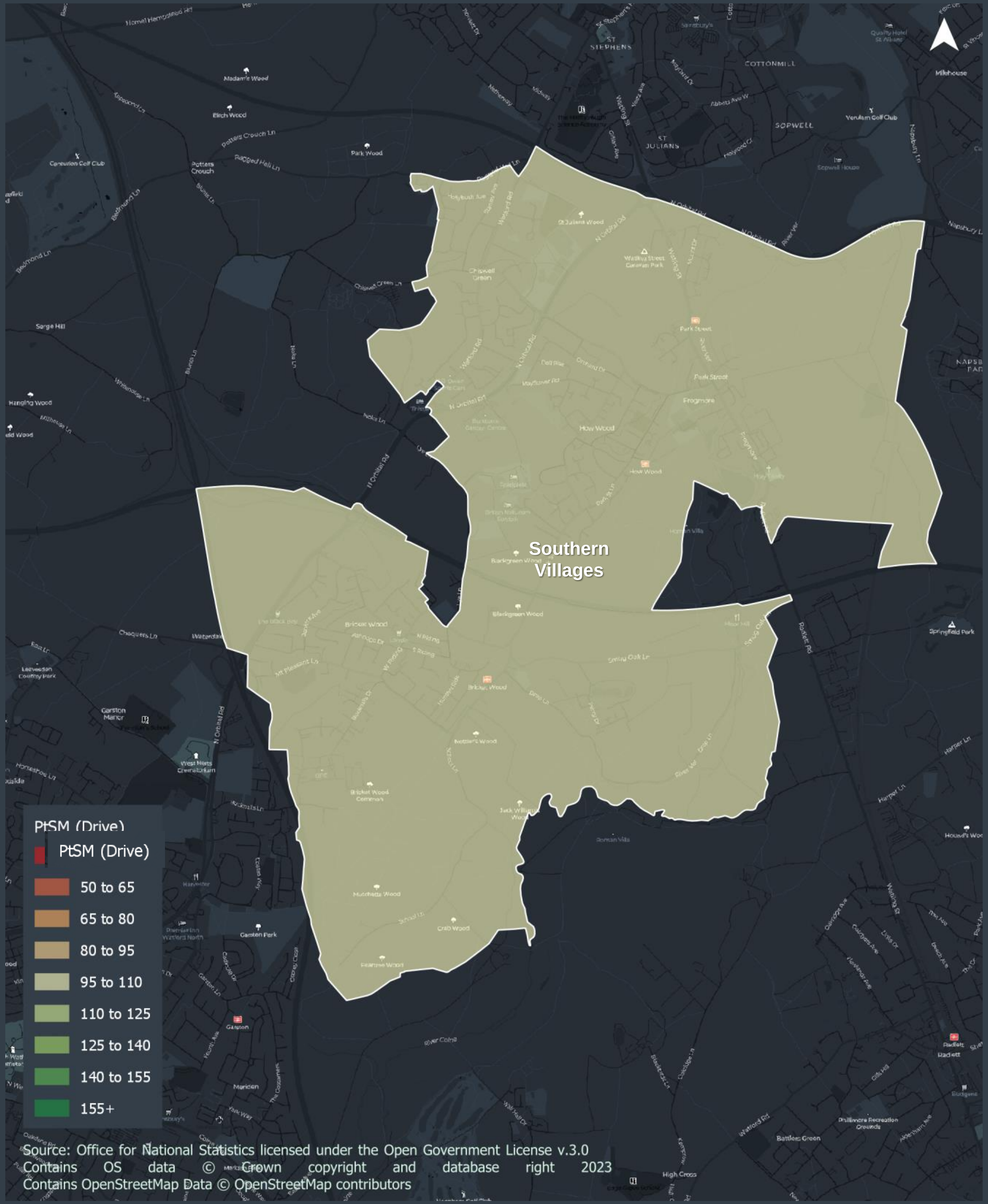
Appendix C25 Driving propensity in Redbourn



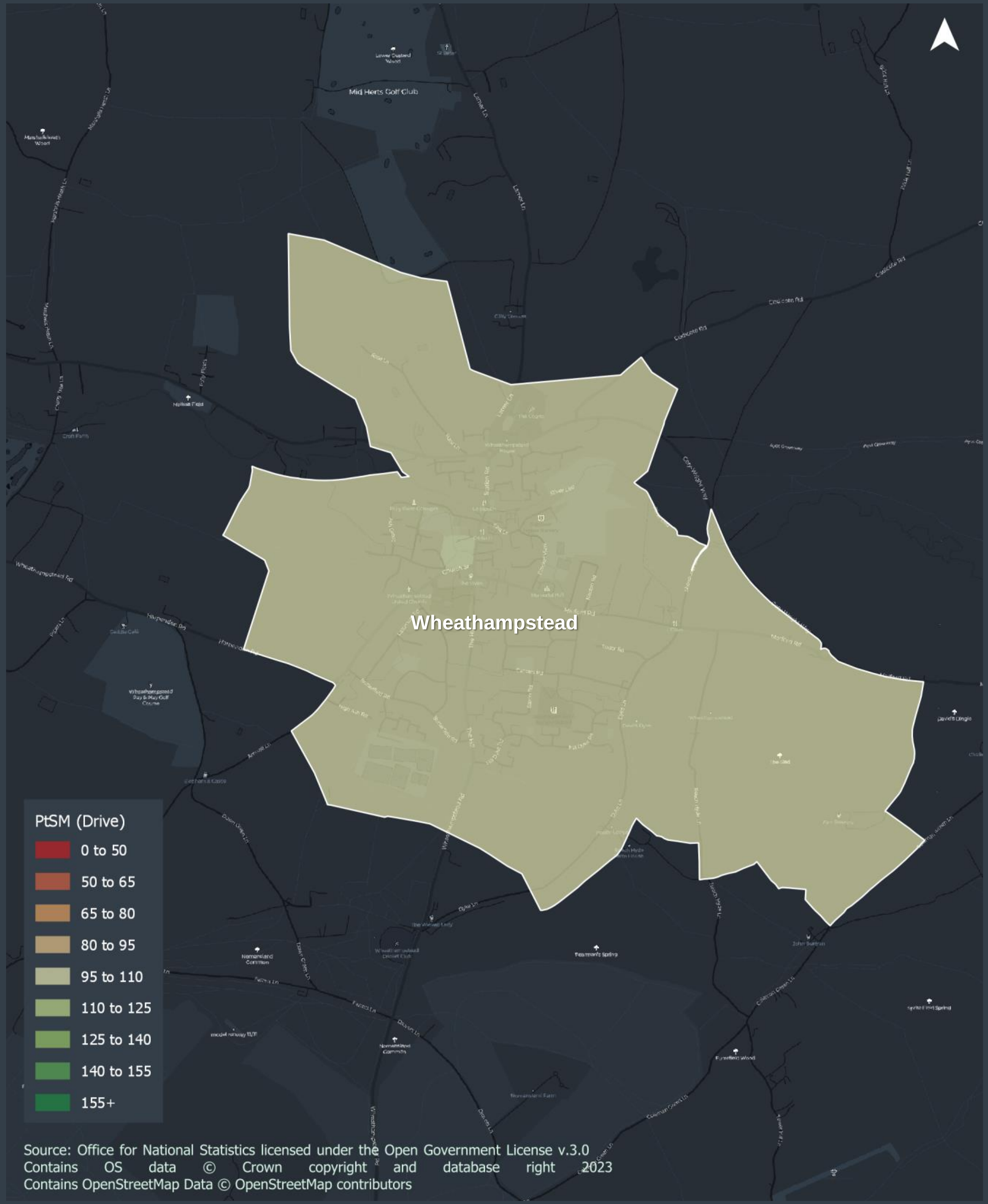
Appendix C26 Driving propensity in Harpenden



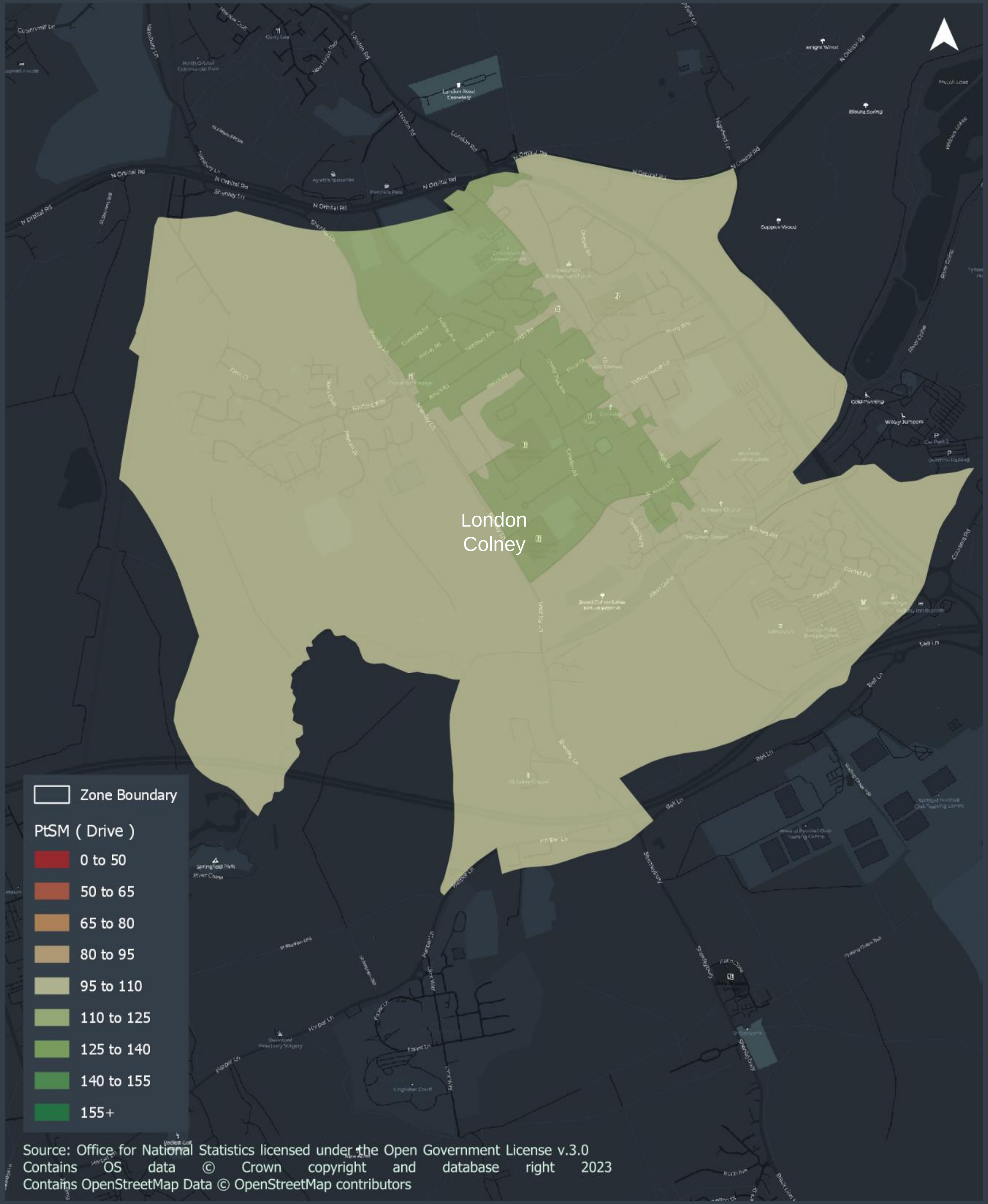
Appendix C27 Driving propensity in Southern Villages



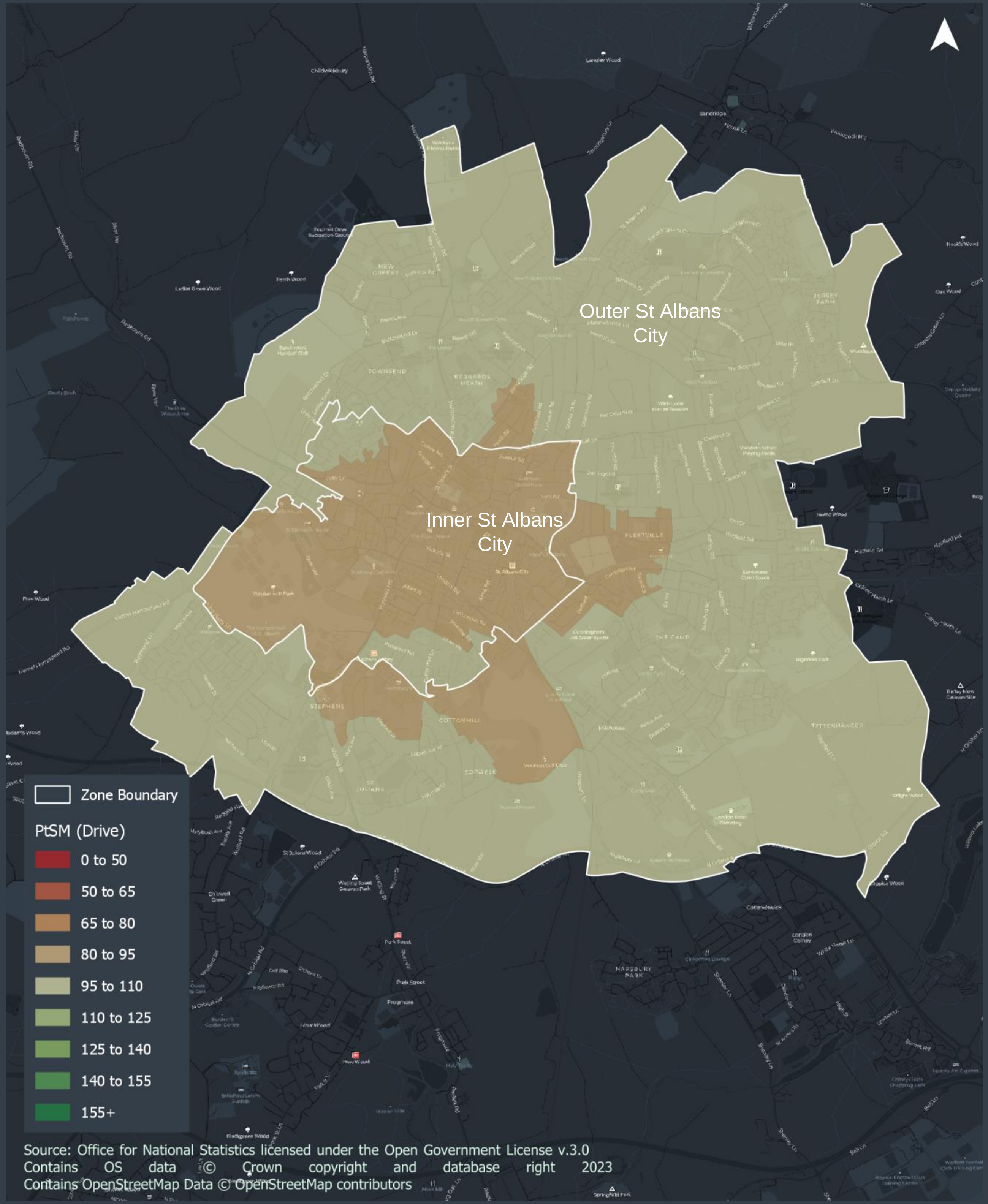
Appendix C28 Driving propensity in Wheathampstead



Appendix C29 Driving propensity in London Colney



Appendix C30 Driving propensity in Inner & Outer St Albans

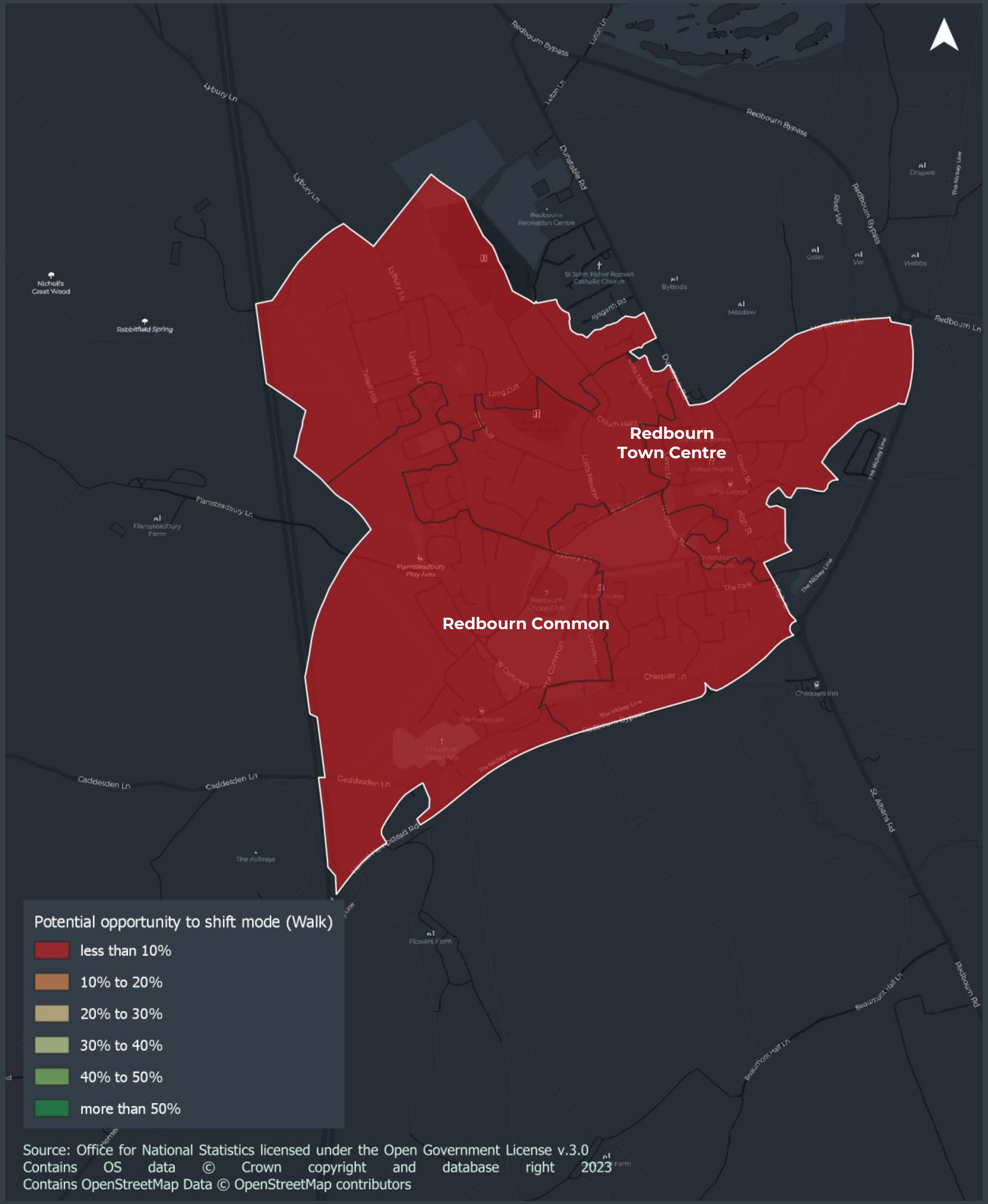


APPENDIX D

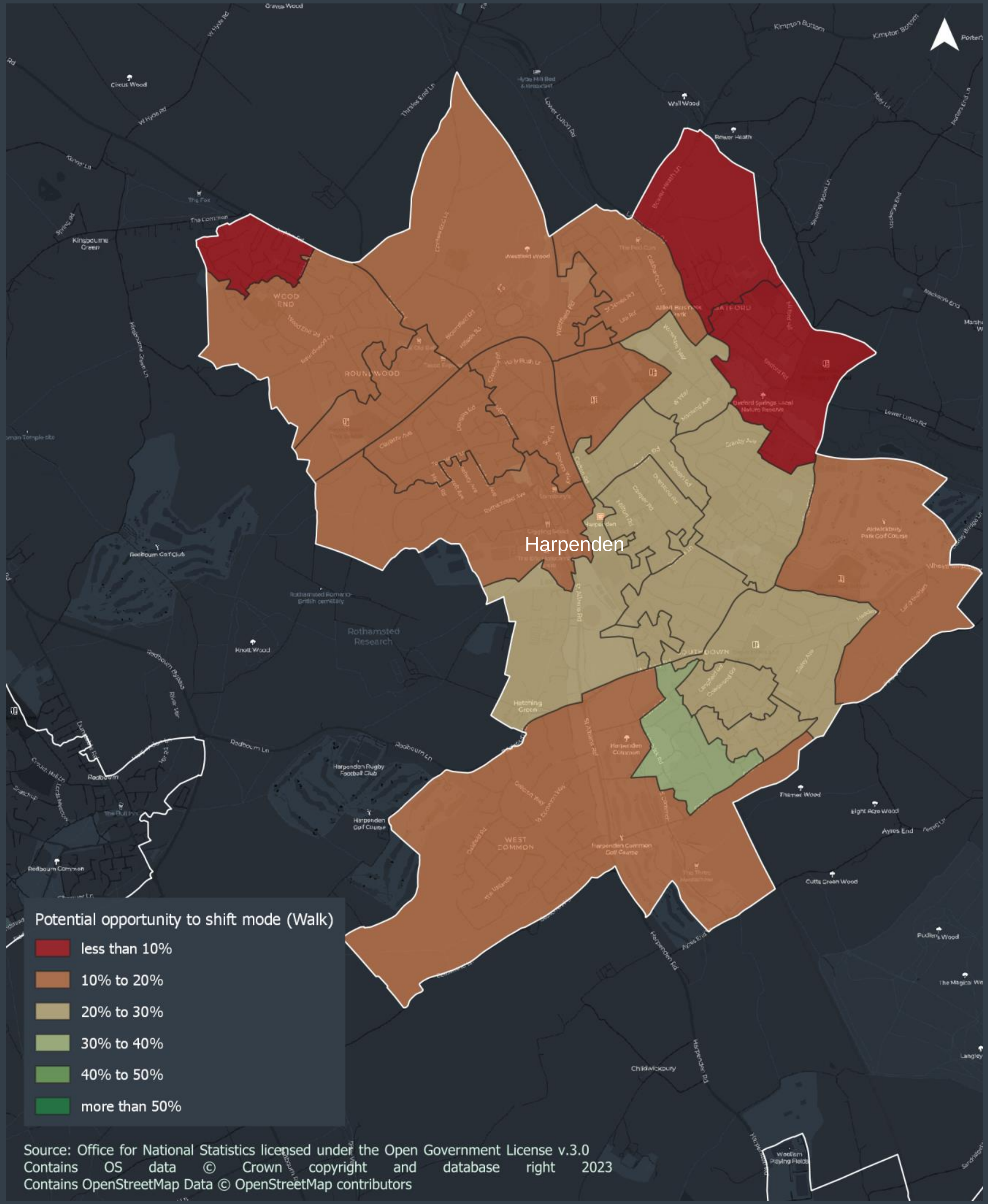
Breakdown of sustainable travel potential for existing communities

Walking potential

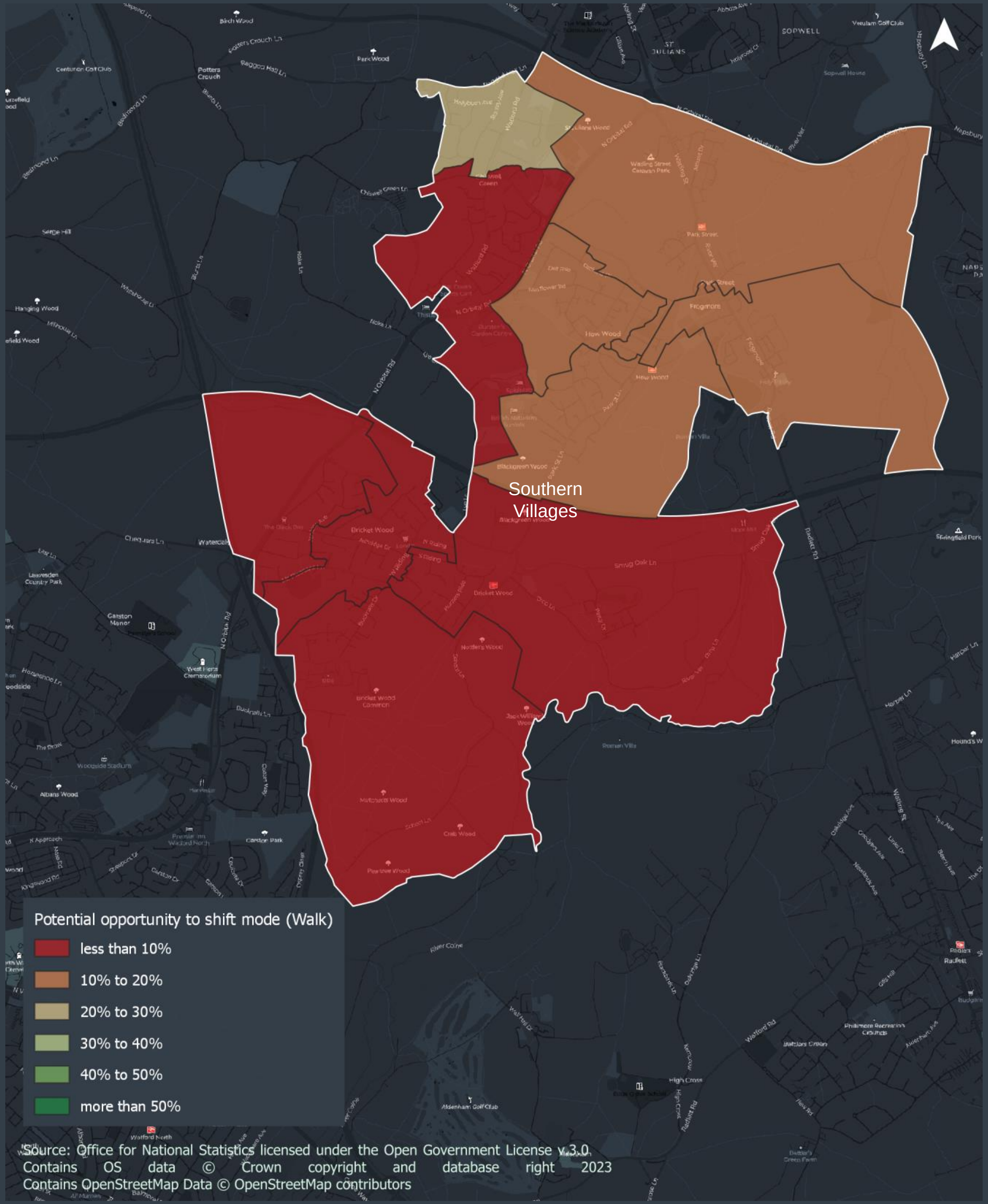
Appendix D1 Walking potential in Redbourn



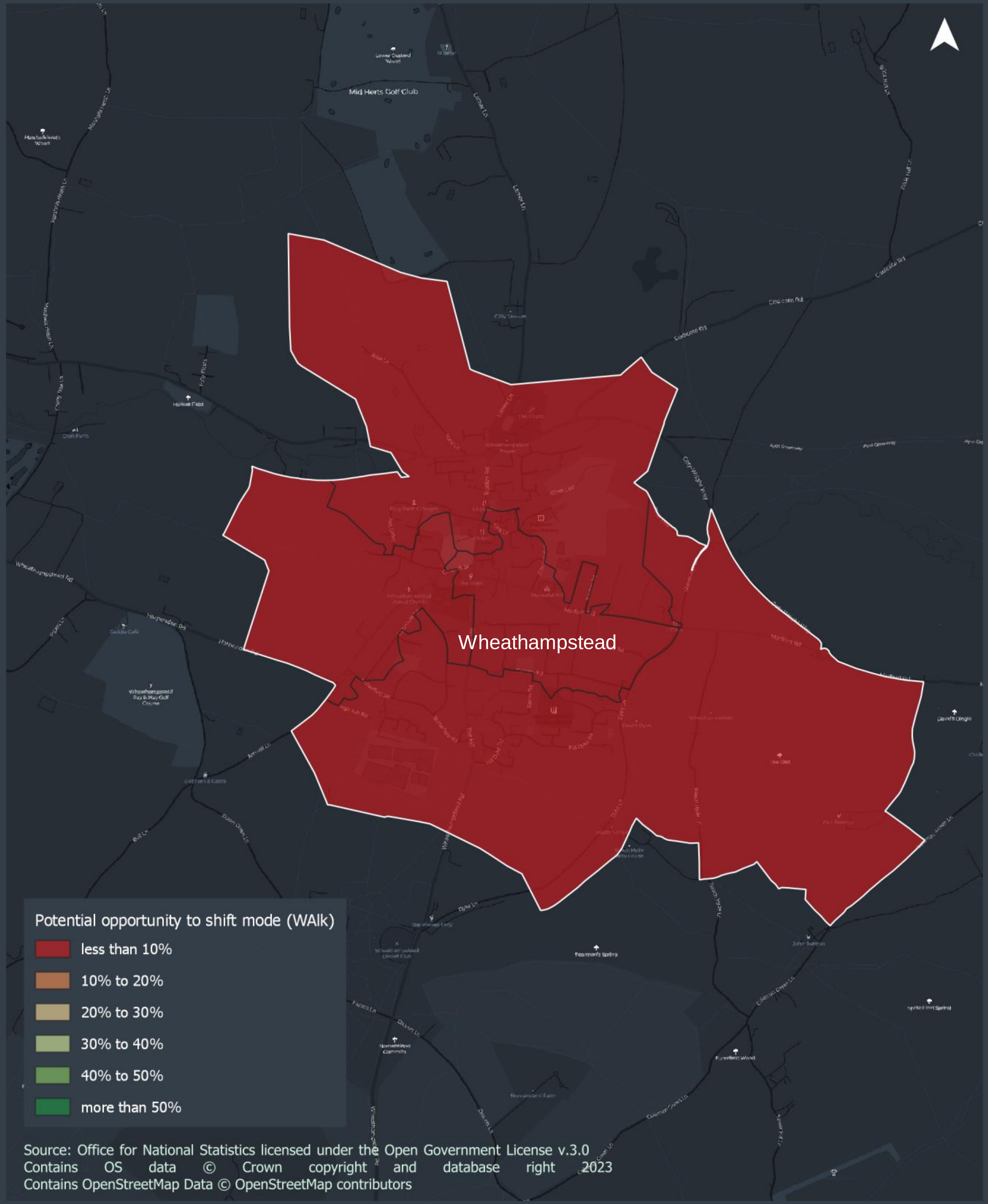
Appendix A1 Walking potential in Harpenden



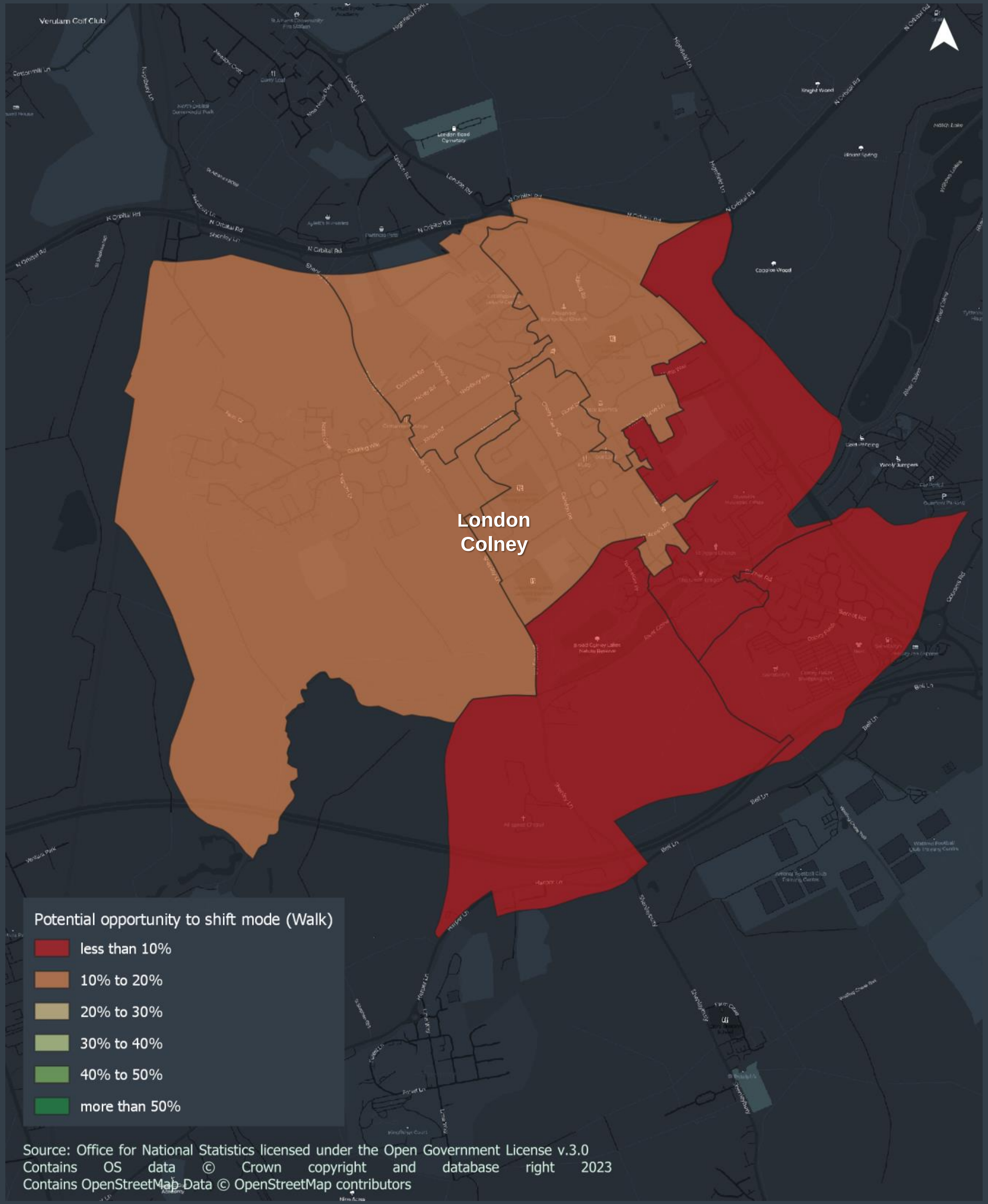
Appendix D3 Walking potential in Southern Villages



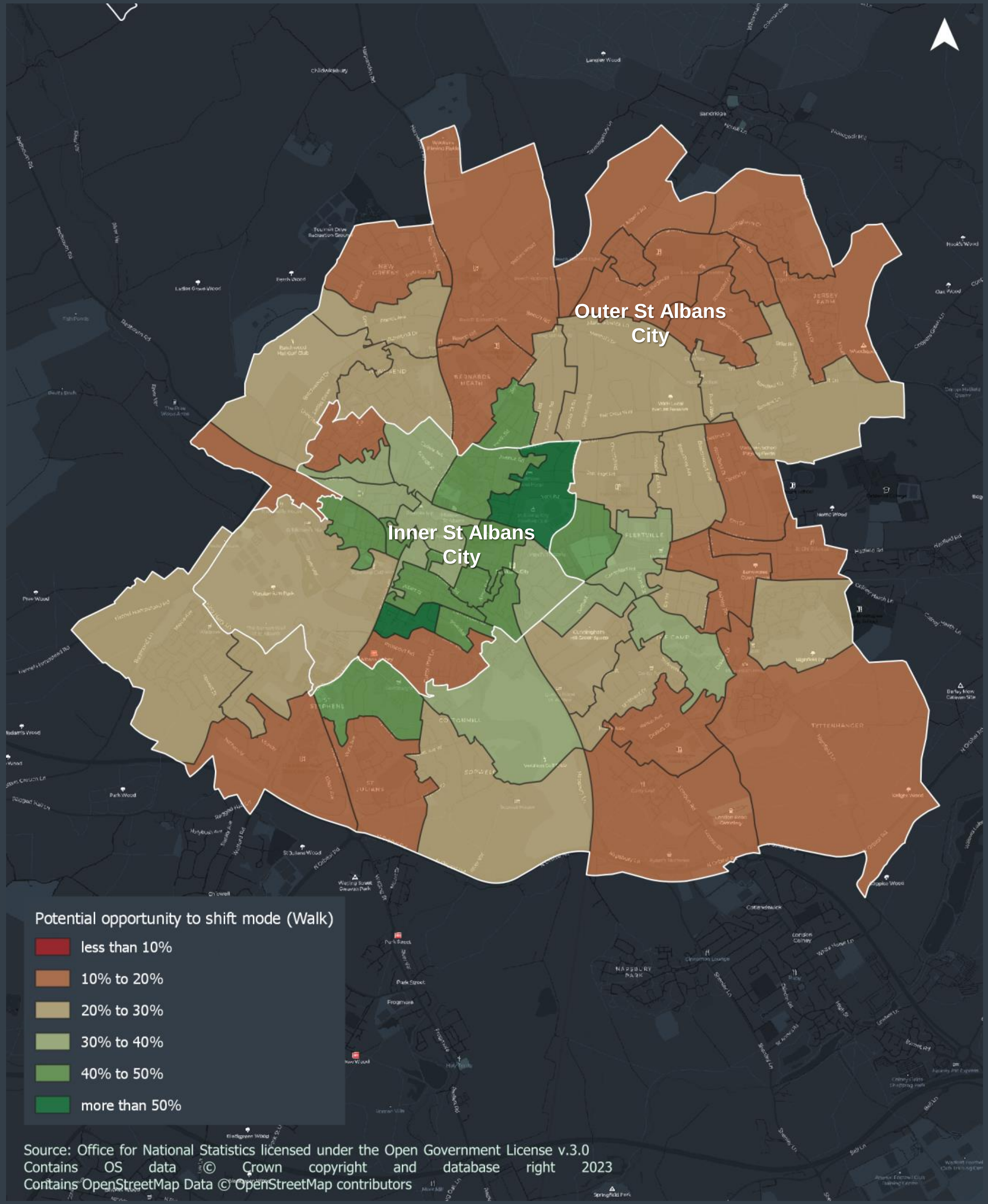
Appendix D4 Walkng potential in Wheathampstead



Appendix D5 Walking potential in London Colney

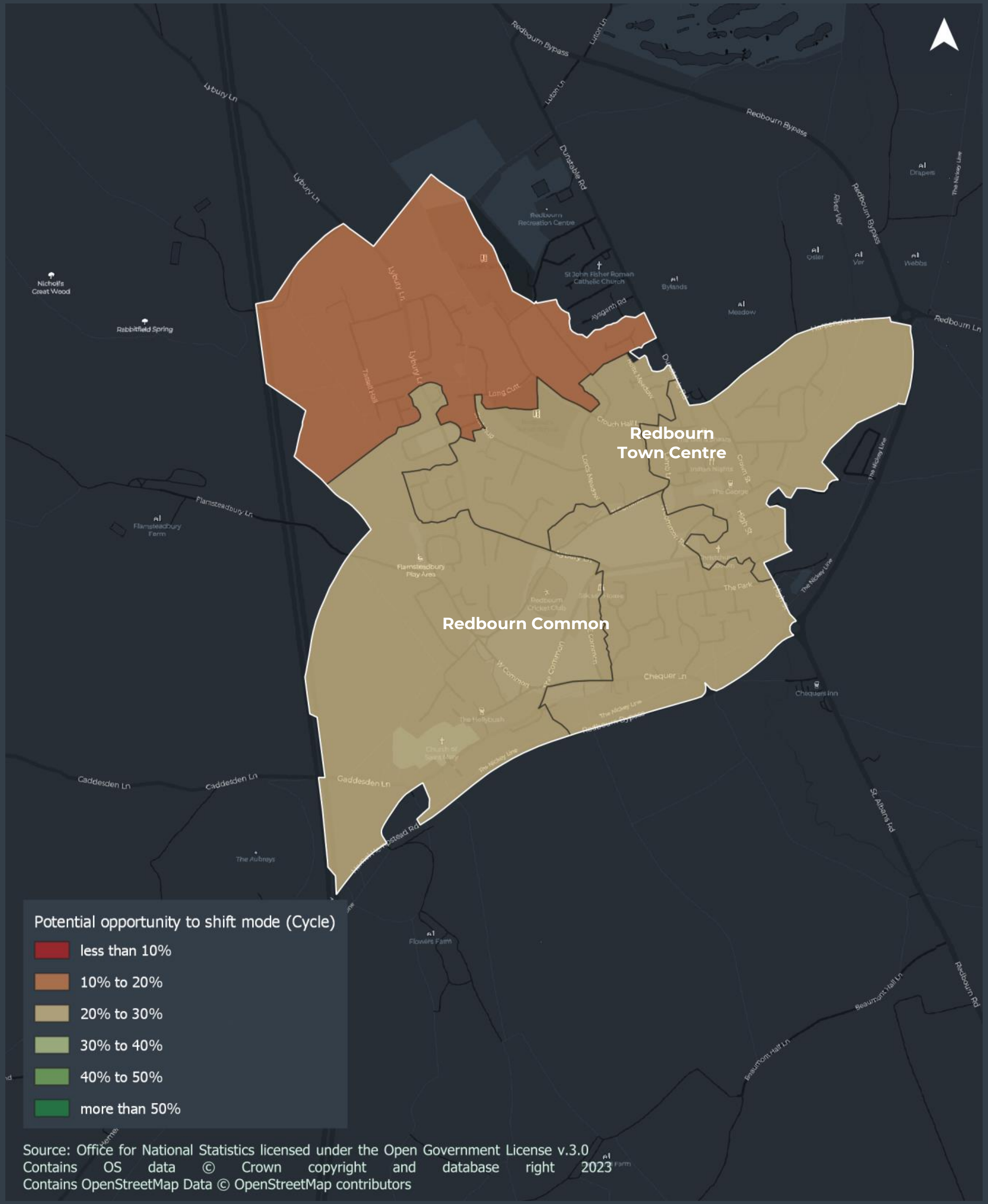


Appendix D6 Walking potential in Inner & Outer St Albans

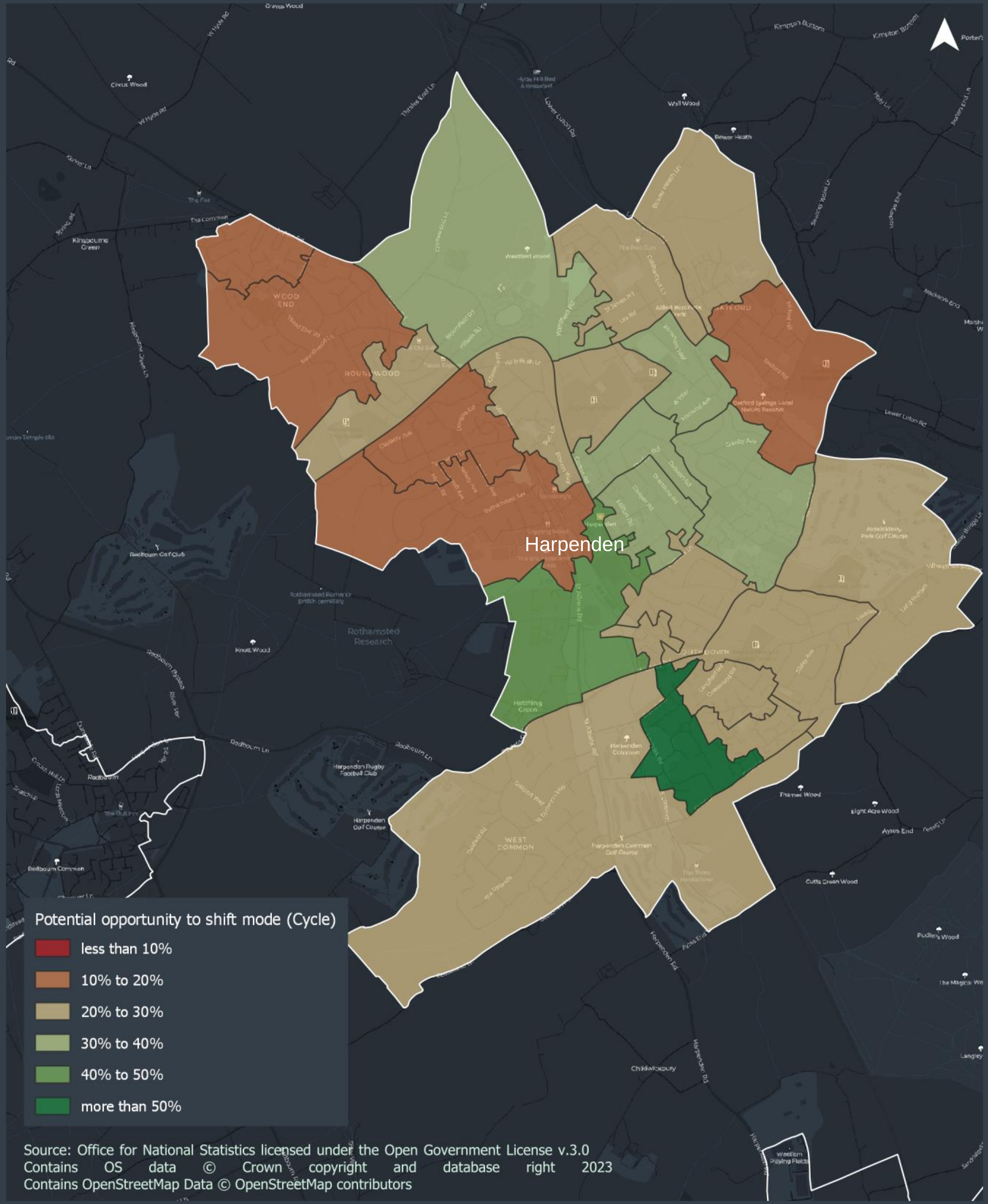


Cycling potential

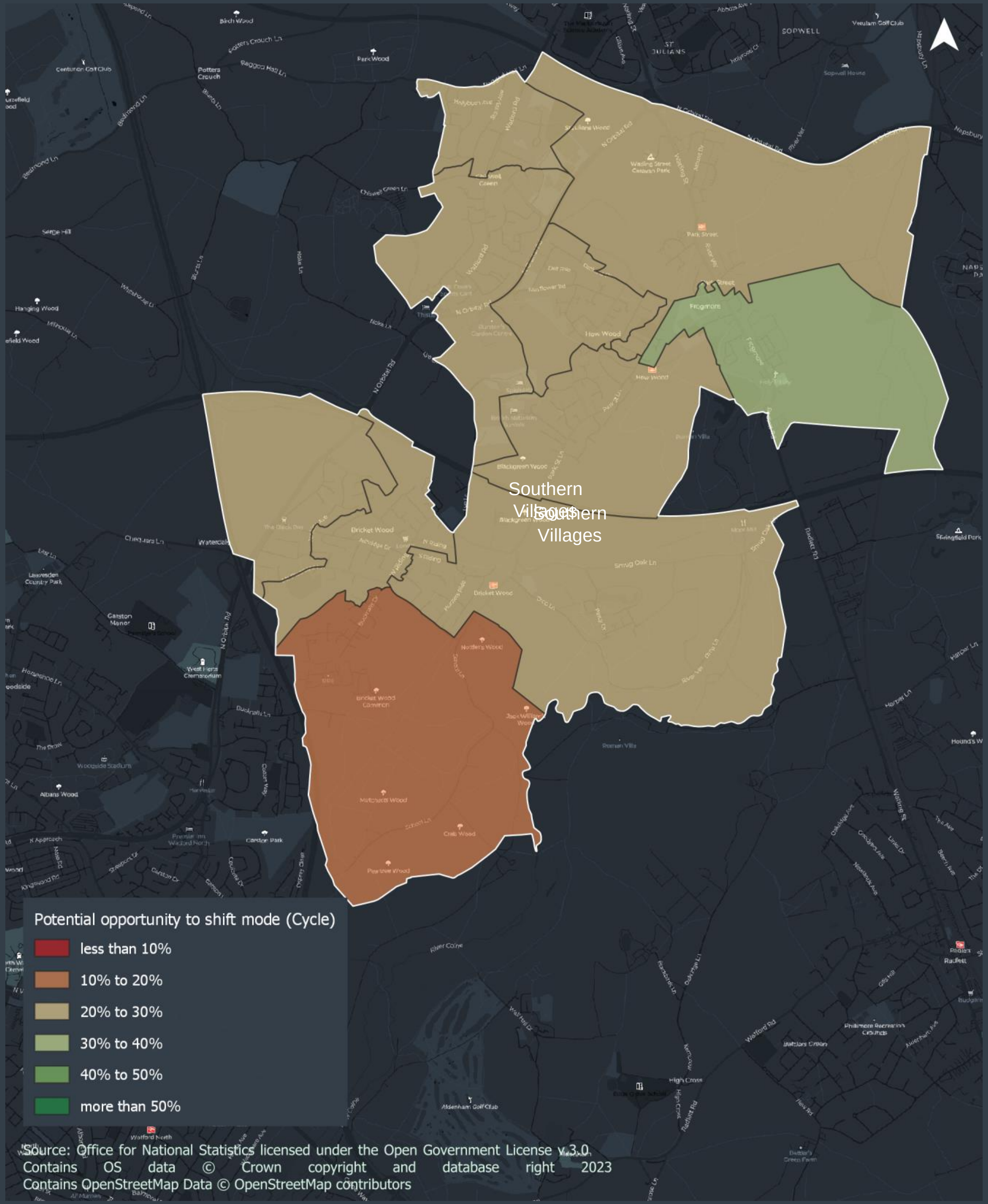
Appendix D7 Cycling potential in Redbourn



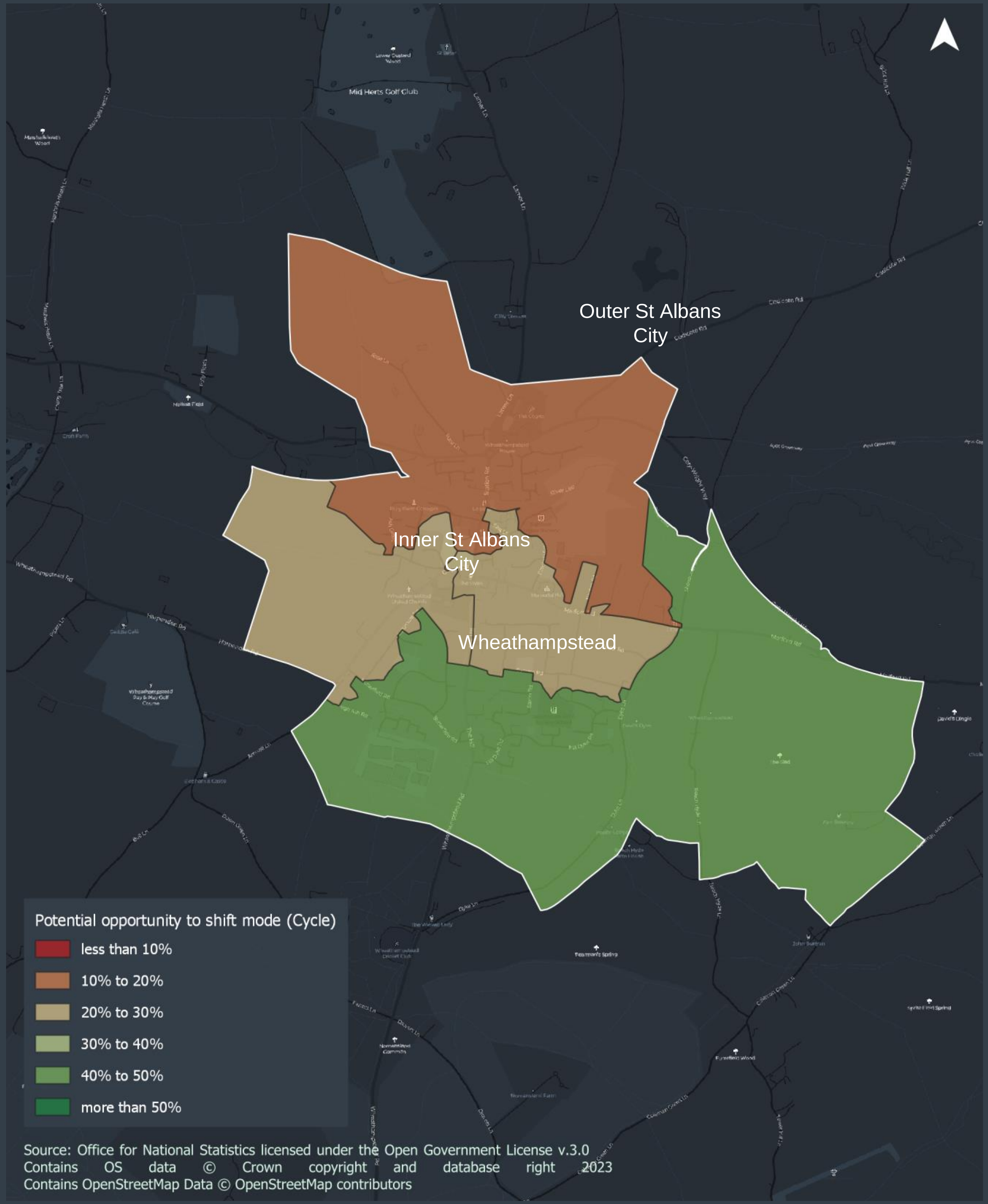
Appendix D8 Cycling potential in Harpenden



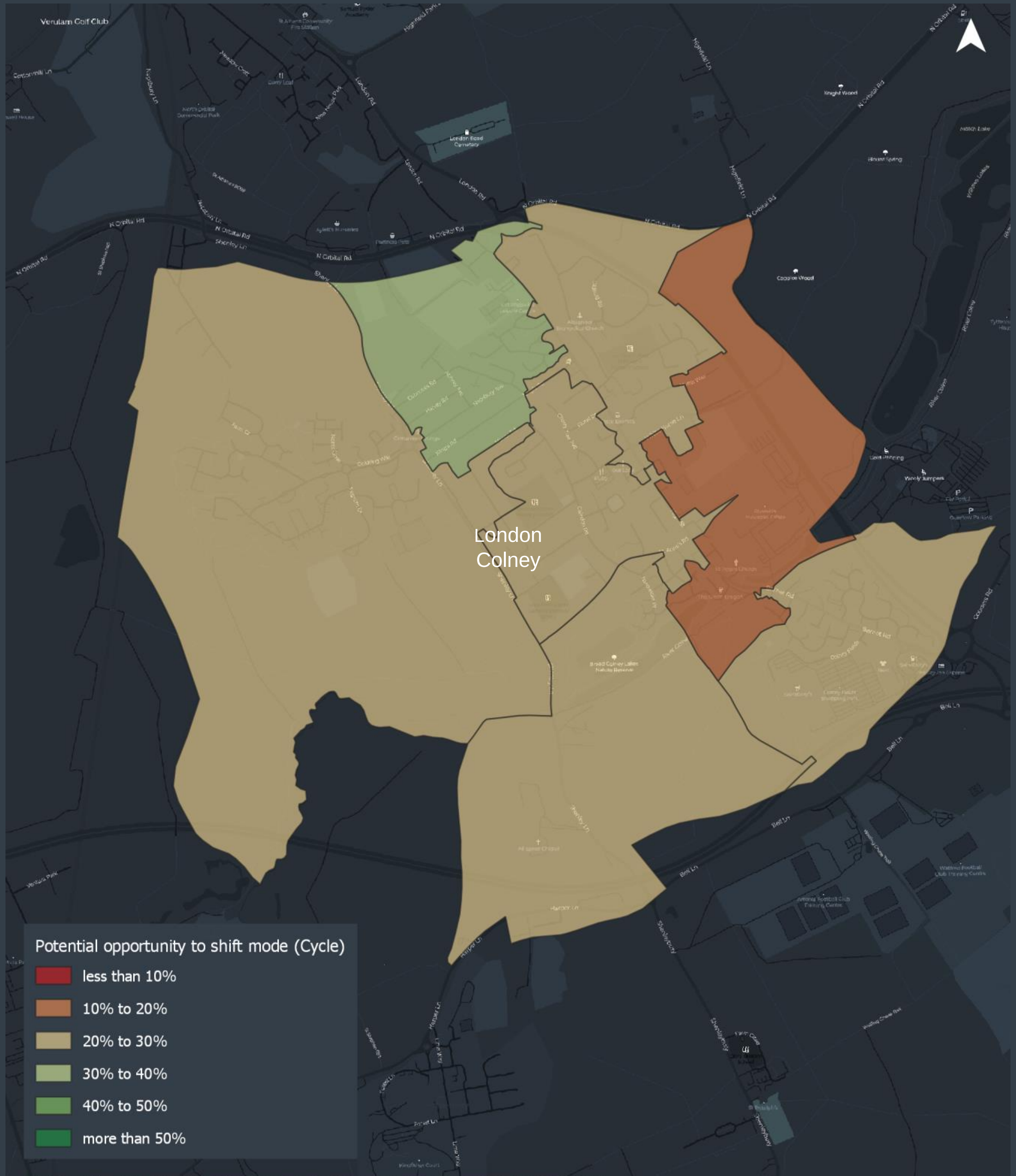
Appendix D9 Cycling potential in Southern Villages



Appendix D10 Cycling potential in Wheathampstead



Appendix D11 Cycling potential in London Colney



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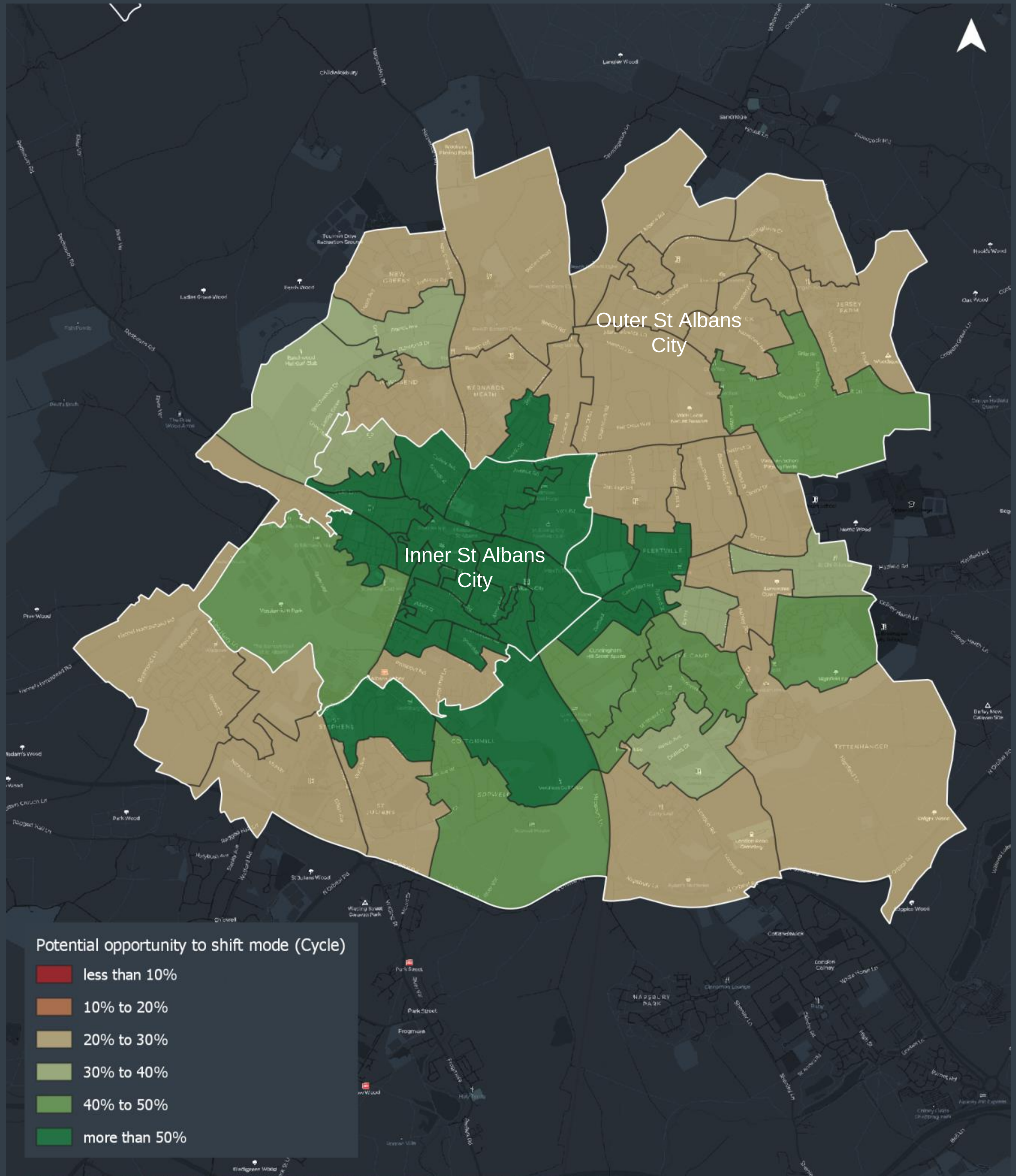
Appendix D12 Cycling potential in Inner & Outer St Albans



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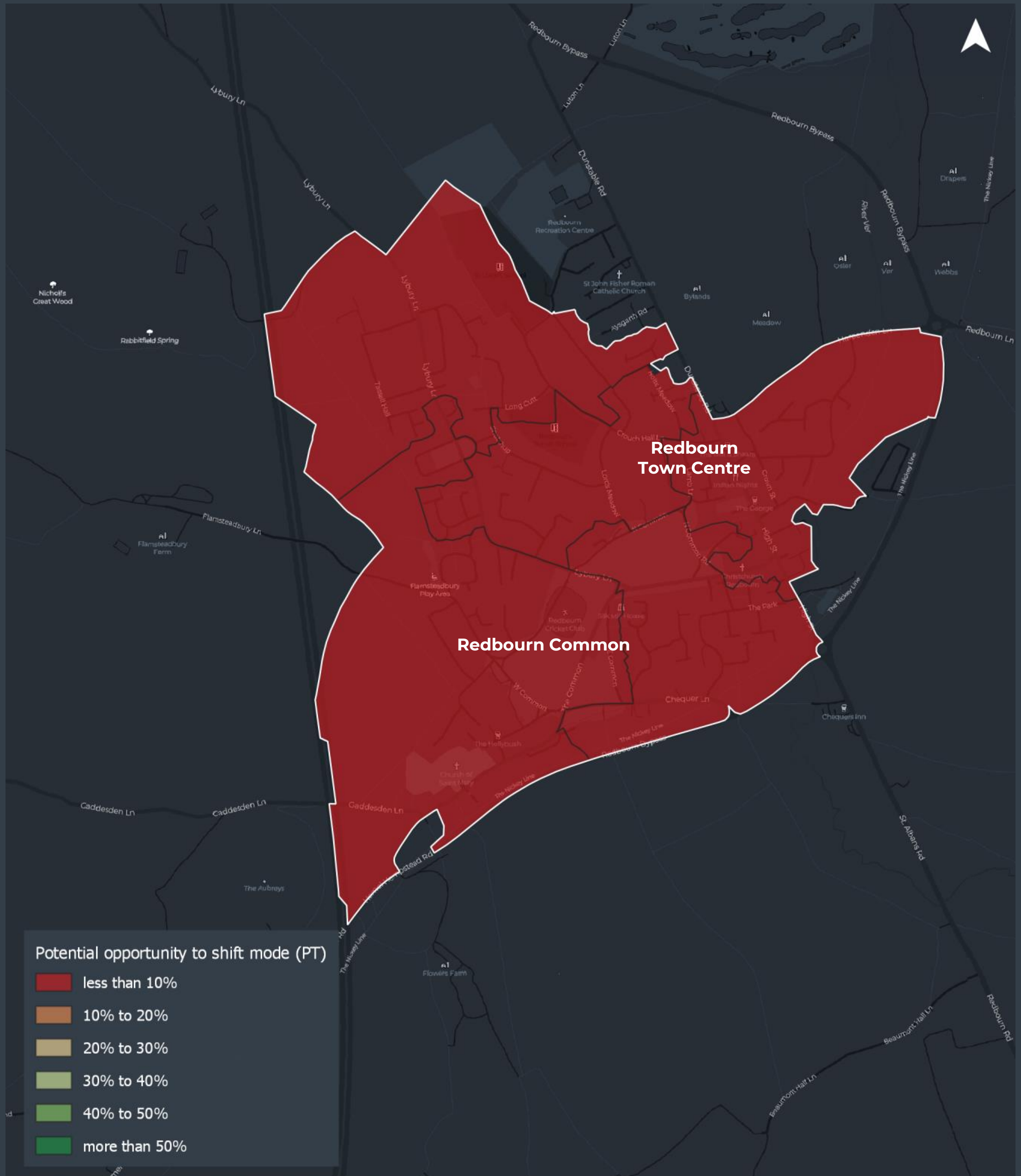
Public transport potential

Appendix D13 Public transport potential in Redbourn



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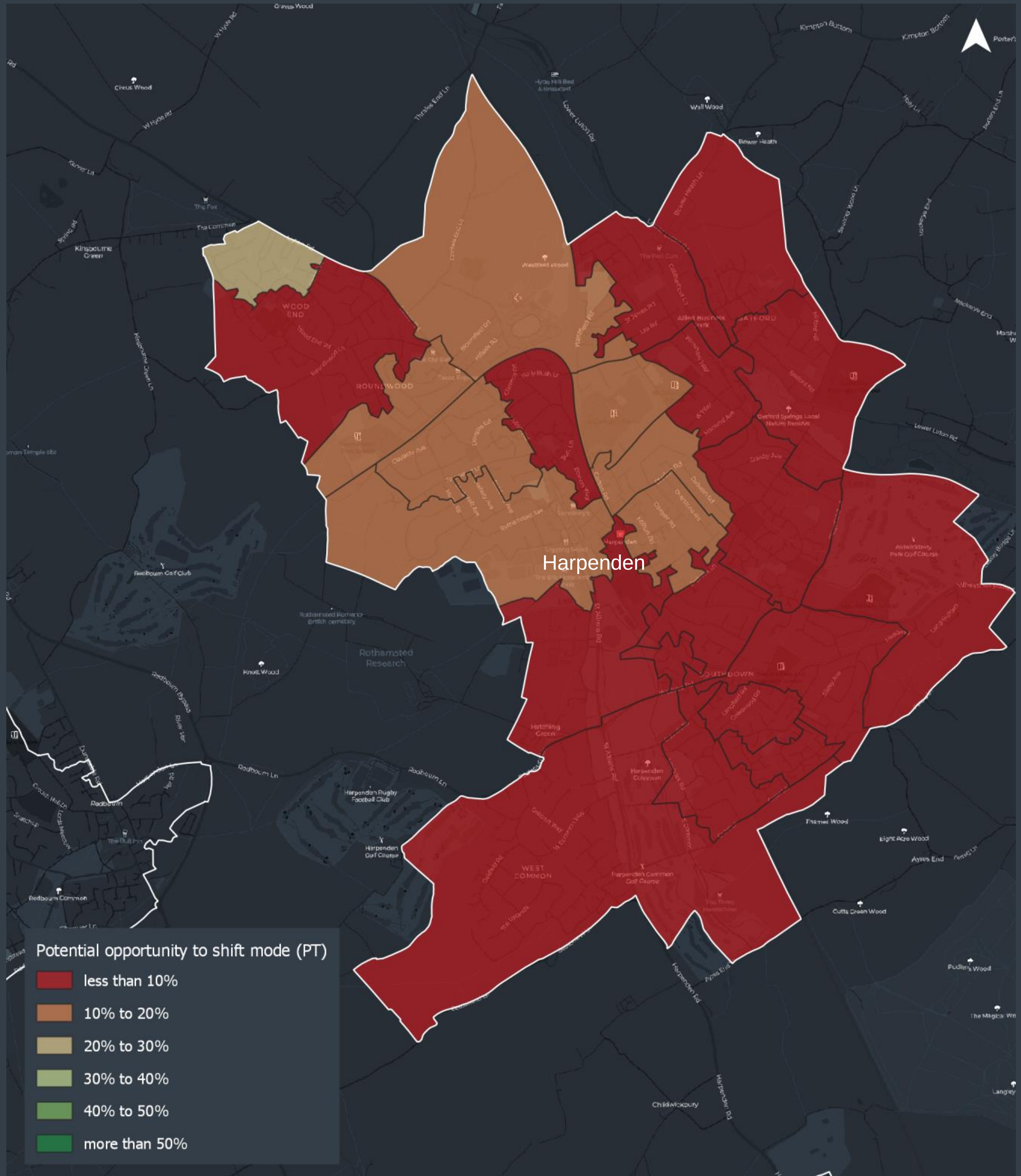
Appendix D14 Public transport potential in Harpenden



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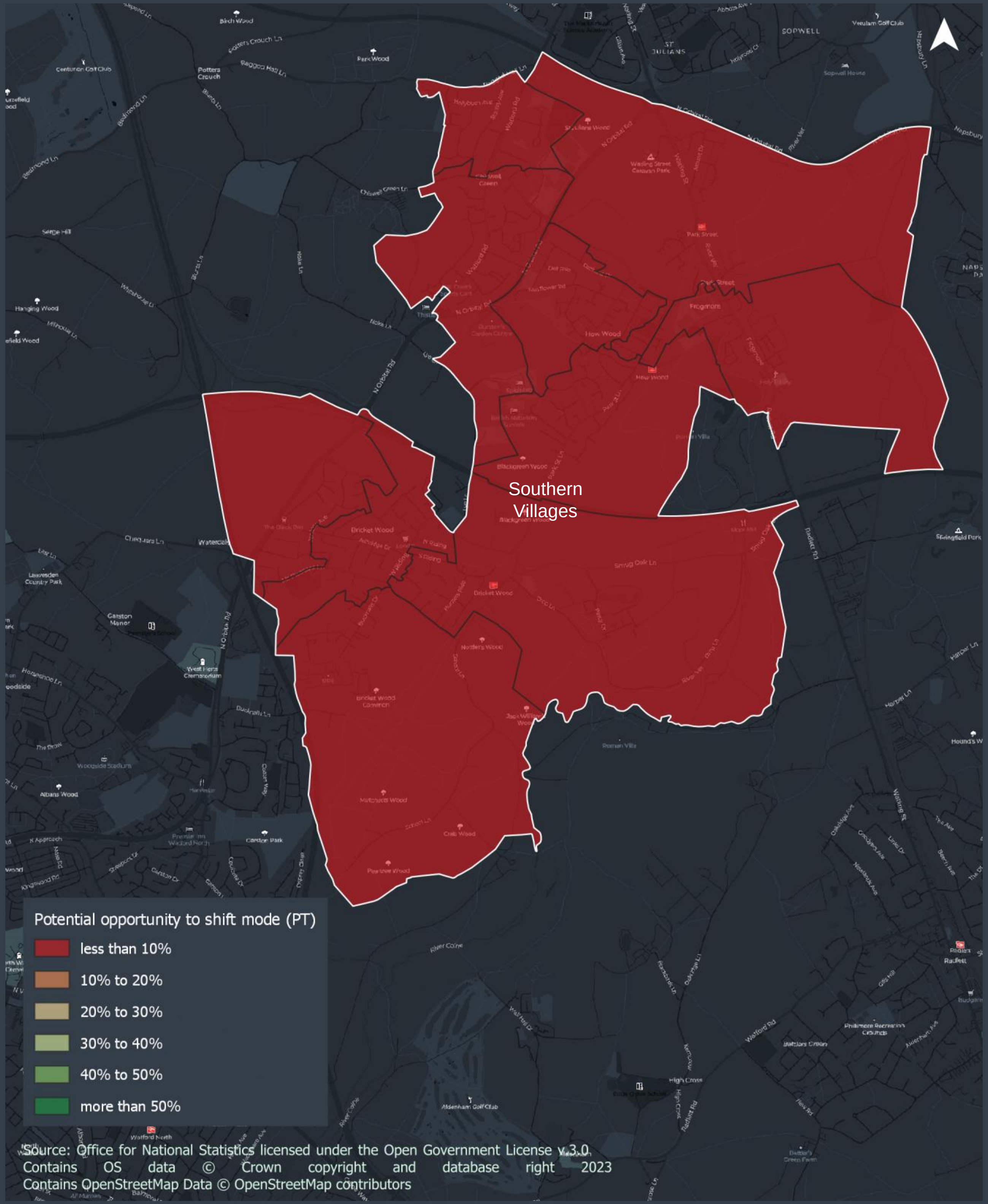
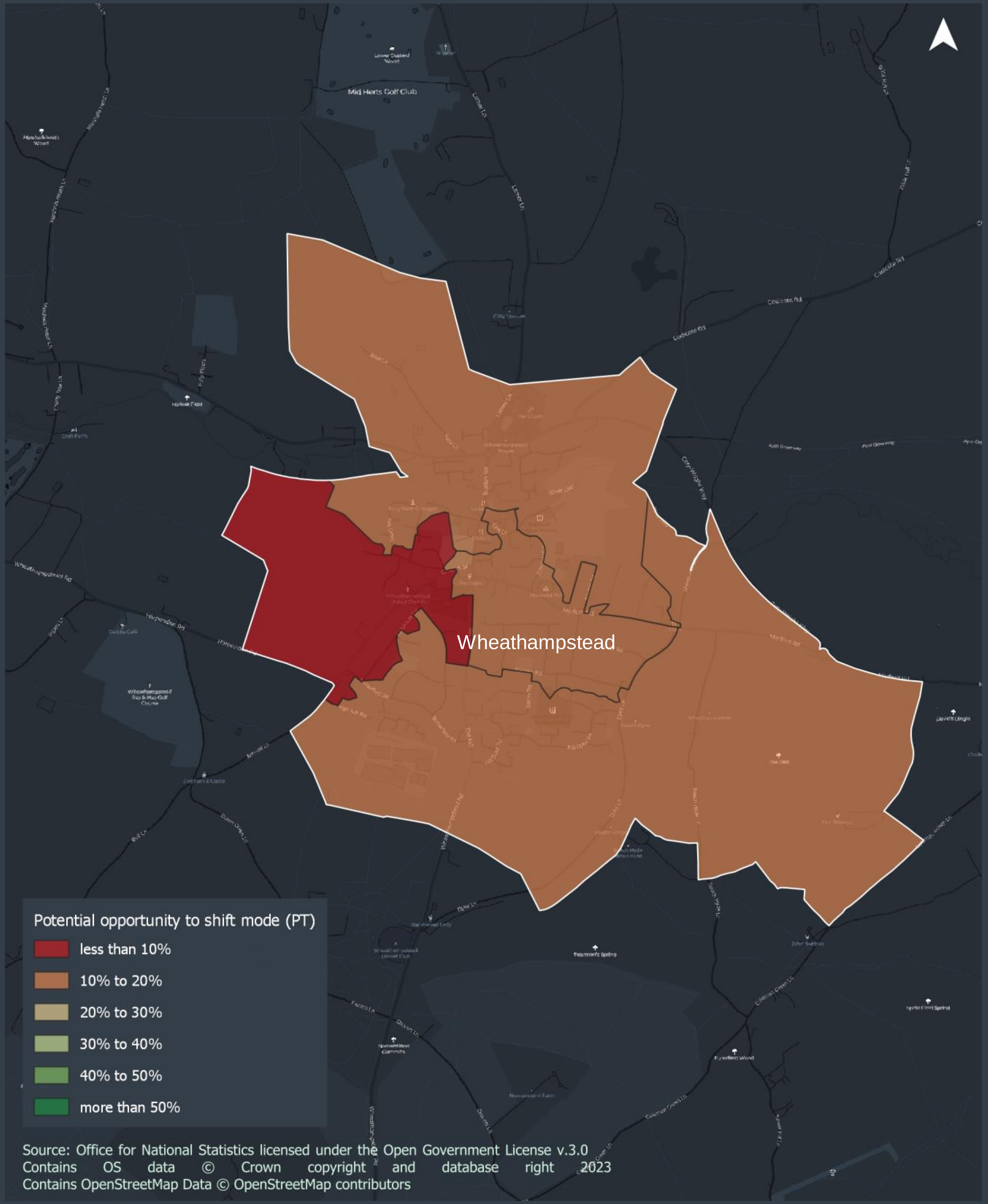
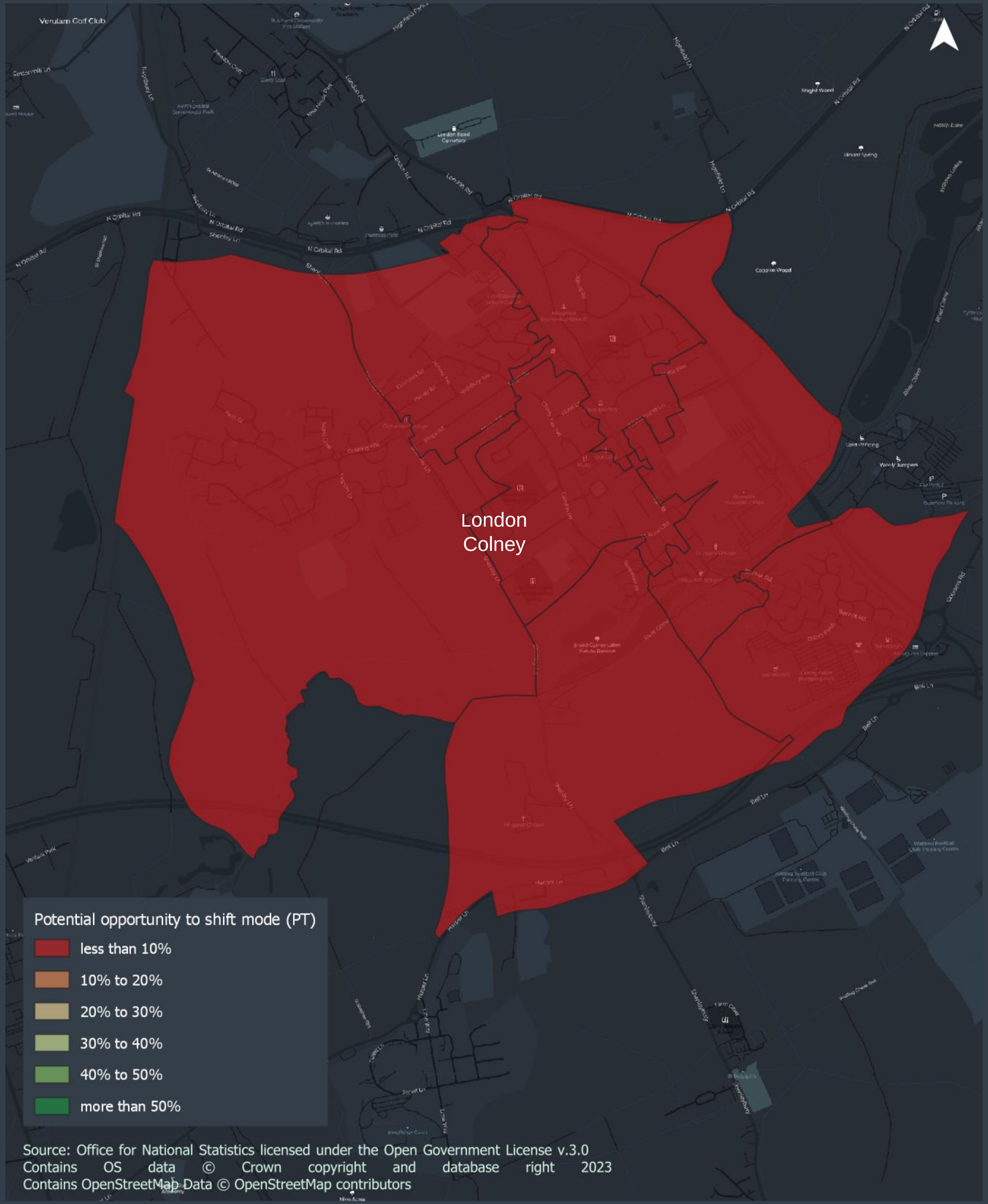
Appendix D15 Public transport potential in Southern Villages



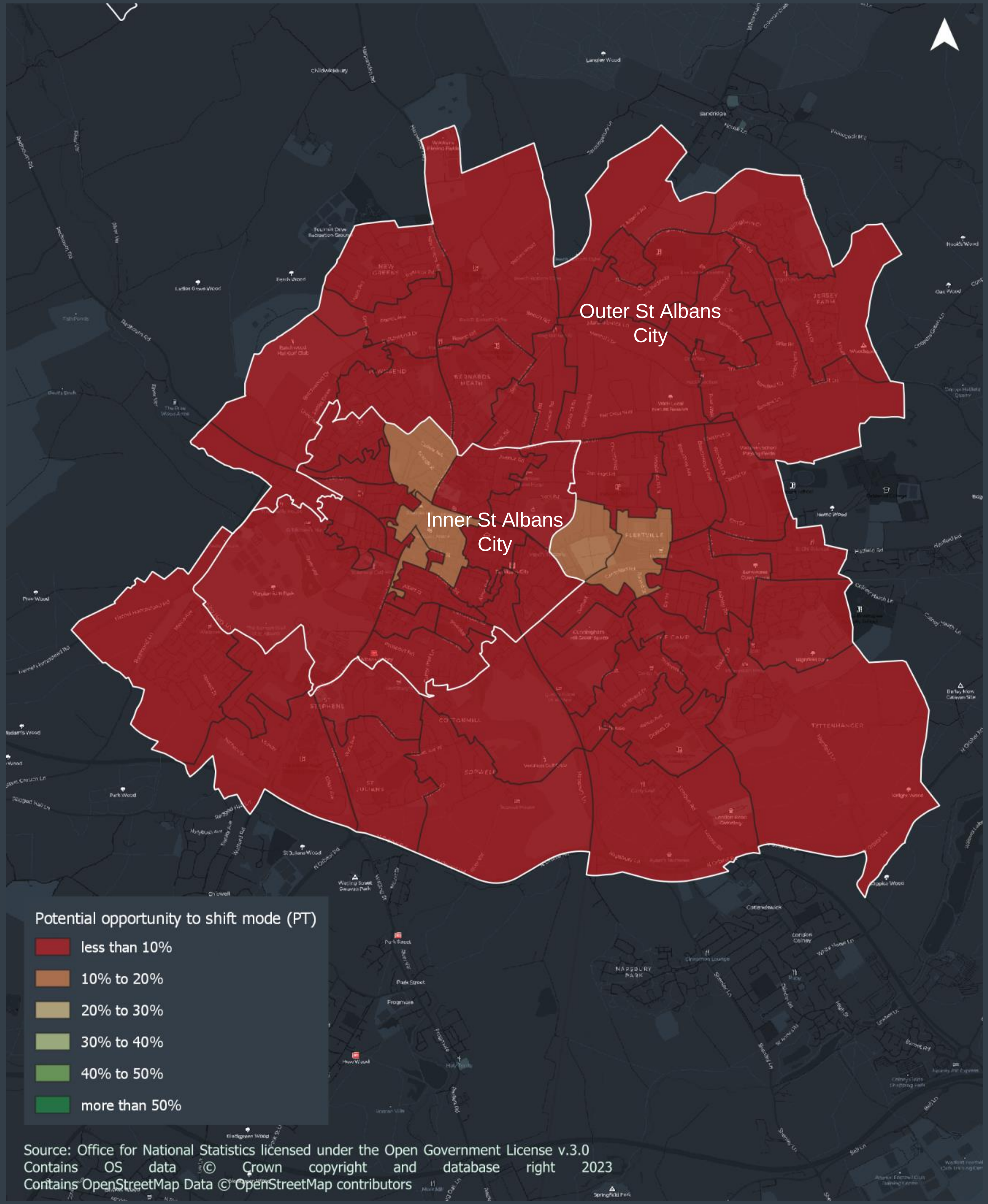
Appendix D16 Public transport potential in Wheathampstead



Appendix D17 Public transport potential in London Colney



Appendix D18 Public transport potential in Inner & Outer St Albans

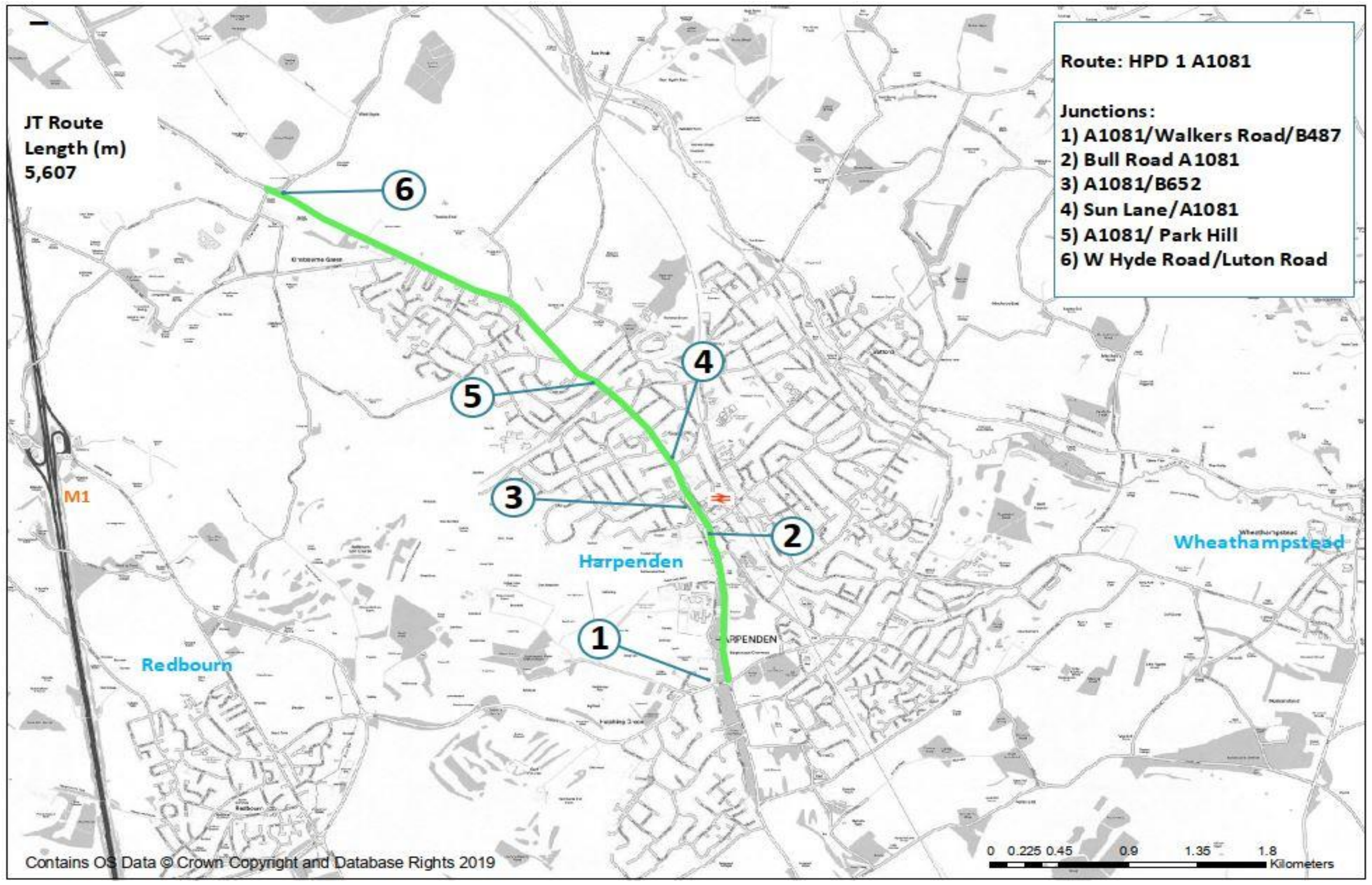


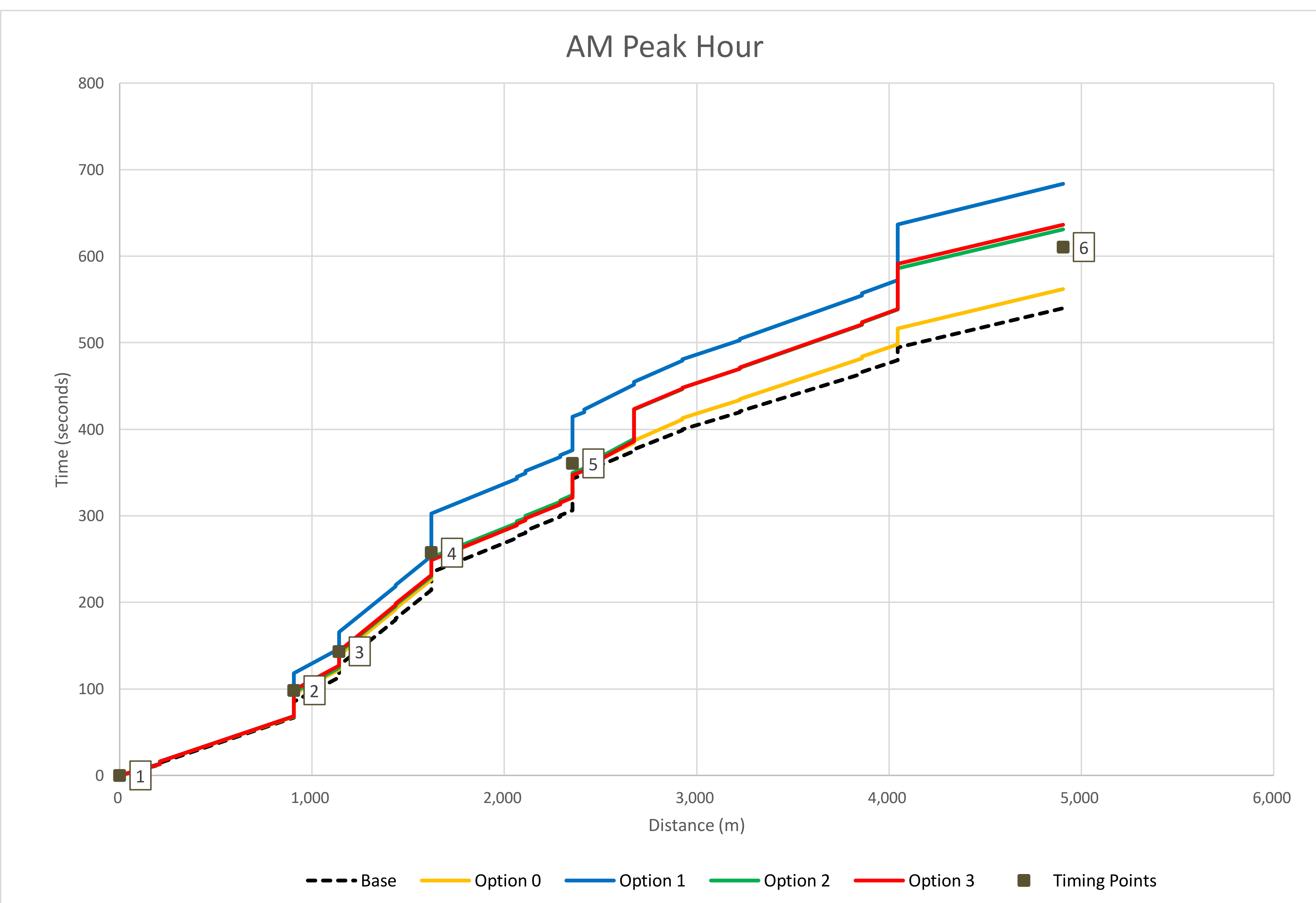
Let’s change the way we think.
Let’s create change.

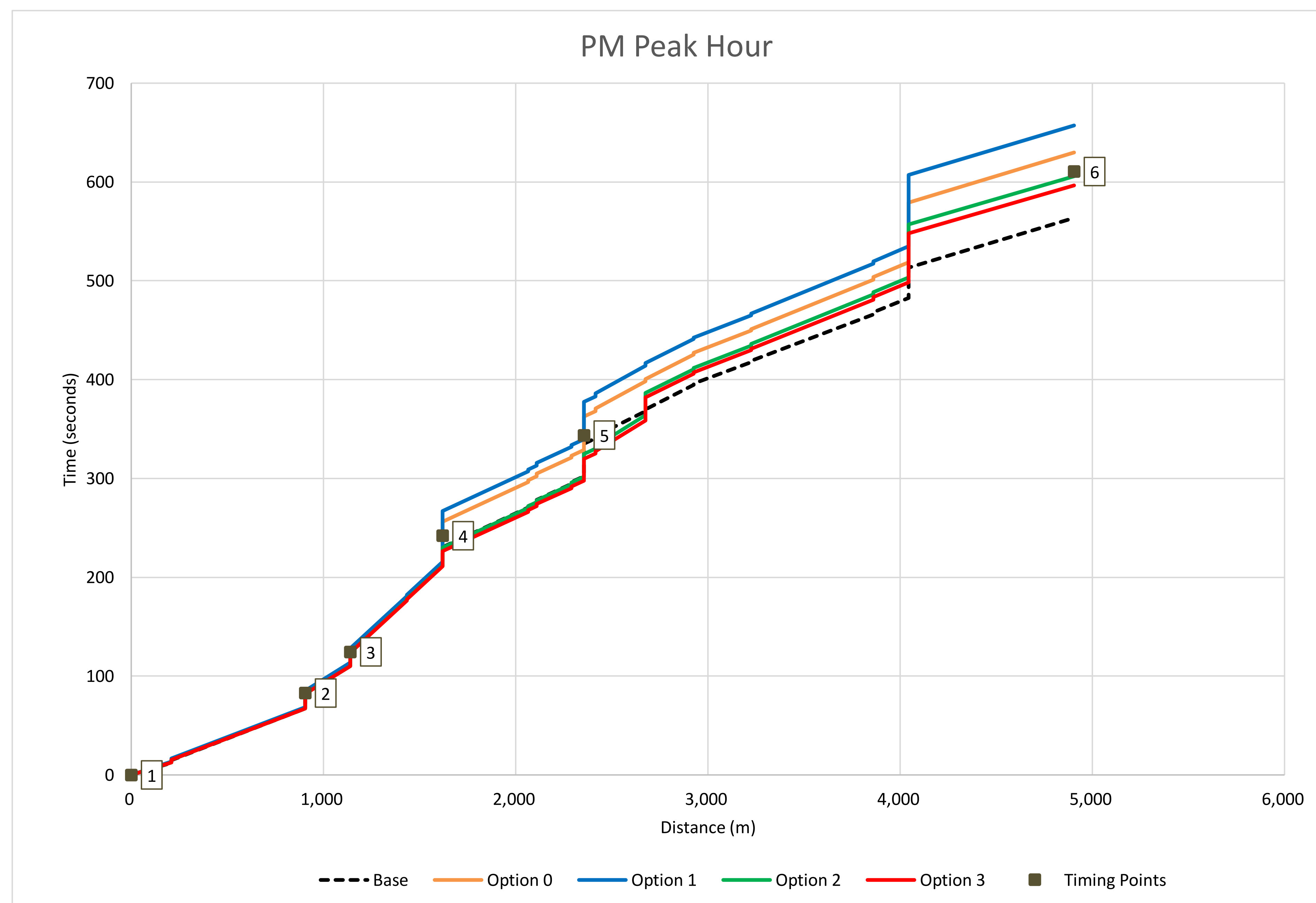
Appendix E

Journey Time Graphs

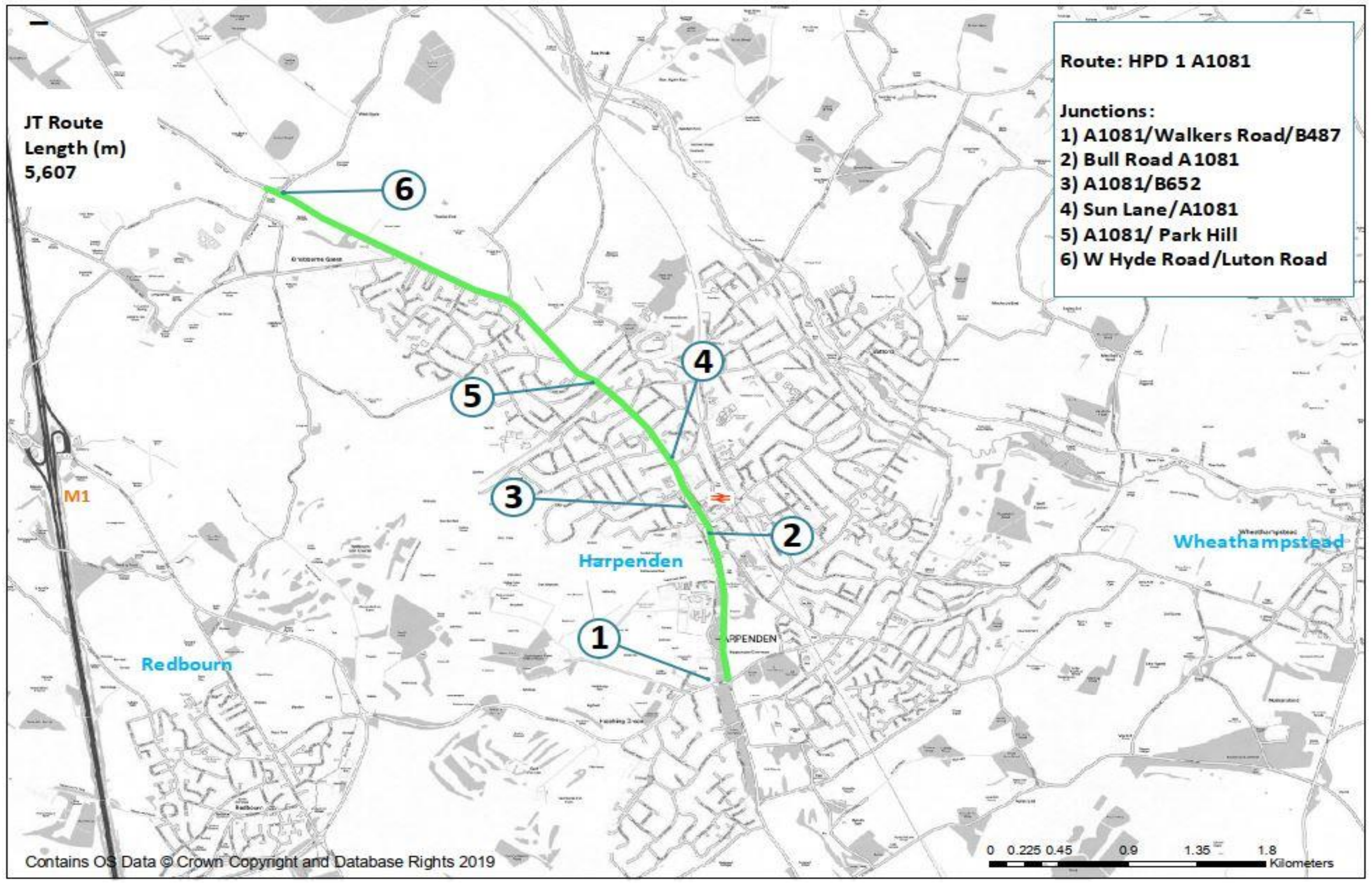
Route: HPD1_NB

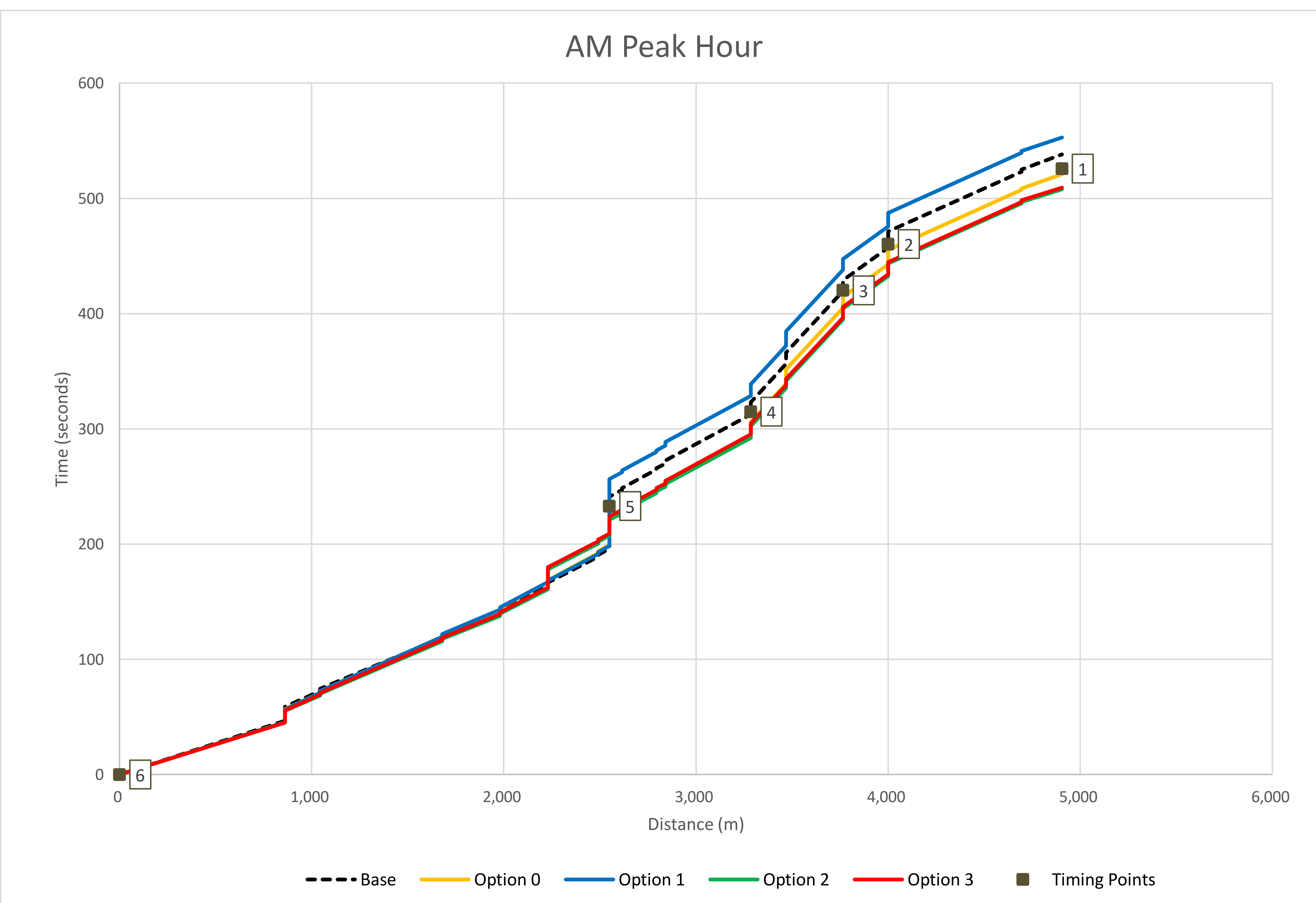


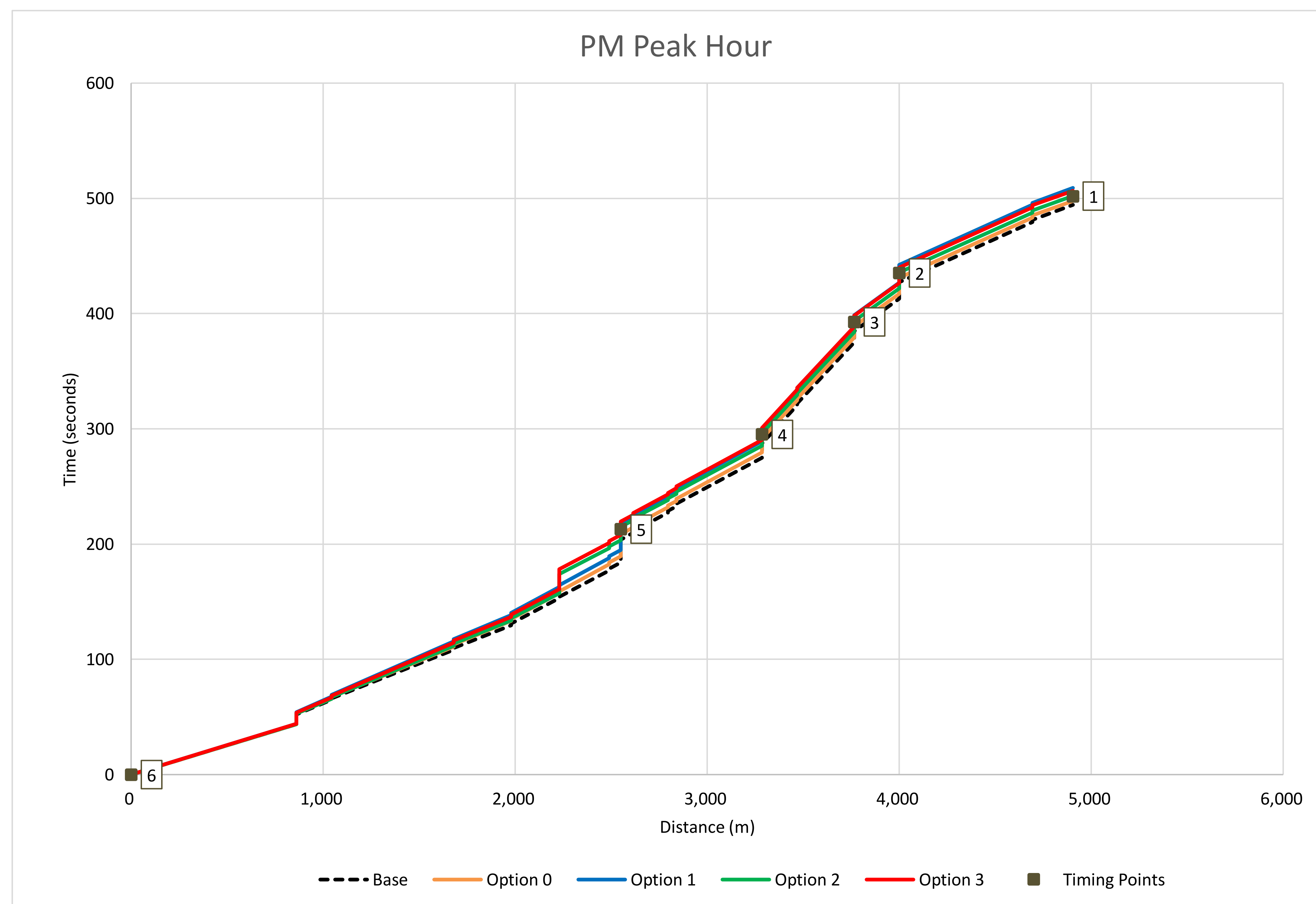




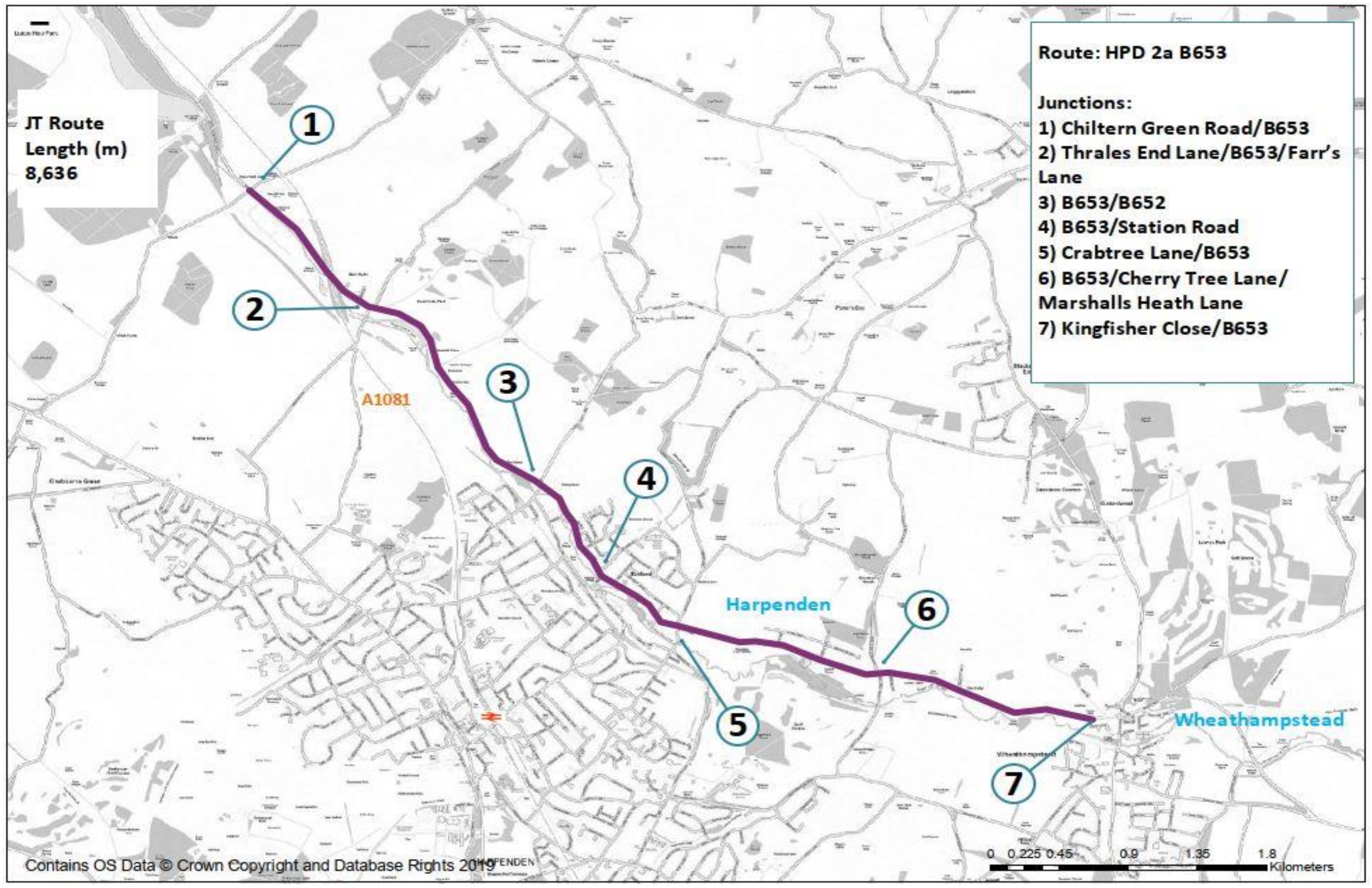
Route: HPD1_SB

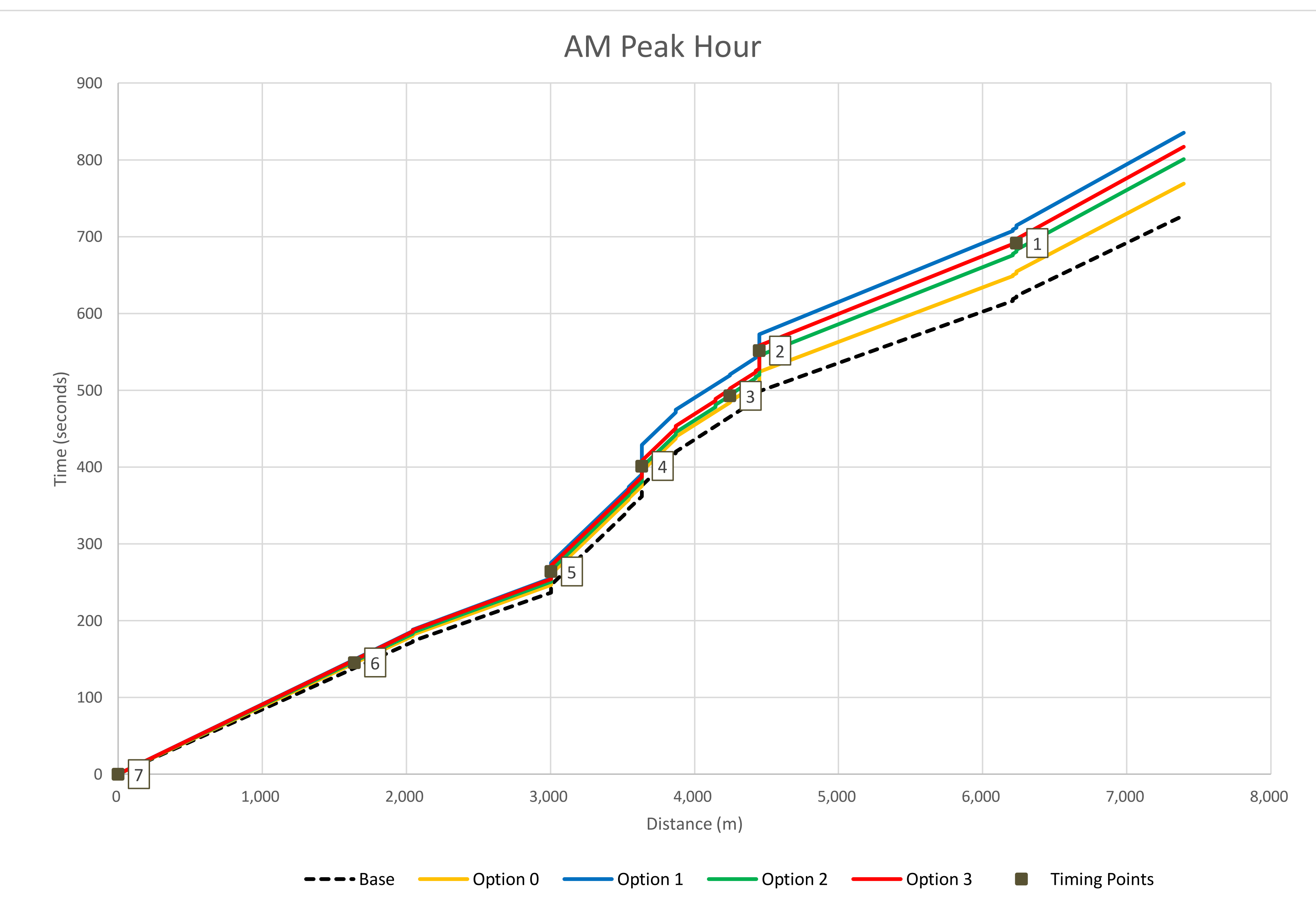


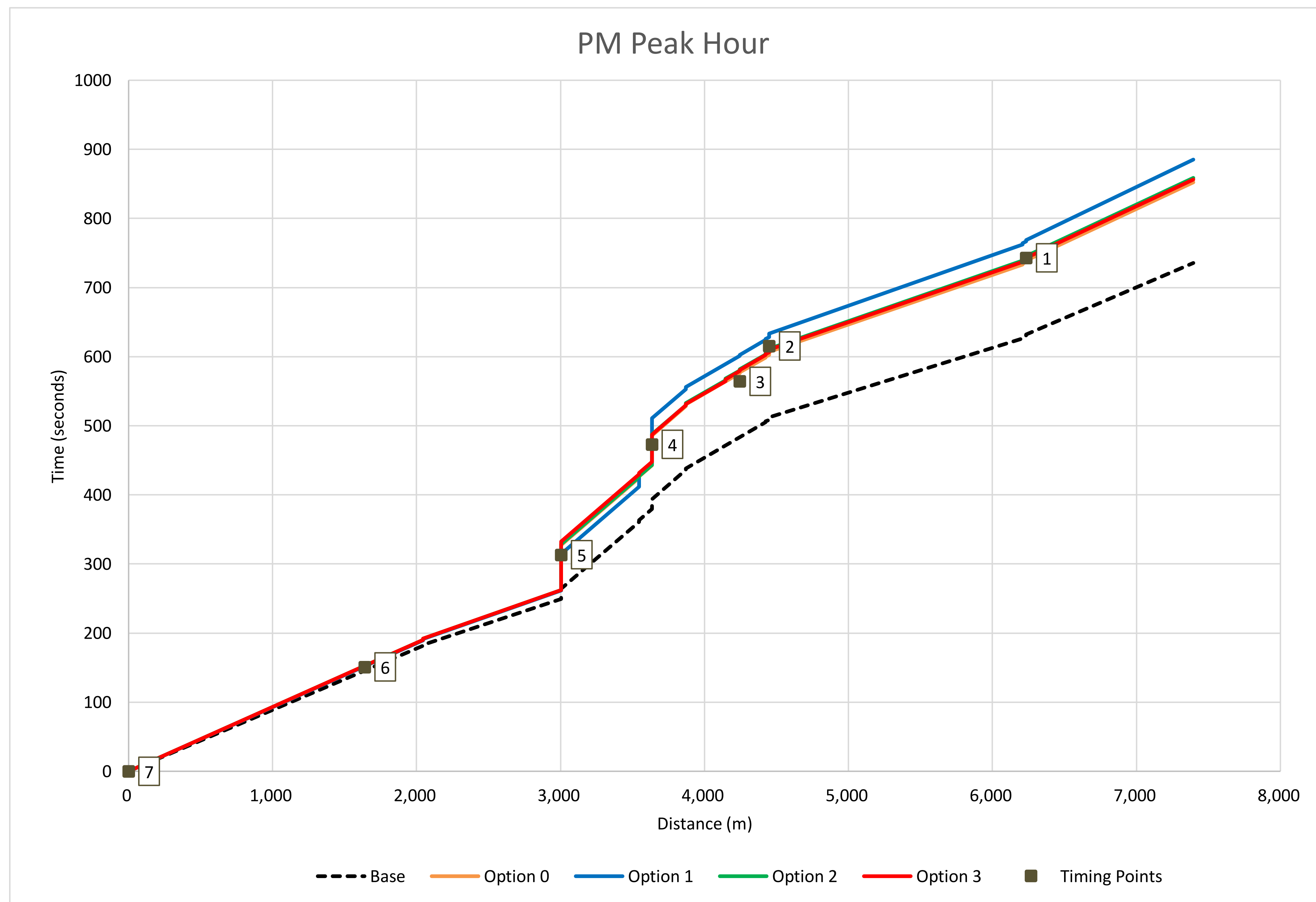




Route: HPD2A_NB







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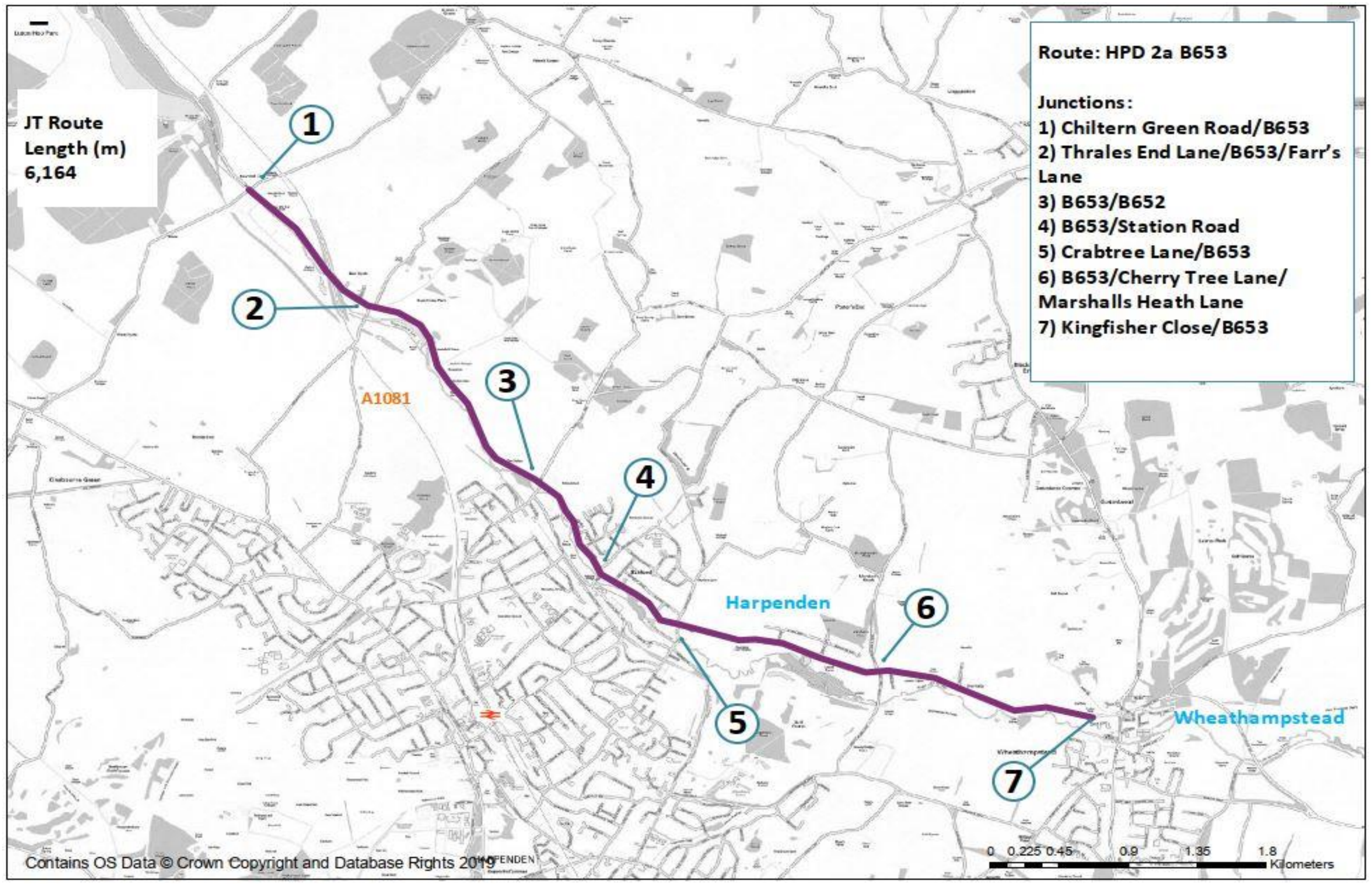
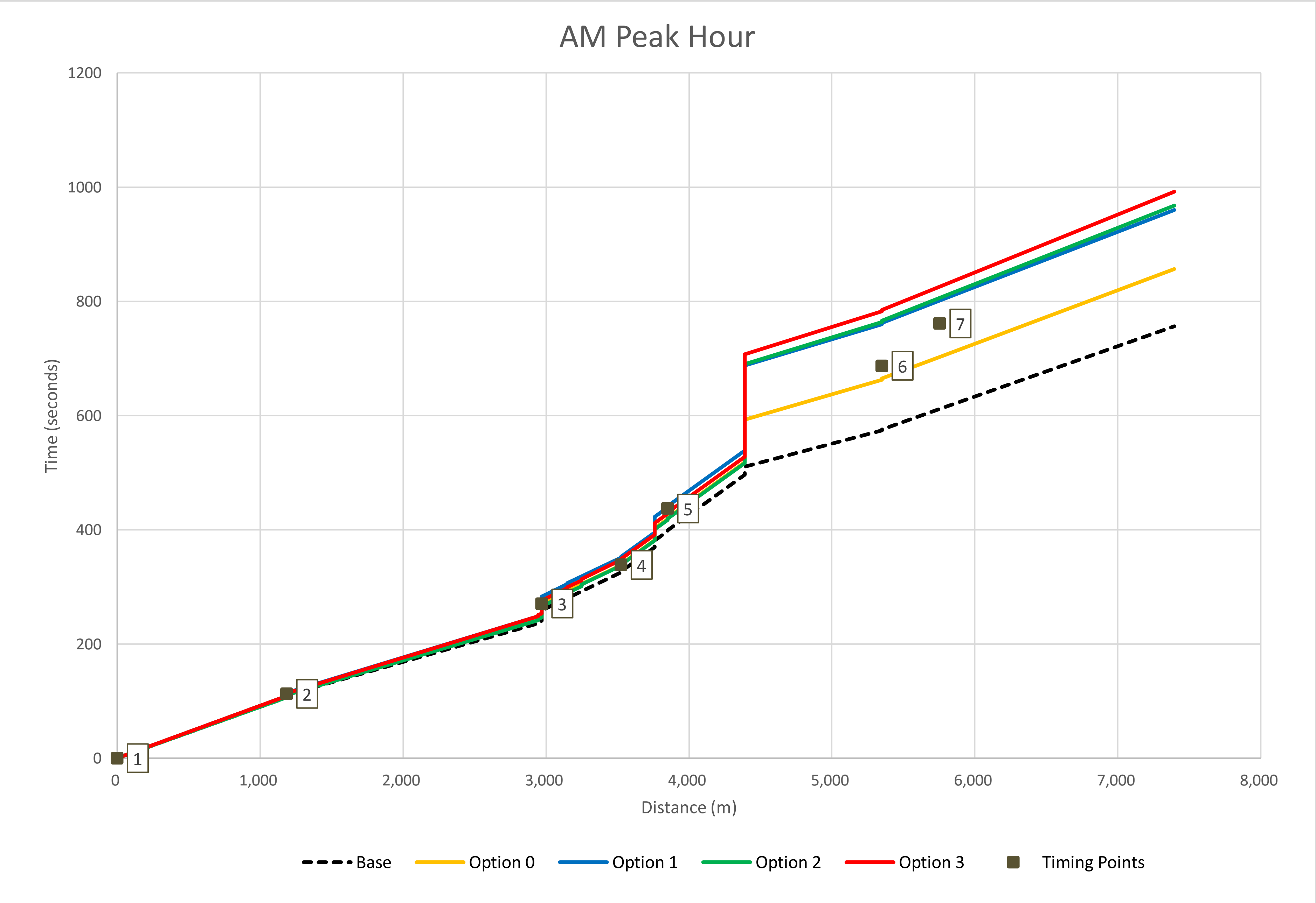
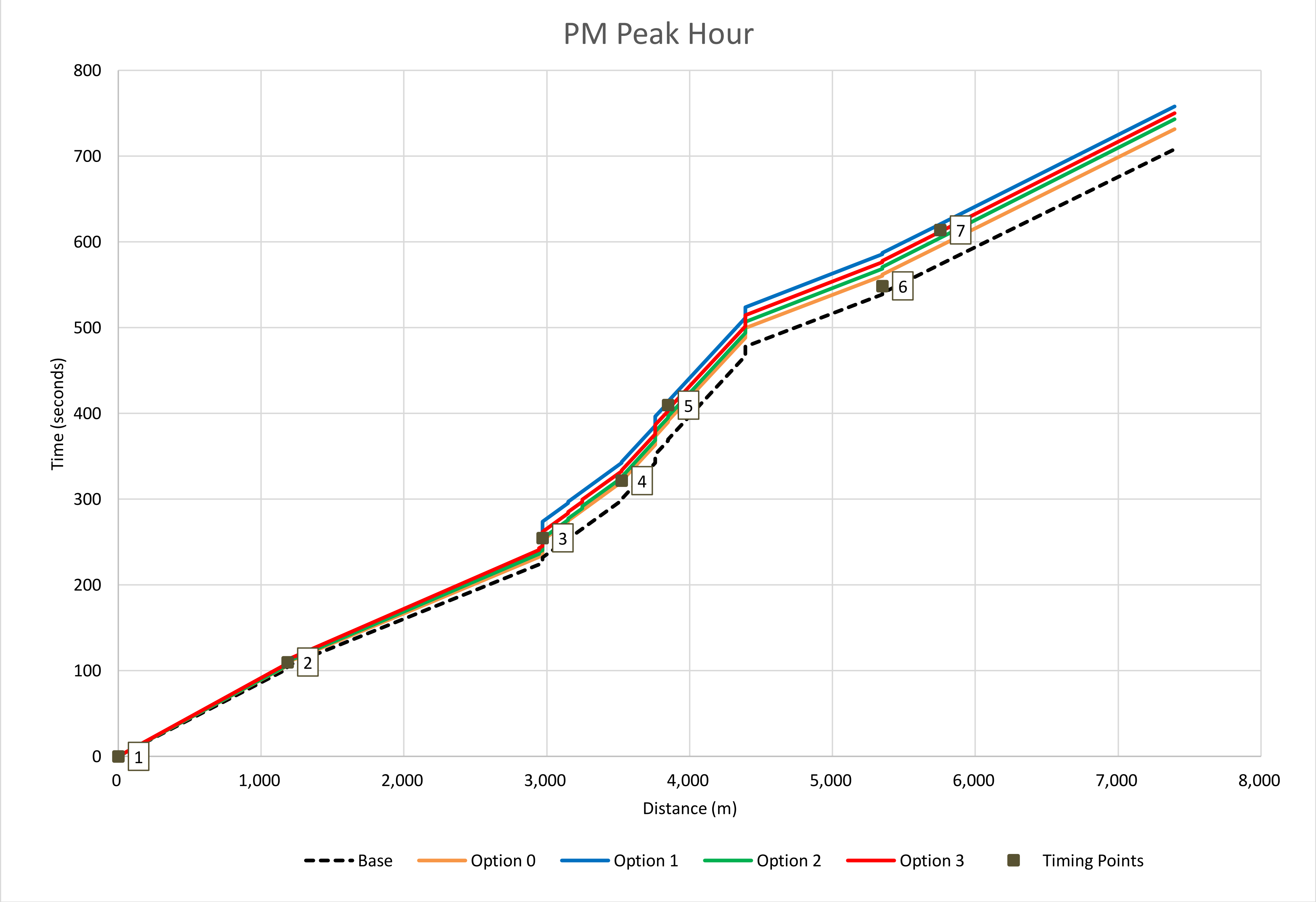
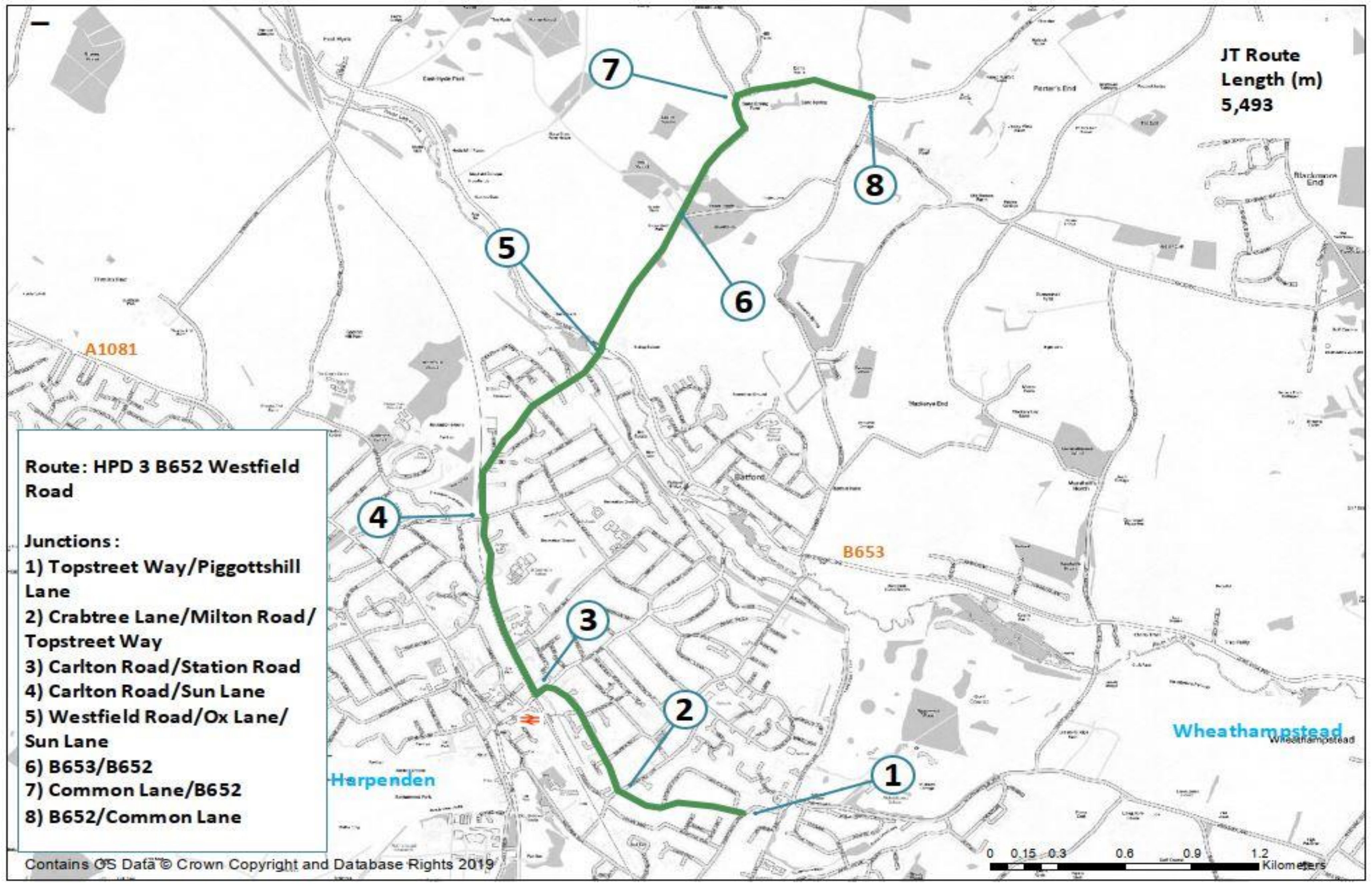
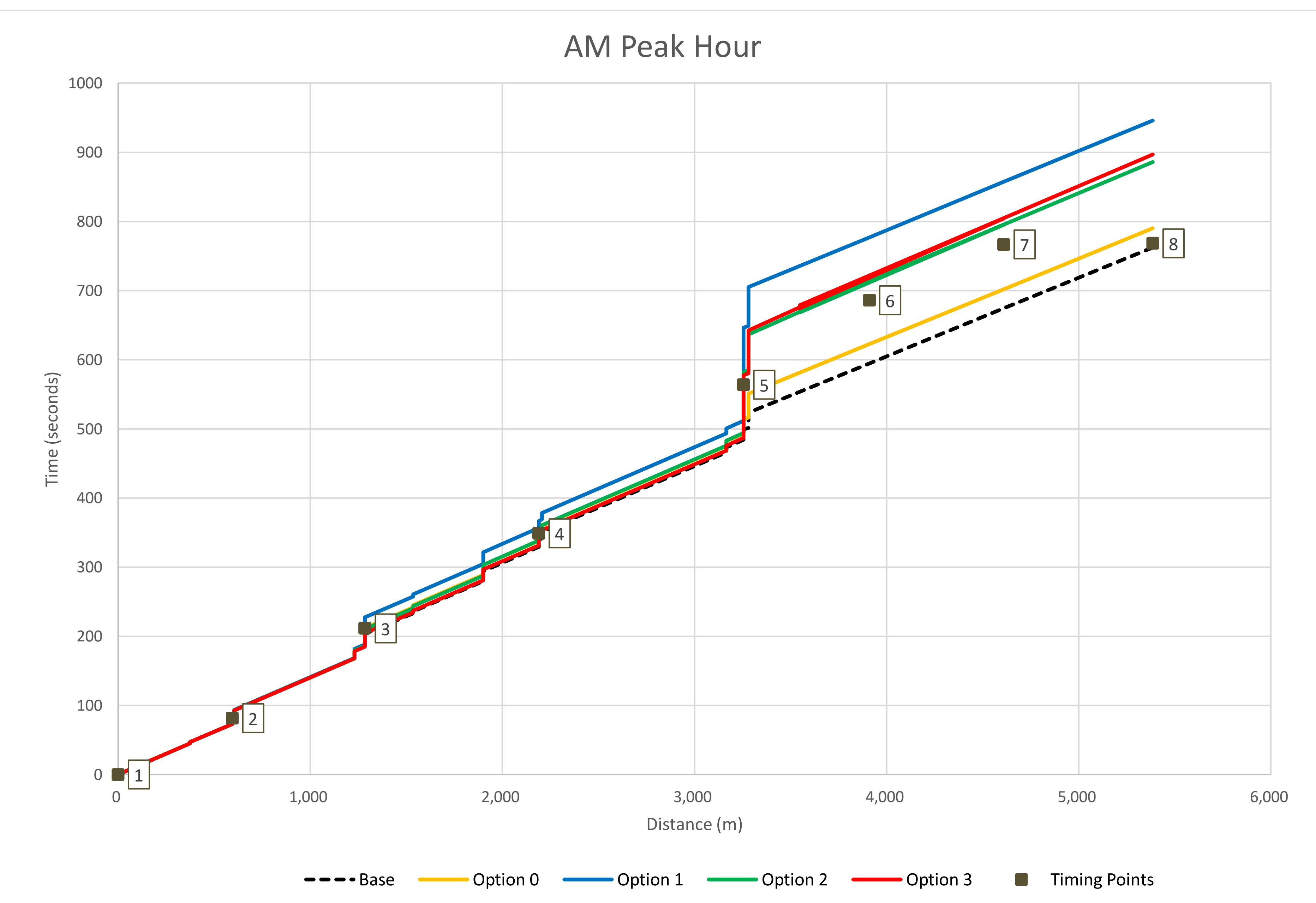


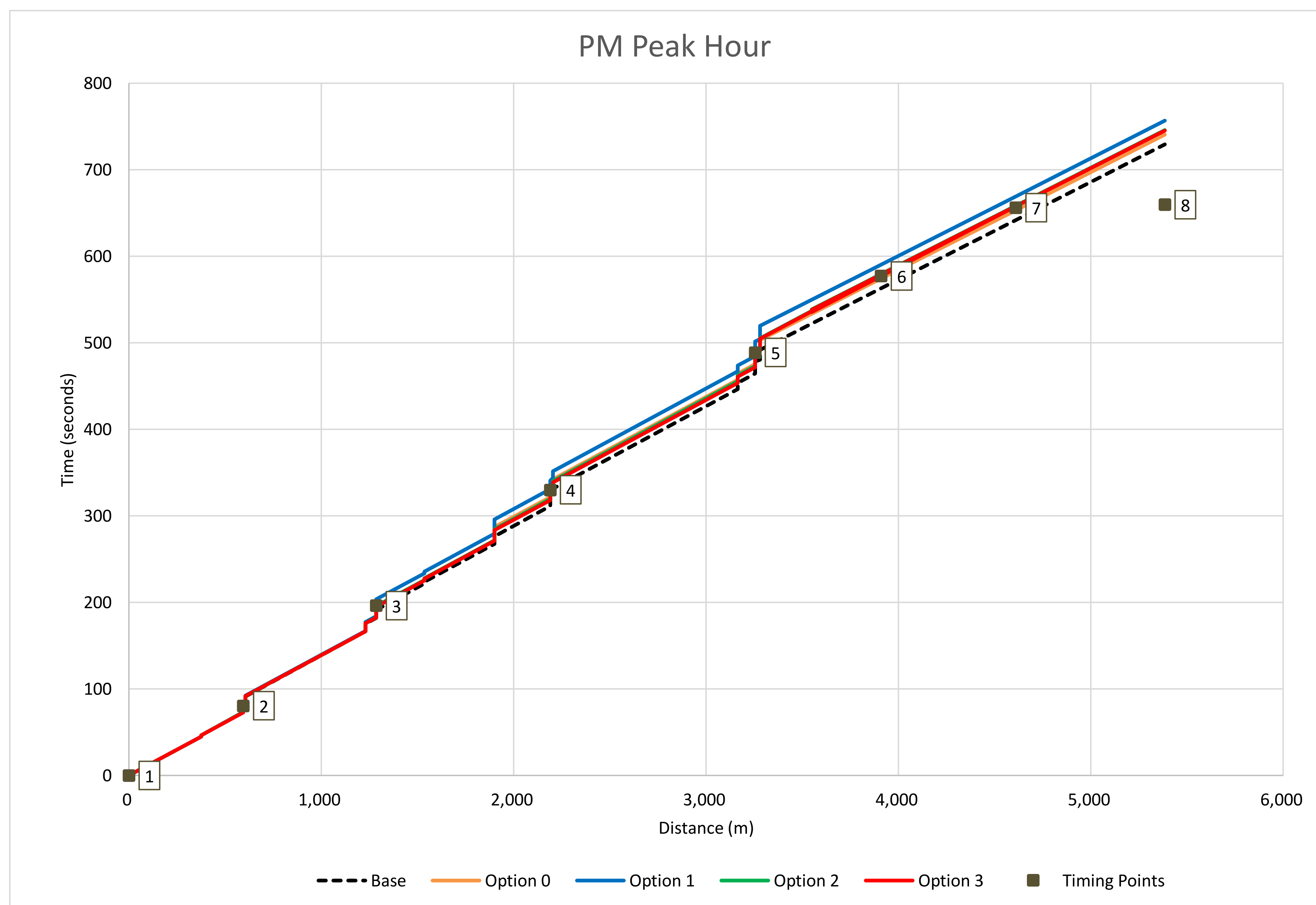




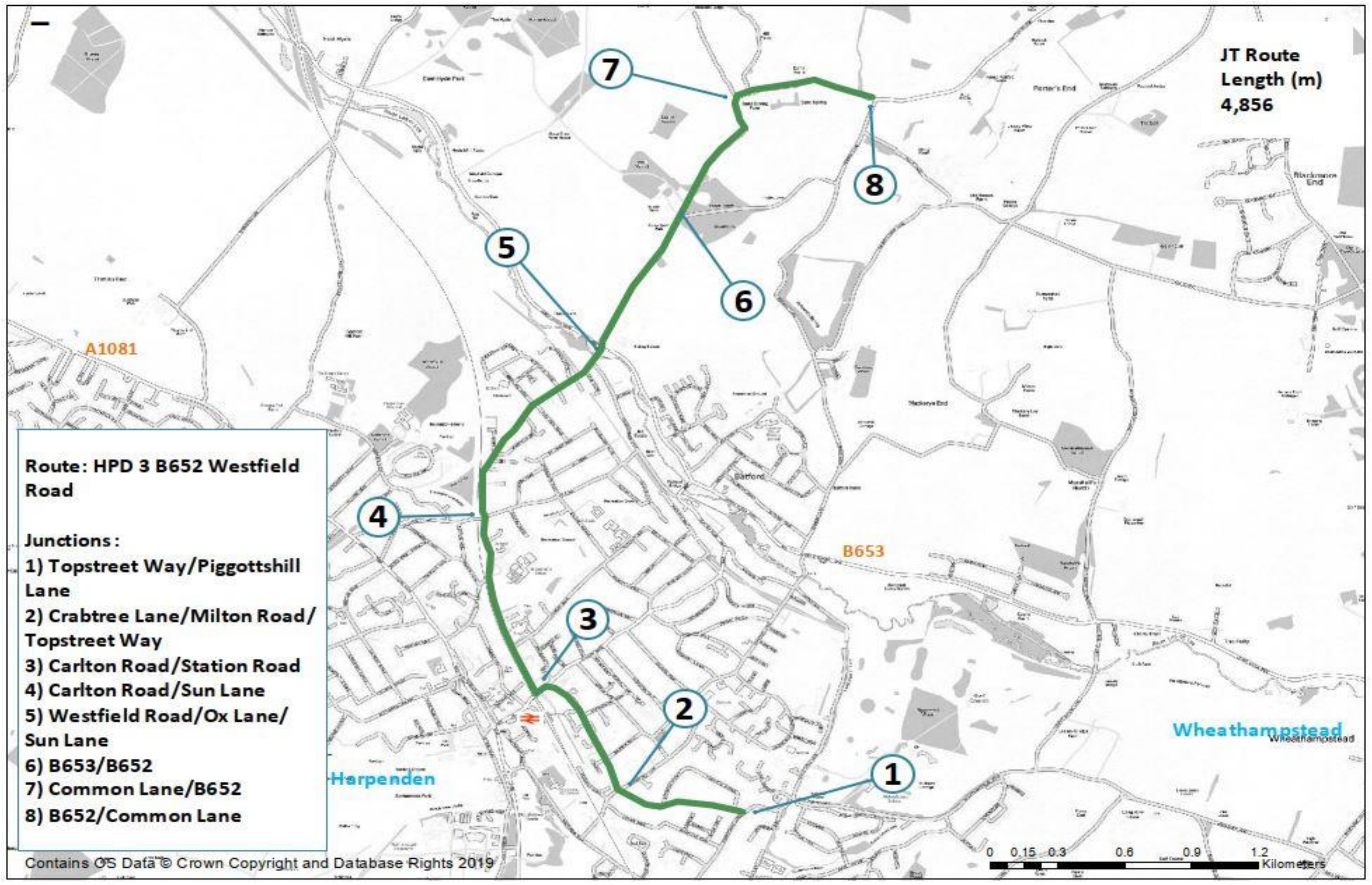
Route: HPD3_NB

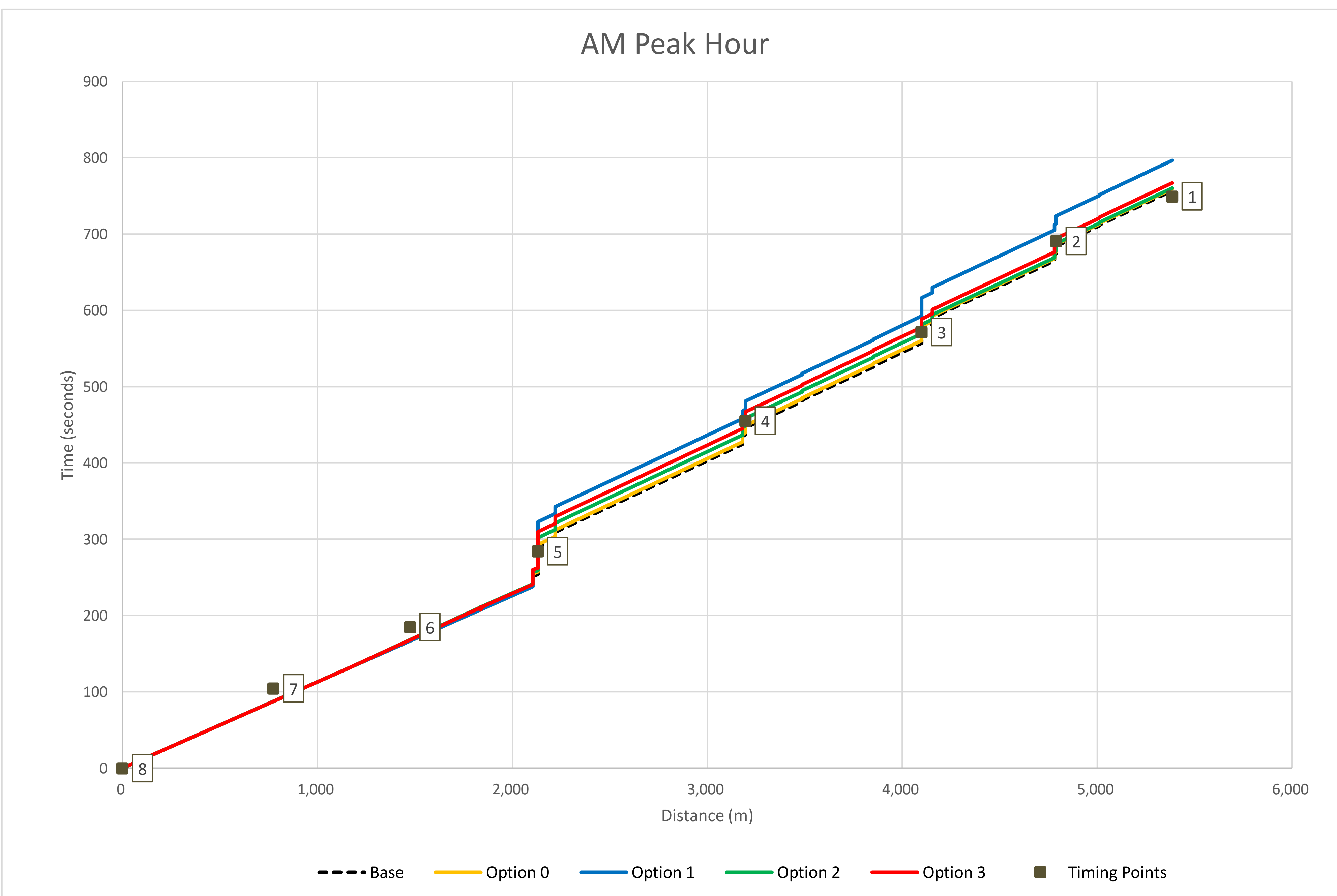


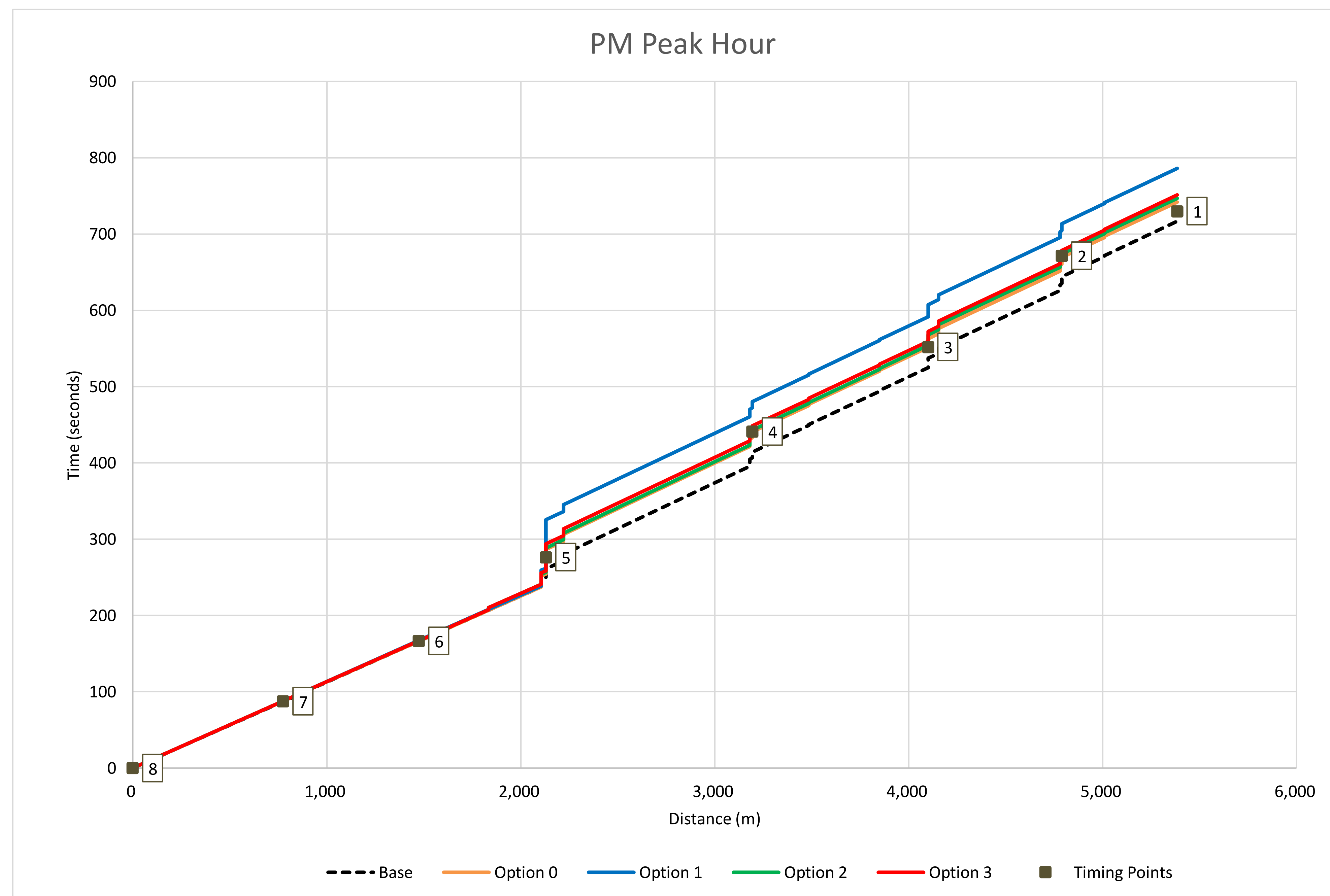




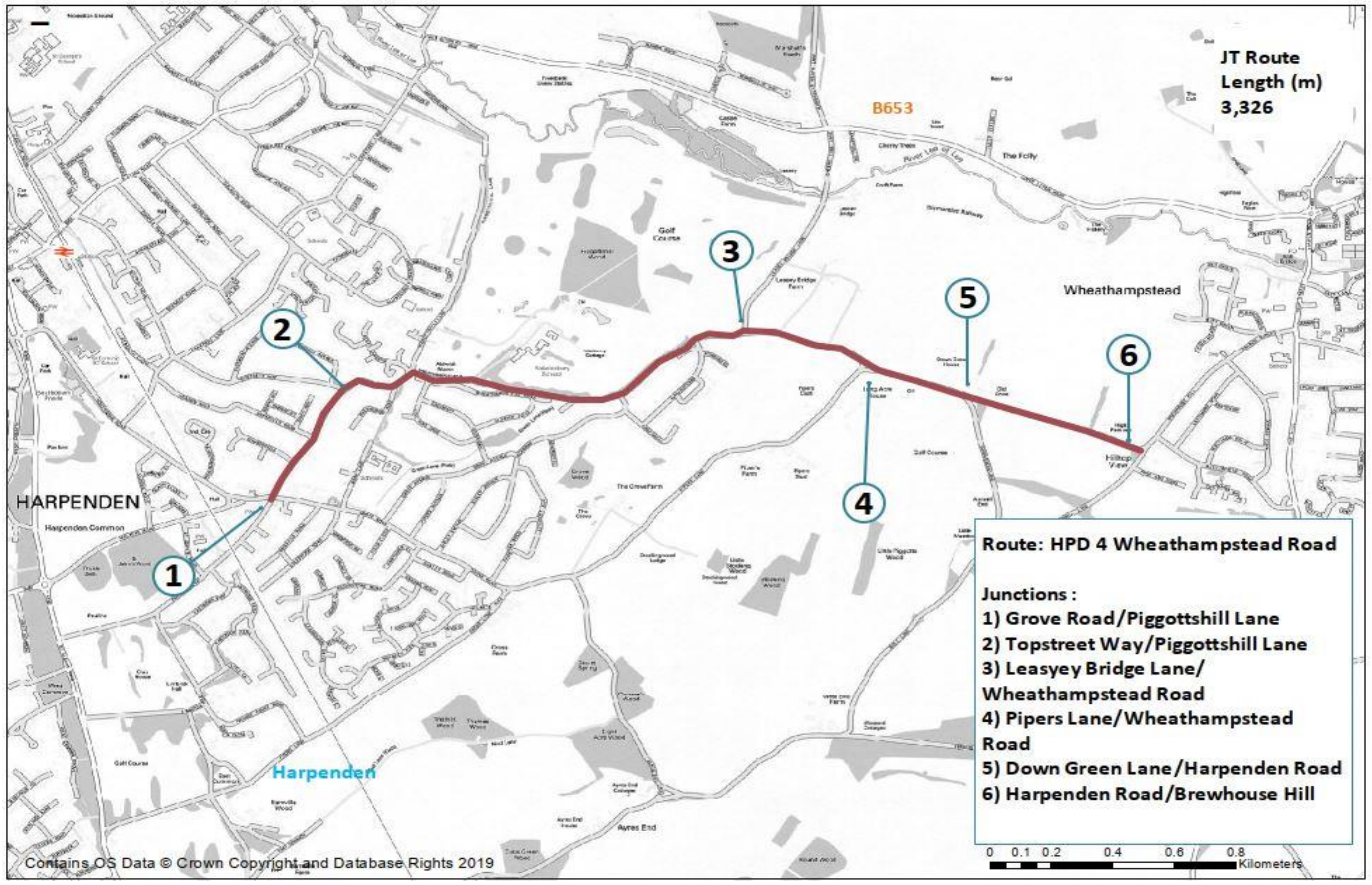
Route: HPD3_SB

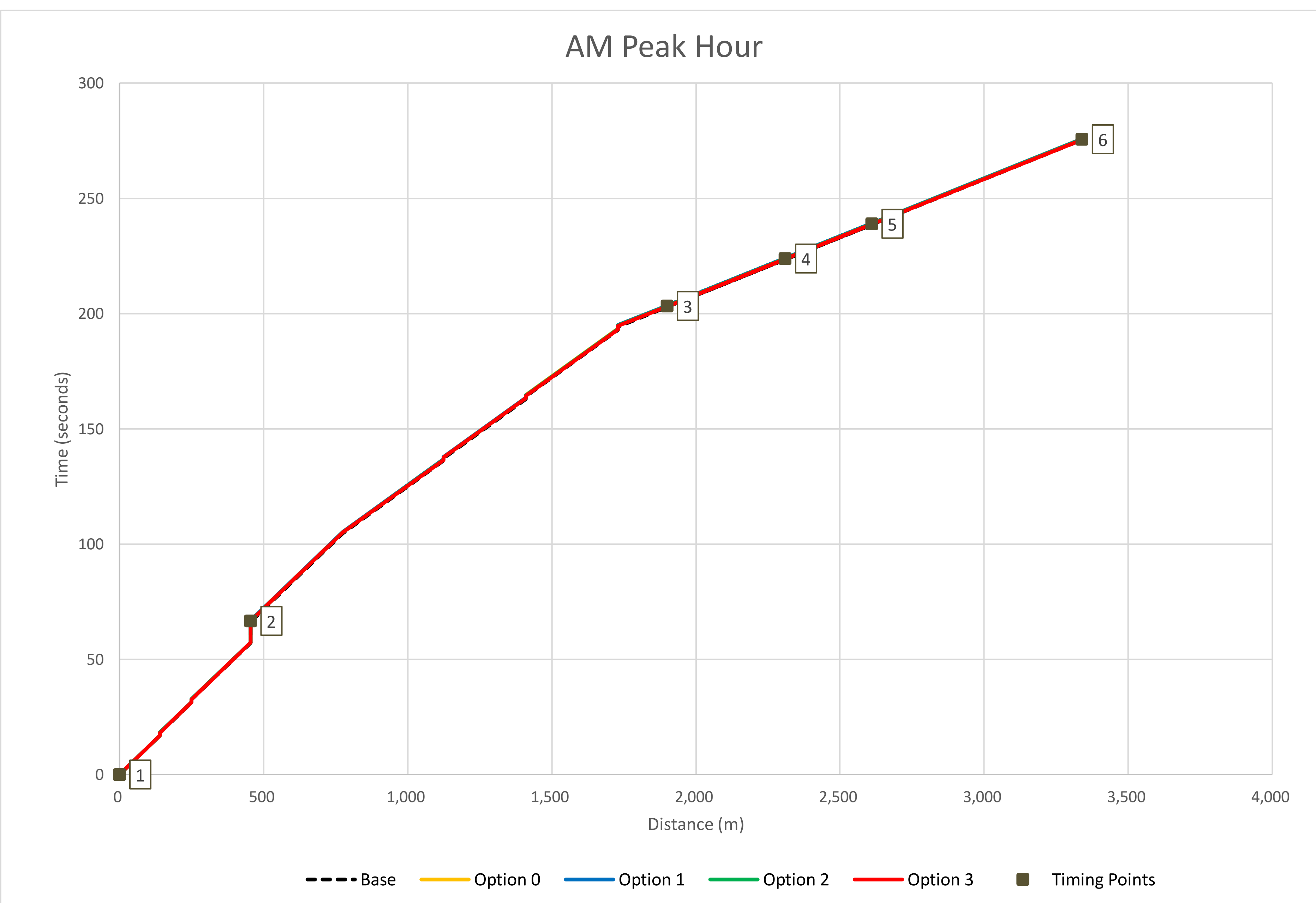


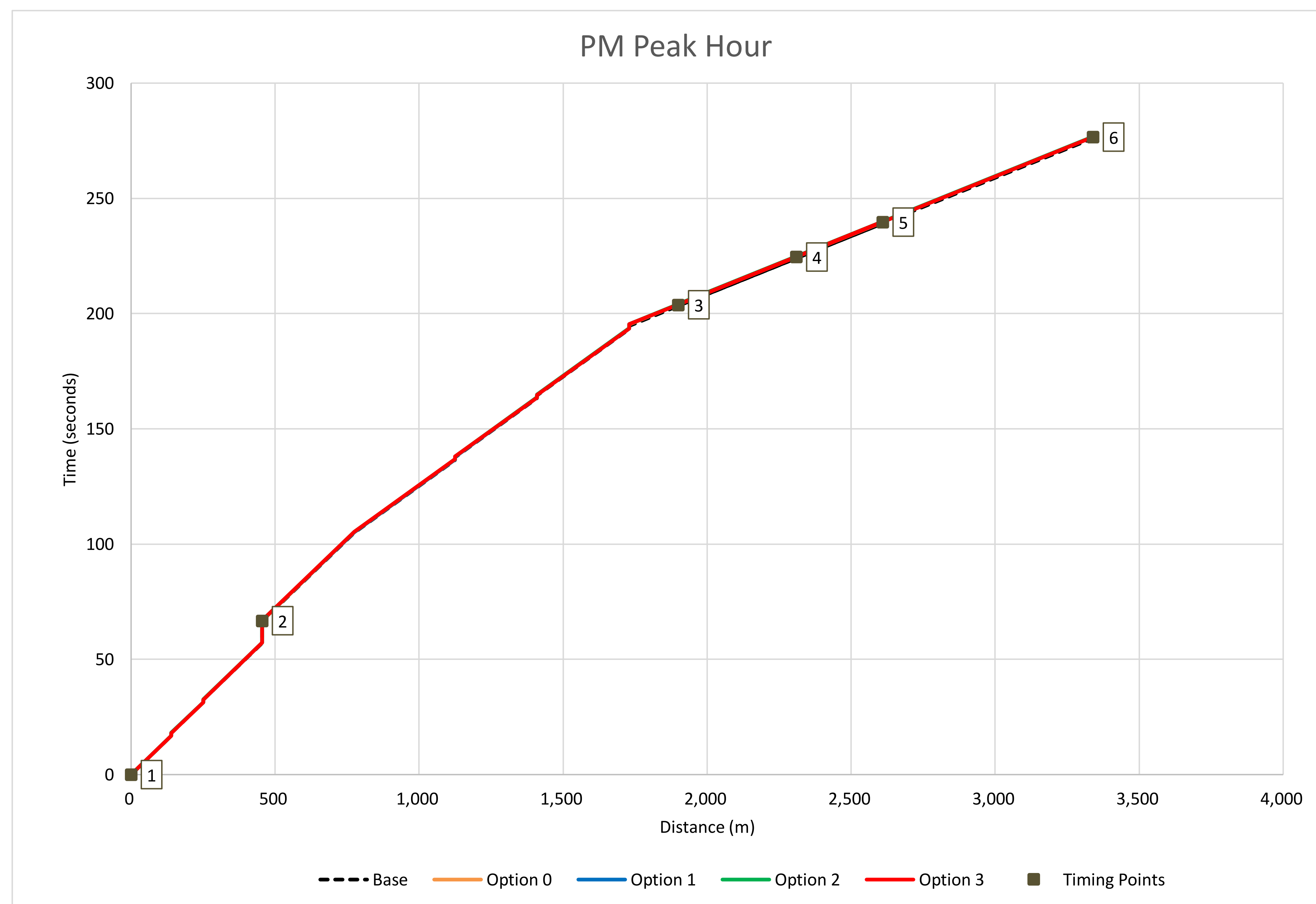




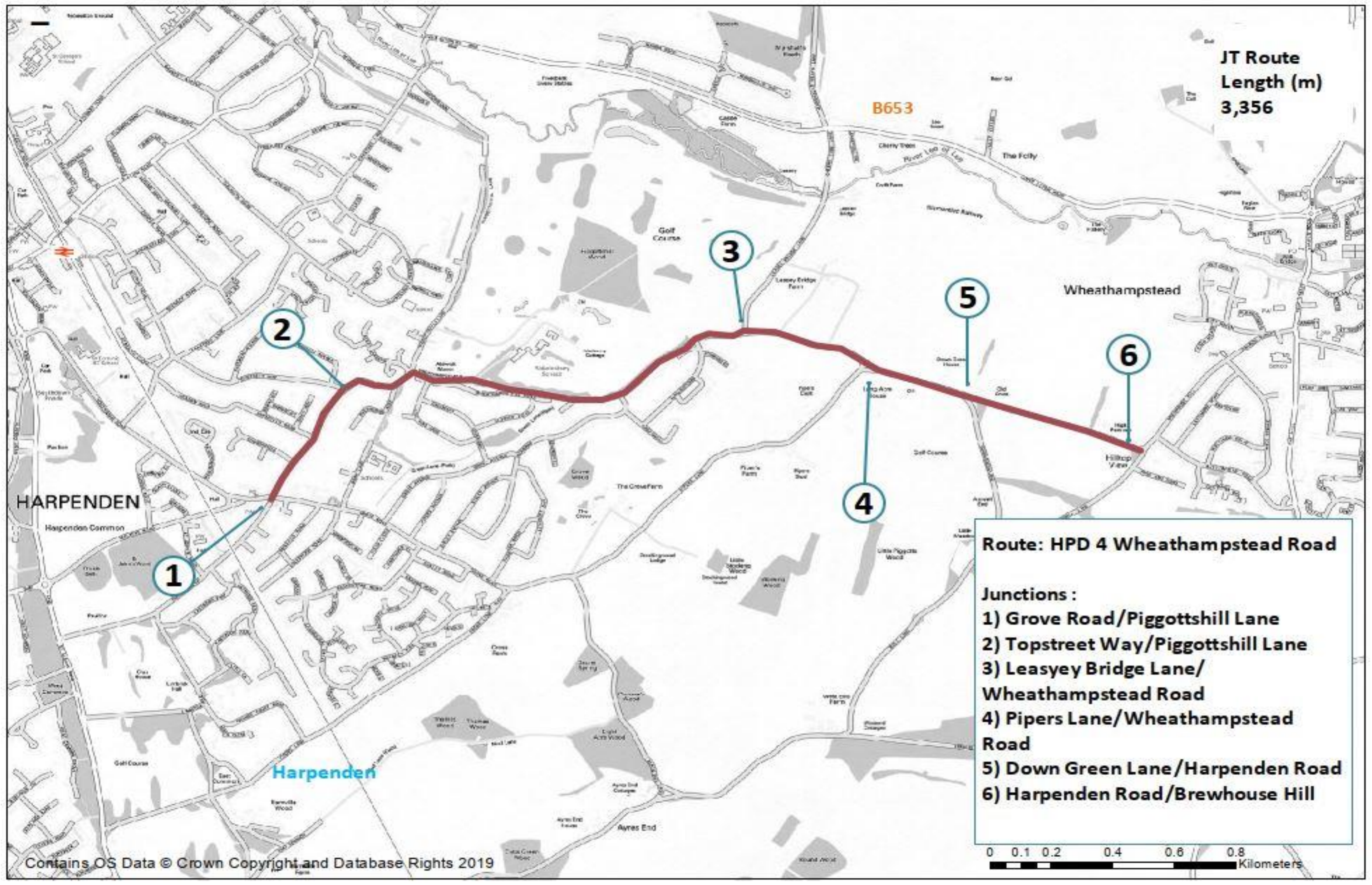
Route: HPD4_EB

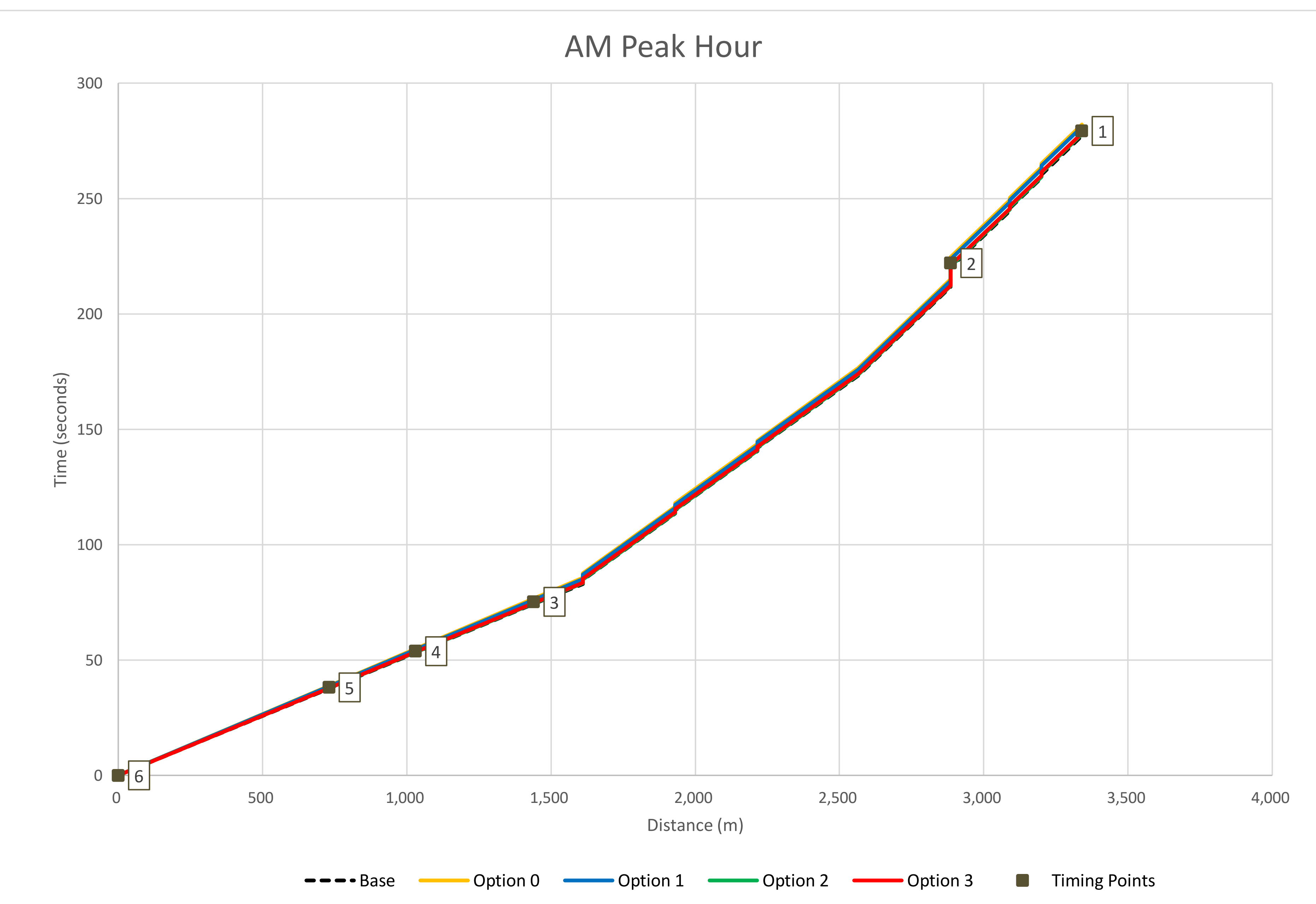


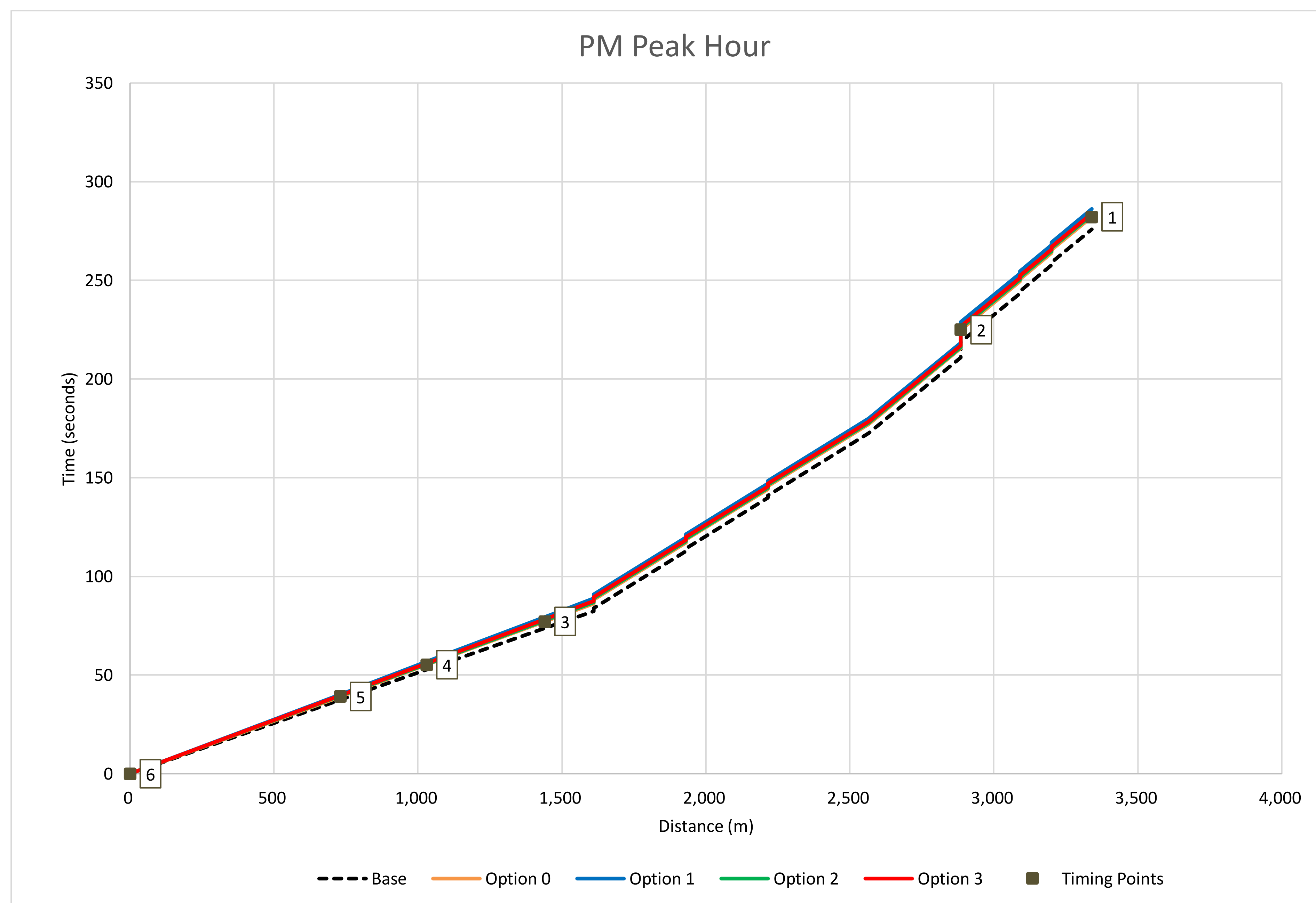




Route: HPD4_WB







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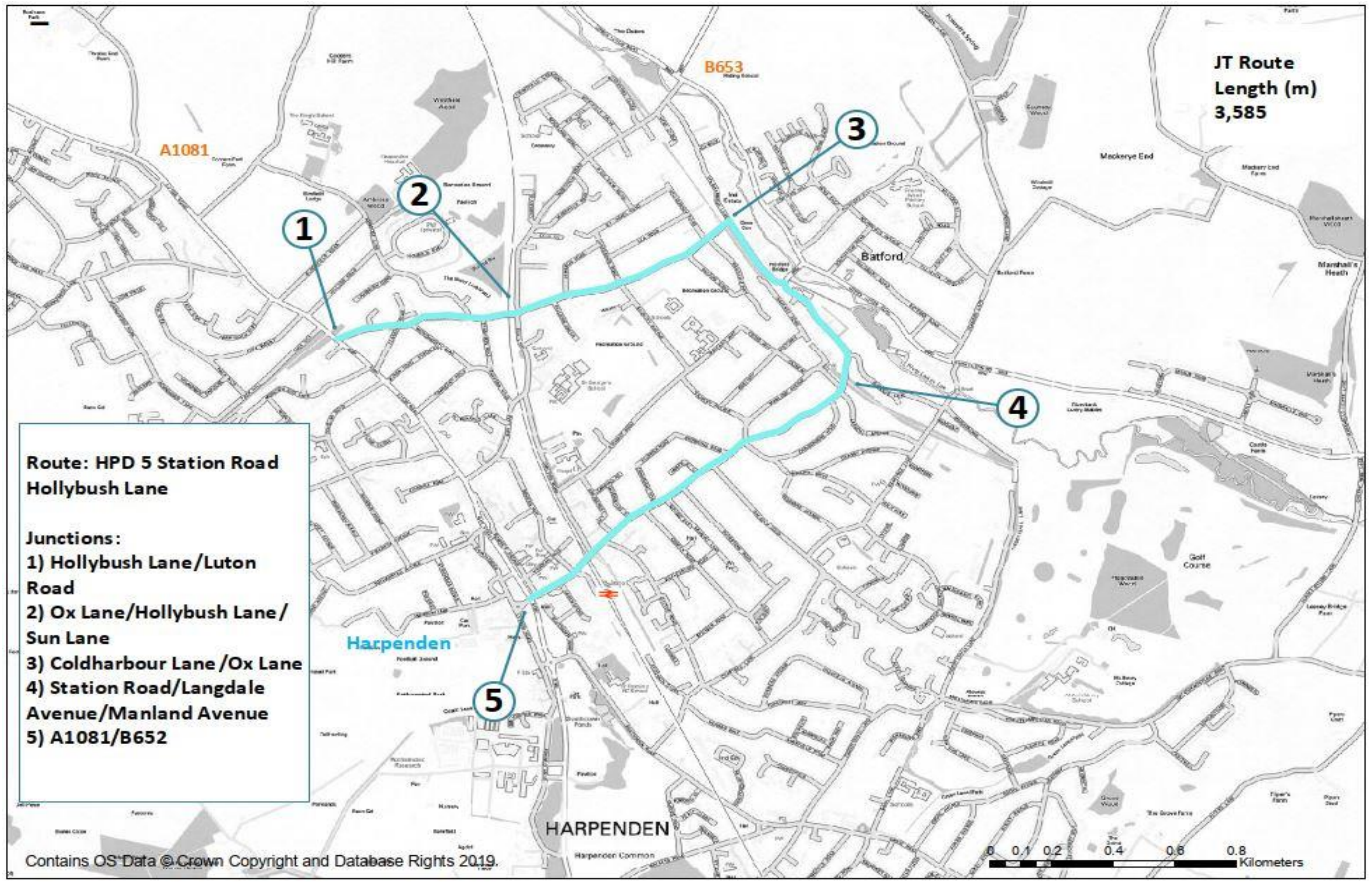
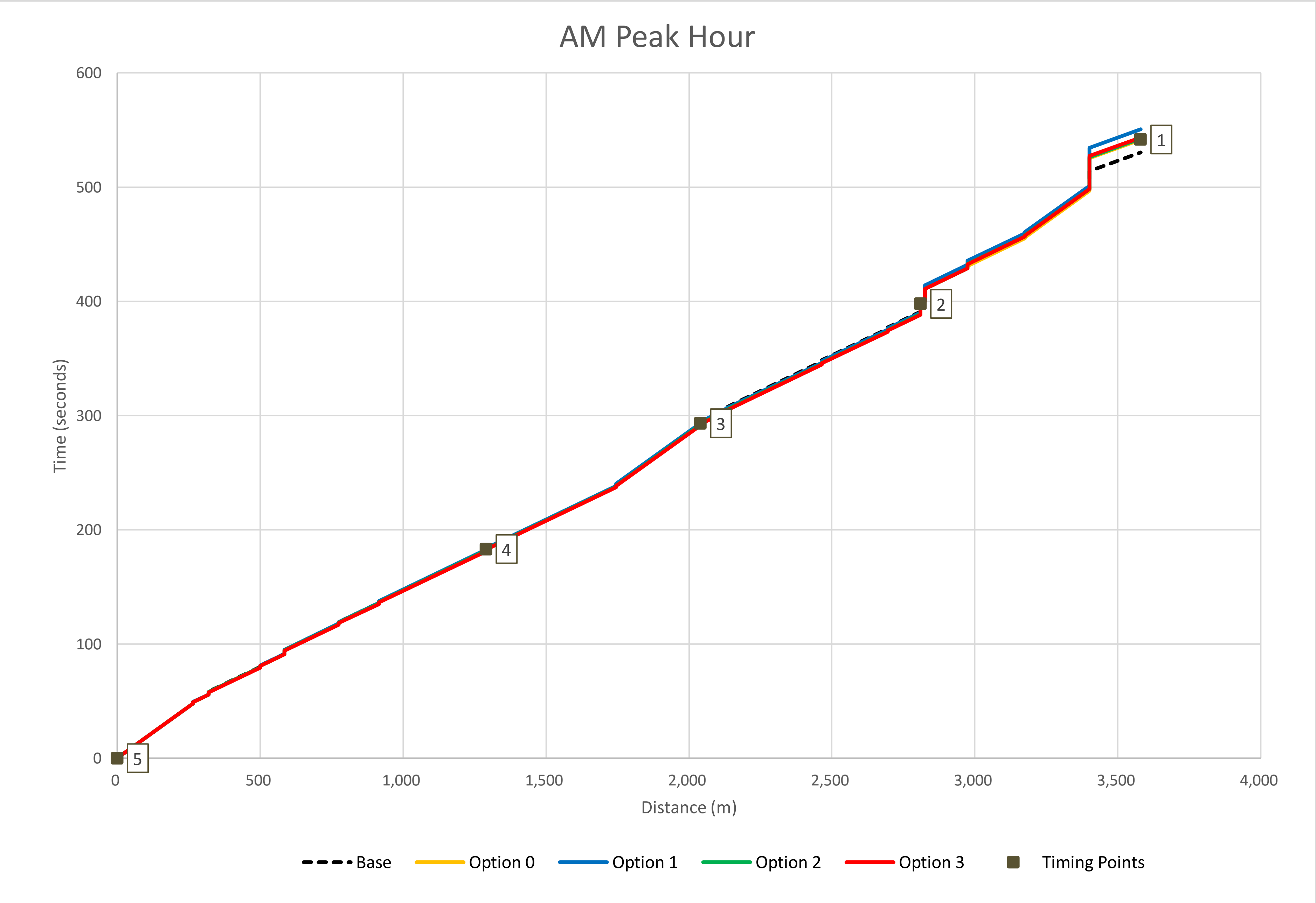
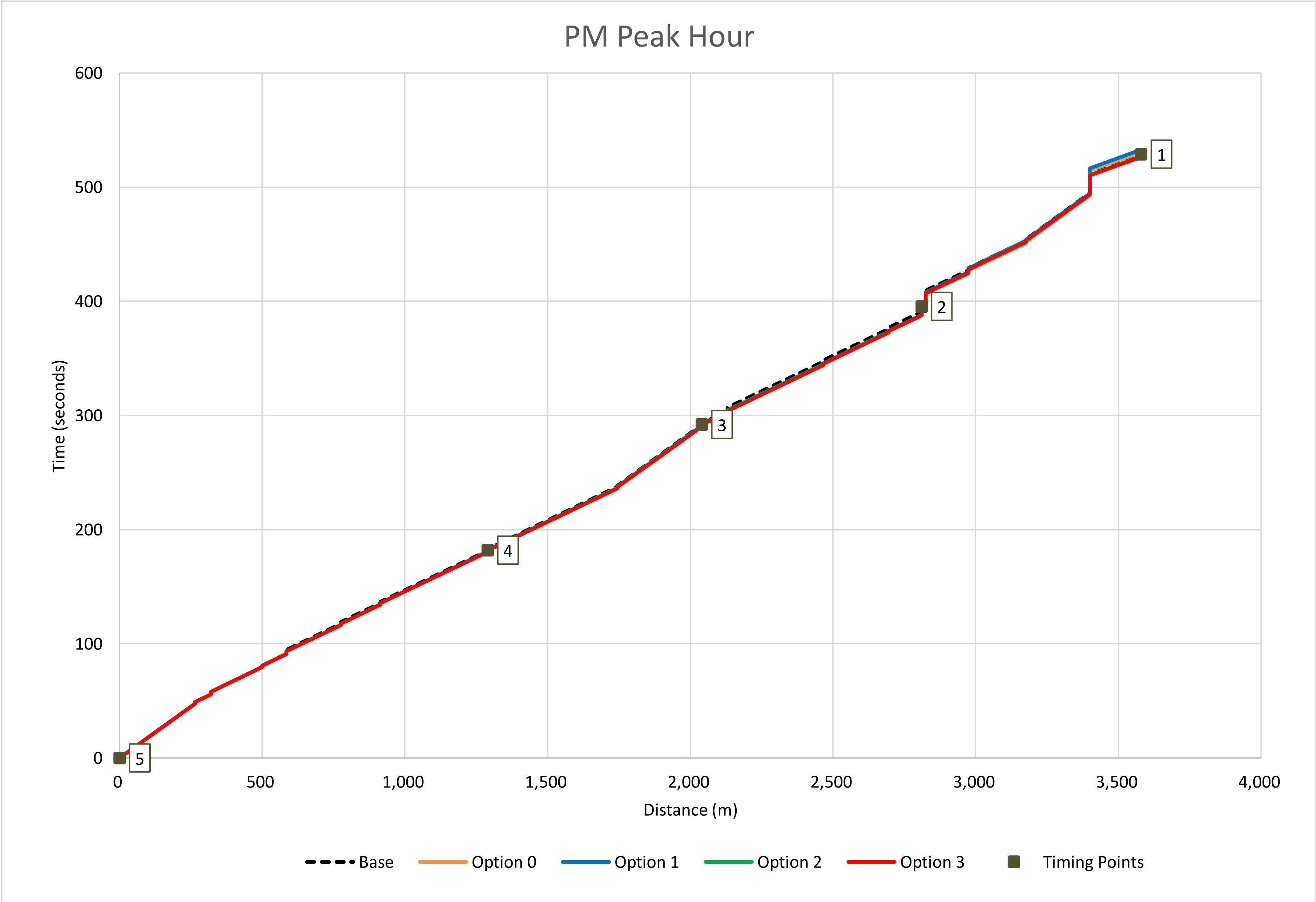
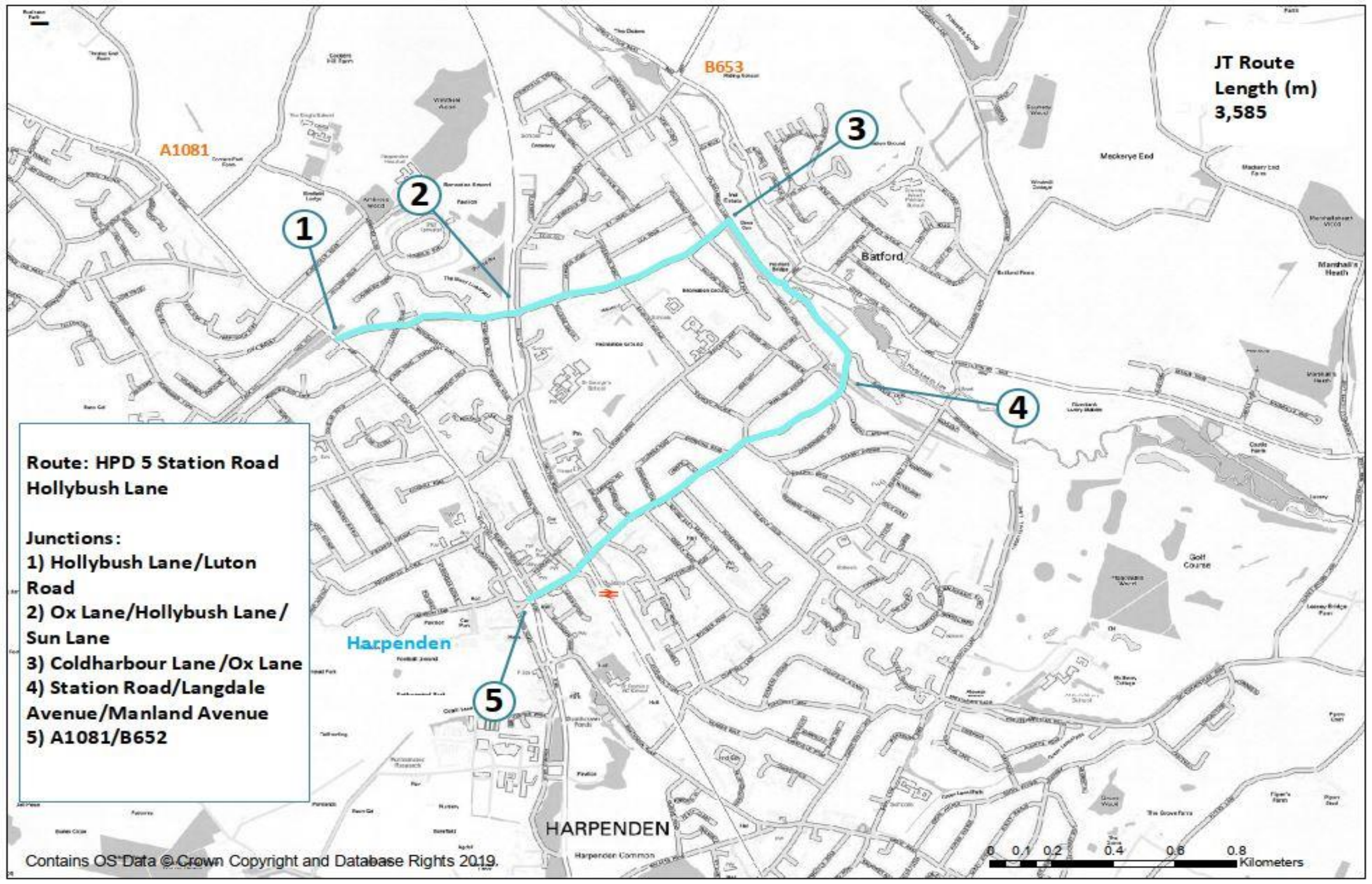
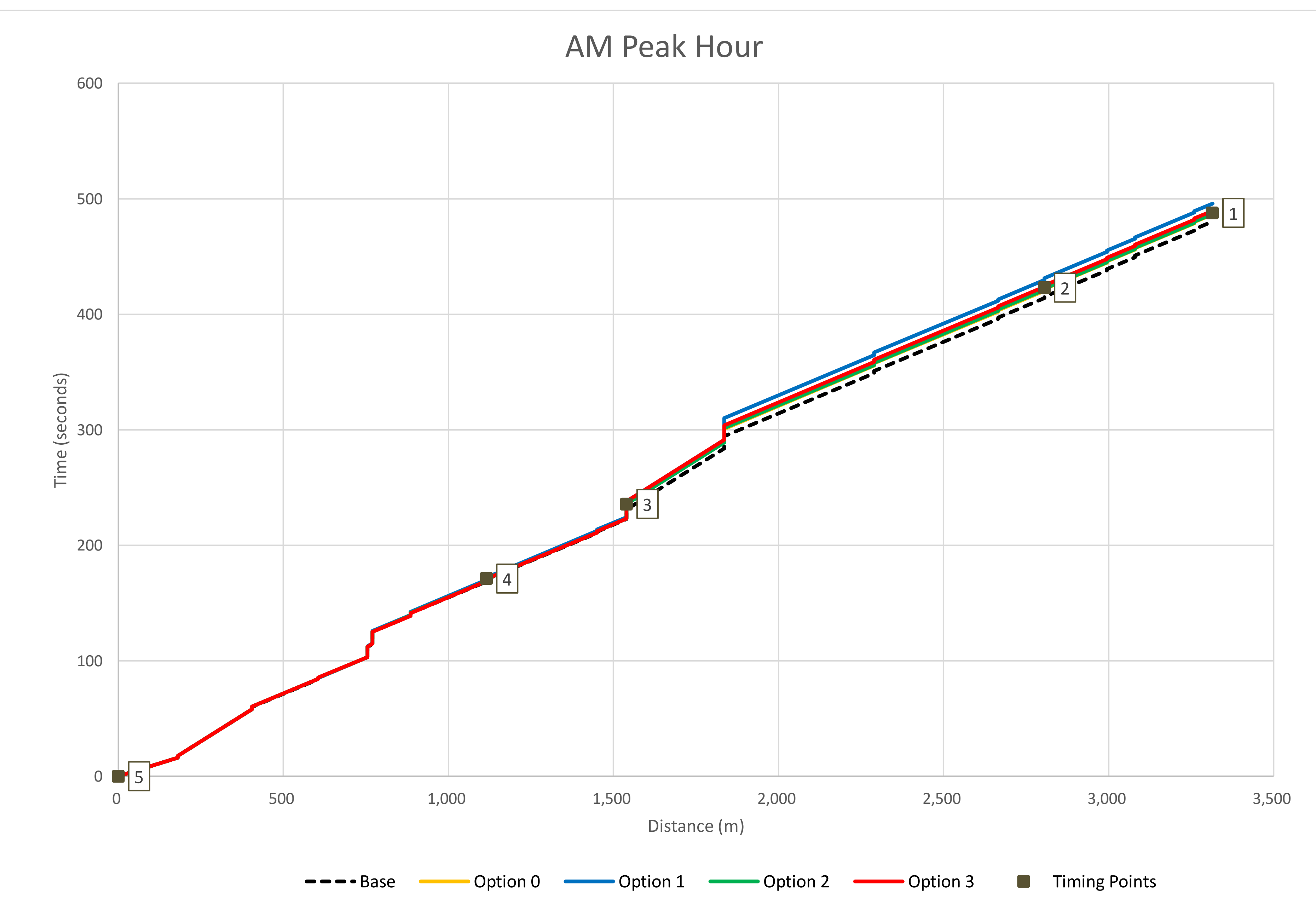


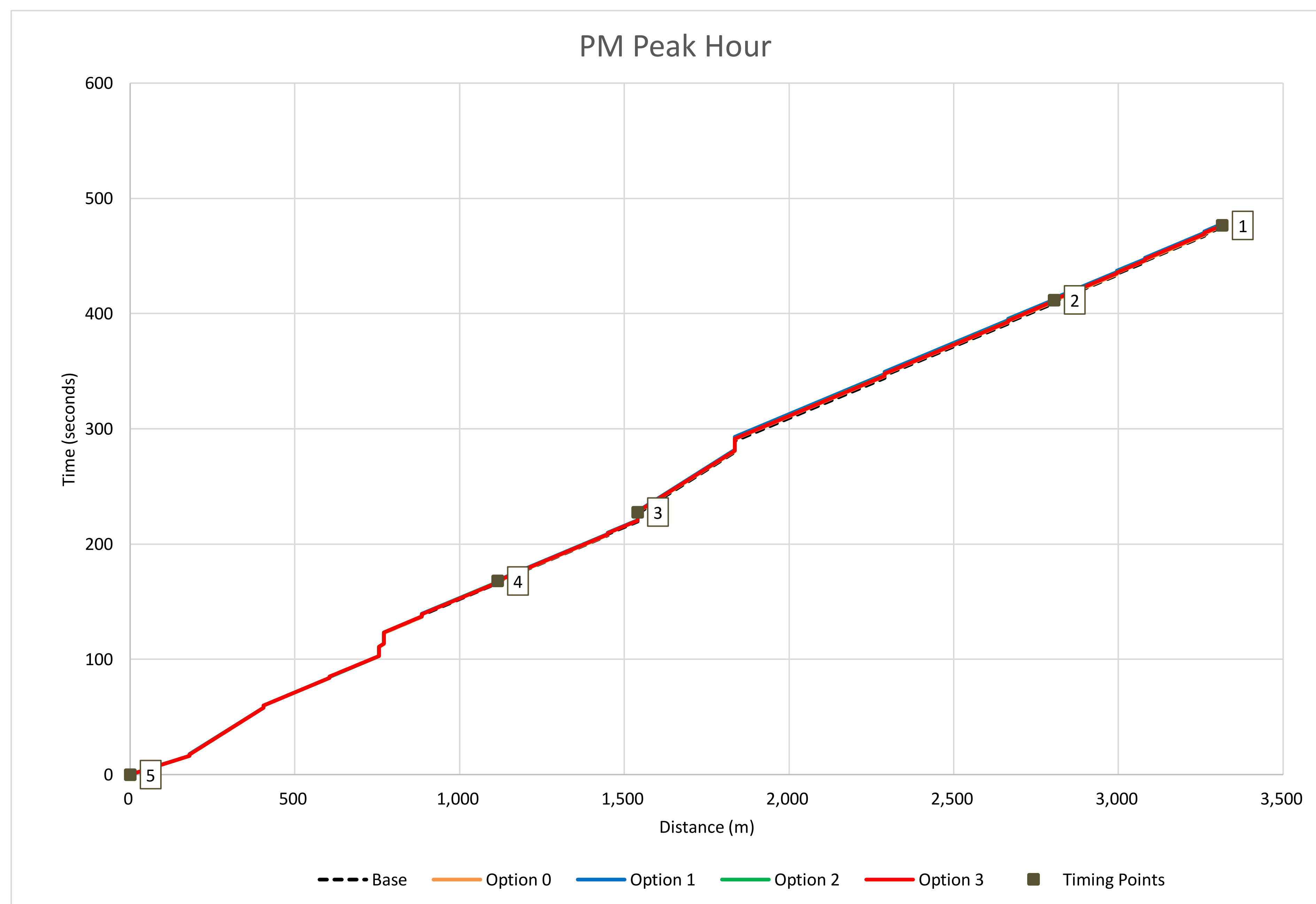




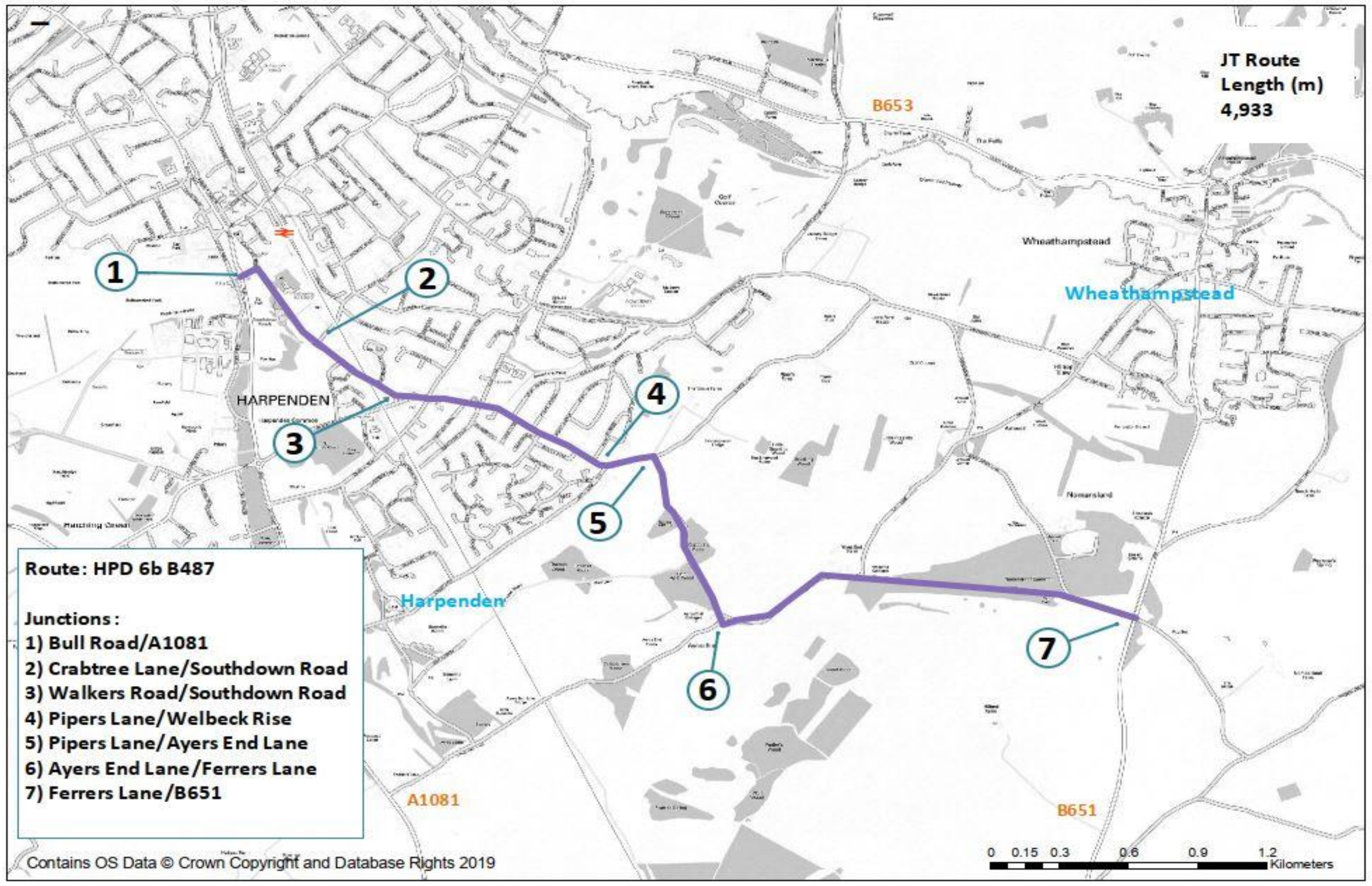
Route: HPD5_SB

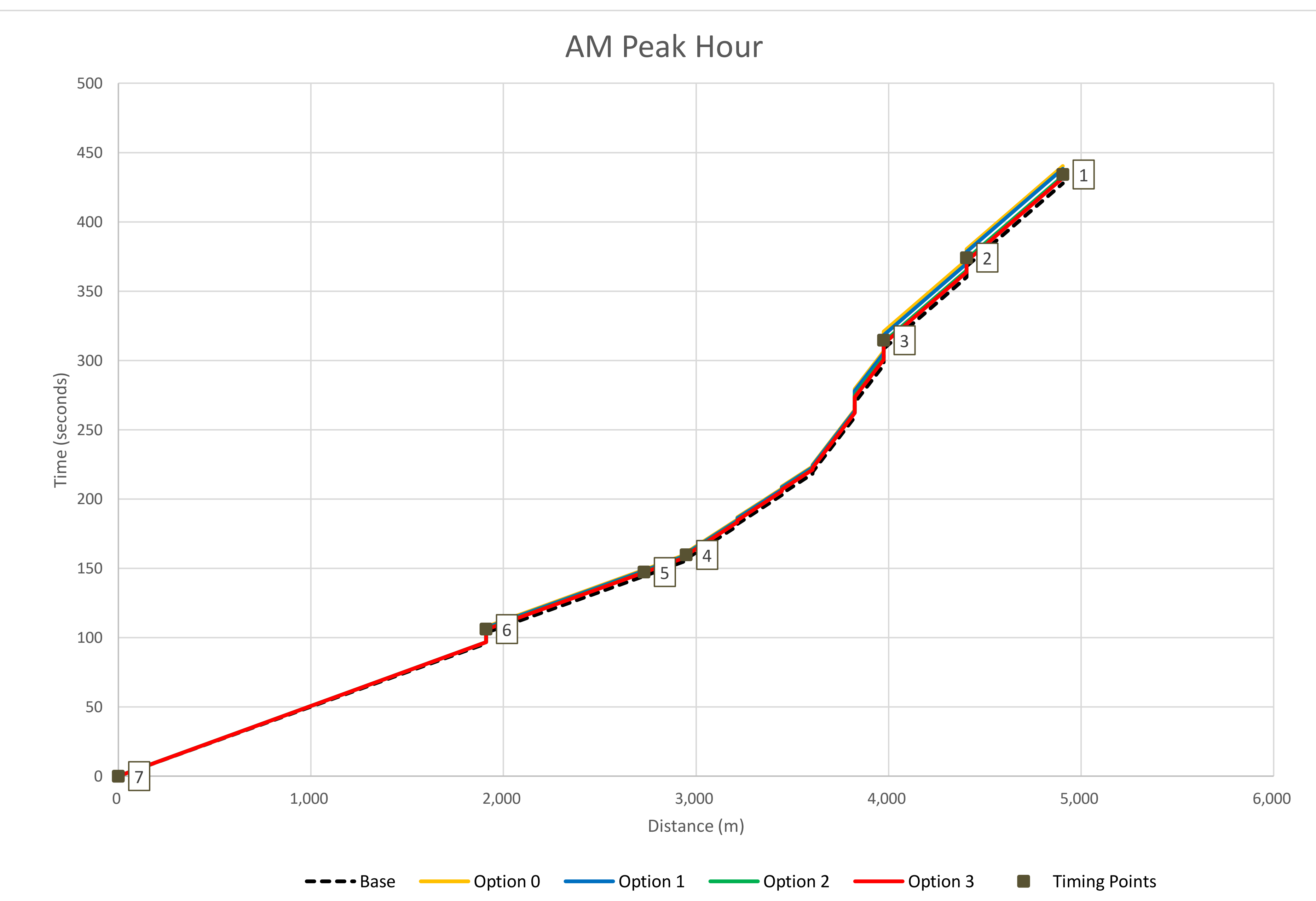


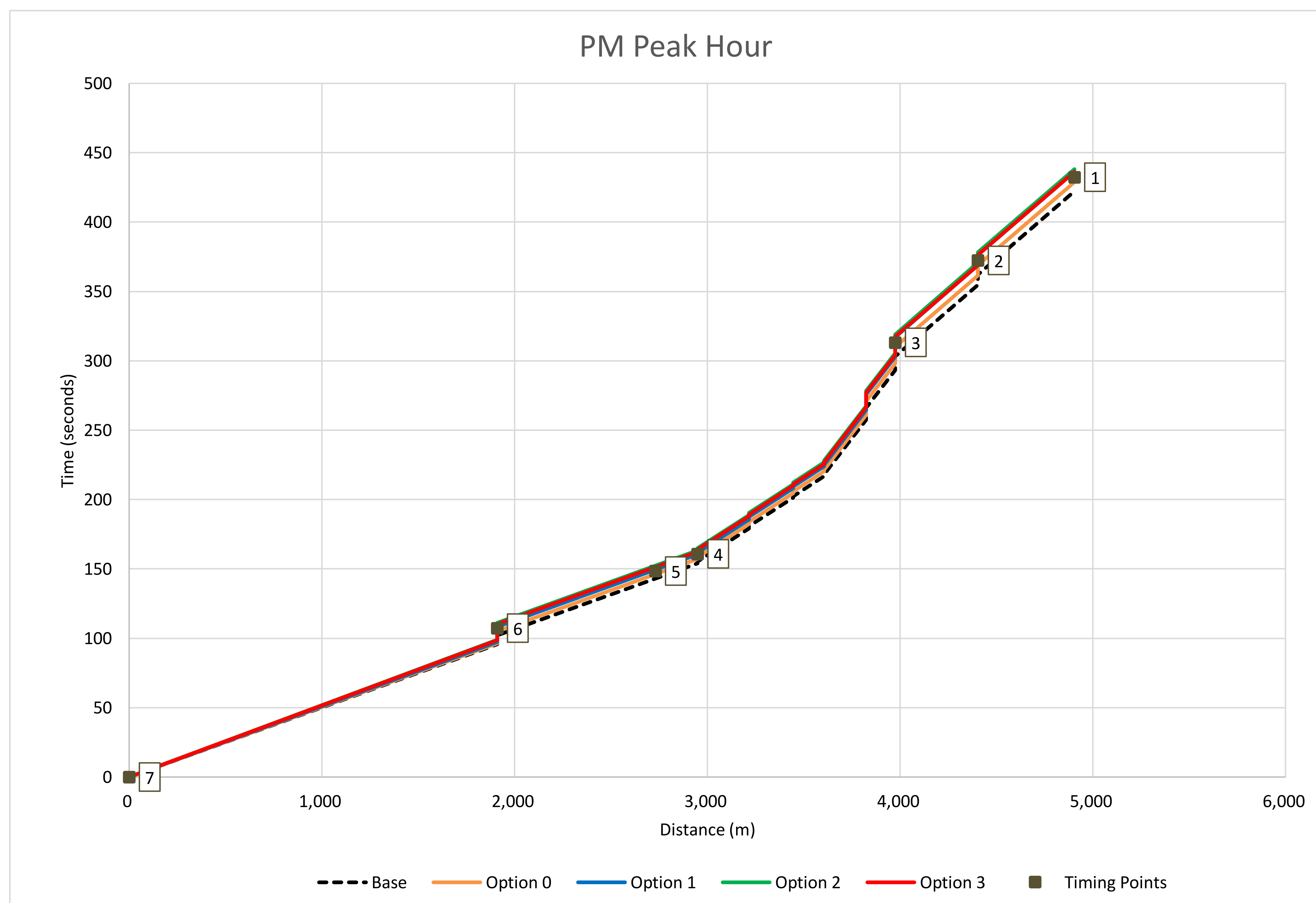




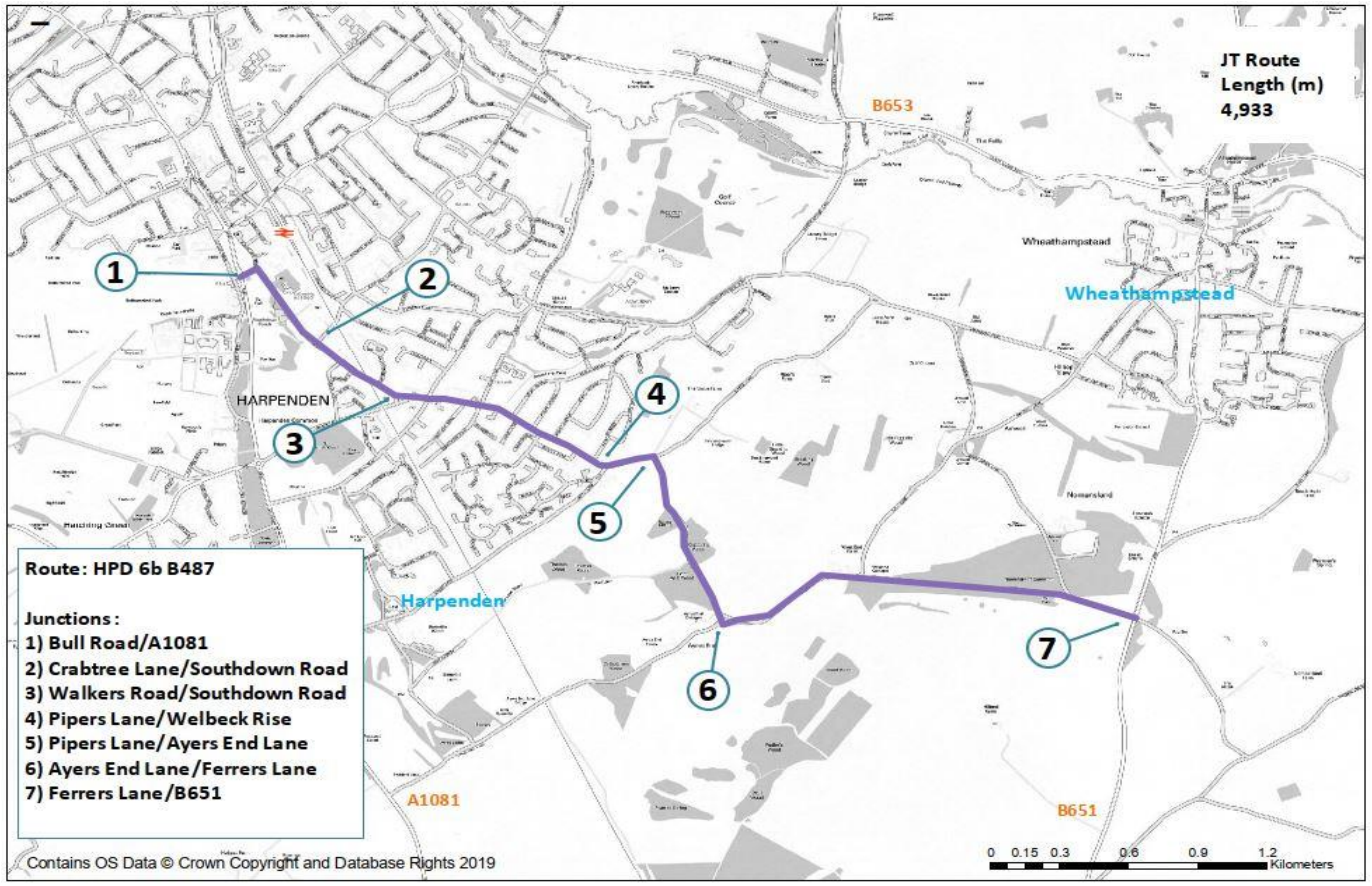
Route: HPD6A_NB

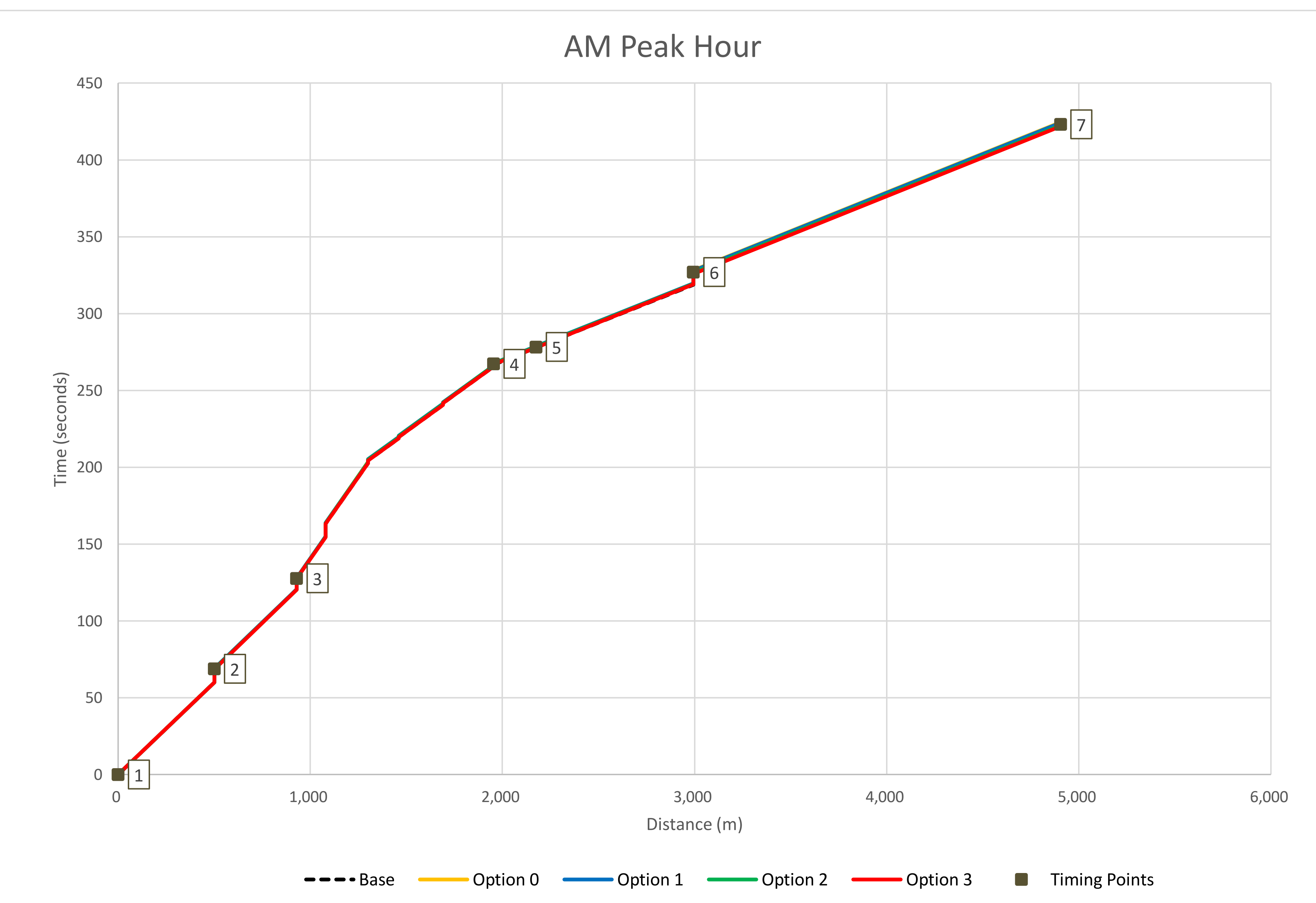


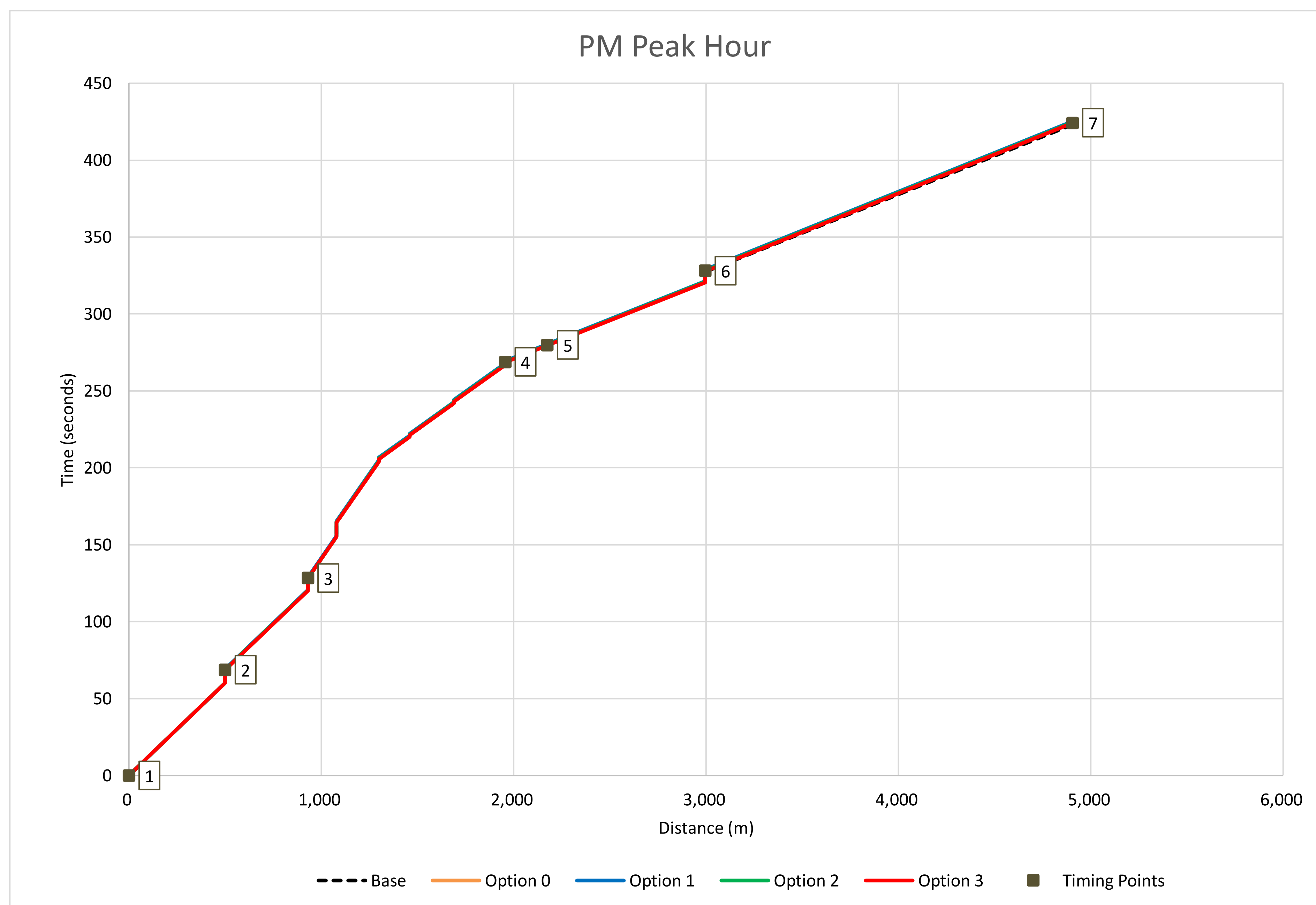




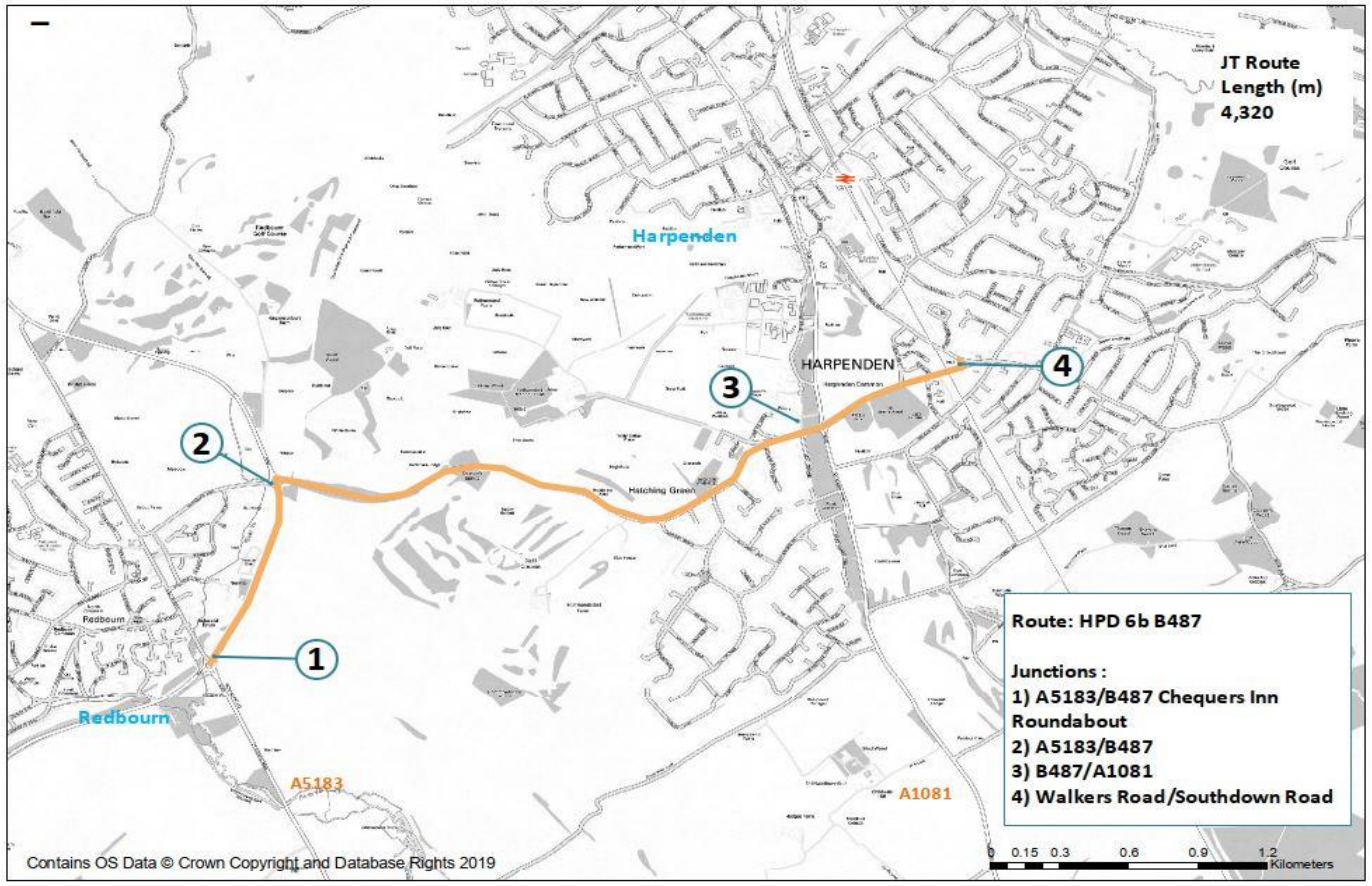
Route: HPD6A_SB

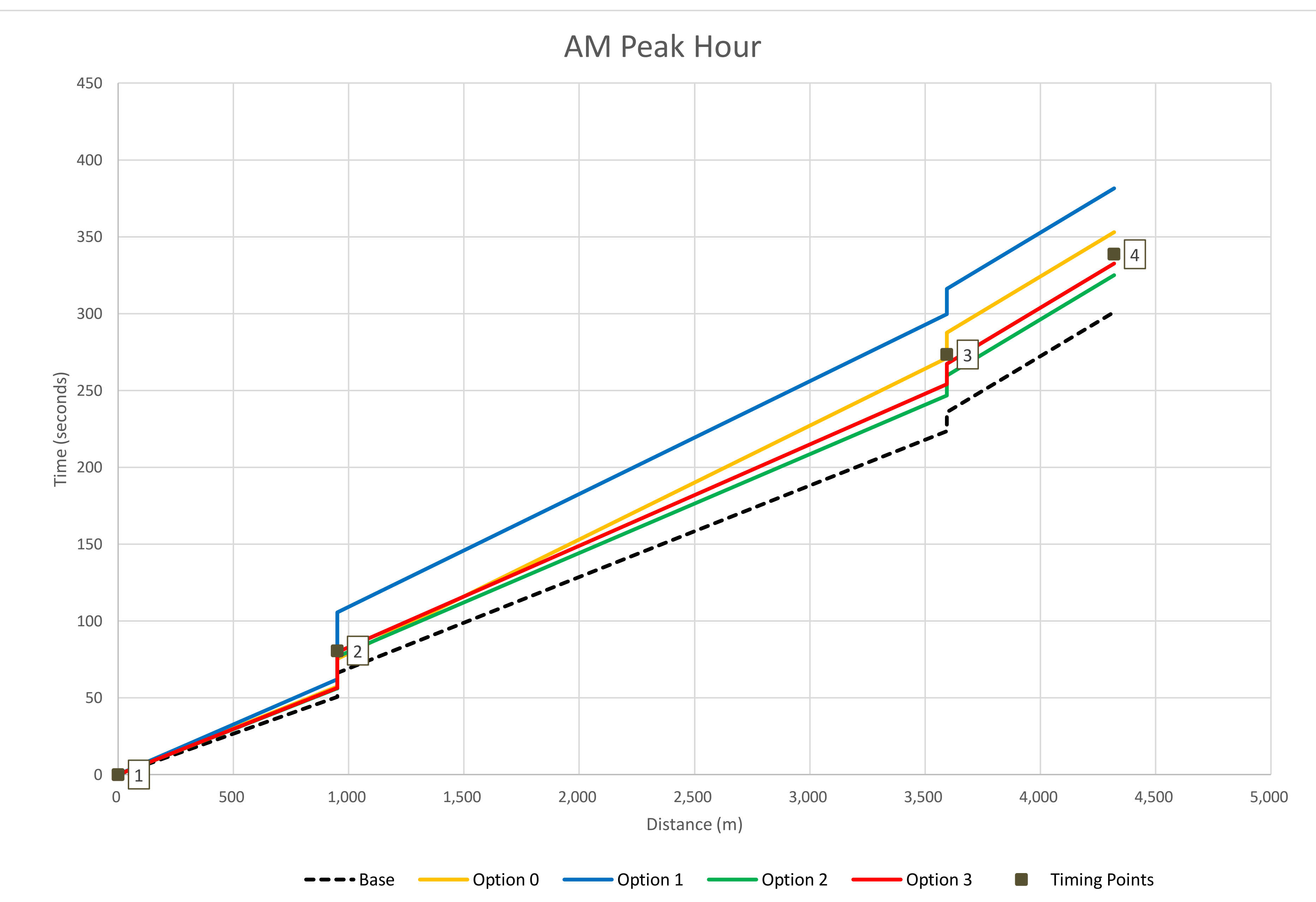


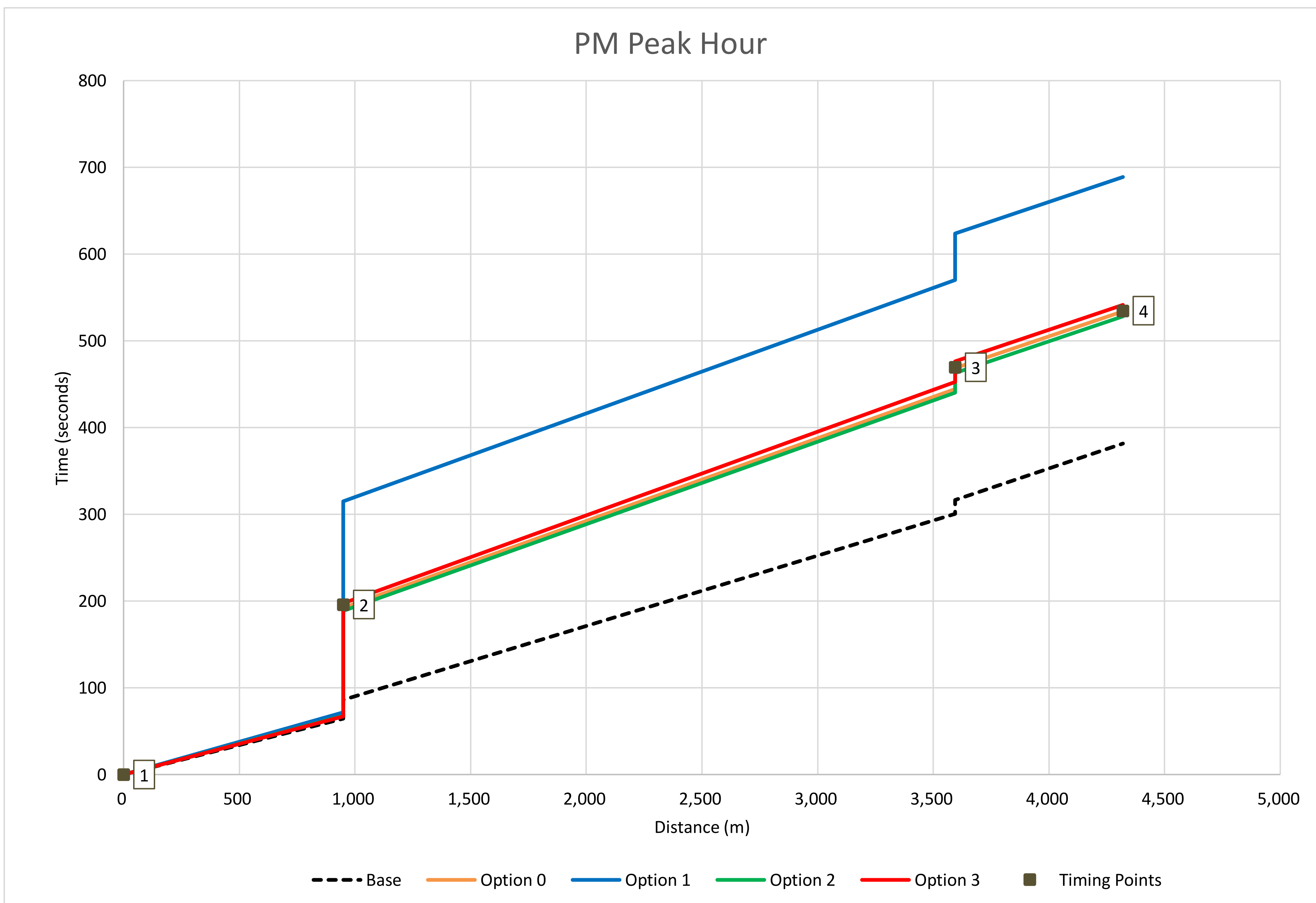




Route: HPD6B_EB







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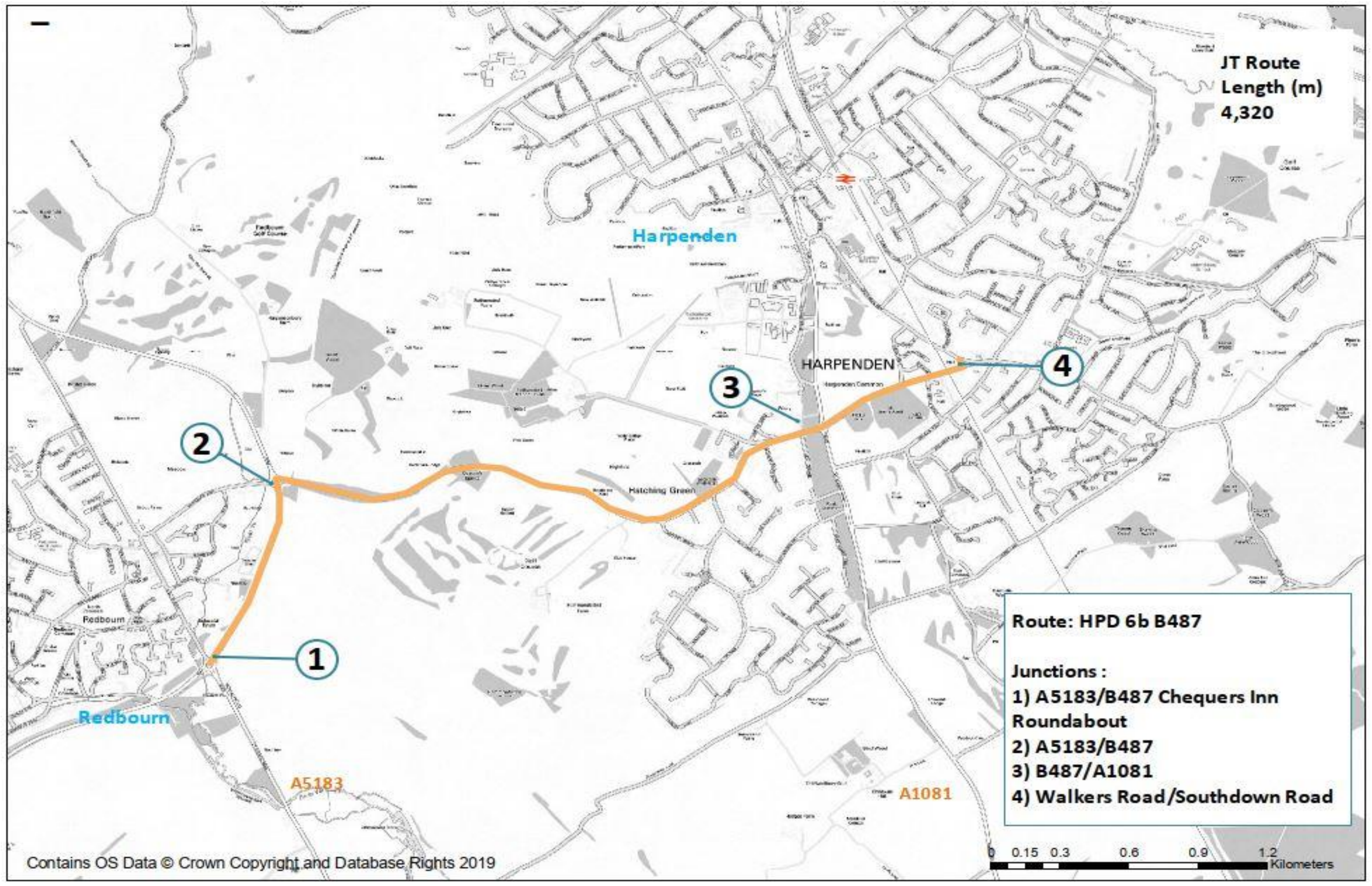

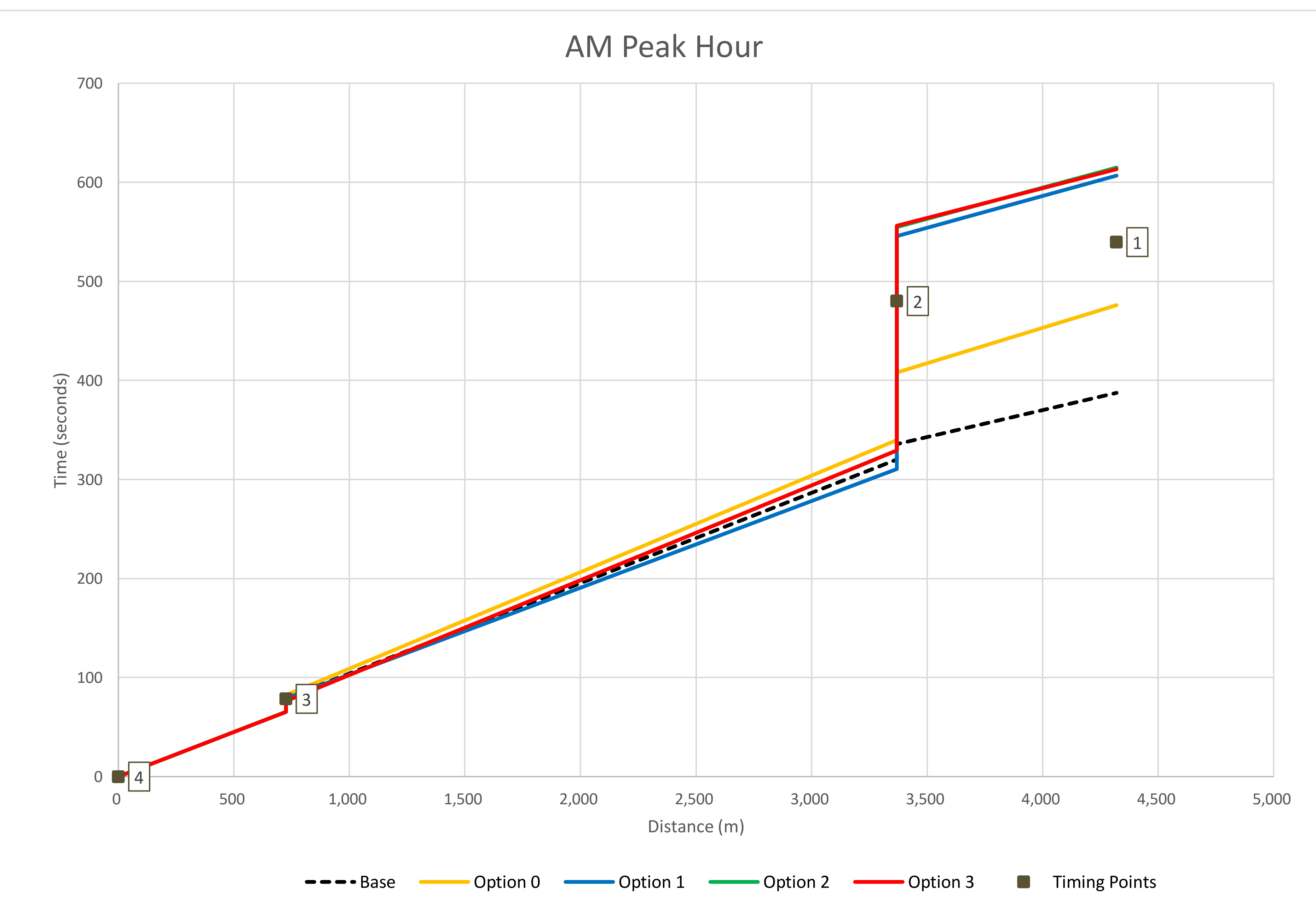

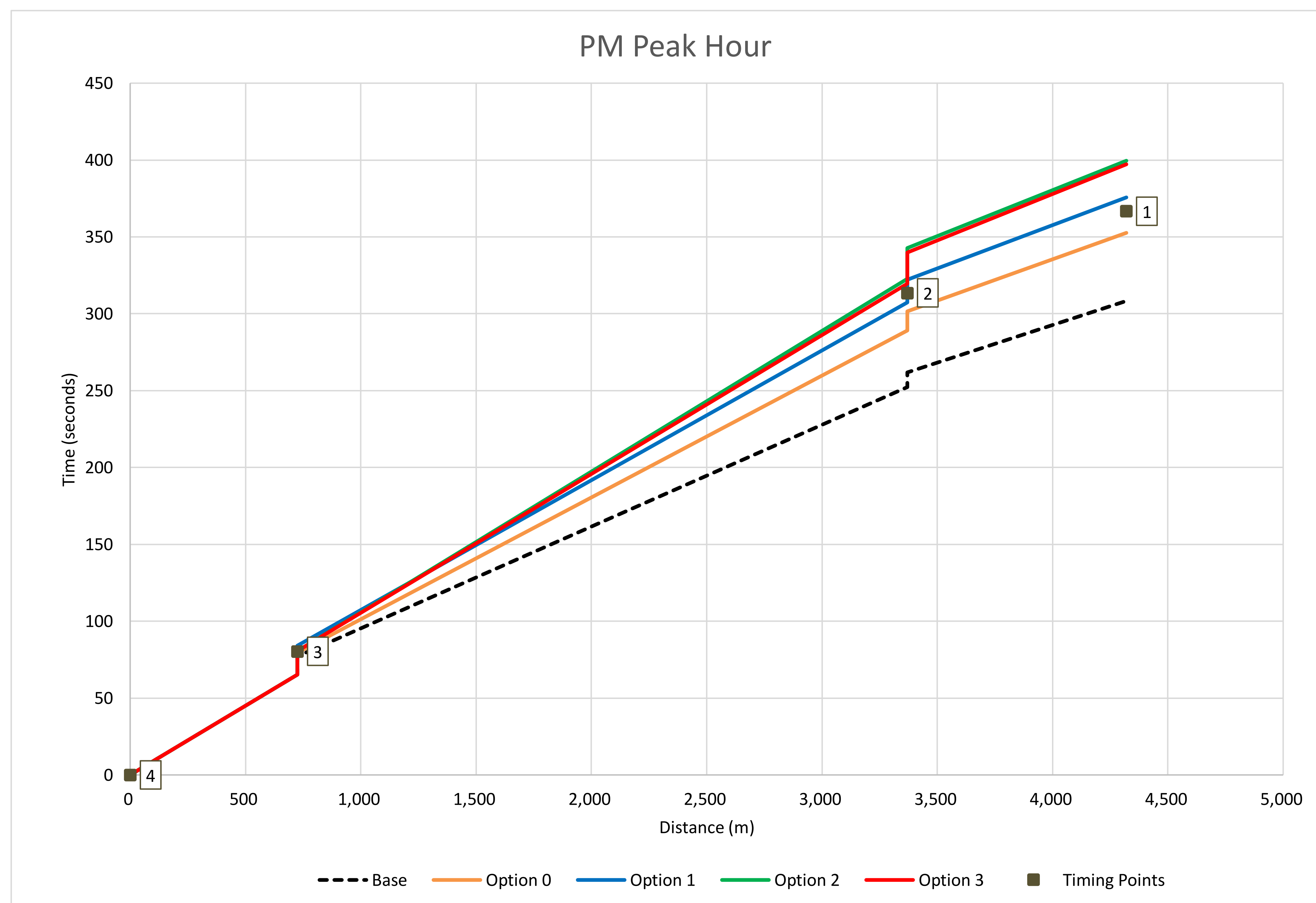

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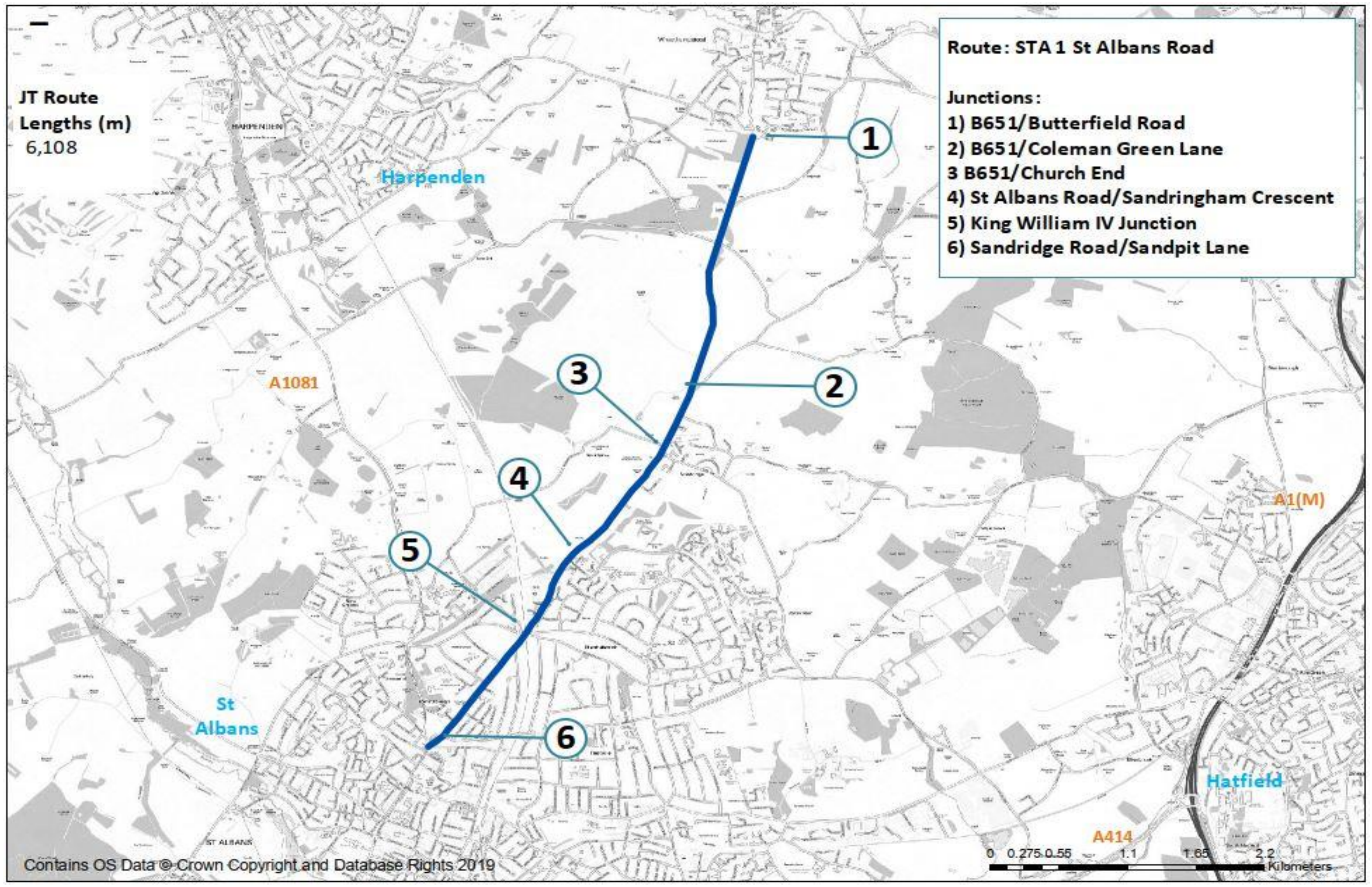
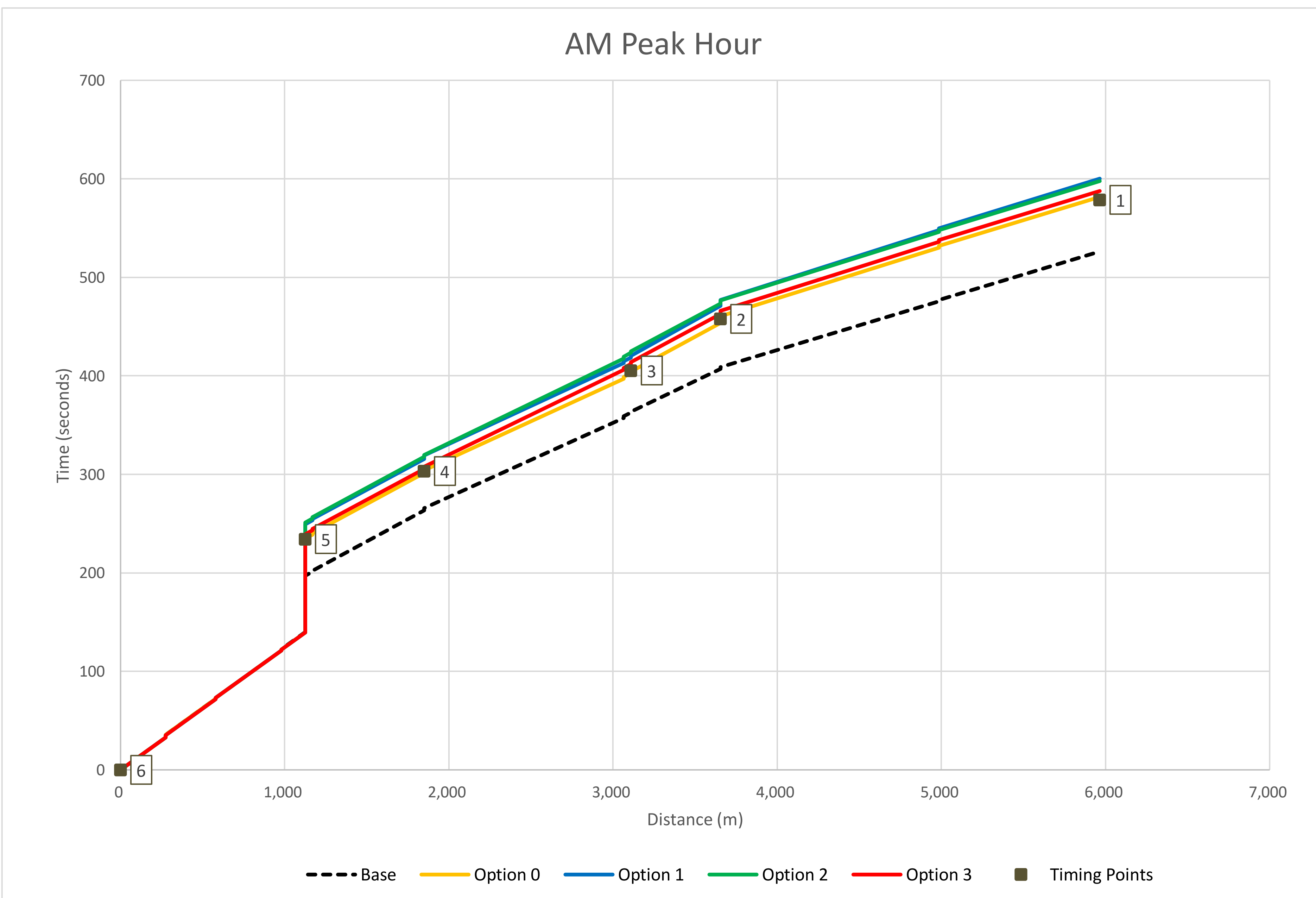
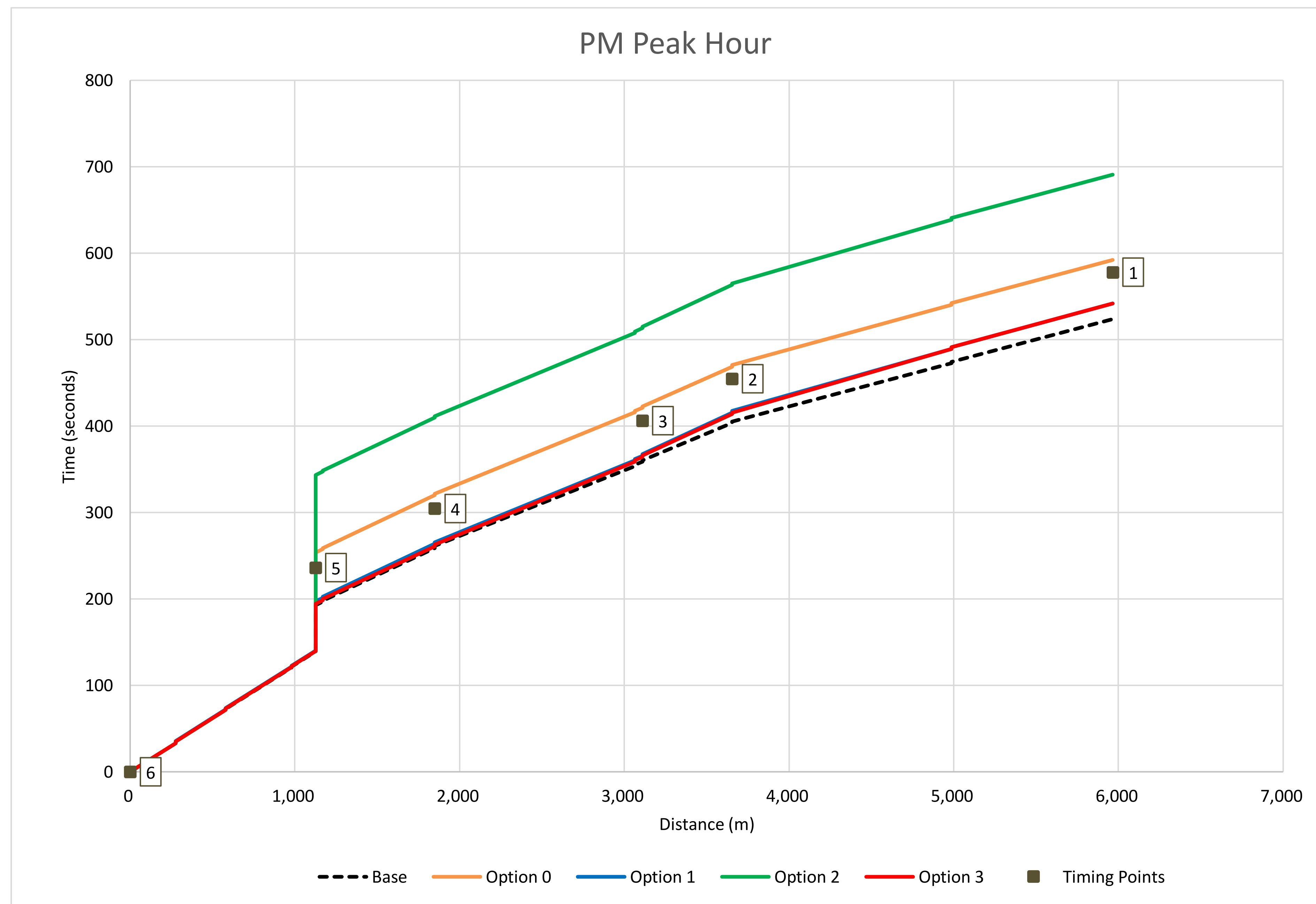
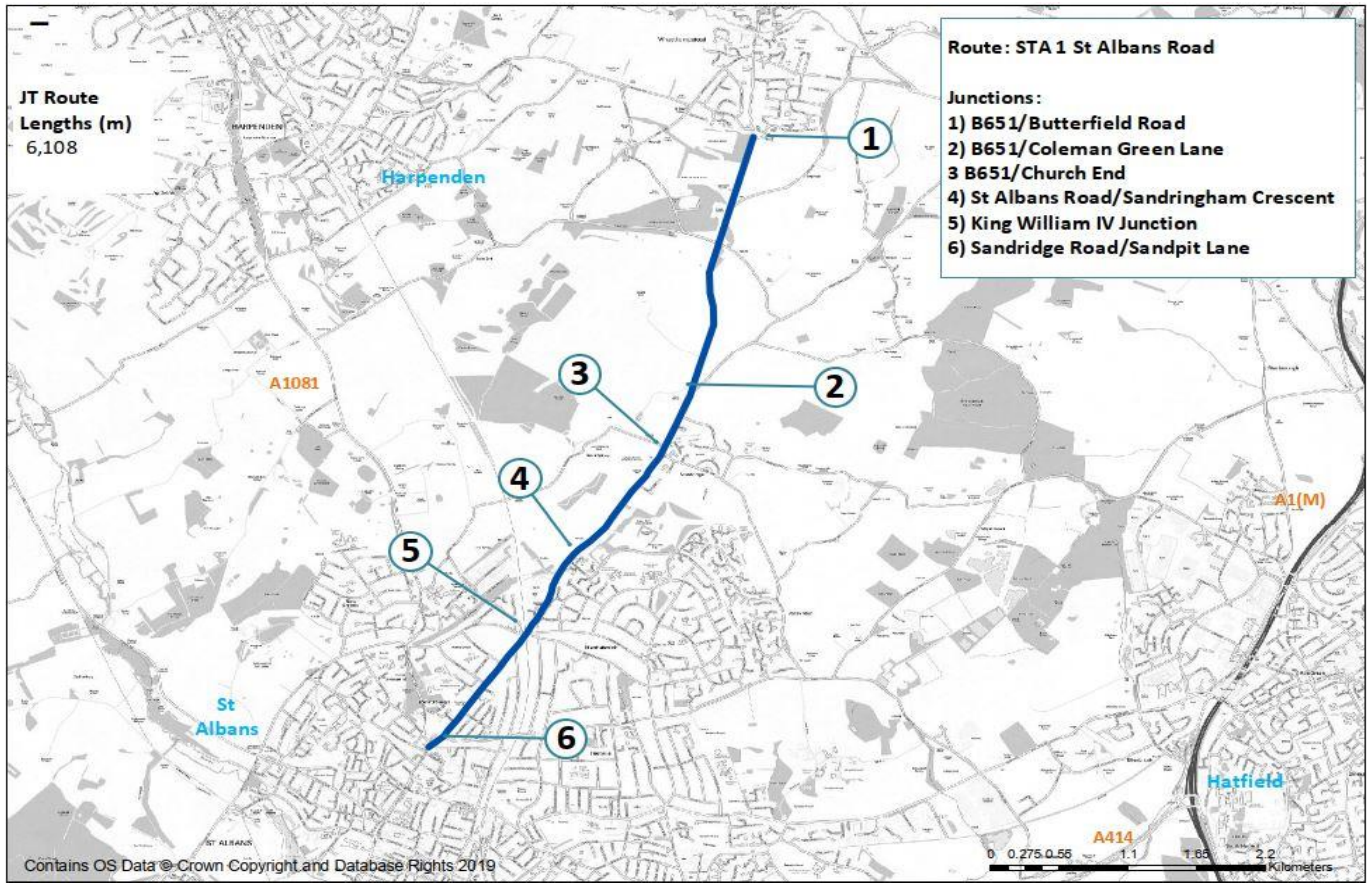
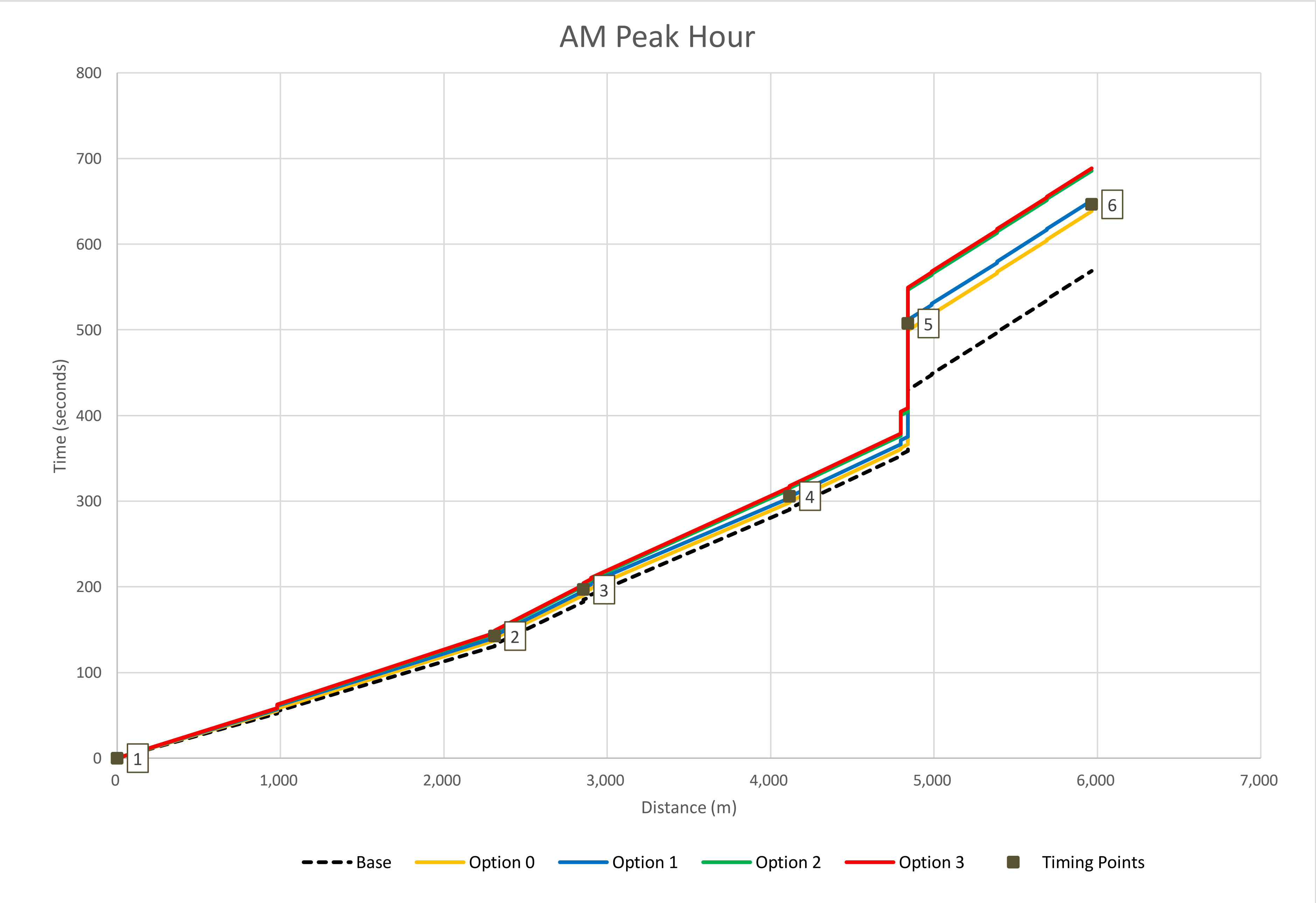


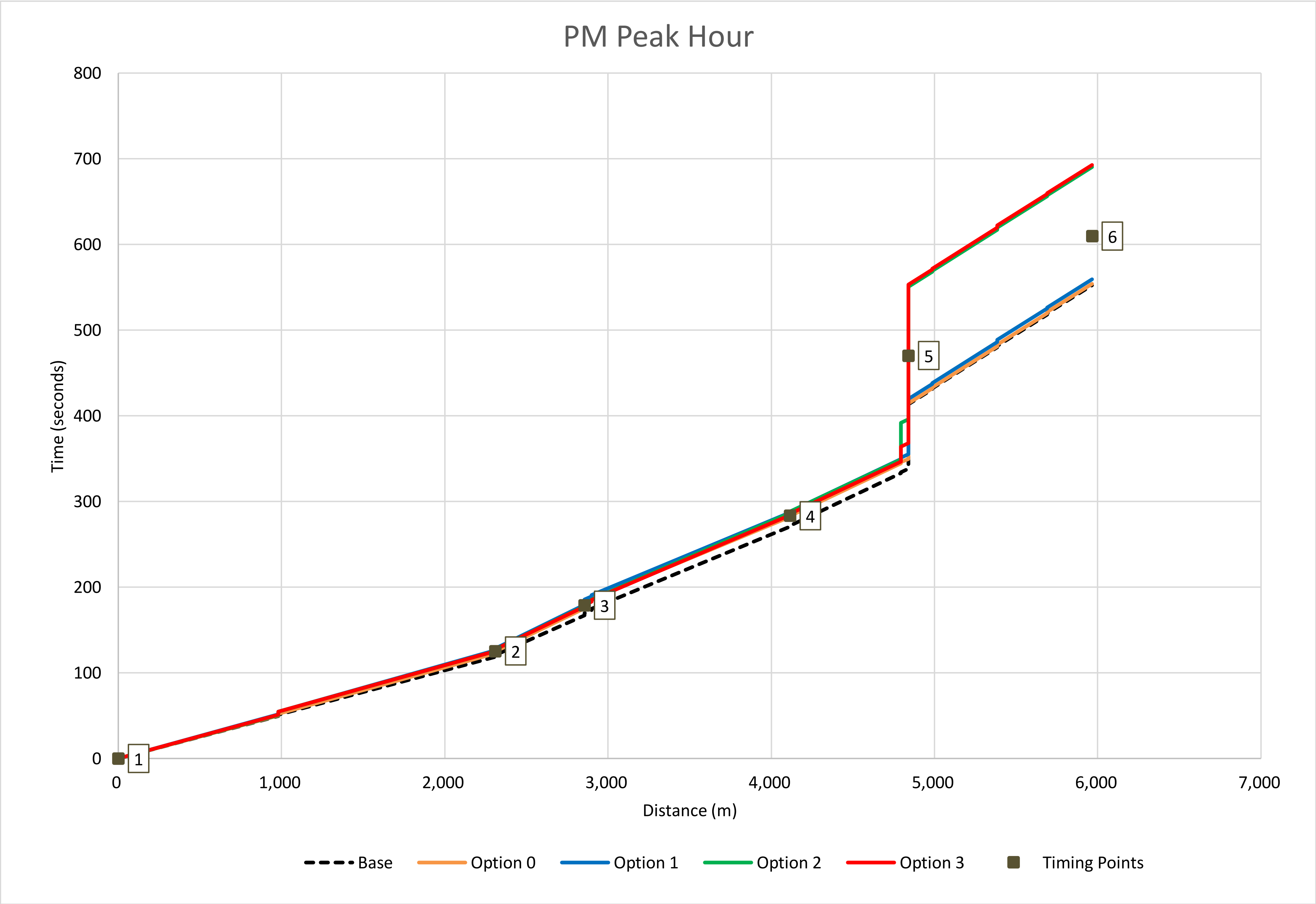




Route: STA1_SB







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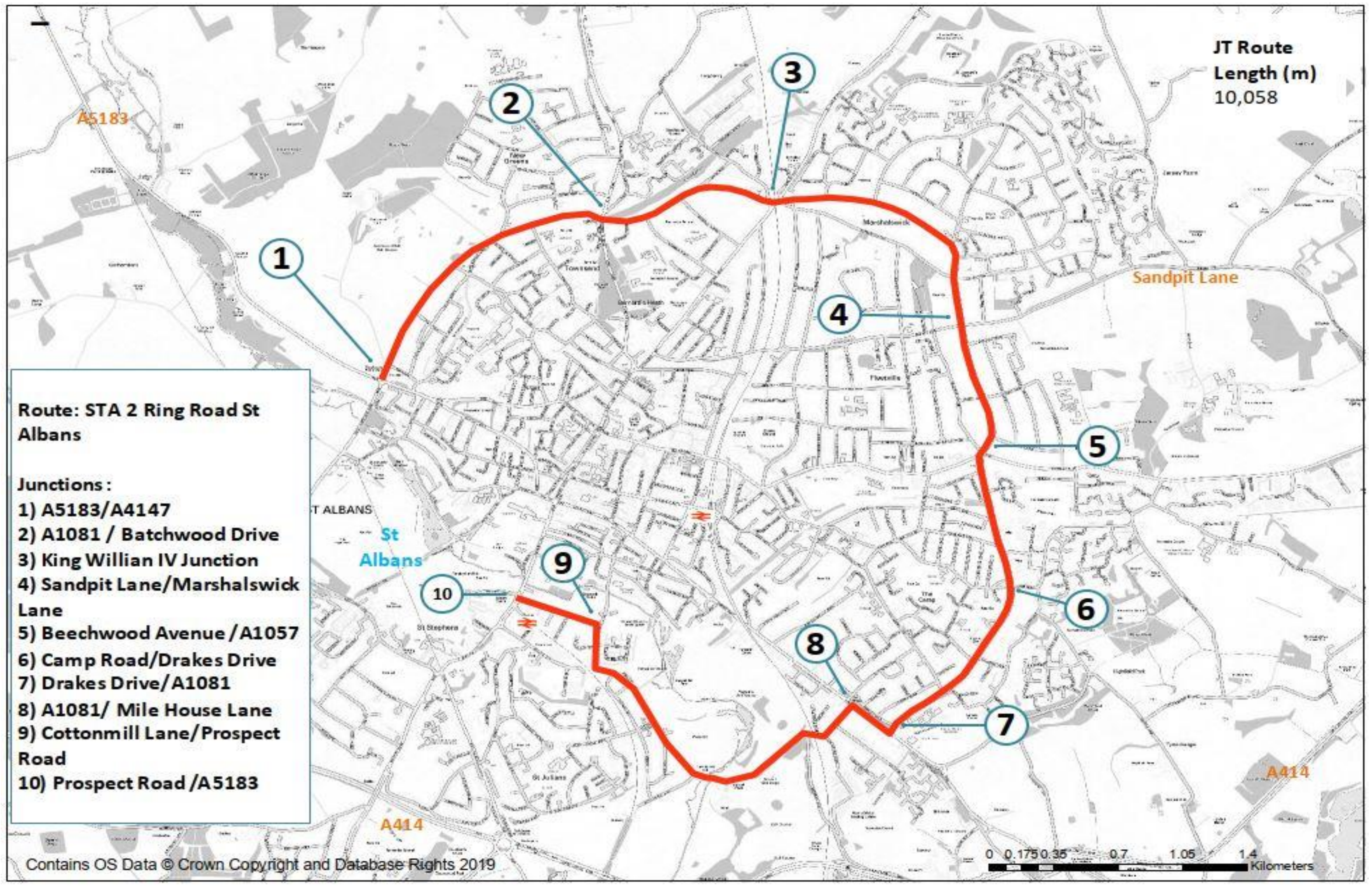
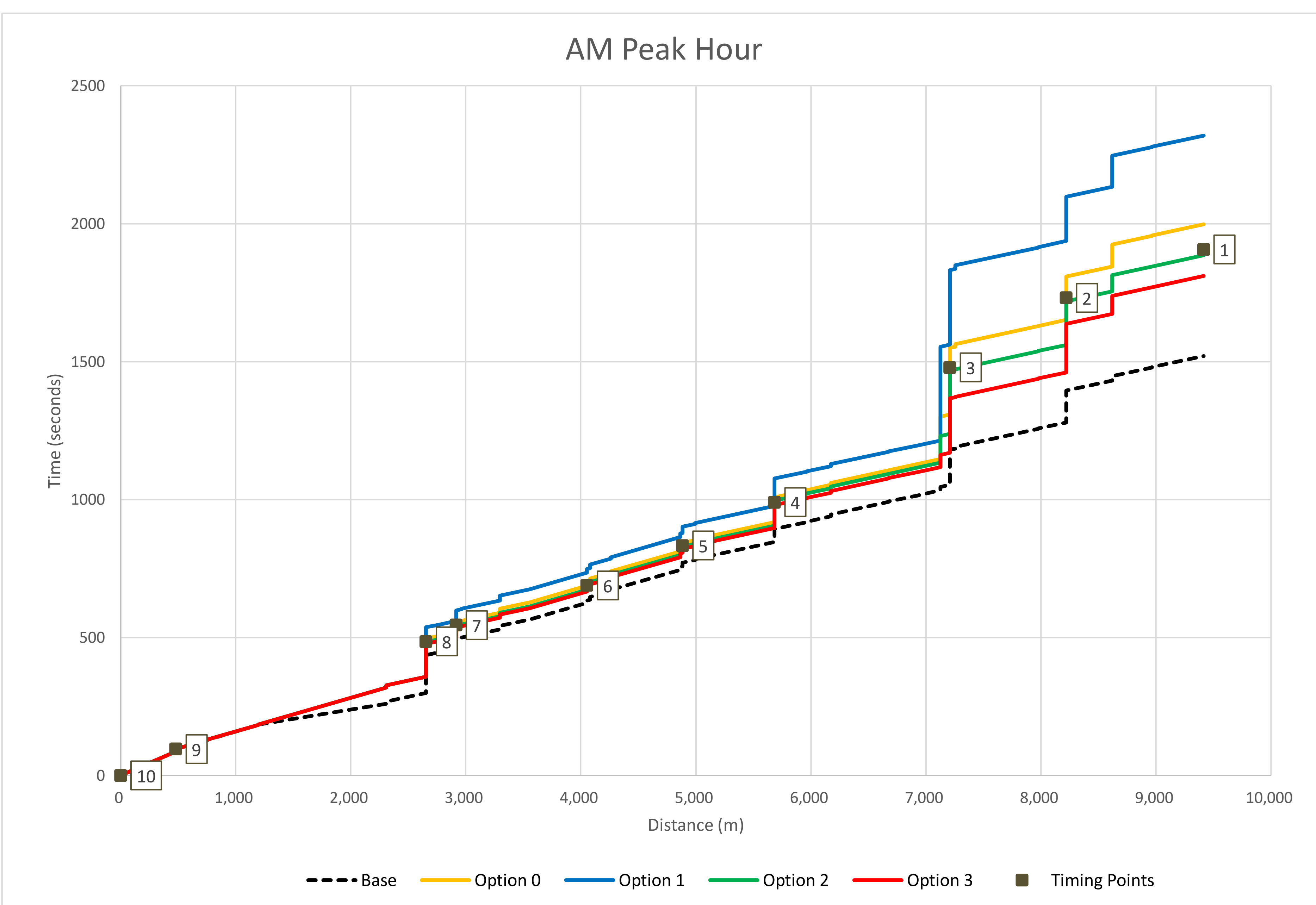
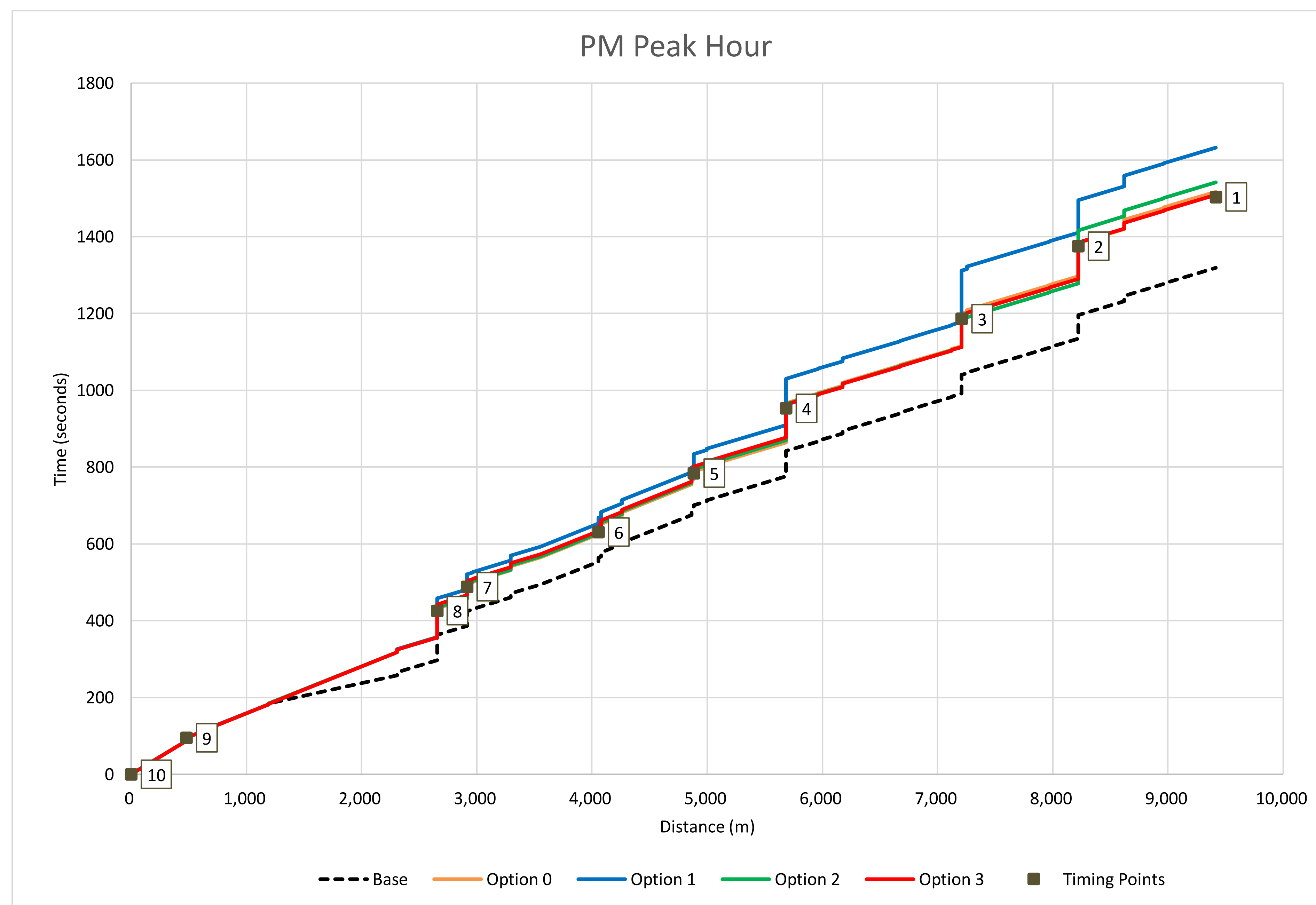
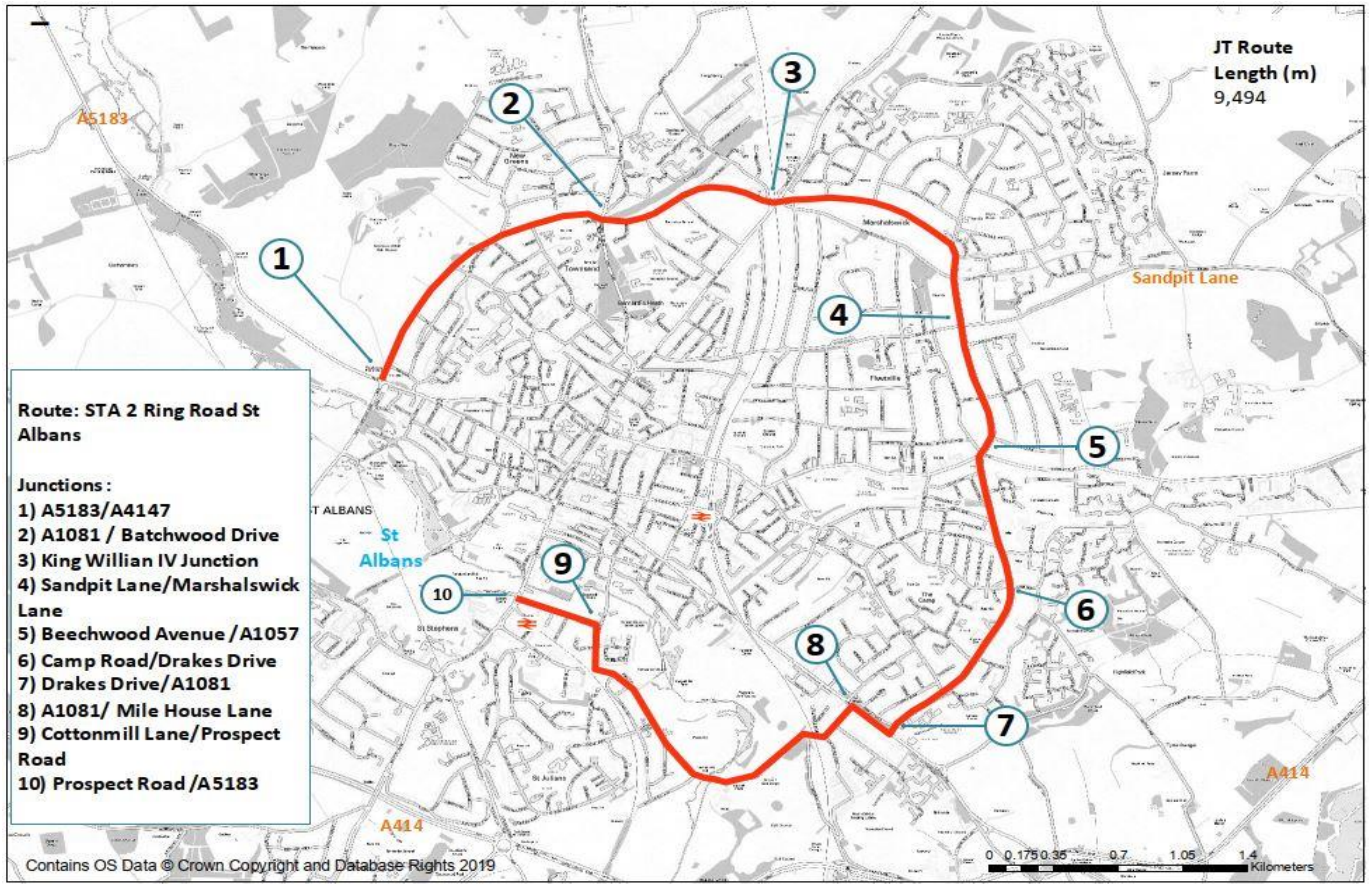
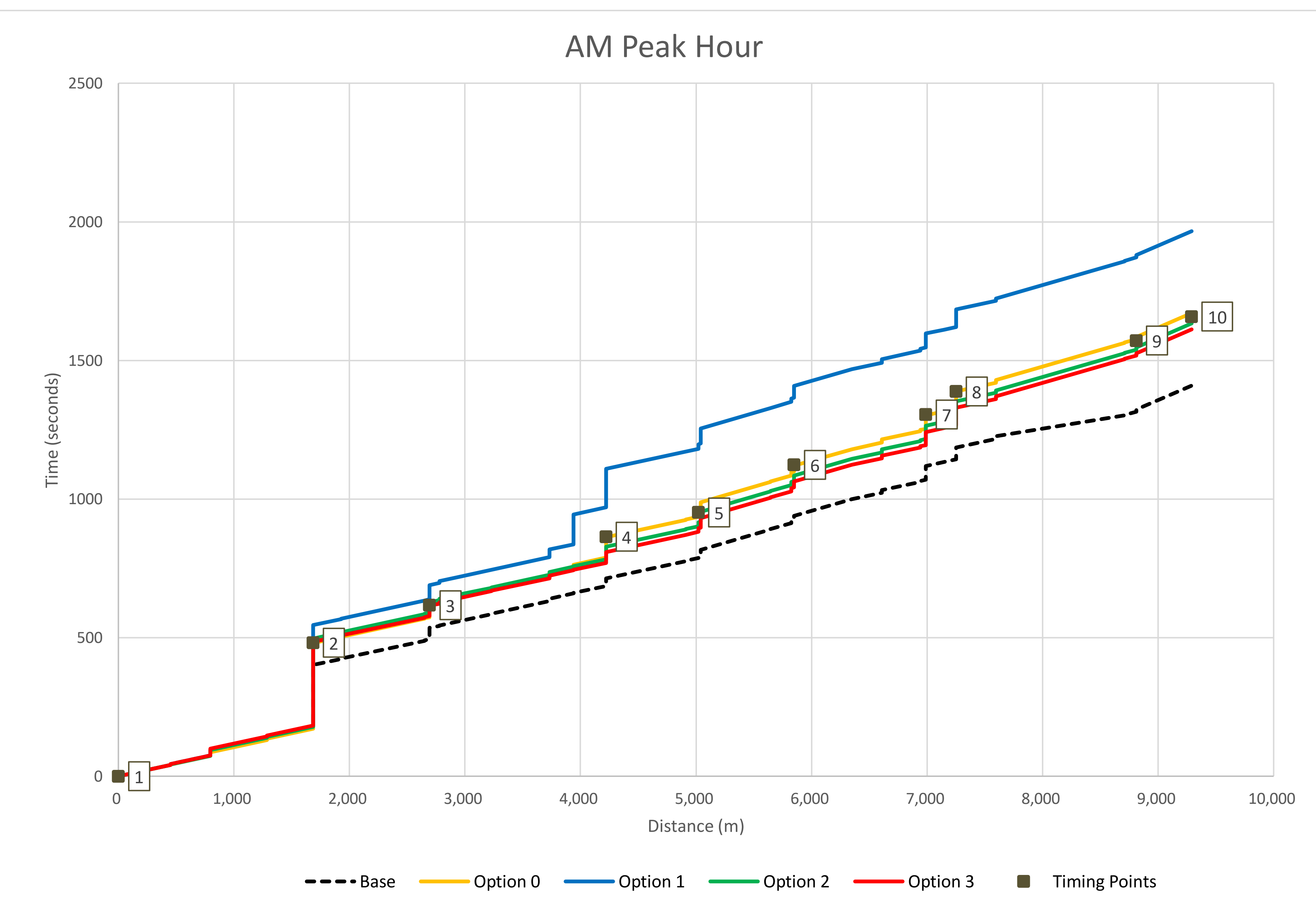


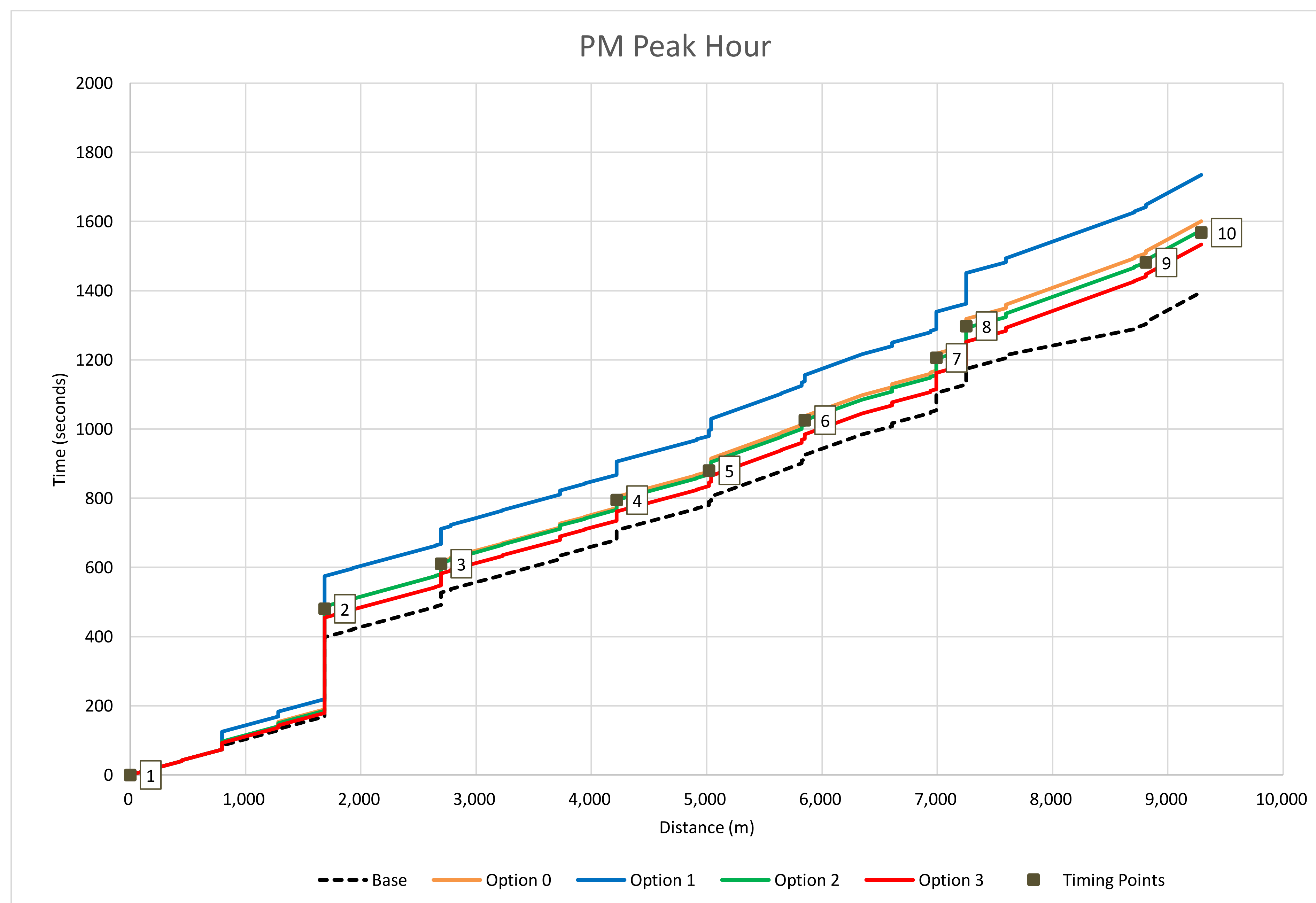




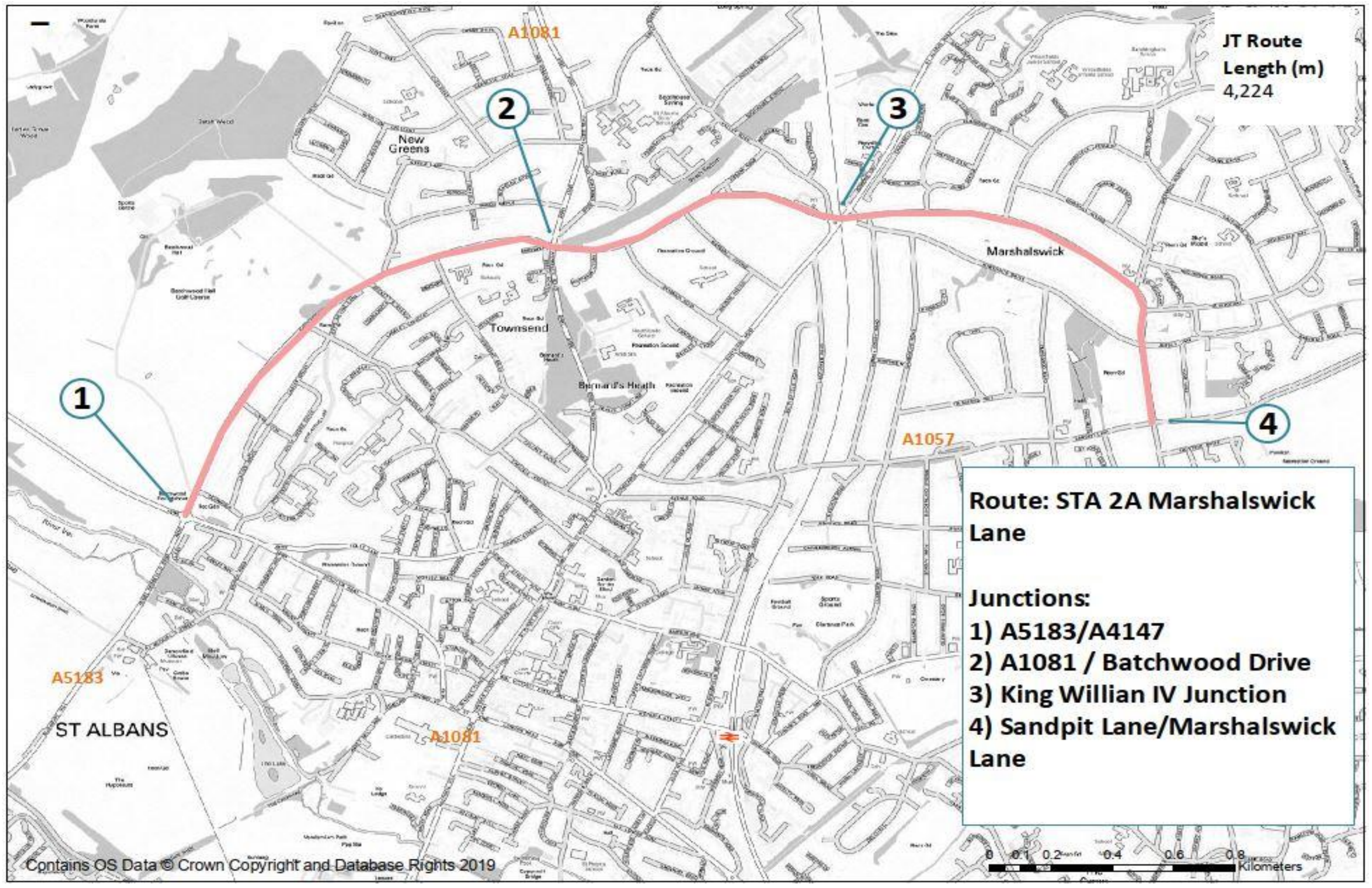
Route: STA2_SB

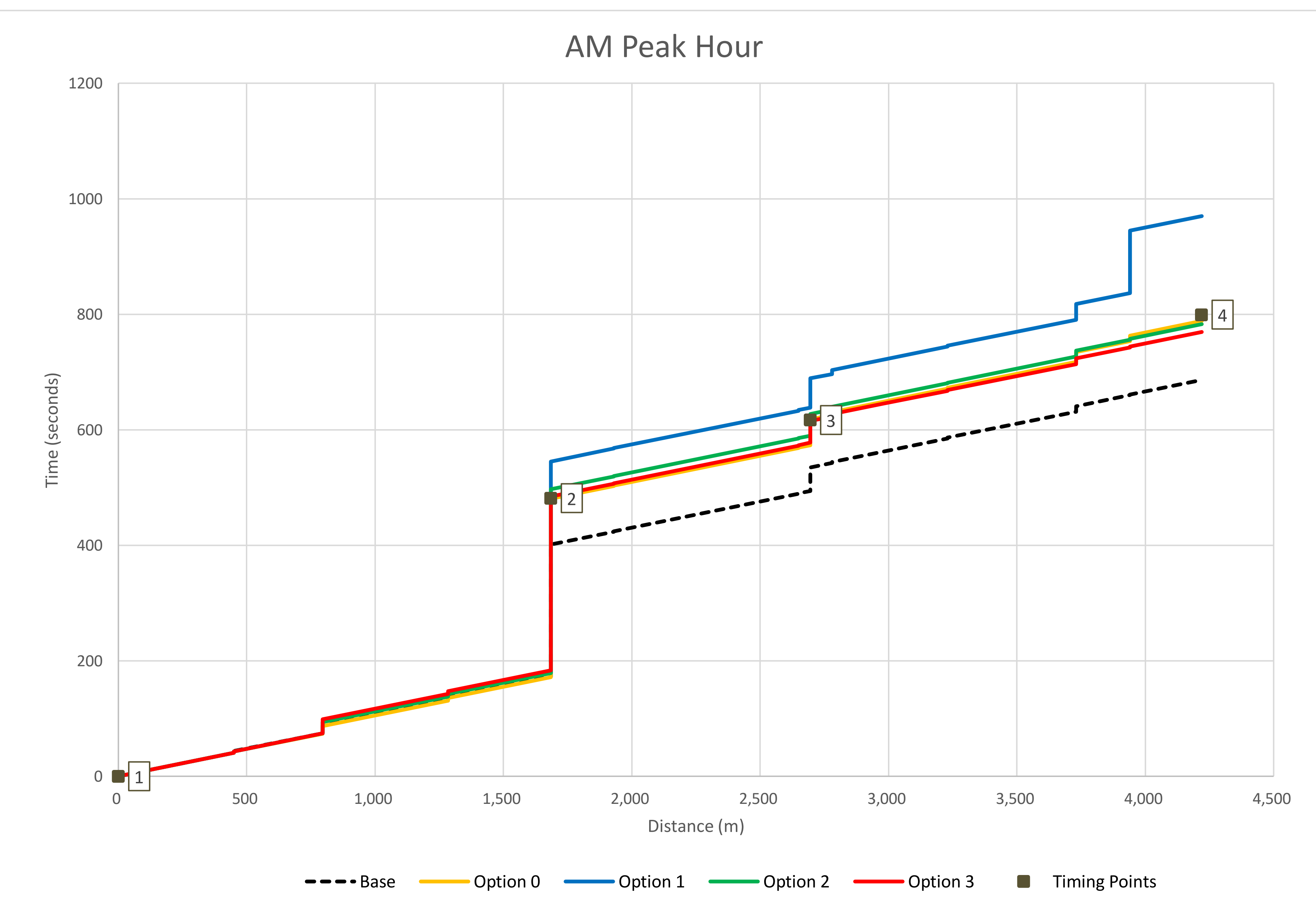


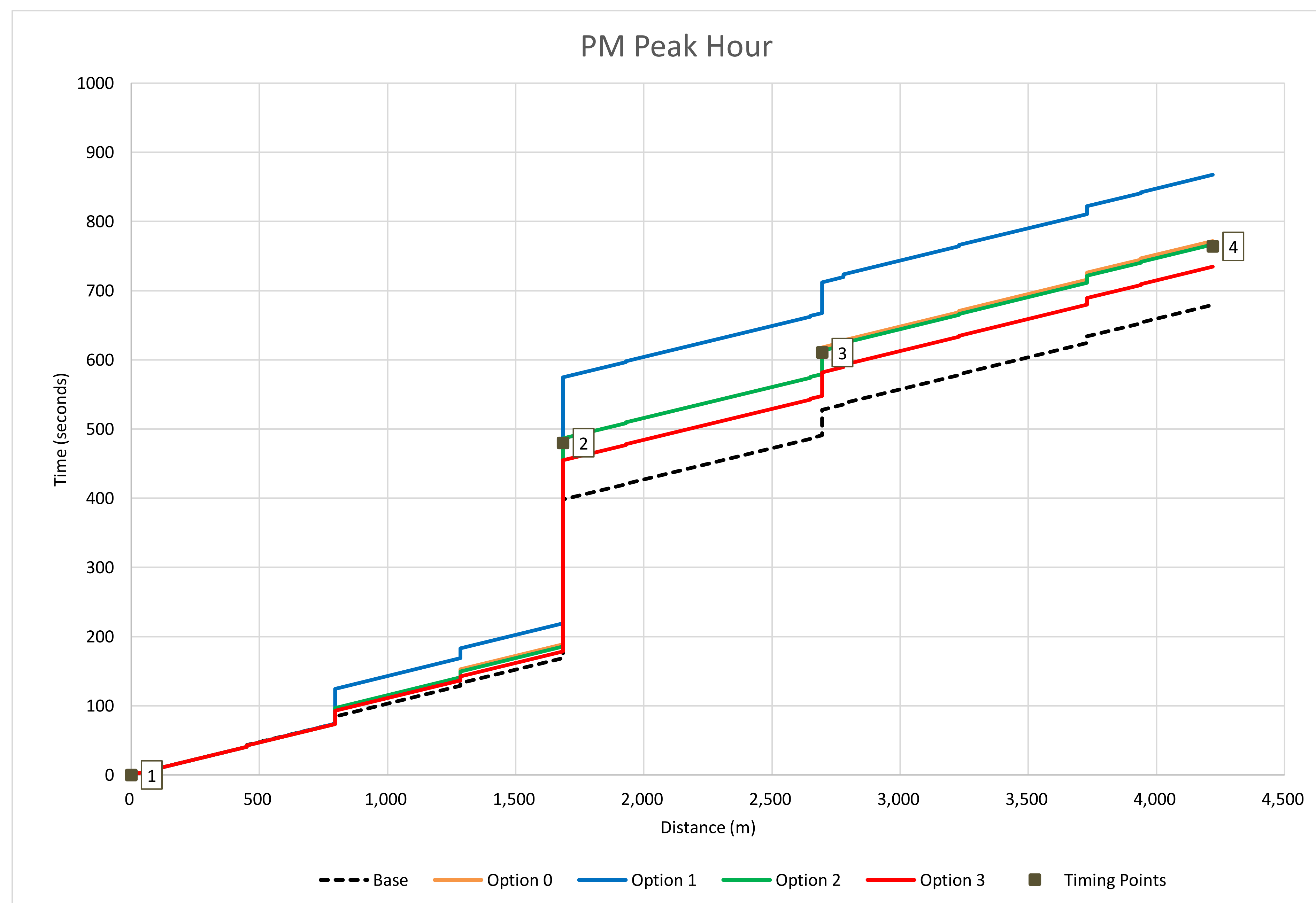




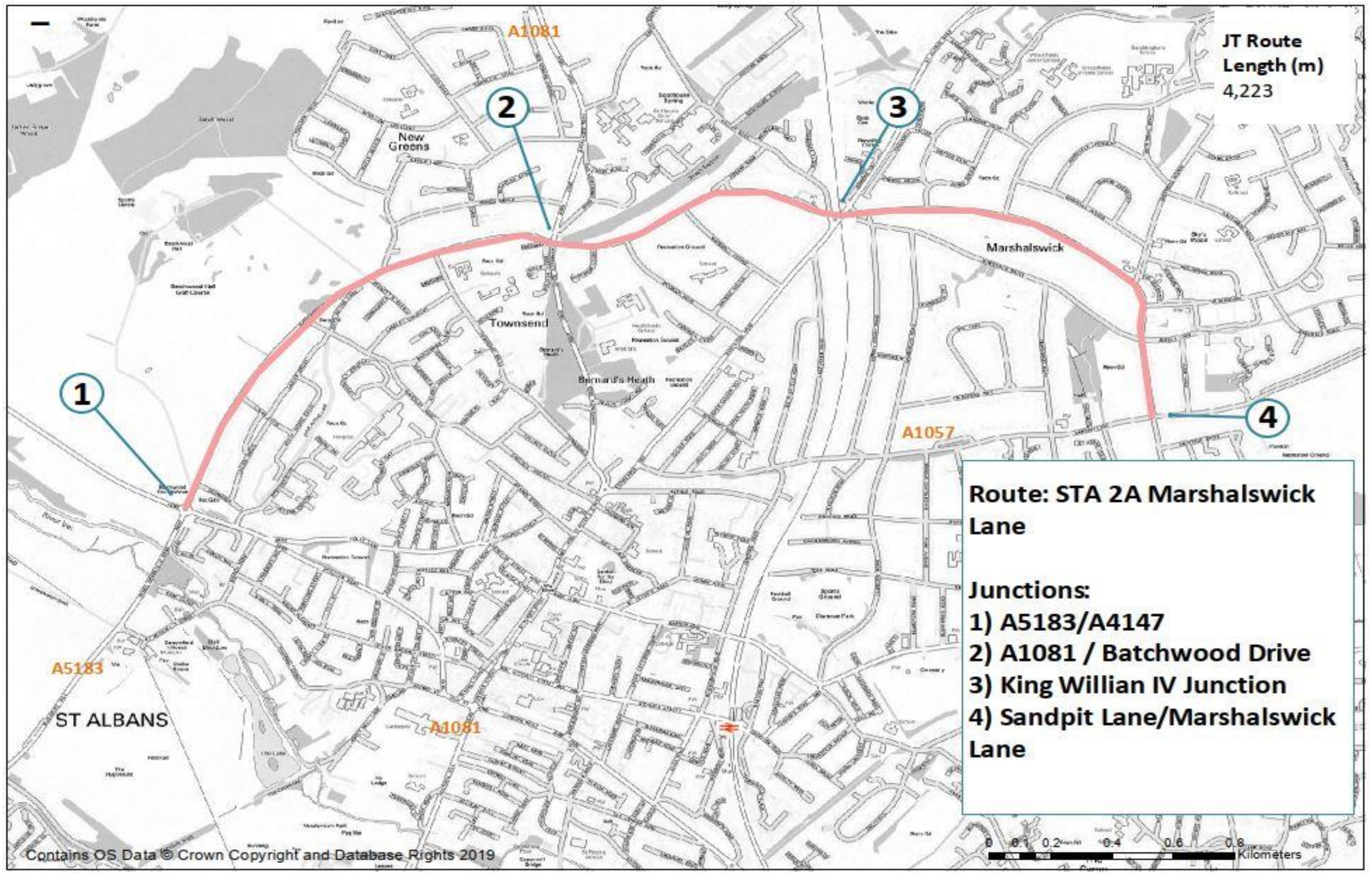
Route: STA2A_EB

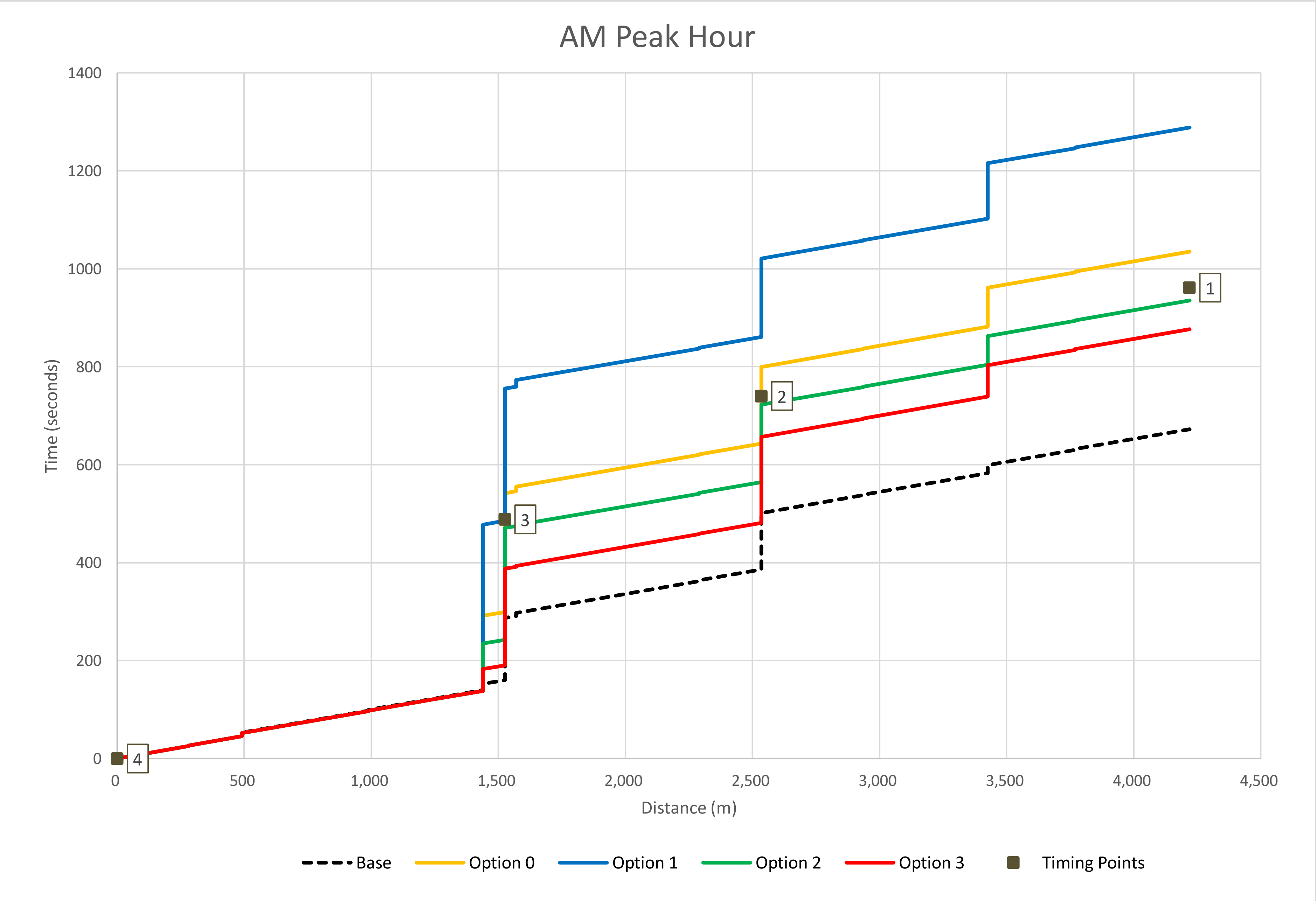


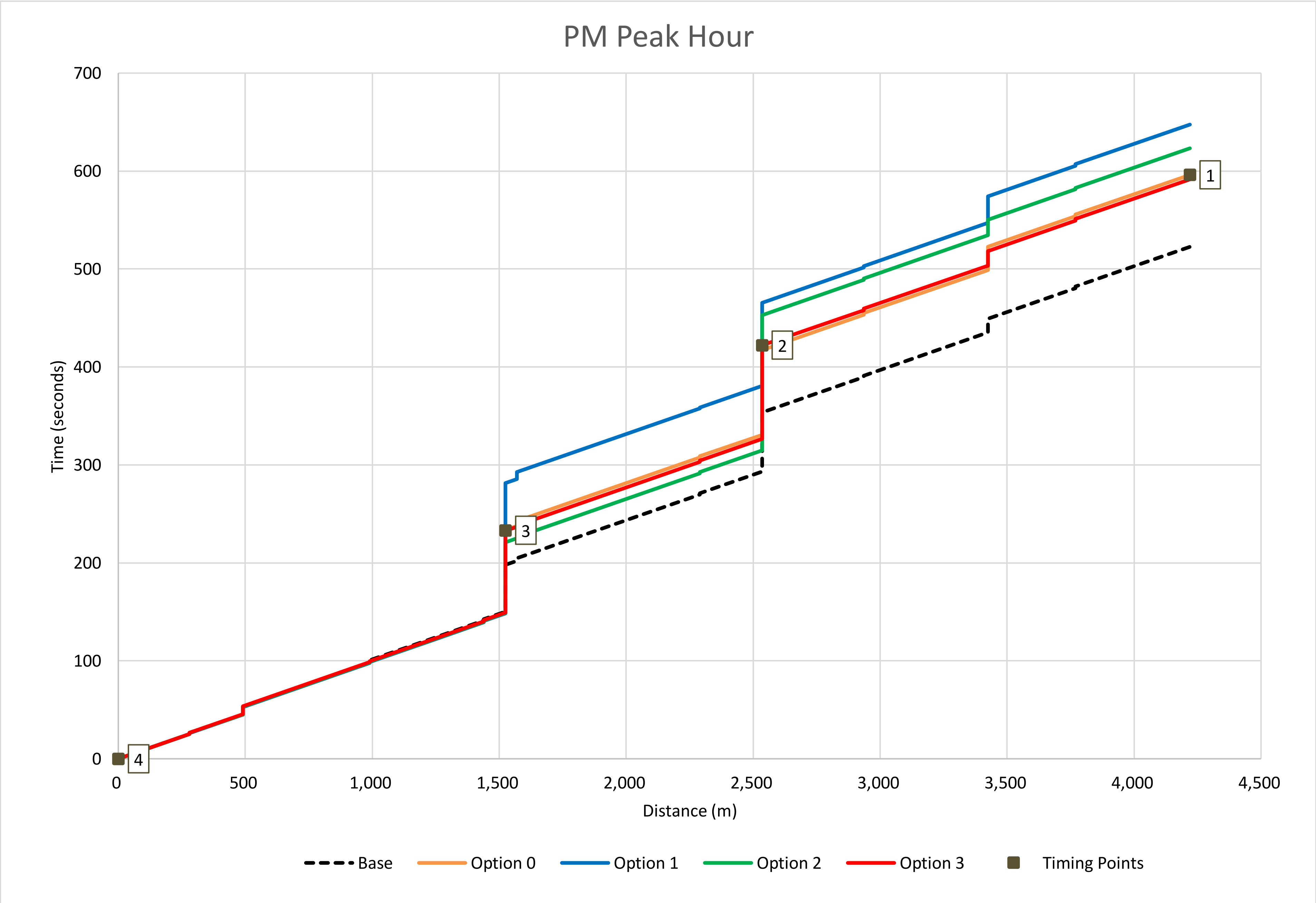




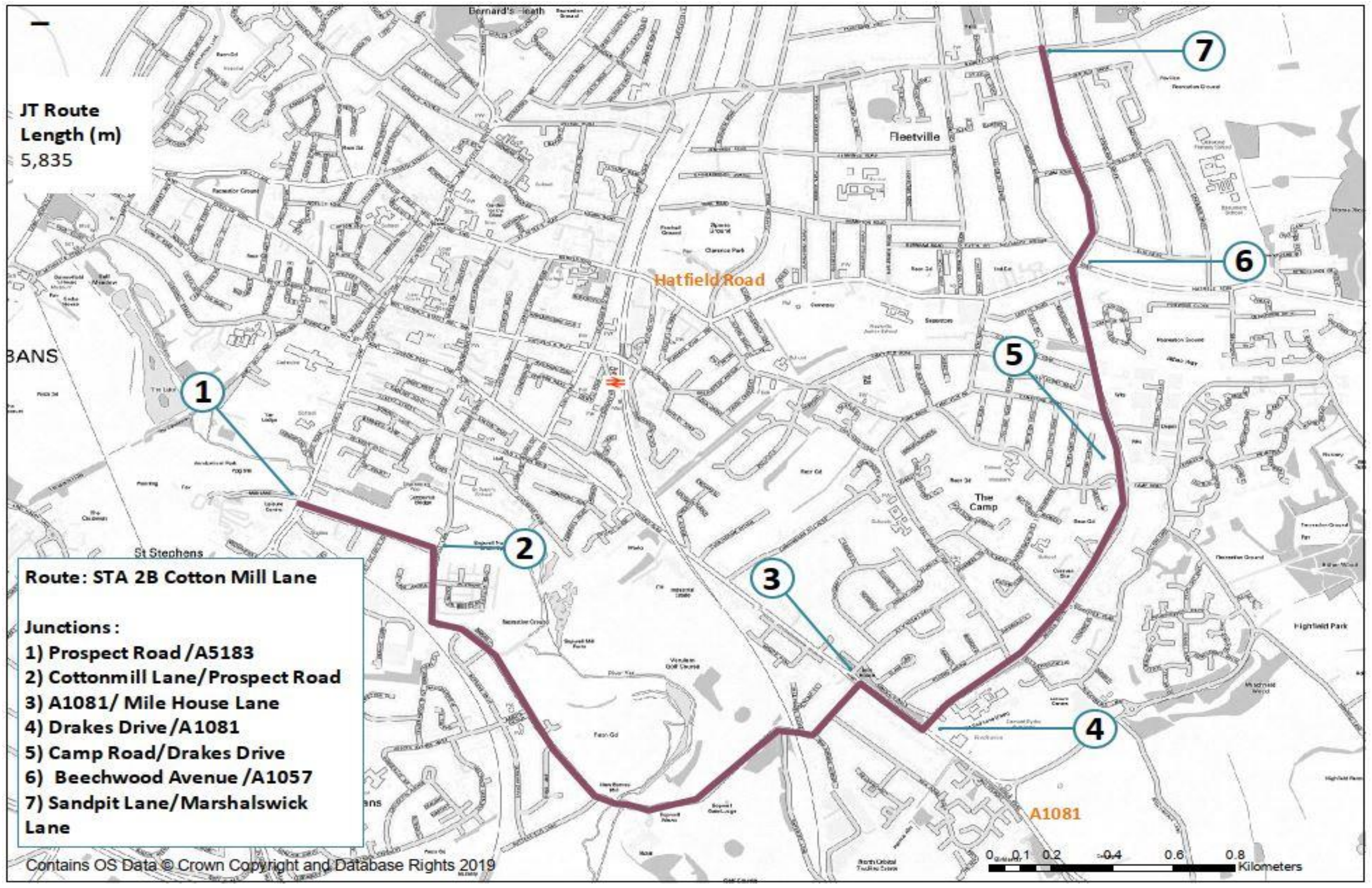
Route: STA2A_WB

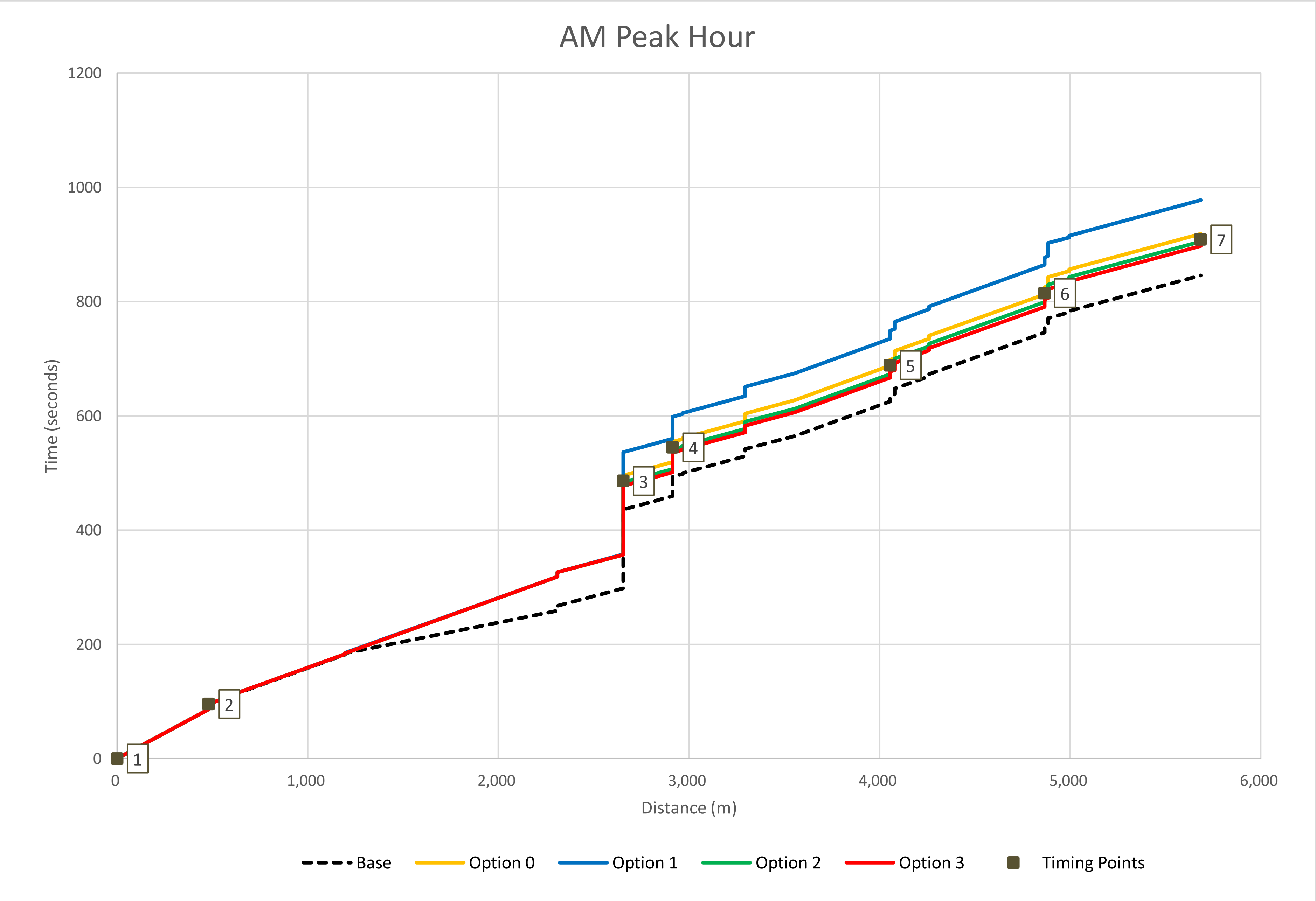


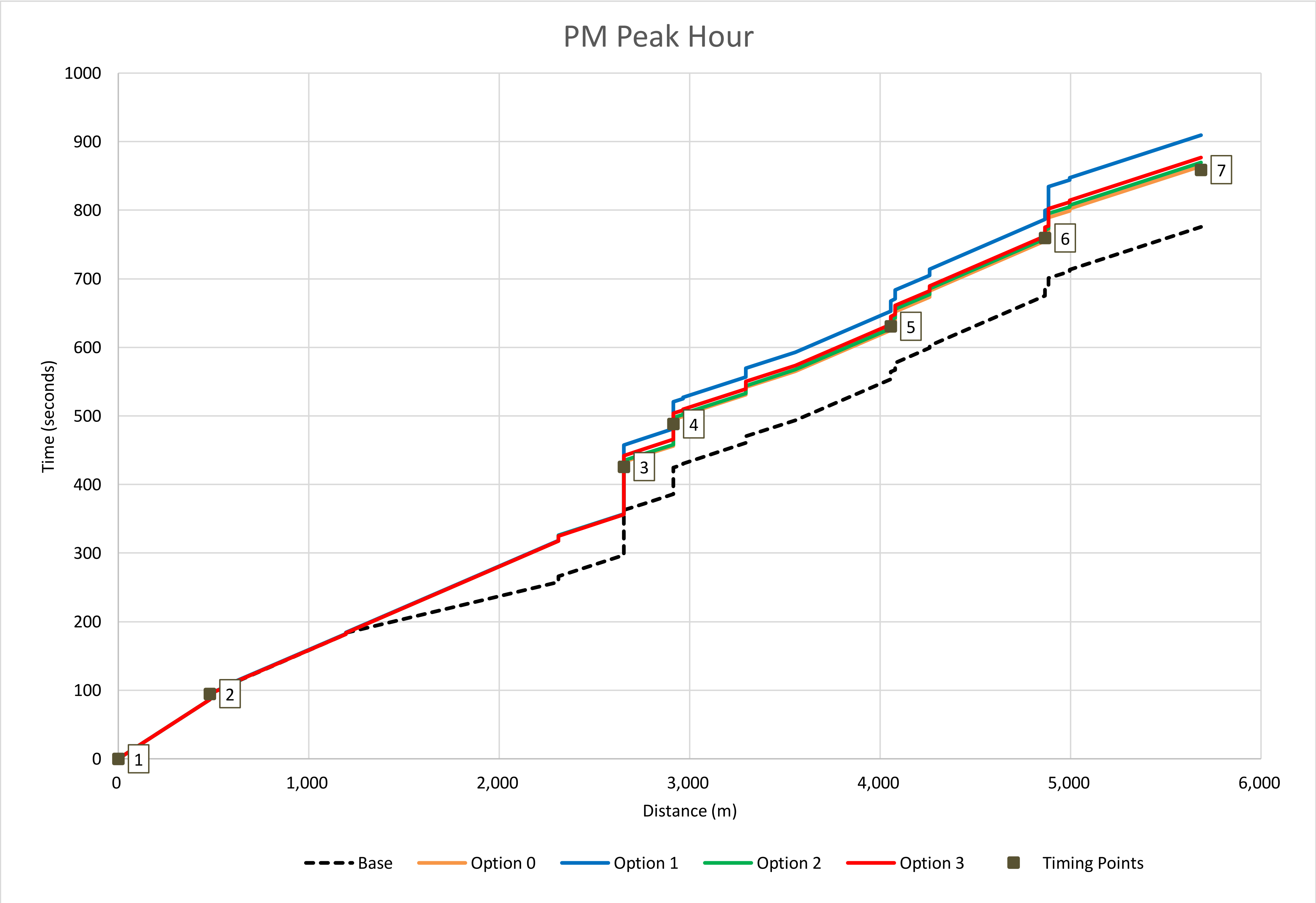




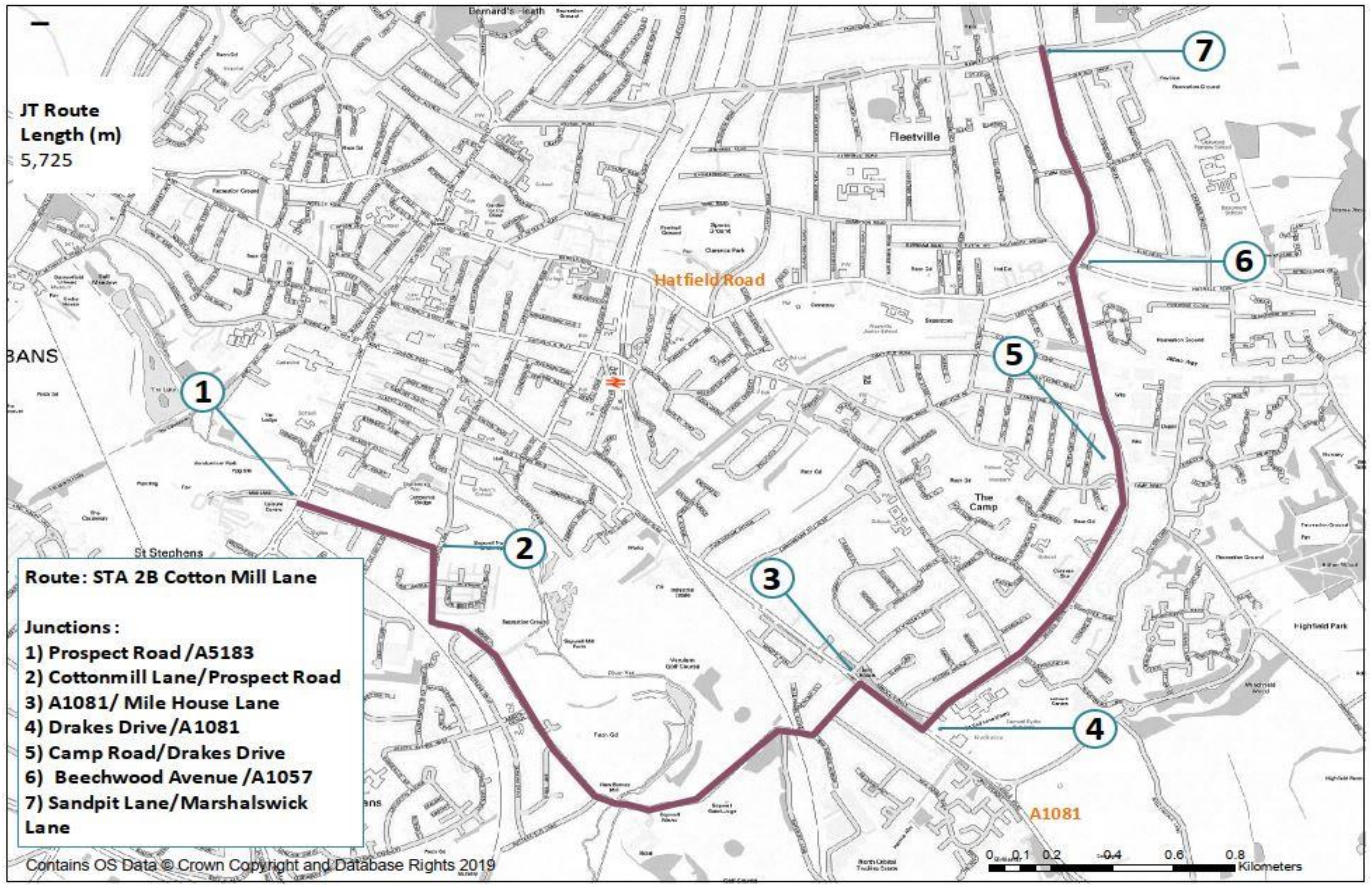
Route: STA2B_NB

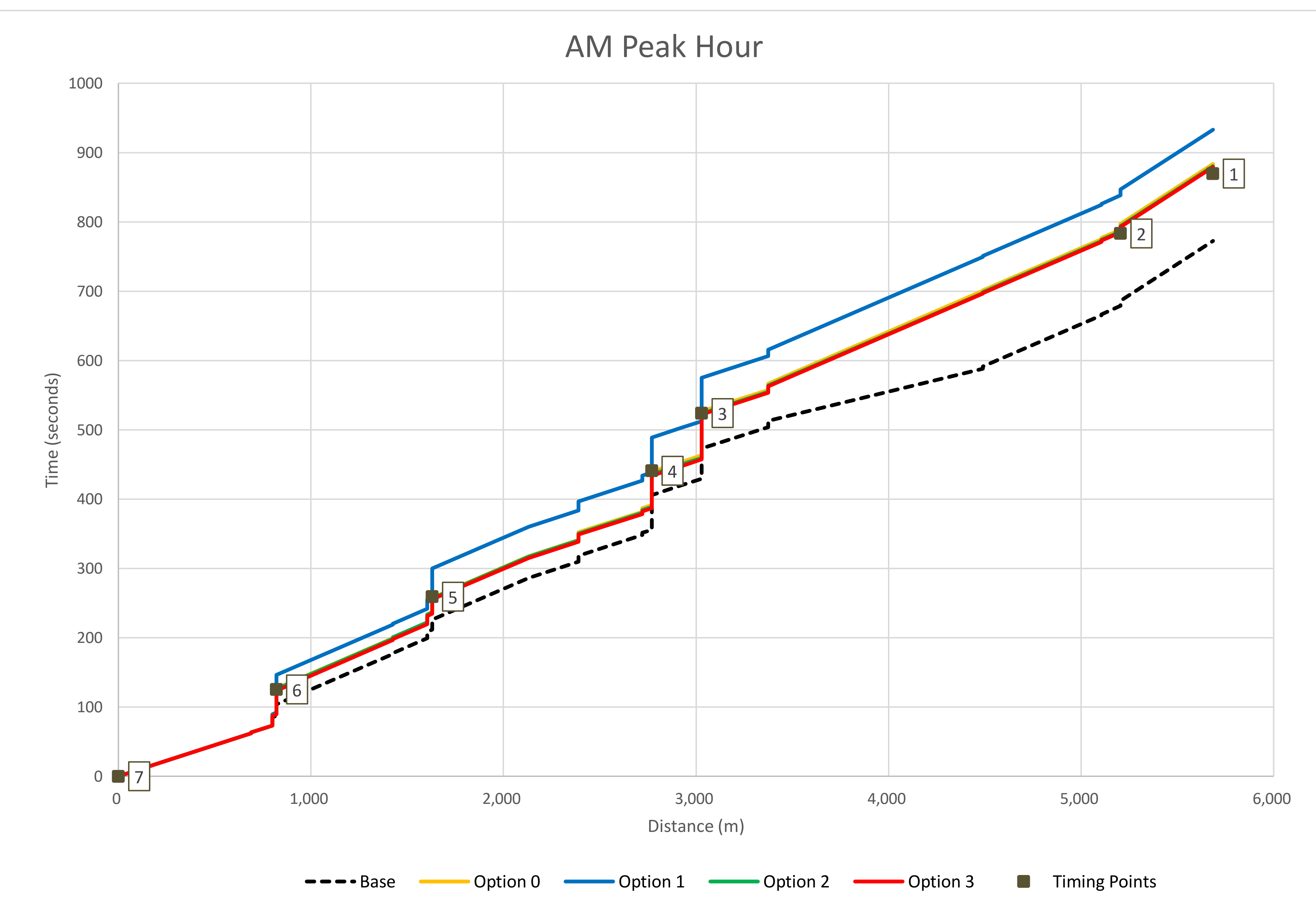


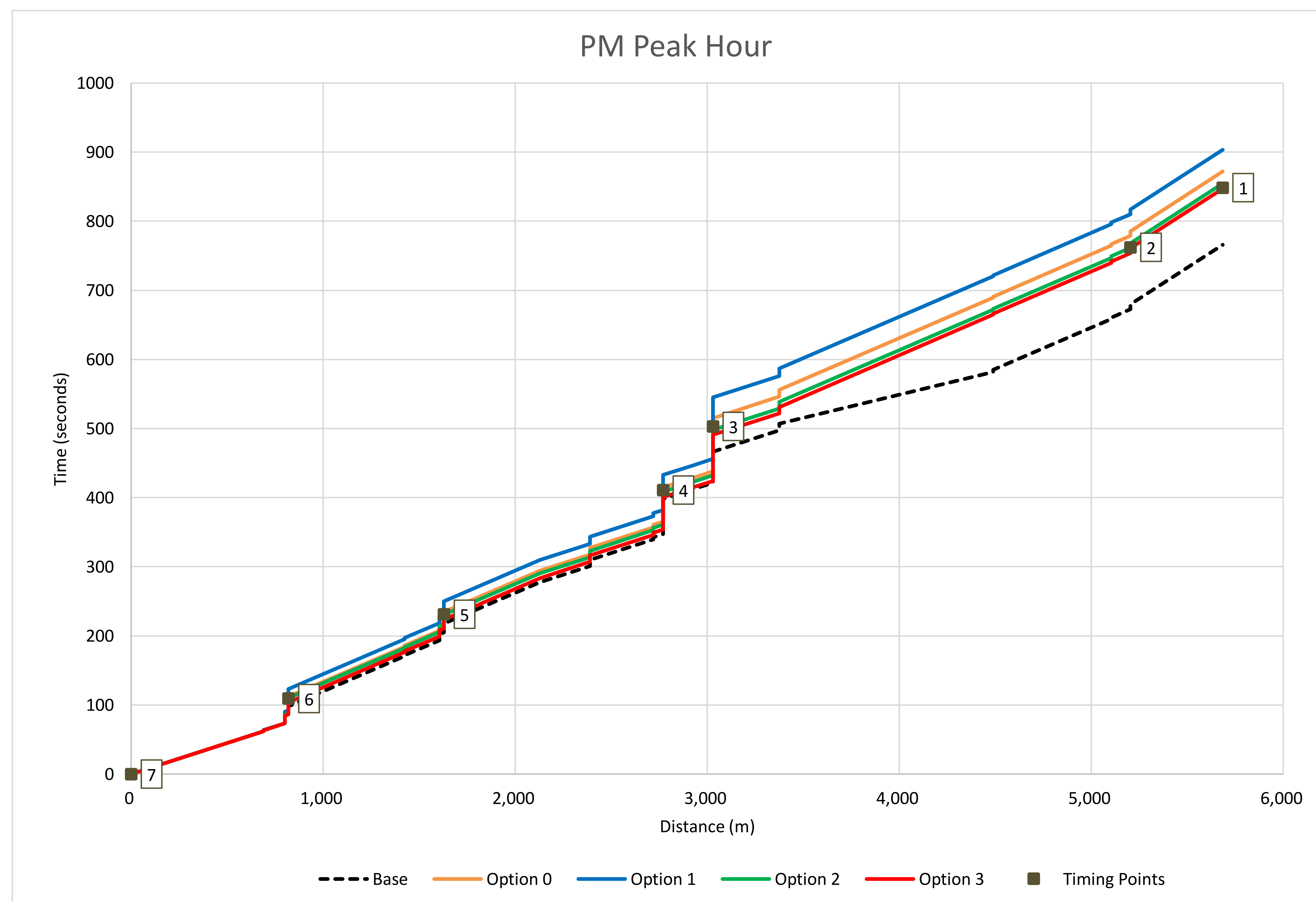




Route: STA2B_SB







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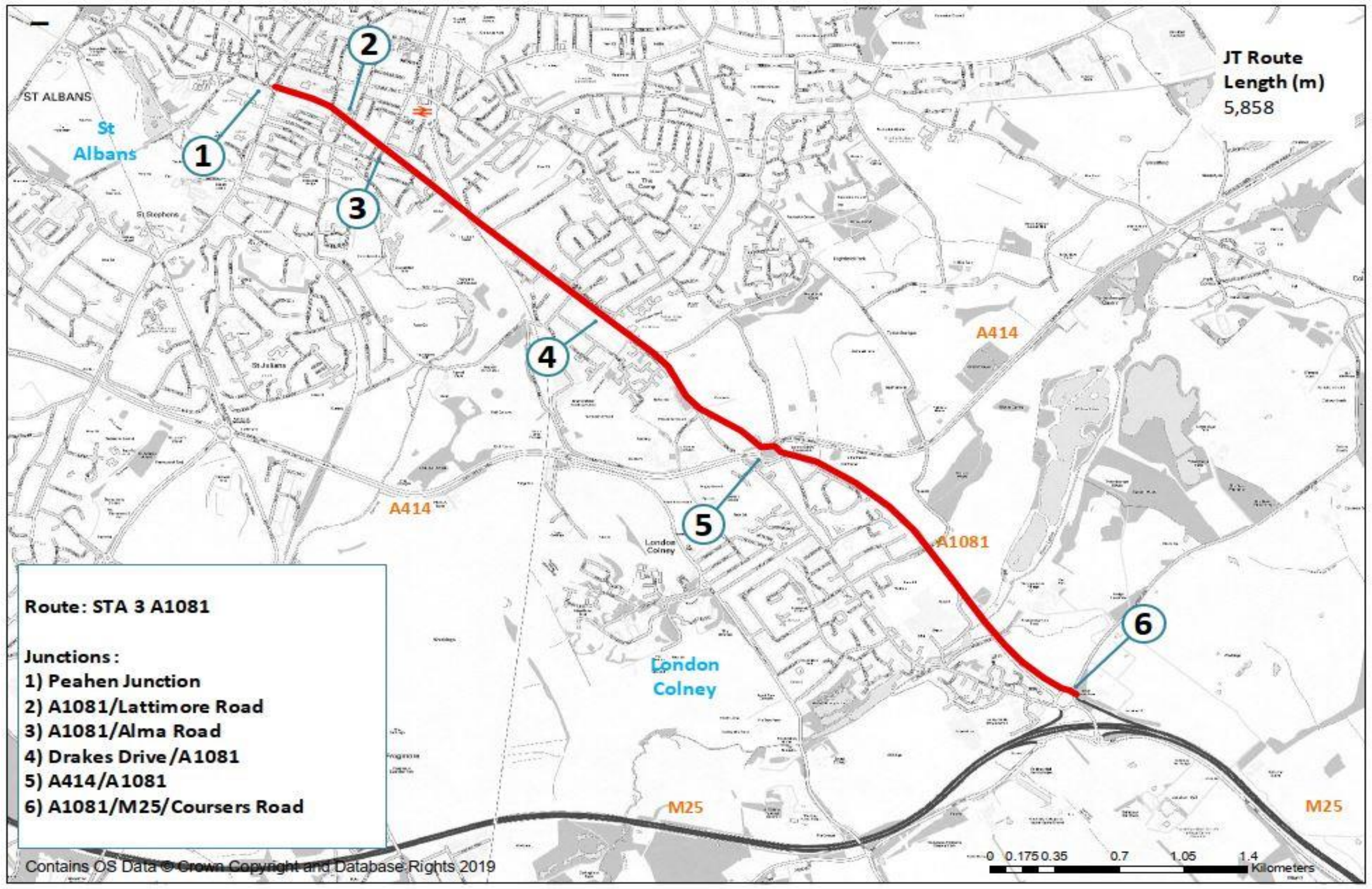
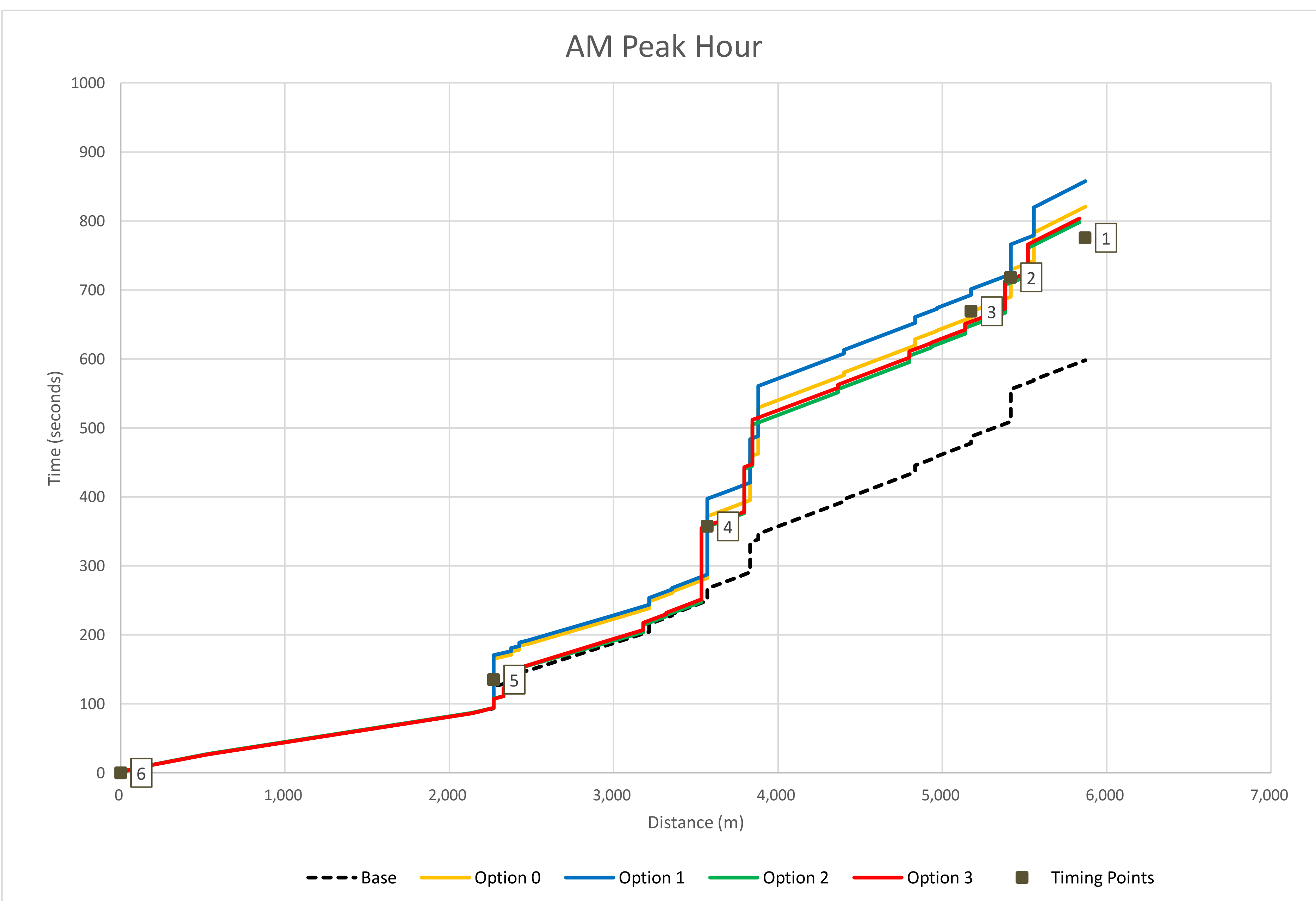
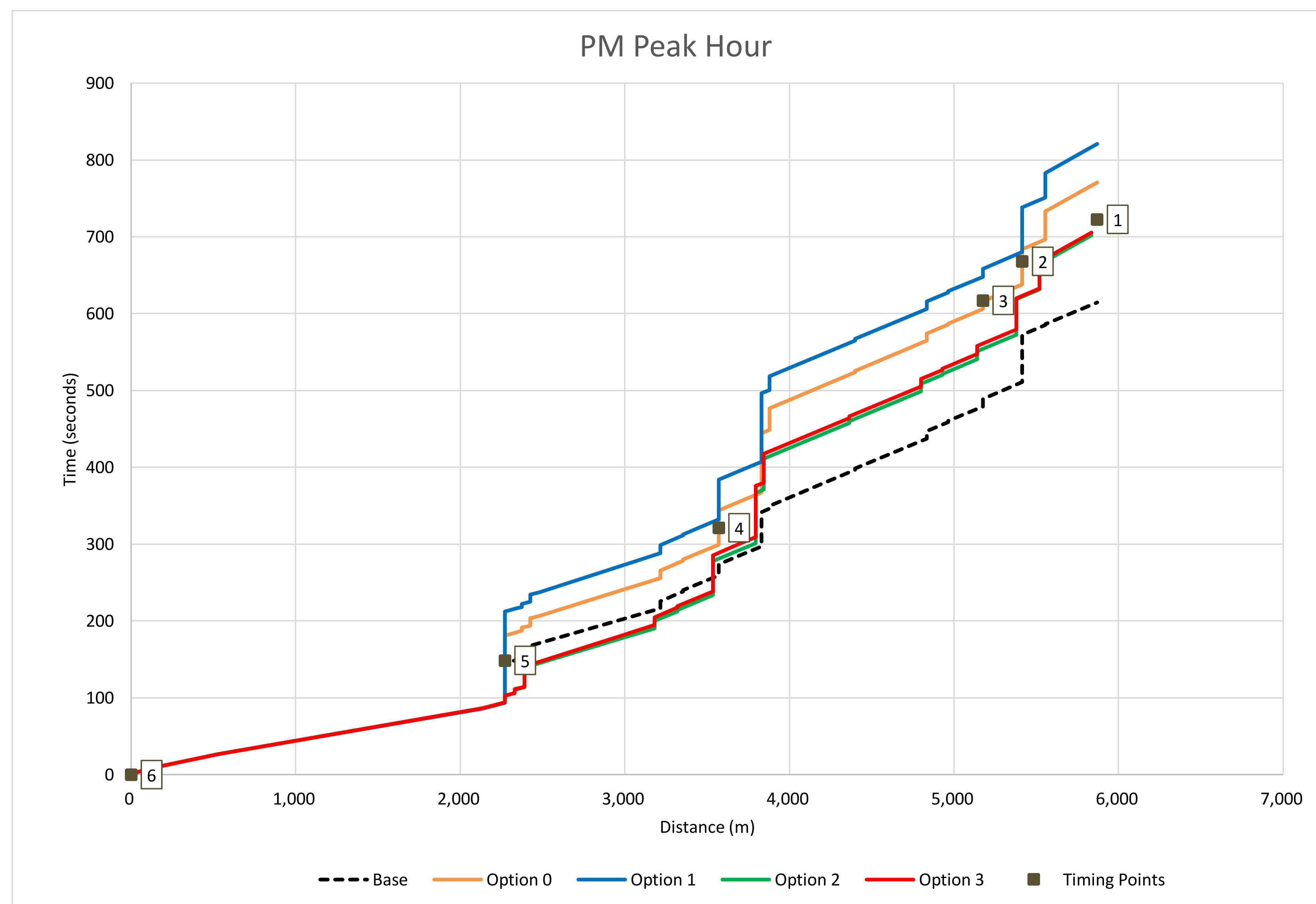
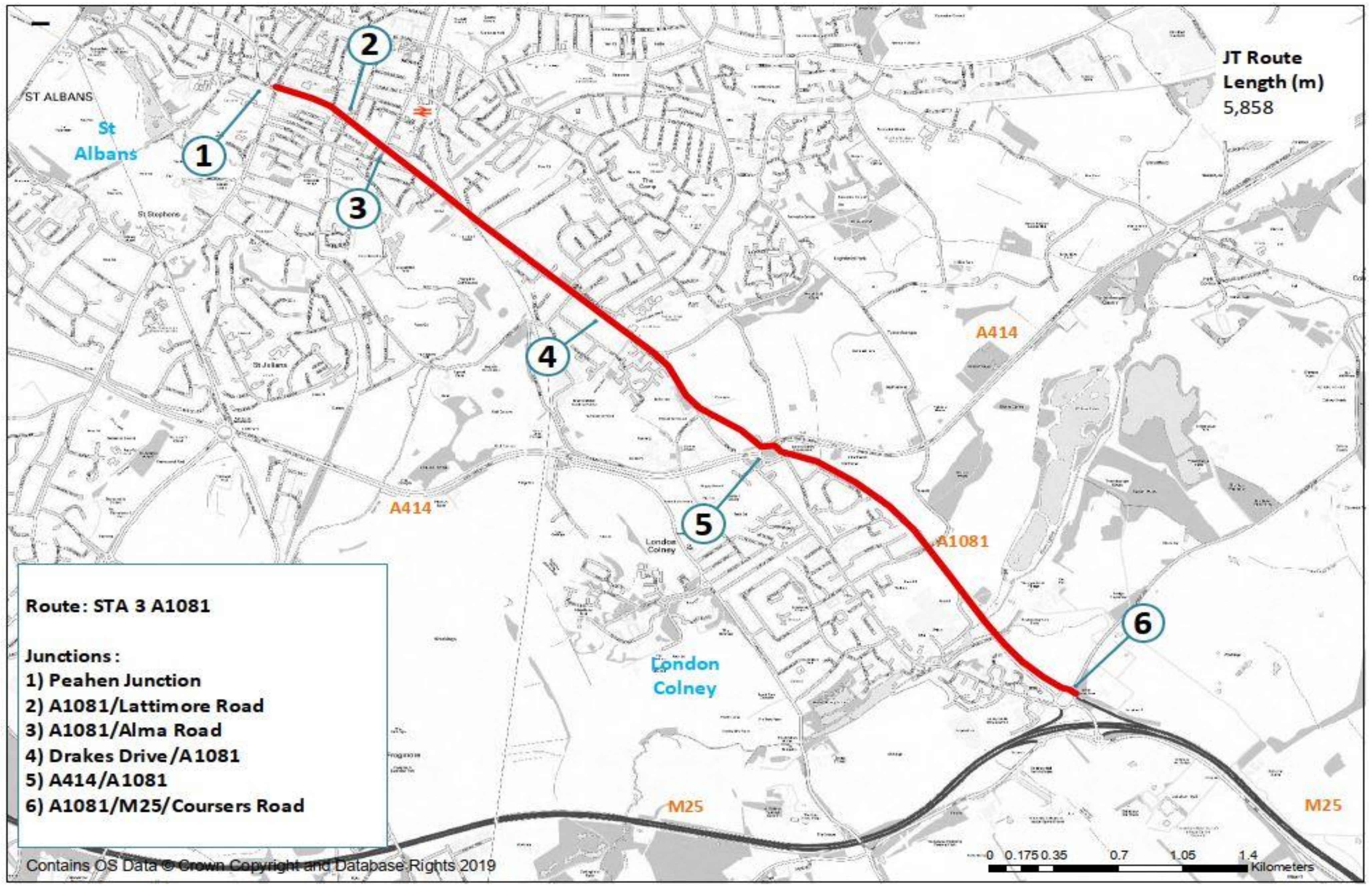
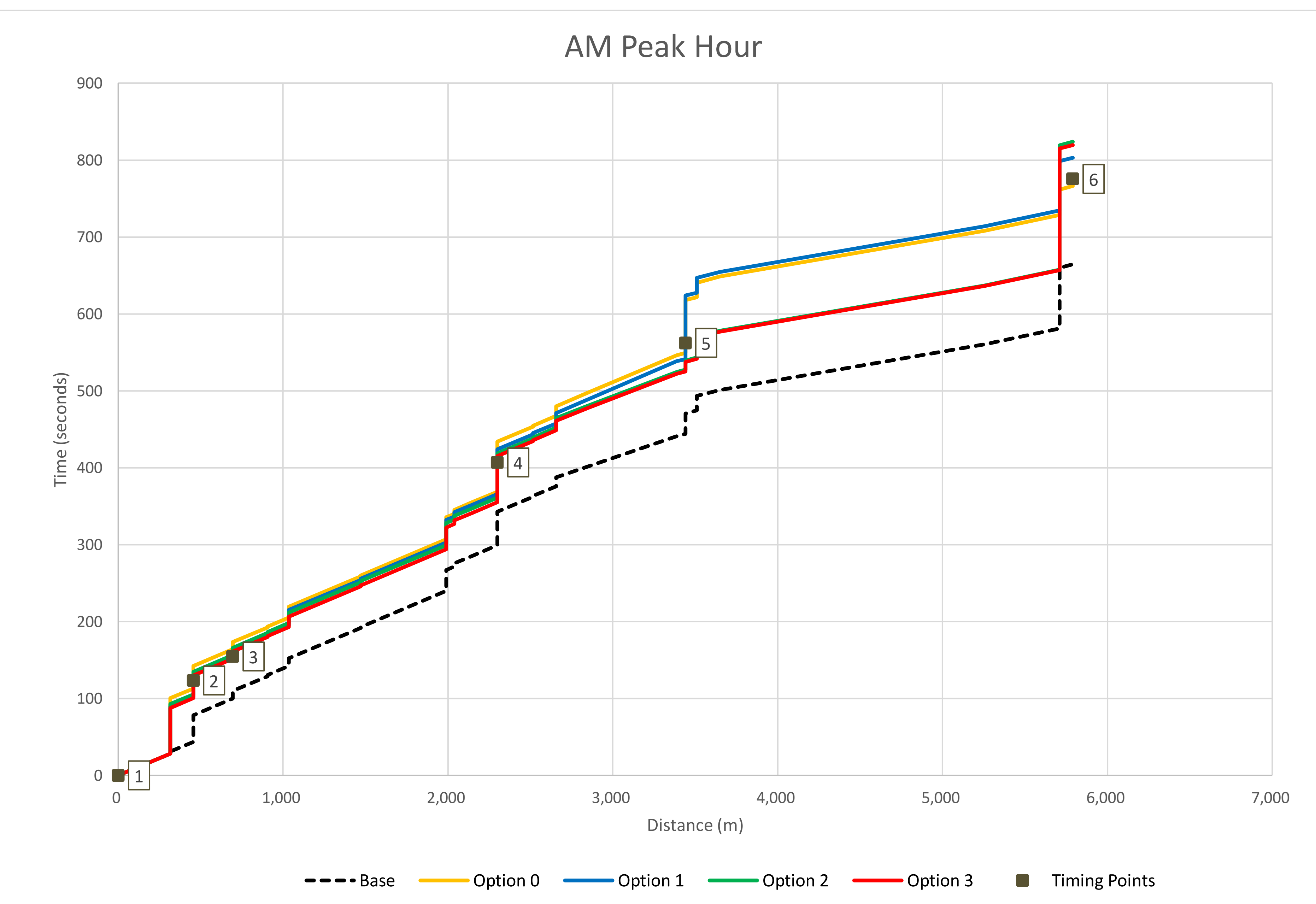


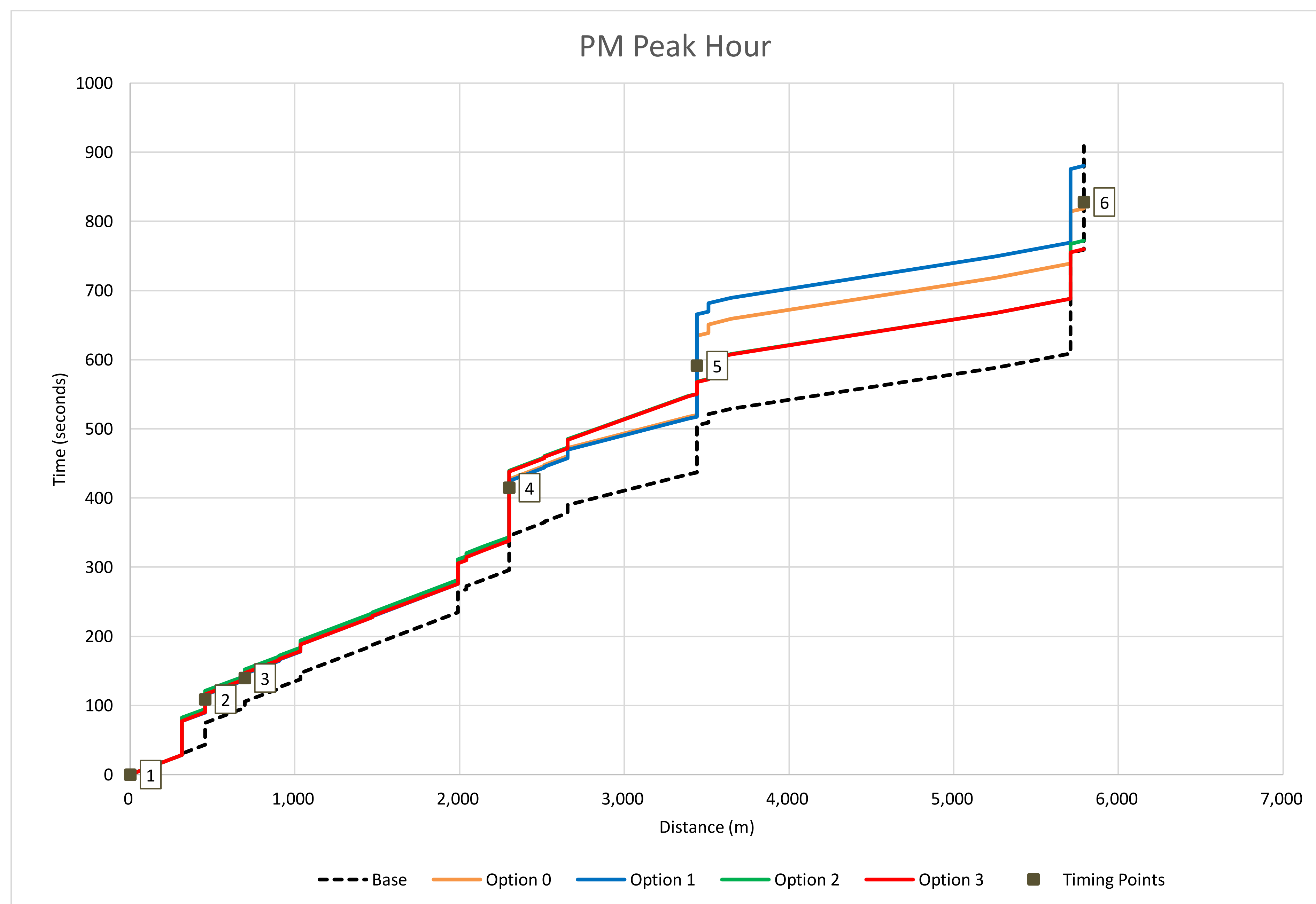




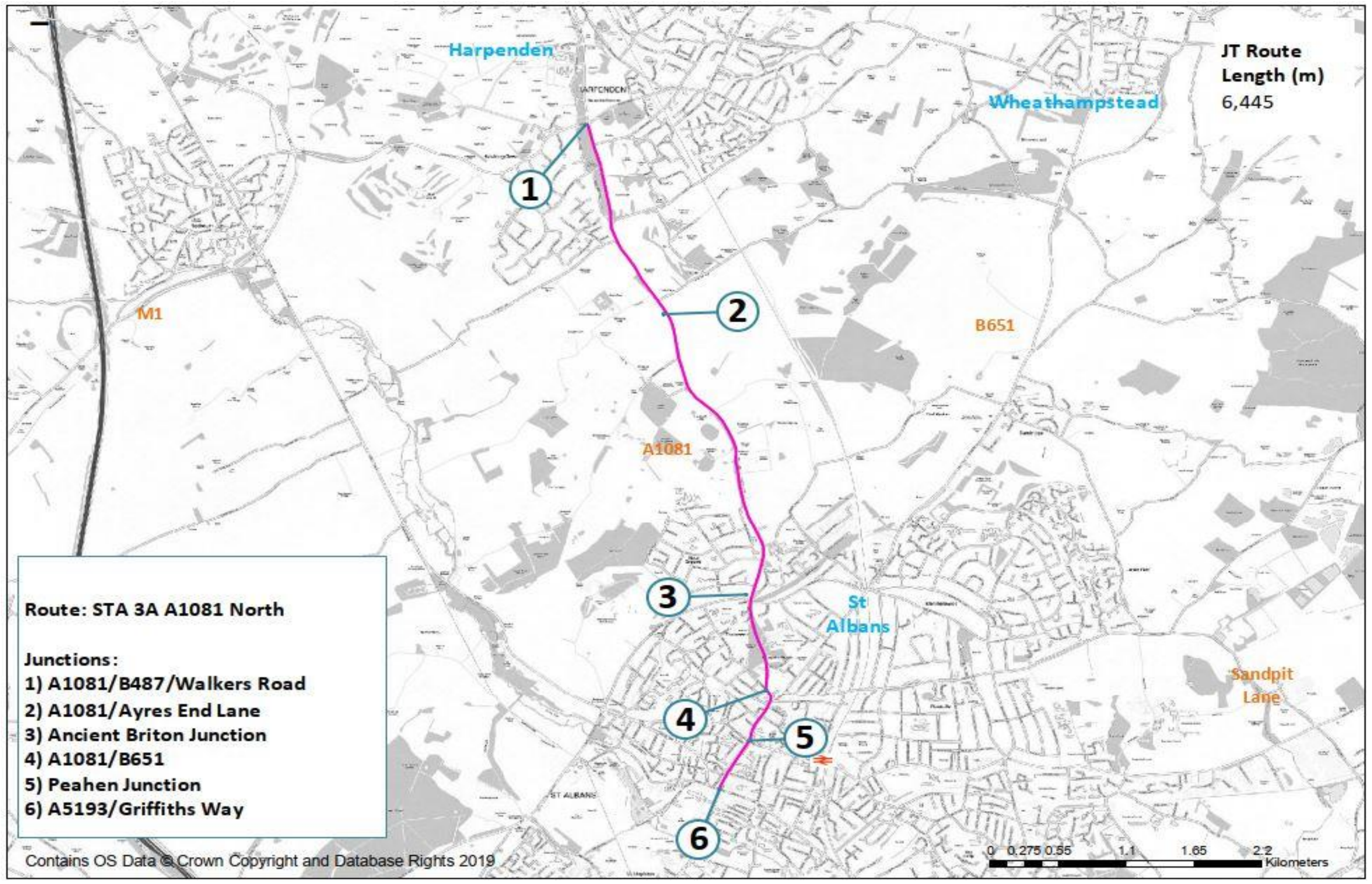
Route: STA3_SB

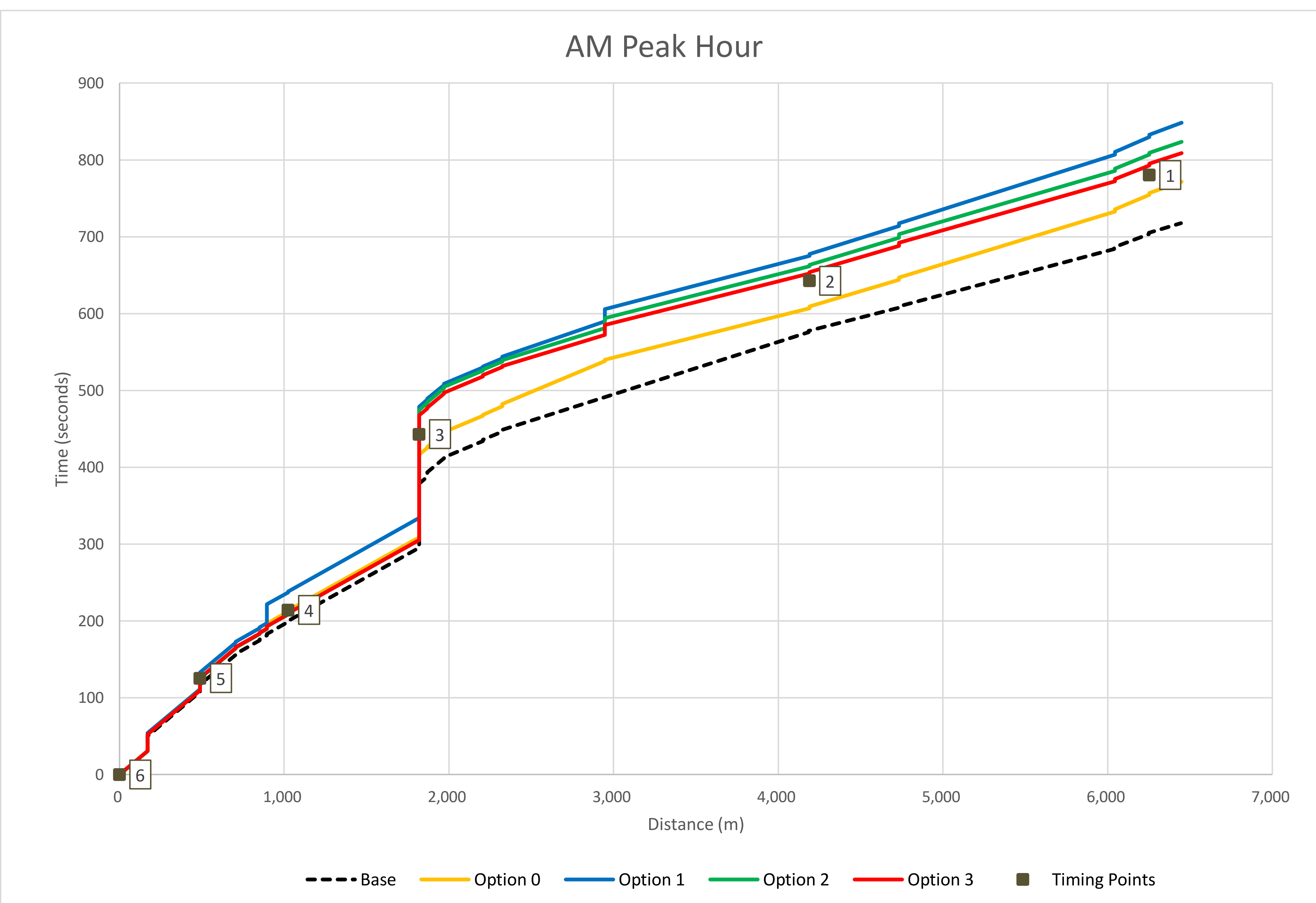


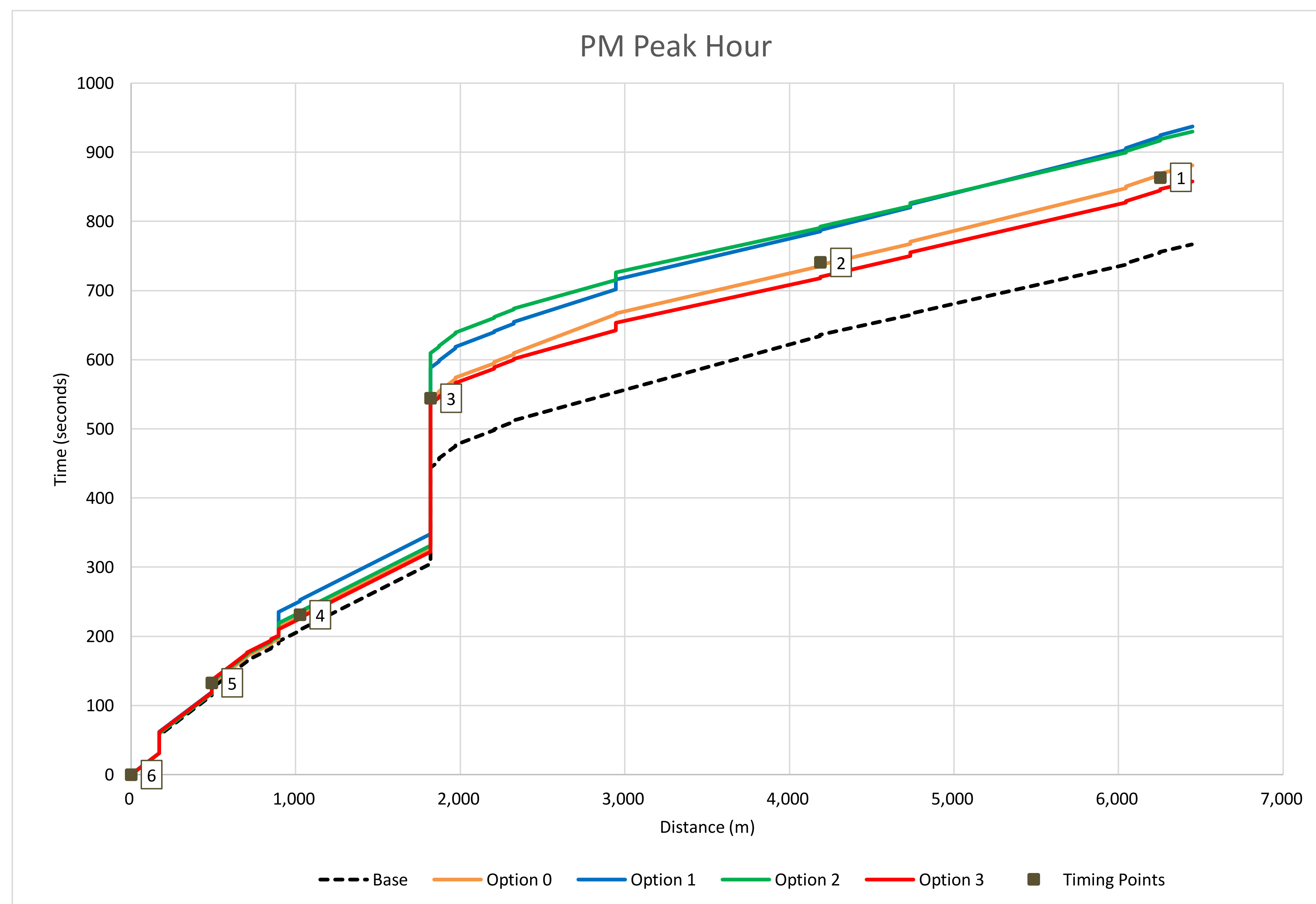




Route: STA3A_NB







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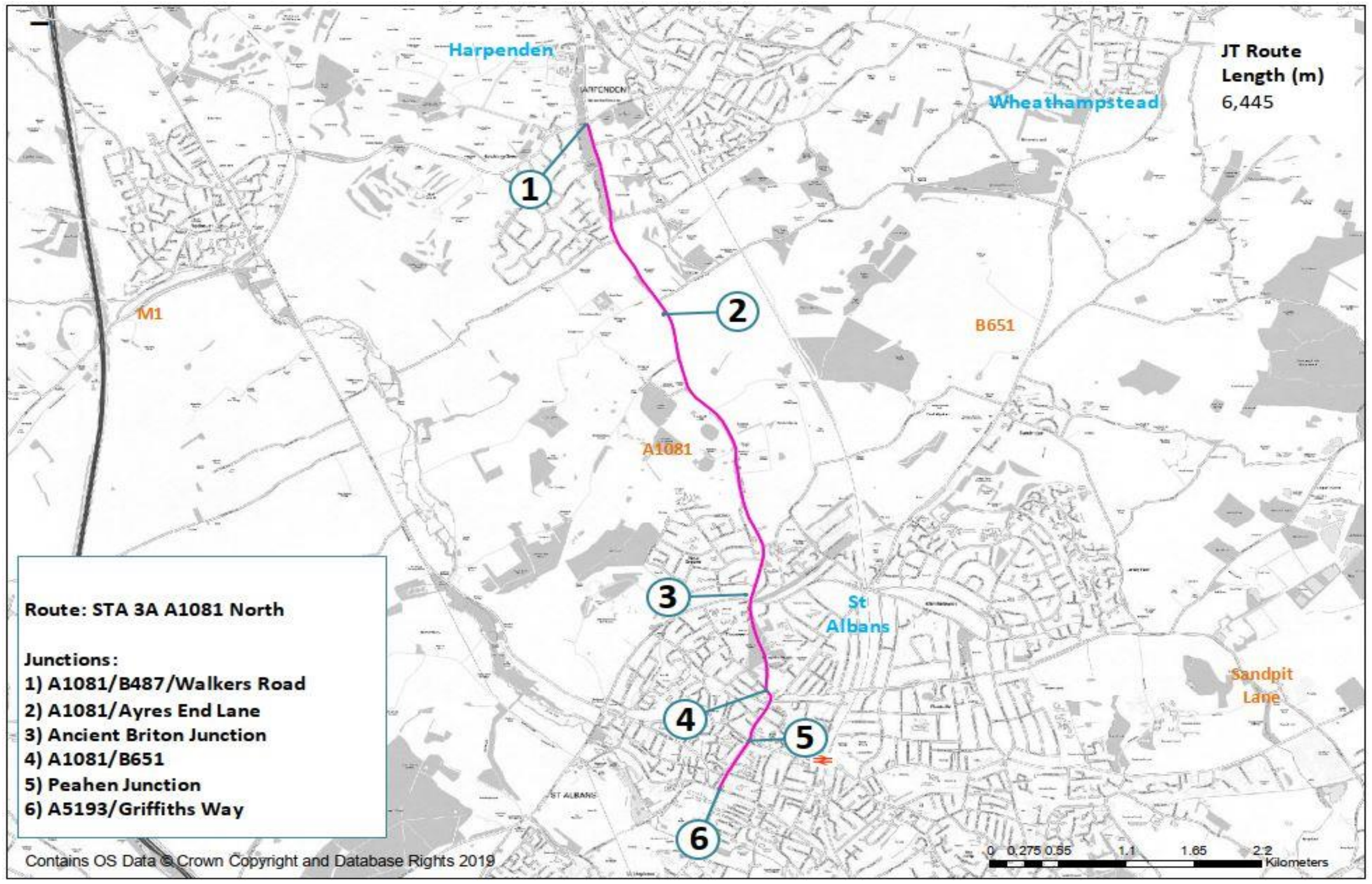
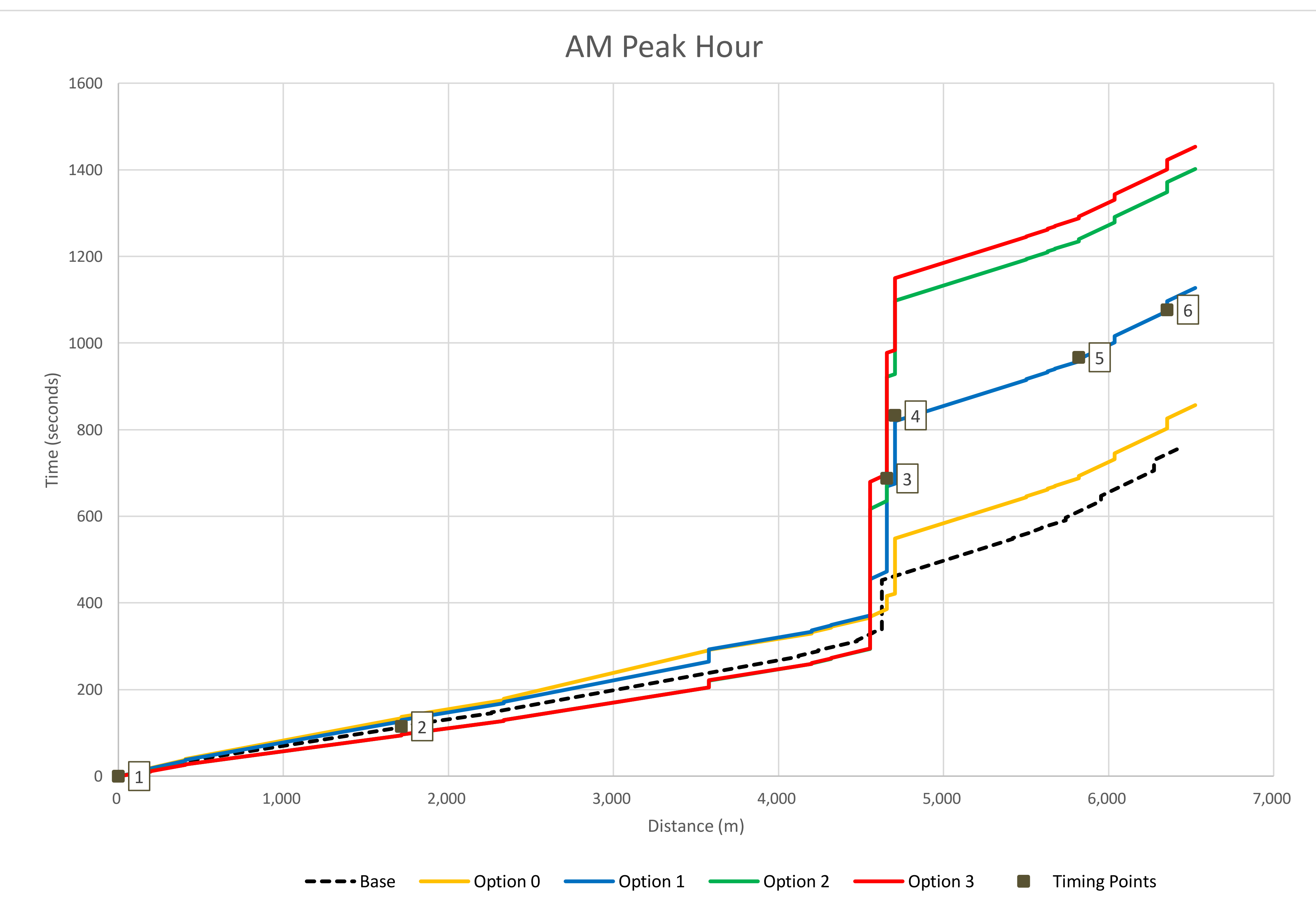
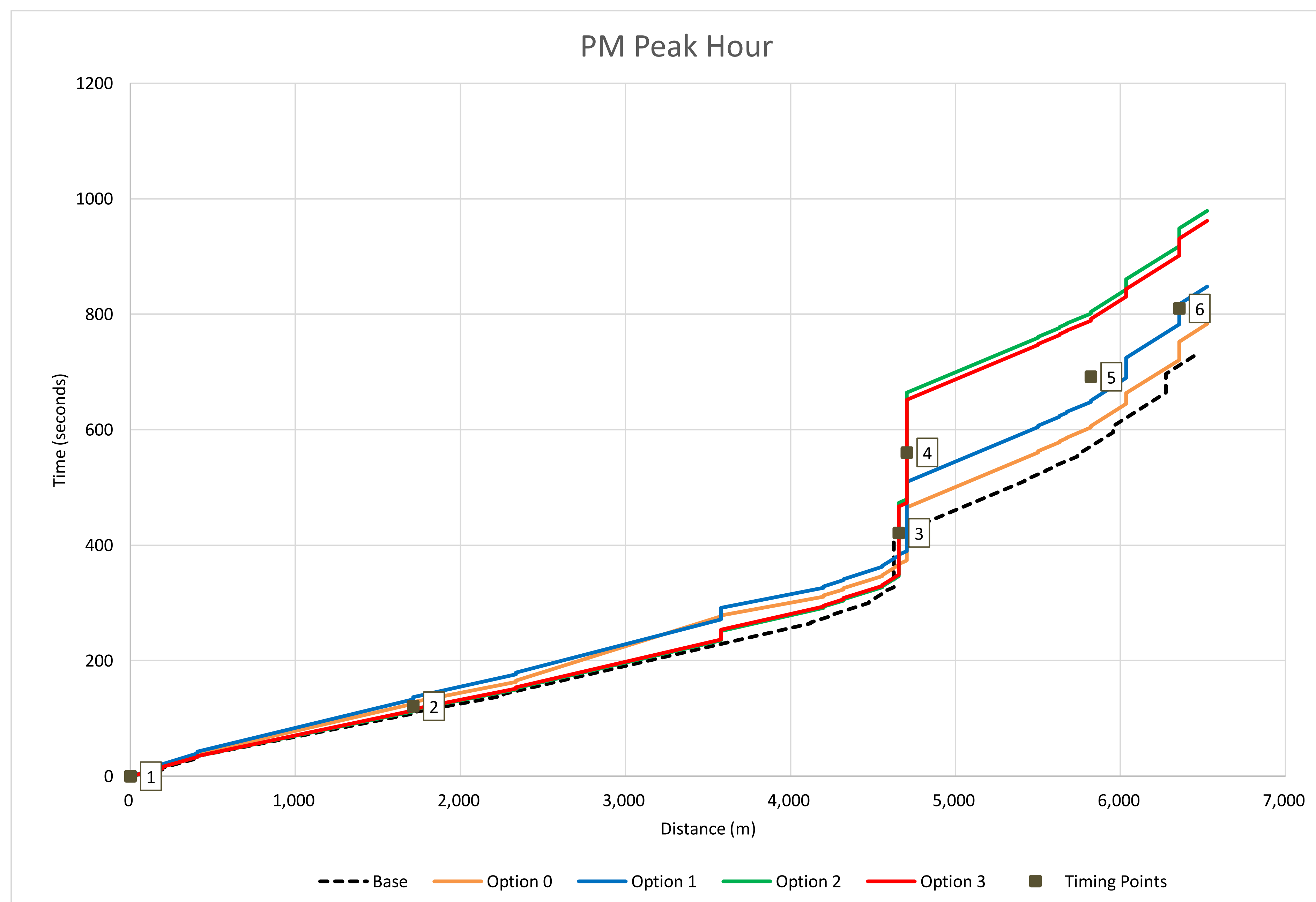
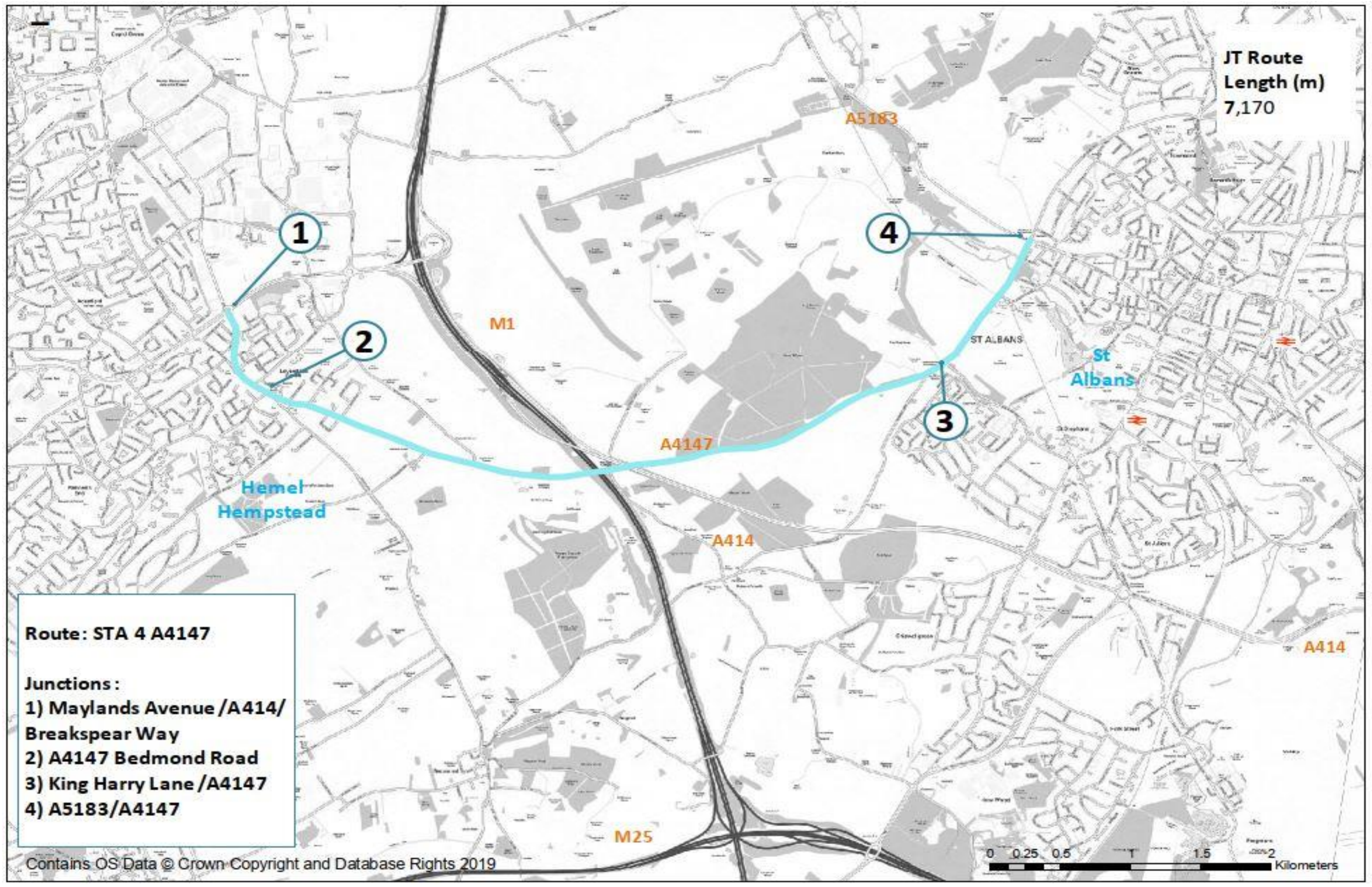
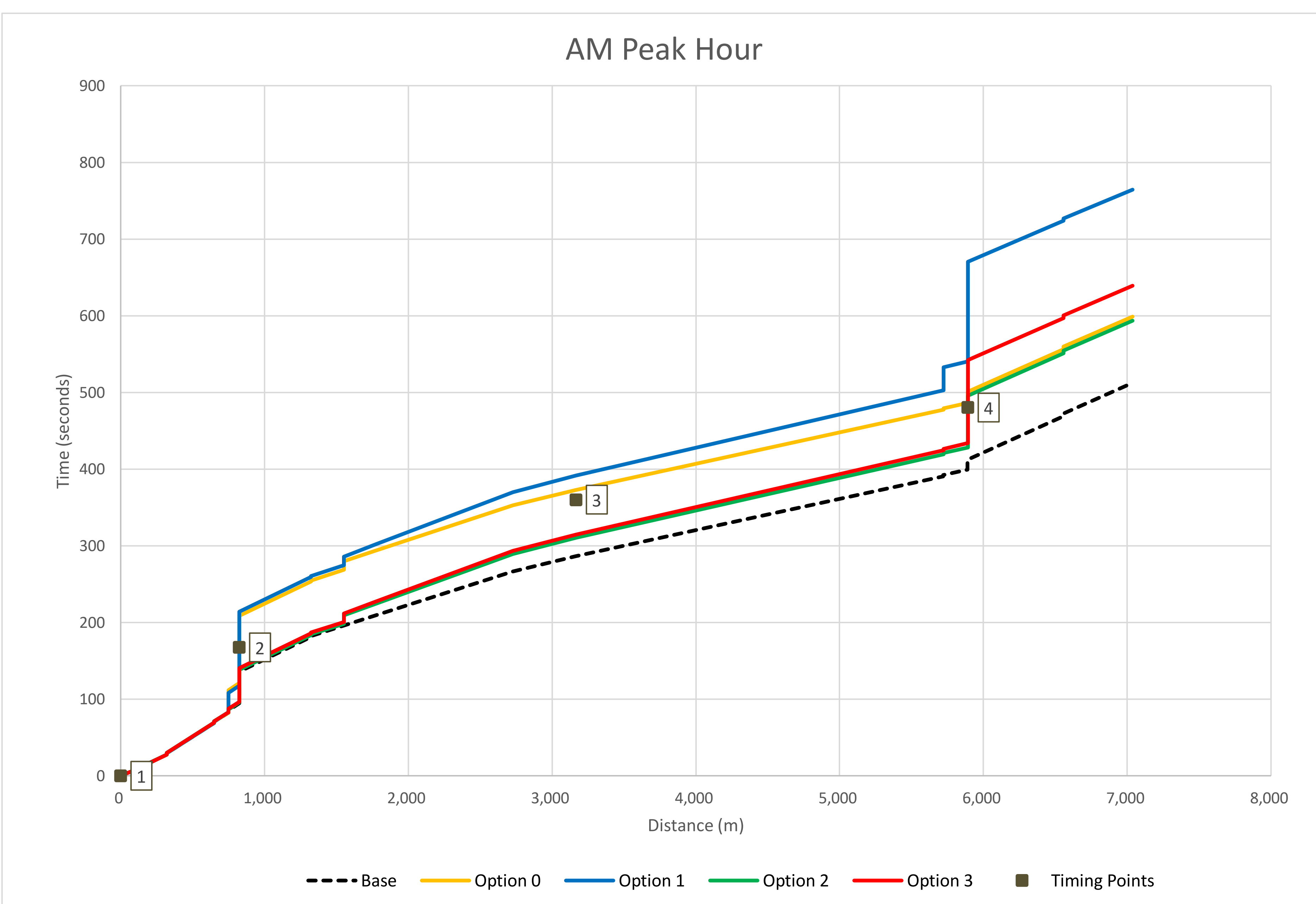


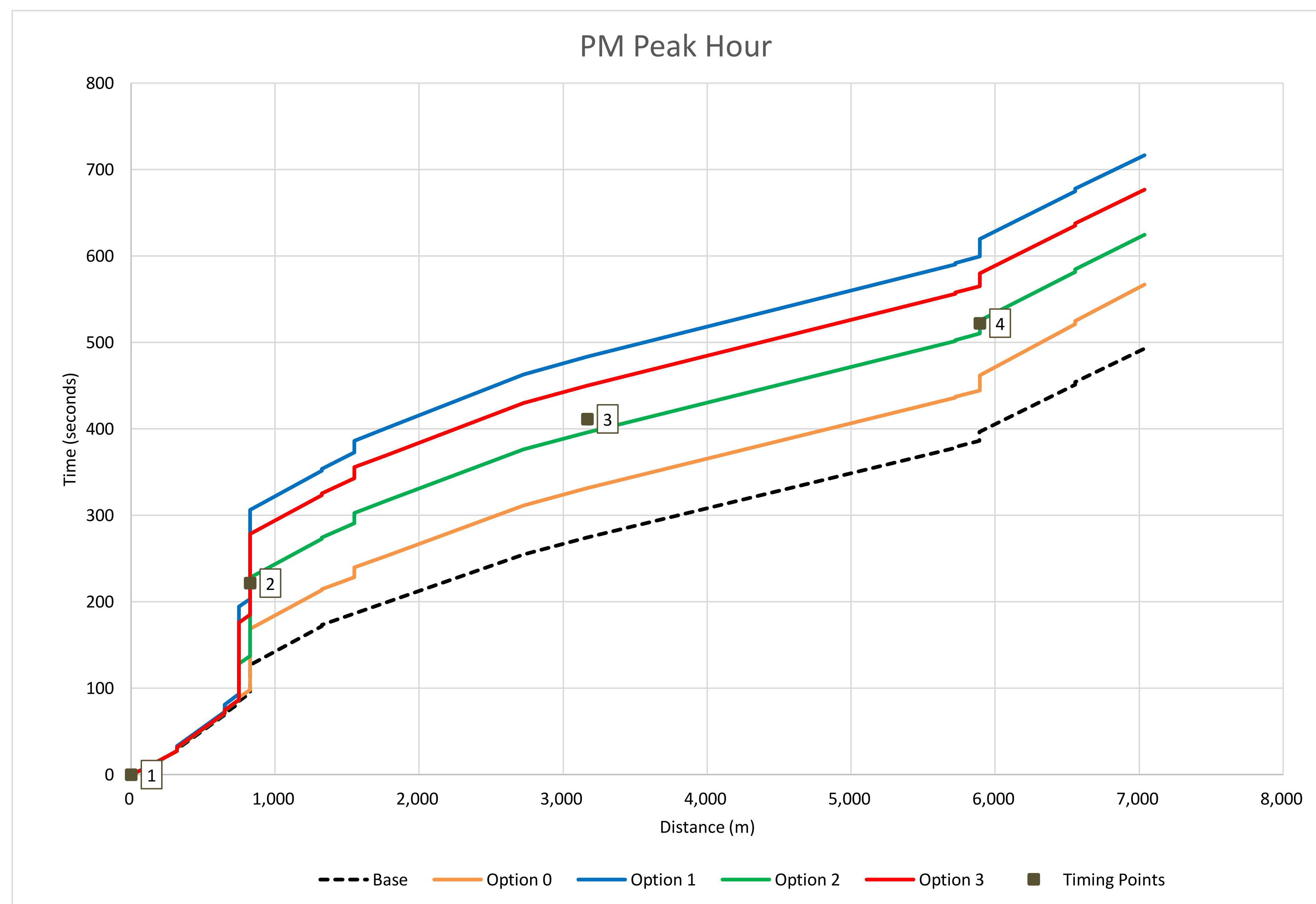




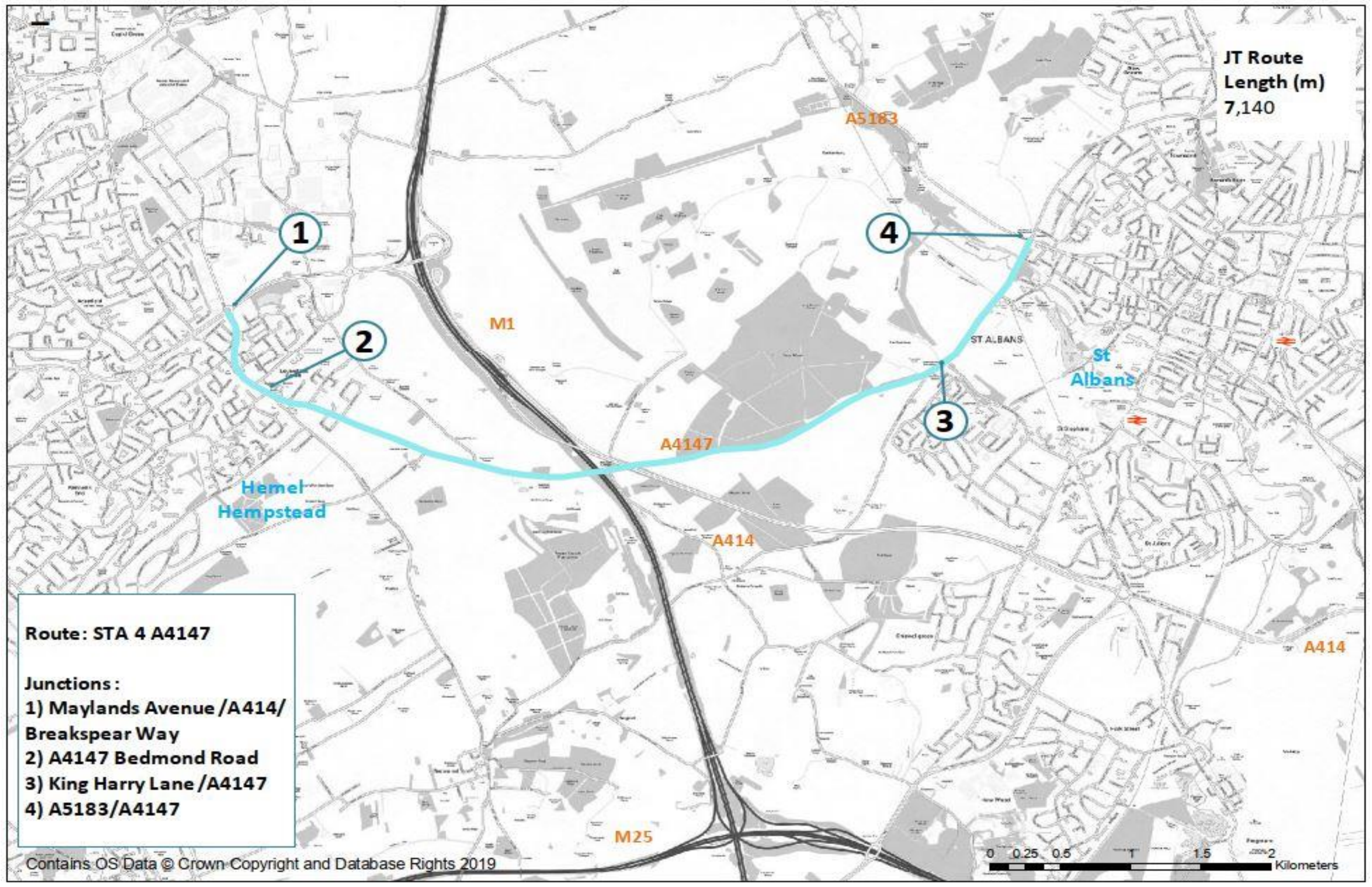
Route: STA4_EB

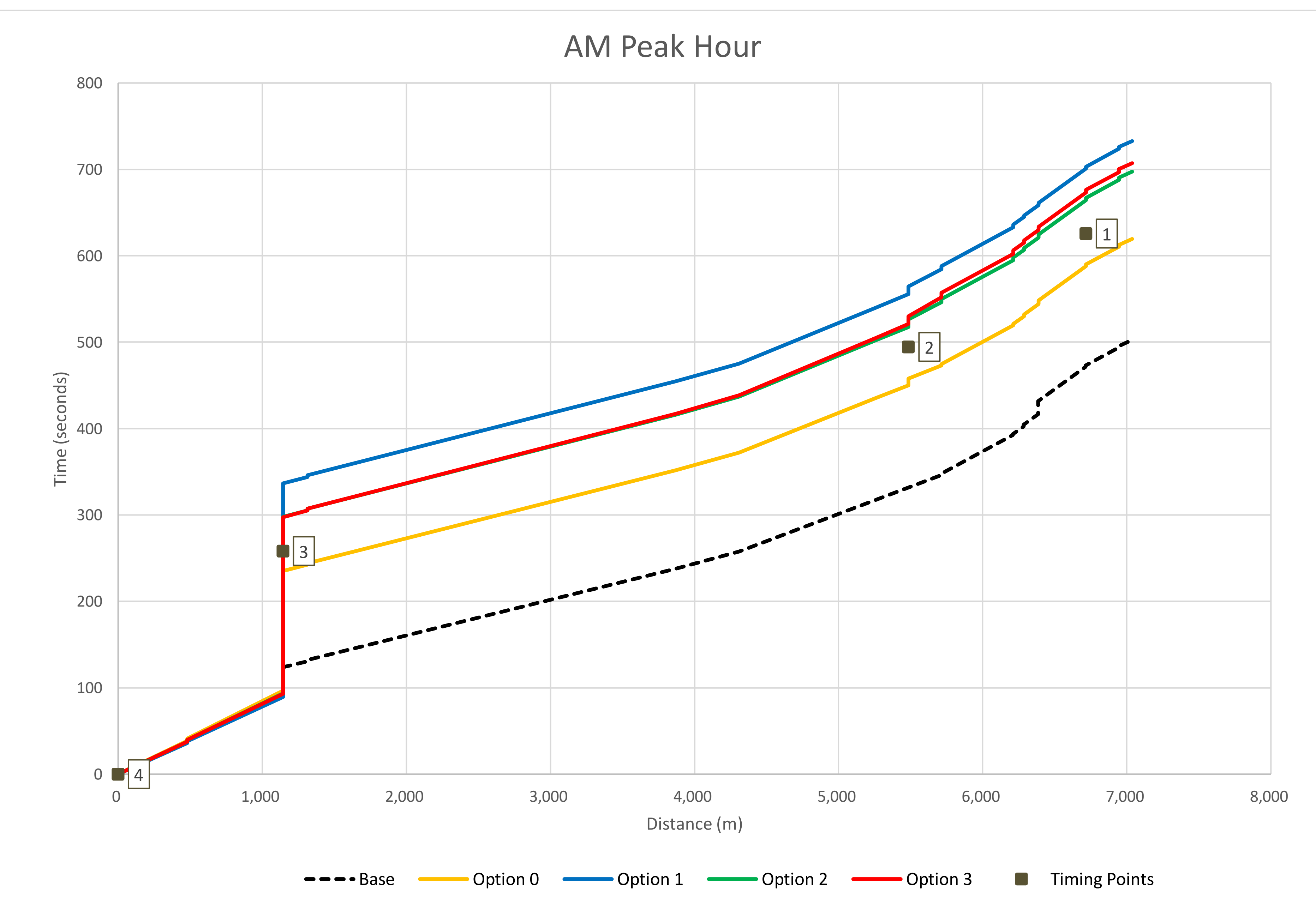


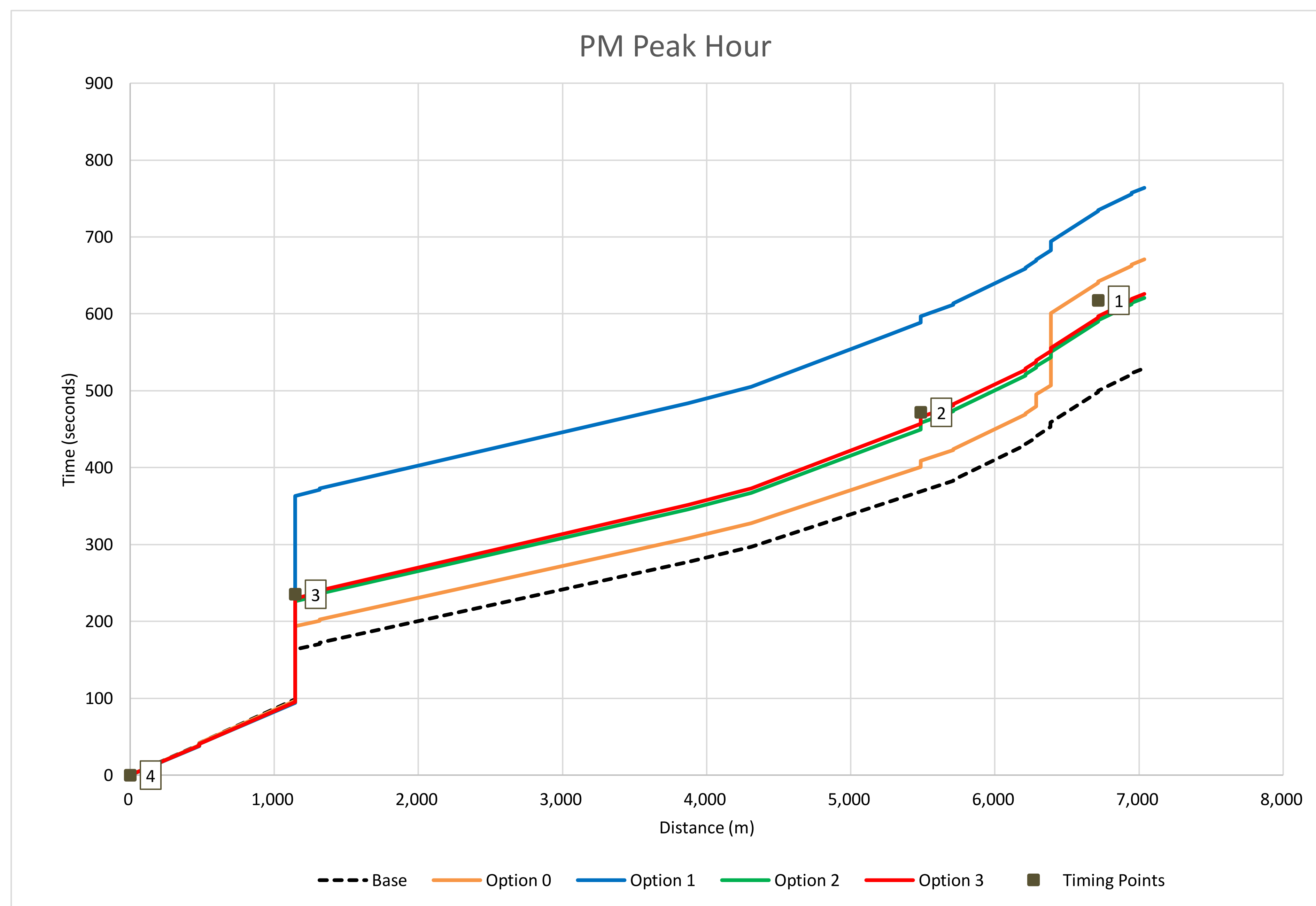




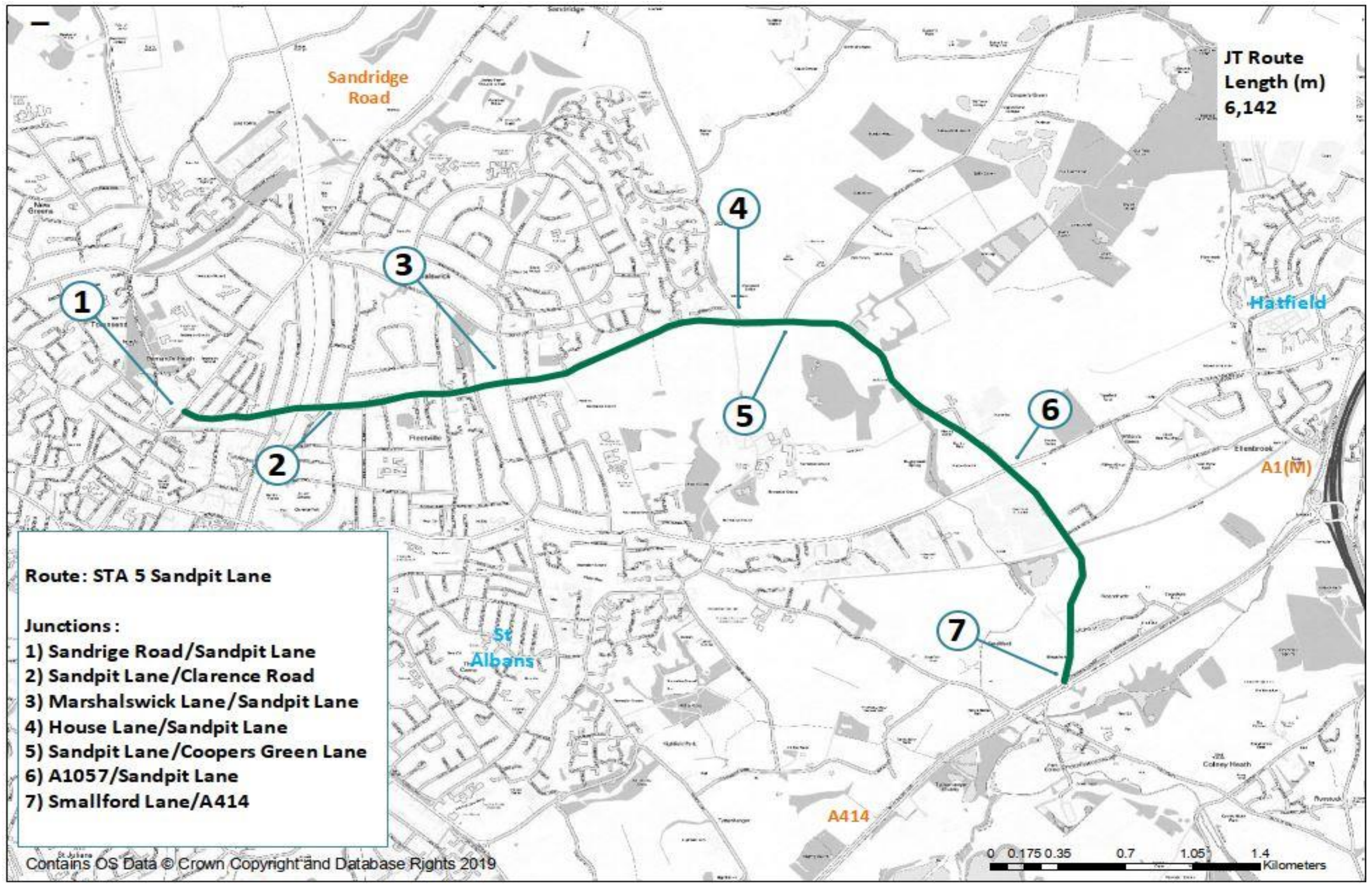
Route: STA4_WB

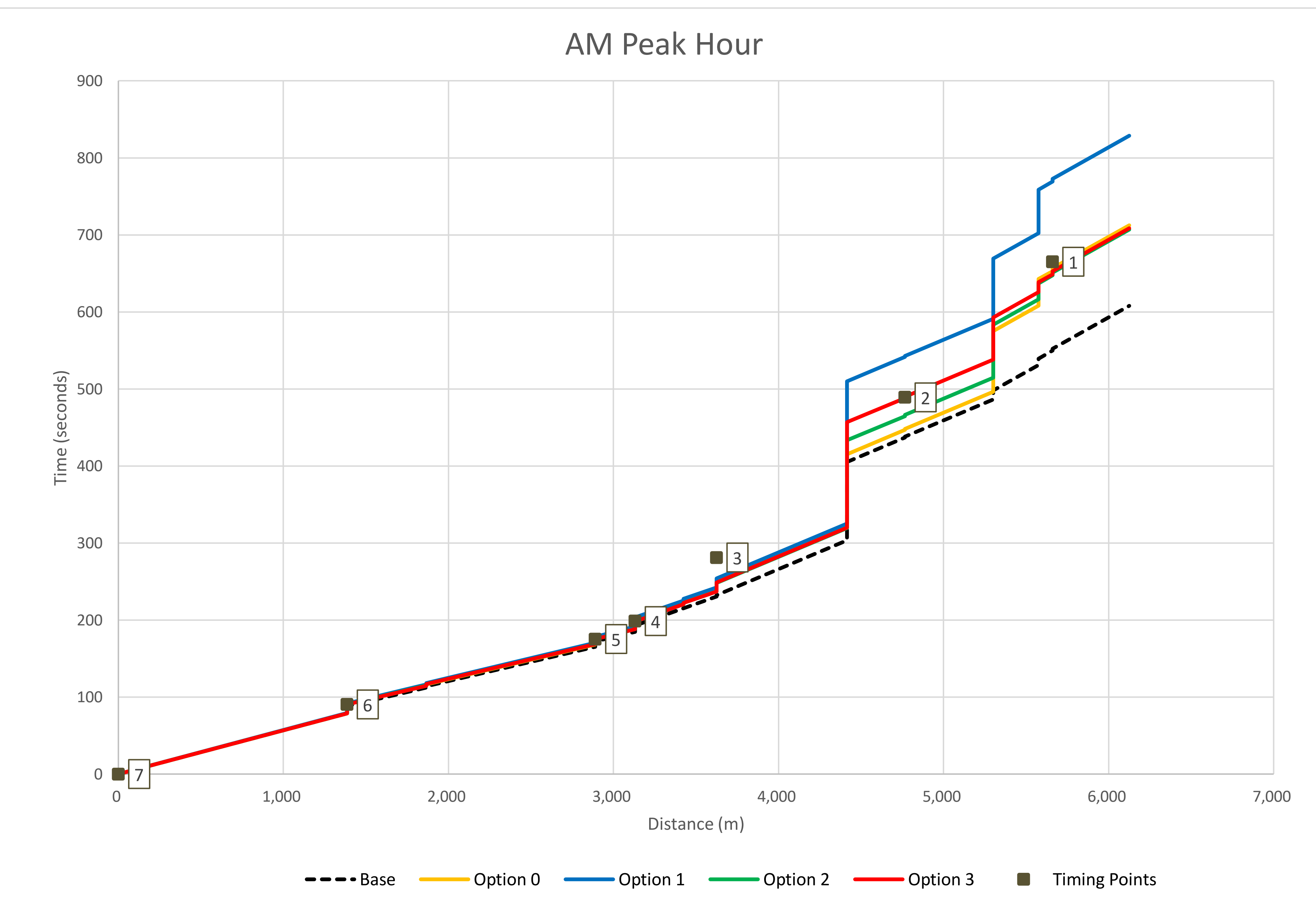


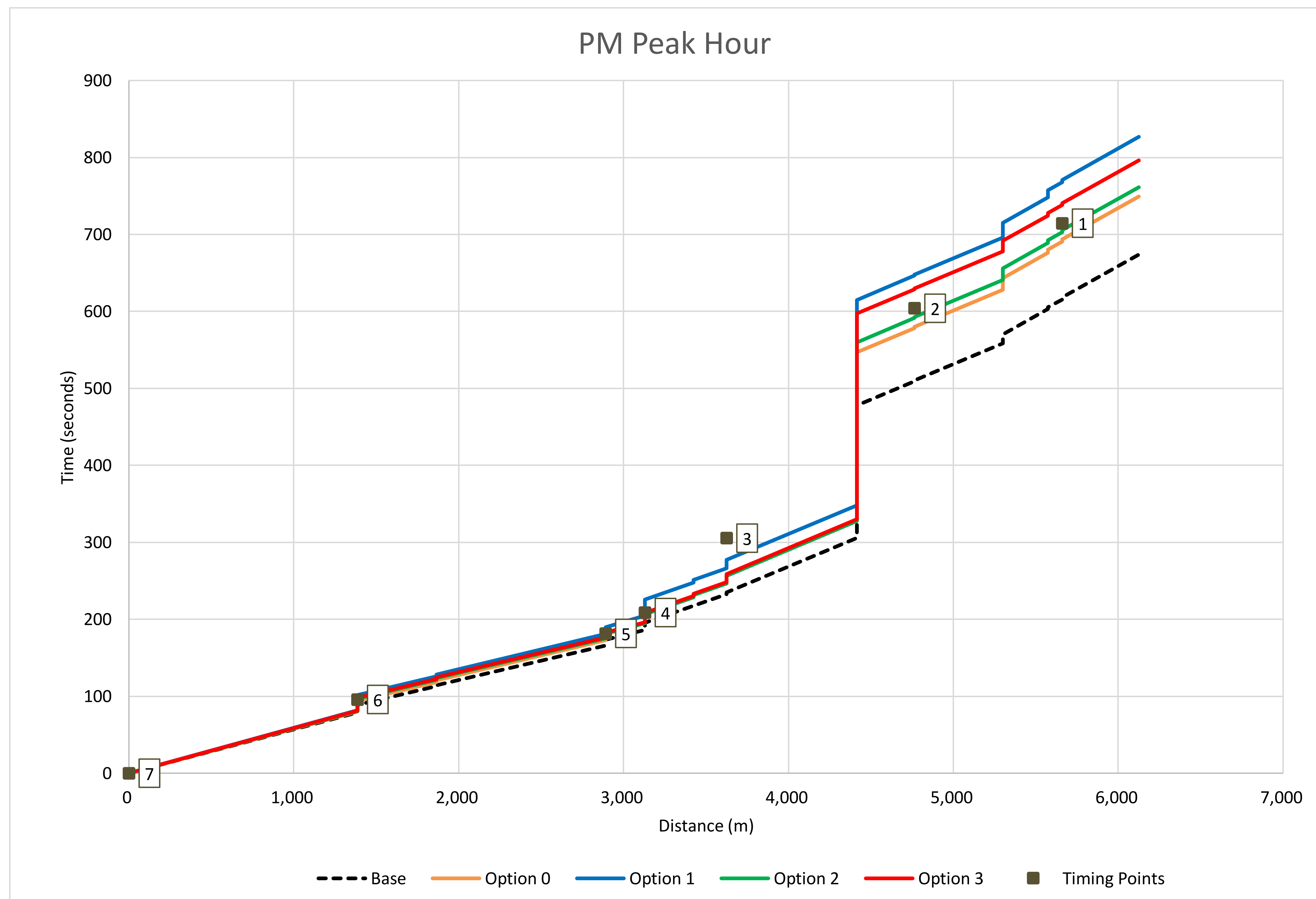




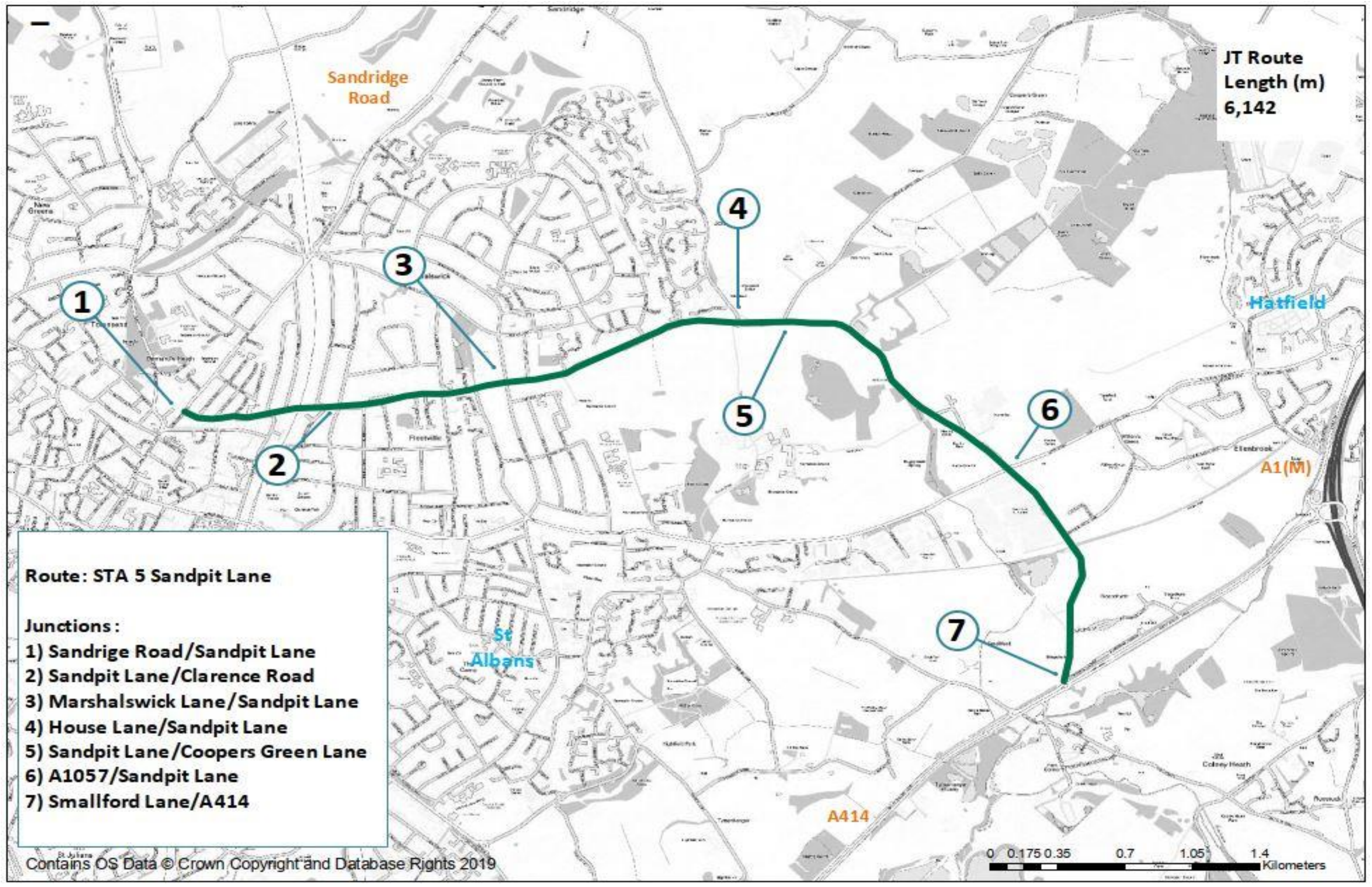
Route: STA5_NB

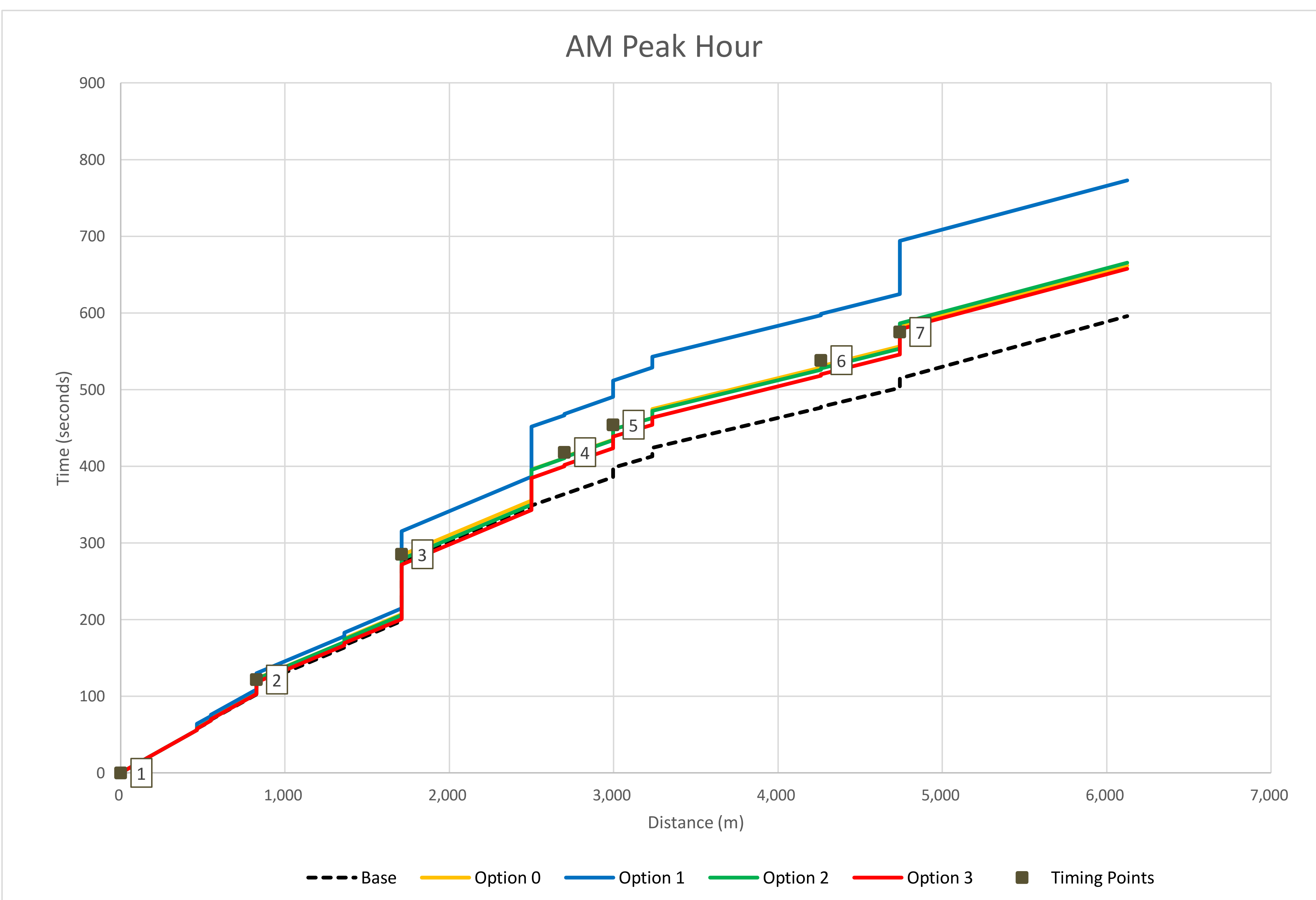


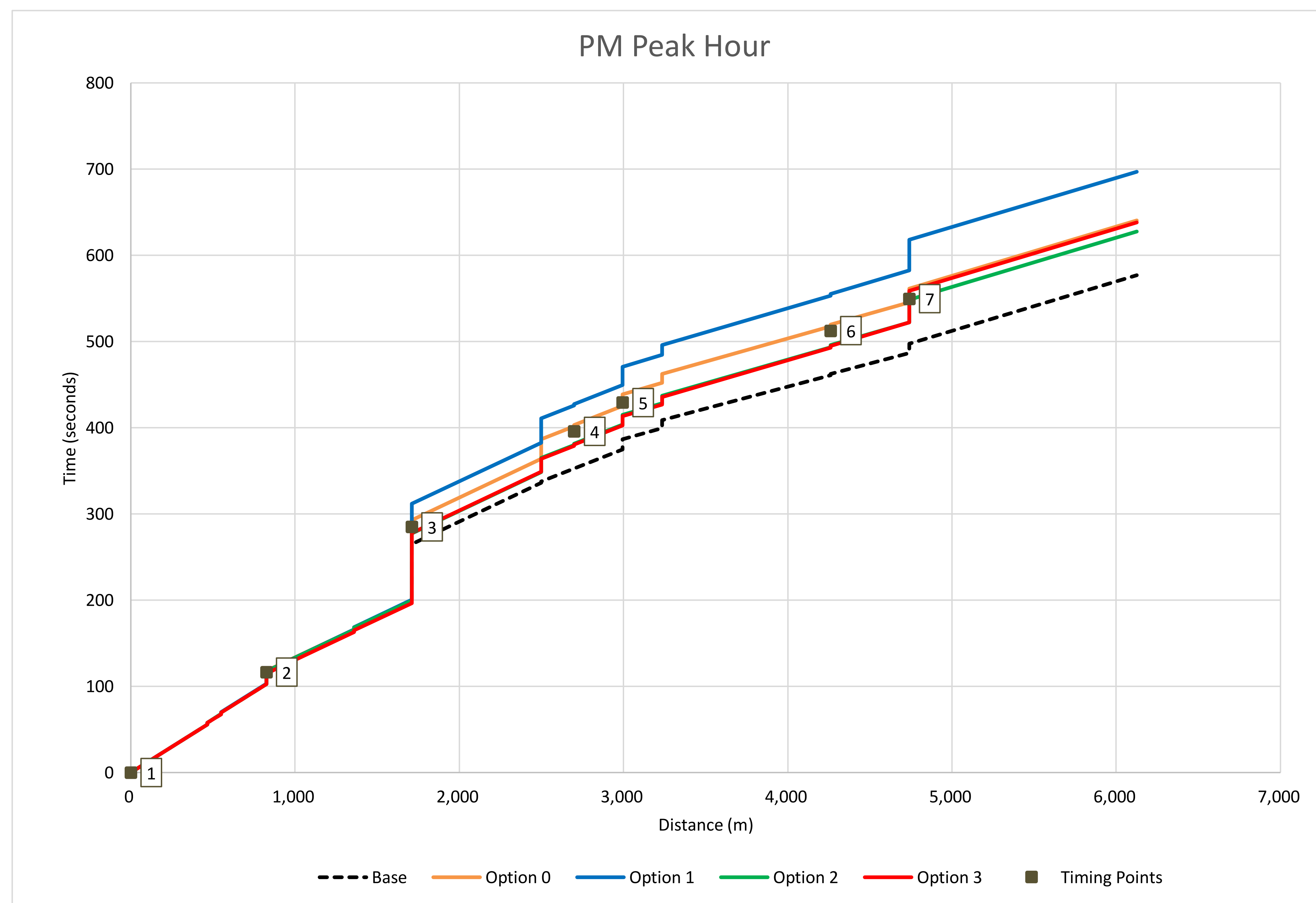




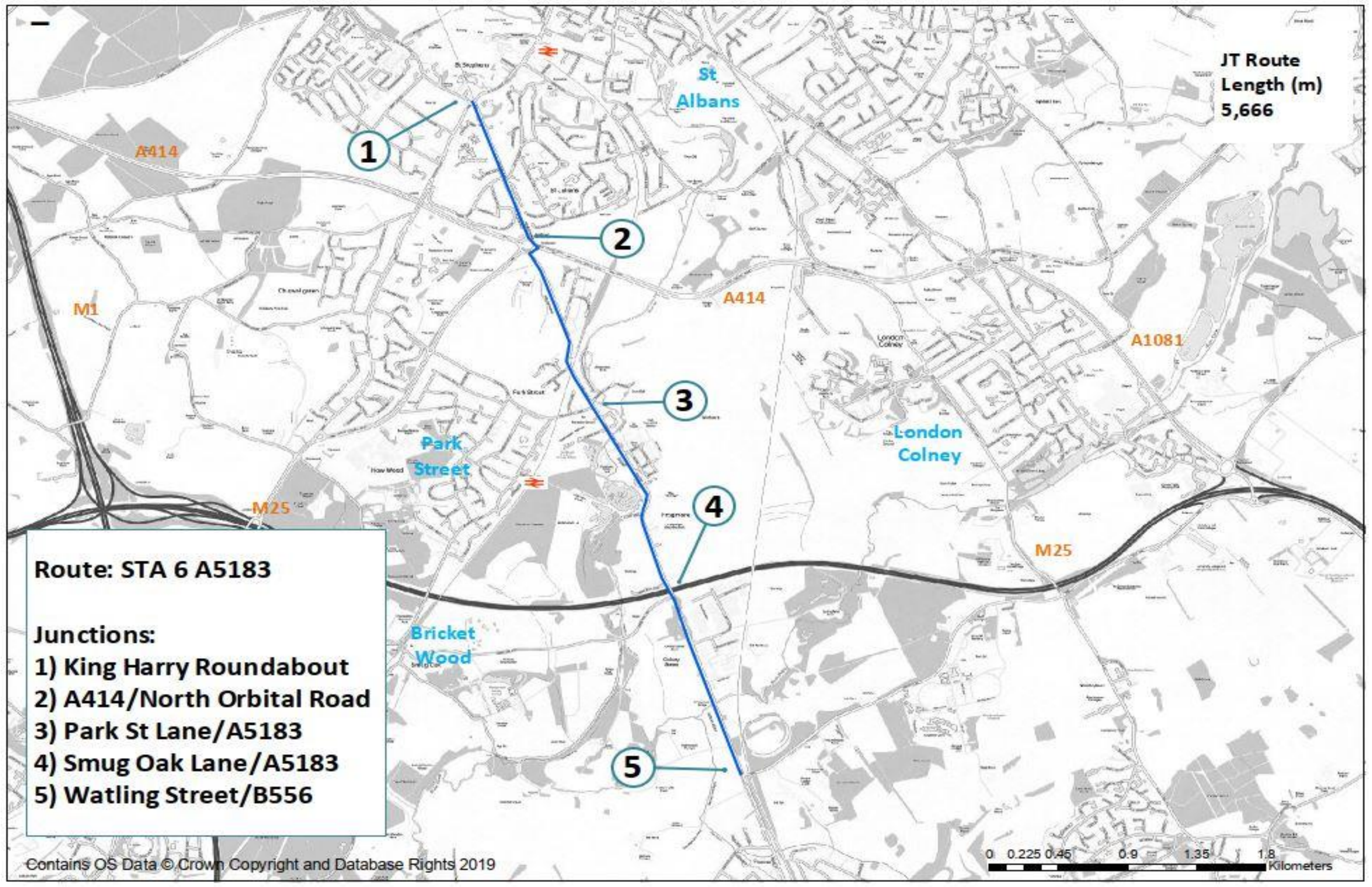
Route: STA5_SB

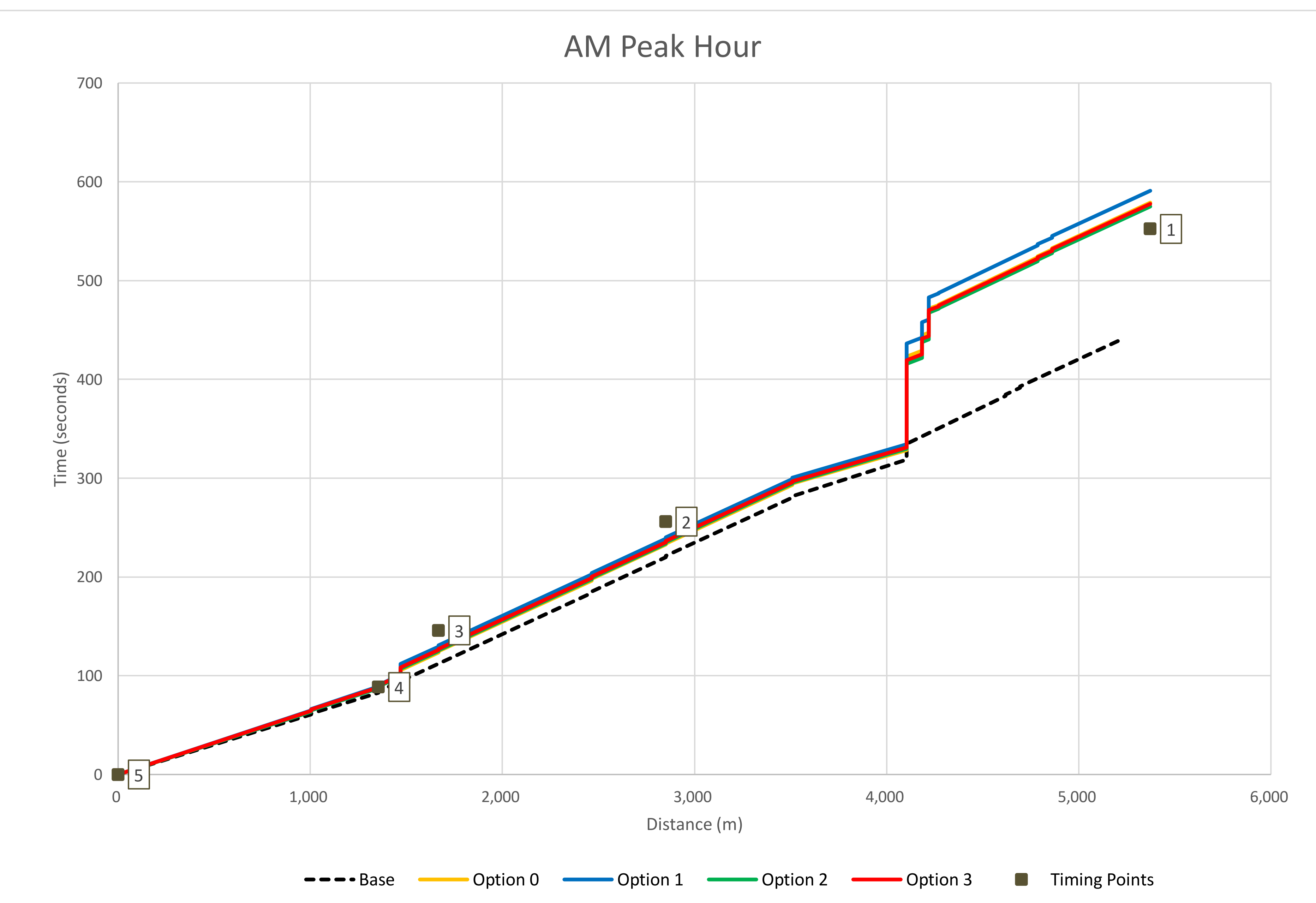


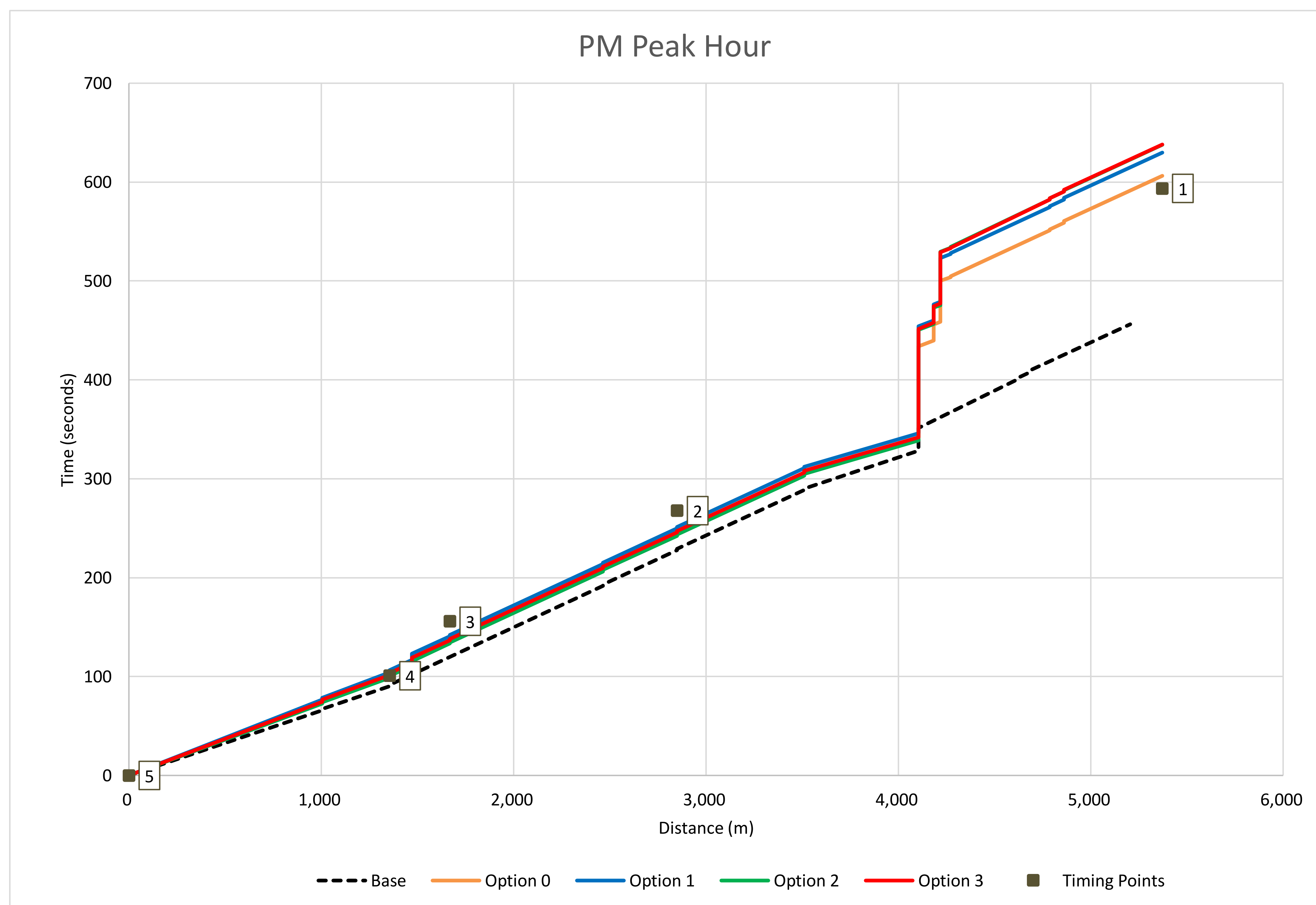




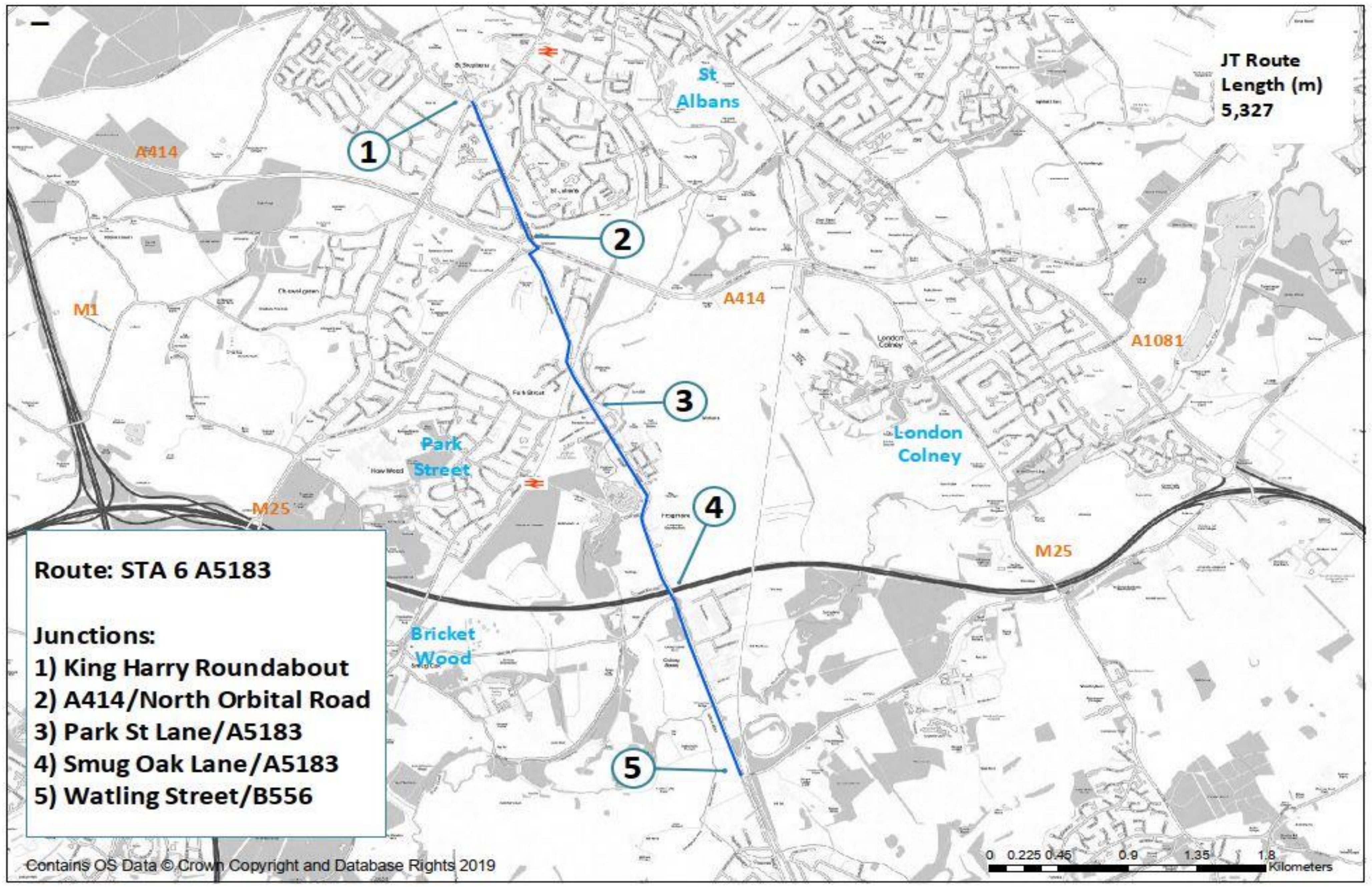
Route: STA6_NB

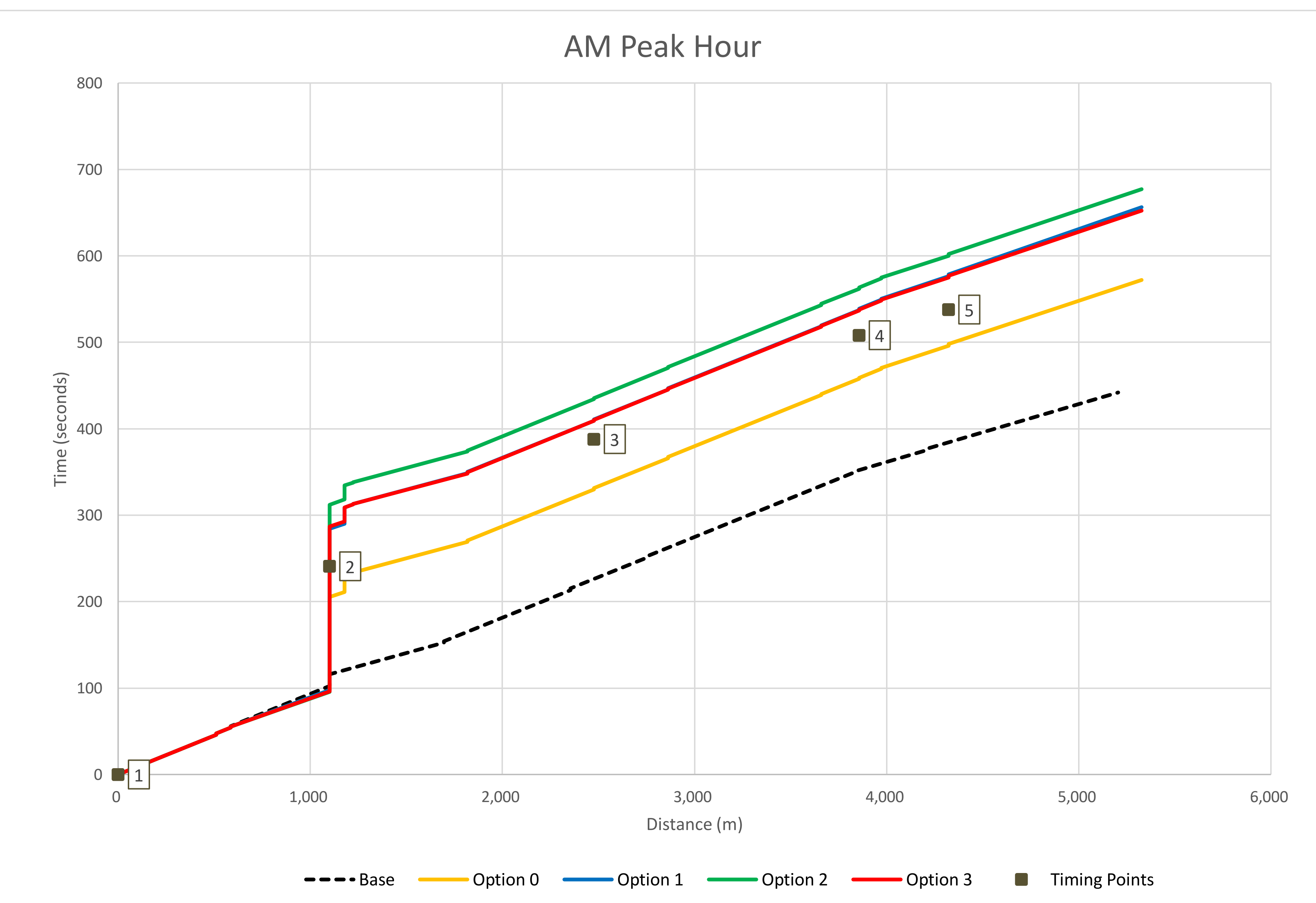


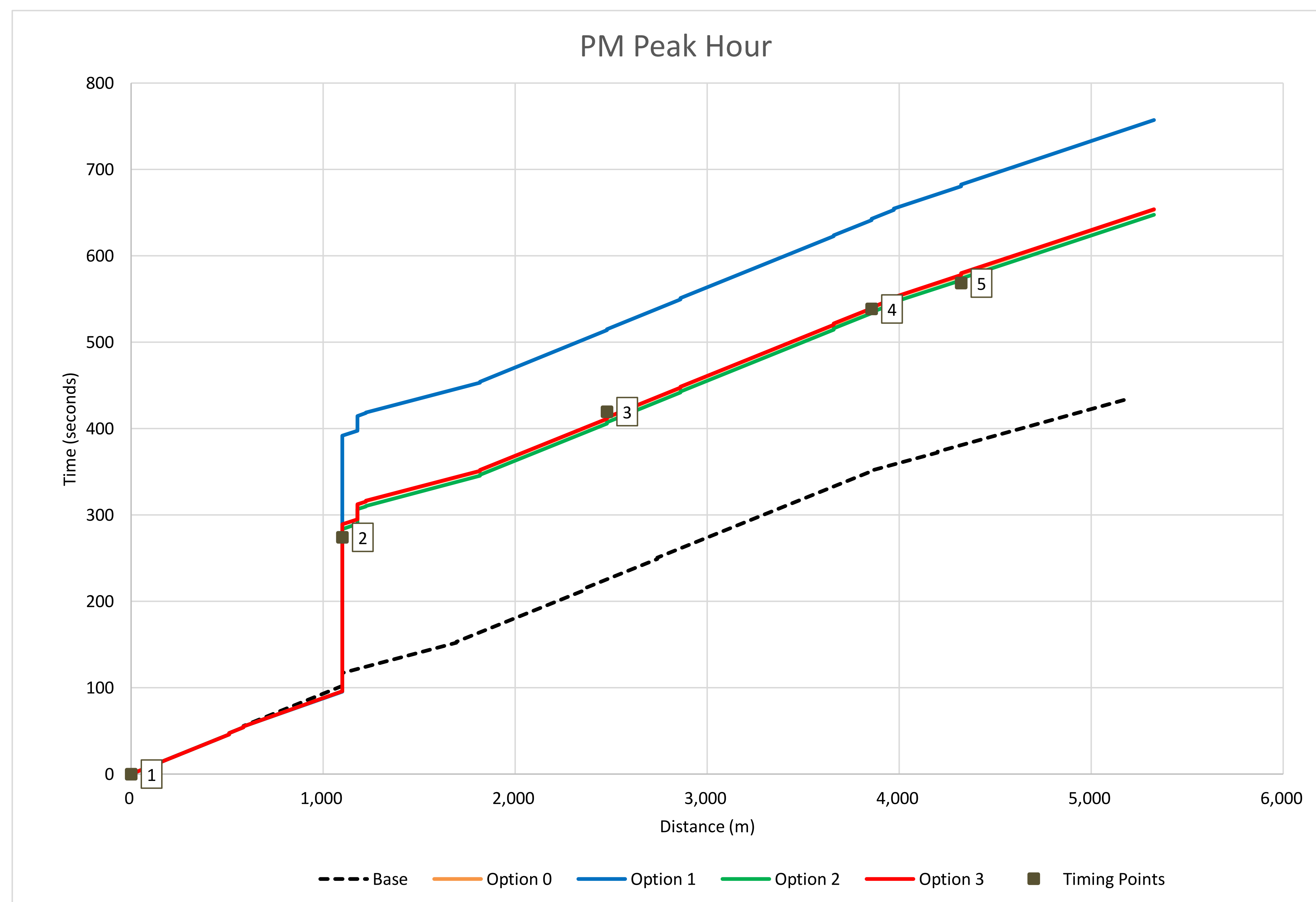




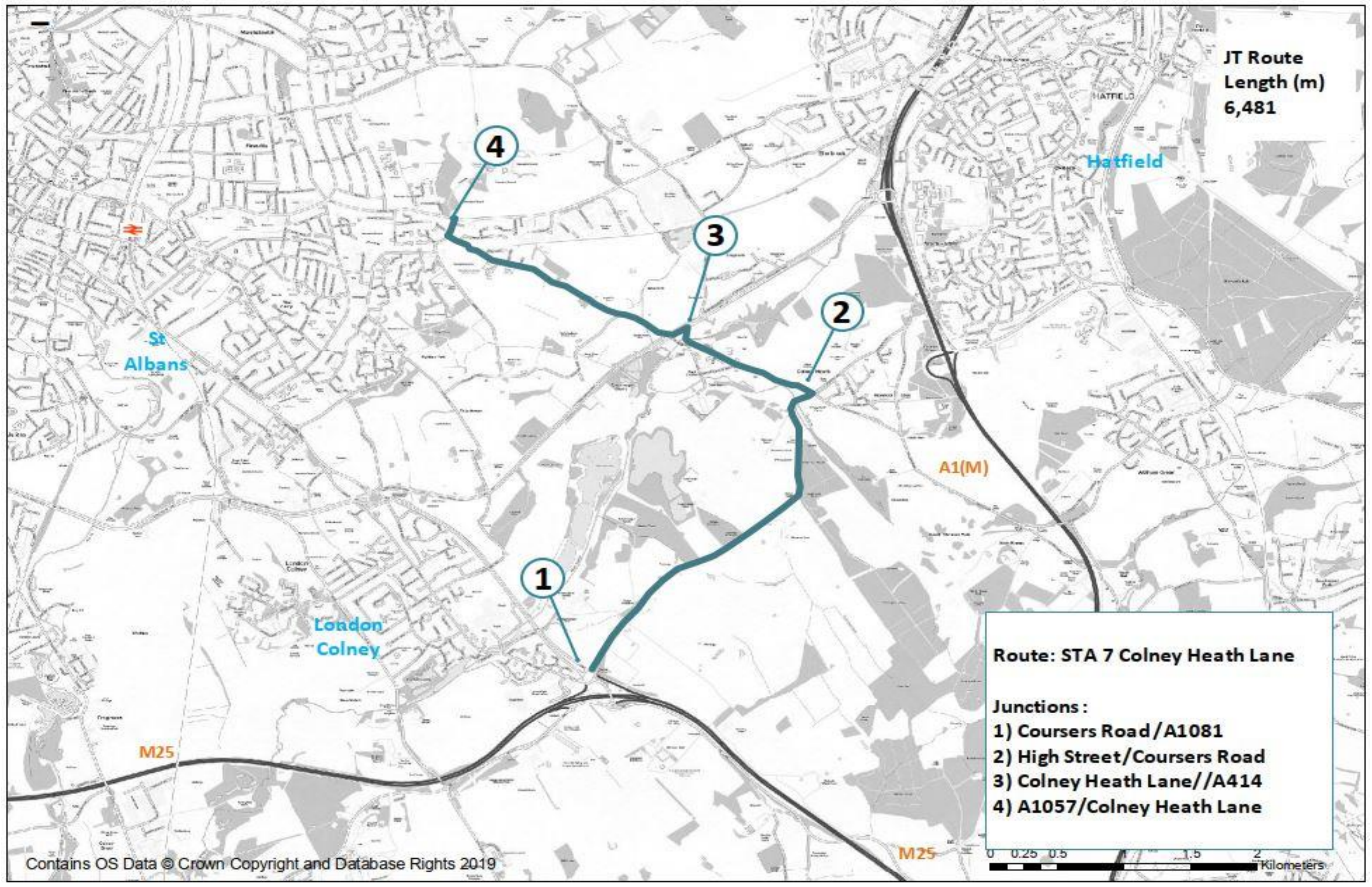
Route: STA6_SB

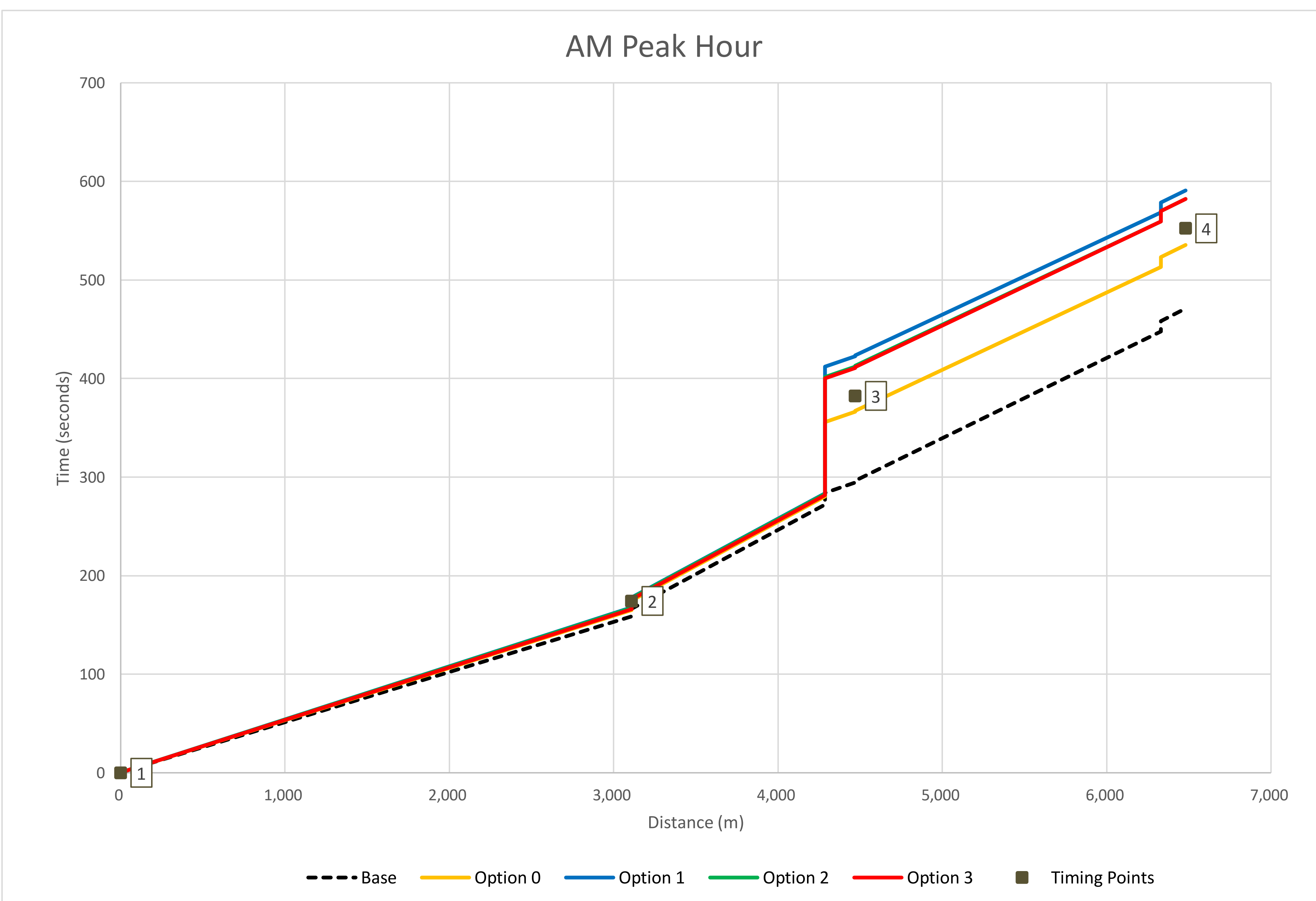


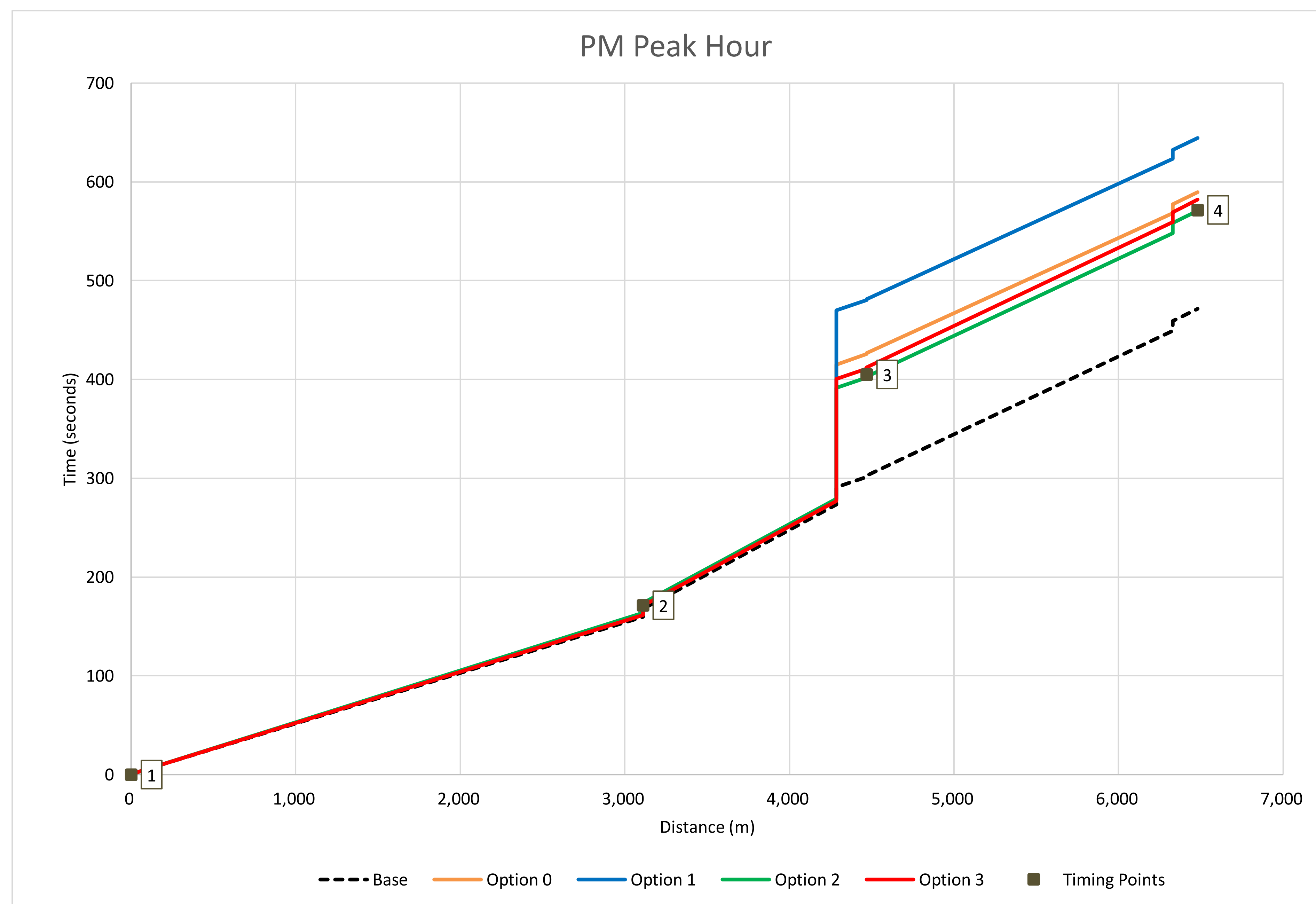




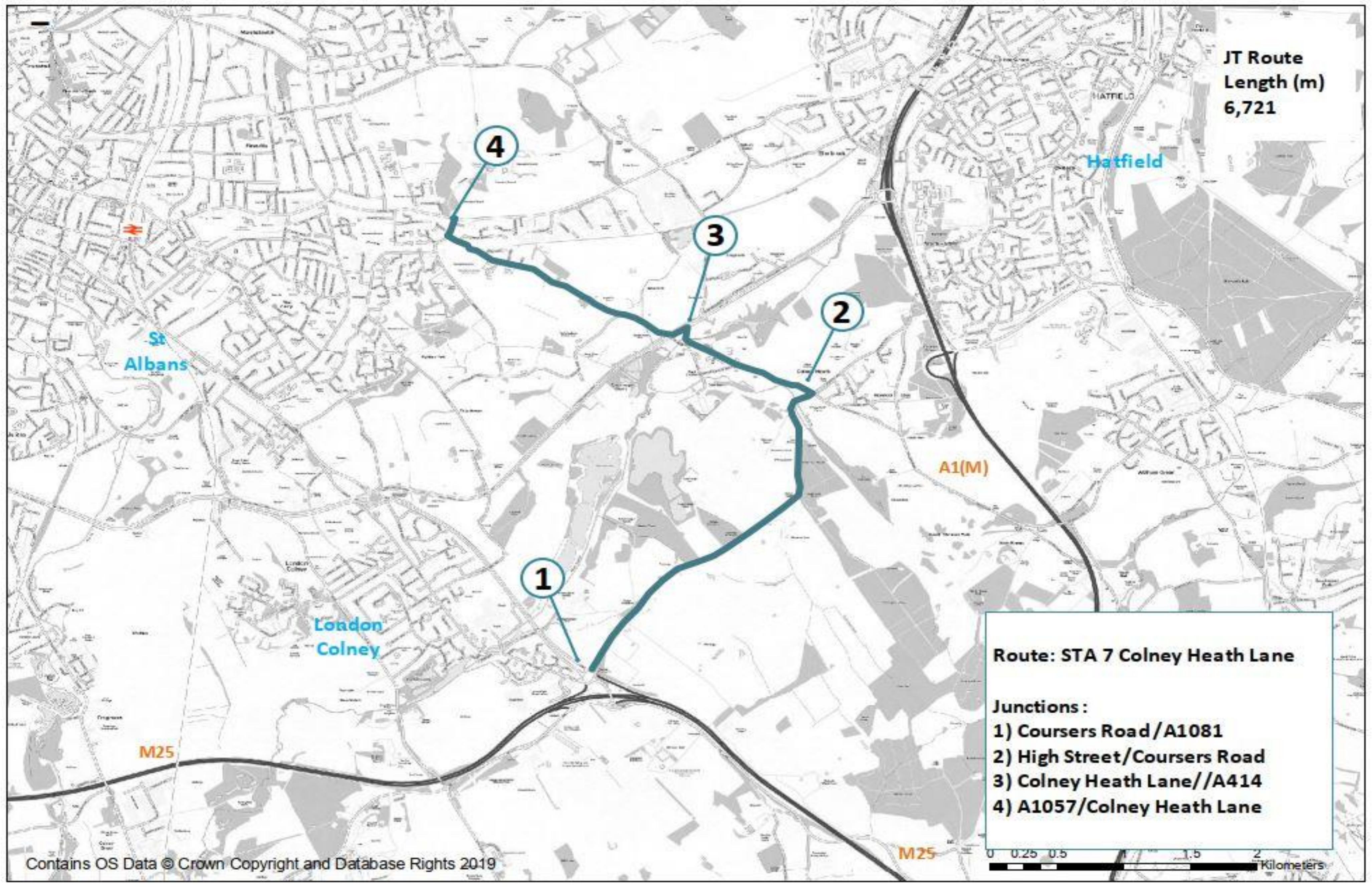
Route: STA7_NB

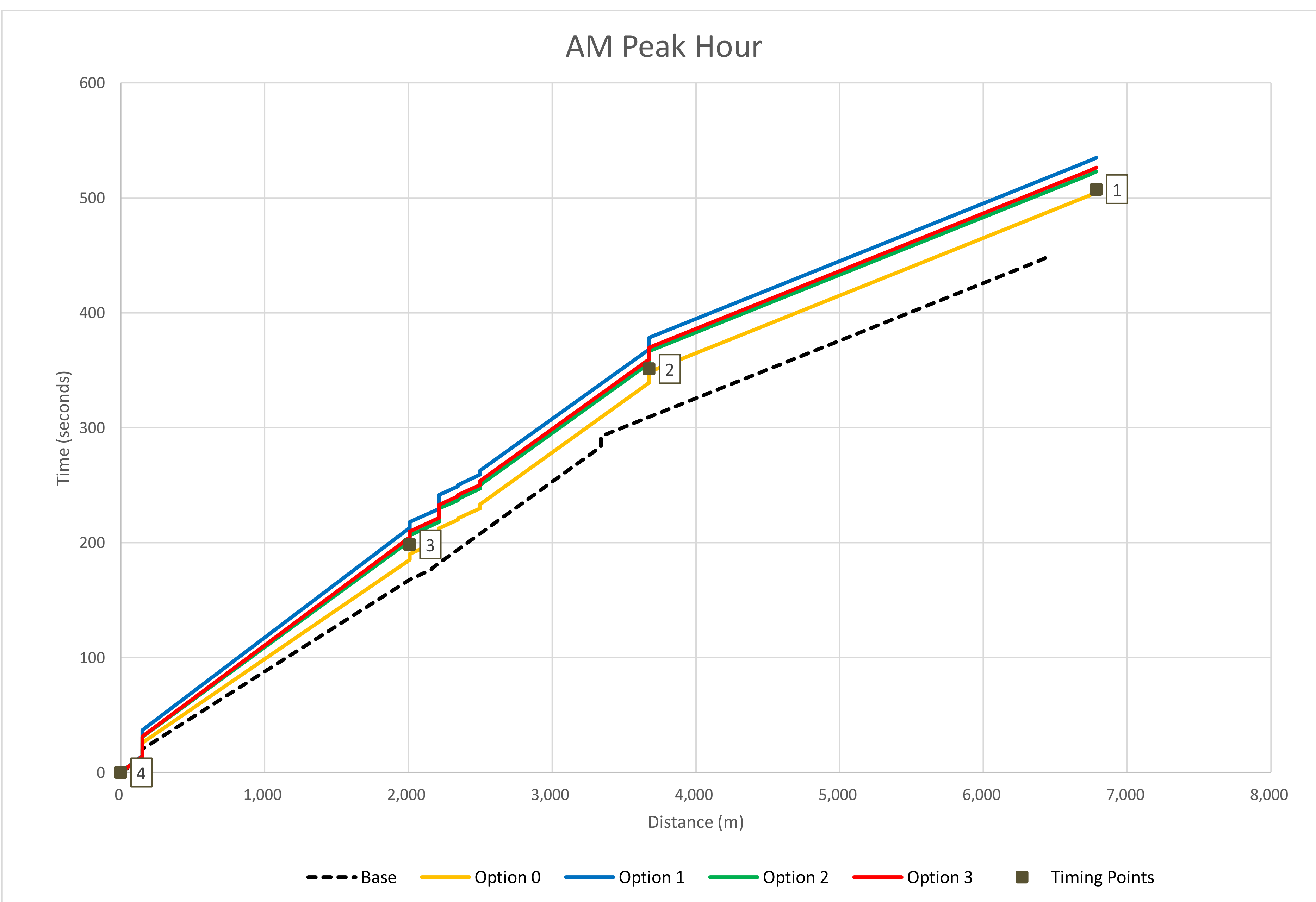


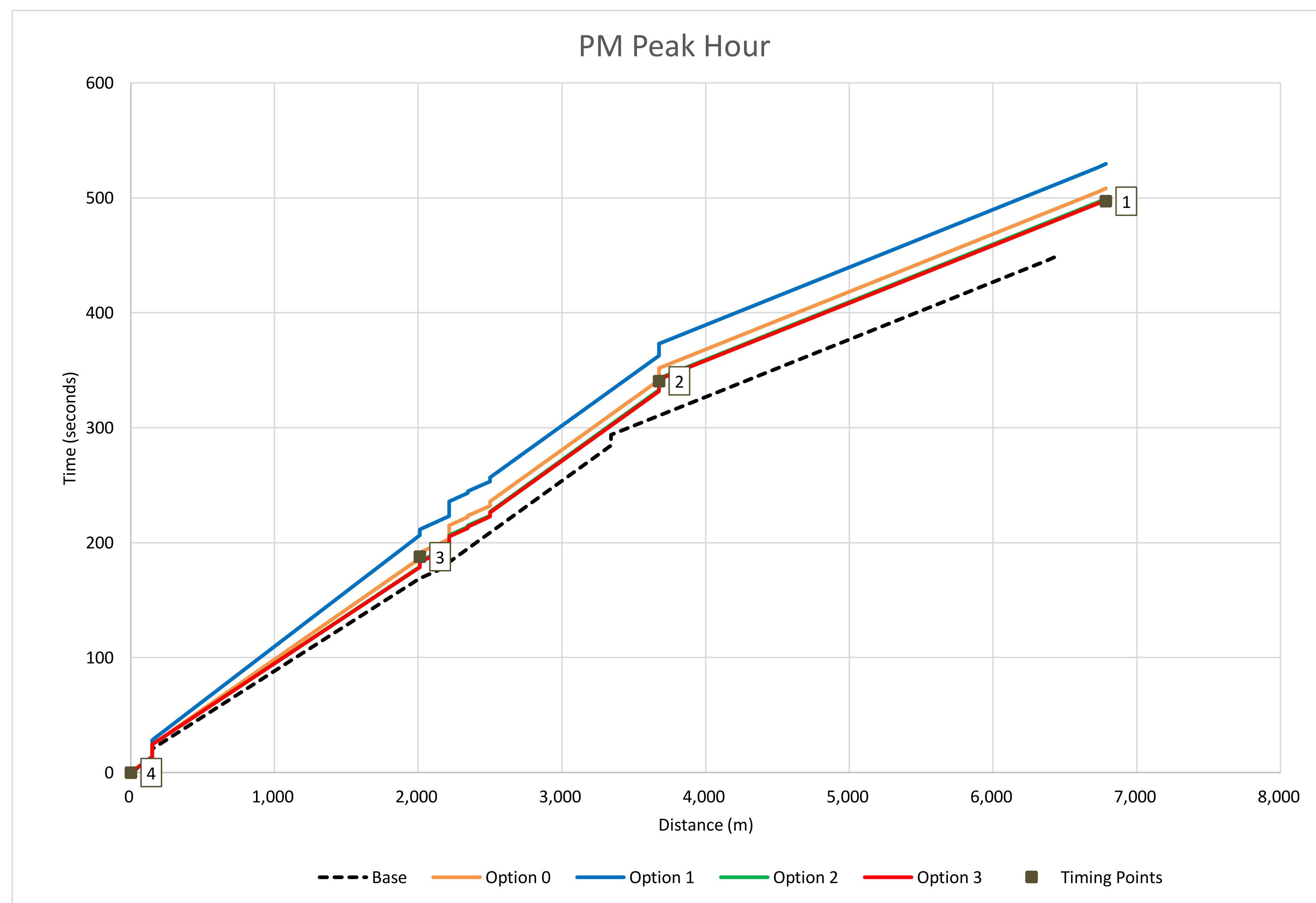




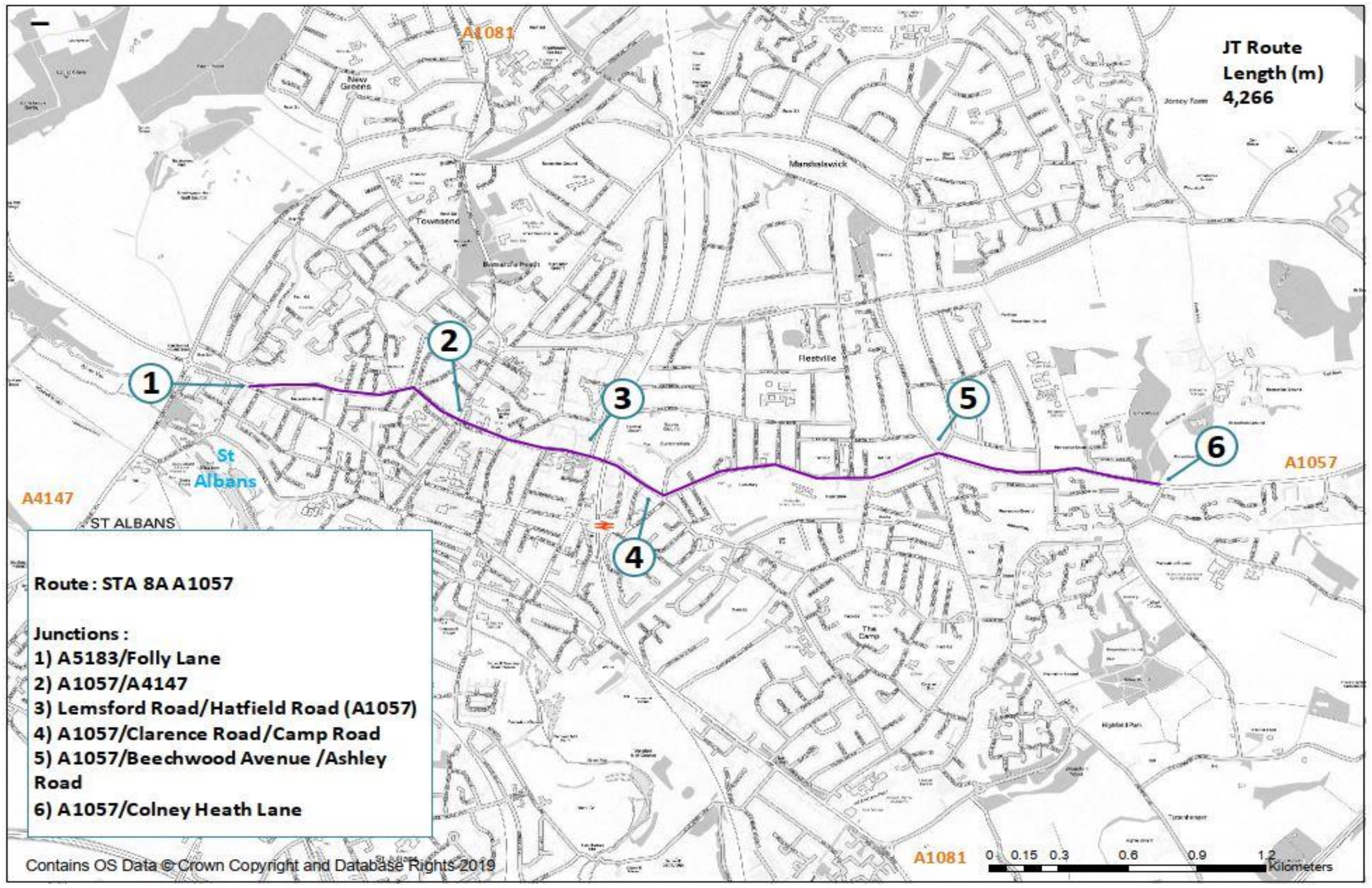
Route: STA7_SB

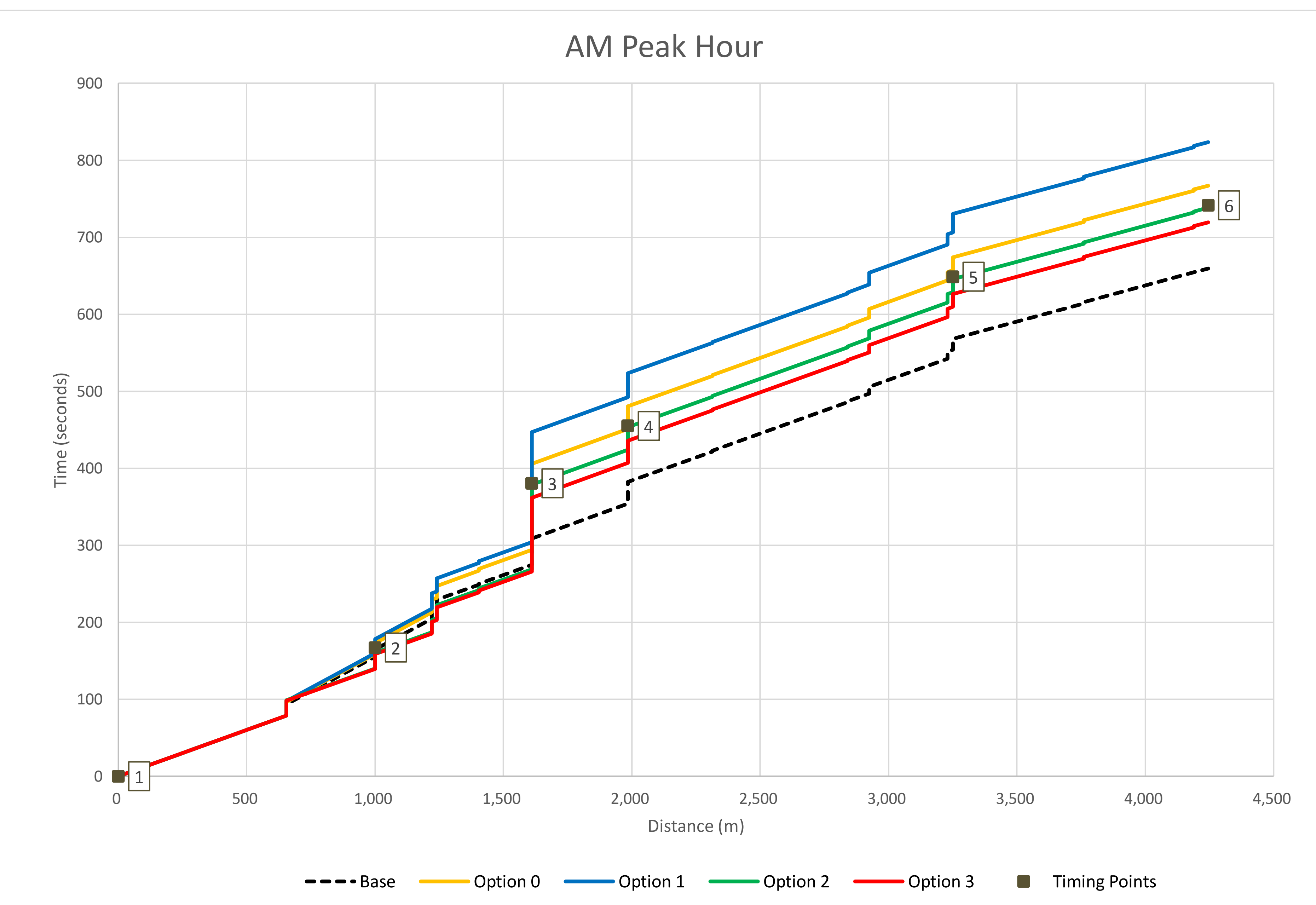


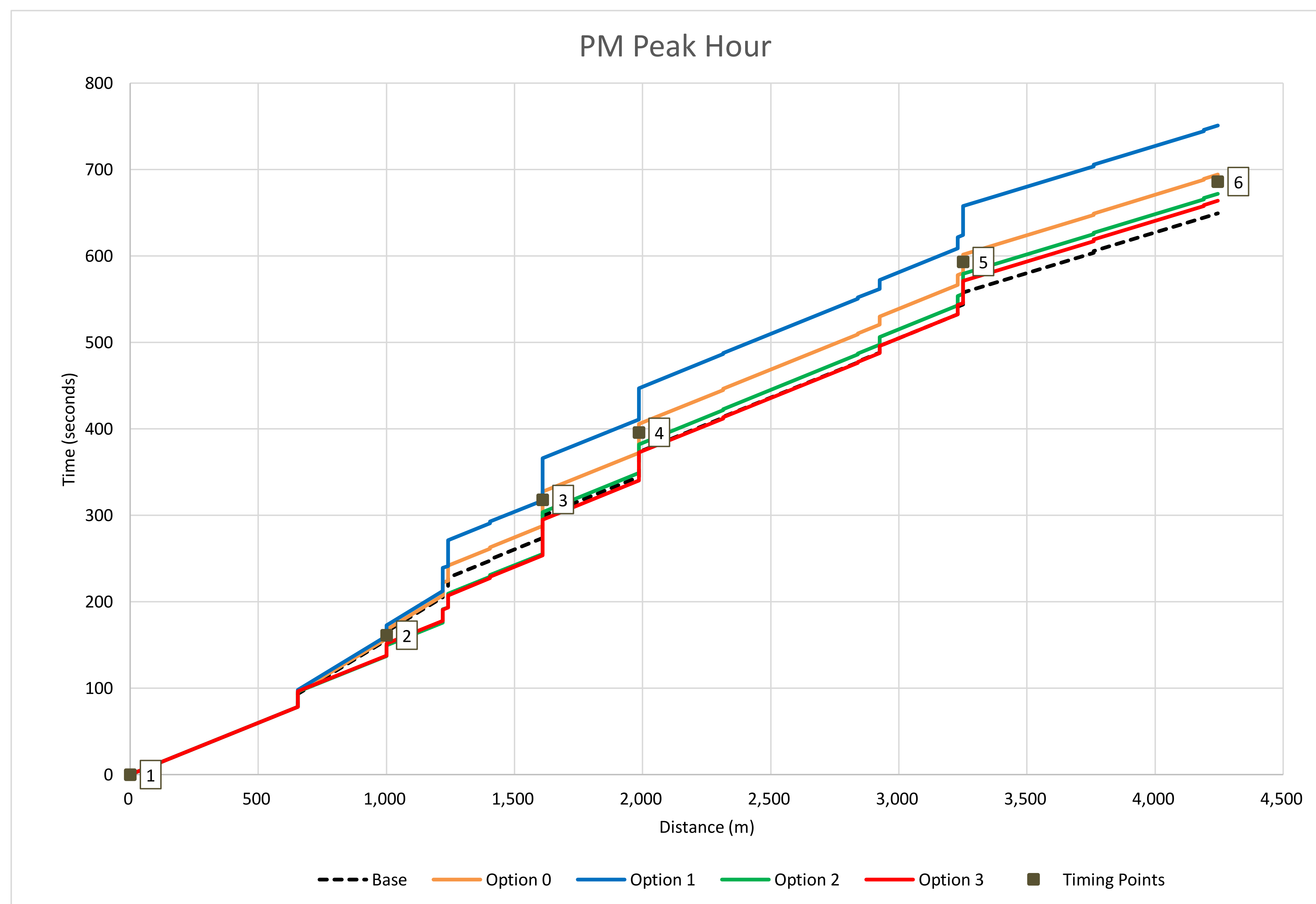




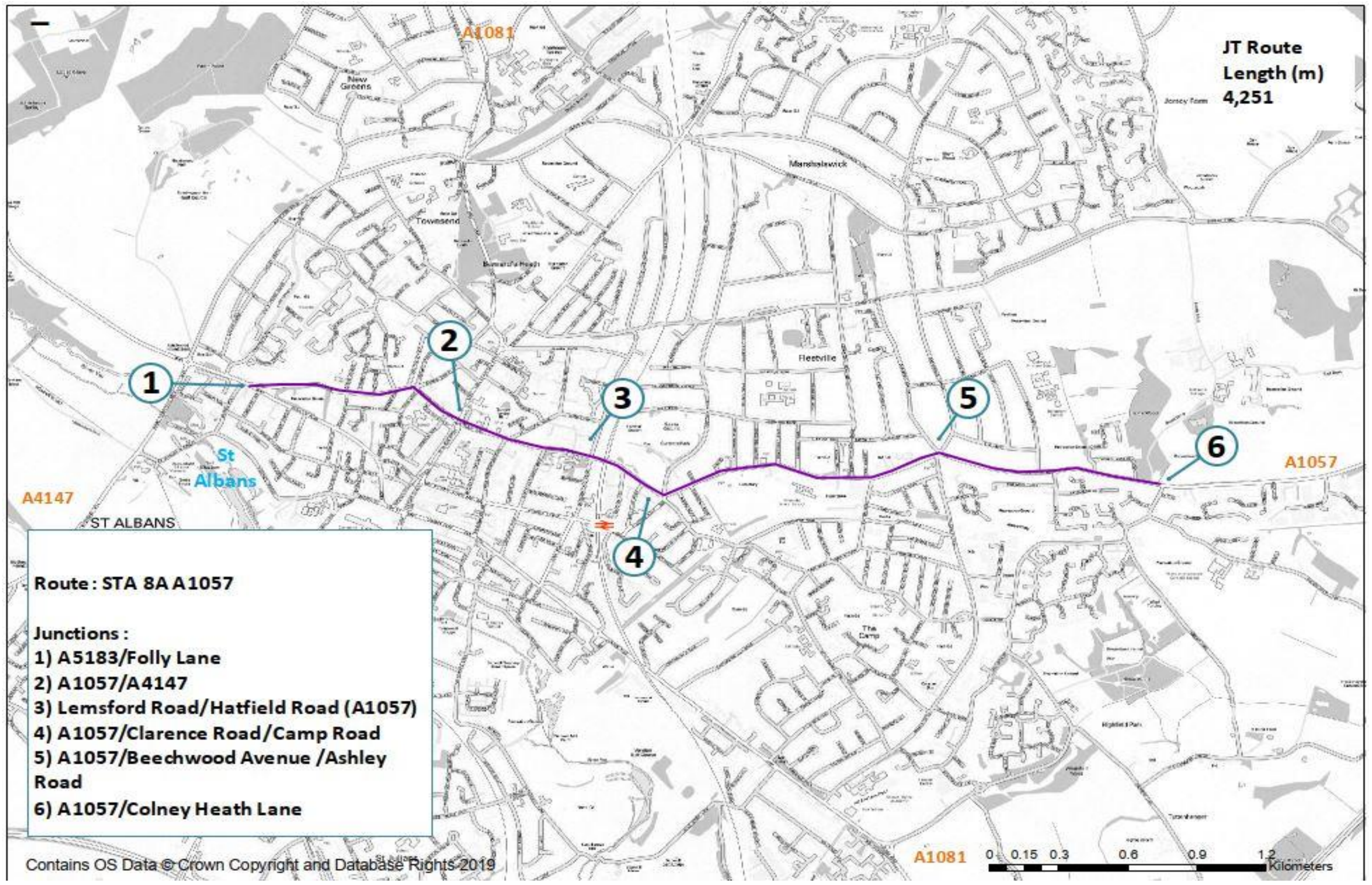
Route: STA8A_EB

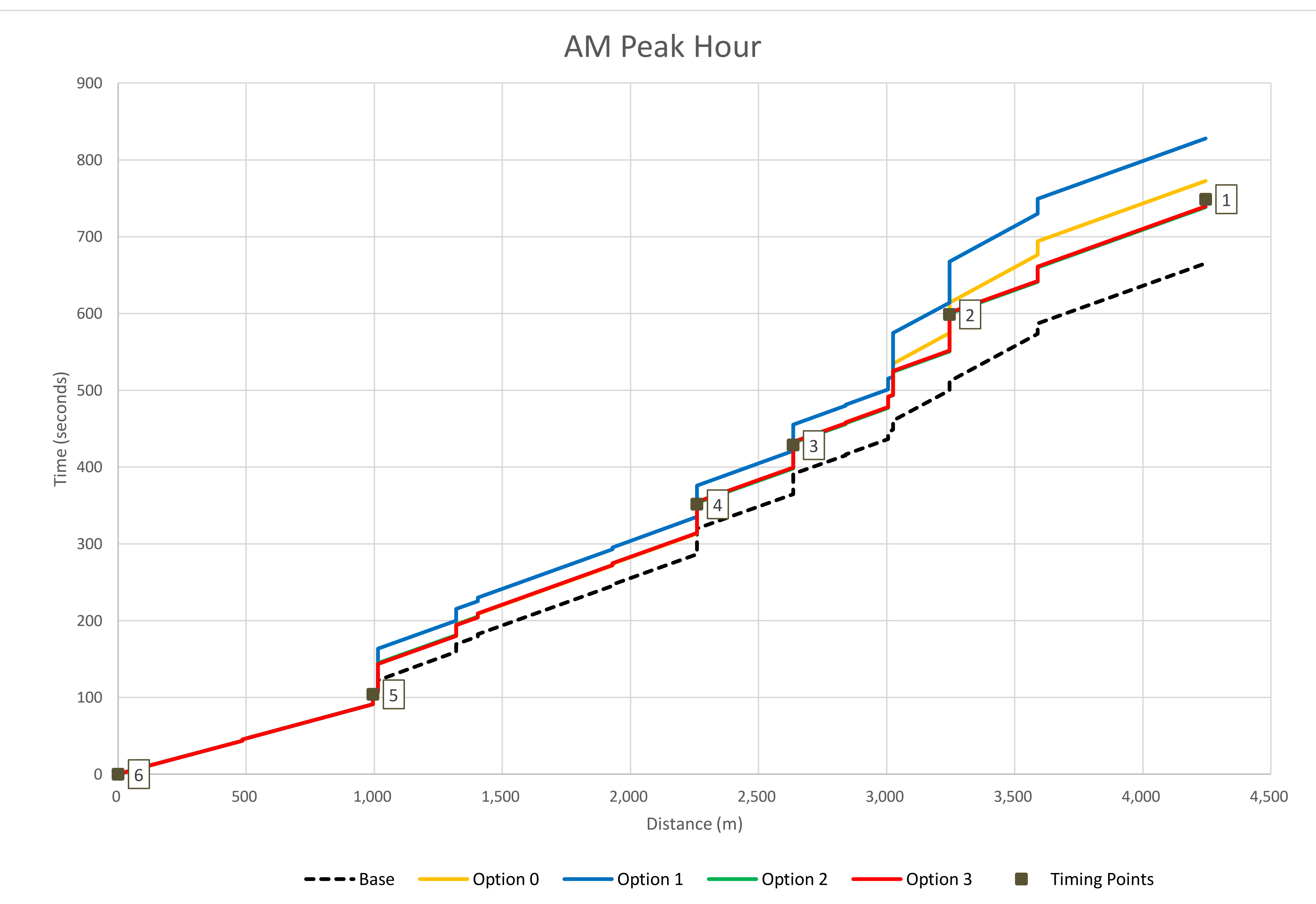


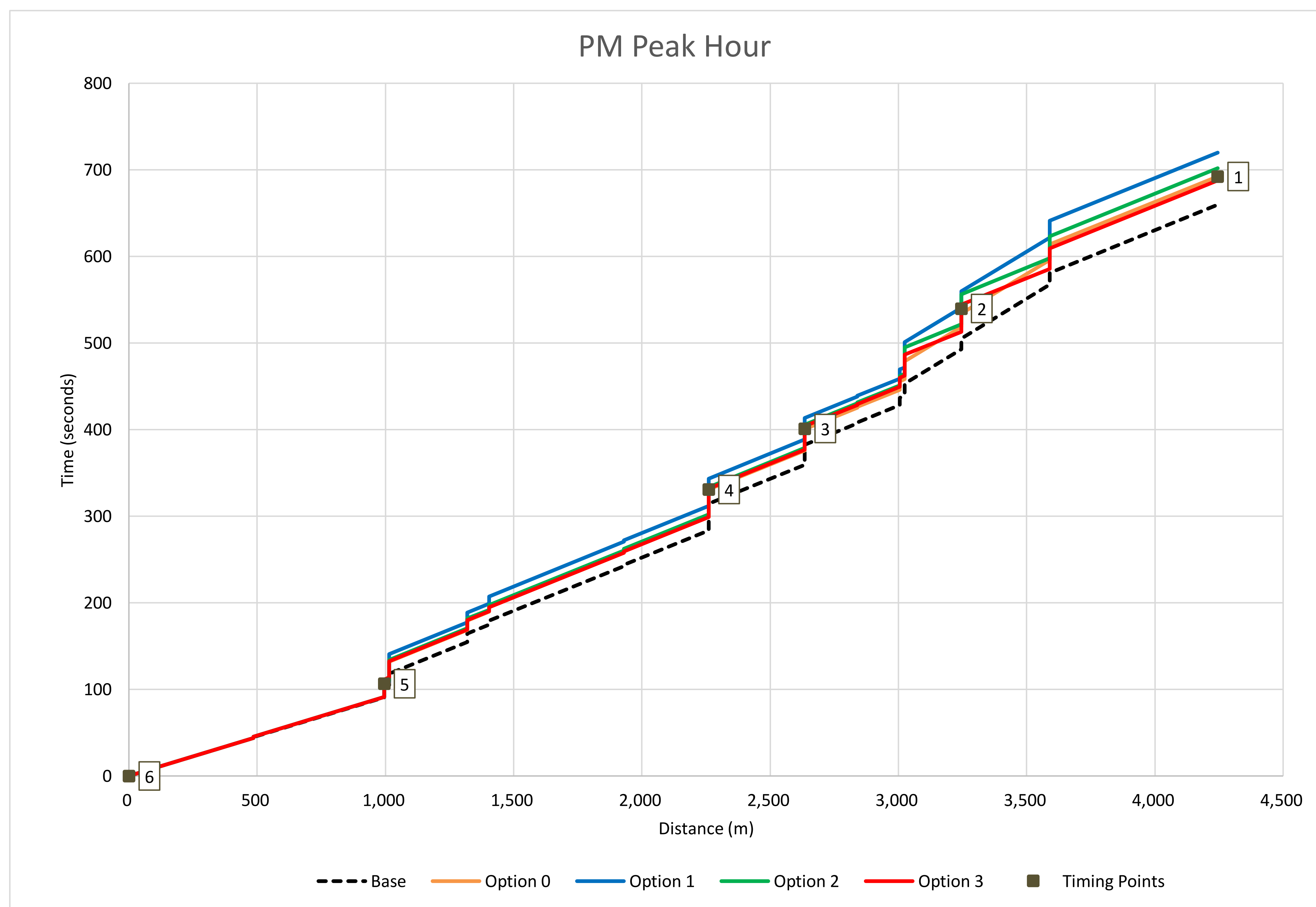




Route: STA8A_WB







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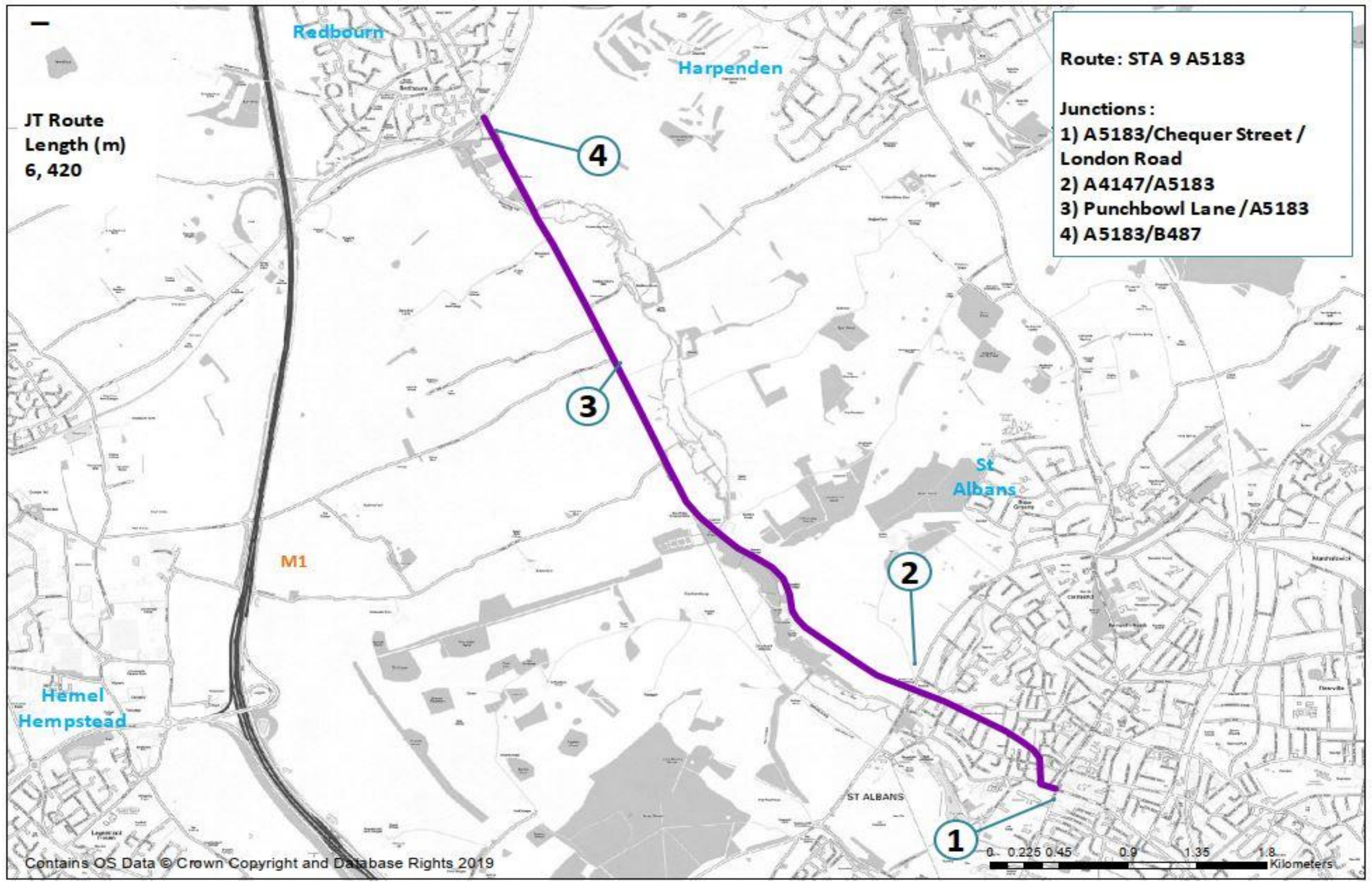

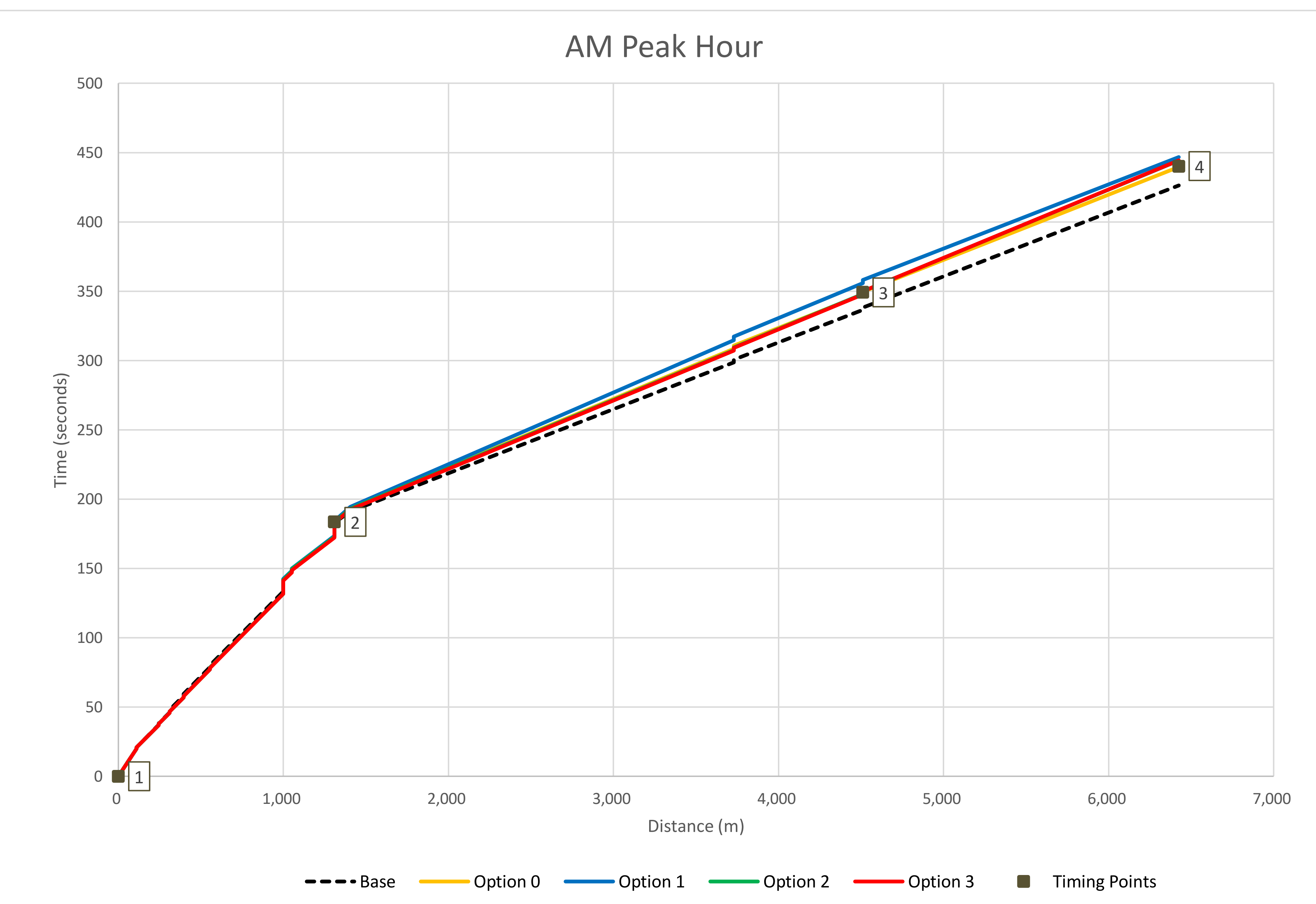

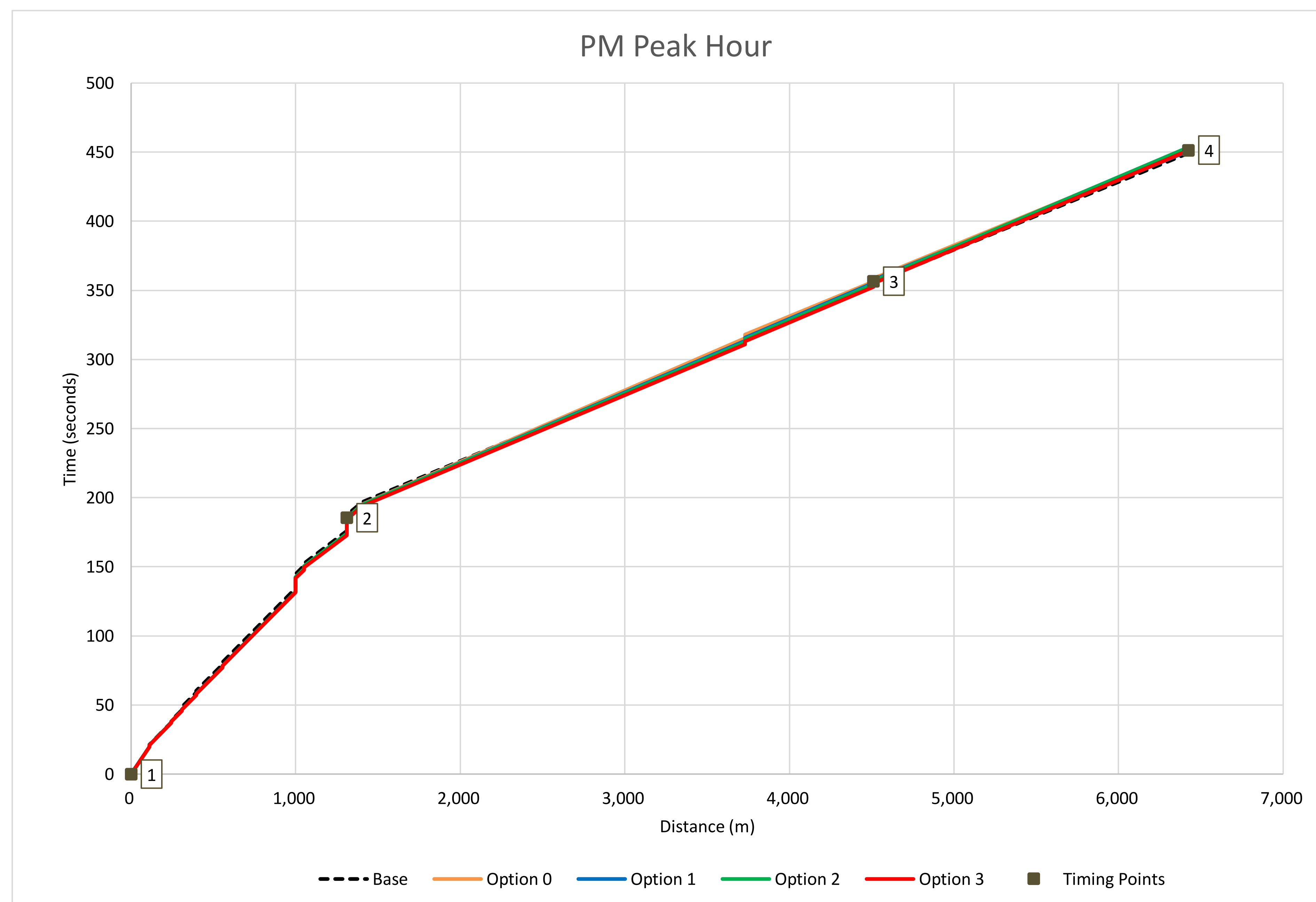

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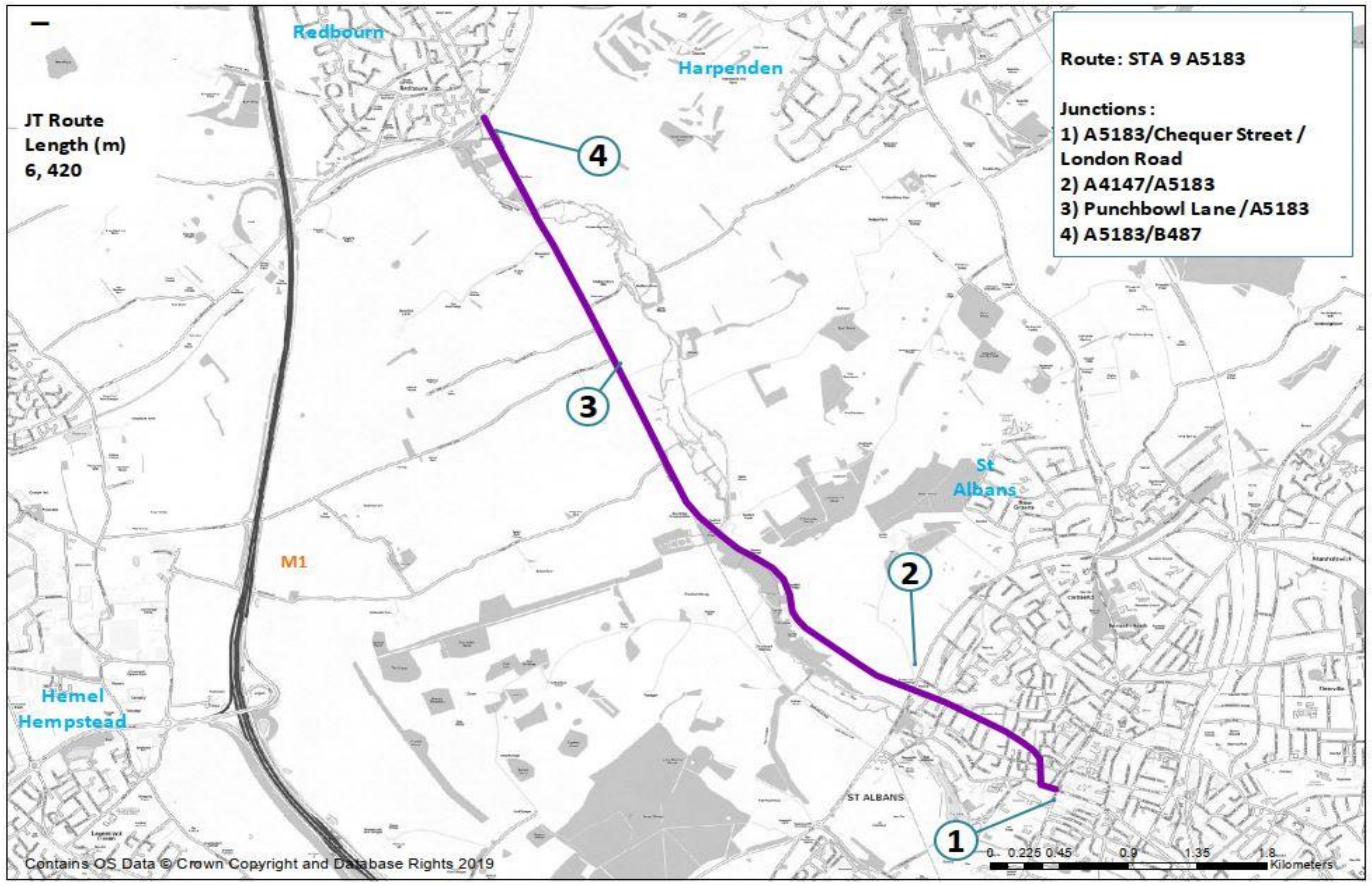

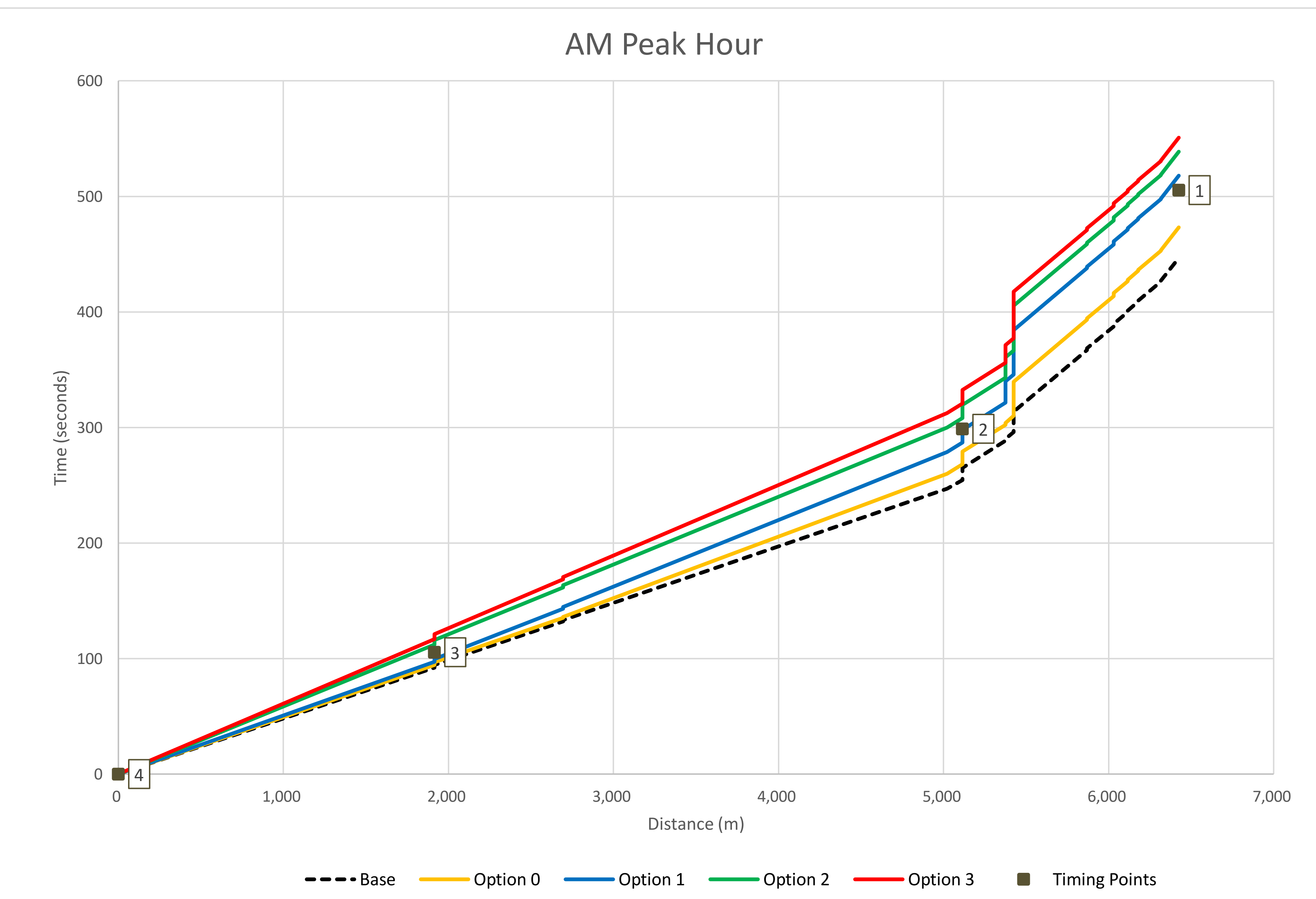

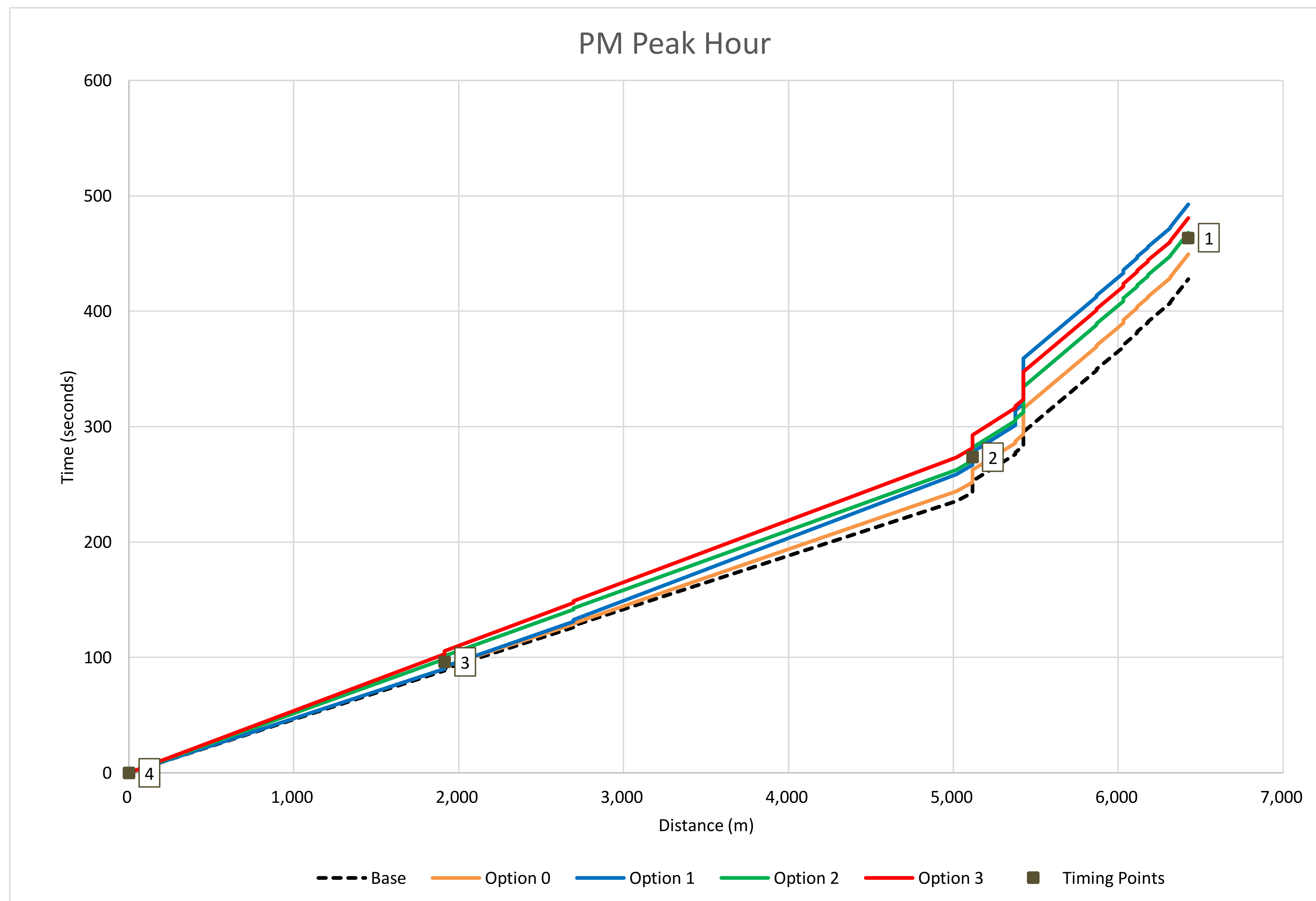

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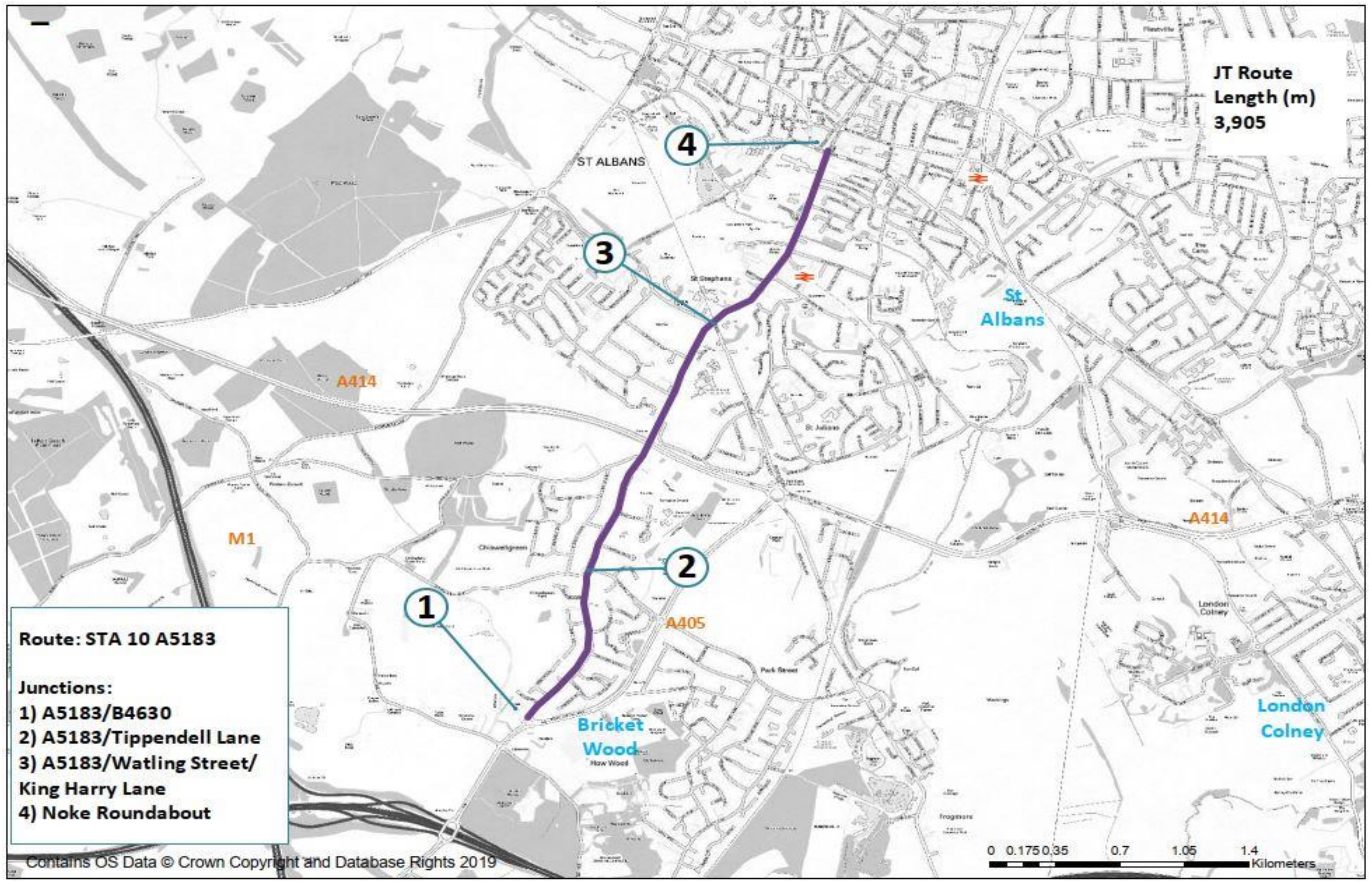

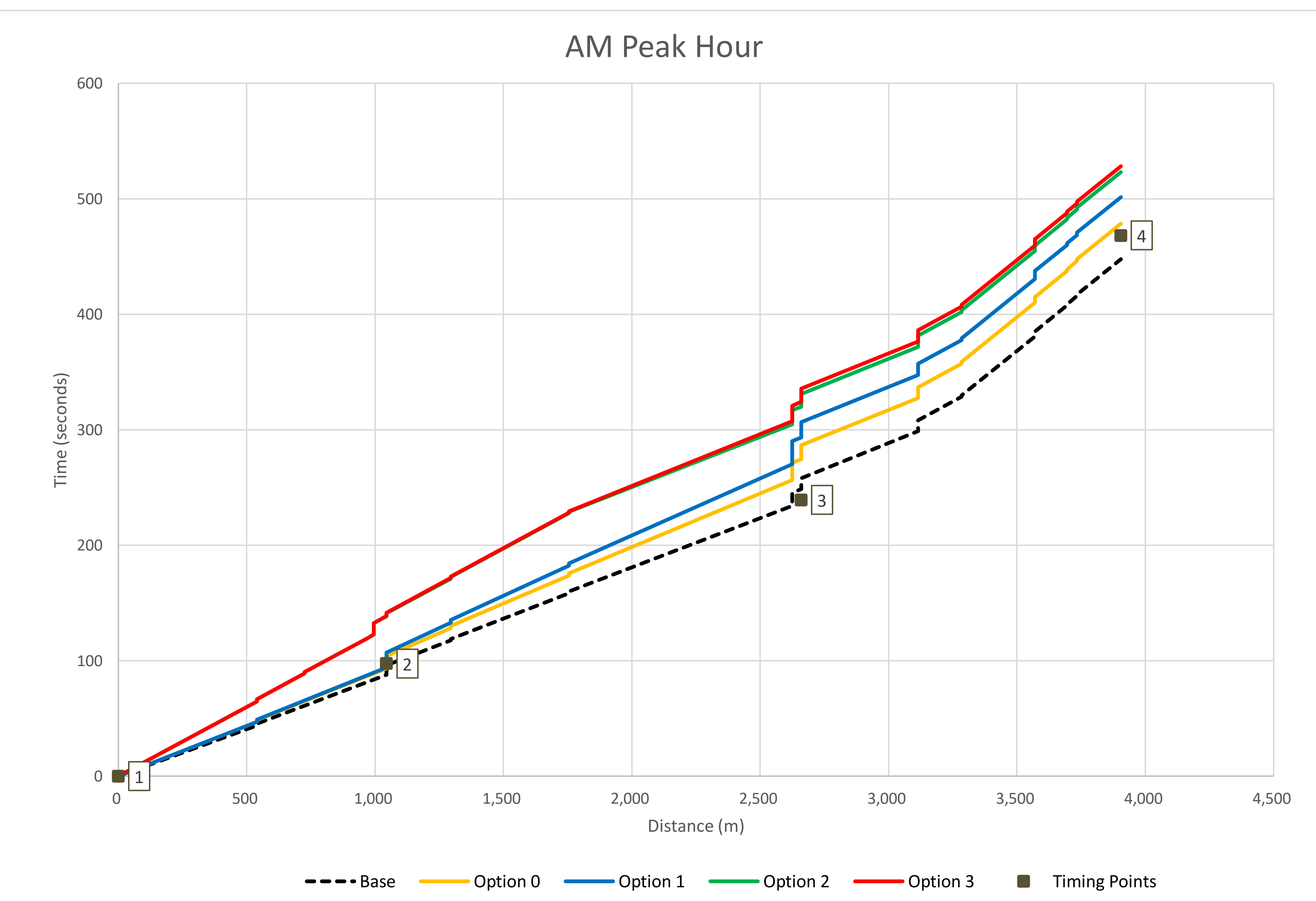

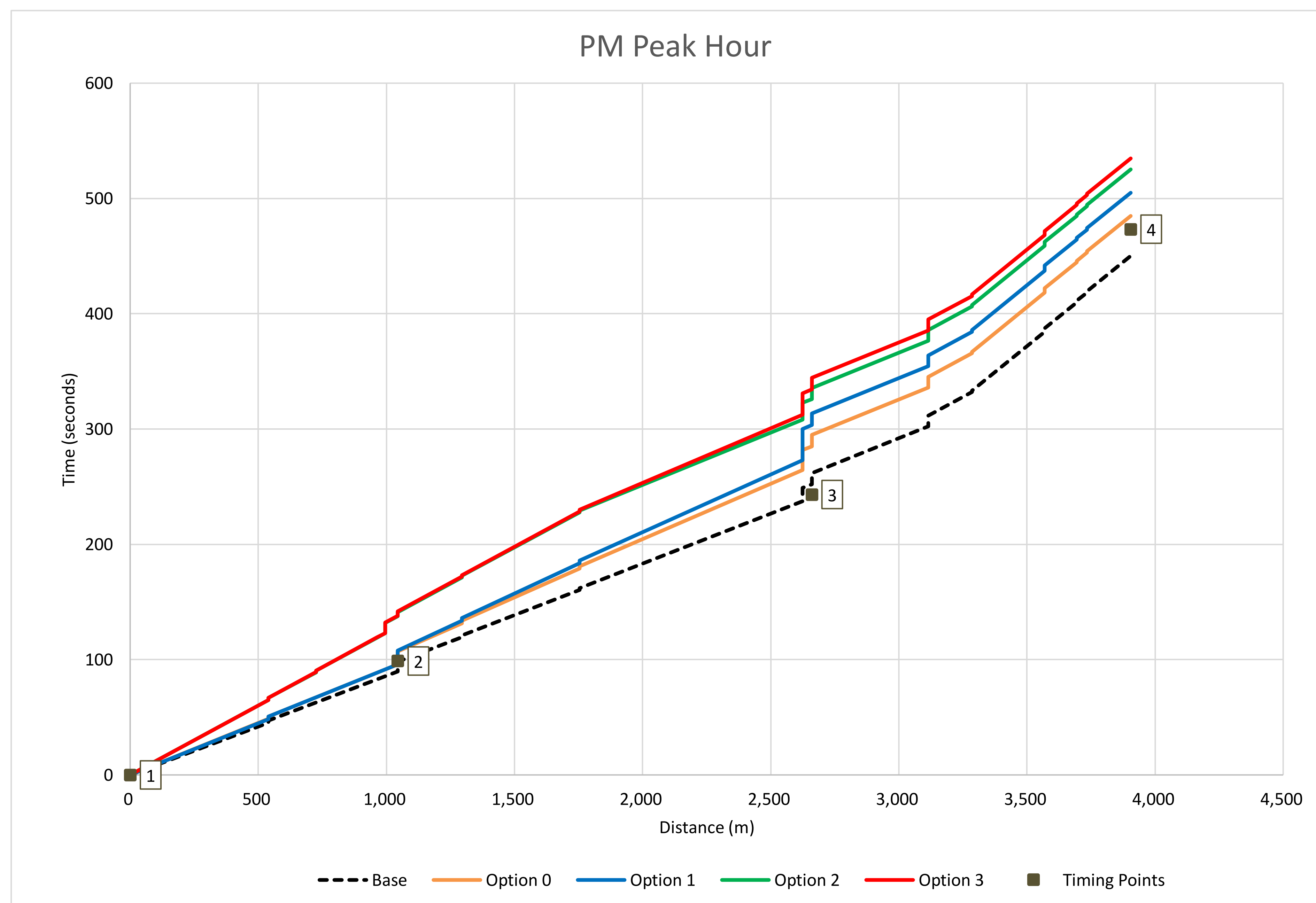

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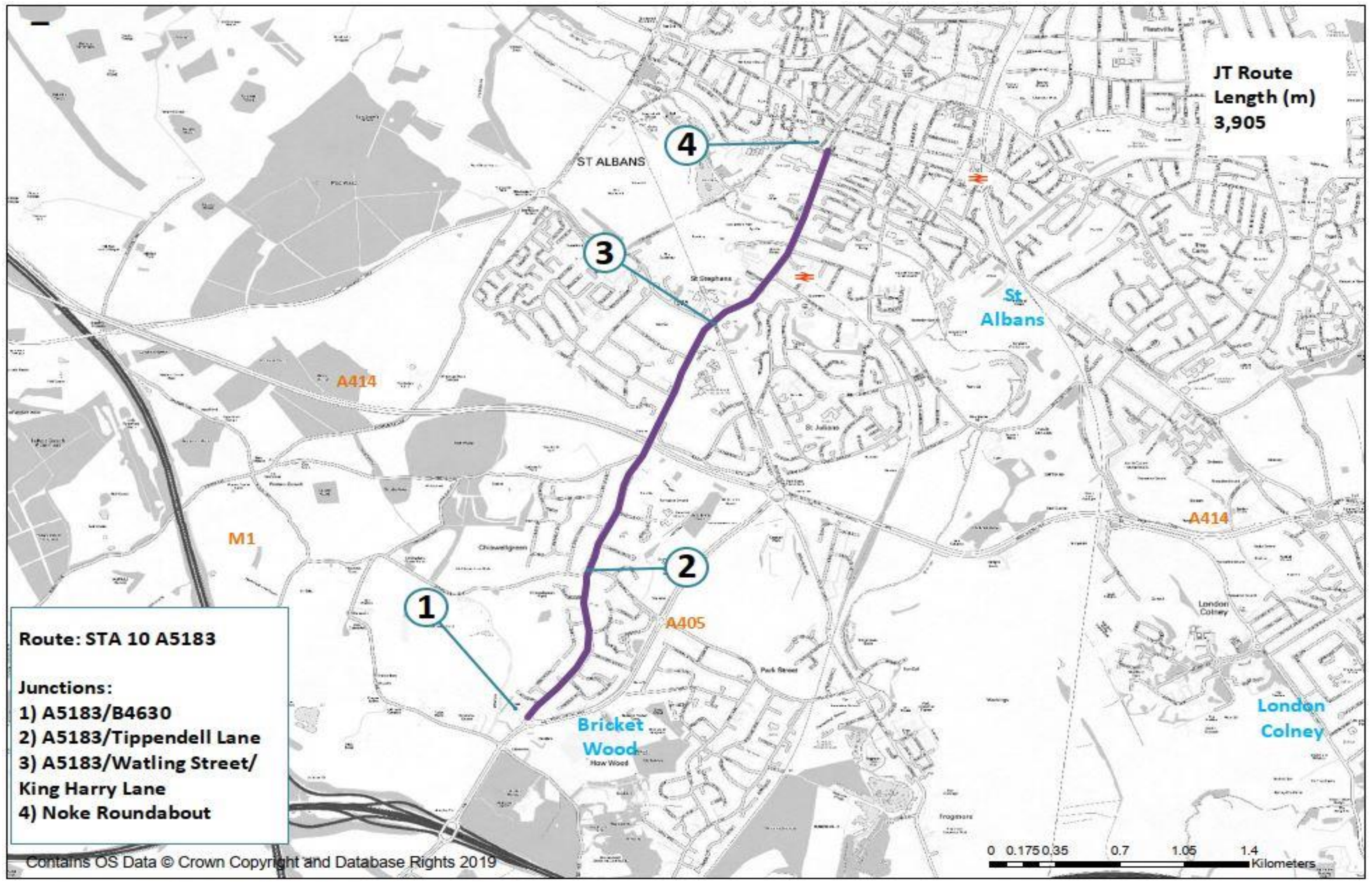

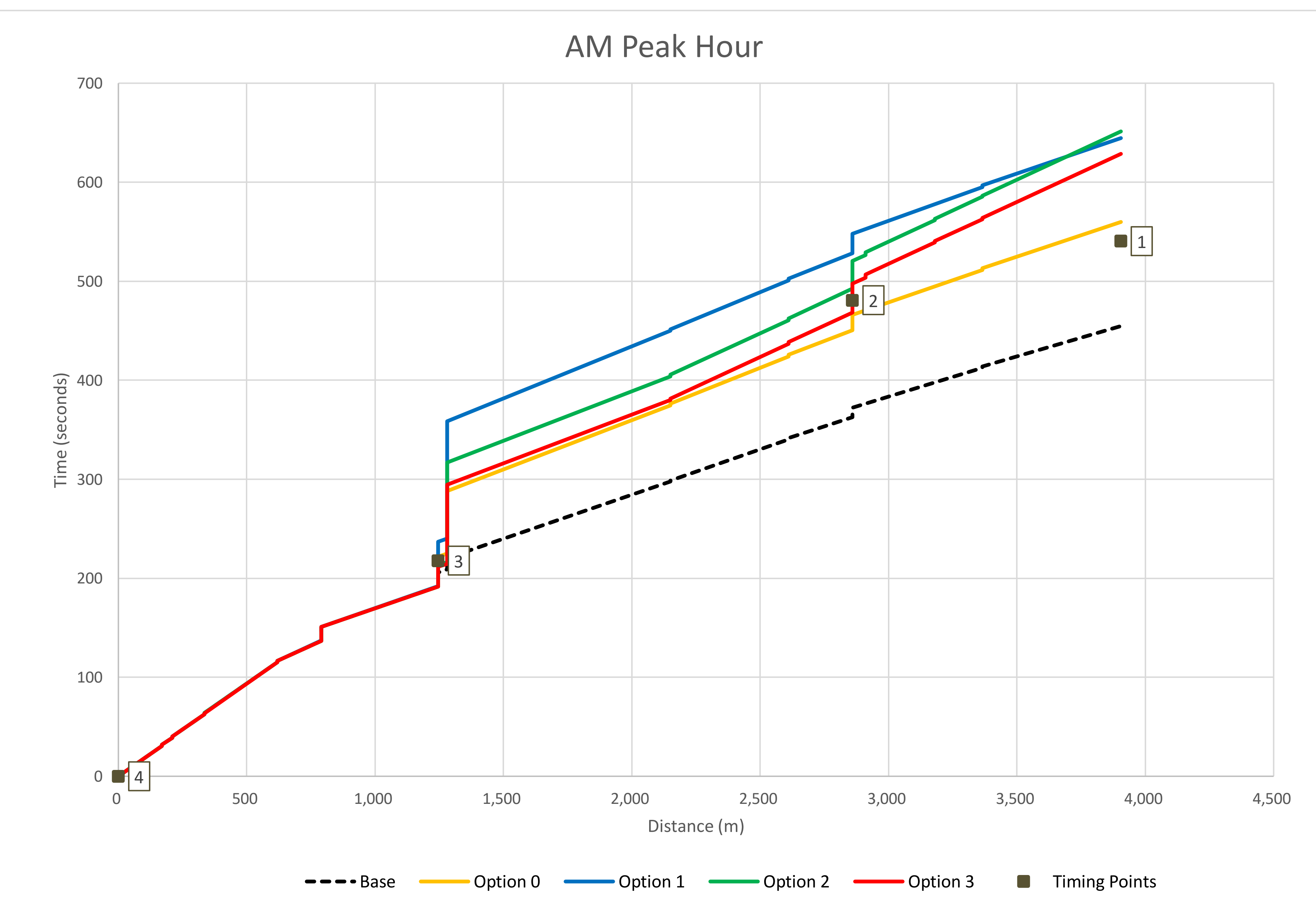

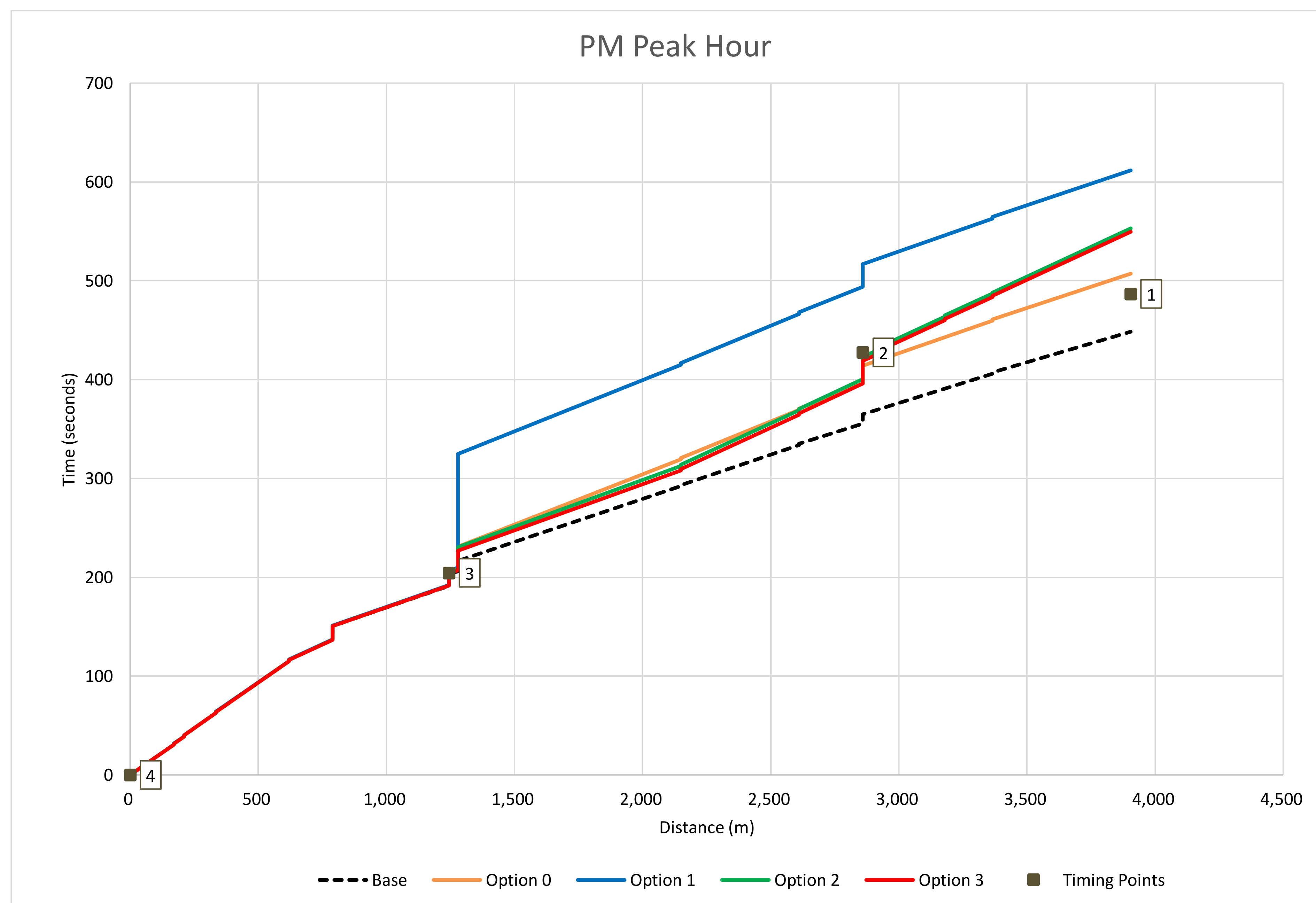

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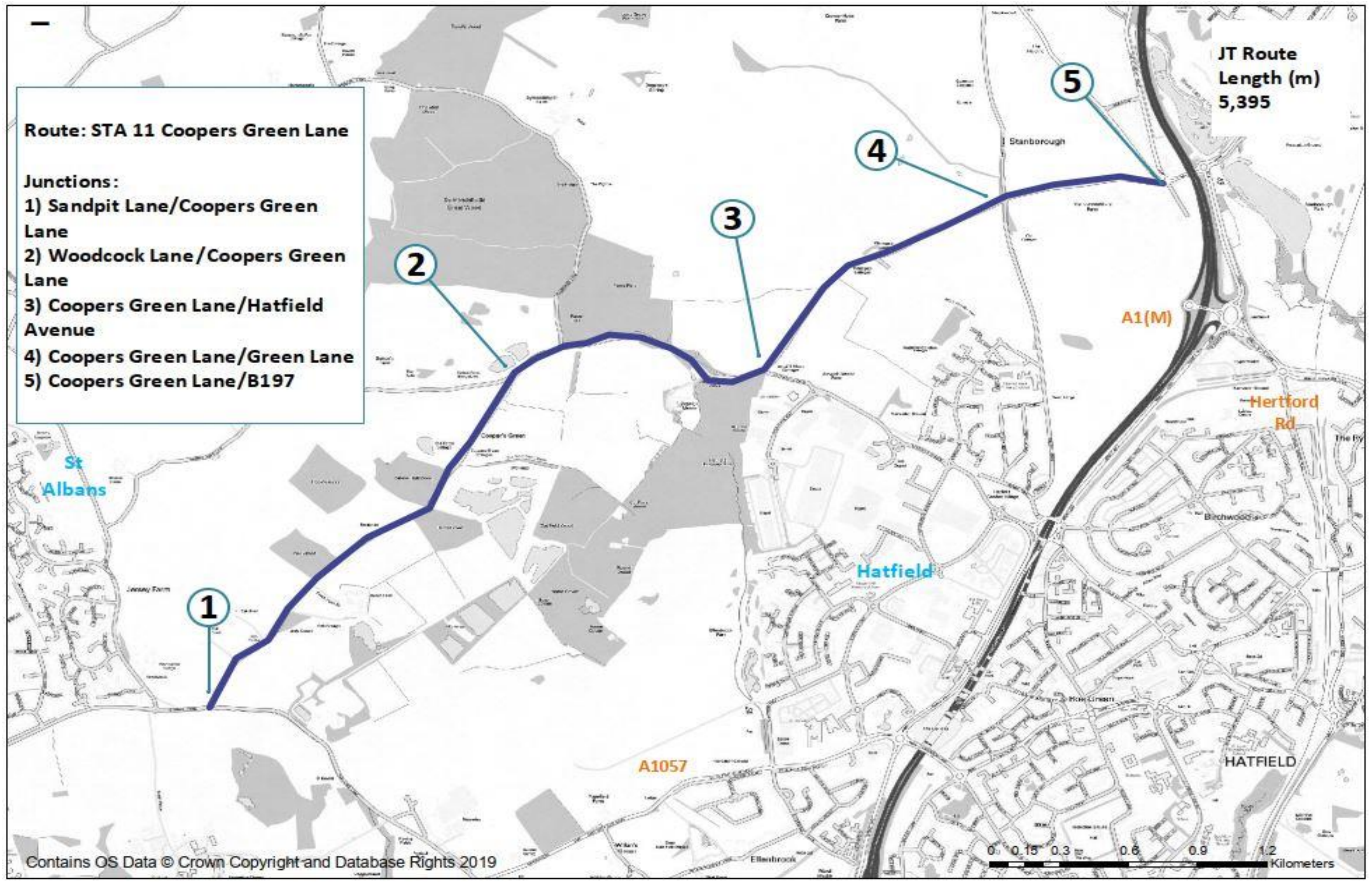

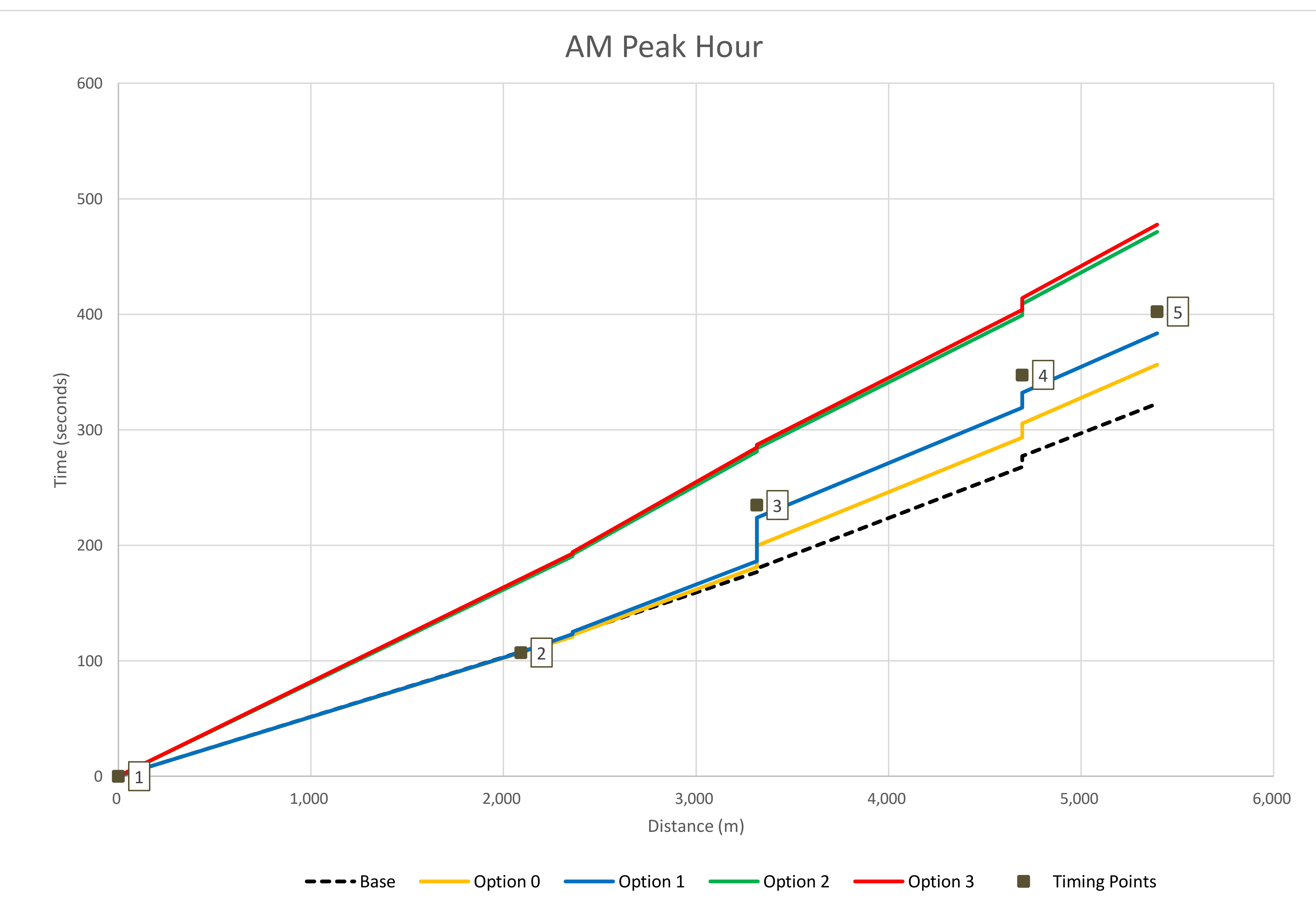

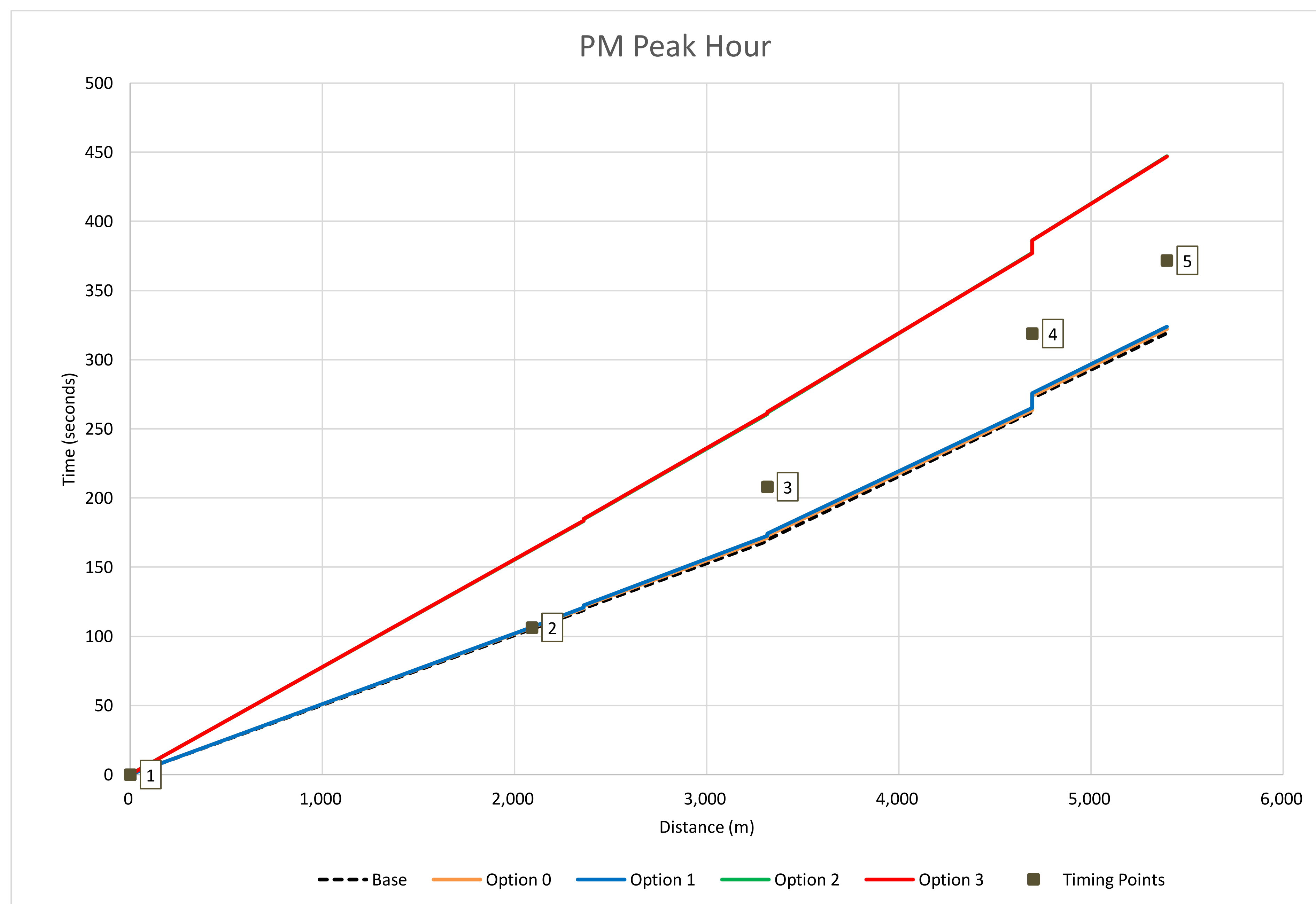

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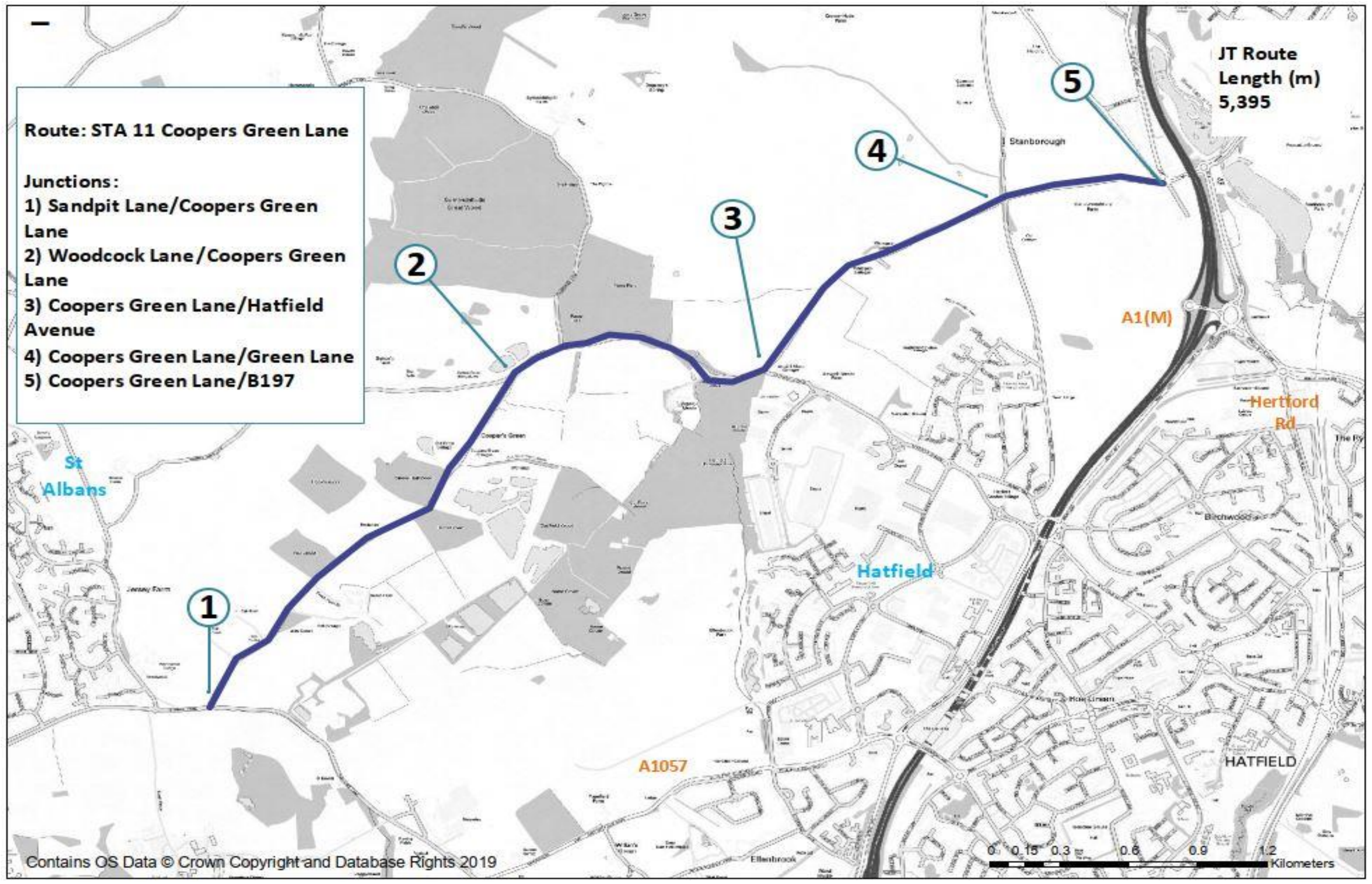

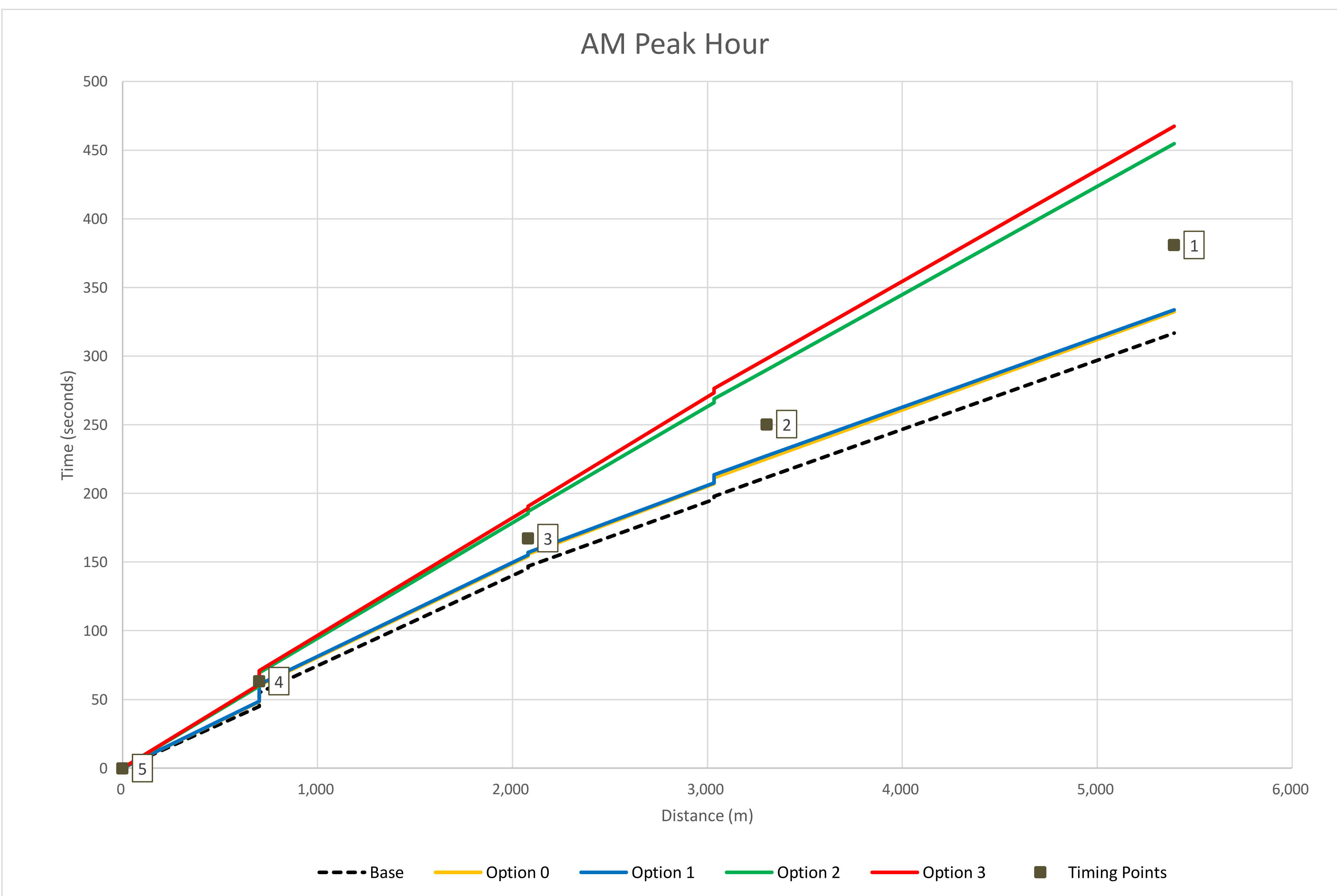

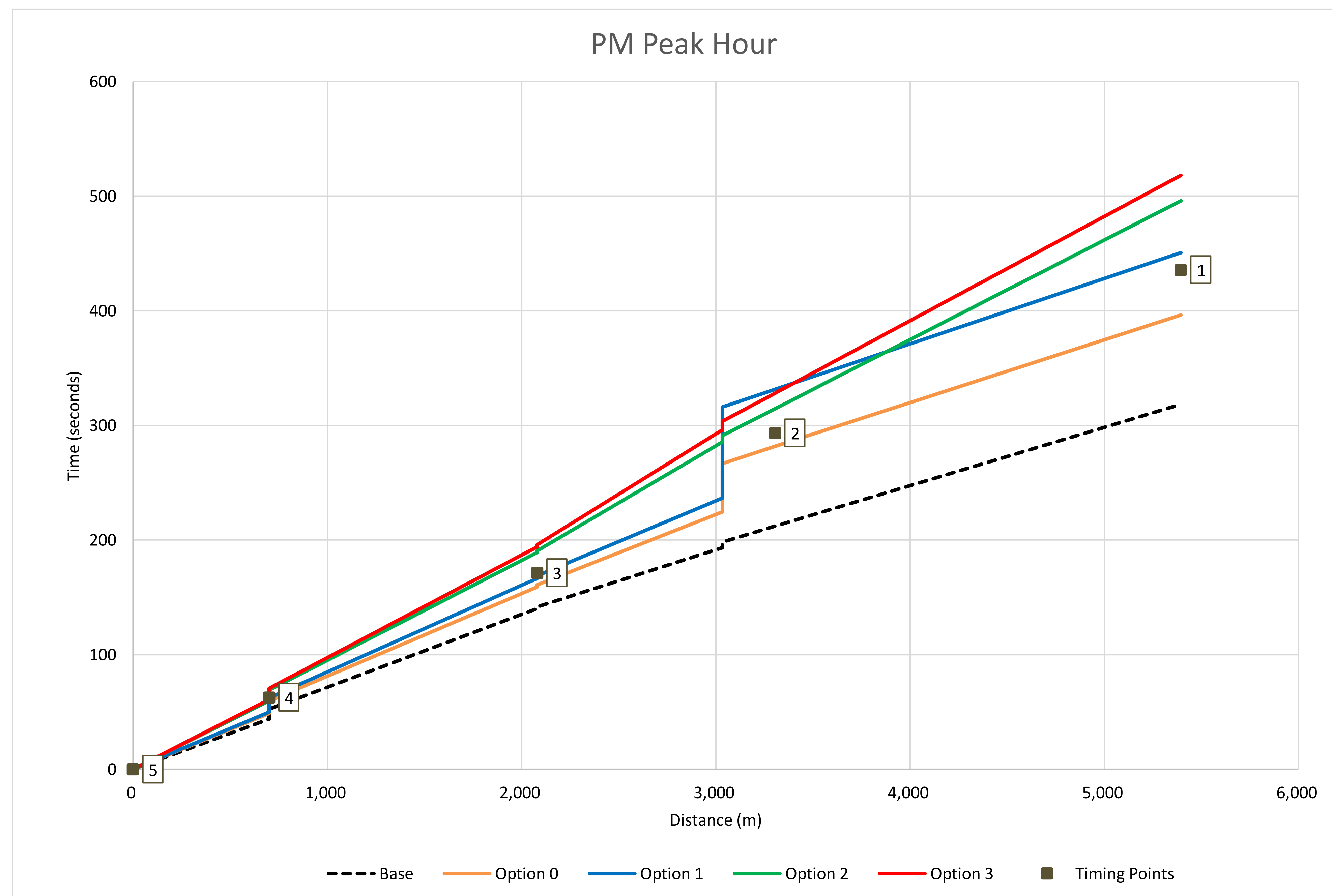

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