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Hertfordshire County Council, Dacorum Borough Council and St Albans District Council

St Albans and Dacorum Combined Local Plans to 2041

Option 4 Traffic Modelling Report

May 2025

Confidential

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Contents

Tables

Figures

Appendices

Appendix H

Impact on SRN Junctions - Figures

Appendix I

HGC Development Trip Distribution Figures

Appendix J

Sensitivity Test on M1 Junction 8

Executive summary

WSP were commissioned by Hertfordshire County Council (HCC) on behalf of Dacorum Borough Council (DBC) and St Albans District Council (SADC) to undertake transport modelling work to assess the combined impact of DBC's and SADC's Local Plan proposals and the proposed upgrade to M1 Junction 8. This report provides the impacts of the combined Local Plan growth on the highway network, especially in the context of Hemel Garden Community development which lies in both the planning authorities. The report also assesses whether a upgrade to M1 Junction 8 is necessary to accommodate the expected growth during the Local Plan period.

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 following sections summarise each chapter of this report including the key findings of the modelling work for each scenario and the overall conclusions.

Introduction

The introduction chapter provides an overview of recent work undertaken by WSP to support the Local Plan Regulation 19 for SADC and DBC, the scenarios developed for the combined assessment, brief overview of the COMET model, details of the M1 Junction 8 upgrade and the purpose and structure of the report. The future year modelled is 2041, reflecting the future year for the new Dacorum Local Plan. The following time periods have been assessed using the model:

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

The options developed are as follows:

- **Option 0A**: 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 Dacorum and St Albans.
- **Option 4a**: This builds on Option 0A by including the Dacorum Local Plan and St Albans Local Plan Allocations along with the proposed IDP mitigation in each area and including the impact of the Opportunity to Shift Mode (OSM) tool assessment in each area but not including the proposed scheme at M1 Junction 8.
- **Option 4b**: This builds on Option 4a by including the proposed scheme at M1 Junction 8.

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 0A, 4a and 4b.

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 0A Assumptions

Option 0A represents all completed and committed developments and transport infrastructure across Hertfordshire between 2014 and 2041. The scenario aligns with the Department for Transport's National Trip End Model (NTEM) growth projections for all districts in Hertfordshire except St Albans and Dacorum.

Planning data for all Hertfordshire districts was provided by Hertfordshire County Council, including all completions and sites granted planning permission from 2014 to 2022 (which was the latest available dataset at the time the work was commissioned). The data was processed to calculate employment numbers from floorspace, allocate sites to model zones, and ensure consistency with previous COMET planning data.

An uplift reflecting additional growth between 2036 and 2041 was applied to the existing COMET model forecasts. This uplift was based on Department for Transport National Road Traffic Projections 2022 (NRTP22).

The forecast network incorporates infrastructure schemes categorized as “near certain” and “more than likely,” in line with DfT guidance TAG Unit M4[1]. Additional schemes in St Albans and Dacorum have been included due to improved certainty.

2041 Option 4a Assumptions

This scenario adds the DBC and SADC Local Plan allocations onto Option 0A, together with the proposed Infrastructure Delivery Plans (IDP) in both areas, and the Opportunity to Shift Mode (OSM) Tool reduction in trips.

This option is a combination of two separate options that were tested for each Local Plan - Option E for Dacorum and Option 3 for St Albans. The results of these can be found in the two separate Local Plan Forecasting Reports on the St Albans and Dacorum Local Plan websites.

[1] \\corp.pbwan.net\GB\Projects\UK0028xxx\UK0028052.3601 - St Albans Dacorum combined LP\03 WIP\TP Transport Planning\05 Reports\Forecasting_Report

The Dacorum Local Plan allocates 13,219 dwellings and 8,776 jobs as part of the Dacorum Local Plan. The St Albans Local allocates 14,417 dwellings and expects to deliver 9,589 jobs. Major sites with more than 300 dwellings or 500 jobs were allocated specific development zones.

Option 4a also includes the transport infrastructure schemes from the Dacorum and St Albans Infrastructure Delivery Plan (IDP). The OSM tool trip reduction applied in this option are the same as those applied in Option C for Dacorum and Option 3 for St Albans.

2041 Option 4b Assumptions

Option 4b only adds the proposed M1 Junction 8 upgrade scheme to the Option 4a, which allows to test the impacts of this upgrade and assess whether this is required to support the impacts of the combined Local Plans.

The scheme involves a new roundabout junction to the east of the M1, directly linking the M1 southbound off-slip and on-slip with a new road over the M1 to link to the proposed new East Hemel Spine Road, now known as the Hamel Garden Communities Sustainable Transport Corridor.

Results

The results chapter provides a comprehensive summary of the main findings derived from the modelling work, as follows.

Option 0A shows that in 2041 that there will be increases in traffic flow and congestion on the Strategic Road Network (SRN) and the local network, as a result of the predicted future year growth in traffic and the completed and committed developments (i.e. those already in the planning system). The impacts in St Albans and Dacorum show very similar results for this option as seen in their individual Local Plans modelling reports (Option 0 for SADC and Option A for DBC).

Option 4a shows the collective impact on the highway network of the Local Plan allocations, IDP schemes and the OSM trip reductions in St Albans and Dacorum. Overall, this option shows an increase in vehicle trips, delays and increases in journey times. Modelling shows increased congestion at junctions such as the A414 Breakspear Way between M1 Junction 8 and Green Lane junction and Redbourn Road approaches at the Three Cherry Lane in Dacorum. Key roads in St Albans also experience increases in congestion such as A414 (North Orbital) eastbound and westbound approaching Colney Heath Lane/Smallford Lane roundabout, A1057 Hatfield Road approaching Station Road roundabout, Batchwood Drive, Sandpit Lane, Potterscrouch Lane and Ragged Hall Lane. Journey times increase in both directions on key routes due to increased traffic.

Most of the impacts in St Albans and Dacorum show very similar results for this option as seen in their individual Local Plans modelling reports (Option 3 for SADC and Option E for DBC), except that due to some network changes, there are a few differences, for example the Dacorum Local Plan does not include the East Hemel spine road.

Option 4b shows the impact of the proposed M1 Junction 8 upgrade. The proposed layout improves accessibility for the Hemel Garden community by providing a direct access to M1 with a new road over the M1 to link to the New East Hemel spine road. This upgrade diverts a traffic away from the Breakspear way/Green Lane junction, reducing congestion. However, the model also forecasts increases of delays on the link road and circulatory links of M1 Junction 8 new roundabout, which is as a result of insufficient capacity at the new M1 Junction 8 southbound on-slip signalised junction causing delay on both circulatory link and A414 Breakspear Way eastbound approach. A sensitivity test has been undertaken to assess the impacts of a widened M1 Junction 8 roundabout to mitigate the delays. The result of this test demonstrates that the delay forecasted in Option 4b can be relieved if such arrangement is possible. The journey times in Option 4b reduces on some routes, particularly the westbound A414 in the AM peak.

Impacts on the Strategic Road Network (SRN)

The impacts on the SRN junctions that are likely to be impacted by the Local Plan growth have also been assessed. This includes M1 Junction 8 and Junction 9, M25 Junction 20, Junction 21A, Junction 22 and Junction 23 and A1(M) Junction 3.

The results have shown there are increases of traffic flow on the SRN as a result of both Local Plans and the M1 Junction 8 upgrade and there are increases in delay at some access points of the SRN and slip roads where further investigation could be considered. The analysis has indicated that M1 Junction 8, M1 Junction 9, M25 Junction 20 and Junction 22 are impacted as a result of the Local Plan allocations and M1 Junction 8 upgrade.

Conclusion

Overall, this report has presented the results of three 2041 future year scenarios, which are:

- 2041 Option 0A – All committed and consented developments and transport schemes
- 2041 Option 4a – Option 0A plus St Albans and Dacorum allocations, IDP schemes and Opportunity to Shift Model tool impacts
- 2041 Option 4b – Option 4a plus M1 Junction 8 scheme

This report has presented the results of three 2041 future year scenarios:

- **Option 0A:** 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 Dacorum and St Albans.
- **Option 4a:** This builds on Option 0A by including the Dacorum Local Plan and St Albans Local Plan Allocations (including all growth within the Hemel Garden Community) along with the proposed IDP mitigation in each area and including the impact of the Opportunity to Shift Mode tool assessment in each area, but not including the proposed scheme at M1 Junction 8.
- **Option 4b:** This builds on Option 4a by including the proposed scheme at M1 Junction 8.

The main findings from the modelling shows that for:

- **Option 4a vs Option 0A**: There is an increase of 0.4-2% in overall vehicle trips and increase in vehicle travel times (11% in AM and 10% in PM) due to impacts of Local Plan allocations and infrastructure schemes.
- **Option 4b vs Option 4a:** Compared with Option 4a, the introduction of M1 Junction 8 upgrade is forecast to lower the AM peak total travel time by 3% because of the delay reduction. However, the capacity constraints in the proposed M1 Junction 8 upgrade

have introduced new delay at the gyratory system with the PM peak's overall travel time increased by 1%.

- **A sensitivity test** has been undertaken to assess the impacts of a widened M1 Junction 8 roundabout to mitigate delays. The results of this test demonstrates that the delay forecasted in Option 4b can be relieved if such an arrangement is assumed and could be delivered. Detailed results are presented in Appendix J.

In general, the forecast results in terms of delay, V/C and journey time show similar patterns as the above network statistics.

The DBC and SADC Local Plan allocations are forecast to generate increased traffic pressure (V/C and delay) as shown in Option 4a. It is clear from the results that to support the Local Plan growth, improvements in infrastructure in Option 4a are required to mitigate against the impact of the proposed developments to ensure the highway network operates effectively. Overall, the model estimates increase traffic pressure and delay on key roads including A414 Breakspear Way, Redbourn Road, Hemel Hempstead Road, East Hemel Spine Road, A41 near Berkhamsted, A414 in London Colney due to the development traffic.

The proposed mitigation measure at M1 Junction 8, as shown in the Option 4b, can relieve the traffic pressure at the congestion hotspots, such as A414/ Green Lane junction, A414 /Maylands Avenue roundabout and M1 Junction 8 as traffic is diverted to the proposed link road between East Hemel Spine Road and M1 Junction 8 roundabout. However, the model also forecasts increases of delays on this link road and circulatory links of M1 Junction 8 new roundabout. Further investigation has shown this is as a result of insufficient capacity at the new M1 Junction 8 southbound on-slip signalised junction causing delay on both circulatory link and A414 Breakspear Way eastbound approach.

Sensitivity testing has been conducted to assess the impacts of a widened M1 Junction 8 roundabout to mitigate the delays. The result of this test demonstrates that the delay forecasted in Option 4b can be relieved if such arrangement is assumed.

The impacts on the SRN junctions that are likely to be impacted by the Local Plan growth have also been assessed. This includes M1 Junction 8 and Junction 9, M25 Junction 20, Junction 21A, Junction 22 and Junction 23 and A1(M) Junction 3.

The results have shown there are increases of traffic flow on the SRN as a result of both Local Plan and the M1 Junction 8 upgrade and there are increases of delay at some access points of the SRN and slip roads where further investigation could be considered. The analysis has indicated that M1 Junction 8, M1 Junction 9, M25 Junction 20 and Junction 22 have shown impacts because of the Local Plan allocations and M1 Junction 8 upgrade.

Apart from M1 Junction 8, the M1 Junction 9 also shows impacts as additional demand estimated in Option 4a is projected to increase the delays on the M1 southbound mainline and southbound on-slip in AM. The M1 Junction 8 upgrade causes additional delays on these links due to increased traffic on M1 as shown in Option 4b.

Delay increases are also forecast at M25 Junction 20 and Junction 22 due to additional demand predicted in Option 4a and 4b. However further assessment has shown that these junctions are already near or over-capacity in Option 0a. The additional demand in Option 4a and 4b exacerbate the congestion and causes additional delays.

1 Introduction

1.1 Overview

1.1.1. WSP were commissioned by Hertfordshire County Council (HCC) on behalf of Dacorum Borough Council (DBC) and St Albans District Council (SADC) to undertake transport modelling work to assess the combined impact of DBC's and SADC's Local Plan proposals and the proposed upgrade to M1 Junction 8.

1.1.2. WSP have previously been commissioned to undertake separate option tests of St Albans District and Dacorum Borough Councils Local Plan allocations. These were run with and without mitigation from the respective Infrastructure Delivery Plans and reported in separate reports.

1.1.3. The options that have been tested in the separate Local Plan assessments are as follows:

St Albans Local Plan

- Option 0: Future year 2041 with committed growth in St Albans
- Option 1: Future year 2041 with committed growth plus Local Plan allocations (no mitigation)
- Option 2: Future year 2041 with committed growth plus Local Plan allocations plus 10% mode shift and mitigations from IDP (where they can be modelled)
- Option 3: As Option 2 but with mode shift more nuanced taken from the Opportunity to Shift Mode work

Dacorum Local Plan

- Option A: Future year 2041 with committed growth in Dacorum
- Option B: Future year 2041 with committed growth plus Local Plan allocations (no mitigation)
- Option C: Future year 2041 with committed growth plus Local Plan allocations plus nuanced mode shift taken from the Opportunity to Shift Mode work
- Option D: As Option C plus mitigation measures from AECOM transport study (where they can be modelled)
- Option E: As Option D plus nuanced mode shift taken from the Opportunity to Shift Modes work

1.1.4. The Hemel Garden Community growth area (HGC) straddles both Dacorum and St Albans and is made up of Local Plan allocations from each authority. Although the separate parts of the growth area were included in the respective Local Plan assessment, it is anticipated that the Local Plan hearings will cover both areas so there is a need to understand how the totality of growth in each location will work and its impact on the transport network.

1.1.5. In addition, none of these tests have included the potential major junction upgrade to M1 Junction 8, but a key issue for the Local Plans is also whether a major upgrade to M1 Junction 8 is required during the Local Plan period.

1.1.6. Further tests using the full COMET model have therefore been undertaken, based on a combination of the scenarios tested for each district/borough.

1.1.7. 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 M1 Junction 8 Upgrade

1.2.1. There is a proposed potential upgrade to M1 Junction 8, explained in detail within Chapter 6 that is likely to have an impact on the traffic flows in the area. The scheme involves a new roundabout junction to the east of the M1 Junction 8, directly linking the M1 southbound off-slip and on-slip with a new road over the M1 to link to the new East Hemel Spine Road.

1.3 Scenarios

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

- **Option 0A**: 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 Dacorum and St Albans. This option is a combination of St Albans Option 0 and Dacorum Option A).
- **Option 4a**: This builds on Option 0A by including the Dacorum Local Plan and St Albans Local Plan Allocations (including all growth within the Hemel Garden Community). It also includes the proposed IDP mitigation and the impact of the Opportunity to Shift Mode tool assessment in each area. The proposed scheme at M1 Junction 8 is not included. This option is a combination of St Albans Local Plan Option 3 and Dacorum Local Plan Option E.
- **Option 4b**: This builds on Option 4a by including the proposed scheme at M1 Junction 8, to test the impact of the scheme on the surrounding network.

1.3.2. Further details relating to these scenarios can be found in Chapter 2 for an overview of the scenarios and Chapters 4 to 6 of all the assumptions used to develop each option.

1.4 Background to COMET Model

1.4.1. 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.

1.4.2. 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

1.4.3. 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.

1.4.4. 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.

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

1.4.6. 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 and trip rates.

1.4.7. 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.

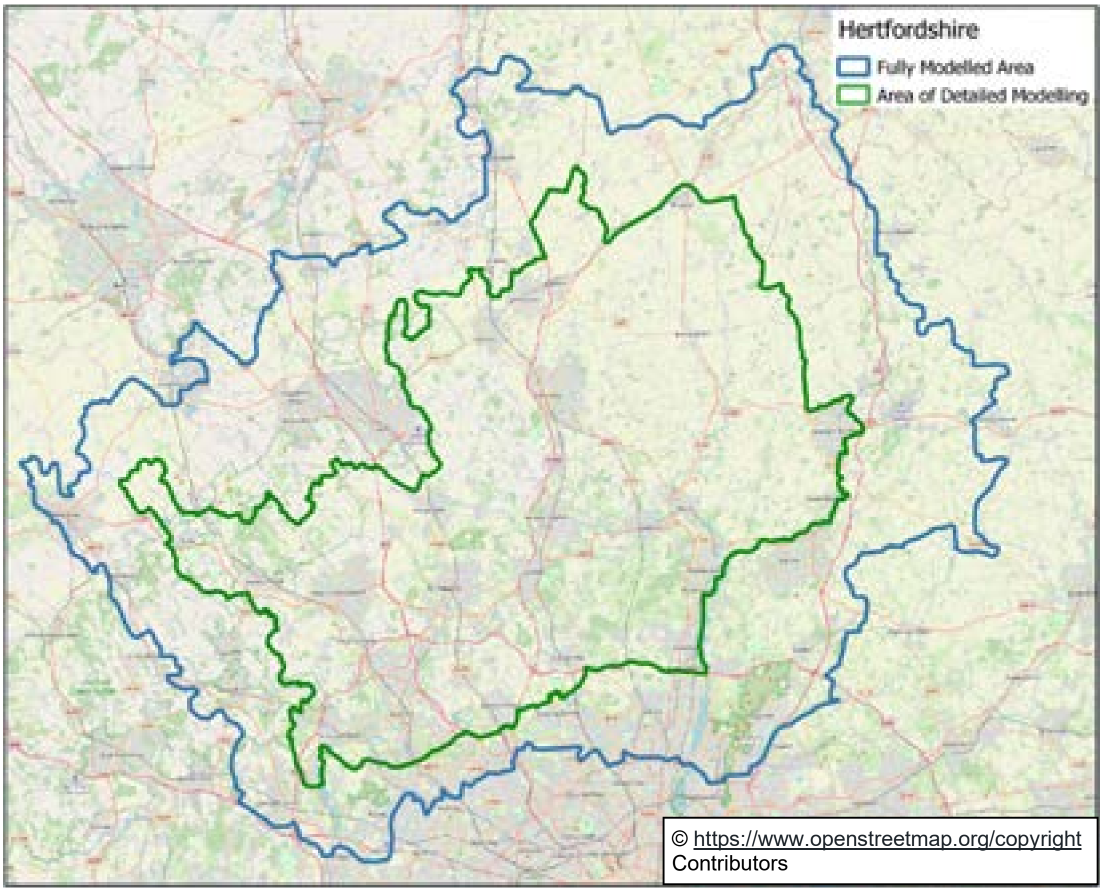

Figure 1-1: COMET Model Extent

1.5 Purpose of the Report

1.5.1. The purpose of this report is to document the forecast modelling process used to assess the combined impacts of the DBC and SADC Local Plan development sites as well as the proposed M1 Junction 8 upgrade. It outlines the methodology for the development of the forecast matrices and networks and details of the proposed developments modelled and presents the results. The analysis within this Forecasting Report has been undertaken to support the Local Plan development process and assess whether a major upgrade to the M1 Junction 8 is required to mitigate the impacts of the Local Plan development sites.

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 combined DBC and SADC Regulation 19 Local Plan sites and the proposed upgrade of M1 Junction 8. This report is structured as follows:

- **Chapter 2: Future Year Scenarios**
- **Chapter 3: COMET Model Forecast Methodology**
- **Chapter 4: 2041 Option 0A Assumptions**
- **Chapter 5: 2041 Option 4a Assumptions**
- **Chapter 6: 2041 Option 4b Assumptions**
- **Chapter 7: Modelling Results**
- **Chapter 8: Conclusions**

2 Future Year Scenarios

2.1 Future Year

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

2.2 Time Periods

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

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

2.3 Scenarios

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

- **Option 0A**: 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 Dacorum and St Albans.
- **Option 4a**: This builds on Option 0A by including the Dacorum Local Plan and St Albans Local Plan Allocations along with the proposed IDP mitigation in each area. This option also includes the impact of the Opportunity to Shift Mode tool assessment in each area, but does not include the proposed scheme at M1 Junction 8.
- **Option 4b**: This builds on Option 4a by including the proposed scheme at M1 Junction 8.

2.3.2. An overview of what is included in each scenario is also shown in Table 2-1.

Table 2-1: Scenario Overview

Scenario element	Option 0A	Option 4a	Option 4b
Completed / Consented developments (NTEM constrained except in DBC and SADC)	Yes	Yes	Yes
Dacorum and St Albans Local Plan development growth	No	Yes	Yes
Dacorum and St Albans IDP Schemes	No	Yes	Yes
Opportunity to Shift Mode reductions	No	Yes	Yes
Improvements at M1 Junction 8	No	No	Yes

2.3.3. Details of how each scenario was developed, including information on inputs and assumptions is provided in Chapters 4 to 6.

3 COMET Model Forecast Methodology

3.1 Forecast Objectives

3.1.1. 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 Dacorum, in their respective scenarios.

3.1.2. 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.

3.2 Model Time Periods

3.2.1. 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

3.2.2. 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)

3.2.3. 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.

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

3.3 Treatment of Variable Demand

3.3.1. 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.

3.4 Model Structure

3.4.1. The structure of the forecasting process, including the interaction between the demand models and assignment models is shown in Figure 3-1.

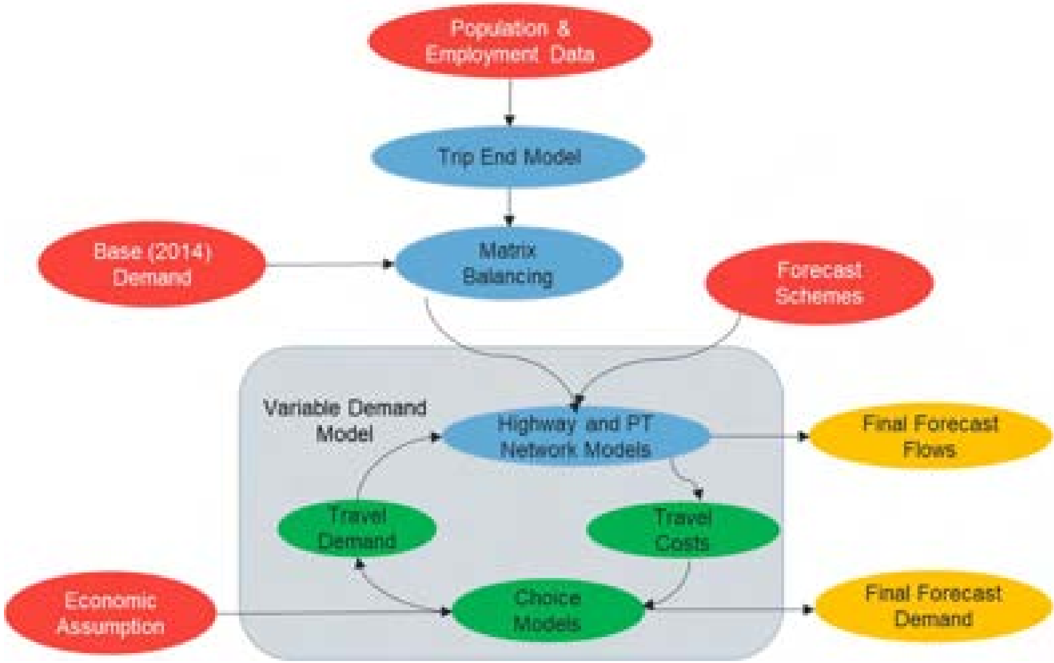

Figure 3-1: Model Structure

3.4.2. 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 4 to 6.

3.4.3. 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.

3.5 COMET Trip End Model

3.5.1. 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.

3.5.2. 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.

4 2041 Option 0A Assumptions

4.1 Overview

4.1.1. 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 Dacorum and St Albans.

4.1.2. This option is a combination of Option 0 that was modelled for the St Albans Local Plan and Option A that was modelled for the Dacorum Local Plan.

4.2 Planning Data - Hertfordshire

Data Received

4.2.1. 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

4.2.2. 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

4.2.3. 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 4-1. For user classes that were not available in the Employment Density Guide (EDG), the factors were calculated using TRICS data.

Table 4-1: 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

4.2.4. 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 Dacorum and St Albans are shown in Table 4-2 and a full list of all development zones (including those in other districts) is provided in Appendix A.

Table 4-2: Committed Sites with Development Zones in Dacorum and St Albans

Zone Number	Planning Reference	Site Name	District	Number of dwellings	Number of jobs
9018	4/02539/16/MOA	SPENCERS PARK PHASE 2, LAND BETWEEN, THREE CHERRY TREES LANE AND CHERRY TREE LANE, HEMEL HEMPSTEAD	Dacorum	357	0
9034	4/03266/18/MFA	LA3, Land At West Hemel Hempstead, Hemel Hempstead	Dacorum	1145	0
9126	4/00064/17/MFA	MAYLANDS GATEWAY, MAYLANDS AVENUE, HEMEL HEMPSTEAD, HP2 4FQ	Dacorum	0	504
9127	4/03355/14/MFA	LIBRARY AND ADJACENT LAND, COMBE STREET, HEMEL HEMPSTEAD	Dacorum	0	644
9163	21/04352/MFA	Unit 4 The Hub, Paradise, Hemel Hempstead, HP2 4TF	Dacorum	0	718
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	0
9110	5/2016/3006	Proposed Rail Freight, North Orbital Road, Chiswell Green	St Albans	0	4095
9136	5/2016/0264	St Albans Retail Park, Griffiths Way, St Albans, AL1 2RJ	St Albans	0	631
9166	5/2020/1773	Civic Centre Opportunity Site (South), Victoria Street, St Albans	St Albans	0	620

Summary (before constraining)

4.2.5. The total number of dwellings and jobs included in the planning data is shown in Table 4-3.

Table 4-3: 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

4.2.6. The number of dwellings and jobs was constrained to NTEM at a Hertfordshire County level but not including Dacorum and St Albans. The planning data for Dacorum and St Albans was excluded from the constraining process to accurately model the known planning data in these districts. This is standard practice in line with DfT guidance, which retains the integrity of the Dacorum and St Albans planning data which is more accurate than NTEM predictions.

4.2.7. Thus, the total number of dwellings and jobs for Hertfordshire without Dacorum and St Albans (so over 8 districts) was constrained to the NTEM total for those districts. The number of dwellings needed to be decreased by 5,923 dwellings and the number of jobs increased by 8,785 jobs to match the NTEM total. The constraint was applied in a way that preserves the planning data totals as far as possible.

4.2.8. 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 six districts proportional to the size of the district, so larger districts have a larger reduction.

4.2.9. For jobs the increase was not applied to Broxbourne, Stevenage or Watford 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)

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

Table 4-4: Dwellings Summary after Constraining

District	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	5,751	-656
Dacorum	7,133	8,392	1,259	8,392	0
East Hertfordshire	10,237	11,515	1,278	9,384	-2,131
Hertsmere	3,030	4,354	1,324	3,723	-631
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	4,157	-785
Three Rivers	2,482	3,079	597	2,562	-517
Watford	5,780	7,185	1,405	5,981	-1,204
Welwyn Hatfield	8,970	7,117	-1,853	7,117	0
Hertfordshire	**57,493**	**64,552**	**7,059**	**58,629**	**-5,923**

Table 4-5: **Jobs Summary after Constraining**

District	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	5,798	0
East Hertfordshire	8,415	4,825	-3,590	6,794	1,969
Hertsmere	6,584	4,097	-2,487	5,637	1,540
North Hertfordshire	7,558	2,094	-5,464	3,862	1,768
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	6,186	1,188
Watford	8,545	8,931	386	8,931	0
Welwyn Hatfield	9,922	5,470	-4,453	7,791	2,321
Hertfordshire	**77,124**	**63,547**	**-13,578**	**72,332**	**8,785**

4.3 Planning Data – Outside Hertfordshire

4.3.1. Outside Hertfordshire no specific data on sites within the planning system was available so housing and employment growth was taken directly from the national government forecasts in NTEM 8.

4.4 Goods Vehicle Demand

4.4.1. 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 4-6 were applied to cells within the LGV and HGV matrices. These factors are based on vehicle kilometre projections for the Southeast 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 4-6: Goods Vehicle uplift factors for 2036-41 based on NRTP22

Vehicle type	NRTP22 Vehicle Kilometres (billions) in 2036	NRTP22 Vehicle Kilometres (billions) in 2041	Uplift Factor 2036 to 2041
LGV	11.185	11.986	1.072
HGV	2.761	2.840	1.029

4.5 Transport Infrastructure

4.5.1. The forecast network for Option 0A 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" in line 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 and also include schemes which have been completed since the model base year (2014).

4.5.2. In addition to the above schemes, a selection of infrastructure schemes situated in St Albans district and Dacorum borough are also included for Option 0A forecast network due to their improved certainty status since the COMET 7 Update in 2022. These schemes are summarised in Table 4-7. It should be noted that in the St Albans area the scheme list includes some bus priority measures developed through the Bus Service Improvement Plan (BSIP) - at the time of testing these were assumed to go forward but are now on hold due to lack of support during the public consultation process.

4.5.3. 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 4-7: Additional Infrastructure Schemes Incorporated in Option 0A

HCC Reference	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 London 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
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	Revisions to frequency, routing and service patterns	Hertfordshire/ Cross District
Bus route 390	Revisions to frequency, routing and service patterns	Hertfordshire/ Cross District
Bus route 724	Revisions to frequency, routing and service patterns	Hertfordshire/ Cross District

4.6 Generalised Cost Parameters

4.6.1. The generalised cost parameters used in the forecast models are from 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.

4.6.2. The generalised cost parameters adopted for the 2036 forecast year is shown in Table 4-8. 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 4-8: Generalised Cost Values 2041

User Class	VOC (PPK) AM	VOC (PPK) IP	VOC (PPK) PM	VOT (PPM) AM	VOT (PPM) IP	VOT (PPM) 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

5 2041 Option 4a Assumptions

5.1 Overview

5.1.1. This scenario adds the DBC and SADC Local Plan allocations onto Option 0A, together with the proposed Infrastructure Delivery Plans (IDP) in both areas, and the Opportunity to Shift Mode (OSM) Tool reduction in trips.

5.1.2. This option is a combination of two separate options that were tested for each Local Plan - Option E for Dacorum and Option 3 for St Albans.

5.2 Local Plan Allocations – Dacorum

5.2.1. A list of the Local Plan allocations in Dacorum was provided by DBC. 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. The locations of the sites are shown in Figure 5-1 and Figure 5-2 for dwellings and employment respectively. In total, 13,219 dwellings and 8,776 jobs have been allocated as part of the Dacorum Local Plan. 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).

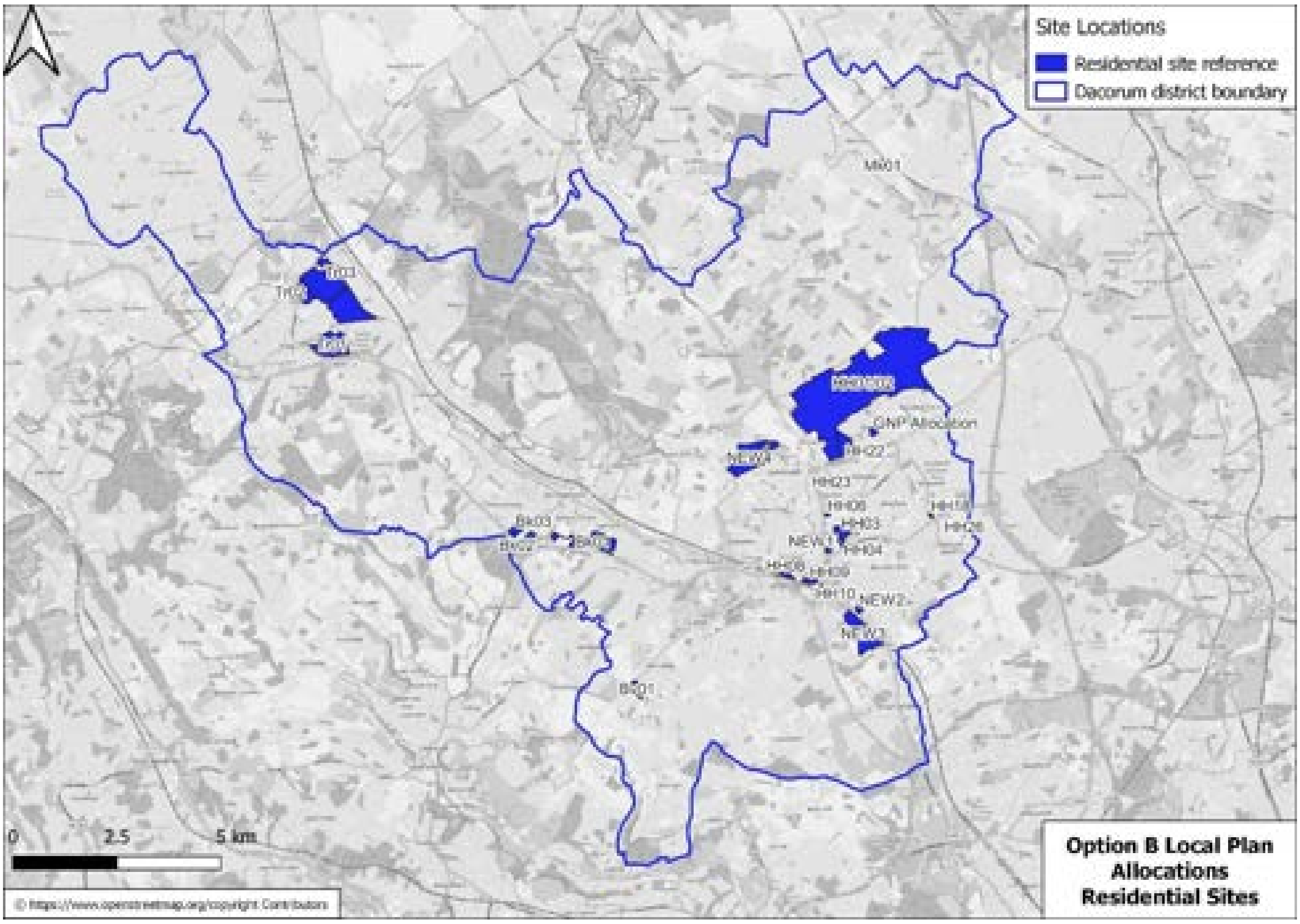

Figure 5-1: Location of Dacorum Local Plan Residential Sites

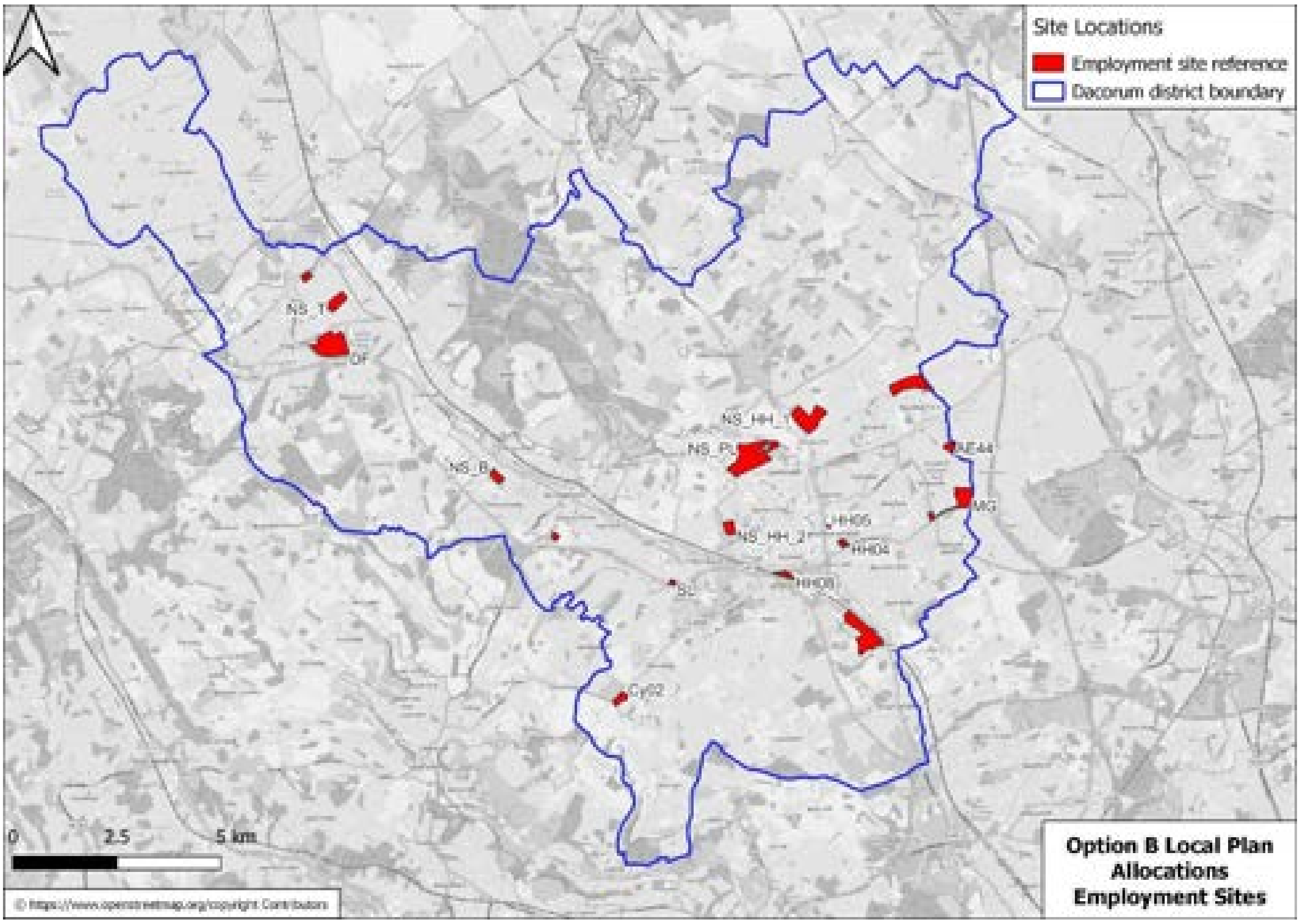

Figure 5-2: Location of Dacorum Local Plan Employment Sites

5.3 Local Plan Allocations – St Albans

5.3.1. A list of the Local Plan allocations 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 D and Appendix E. In total, 14,417 dwellings and 9,589 jobs have been allocated as part of the St Albans Local Plan. 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 5-1.

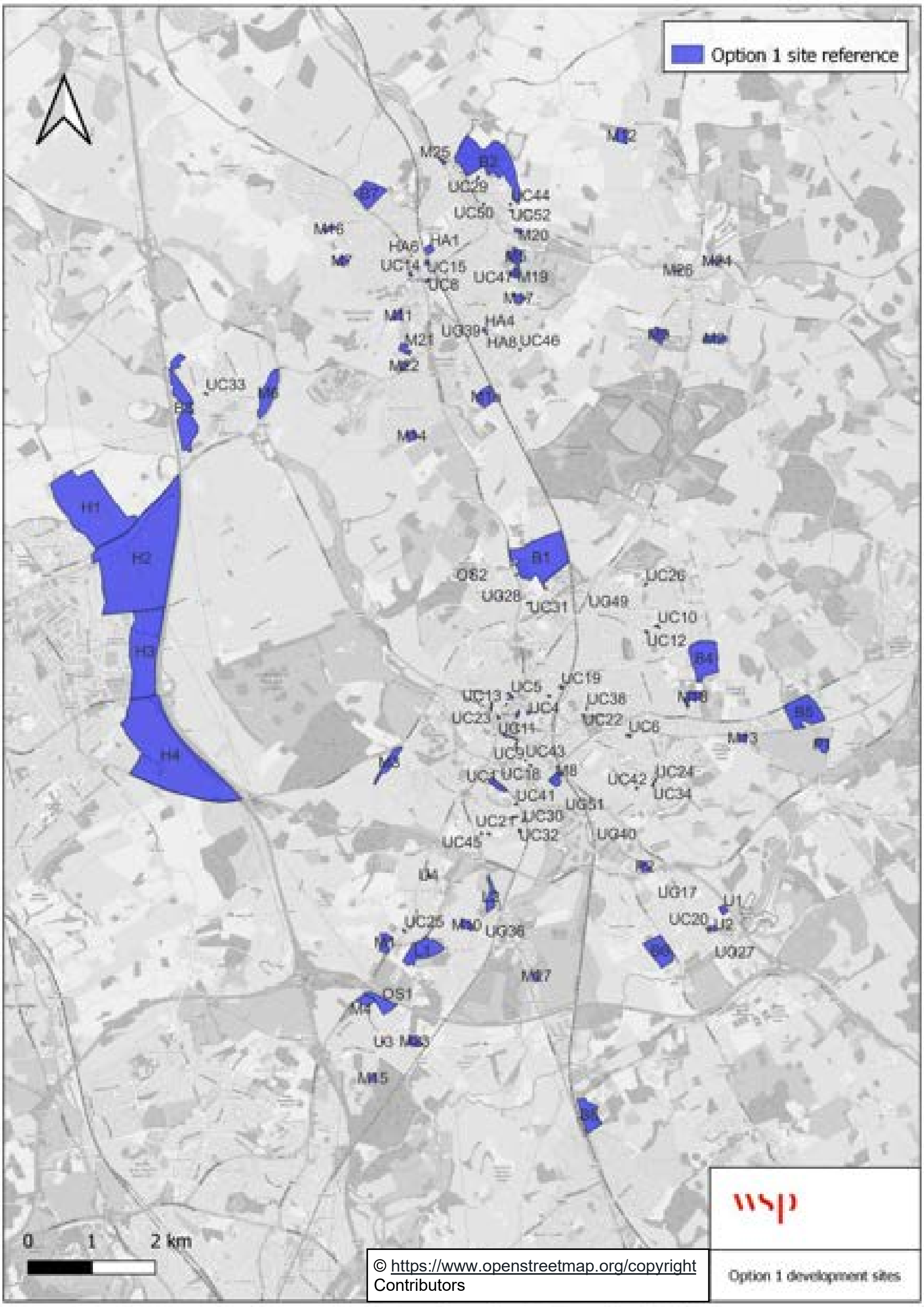

Figure 5-3: Location of St Albans Local Plan Sites

5.4 Watling Street Truck Stop

5.4.1. There is a proposal to expand the Watling Street Truck stop which is located on the A5183 close to M1 Junction 9 in Dacorum. It is understood that it is a large expansion of HGV parking (an additional 245 spaces on top of the existing 30 spaces plus 50 spaces for an EV hub) and that it will have an improved access onto the A5183 just north of M1 Junction 9. Although there is some proposed haulage related commercial use, additional employment on this site is likely to be modest (i.e. there is no associated business park or wider employment or housing development). However, there will be additional HGV trips to/from the site as a result of the expansion.

5.4.2. To model the expansion, HGV trips have been added to/from the zone that represents the site, with the trips loading to a new connector onto the A5183.

5.4.3. The distribution of the trips has been estimated by running a select link analysis on the M1 near Junction 9 for HGV trips only, to capture the M1 (near Junction 9 mainline) traffic pattern and this has been used as a proxy for the HGV trips for the truck stop.

5.4.4. Trip rates found from TRICs for a truck stop with a parking of 240 HGV spaces has been used to calculate the additional trips. The uplift applied is shown in Table 5-1.

Table 5-1: HGV Uplift for Watling Street Truck Stop

Peak Hour	TRICS Trip Rates Arrive	TRICS Trip Rates Depart	Existing HGV Trips Arrive	Existing HGV Trips Depart	Uplift Arrive	Uplift Depart	Total Trips Arrive	Total Trips Depart
AM	0.26	0.28	1.9	1.3	72	77	74	78
PM	0.36	0.16	0.2	1.2	98	44	98	45

5.5 Transport Infrastructure

Infrastructure for developments

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

5.5.2. In some cases, it has been possible to represent specific access arrangements where these are already known. 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

5.5.3. For the North Hemel site in Dacorum, three accesses are assumed to be located at Leighton Buzzard Road, Link Road and Redbourn Road. These accesses have been modelled as signalised junctions 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. Signalisation of key development access junctions is also in line with HCC's new Place and Movement Design Guide. A "North Hemel Link Road" is also assumed to link the Leighton Buzzard Road and Redbourn Road accesses as shown in Figure 5-4 to allow development traffic to connect to local network. No through traffic is permitted on this link road. An additional roundabout access has also been assumed onto the Link Road from Marchmont Farm to serve that particular development only. This is in line with the layout assumed in the planning application. This access has been modified from the Dacorum Option D and E proposals as more information became available.

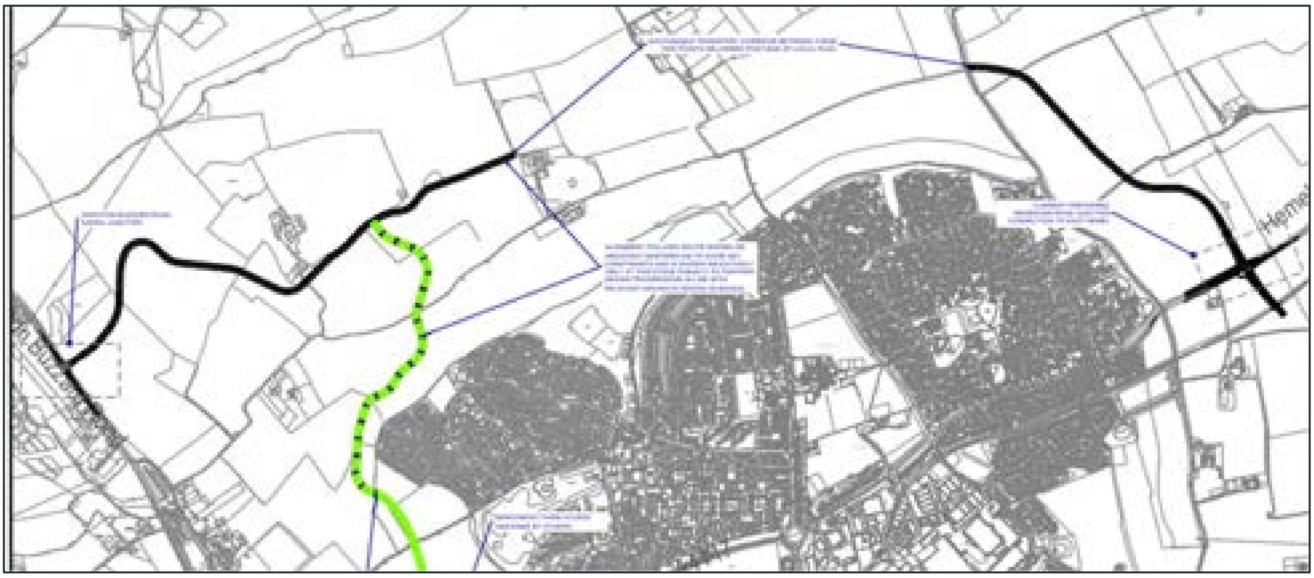

Figure 5-4:   Proposed North Hemel Link Road

5.5.4. In St Albans, the East Hemel Spine Road was included as it provides access to the East Hemel development. Figure 5-5 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. It should be noted that the junction between East Hemel Spine Road and Redbourn Road is assumed to be signal access on Redbourn Road instead of a roundabout as shown in Figure 5-5. The signal timing assumption was optimised to best suit the forecast level of traffic.

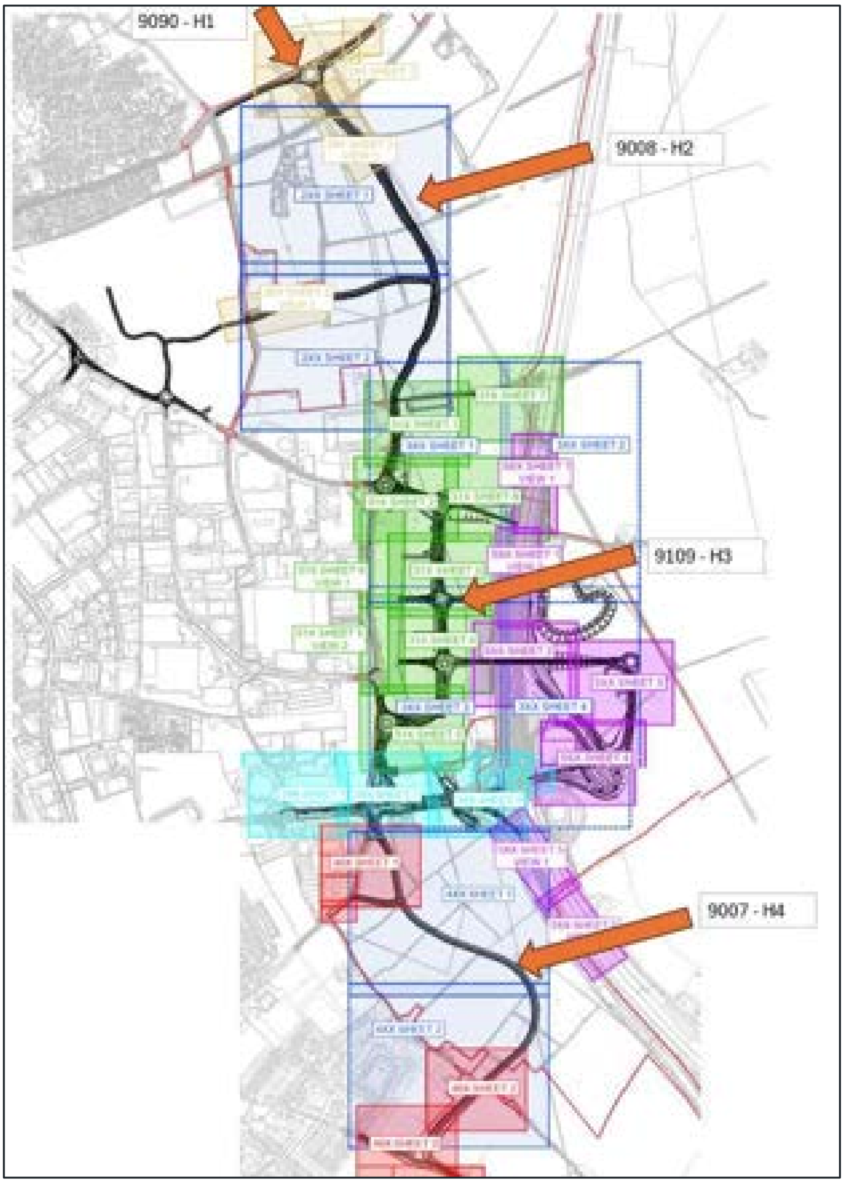

Figure 5-5: Proposed East Hemel Spine Road within the St Albans District Boundary

5.5.5. For the section of East Hemel Spine Road near East Hemel South development (H4) the spine road alignment is based on the development's framework masterplan as shown in Figure 5-6. A signal junction is also assumed at the intersection between the East Hemel Spine Road and A4147 Hemel Hempstead Road.

Figure 5-6: Proposed East Hemel South Spine Road near East Hemel South (H4)

IDP Schemes

5.5.6. Mitigation measures were taken from the SADC and DBC IDP documents and those which could be represented with a strategic transport model were incorporated. Appendix G lists the transport schemes that have been modelled in St Albans whilst the broad location of each scheme is shown in Figure 5-7. 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.

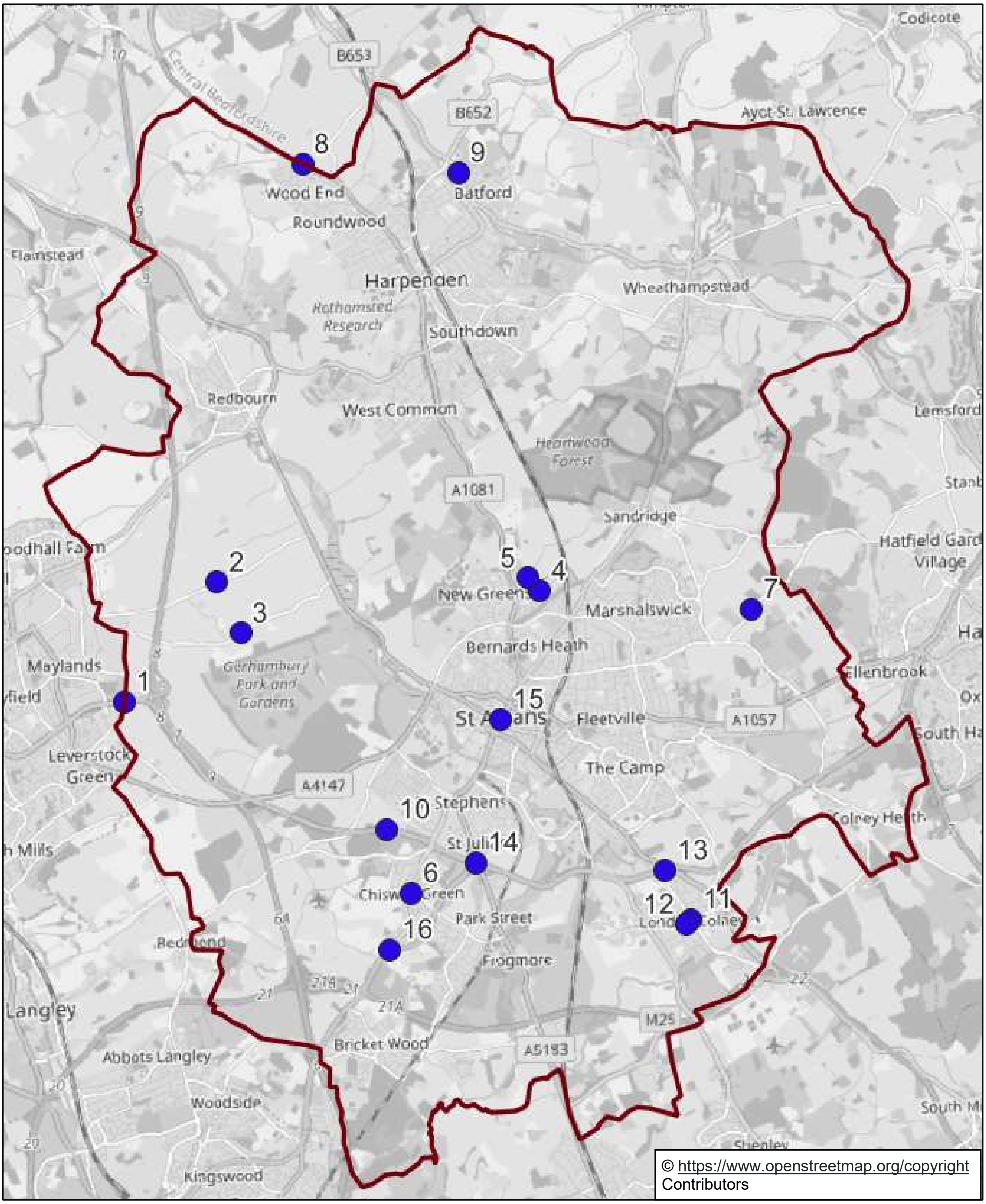

Figure 5-7: Location of IDP Schemes in St Albans

5.5.7. Figure 5-8 and Figure 5-9 shows the locations of the IDP highway schemes that have been modelled in Dacorum. The details of the schemes, identified by the ID in the figures is provided in Appendix F.

5.5.8. Although the Tring and Berkhamsted and Hemel Hempstead transport studies were taken as a starting point, a number of schemes were either small scale or did not affect highway capacity and therefore couldn't be included in this type of strategic model. The schemes included in this report are just those that were able to be modelled.

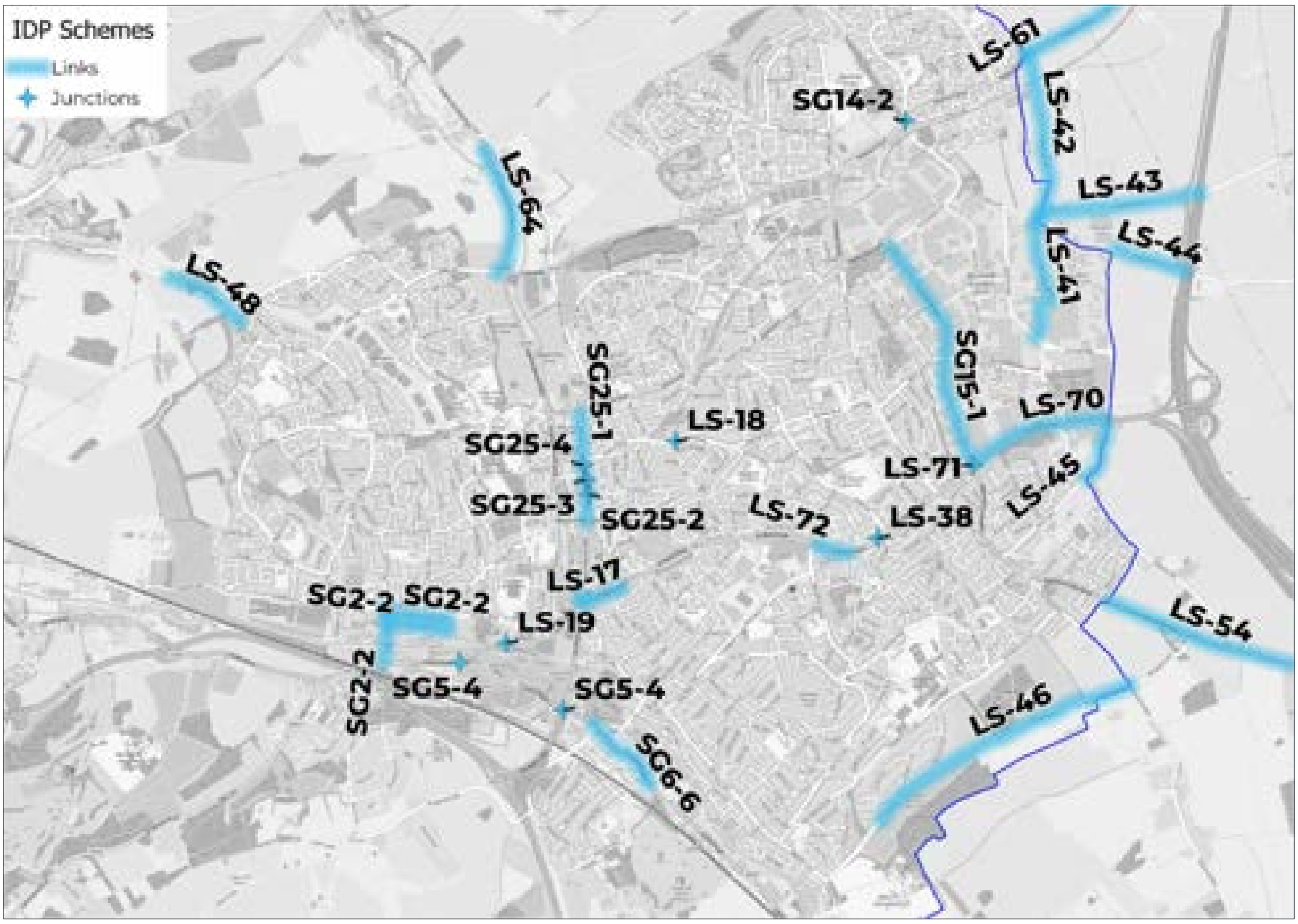

Figure 5-8: Location of Modelled IDP Highway Schemes in Hemel Hempstead

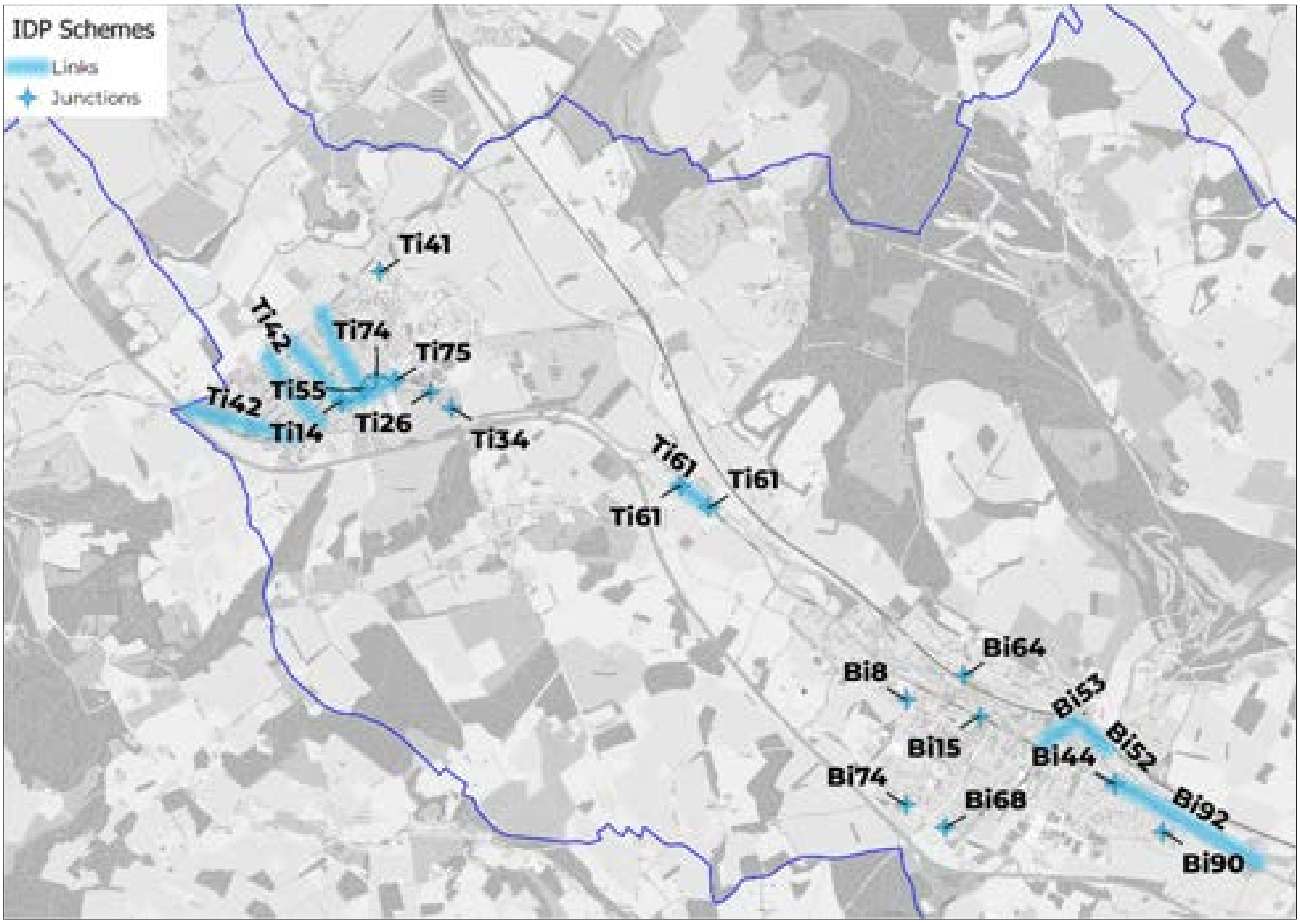

Figure 5-9: Location of Modelled IDP Highway Schemes in Tring and Berkhamsted

5.5.9. The following public transport schemes have also been modelled in Dacorum:

- Removal of coach route 758
- St Albans-Hemel Hempstead Bus Connectivity (LS-62)
- Northern Hemel Hempstead-Watford Town Centre, Croxley and Rickmansworth Connectivity (LS-63)
- Luton-Hemel Hempstead Bus Connectivity (LS-65)
- Impact of mobility hubs represented by reducing the wait time perception EMME factor from 2.0 to 1.5 – locations are shown in Figure 5-10.

Figure 5-10: Location of Mobility Hubs

Signal Optimisation

5.5.10. Traffic signal timings have been optimised within Option 4a where signal junctions were forecast with high increase of delay (>30 seconds) between Option 0A and 4a 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 5-11.

- **Maylands Avenue / Wood End Lane** (node 2450): The capacity for Mayland Avenue (southbound) arm was reduced from 2 lanes following the assumption of an improvement scheme (SG15-1). As a result, the junction was found to be over-capacity and was optimised.
- **A414 Breakspear Way / Green Lane** (nodes 2580, 2461 and 6356): This is a key junction and the location of an improvement scheme in Option 4a (scheme ref SM7_SW – Scheme 1 in Figure 5-7). The new layout was found to be over-capacity and was optimised, although it remains over-capacity in both peaks following optimisation.

- **A405 North Orbital Road / Watford Road (**node 6295): This is the location of an improvement scheme in option 4a (scheme ref SM201- Scheme 16 in Figure 5-7). The junction was signalised in Option 4a 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 4a (scheme ref CG_Acc – Scheme 6 in Figure 5-7). 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 0 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 4a.
- **A1081 Luton Road/ Roundwood Lane** (node 6538): This is the signalised access node for Northwest Harpenden developments. (scheme ref 10338_HL_07) The new development access has increased traffic delay along Luton Road thus requires optimisation.
- **Redbourn Road / Proposed East Hemel Spine Road / Proposed North Hemel Link Road** (node 2592): This junction is the proposed signal access for North Hemel and East Hemel developments to Redbourn Road, signal optimisation was attempted here but it was not possible to improve the performance of the junction as both link road arms are over-capacity.
- **Redbourn Road / Three Cherry Trees Lane** (node 2162): This junction is the location of improvement scheme (SG14-2). The roundabout was signalised in Option 4a network, signal optimisation was attempted here but it was not possible to improve the performance of the junction due to high level of traffic on Redbourn Road.
- **A4147 Hemel Hempstead Road / Proposed East Hemel Spine Road** (node 6417) This is the proposed signal junction connecting the Proposed East Hemel Spine Road to Hemel Hempstead Road, thus the signal timings at this junction have been optimised to best suit the traffic flows for Option 4a.
- **A414 Breakspear Way / A4147 Hemel Hempstead Road** (nodes 17010 / 17012): This is a key junction in the network which is the location of an improvement scheme in Option 4a whereby the existing roundabout becomes signalised (LS-71). Optimisation

of the assumed signal timing was attempted to best suit the forecast traffic but blocking back is forecast on the circulatory arms.

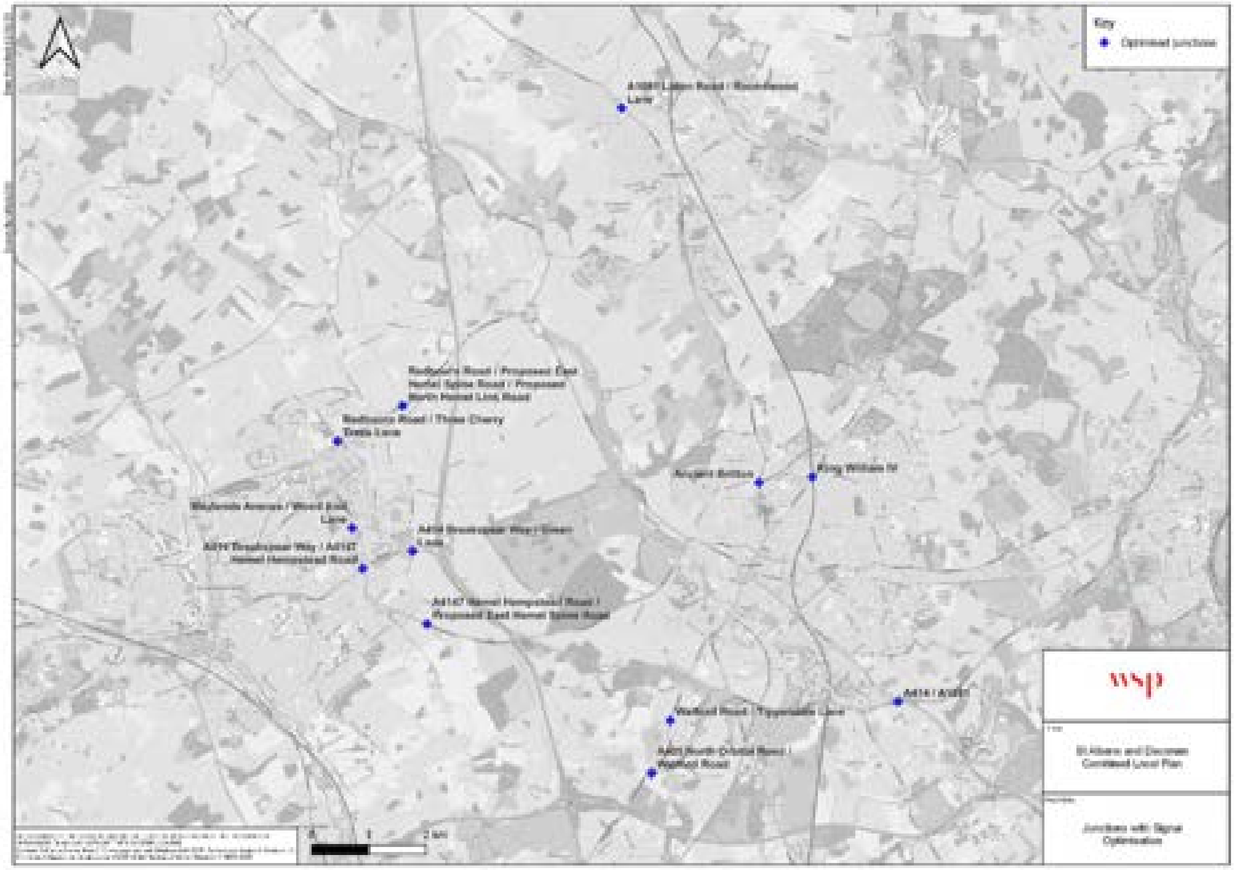

Figure 5-11: Signal Junctions with Traffic Signal Optimisation

5.6 Trip Generation Adjustment

5.6.1. 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, DBC, SADC and NH the highway trip generation for large developments were matched with those in the agreed development Transport Assessments where these were available.

5.6.2. HCC provided WSP with the highway trip rate for residential sites within Dacorum district which was sourced from TRICS. The trip rates were consistent with those used in the supporting Hemel Hempstead, Tring and Berkhamsted Transport studies. Employment rates were not provided therefore WSP extracted trip rate from TRICS for employment sites. For key Local Plan sites within St Albans, HCC provided WSP a generic highway trip rate which was used for most of the 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.

5.6.3. 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 rates are summarised in Table 5-2 and Table 5-3 for residential and employment sites respectively and the final trip generation for these developments are summarised in Table 5-4 for AM peak and Table 5-5 for PM peak.

Table 5-2: Residential Site Trip Rates

Development	Trip Rate Source	Residential Trip Type	AM Peak Departs	AM peak Arrivals	PM Peak Departs	PM Peak Arrivals
North Hemel	TRICS	Urban Edge	0.313	0.136	0.154	0.306
South of Berkhamsted	TRICS	Urban Edge	0.313	0.136	0.154	0.306
New Mill	TRICS	Urban Edge	0.313	0.136	0.154	0.306
Marchmont Farm	TRICS	Urban Edge	0.313	0.136	0.154	0.306
Hemel Hempstead Hospital / Market Square	TRICS	Inner Urban	0.267	0.113	0.154	0.263
Paradise	TRICS	Inner Urban	0.267	0.113	0.154	0.263
National Grid and 339-353 London Road	TRICS	Inner Urban	0.267	0.113	0.154	0.263
Polehanger Lane	TRICS	Urban Edge	0.313	0.136	0.154	0.306
Dunsley Farm	TRICS	Urban Edge	0.313	0.136	0.154	0.306
Hemel Hempstead Station Gateway	TRICS	Inner Urban	0.267	0.113	0.154	0.263
Apsley Mills Retail Park	TRICS	Inner Urban	0.267	0.113	0.154	0.263
Riverside	TRICS	Inner Urban	0.267	0.113	0.154	0.263
Shendish Manor and Fairfields	TRICS	Suburban	0.376	0.098	0.16	0.332
Land East of Tring	TRICS	Urban Edge	0.313	0.136	0.154	0.306
East Hemel Hempstead South	Trip Generation Report	N/A	0.613	0.235	0.376	0.645
East Hemel Hempstead North	Trip Generation Report	N/A	0.613	0.235	0.376	0.645
North St Albans	Trip Generation Report	N/A	0.394	0.191	0.221	0.313
West of London Colney	Generic	N/A	0.347	0.119	0.221	0.363
North East Harpenden	Generic	N/A	0.347	0.119	0.221	0.363
East St Albans	Generic	N/A	0.347	0.119	0.221	0.363
North Hemel Hempstead	Generic	N/A	0.347	0.119	0.221	0.363
Glinwell, Hatfield Road, St Albans	Generic	N/A	0.347	0.119	0.221	0.363
West Redbourn, Redbourn	Generic	N/A	0.347	0.119	0.221	0.363

Table 5-3: Employment Site Trip Rates

Development	Trip Rate Source	Employment TRICS Category	AM Peak Departs	AM Peak Arrivals	PM Peak Departs	PM Peak Arrivals
North Hemel	TRICS	Secondary school	0.952	1.3	0.209	0.169
South of Berkhamsted	TRICS	Secondary school	0.952	1.3	0.209	0.169
Hemel Hempstead Hospital / Market Square	TRICS	Community Hospital	0.134	0.397	0.175	0.075
Paradise	TRICS	Industrial Unit	0.011	0.132	0.125	0.024
Polehanger Lane	TRICS	Retail - Shopping Centre, Local Shops	0.626	0.799	1.349	1.263
Dunsley Farm	TRICS	Industrial Estate	0.039	0.177	0.175	0.056
Hemel Hempstead Station Gateway	TRICS	B1 office	0.008	0.099	0.094	0.008
Shendish Manor and Fairfields	TRICS	Secondary school	0.952	1.3	0.209	0.169
Land East of Tring	TRICS	Secondary school	0.952	1.3	0.209	0.169
East Hemel Hempstead (Central)	Trip Generation Report	N/A	0.016	0.118	0.116	0.008

Table 5-4: Assumed AM Peak Trip Generation for Key Local Plan Sites

Development Name	Uplifted Trip Generation Departs	Uplifted Trip Generation Arrivals	VDM Trips Departs	VDM Trips Arrivals	Difference (Uplifted – VDM) Departs	Difference (Uplifted – VDM) Arrivals
North Hemel	962	837	223	227	739	610
South of Berkhamsted	531	498	128	121	403	378
New Mill	130	58	52	25	78	33
Marchmont Farm	113	51	40	27	73	24
Hemel Hempstead Hospital / Market Square	128	70	56	41	72	29
Paradise	96	48	46	34	50	14
National Grid and 339-353 London Road	130	57	61	34	69	22
Polehanger Lane	274	150	94	67	180	84
Dunsley Farm	121	169	121	192	1	-23
Hemel Hempstead Station Gateway	107	55	58	43	49	11
Apsley Mills Retail Park	144	63	59	26	85	38
Riverside	86	38	34	15	52	22
Shendish Manor and Fairfields	480	449	83	80	397	369
Land East of Tring	747	603	176	98	571	505
East Hemel Hempstead South	1334	548	235	153	1099	395
East Hemel Hempstead North	836	314	150	90	685	224
North St Albans	397	196	134	75	263	121
West of London Colney	141	49	52	30	90	19
North East Harpenden	266	93	103	61	163	32
East St Albans	182	63	68	42	114	21

Development Name	Uplifted Trip Generation Departs	Uplifted Trip Generation Arrivals	VDM Trips Departs	VDM Trips Arrivals	Difference (Uplifted – VDM) Departs	Difference (Uplifted – VDM) Arrivals
North Hemel Hempstead	445	163	148	93	297	70
Glinwell, Hatfield Road, St Albans	152	53	56	35	96	17
West Redbourn, Redbourn	210	76	71	43	140	33
East Hemel Hempstead (Central)	130	942	874	1622	-744	-680

Table 5-5: Assumed PM Peak Trip Generation for Key Local Plan Sites

Development Name	Uplifted Trip Generation Departs	Uplifted Trip Generation Arrivals	VDM Trips Departs	VDM Trips Arrivals	Difference (Uplifted – VDM) Departs	Difference (Uplifted – VDM) Arrivals
North Hemel	352	556	212	233	140	323
South of Berkhamsted	185	290	113	127	72	164
New Mill	64	125	37	40	27	86
Marchmont Farm	58	111	28	37	29	74
Hemel Hempstead Hospital / Market Square	80	124	42	53	38	71
Paradise	62	95	35	44	27	51
National Grid and 339-353 London Road	77	128	38	55	38	73
Polehanger Lane	191	299	70	85	122	214
Dunsley Farm	171	122	168	146	3	-24
Hemel Hempstead Station Gateway	70	105	44	54	26	51
Apsley Mills Retail Park	82	135	32	48	50	87
Riverside	49	81	19	27	30	54
Shendish Manor and Fairfields	146	220	77	85	68	135
Land East of Tring	288	489	114	141	174	348
East Hemel Hempstead South	864	1442	164	217	700	1226
East Hemel Hempstead North	502	910	97	130	404	780
North St Albans	227	317	82	110	145	207
West of London Colney	91	148	35	44	56	105
North East Harpenden	173	281	63	83	110	197
East St Albans	118	192	42	60	75	132

Development Name	Uplifted Trip Generation Departs	Uplifted Trip Generation Arrivals	VDM Trips Departs	VDM Trips Arrivals	Difference (Uplifted – VDM) Departs	Difference (Uplifted – VDM) Arrivals
North Hemel Hempstead	276	477	98	129	178	348
Glinwell, Hatfield Road, St Albans	98	160	36	50	62	110
West Redbourn, Redbourn	141	223	47	63	94	161
East Hemel Hempstead (Central)	926	68	1487	1073	-562	-1005

5.7 Opportunity to Shift Mode Reductions

5.7.1. 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.

5.7.2. 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.

5.7.3. These reductions are the same as those applied in Option C and E for Dacorum and Option 3 for St Albans.

5.7.4. Table 5-6 and Table 5-7 illustrate the degree of modal shift that was estimated by the OSM tool in Dacorum and St Albans, based on the sustainable travel potential, when they were applied to the COMET model.

Table 5-6: Reduction in Car Trips with Mode Shift Assumptions in Dacorum and St Albans (AM Peak)

From	To	Car Trips Before	Car Trips After	Reduction	% Reduction
Dacorum / St Albans	Dacorum / St Albans	31,982	23,136	-8,846	-28%
Dacorum / St Albans	Elsewhere	20,762	19,734	-1,027	-5%
Elsewhere	Dacorum / St Albans	20,634	20,634	0	0%
Total	Total	73,378	63,504	-9,874	-13%

Table 5-7: Reduction in Car Trips with Mode Shift Assumptions in Dacorum and St Albans (PM Peak)

From	To	Car Trips Before	Car Trips After	Reduction	% Reduction
Dacorum / St Albans	Dacorum / St Albans	30,507	21,566	-8,941	-29%
Dacorum / St Albans	Elsewhere	20,825	19,497	-1,328	-6%
Elsewhere	Dacorum / St Albans	21,124	21,123	-1	0%
Total	Total	72,456	62,187	-10,269	-14%

6 2041 Option 4b Assumptions

6.1 Overview

6.1.1. Option 4b represents the future year of 2041 with the Local Plan and IDP schemes in place and the proposed upgrade to M1 Junction 8.

6.1.2. This option allows the impact of the M1 Junction 8 scheme to be assessed.

6.2 M1 Junction 8 Proposal

6.2.1. The proposed upgrade to M1 Junction 8 is shown in Figure 6-1 and Figure 6-2. The scheme involves a new roundabout junction to the east of the M1, directly linking the M1 southbound off-slip and on-slip with a new road over the M1 to link to the new East Hemel Spine Road.

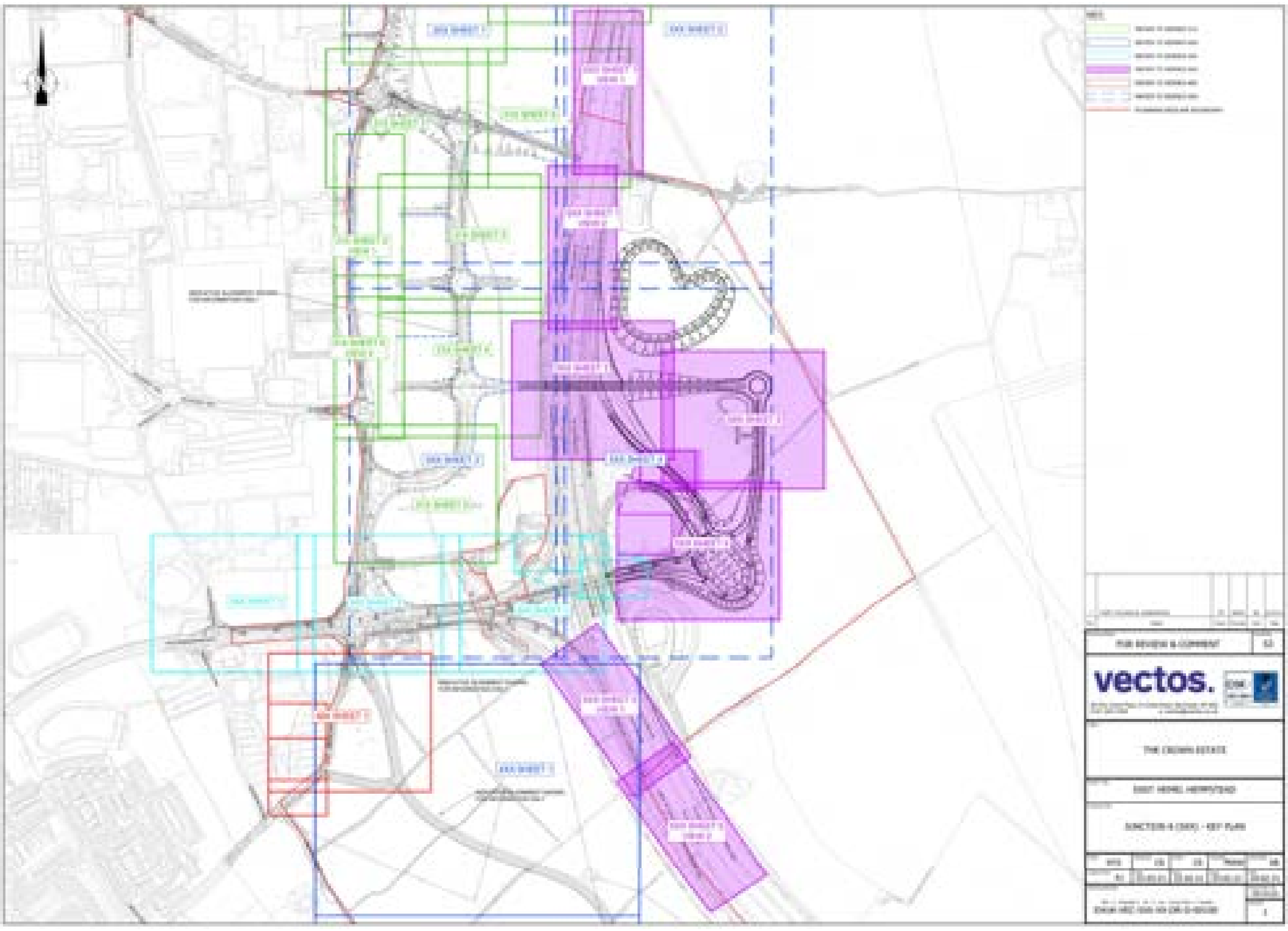

Figure 6-1: M1 Junction 8 Scheme Drawing

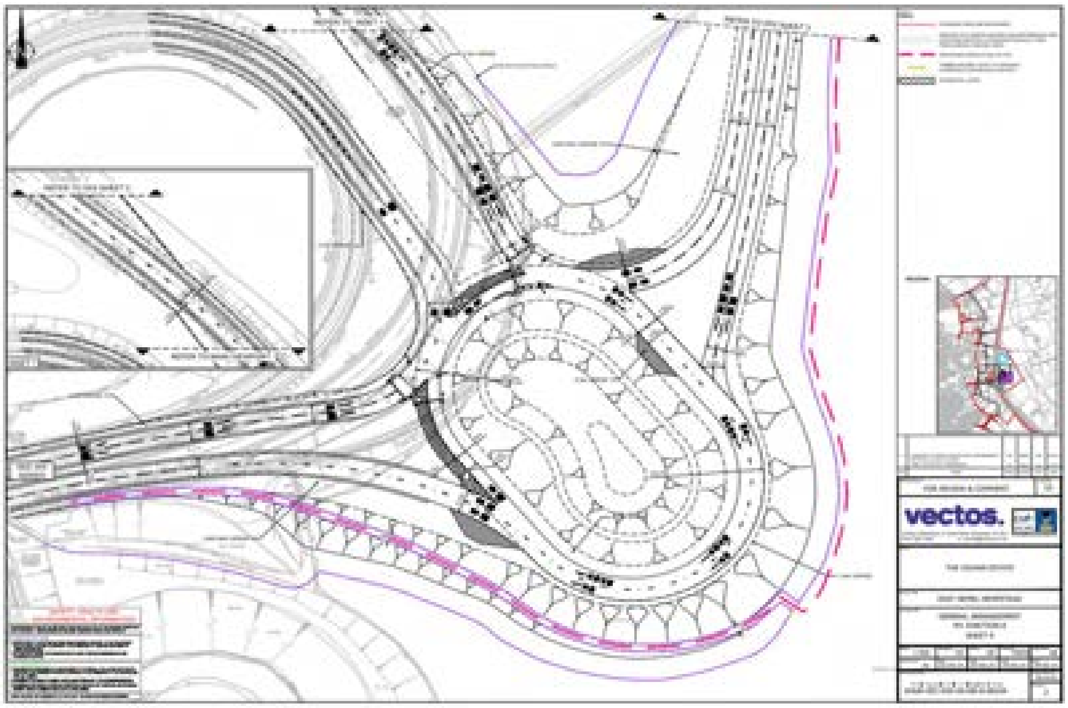

Figure 6-2: M1 Junction 8 Roundabout Scheme Drawing

Signal Optimisation

6.2.2. Due to traffic reassignment impacts of the proposed M1 Junction 8 scheme, signal optimisation was carried out for signal nodes listed in section 5.5 of this report and the signal junctions at the proposed M1 Junction 8 roundabout to best suit the traffic flows forecast for Option 4b.

7 Modelling Results

7.1 Overview

7.1.1. 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 have been drawn to show the incremental change between scenarios. These comparisons are as follows:

- **Option 4a vs Option 0A**: This comparison shows the impact of the Local Plan development allocations and proposed Local Plan highway improvements without the upgrade of M1 Junction 8 against the future year baseline (Option 0A)
- **Option 4b vs Option 4a**: This comparison shows the impact of the upgrade of M1 Junction 8 as this is the only difference between Option 4a and Option 4b.
- **Option 4b vs Option 0A**: This comparison shows the impact of the Local Plan development allocations, proposed Local Plan highway improvements and the upgrade of M1 Junction 8 compared to the future year baseline (Option 0A)

7.1.2. The following metrics are presented:

- **Highway Network Performance** (section 7.2)
  - Highway network statistics for the Dacorum and St Albans area
  - 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 7.3)
  - Diagrams showing the net change in traffic flow between the options, as described above.
  - Select Link Analysis of traffic travelling through M1 Junction 8
  - Diagrams showing forecast traffic flows to and from the key development allocations.
- **Performance of Junctions** (section 7.4)
  - Diagrams showing the changes in node delay
  - Summary of flow changes at key junctions across each scenario
  - Summary of average delay per vehicle at key junctions across each scenario
- **Highway Journey Times** (section 7.5)
  - Summary of journey times along routes in each scenario

▪ **Impact on Strategic Road Network (SRN) Junctions** (section 7.6)

  o Summary of the impacts on SRN junctions

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

7.1.4. Figure 7-1 and Figure 7-2 show the key roads in the Dacorum / St Albans district for the ease of the readers to identify the impacts shown in figures to follow.

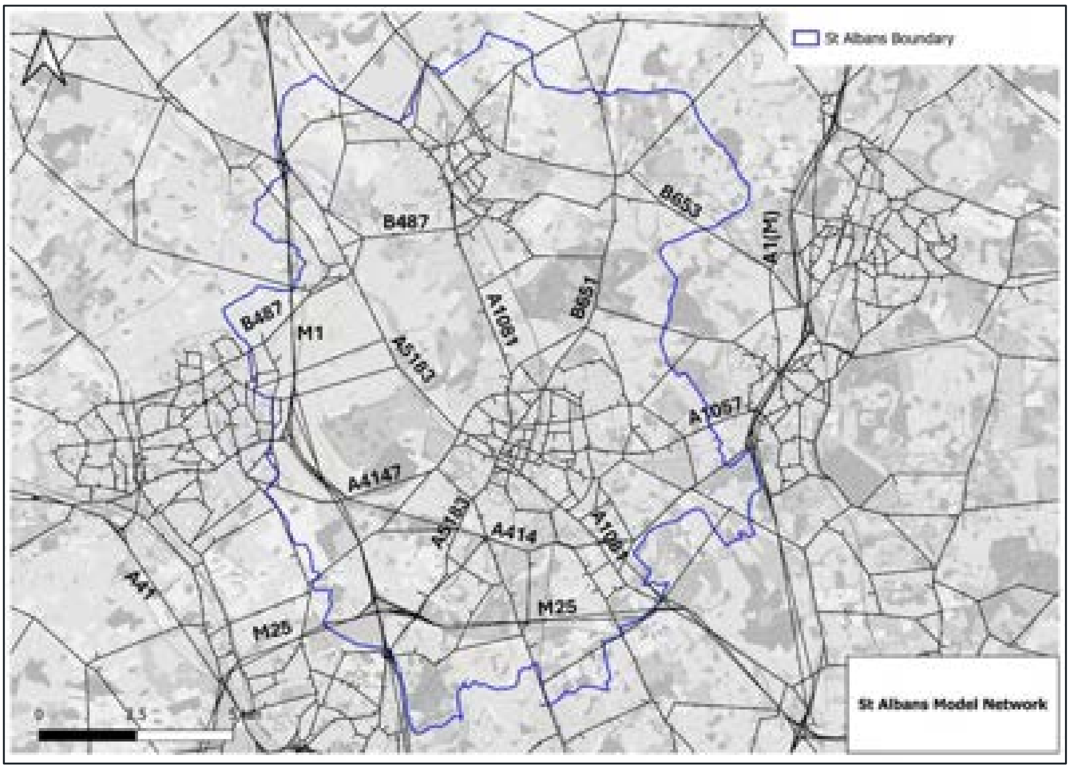

Figure 7-1: Key Roads in St Albans

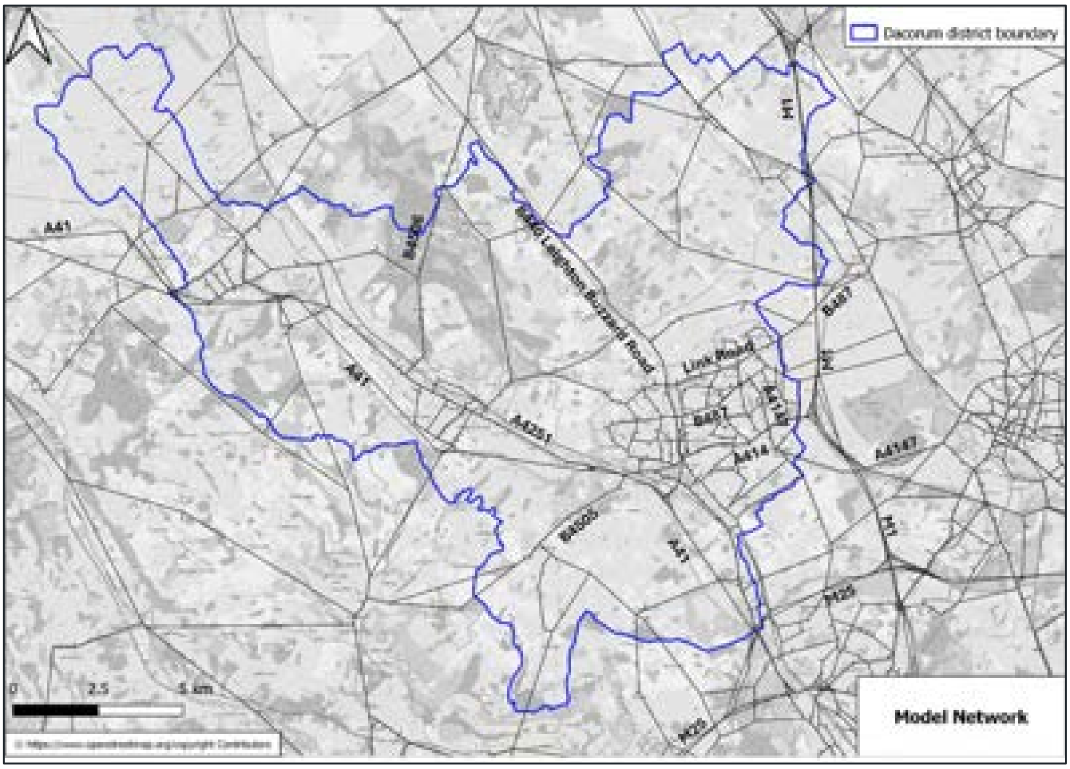

Figure 7-2: Key Roads in Dacorum

7.2 Highway Network Performance

7.2.1. Table 7-1 and Table 7-2 show summary indicators of network performance for the Dacorum and St Albans highway network. These have been derived by cordoning the network in Dacorum and St Albans from the wider COMET model area and examining the network statistics within the SATURN highway assignment model. Overall, the statistics shows that as a result of the Local Plan allocations, there is an increase in vehicle trips and travel time in Option 4a compared to Option 0A. Option 4b compared to Option 4a has a very similar number of trips, but the travel time has decreased slightly in the AM peak and increased slightly in the PM peak.

7.2.2. These results show the following changes between scenarios:

Total Vehicle Trips

7.2.3. Total vehicle trips increase across St Albans and Dacorum between Option 0A and Option 4a as a result of the proposed developments in the Local Plan, IDP schemes, and mode shift, by 2% in AM and 0.4% in PM. In Option 4b compared to Option 4a, there is no significant change in the number of trips as a result of the proposed upgrade at M1 Junction 8 in either peak.

Total Time Travelled

7.2.4. The total time travelled increases across St Albans and Dacorum between Option 0A and Option 4a by 11% in AM Peak and 10% in PM Peak. In Option 4b as a result of the M1 Junction 8 upgrade the total time travelled is lower by -3% compared to Option 4a in AM and higher by 1% in PM Peak.

Time on Links

7.2.5. The time on links increases across St Albans and Dacorum between Option 0A and Option 4a by 6% in AM Peak and 5% in PM Peak. In Option 4b, the proposed upgrade to M1 Junction 8 has no significant change on the time on links compared to Option 4a.

Time at Junctions

7.2.6. The time at junctions increases across St Albans and Dacorum between Option 0A and Option 4a by 27% in AM Peak and 30% in PM Peak. In Option 4b, as a result of the proposed upgrade to M1 Junction 8, the time at junctions is lower by -8% in AM Peak but 2% higher in PM peak, when compared to Option 4a.

Average Speed

7.2.7. The average speed in the AM and PM peak decreases in Option 4a compared to Option 0A by less than 1% in AM and PM Peak. There is no change in the average speed between Option 4a and Option 4b.

Table 7-1: Summary of Dacorum and St Albans Highway Network Performance (AM Peak Hour)

Indicator	Option 0A (Committed Developments and Infrastructure)	Option 4a (With Local Plan allocations added)	Option 4b (With Local Plan allocations and M1 Junction 8 upgrade)
Total vehicle trips	101,546	103,754	103,611
Total Time Travelled (PCU-Hours)	21,861	24,339	23,698
Time on links (PCU-Hours)	15,963	16,879	16,831
Time at junctions (PCU-Hours)	5,897	7,461	6,868
Average Speed (mph)	40.3	39.8	39.8

Table 7-2: Summary of Dacorum and St Albans Highway Network Performance (PM Peak Hour)

Indicator	Option 0A (Committed Developments and Infrastructure)	Option 4a (With Local Plan allocations added)	Option 4b (With Local Plan allocations and M1 Junction 8 upgrade)
Total vehicle trips	98,778	99,104	99,246
Total Time Travelled (PCU-Hours)	19,906	21,944	22,056
Time on links (PCU-Hours)	15,448	16,166	16,171
Time at junctions (PCU-Hours)	4,458	5,778	5,885
Average Speed (mph)	40.8	40.3	40.3

Link Capacity

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

Option 0A

7.2.9. Figure 7-3 to Figure 7-10 show the 2041 Option 0A V/C in the AM and PM peaks. As a result of the future increase in traffic by 2041, resulting from growth which is already committed, there are some high levels of V/C across both Dacorum and St Albans districts.

7.2.10. The impacts in St Albans and Dacorum show very similar results for this option as seen in their individual Local Plans modelling reports[1] (Option 0 for SADC and Option A for DBC).

Dacorum

7.2.11. As a result of the committed residential and commercial developments, there are a number of key roads in Hemel Hempstead's local network subject to high level of traffic stress and some of these roads are forecast to be over-capacity. Key roads which experience a high V/C (100% or above) in the AM peak include the A41 off slips at the Two Waters Way junction, Maylands Avenue northbound at their junctions with Wood Lane End, Leverstock Green Way and Bedmond Road approaches at their junction, Boundary Way westbound and Green Lane and Breakspear Way approaches at the A414 Breakspear Way / Green Lane roundabout. Over 100% V/C can also be seen on A4251 London Road and B4505 Box Lane northbound at the junction where they meet.

7.2.12. In the PM peak, key roads which experience a high V/C (100% or above) include Green Lane southbound and A414 Breakspear Way eastbound approach at Breakspear Way roundabout, Maylands Avenue northbound, Leverstock Green Road, Bedmond Road, A14 eastbound and westbound off slips at the Two Waters Way junction, A4251 London Road and B4505 Box Lane northbound at the junction where they meet. In Tring, over 100% V/C is seen on A4251 London Road northbound and Station Road westbound.

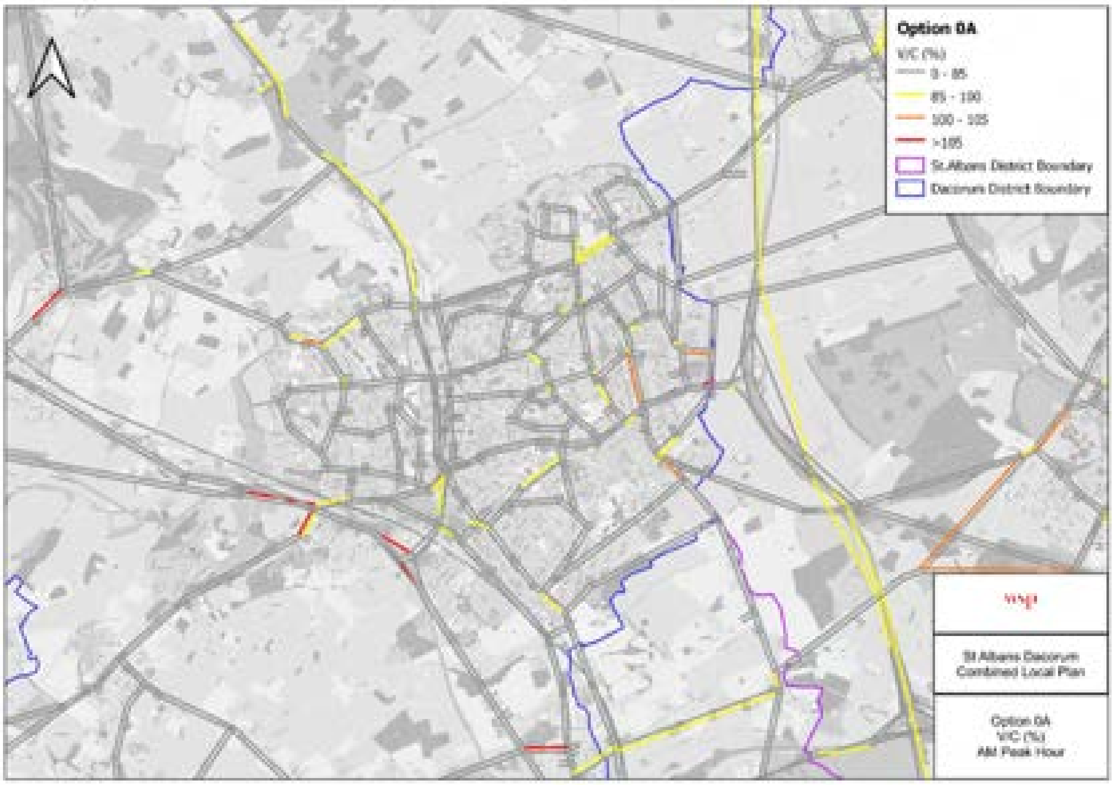

Figure 7-3: Option 0A Link Volume/Capacity Ratio in Hemel Hempstead, AM Peak

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Project No.: UK0028052.3601 | Our Ref No.: — February 2025
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[1] St Albans Local Plan Transport Modelling Report (INF09.11 - Transport Impact Assessment COMET St Albans LP Modelling Report (2024) & Dacorum Local Plan Transport Modelling Report (TRA04.1 Local Plan Transport modelling (Nov 2024)

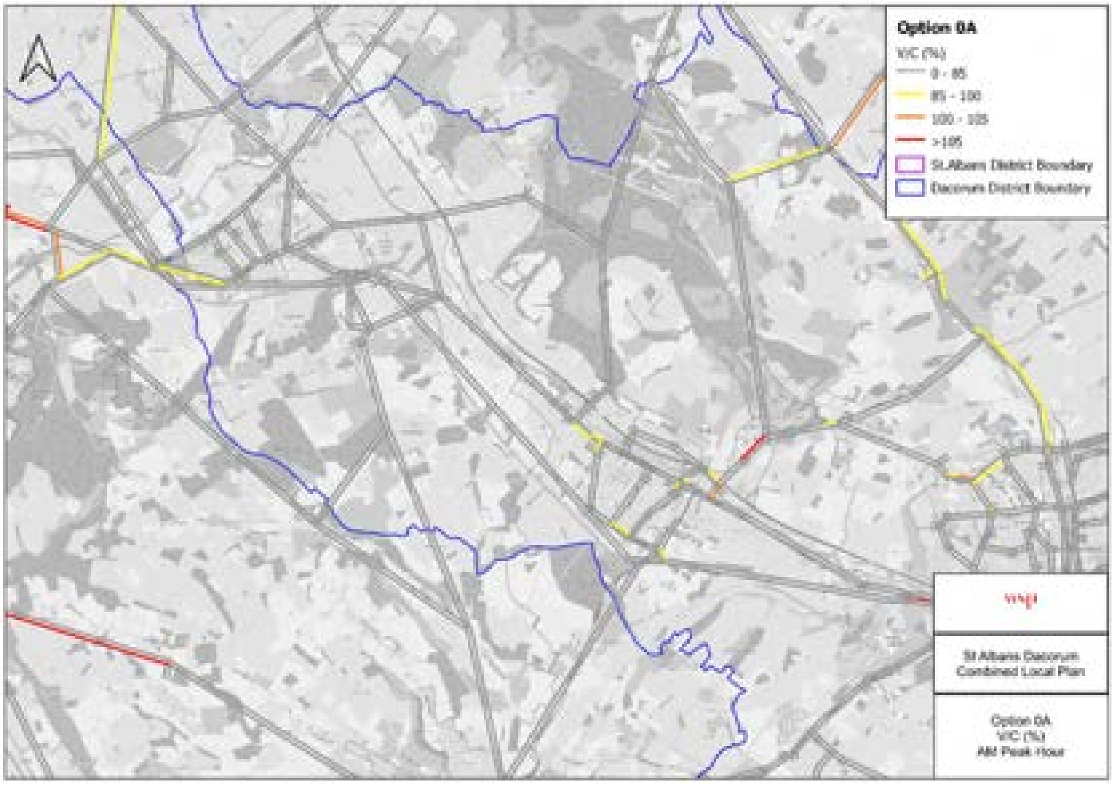

Figure 7-4: Option 0A Link Volume/Capacity Ratio in Berkhamsted and Tring, AM Peak

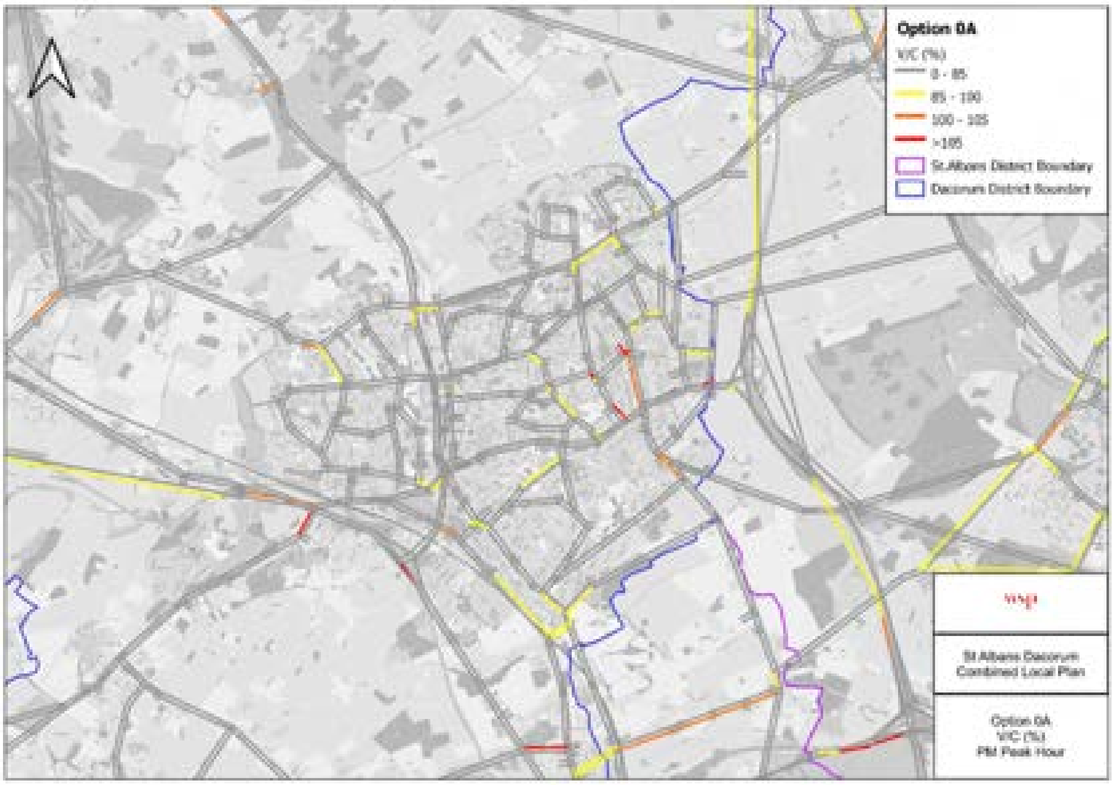

Figure 7-5: Option 0A Link Volume/Capacity Ratio in Hemel Hempstead, PM Peak

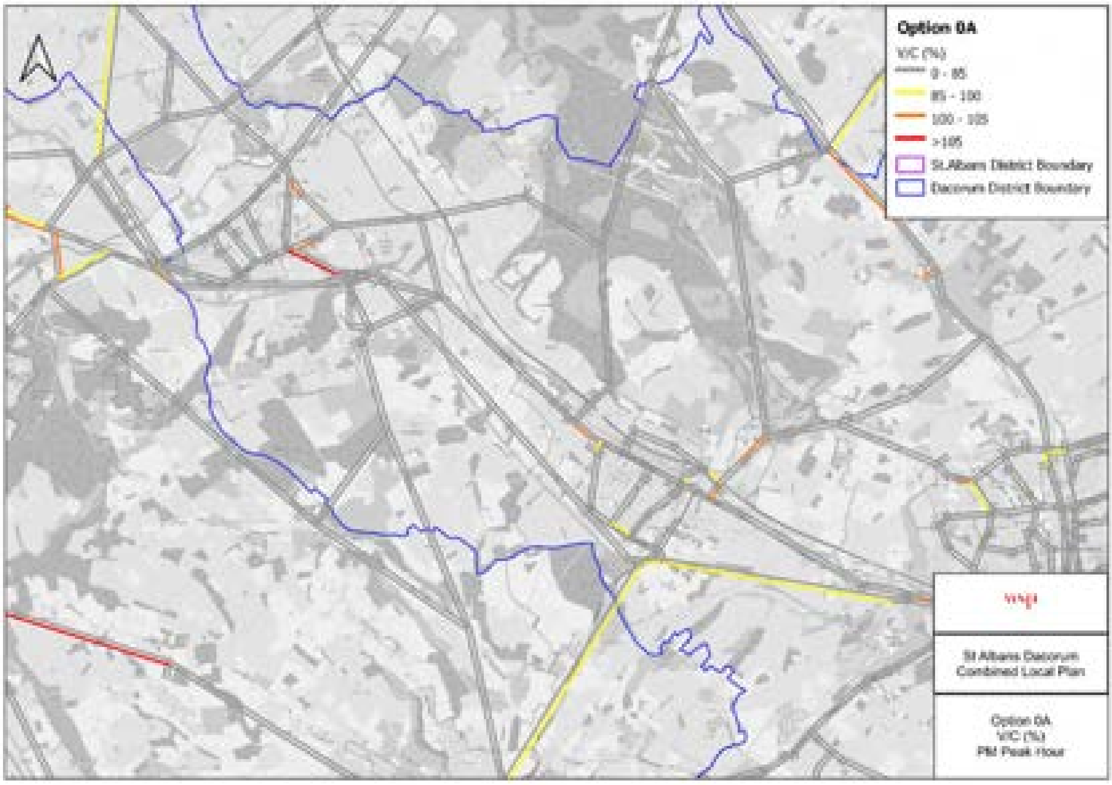

Figure 7-6: Option 0A Link Volume/Capacity Ratio in Berkhamsted and Tring, PM Peak

7.2.13. On several arms of the Green Lane A414 roundabout V/C of over 105% V/C are forecast in the AM peak and PM peak. This indicates that the current roundabout configuration is unable to cope with future committed growth as seen in Figure 7-7 and Figure 7-8.

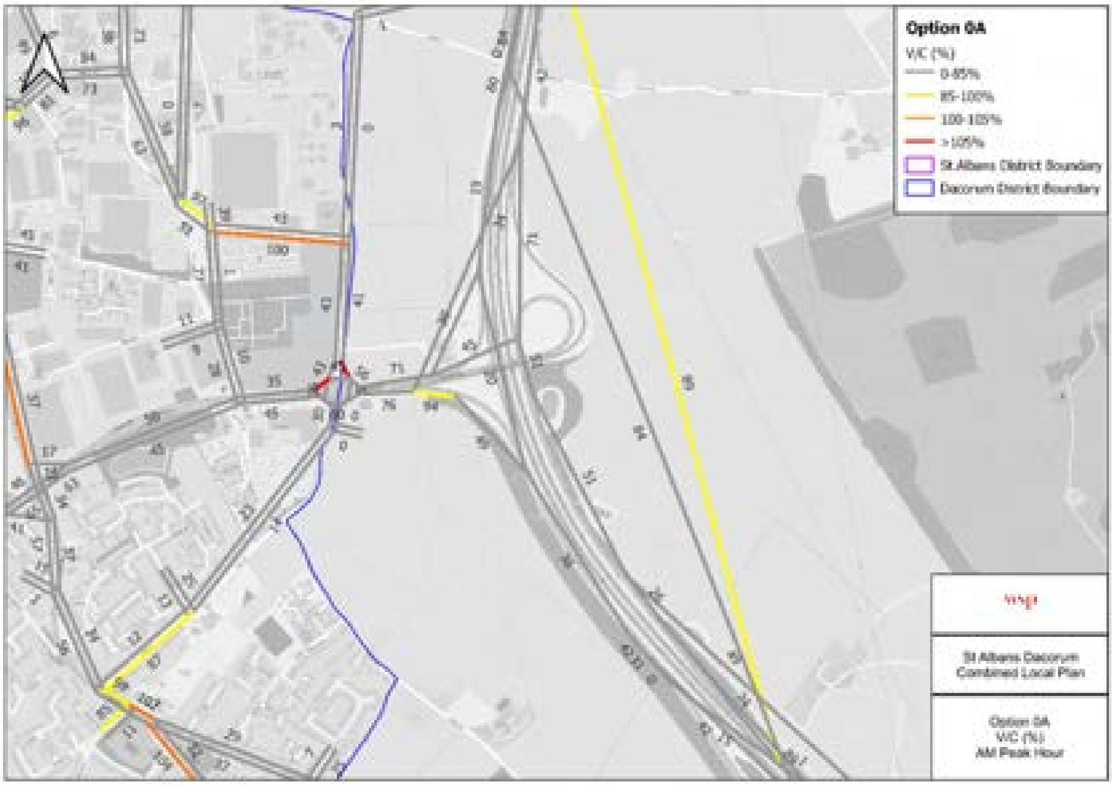

Figure 7-7: Option 0A Link Volume/Capacity Ratio around M1 Junction 8, AM Peak

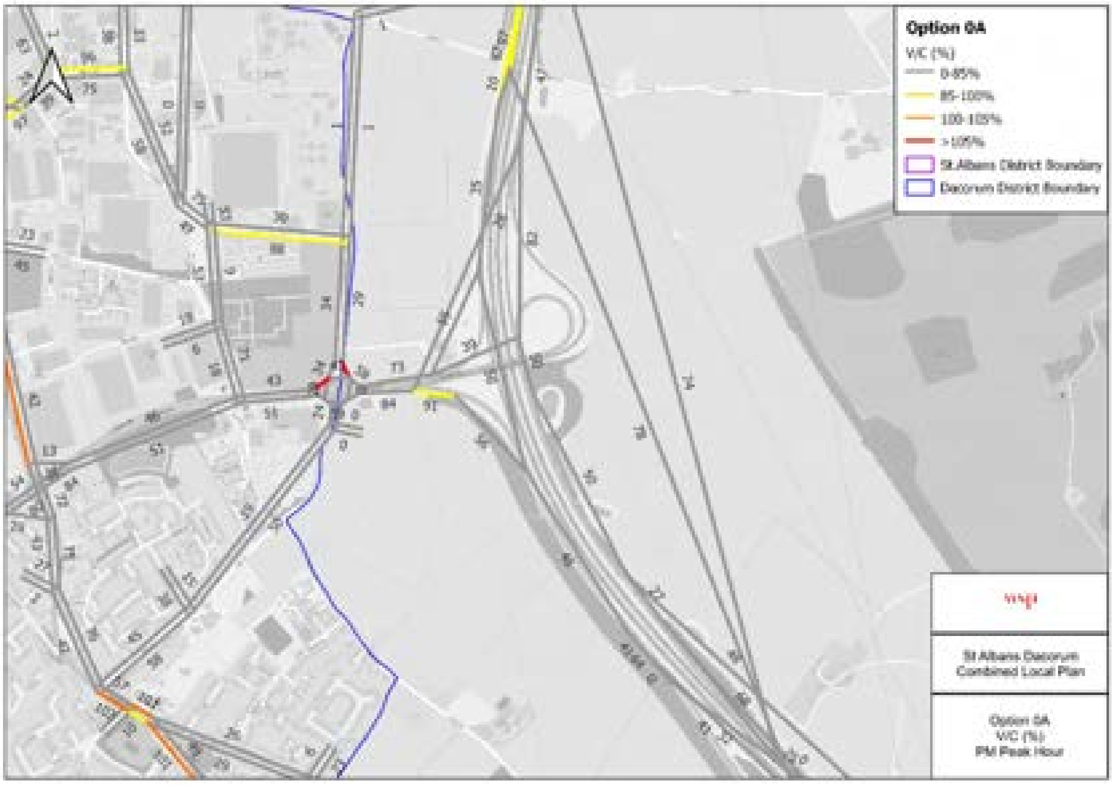

Figure 7-8: Option 0A Link Volume/Capacity Ratio around M1 Junction 8, PM Peak

St Albans

7.2.14. Figure 7-9 and Figure 7-10 present the V/C results for Option 0A in St Albans for AM and PM respectively. In St Albans, key roads which experience high V/C (100% and above) in the AM peak include A4147 to the west of St Albans, the sections of A414 (North Orbital) between A1(M) Junction 3 and White Horse Lane junction, Sandpit Lane, Batchwood Drive and Beech Road. In the PM peak key roads which experience high V/C are the M25 Junction 21 with the M1, A414 (North Orbital) between A1(M) Junction 3 and White Horse Lane junction, A1057 approaching to the Station Road junction, Batchwood Drive and Harpenden Road.

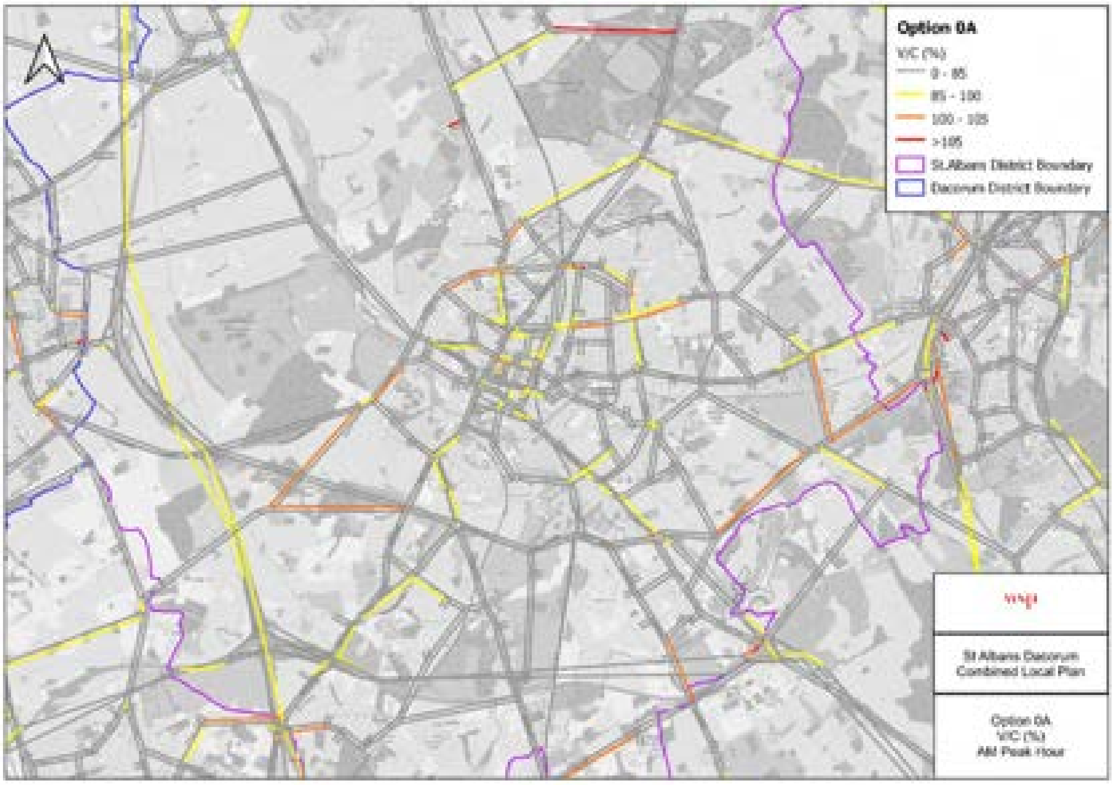

Figure 7-9: Option 0A Link Volume/Capacity Ratio in St Albans, AM Peak

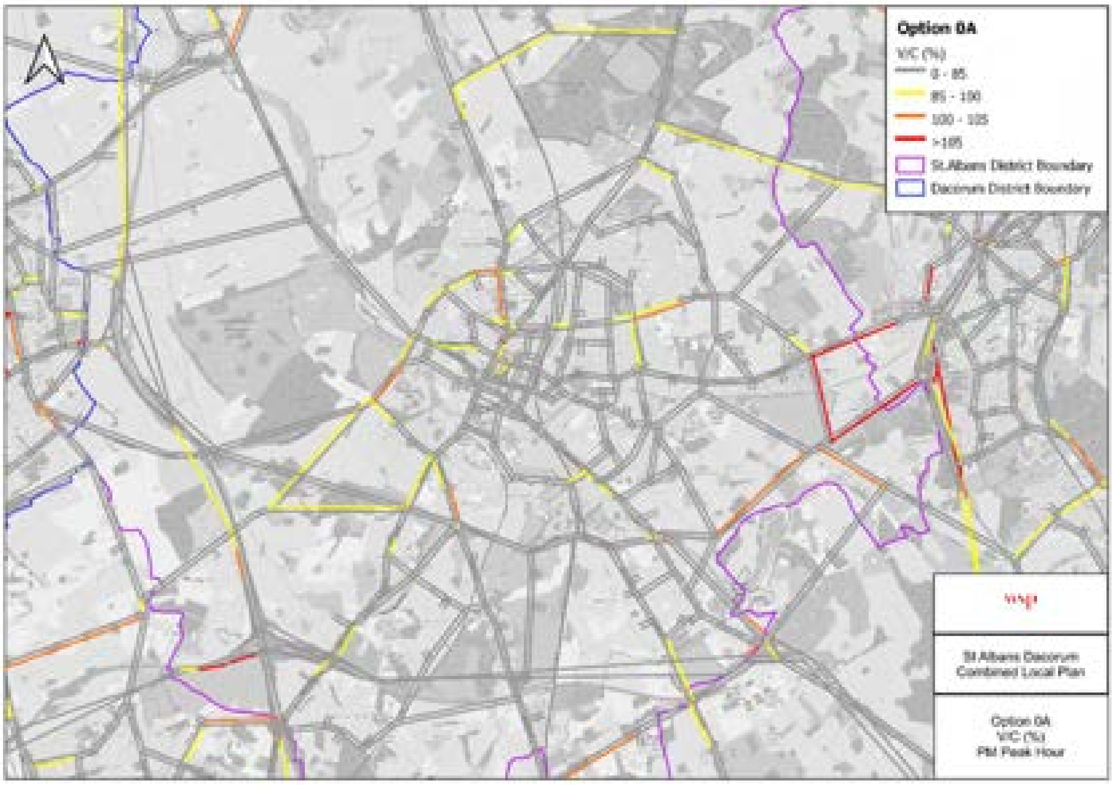

Figure 7-10: Option 0A Link Volume/Capacity Ratio in St Albans, PM Peak

Option 4a

7.2.15. Figure 7-11 to Figure 7-16 show the 2041 Option 4a V/C in the AM and PM peaks. The Option 4a scenario assumes DBC and SADC Local Plan development allocations and the highway infrastructure improvement under IDP schemes.

7.2.16. Most of the impacts in St Albans and Dacorum show very similar results for this option as seen in their individual Local Plans modelling reports[2] (Option 3 for SADC and Option E for DBC), except that due to some network changes, there are a few differences, for example the Dacorum Local Plan does not include the East Hemel spine road.

Dacorum

7.2.17. As a result of large-scale developments in the HGC and within Hemel Hempstead, a number of key roads connecting these developments are subject to high level of traffic stress. Key roads which experience increases in V/C to become over capacity (100% or above) in the AM peak include the westbound section of A414 Breakspear Way between M1 Junction 8 and Breakspear Way / Green Lane roundabout, Redbourn Road approaches at the Three Cherry Lane roundabout, Leverstock Green Road, North Hemel Link Road approach to Redbourn Road junction, East Hemel Spine Road southbound approach to Hemel Hempstead Road junction and Two Waters Road northbound approach to the Plough Roundabout, A41 eastbound and westbound off slips at the Two Waters Way junction.

7.2.18. Key roads which experience increases in V/C to become over-capacity in the PM peak include the section of A414 Breakspear Way between M1 Junction 8 and Breakspear Way / Green Lane roundabout, Redbourn Road approaches at the Three Cherry Lane roundabout, Leverstock Green Road, the North Hemel Link Road approach to Redbourn Road and the East Hemel Spine Road south of the A414.

7.2.19. In Berkhamsted, eastbound A41 on-slip from the A416 / Chesham Road roundabout, and Hudnall Lane northbound at the junction with the B440 to become over-capacity in AM peak.

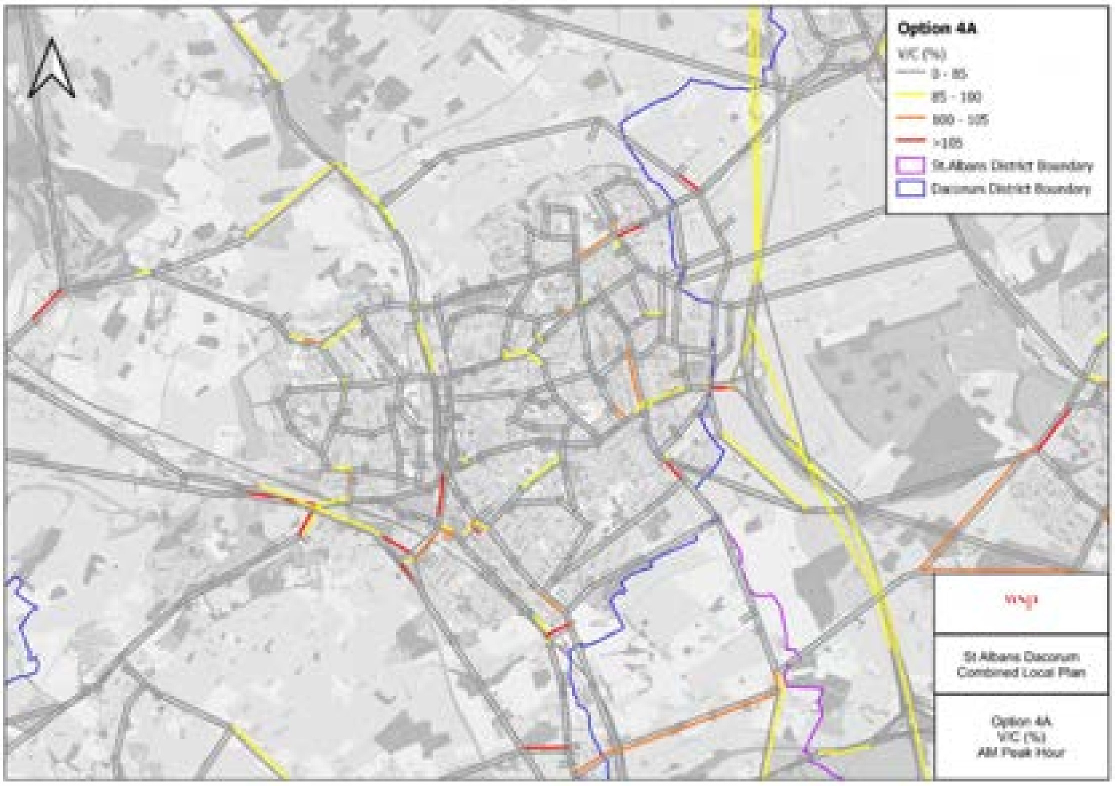

Figure 7-11: Option 4a Link Volume/Capacity Ratio in Hemel Hempstead, AM Peak

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[2] St Albans Local Plan Transport Modelling Report (INF09.11 - Transport Impact Assessment COMET St Albans LP Modelling Report (2024) & Dacorum Local Plan Transport Modelling Report (TRA04.1 Local Plan Transport modelling (Nov 2024)

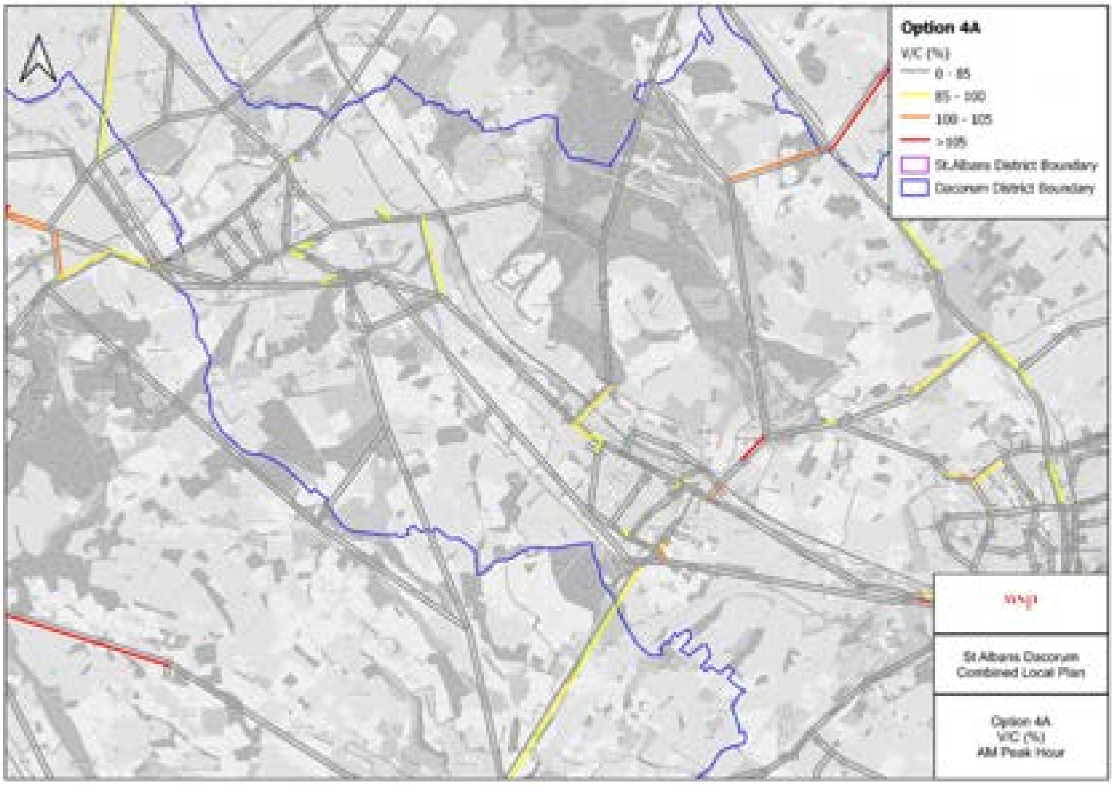


Figure 7-12: Option 4a Link Volume/Capacity Ratio in Berkhamsted and Tring, AM Peak

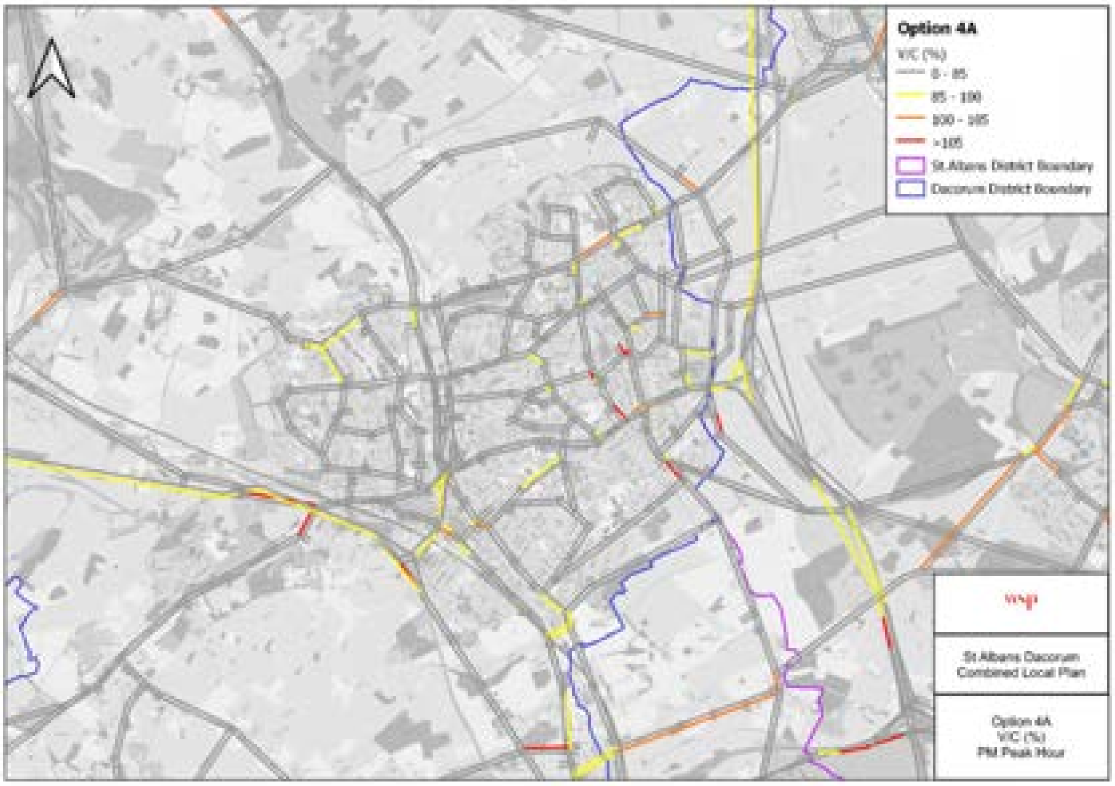


Figure 7-13: Option 4a Link Volume/Capacity Ratio in Hemel Hempstead, PM Peak

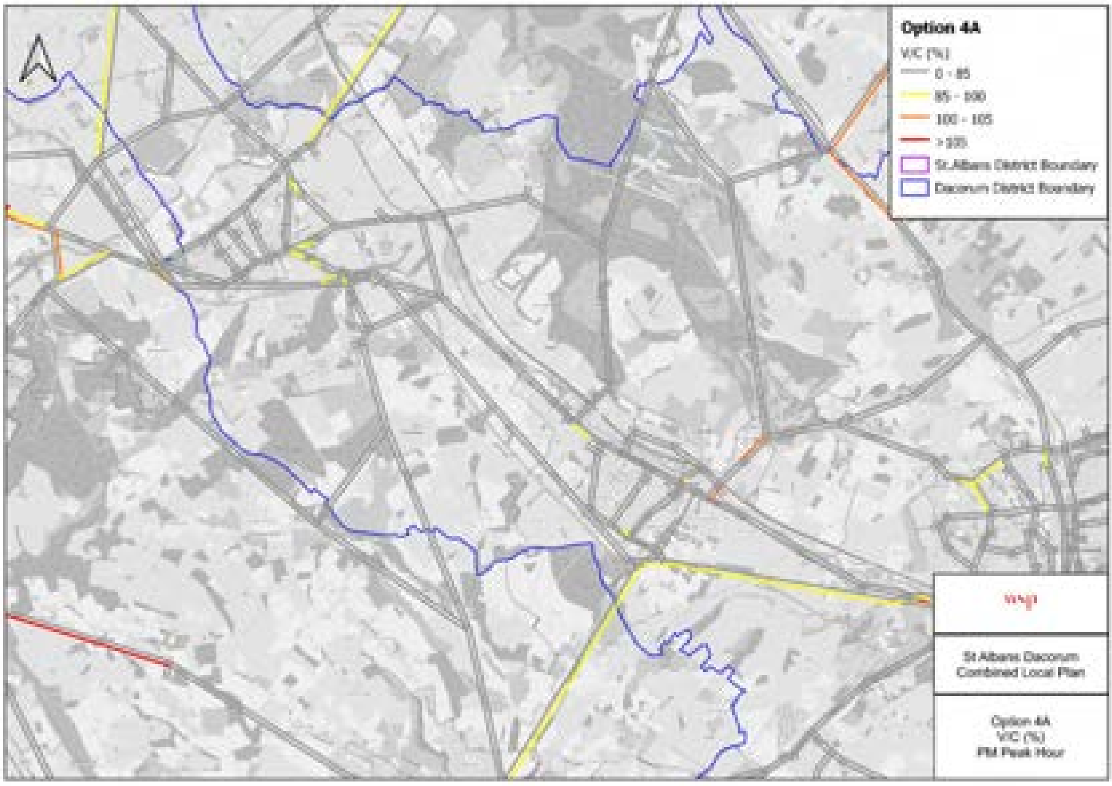


Figure 7-14: Option 4a Link Volume/Capacity Ratio in Berkhamsted and Tring, PM Peak

St Albans

7.2.20. As a result of the Local Plan allocations and IDP schemes, key roads in St Albans which experience increases in V/C in the AM peak include A414 (North Orbital) eastbound and westbound approaching Colney Heath Lane/Smallford Lane roundabout, A1057 Hatfield Road approaching Station Road roundabout, Batchwood Drive, Sandpit Lane, Potterscrouch Lane, Ragged Hall Lane, A4147 Bluehouse Hill and Harpenden Road.

7.2.21. In the PM peak, key roads which experience increases in V/C are A414 eastbound and westbound approaching Colney Heath Lane/Smallford Lane roundabout, A1057 Hatfield Road approaching Station Road roundabout, A4147 Hemel Hempstead Road, A4147 Bluehouse Hill and Harpenden Road.

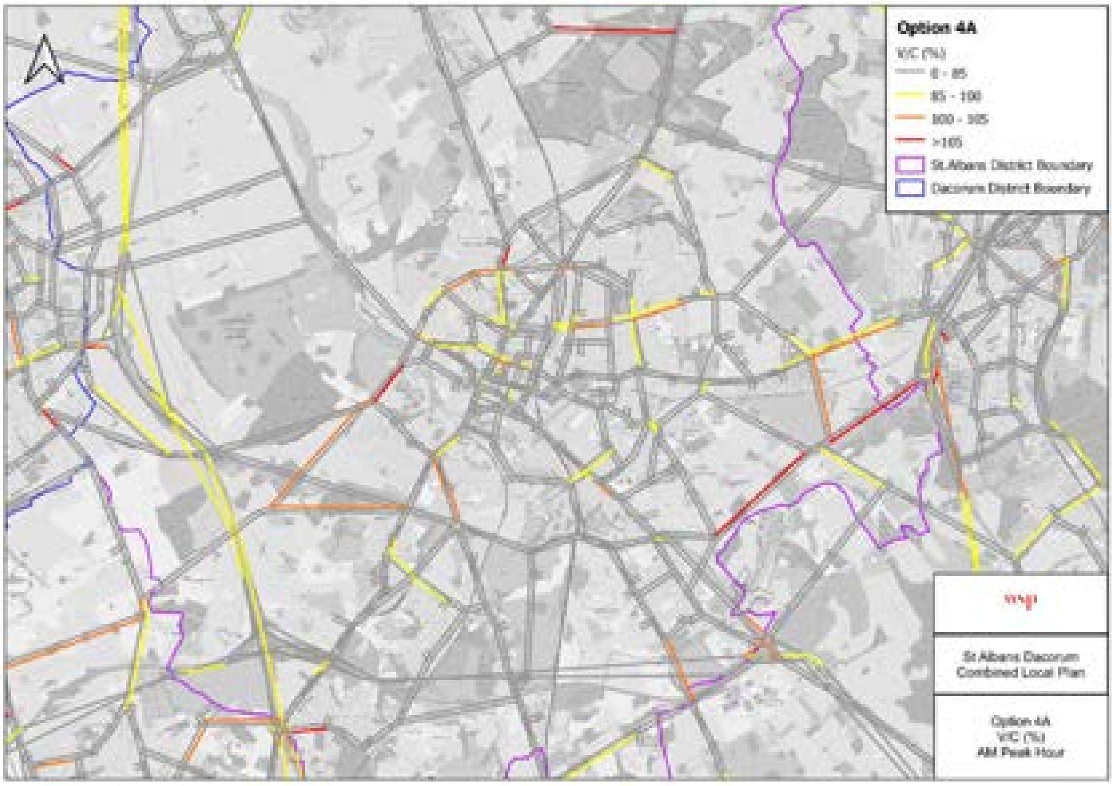


Figure 7-15: Option 4a Link Volume/Capacity Ratio in St Albans, AM Peak

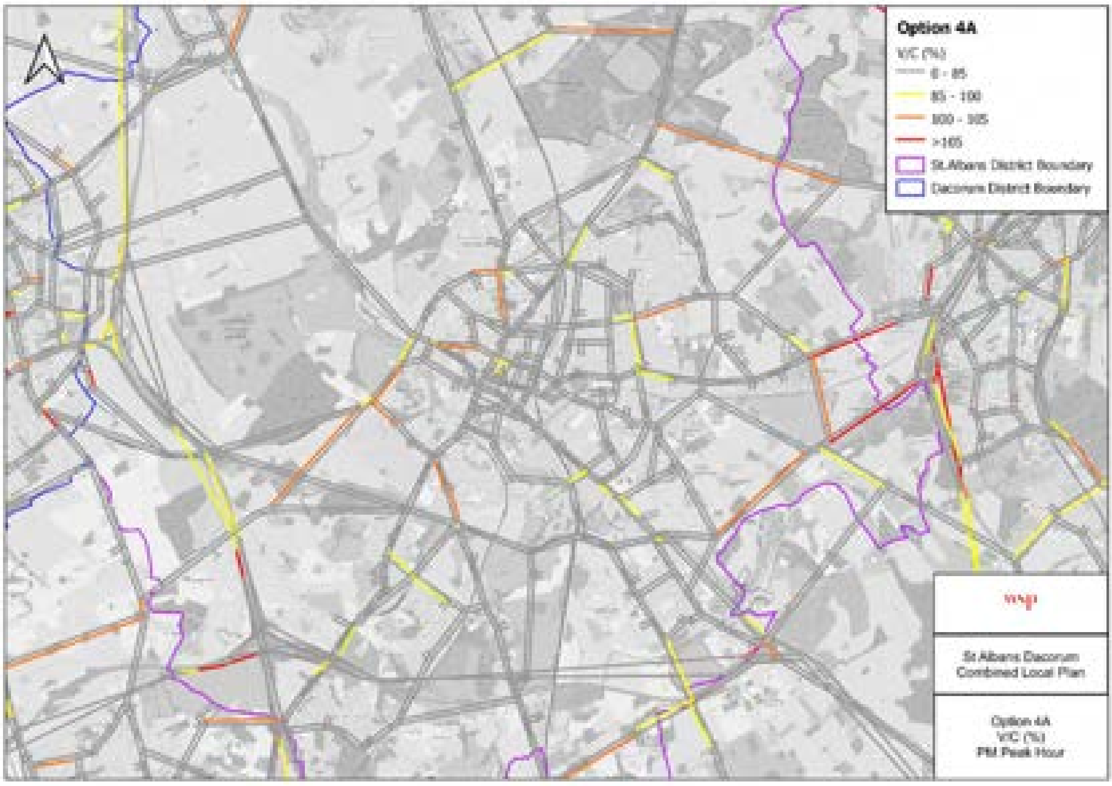


Figure 7-16: Option 4a Link Volume/Capacity Ratio in St Albans, PM Peak

Option 4b

Dacorum

7.2.22. Figure 7-17 to Figure 7-22 show the 2041 Option 4b V/C in the AM and PM peaks when the M1 Junction 8 upgrade is assumed to be built. Overall, the model predicts an improvement in V/C on A414 Breakspear Way due to the reduction in traffic compared with Option 4a. This is a result of the new link to M1 junction 8 allowing vehicles from East Hemel north to avoid the junction with the A414.

7.2.23. In the AM peak, the greatest reductions are predicted on A414 Breakspear Way eastbound and westbound approaches to Breakspear Way/ Green Lane junction and East Hemel Spine Road southbound. However, increase V/C is forecast on the A414 eastbound approach, circulatory links at the new Junction 8 roundabout, and also Boundary Way westbound.

7.2.24. In the PM peak, the greatest reductions compared to Option 4a are demonstrated on A414 Breakspear Way eastbound approach to Breakspear Way/ Green Lane junction but increased V/C is forecast on A414 approach and circulatory links at the new Junction 8 roundabout, A414 northbound off slip and Boundary Way southbound.

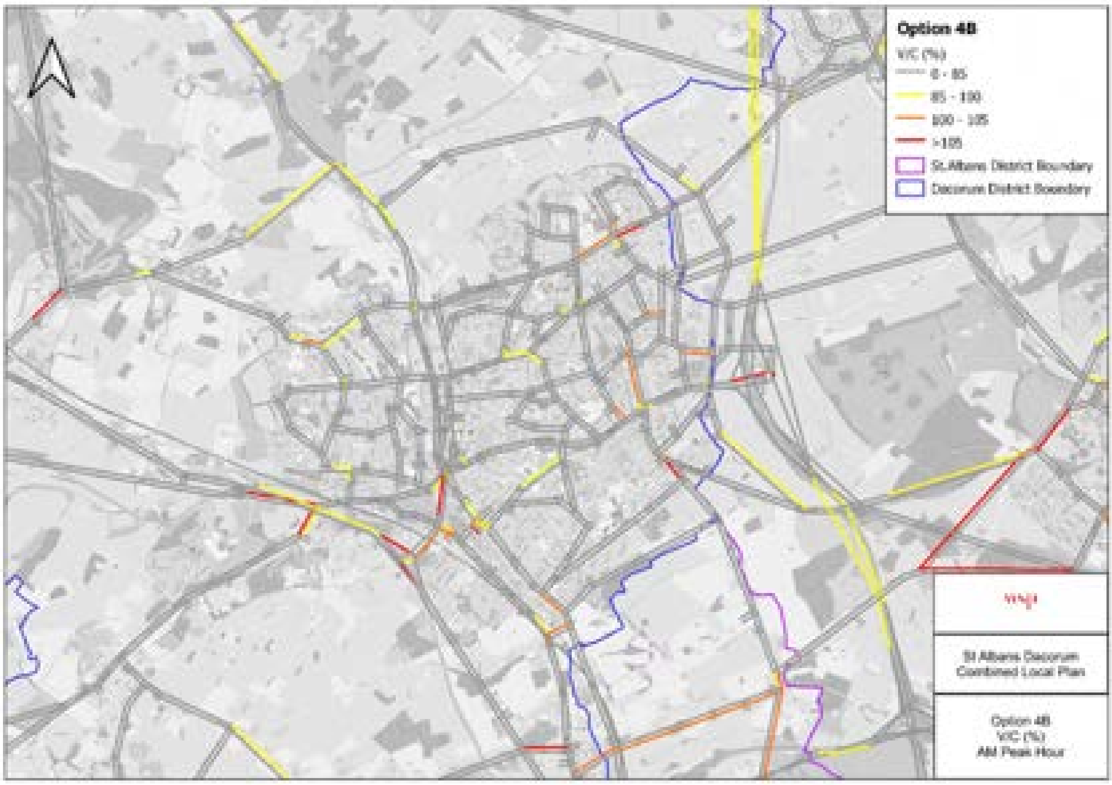


Figure 7-17: Option 4b Link Volume/Capacity Ratio in Hemel Hempstead, AM Peak

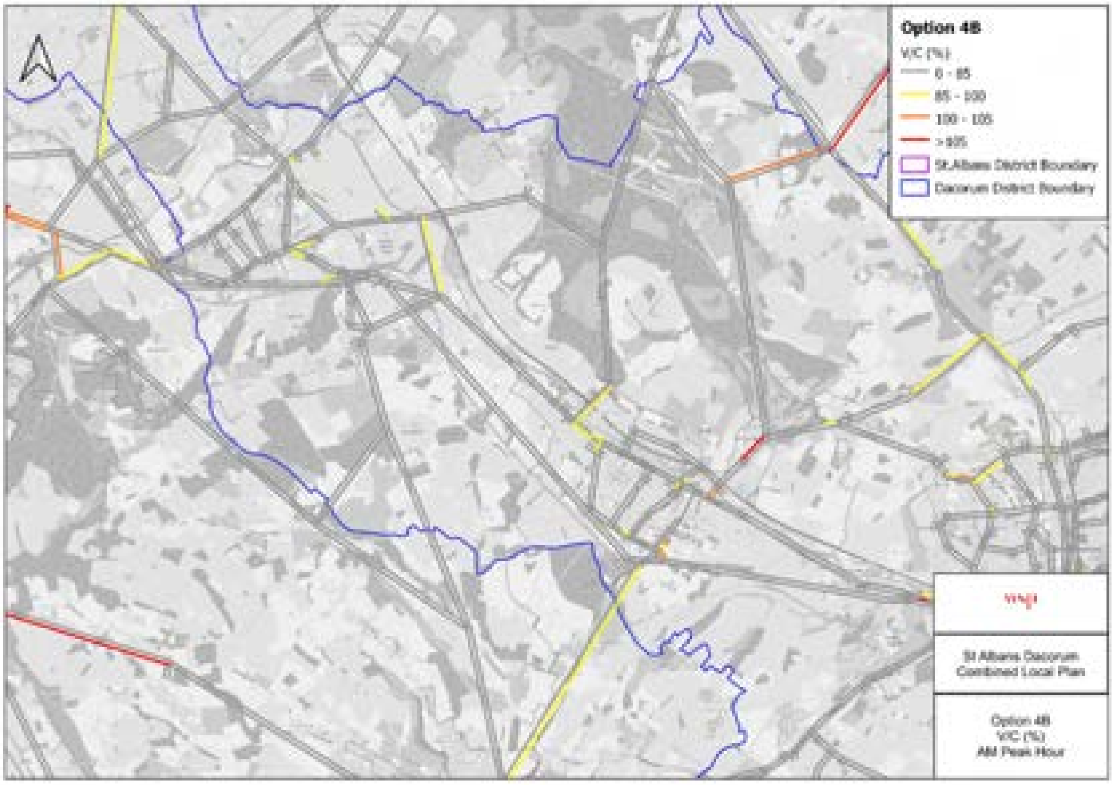


Figure 7-18: Option 4b Link Volume/Capacity Ratio in Berkhamsted and Tring, AM Peak

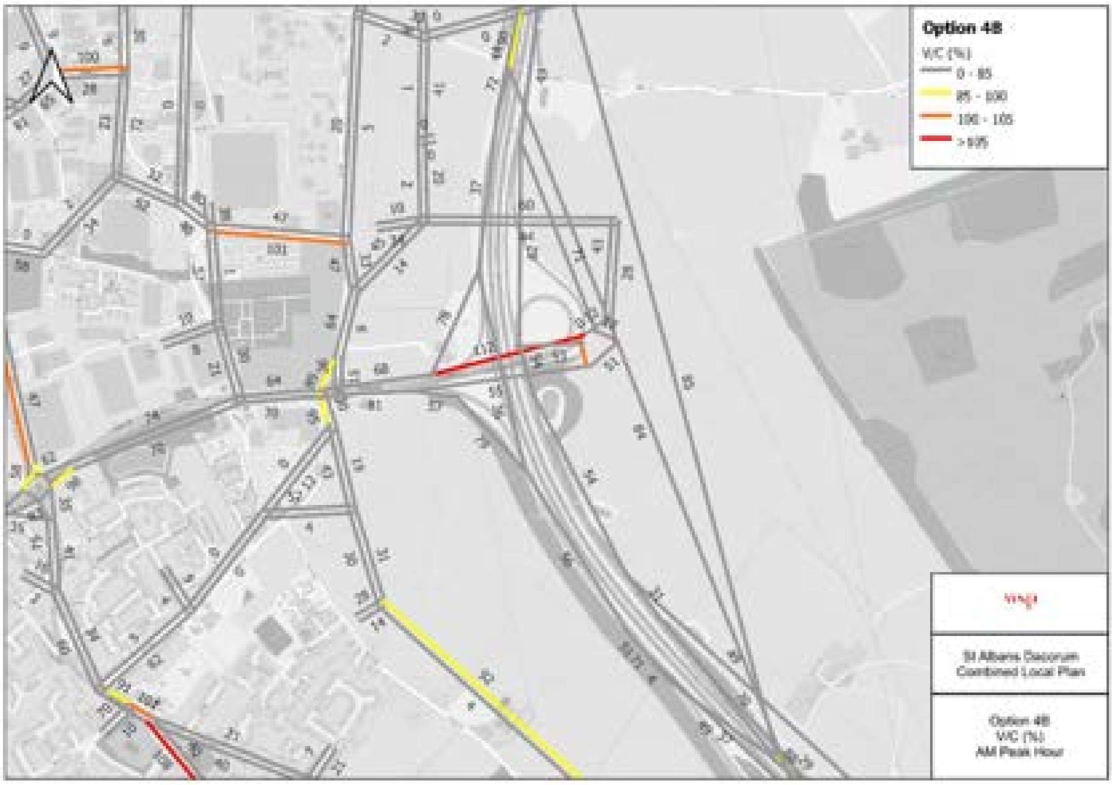


Figure 7-19: Option 4b Link Volume/Capacity Ratio around M1 Junction 8, AM Peak

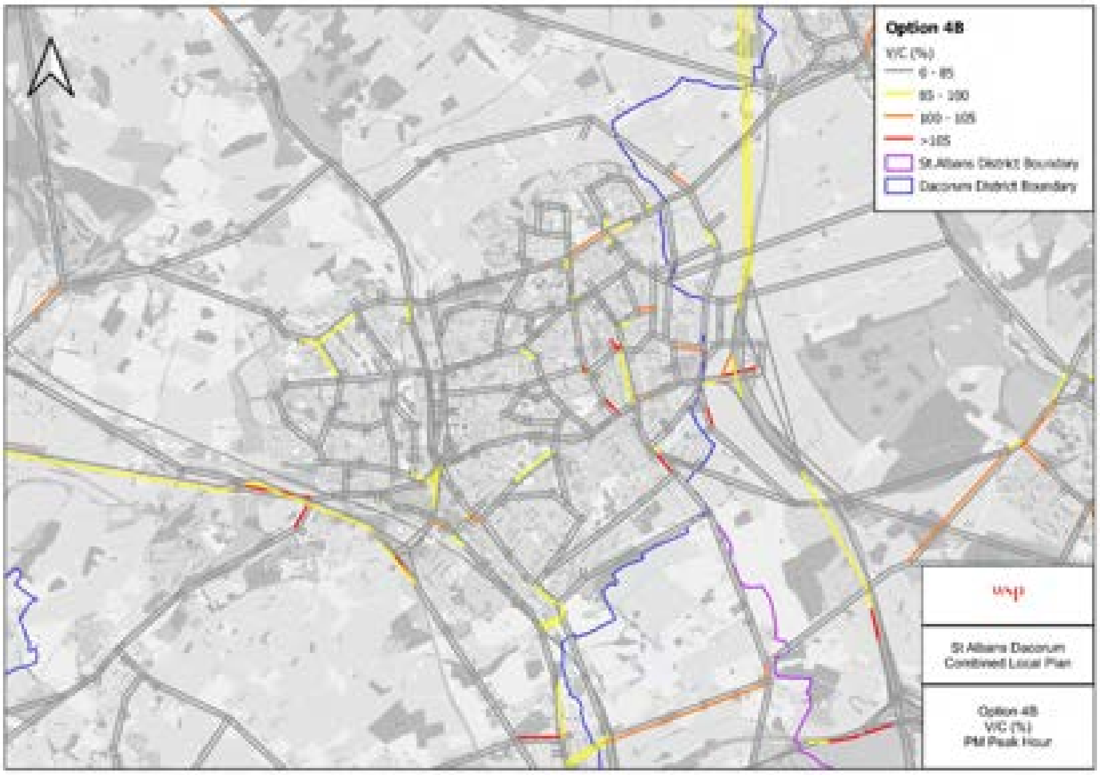


Figure 7-20: Option 4b Link Volume/Capacity Ratio in Hemel Hempstead, PM Peak

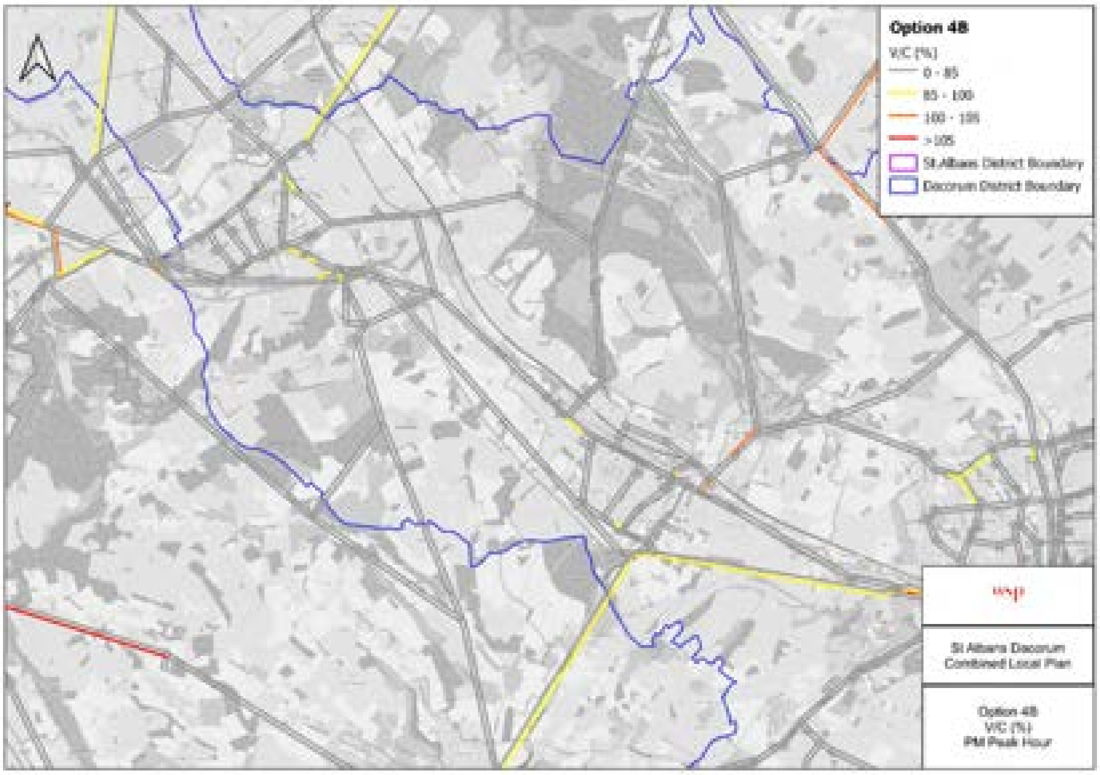


Figure 7-21: Option 4b Link Volume/Capacity Ratio in Berkhamsted and Tring, PM Peak

Figure 7-22: Option 4b Link Volume/Capacity Ratio around M1 Junction 8, PM Peak

St Albans

7.2.25. Figure 7-23 and Figure 7-24 show the 2041 Option 4b V/C in St Albans district in the AM and PM peaks when the M1 Junction 8 upgrade is assumed to be built.

7.2.26. In the St Albans district, there is no significant impact on the V/C, apart from the changes around M1 Junction 8 and slight increases in V/C on the A414 as a result of some strategic traffic rerouting .

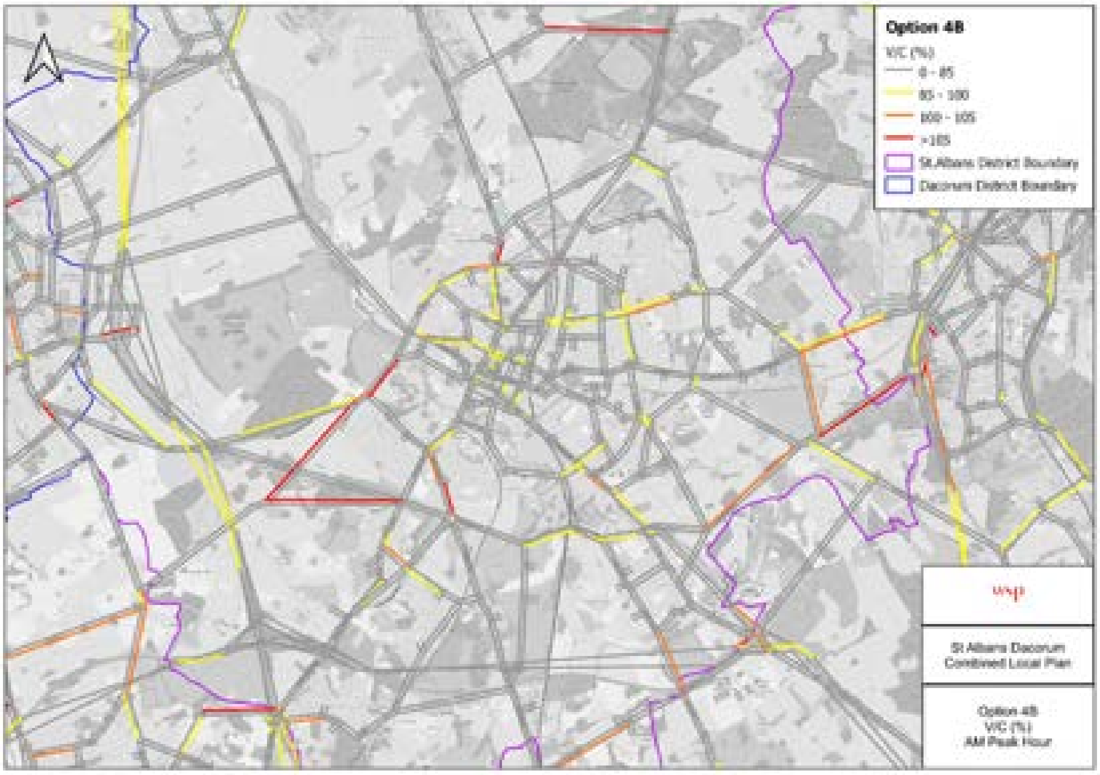


Figure 7-23: Option 4b Link Volume/Capacity Ratio in St Albans, AM Peak

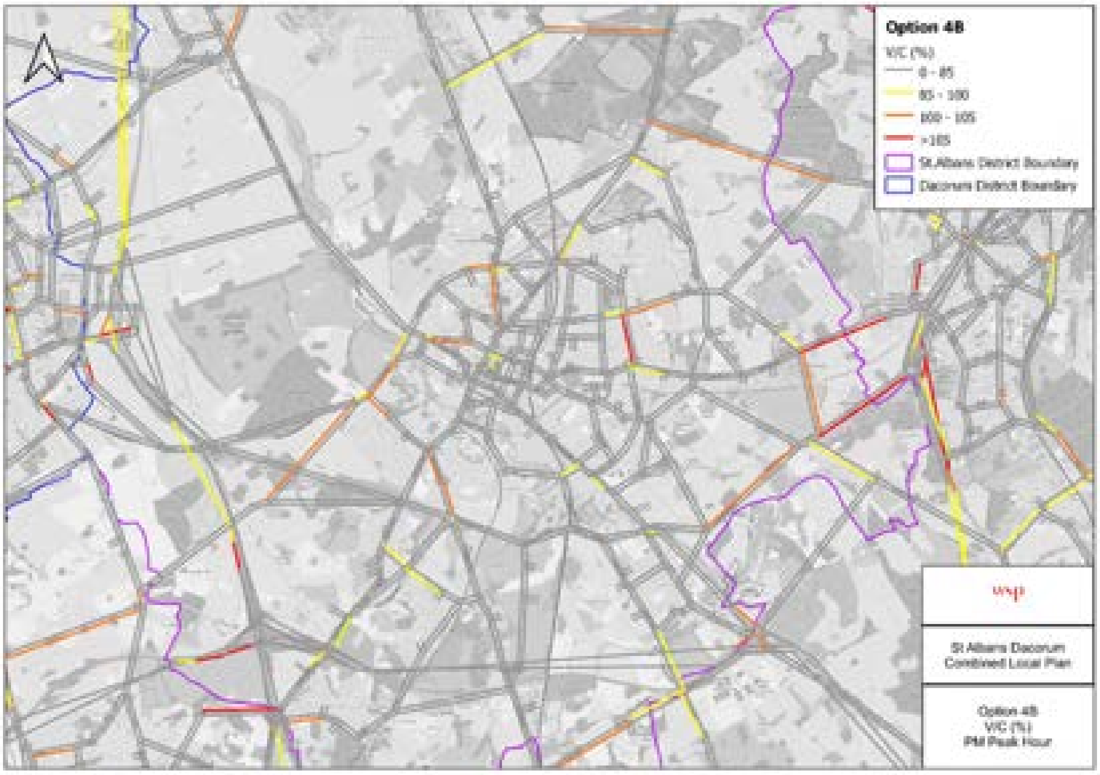


Figure 7-24: Option 4b Link Volume/Capacity Ratio in St Albans, PM Peak

Link Delay

7.2.27. The following figures show the link delay for all links in the network. In these plots the following colour coding has been used to show the range of link delays:

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

7.2.28. 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.

Option 4a vs Option 0A (Impact of Local Plan/IDP schemes & Mode shift)

7.2.29. The impacts of the DBC Local Plan, SADC Local Plan, proposed IDP highway improvements and OSM reduction on the link delays are presented in Figure 7-25 to Figure 7-30 for AM and PM peak, which show the delay difference between Option 4a and Option 0A.

Dacorum

7.2.30. The majority of the increases in delay are found in Hemel Hempstead where the greatest Local Plan growth is located. There are some increases in delay on roads in Berkhamsted, but no link delay increases of over a minute in Tring.

7.2.31. In Hemel Hempstead, key links which experience increases in delay in the AM peak are Redbourn Road, Link Road, A414 Breakspear Way eastbound between M1 Junction 8 and Green Lane junction, the new North Hemel Link Road and East Hemel Spine Road where they intersect with Redbourn Road, the exit slip road from M1 Junction 8 southbound, the junction of East Hemel Spine Road with Hemel Hempstead Road, Bedmond Road, the exit slip roads from the A41 at the Two Waters Way junction, Two Waters Way approach to the Plough Roundabout , Red Lion Lane eastbound, approaches to the A4251 London Road / B4505 Box Lane junction, and Potten End Hill approach to Leighton Buzzard Road.

7.2.32. Key links which experience increases in delay in the PM peak are Redbourn Road, Link Road, A414 Breakspear Way eastbound between M1 Junction 8 and Green Lane junction, Bedmond Road, the North Hemel Link Road approach and East Hemel Spine Road approaches to the Redbourn Road junction, the junction of East Hemel Spine Road and Hemel Hempstead Road, the northbound exit slip road from the A41 at the Two Waters Way junction and approaches to the A4251 London Road / B4505 Box Lane junction.

7.2.33. In Berkhamsted, there are delay increases on Ravens Lane, Gravel Path, Kings Road, and Durrants Lane at their junctions with A4251 High Street along with the on-slip to A41 southbound from A416 in the AM Peak. In the PM peak there are no significant increases in delay in Berkhamsted apart from Durrants Lane.

7.2.34. In Tring, there is no significant increase in delay on the highway network associated with the Local Plan developments.

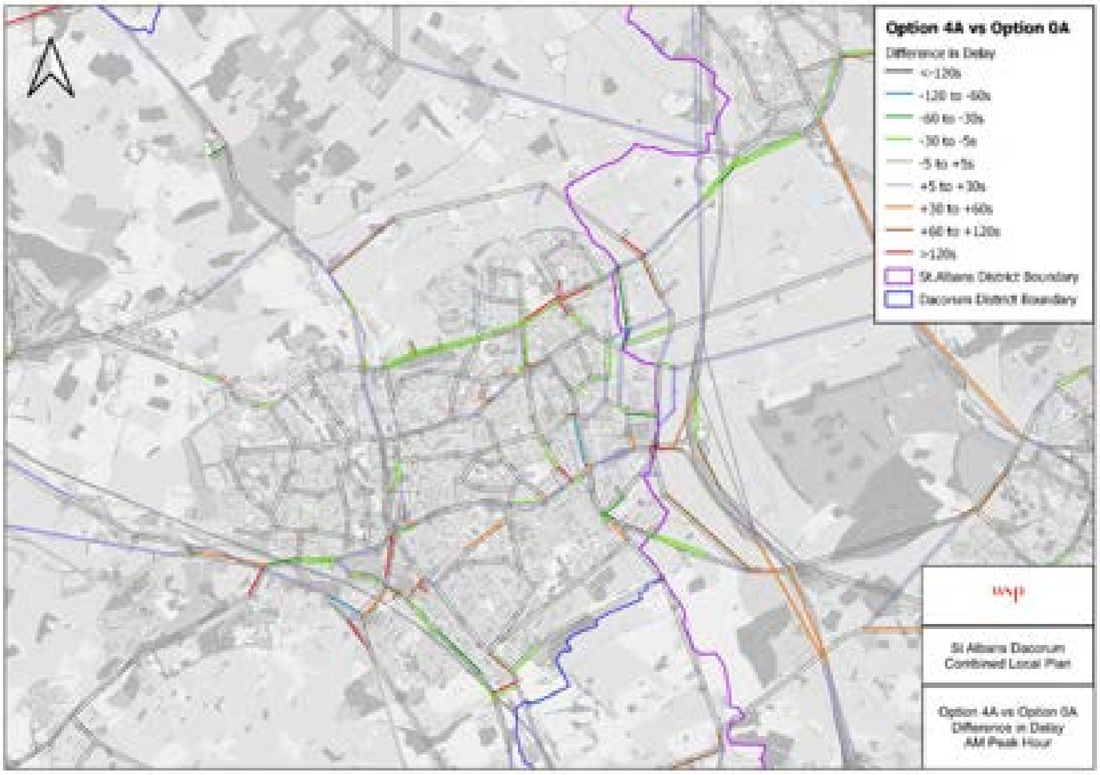


Figure 7-25: Link Delay Difference Option 4a vs Option 0A, Hemel Hempstead, AM Peak

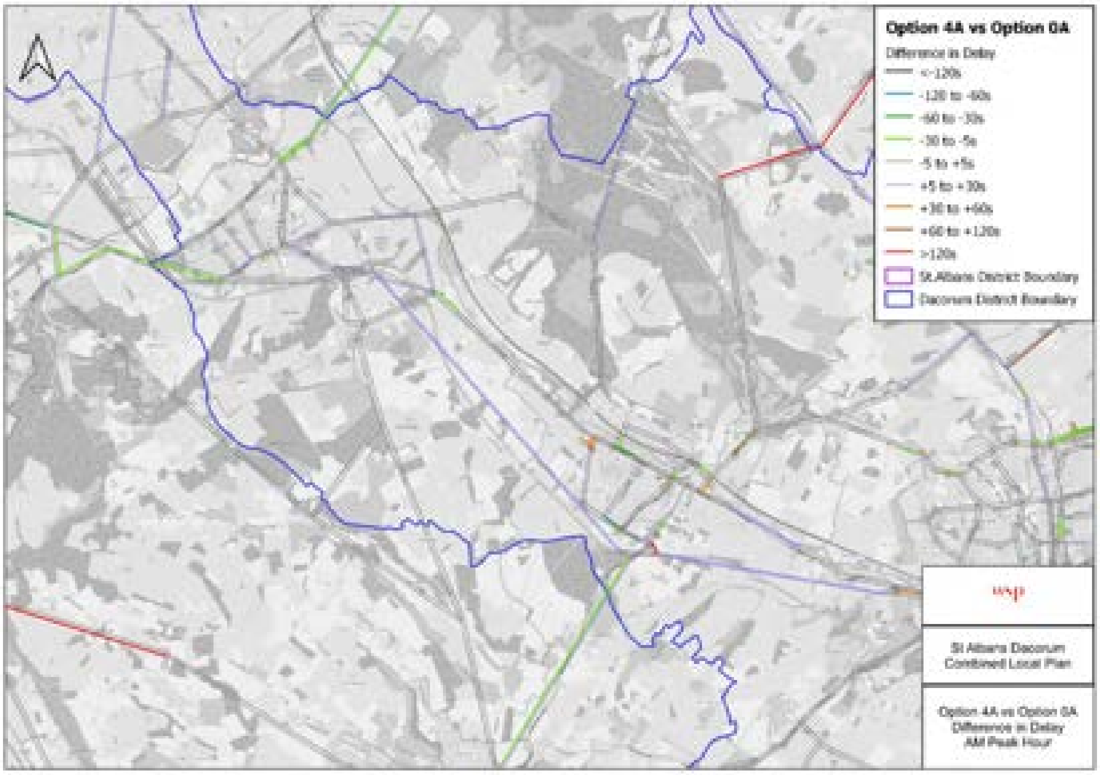


Figure 7-26: Link Delay Difference Option 4a vs Option 0A, Berkhamsted and Tring, AM Peak

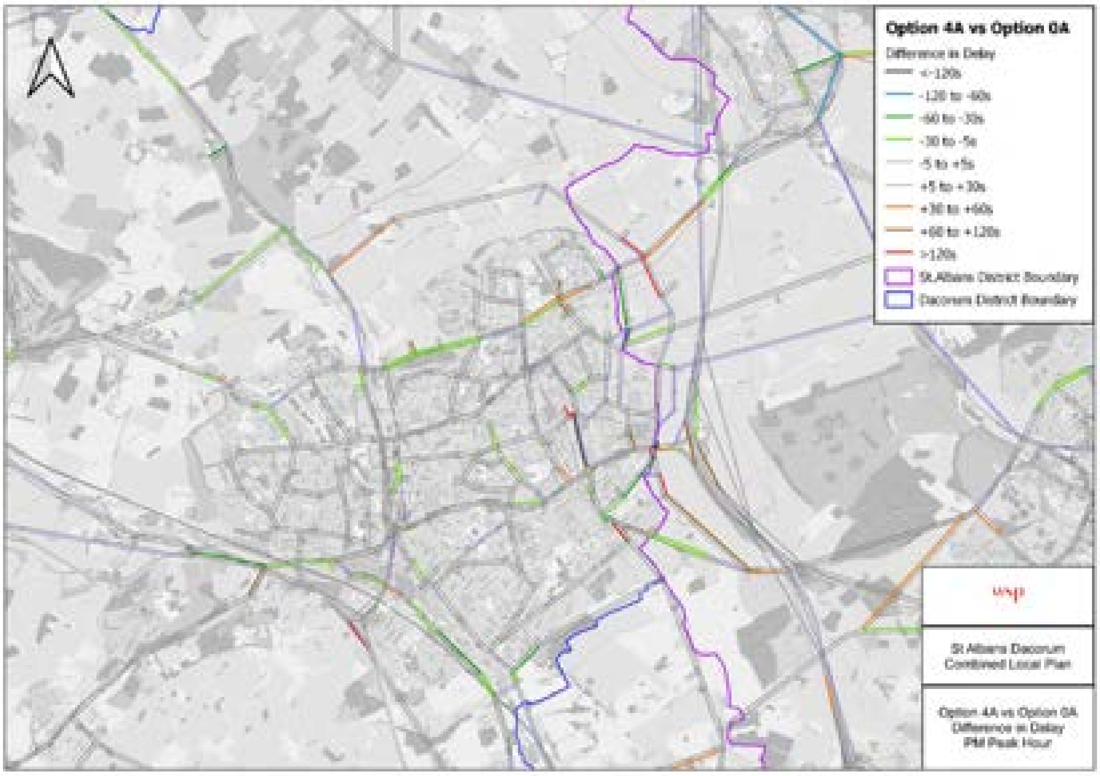


Figure 7-27: Link Delay Difference Option 4a vs Option 0A, Hemel Hempstead, PM Peak

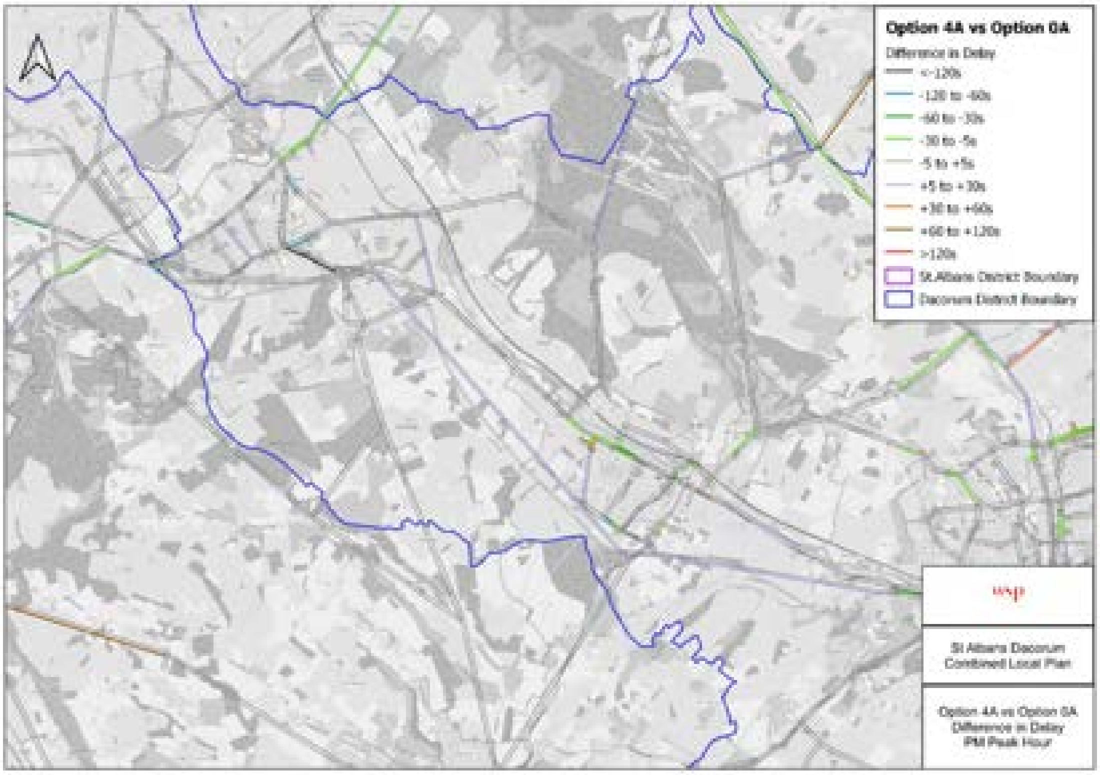


Figure 7-28: Link Delay Difference Option 4a vs Option 0A, Berkhamsted and Tring, PM Peak

St Albans

7.2.35. Figure 7-29 and Figure 7-30 show the delay difference within St Albans. Key links which experience increases in delay of over 30 seconds in the AM peak are Redbourn Road approach to Batchwood Drive roundabout, A4147 Bluehouse Hill and Hemel Hempstead Road approach at their roundabout, Harpenden Road, A414 (North Orbital) eastbound approaching Colney Heath Lane junction, Ragged Hall Lane and Watling Street.

7.2.36. In the PM peak, key roads which experience increases in delay are A414 (North Orbital) eastbound approaching Colney Heath Lane junction, St Albans Road, Sandpit Lane, Harpenden Road, Bedmond Lane, King Harry Lane and Watling Street.

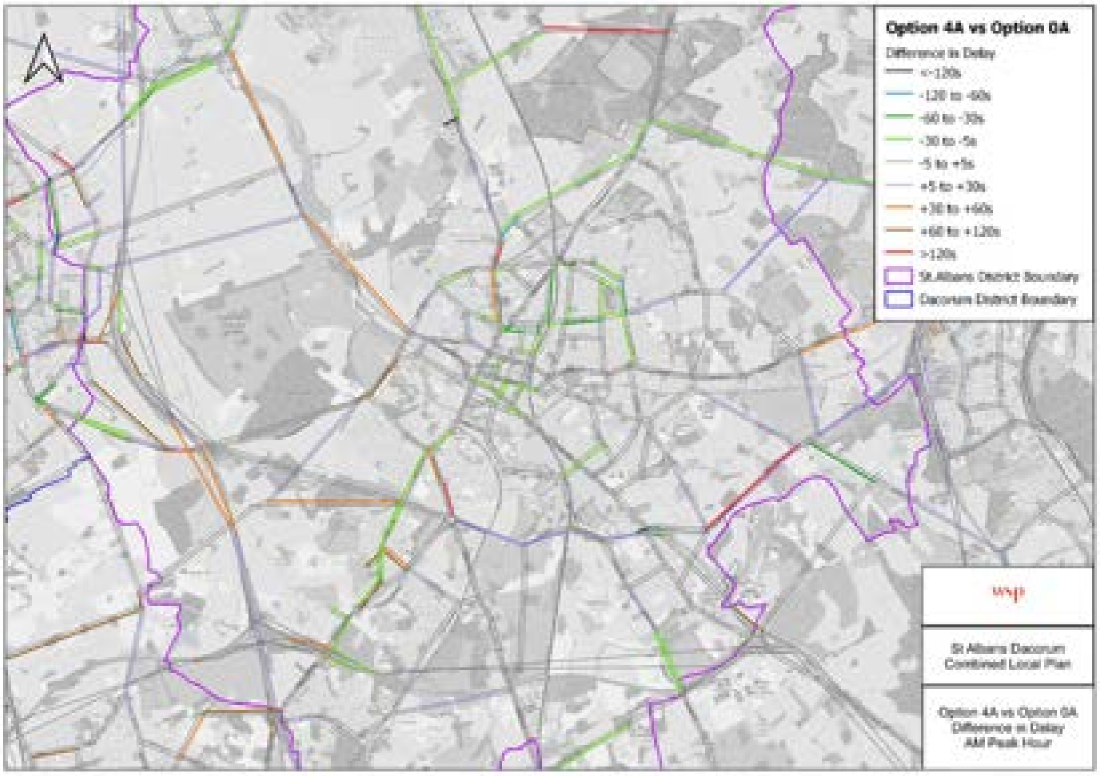


Figure 7-29: Link Delay Difference Option 4a vs Option 0A, St Albans, AM Peak

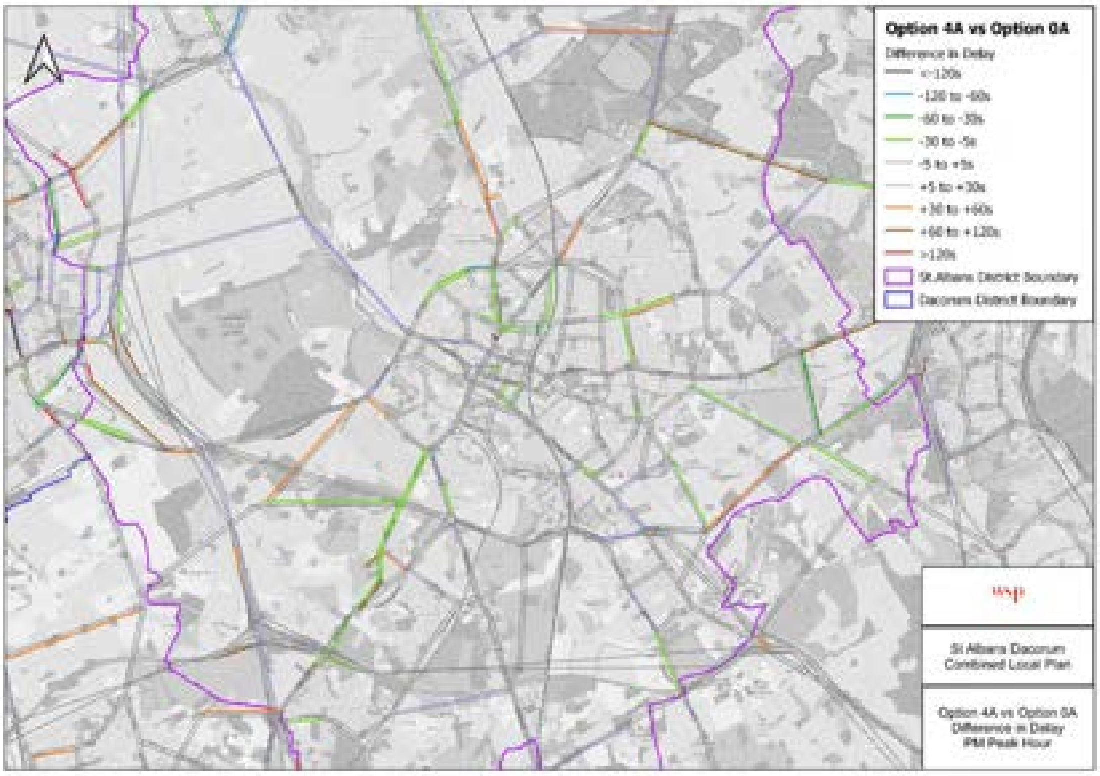


Figure 7-30: Link Delay Difference Option 4a vs Option 0A, St Albans, PM Peak

Option 4b vs Option 4a (Impact of M1 Junction 8 Upgrade)

7.2.37. The impacts of the M1 Junction 8 upgrade on the link delays is presented in Figure 7-32 to Figure 7-36 for AM and PM peak, which reflect the link delay difference between Option 4b and Option 4a. This demonstrates the impact of the M1 Junction 8 upgrade to mitigate the impact of the combined Local Plan growth within Dacorum and St Albans.

7.2.38. The M1 Junction 8 upgrade scheme is aimed to improve the accessibility of HGC development traffic to access M1 Junction 8 via a new link road to the north of the junction. By providing this link road, M1 southbound traffic from the HGC development can bypass the busy Breakspear Way / Green Lane junction to reach the M1.

7.2.39. As shown in the following plots, the congestion at A414 Breakspear Way / Green Lane junction is forecast to reduce as traffic is diverted to the link road.

7.2.40. Delay reductions are forecast on A414 Breakspear Way approach to A414 Breakspear Way / Green Lane junction westbound, the North Hemel Link Road southbound approach and East Hemel Spine Road northbound approach to their intersection with Redbourn Road.

7.2.41. It should be noted that although the M1 Junction 8 upgrade reduces congestion at A414 Breakspear Way and some of the other links as mentioned above, the Option 4b model shows an increase in delays on the A414 Breakspear Way eastbound approach and circulatory links of M1 Junction 8 new roundabout, see Figure 7-31. Further investigation has shown that this is as a result of insufficient capacity at the new M1 Junction 8 southbound on-slip signalised junction. Both the circulatory link and the A414 Breakspear Way eastbound approach are forecast to be over-capacity. Queues do exist in both AM and PM peaks on he A414 Brakespear Way eastbound approach, however these do not extend back and interfere with the M1 northbound onslip or Green Lane junction.

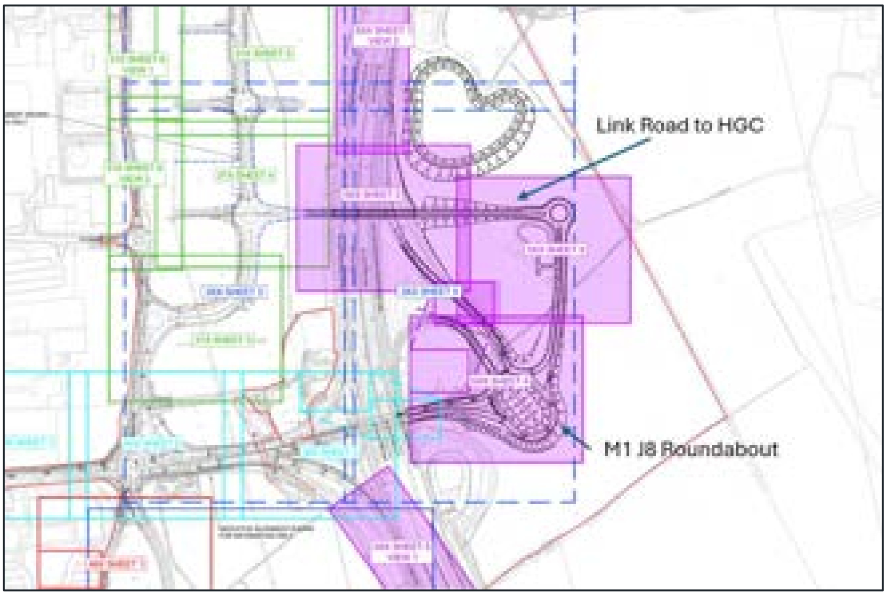


Figure 7-31: Layout of M1 Junction 8 Upgrade Scheme

7.2.42. A sensitivity test has been conducted to assess the impacts of additional circulatory capacity at the proposed M1 Junction 8 roundabout to mitigate the delays. This increases the circulatory capacity from 1 lane to 2 lanes. Noting that this improvement has been assessed within the transport model but would need to be reviewed by the highway design team to ensure it is deliverable. The result of this test demonstrates that the delay forecasted in Option 4b can be relieved if such arrangement is assumed and is practically deliverable on the ground. The plots provided in Appendix J show the changes in flows and reduction in delay between existing Option 4b and the proposed improvement in capacity at the M1 Junction 8 roundabout .

7.2.43. In the PM peak, delay reductions are all under 30 seconds. . Similar to AM peak, the model estimates delay increases on the A414 eastbound approach and circulatory links of M1 Junction 8. There is also an increase in delay of approximately a minute on the A414 northbound on slip.

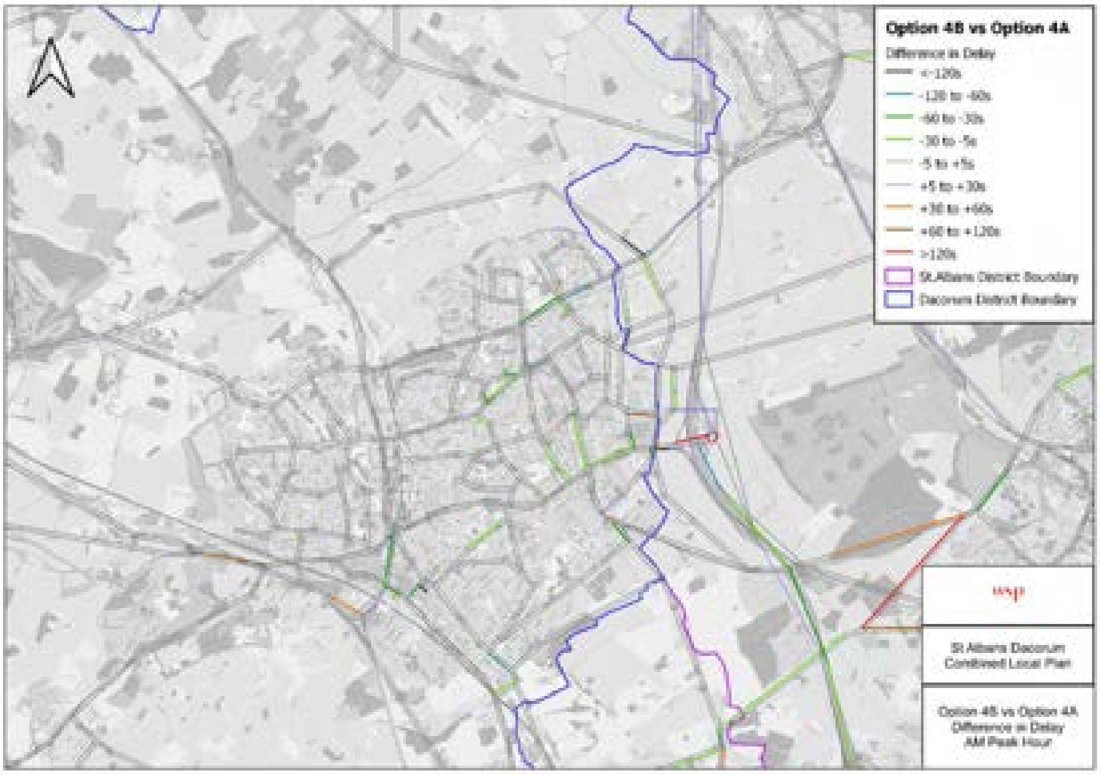


Figure 7-32: Link Delay Difference Option 4b vs Option 4a, Hemel Hempstead AM Peak

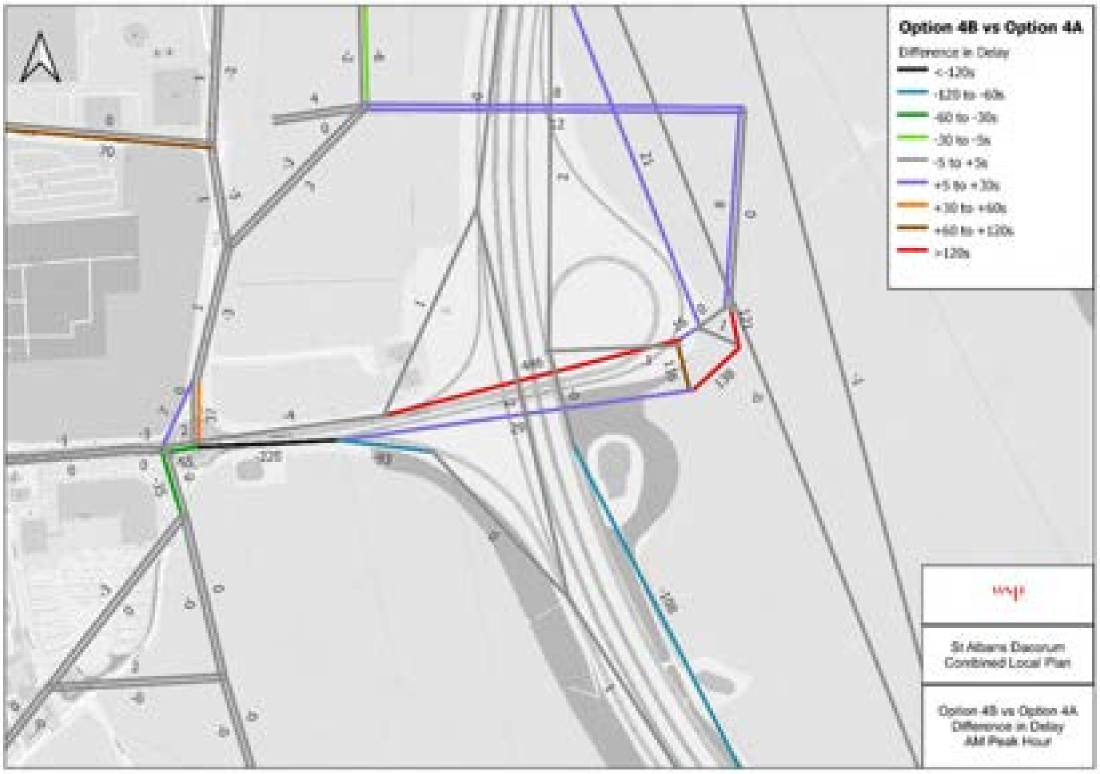


Figure 7-33: Link Delay Difference Option 4b vs Option 4a, M1 Junction 8 AM Peak

7.2.44. As a result of the differences in network structure, the M1 Junction 8 delays estimated for Option 4a and Option 4b models have also been presented individually in Figure 7-34 and Figure 7-37.

Option 4a

Option 4b

Figure 7-34: Link Delay at M1 Junction 8 for Option 4a and Option 4b, AM Peak

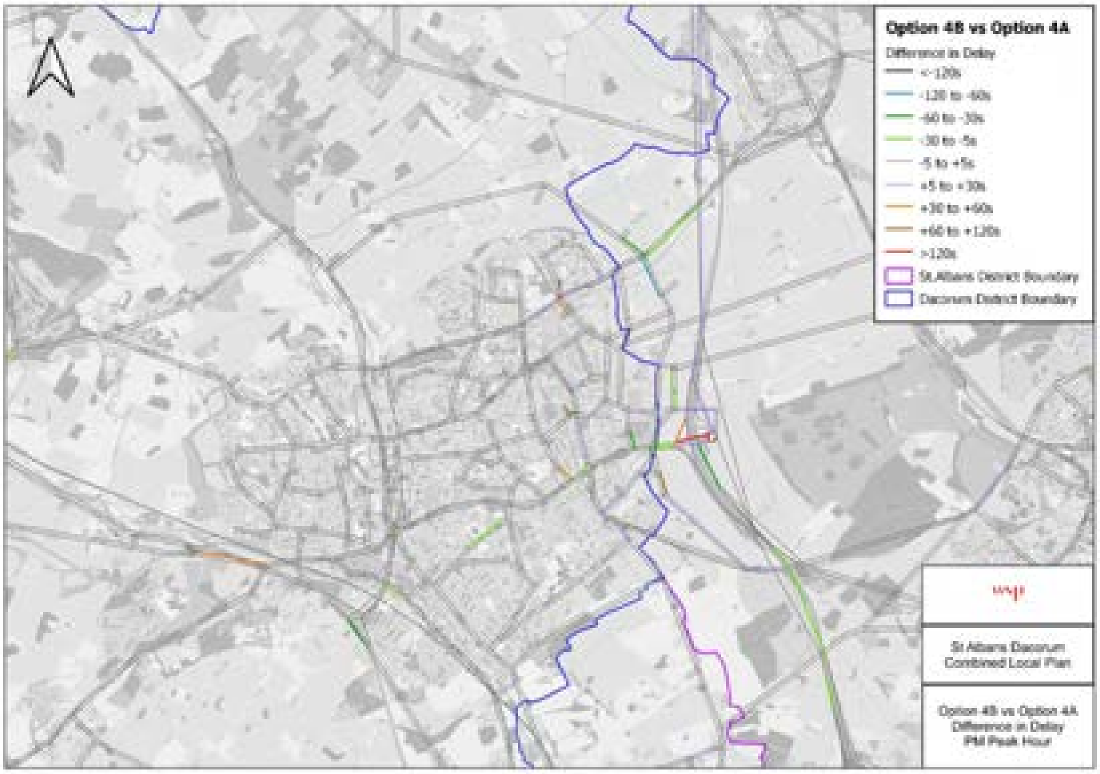


Figure 7-35: Link Delay Difference Option 4b vs Option 4a, Hemel Hempstead, PM Peak

Figure 7-36: Link Delay Difference Option 4b vs Option 4a, M1 Junction 8, PM Peak

Option 4a

Option 4b

Figure 7-37: Link Delay at M1 Junction 8 for Option 4a and Option 4b, PM Peak

![WSP logo]

Option 4b vs Option 0A (Impact of Local Plan/IDP schemes/Mode shift and M1 Junction 8 upgrade)

7.2.45. The impacts of the Local Plan allocations, IDP schemes, mode shift and the M1 Junction 8 upgrade on the link delays is presented in Figure 7-38 to Figure 7-45, which show the delay differences between Option 4b and Option 0A, in AM and PM peaks. Overall, the delay comparison shows very similar results to previous Option 4a vs Option 0A comparisons, apart from the delay on Breakspear Way eastbound approach to the M1 Junction 8 northbound on-slip is forecast to reduce in AM peak, and there is less increase in delay on the westbound approach to A414 Green Lane junction (less than 30 seconds) in AM and PM peak. The plots below also show delay increases at the M1 Junction 8 circulatory links similar to as observed in Option 4b versus Option 4a, but the delay increase on the new link road is less than 10 seconds.

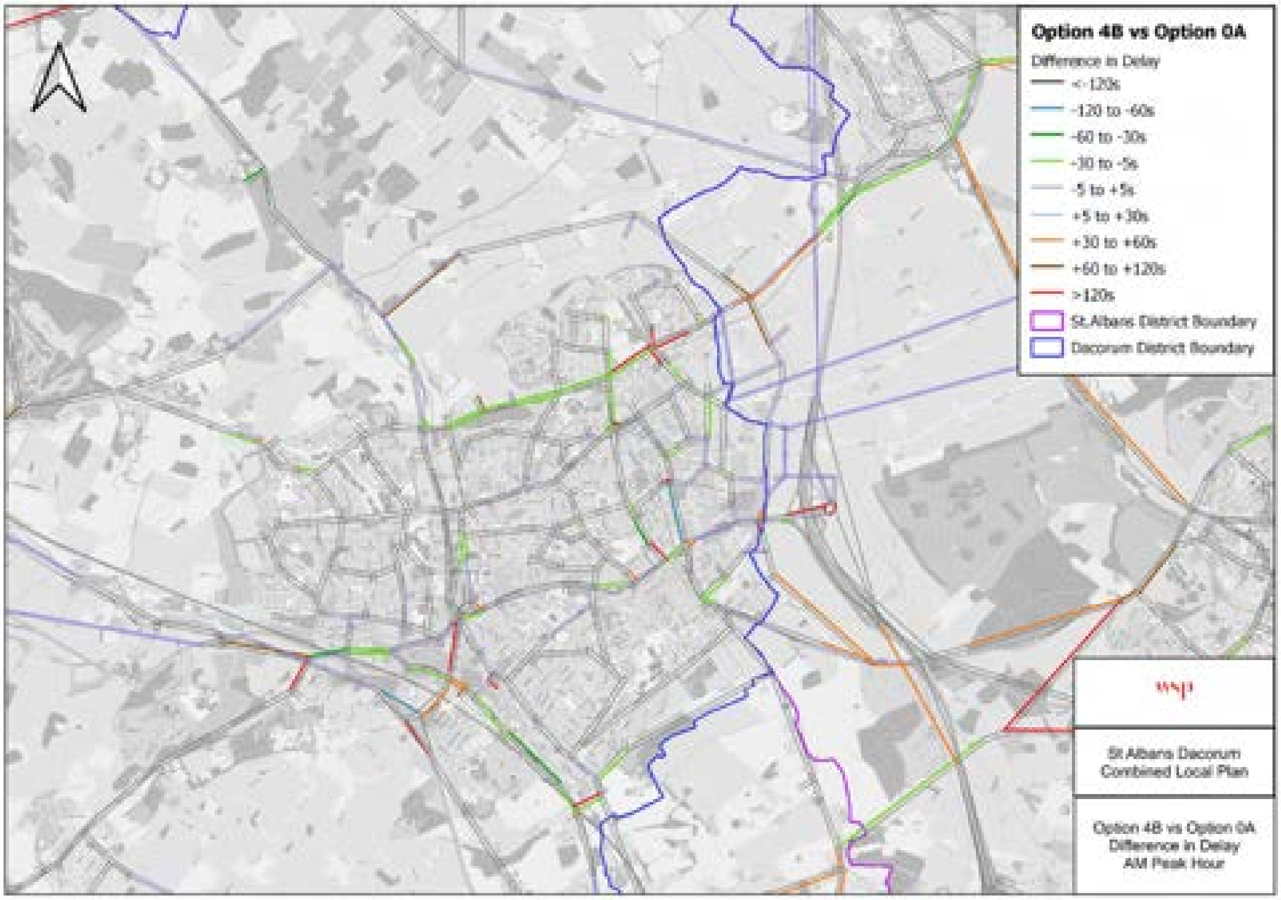
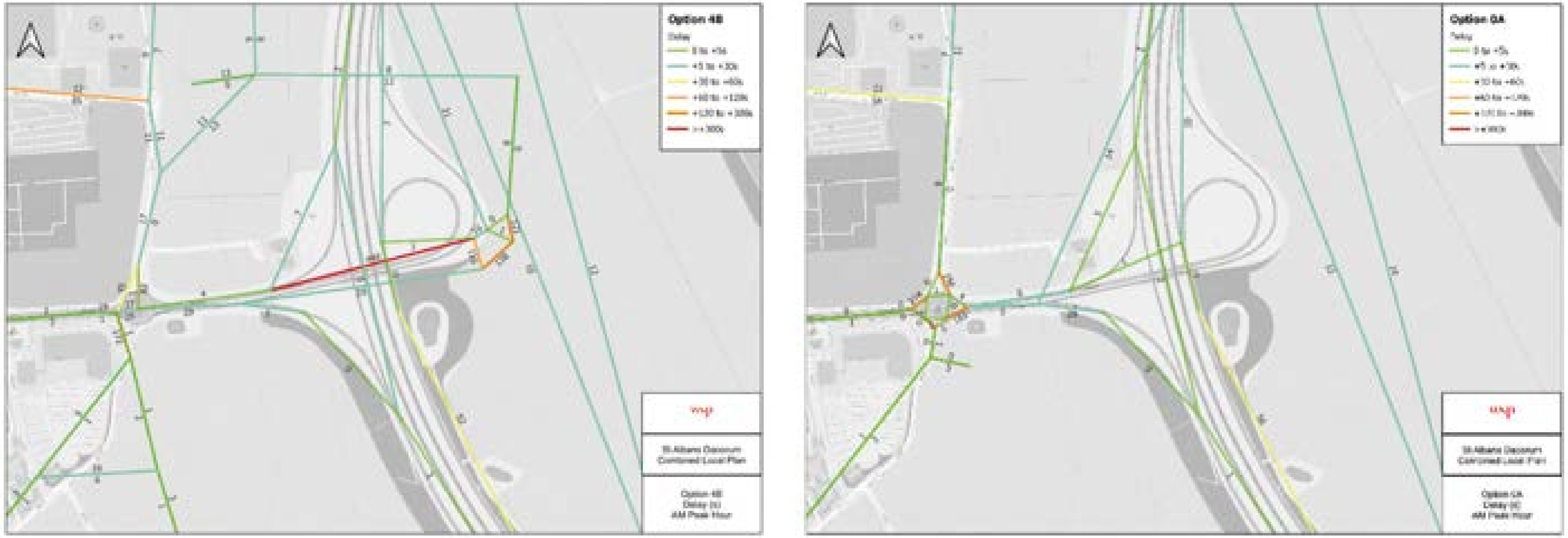


Figure 7-38: Link Delay Difference Option 4b vs Option 0A, Hemel Hempstead, AM Peak

Figure 7-39: Link Delay Difference Option 4b vs Option 0A, M1 Junction 8, AM Peak

7.2.46. As a result of the differences in network structure, the M1 Junction 8 delay estimated for Option 4b and Option 0A models are also presented individually in Figure 7-40 and Figure 7-44.



Option 4b **Option 0A**

Figure 7-40: Link Delay at M1 Junction 8 for Option 4b and Option 0A, M1 Junction 8, AM Peak

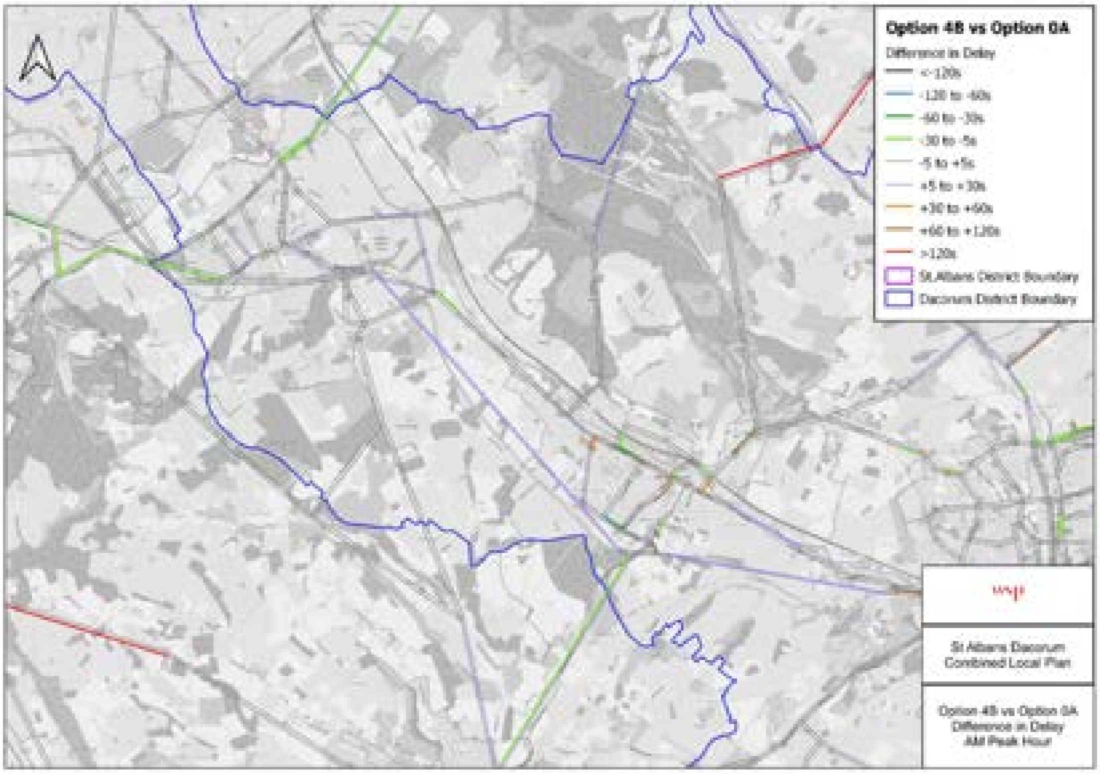


Figure 7-41: Link Delay Difference Option 4b vs Option 0A, Berkhamsted and Tring, AM Peak

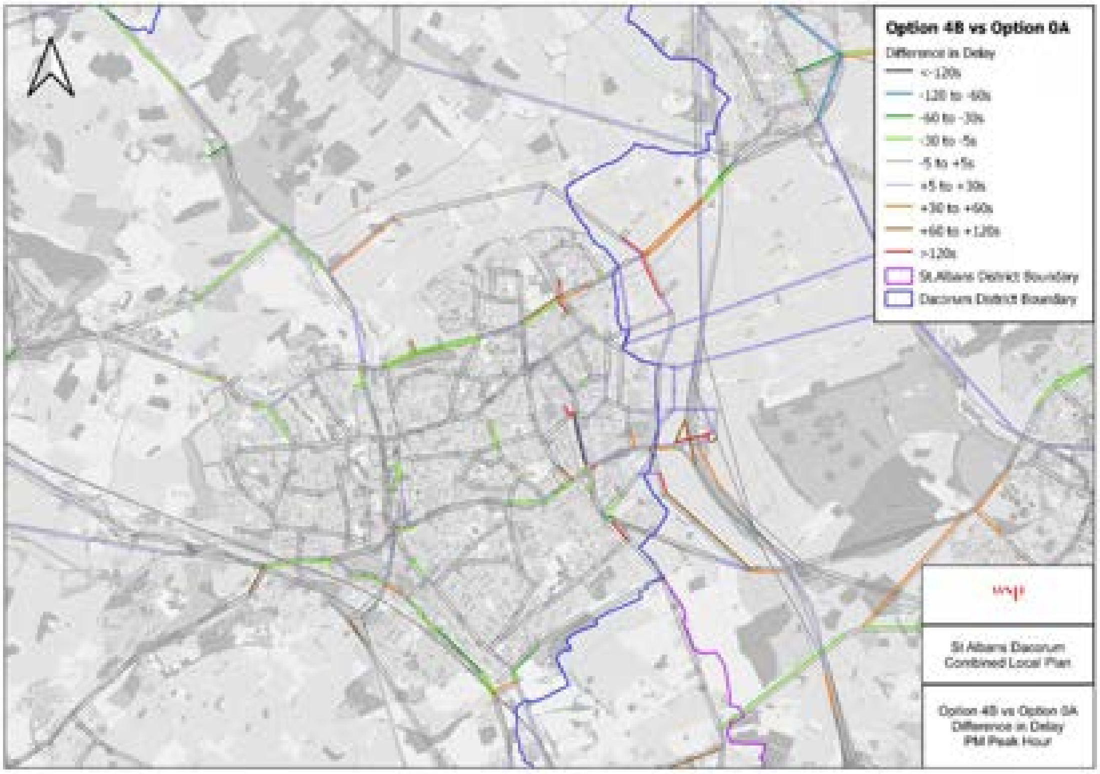


Figure 7-42: Link Delay Difference Option 4b vs Option 0A, Hemel Hempstead, PM Peak

Figure 7-43: Link Delay Difference Option 4b vs Option 0A, M1 Junction 8, PM Peak

Option 4b

Option 0A

Figure 7-44: Link Delay at M1 Junction 8 for Option 4b and Option 0A, M1 Junction 8, PM Peak

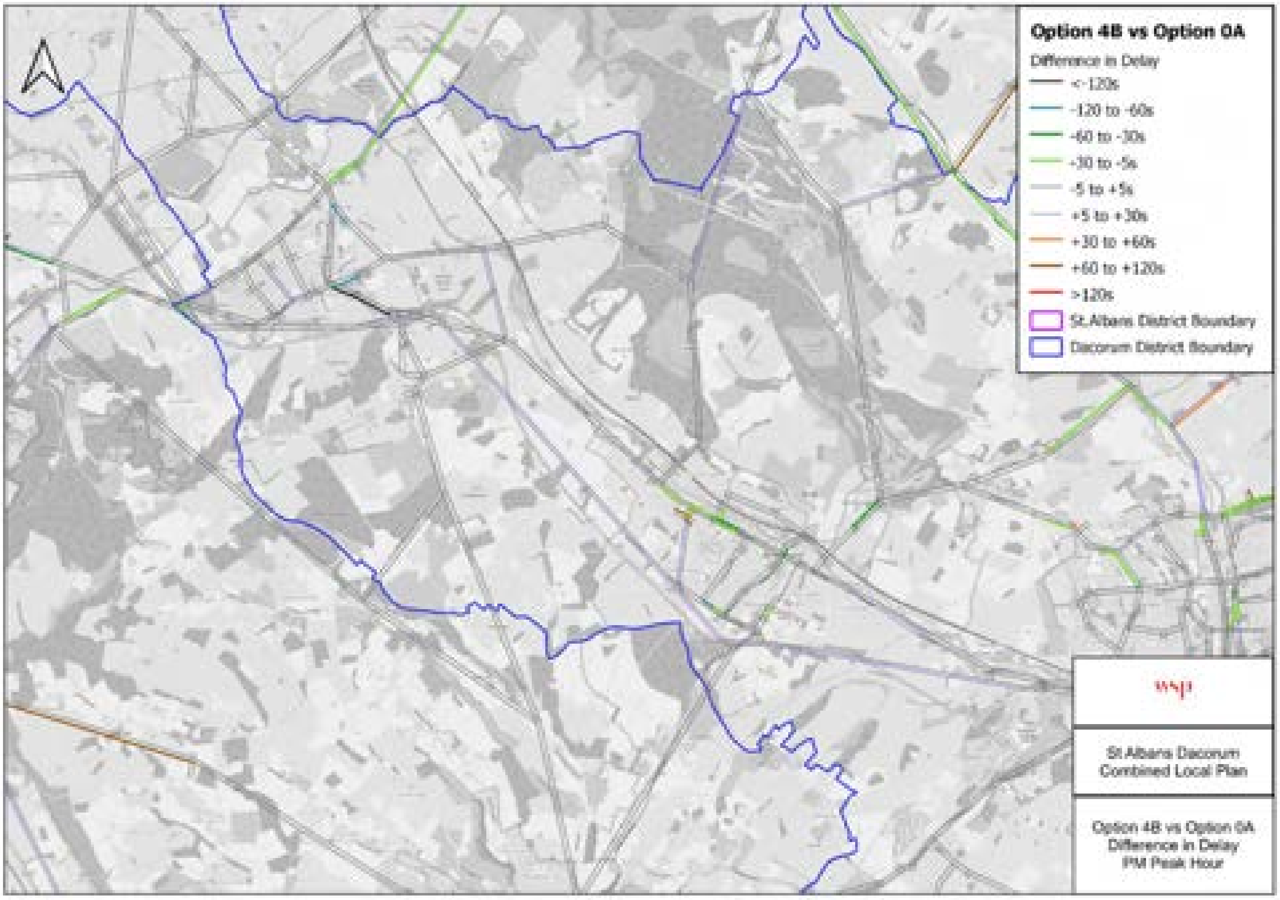


Figure 7-45: Link Delay Difference Option 4b vs Option 0A, Berkhamsted and Tring, PM Peak

St Albans

7.2.47. The impact to St Albans with Local Plan allocations and M1 Junction 8 upgrade on the link delays is presented in Figure 7-46 and Figure 7-47. These plots show very similar results as previous Option 4a vs Option 0A, indicating the M1 Junction 8 upgrade makes only minor impacts on delays in St Albans.

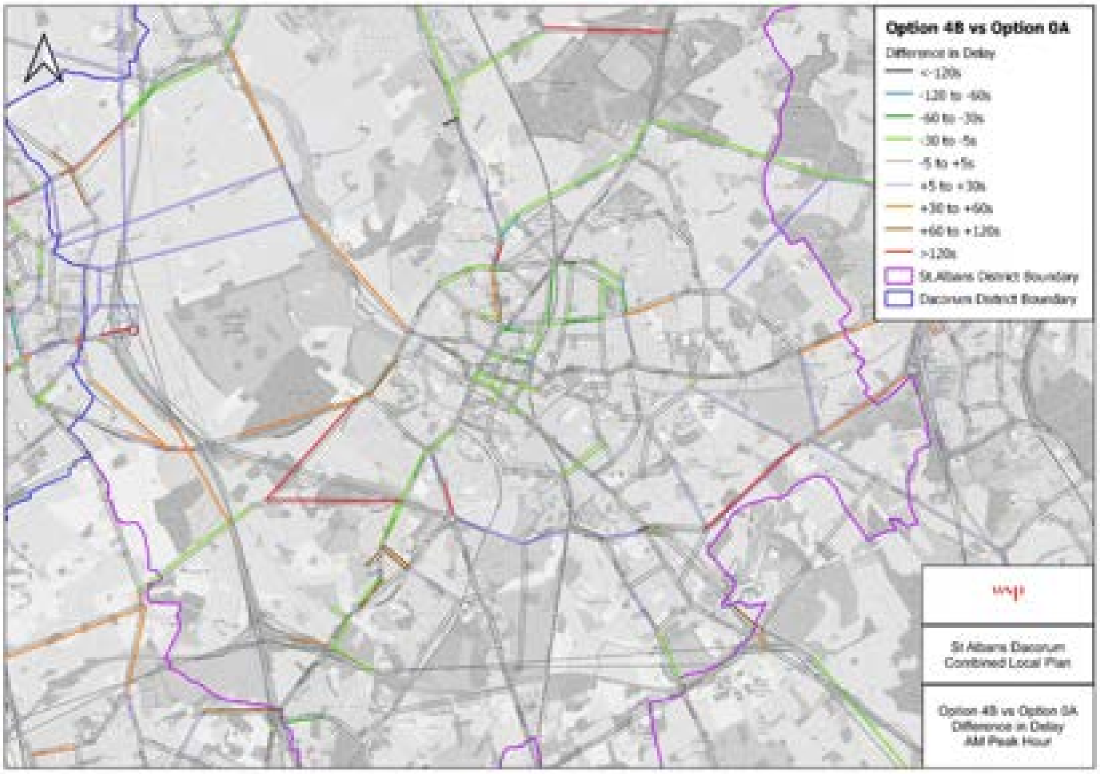


Figure 7-46: Link Delay Difference Option 4b vs Option 0A, St Albans, AM Peak

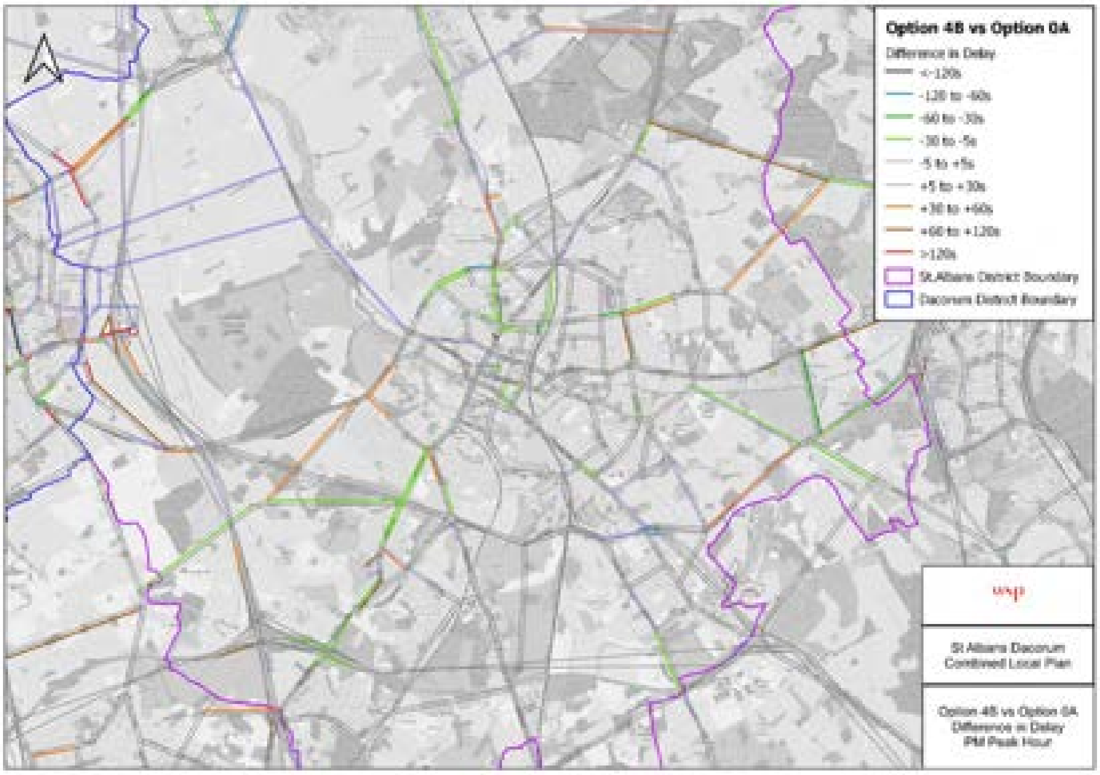


Figure 7-47: Link Delay Difference Option 4b vs Option 0A, St Albans, PM Peak

7.3 Traffic Flows

Traffic Flow Changes in Dacorum and St Albans

7.3.1. This section of the report provides details of the traffic flow changes across Dacorum and St Albans between scenarios as outlined in section 7.1.

7.3.2. These plots show flows in 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.

Traffic Flow Differences - Option 4a vs Option 0A

7.3.3. Figure 7-48 to Figure 7-53 present the changes in traffic flow which occur as a result of the DBC and SADC Local Plan allocations, IDP highway improvements and OSM reduction in AM and PM peak respectively. These results show increases in traffic around the key Local Plan sites such as Hemel Garden Community.

Dacorum

7.3.4. In Hemel Hempstead, the models show that there are over 300 pcus increase of traffic on the North Hemel Link Road and East Hemel Spine Road connecting the Hemel Garden Community area to the wider network. Key roads such as A414 Breakspear Way, Mayland Avenue and the M1 show an increase of over 300 pcus. The model also forecast decrease of traffic on Redbourn Road, Station Road and Green Lane which is as a result of increased congestion occurring on the network and proposed traffic calming schemes in the area.

7.3.5. In Berkhamsted and Tring, the AM peak model predicts over 300 pcus increase of traffic on A41 WB indicating the impacts of development traffic on this corridor.

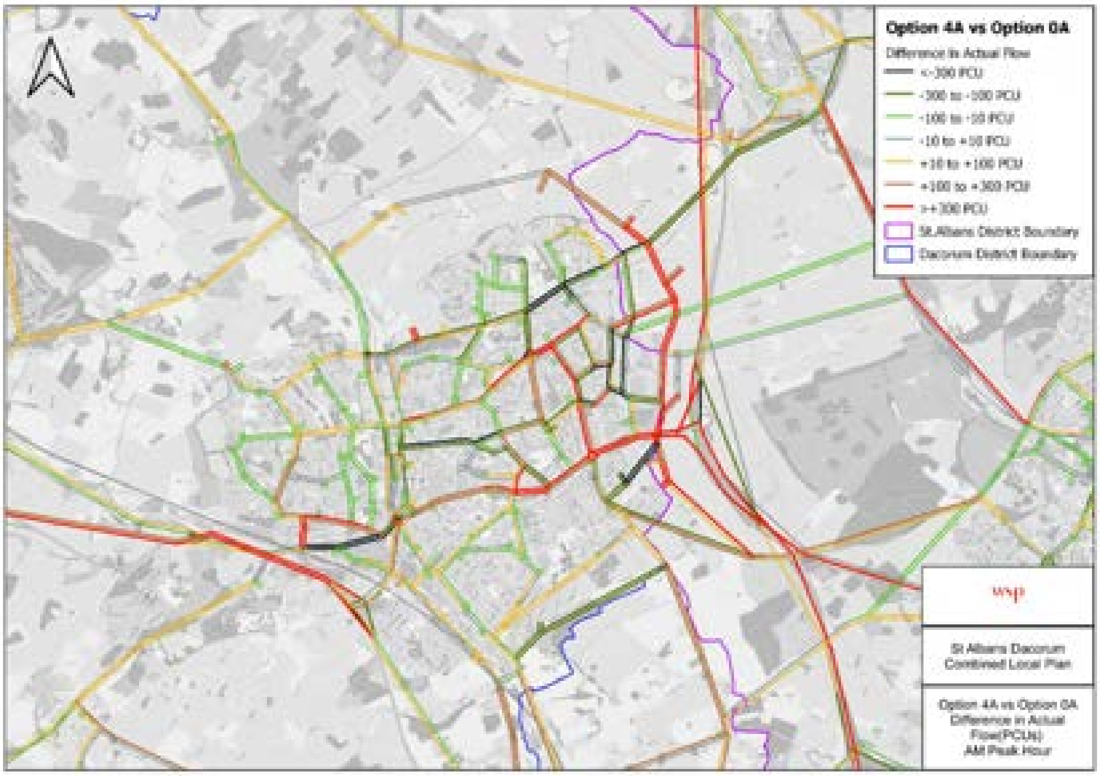


Figure 7-48: Changes in Traffic Flow between Option 4a and Option 0A, Hemel Hempstead, AM Peak

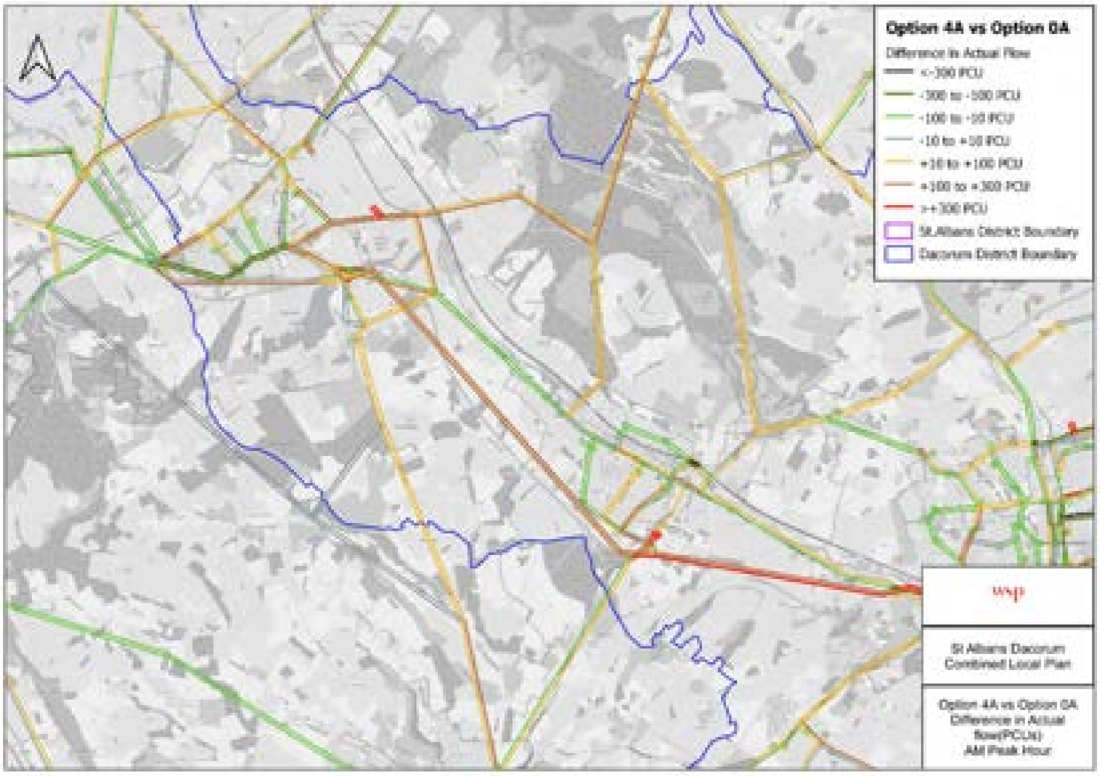


Figure 7-49: Changes in Traffic Flow between Option 4a and Option 0A, Berkhamsted and Tring, AM Peak

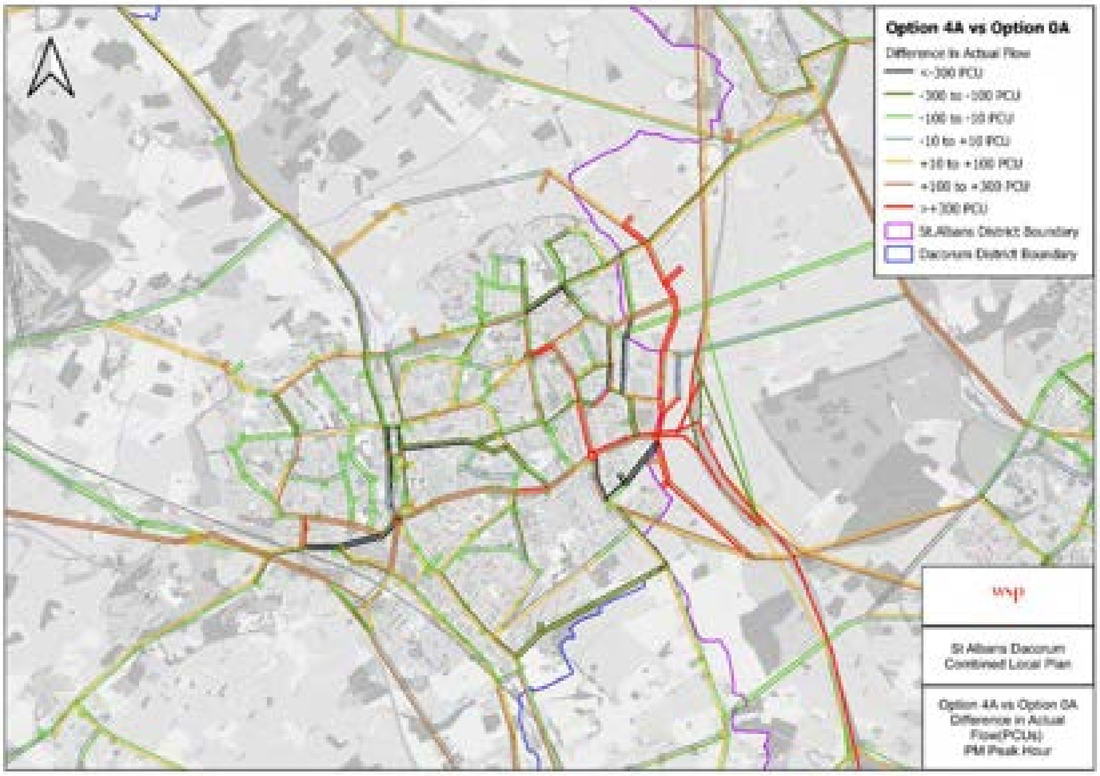


Figure 7-50: Changes in Traffic Flow between Option 4a and Option 0A, Hemel Hempstead, PM Peak

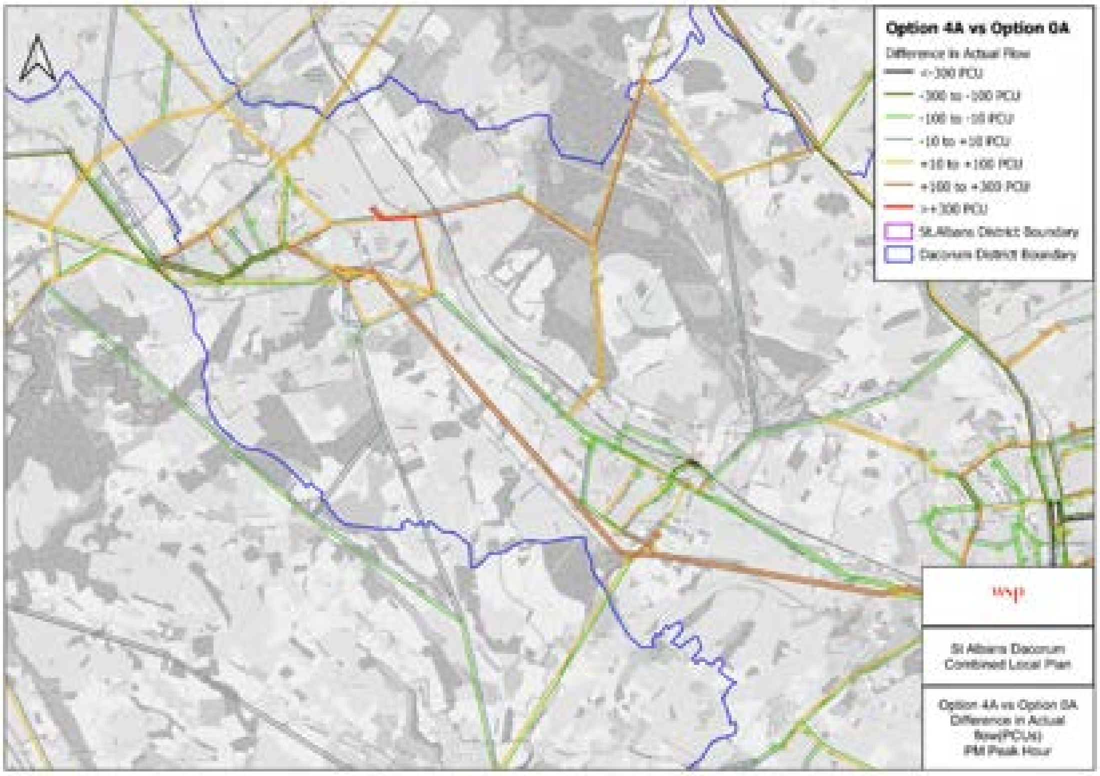


Figure 7-51: Changes in Traffic Flow between Option 4a and Option 0A, Berkhamsted and Tring, PM Peak

St Albans

7.3.6. Figure 7-52 and Figure 7-53 present the changes in traffic flow in St Albans. The AM model shows the greatest increases occuring on Redbourn Road, sections of A414 between M1 Junction 8 and London Colney Roundabout and east of Watford Road roundabout.

7.3.7. In PM peak, the model predicts high increases of traffic flow on A414 approach to Watford Road roundabout and London Road A1081 approach to London Colney Roundabout.

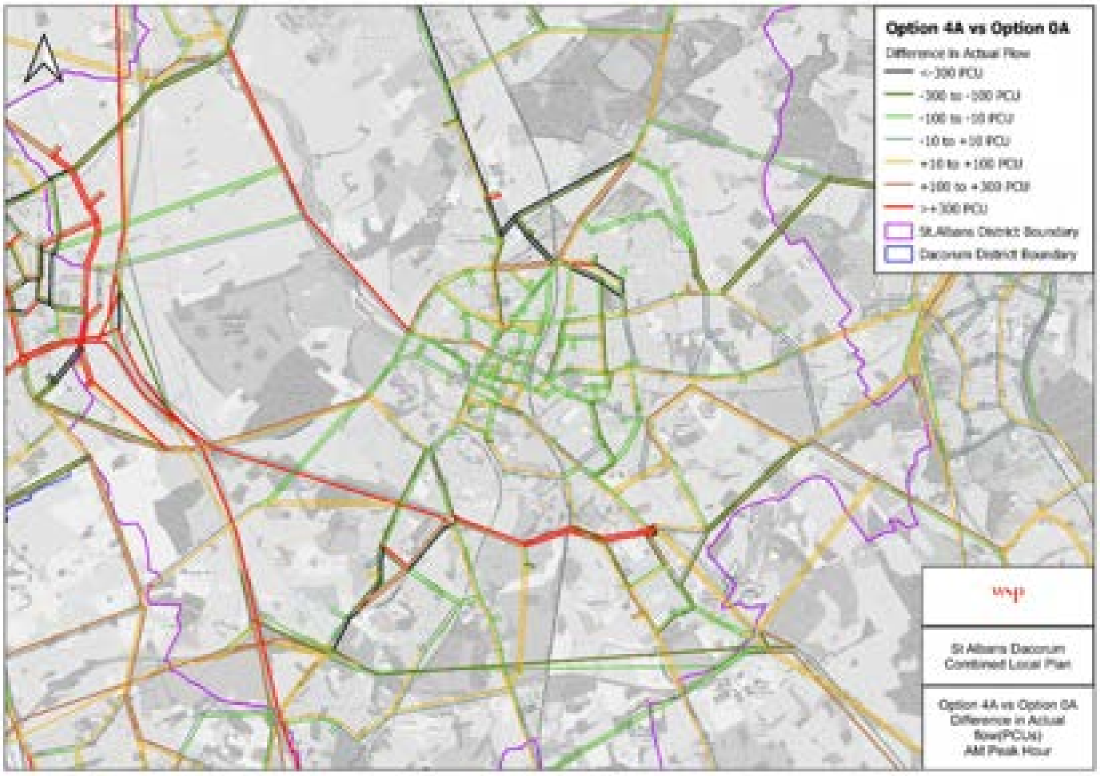


Figure 7-52: Changes in Traffic Flow between Option 4a and Option 0A, St Albans, AM Peak

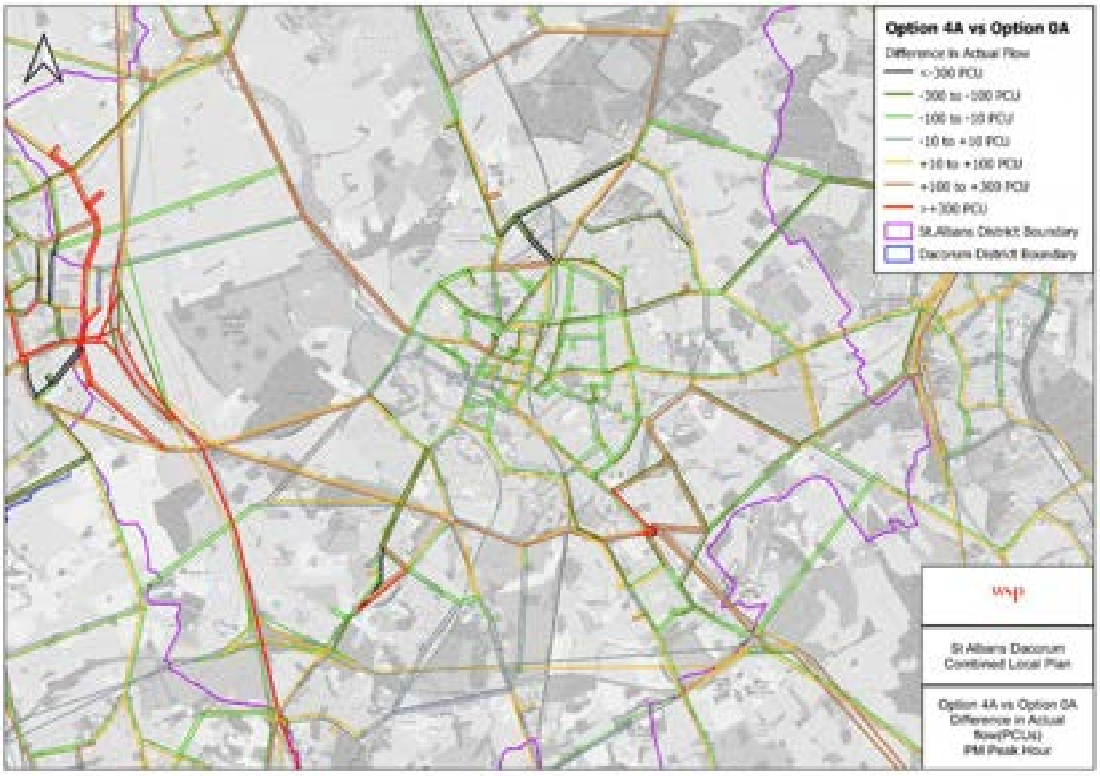


Figure 7-53: Changes in Traffic Flow between Option 4a and Option 0A, St Albans, PM Peak

Traffic Flow Differences - Option 4b vs Option 4a

7.3.8. Figure 7-54 to Figure 7-59 present the changes in traffic flow which occurs as a result of the M1 Junction 8 upgrade in the AM and PM peaks respectively.

7.3.9. As indicated earlier in V/C and link delay analysis, the introduction of M1 Junction 8 upgrade causes an increase in traffic flows on the circulatory links of the new M1 Junction 8 roundabout and the link roads to the gyratory system. In the AM peak, the model predicts increases of over 300 pcus on A414 Breakspear Way westbound, the link roads connecting the East Hemel Spine Road to the M1 Junction 8 roundabout and also the M1/A414 northbound off-slip to A414 Breakspear Way. Flow reductions are also forecast on links including A414 Breakspear Way eastbound (west of M1 Junction 8) and Green Lane, reflecting traffic diverting to the new link road to reach M1 Junction 8.

7.3.10. As a result of this upgrade, the model predicts increased overall throughput at the Breakspear Way / Green Lane Junction which has attracted more traffic from A414 (west of Park Street Roundabout in St Albans). The select link analysis has shown a proportion of traffic travelling from M25 Junction 22 to Hemel Hempstead has switched route from M25/M1 route in Option 4a to A1081/A414 route in Option 4b.

7.3.11. In the PM peak the impacts of the M1 Junction 8 scheme are similar. The model predicts some diversion of traffic from A414 Breakspear Way eastbound to the new link road to reach M1 Junction 8. The model also predicts increased traffic on the M1 Junction 8 northbound on-slip to M1 but a reduction in flow for the northbound off-slip from M1 to A414 westbound due to easing of congestioin at the Breakspear Way / Green Lane junction.

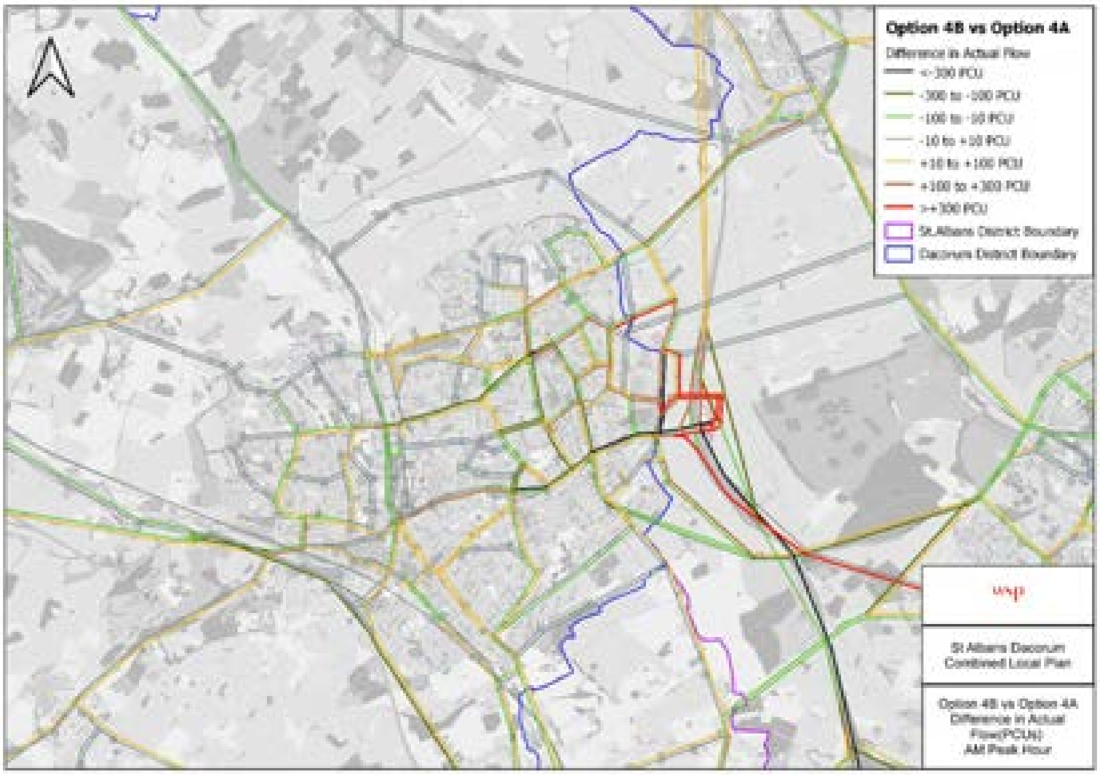


Figure 7-54: Changes in Traffic Flow between Option 4b and Option 4a, Hemel Hempstead, AM Peak

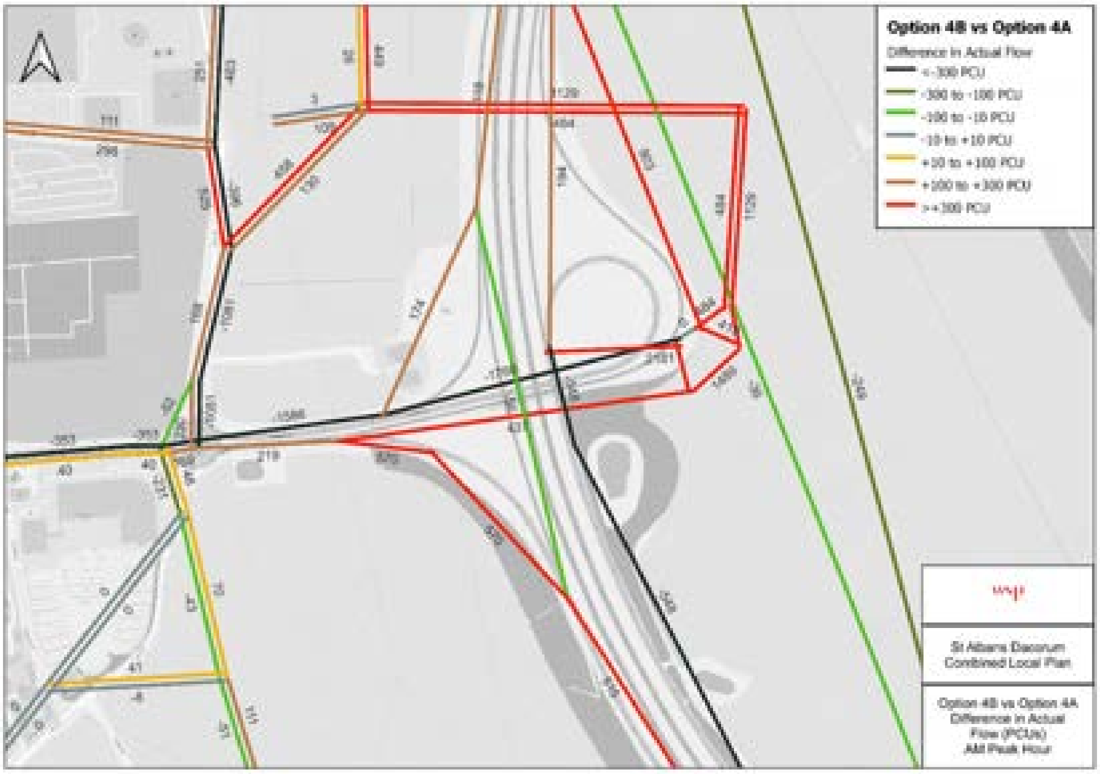
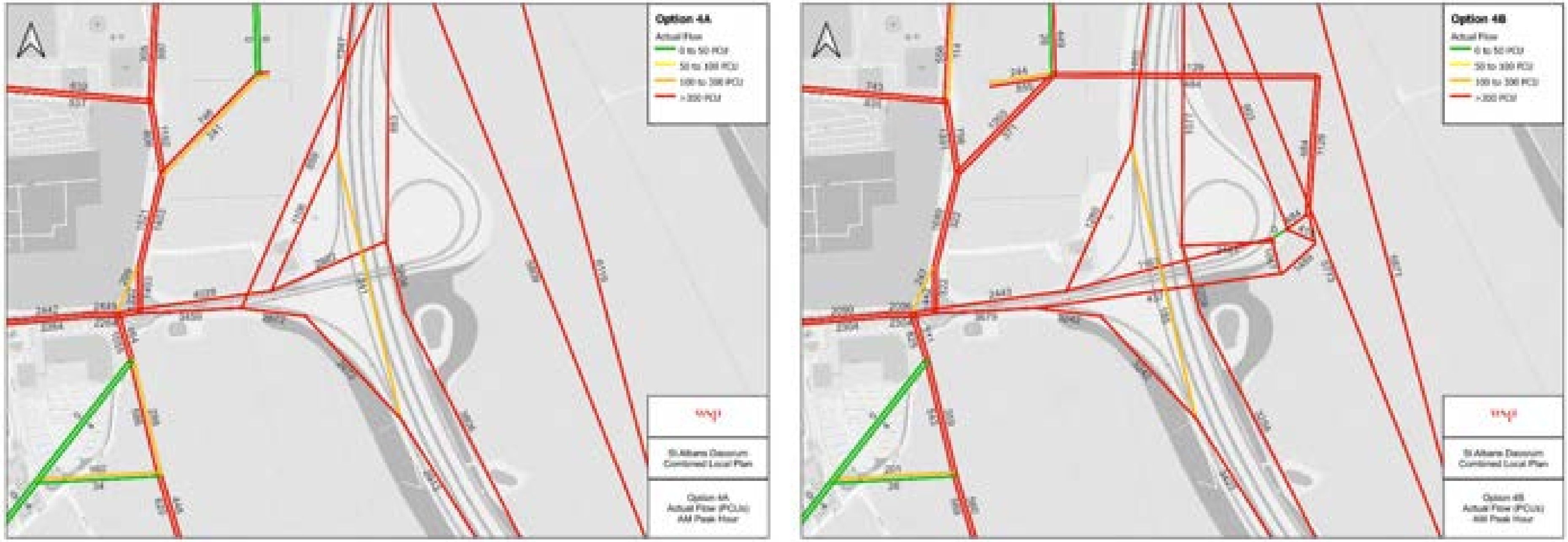


Figure 7-55: Changes in Traffic Flow between Option 4b and Option 4a, Area around M1 J8, AM Peak

7.3.12. As a result of the differences in network structure, the traffic flow estimated for Option 4b and Option 4a models are presented for clarity in Figure 7 56 in the AM peak.



Option 4a **Option 4b**

Figure 7-56: Traffic Flow at M1 Junction 8 for Option 4b and Option 4a, AM Peak

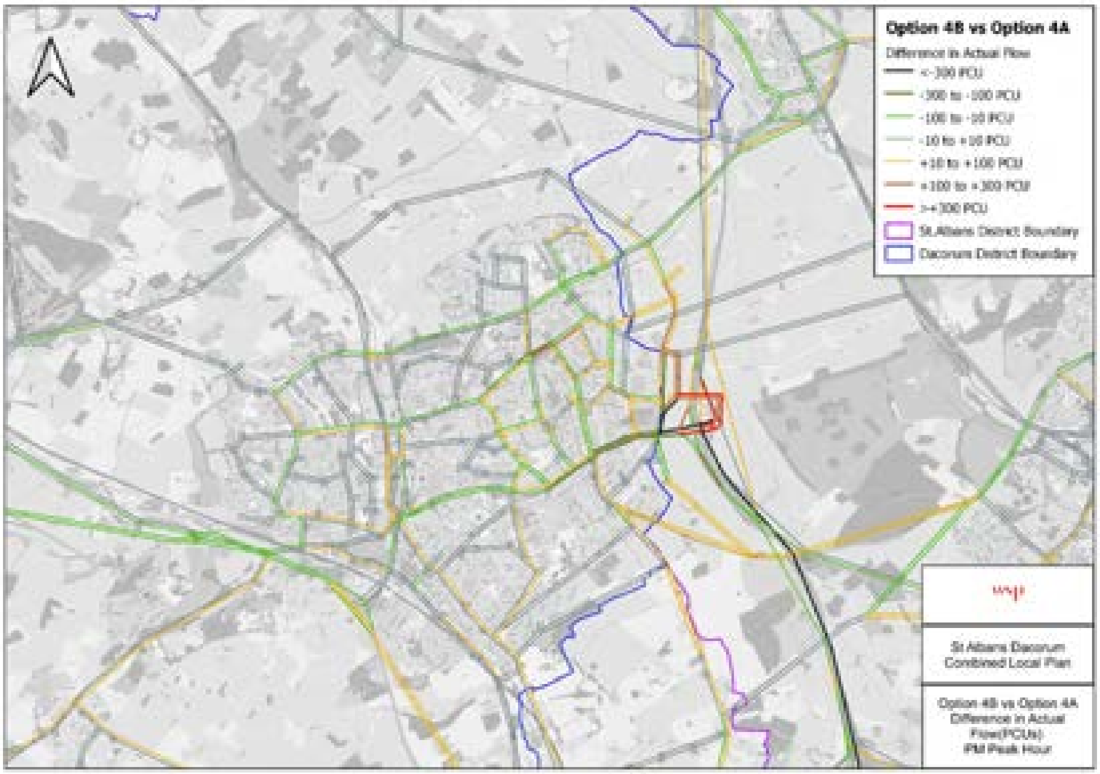


Figure 7-57: Changes in Traffic Flow between Option 4b and Option 4a, Hemel Hempstead, PM Peak

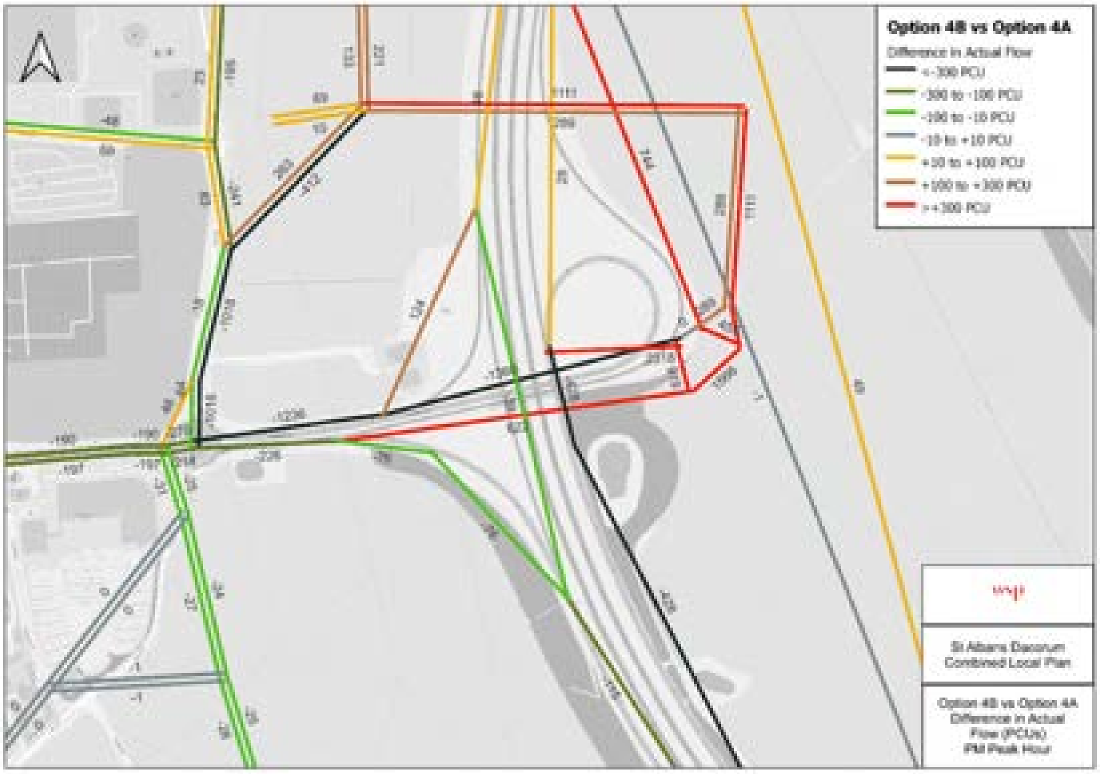


Figure 7-58: Changes in Traffic Flow between Option 4b and Option 4a, Area around M1 J8, PM Peak

7.3.13. As a result of the differences in network structure, the traffic flow estimated for Option 4b and Option 4a models are presented for clarity in Figure 7-59 in the PM peak.

Option 4a

Option 4b

Figure 7-59: Traffic Flow at M1 Junction for Option 4b and Option 4a, PM Peak

Traffic Flow Differences - Option 4b vs Option 0A

7.3.14. Figure 7-60 to Figure 7-77 present the changes in traffic flow which occur as a result of the DBC and SADC Local Plan Developments, M1 Junction 8 upgrade and OSM reductions in the AM and PM peaks respectively.

Dacorum

7.3.15. Overall, the flow comparison shows very similar results to previous Option 4a vs Option 0A comparisons. In Hemel Hempstead, there are increases of traffic on the new North Hemel Link Road, East Hemel Spine Road and link road between East Hemel Spine Road and the new M1 Junction 8 roundabout. Key roads within Hemel including A41, A414 Breakspear Way, Swallowdale Lane, Maylands Avenue and Hemel Hempstead Road show increases of over 300 pcus. The model forecasts a decrease in traffic on Redbourn Road, Station Road and Green Lane which is as a result of increased congestion occurring on the network and various traffic calming schemes in the area.

7.3.16. In Berkhamsted and Tring, the AM peak model predicts over 300 pcus increase of traffic on A41 WB indicating the impacts of development traffic on this corridor.

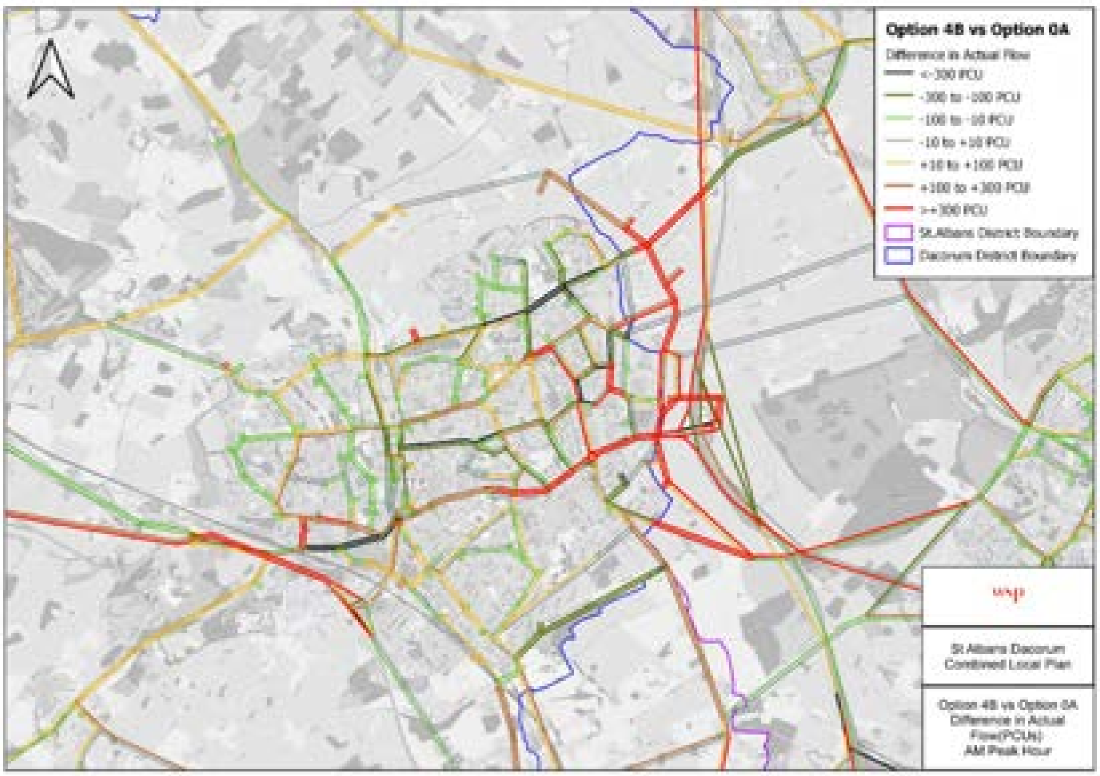


Figure 7-60: Changes in Traffic Flow between Option 4b and Option 0A, Hemel Hempstead, AM Peak

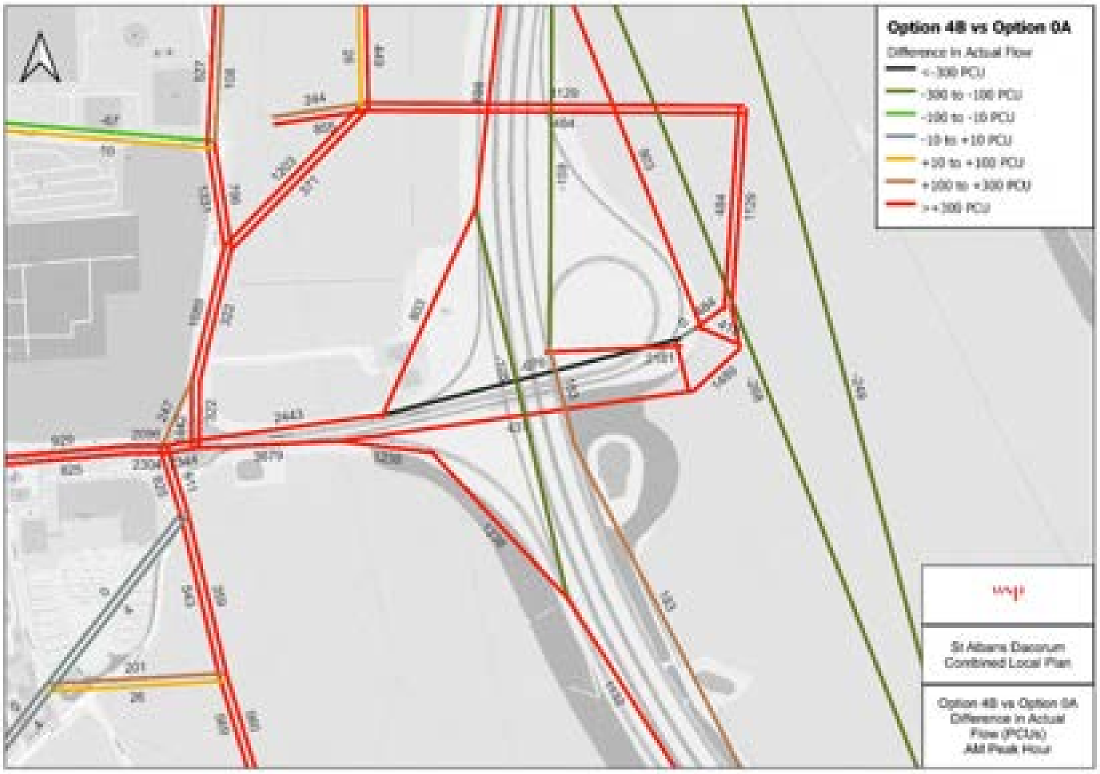
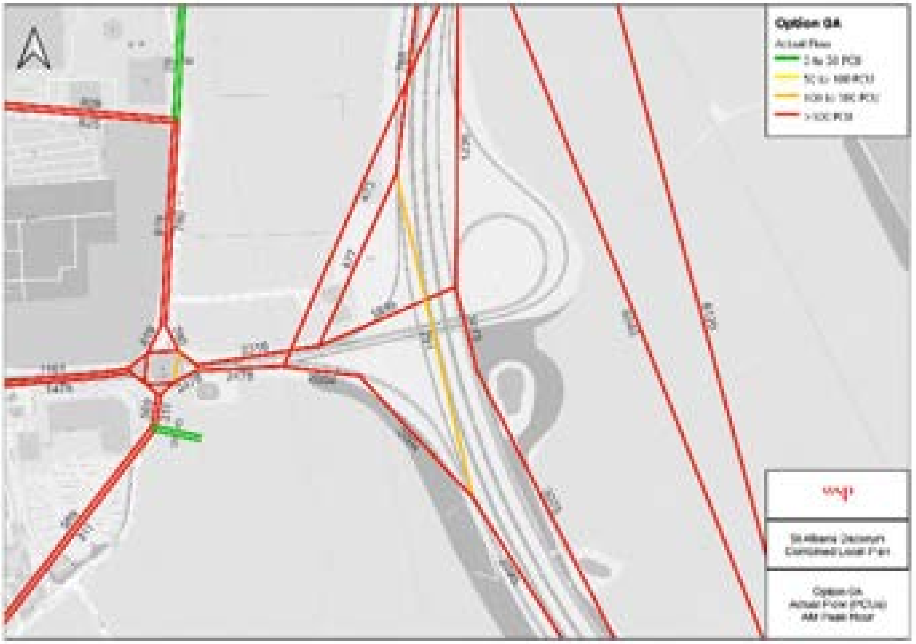


Figure 7-61: Changes in Traffic Flow between Option 4b and Option 0A, Area around M1 J8, AM Peak

7.3.17. As a result of the differences in network structure, the traffic flow estimated for Option 4b and Option 0A models are presented for clarity in Figure 7-62 in the AM peak.

Option 4b



Option 0A

Figure 7-62: Traffic Flow at M1 Junction 8 for Option 4b and Option 0A, AM Peak

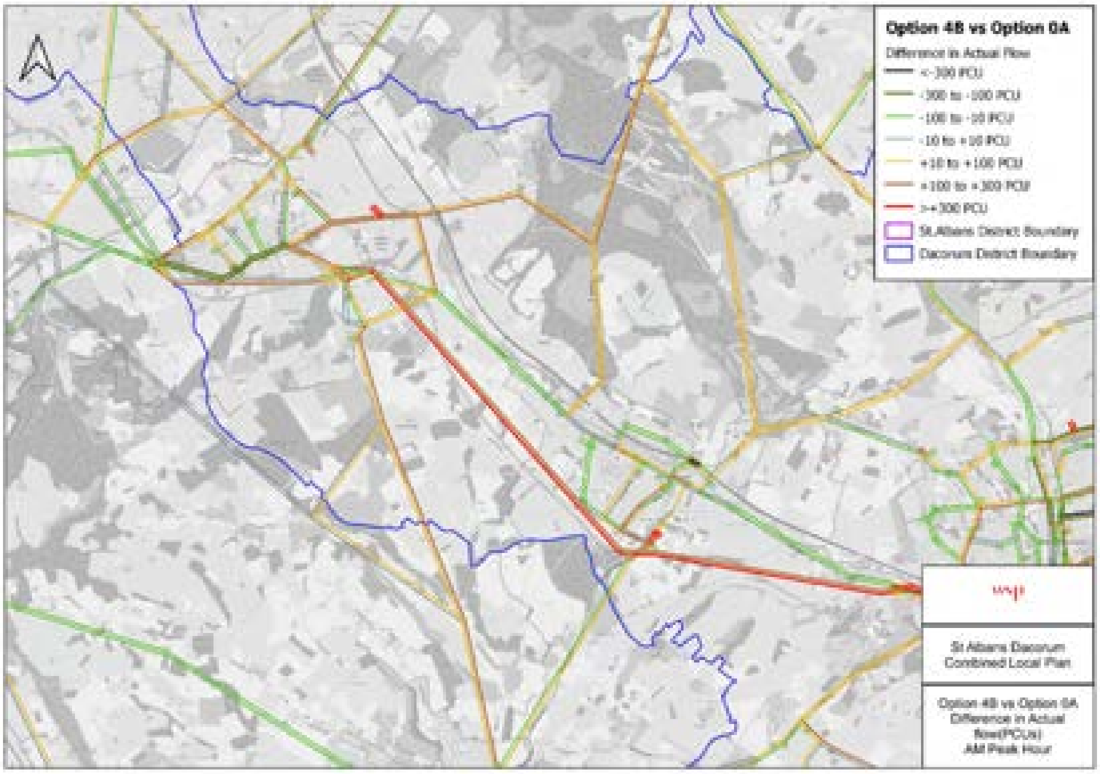


Figure 7-63: Changes in Traffic Flow between Option 4b and Option 0A, Berkhamsted and Tring, AM Peak

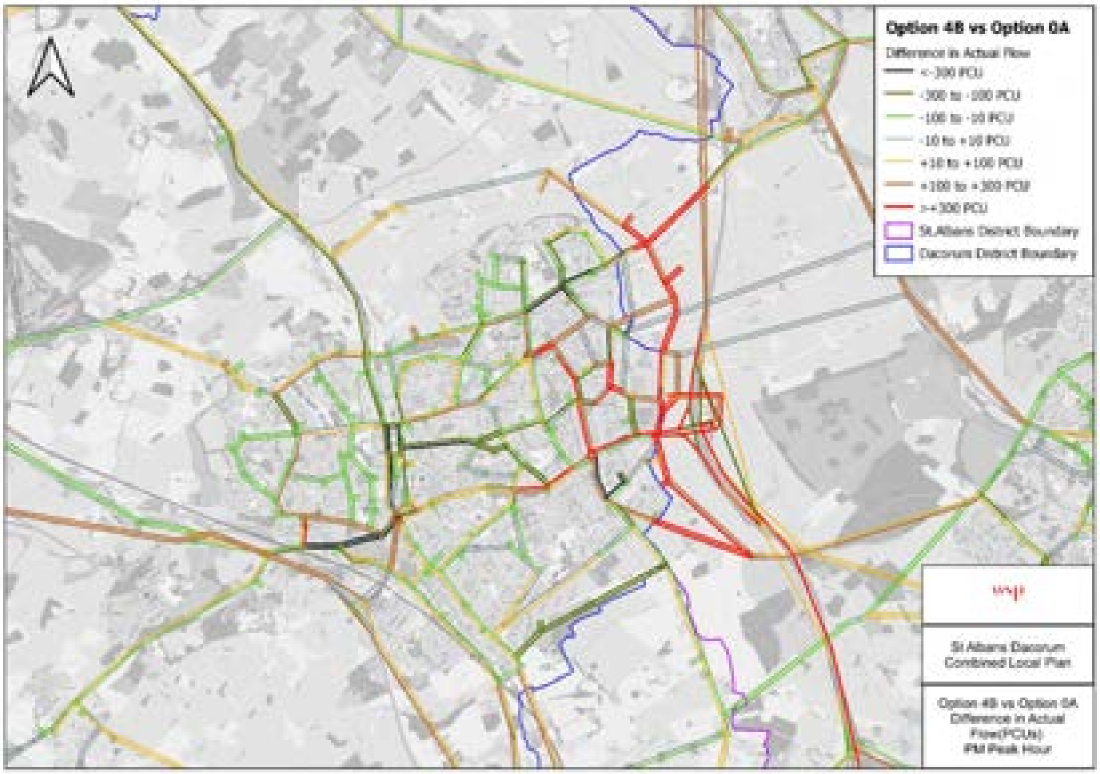


Figure 7-64: Changes in Traffic Flow between Option 4b and Option 0A, Hemel Hempstead, PM Peak

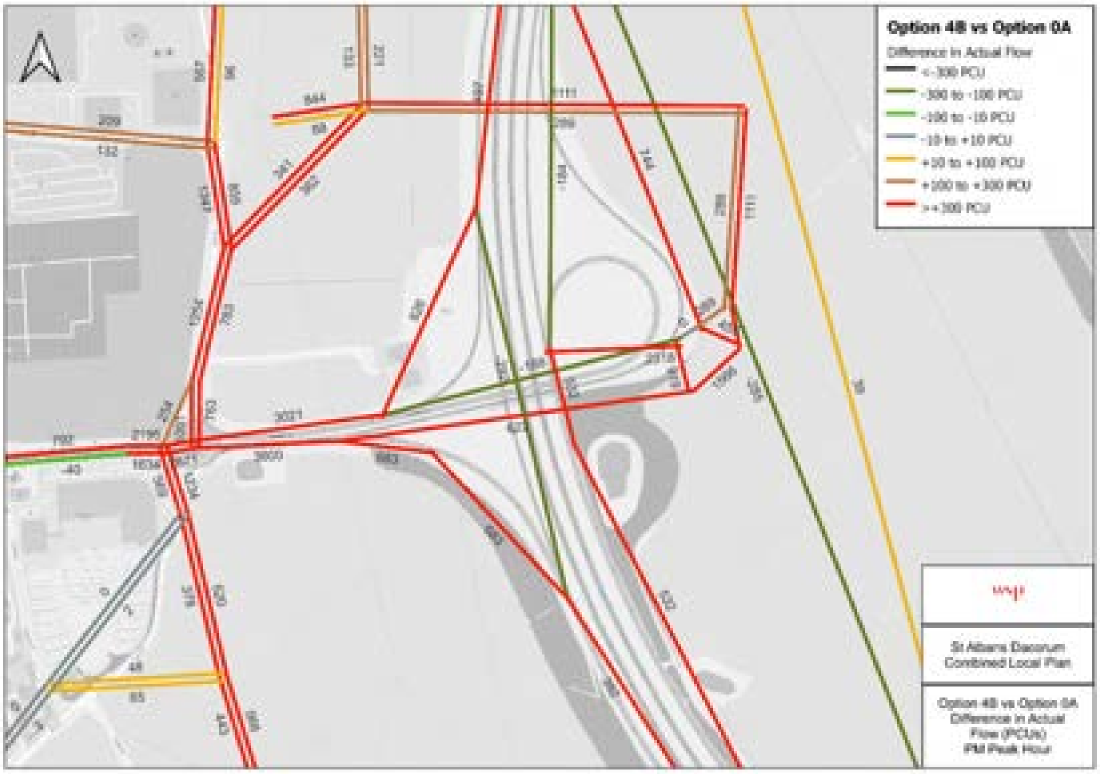
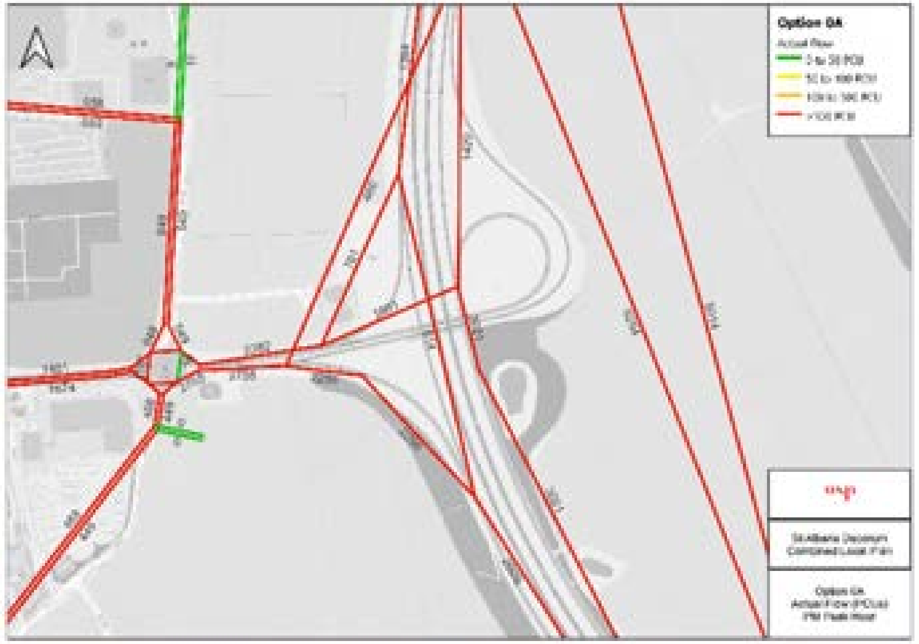


Figure 7-65: Changes in Traffic Flow between Option 4b and Option 0A, Area around M1 J8, PM Peak

7.3.18. As a result of the differences in network structure, the traffic flow estimated for Option 4b and Option 0A models are presented for clarity in Figure 7-66 in the PM peak.

Option 4b



Option 0A

Figure 7-66: Traffic Flow at M1 Junction 8 for Option 4b and Option 0A, PM Peak

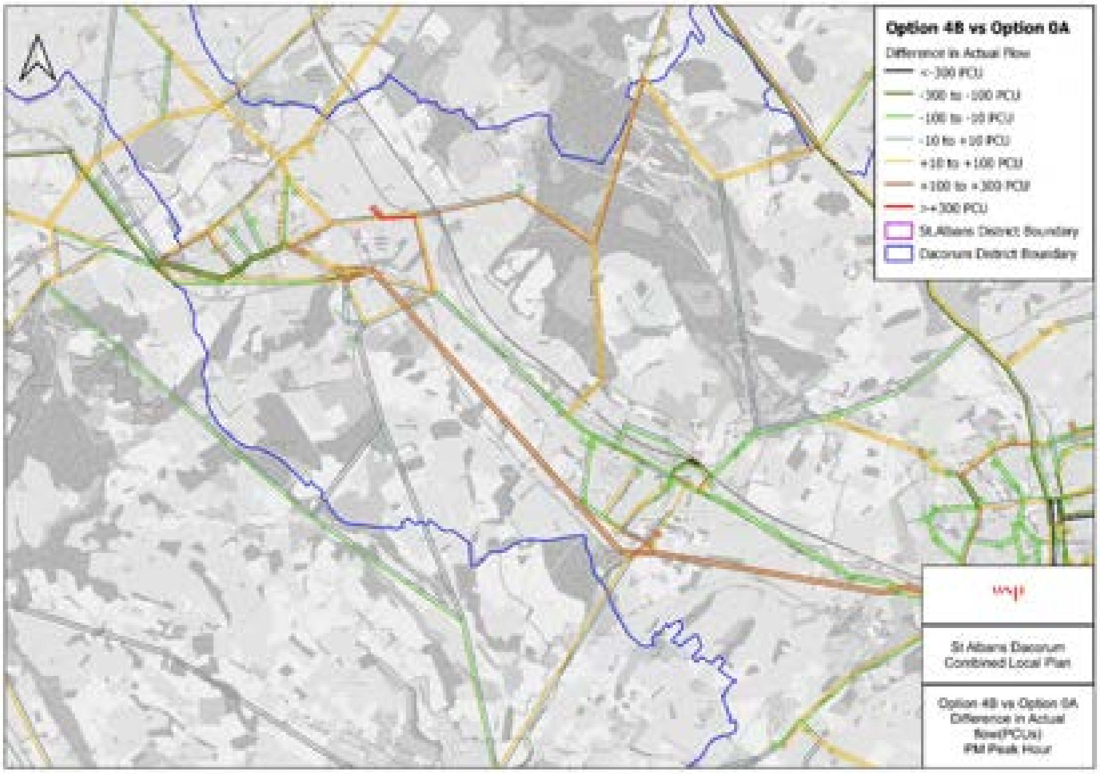


Figure 7-67: Changes in Traffic Flow between Option 4b and Option 0A, Berkhamsted and Tring, PM Peak

St Albans

7.3.19. Figure 7-68 and Figure 7-69 present the changes in traffic flow in St Albans. In the AM peak, the model shows the greatest increases occuring on Hemel Hempstead Road, Redbourn Road, sections of A414 between M1 Junction 8 and London Colney Roundabout. Due to the relief of congestion at Breakspear Way / Green Lane junction and increased delays on the M1 diverge at A414 some M25 westbound traffic is forecast to re-route via A1081/A414 to reach Hemel Hempstead. This traffic diversion has increased the stress on the busy sections of A414 in the London Colney area.

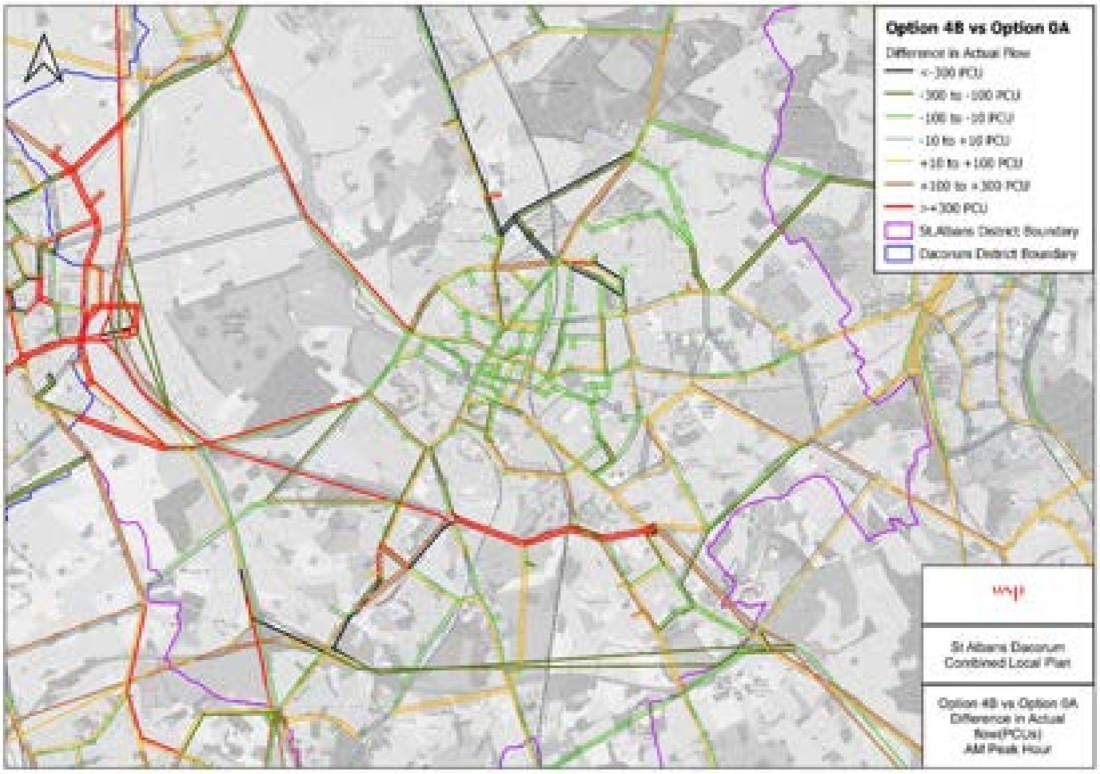


Figure 7-68: Changes in Traffic Flow between Option 4b and Option 0A, St Albans, AM Peak

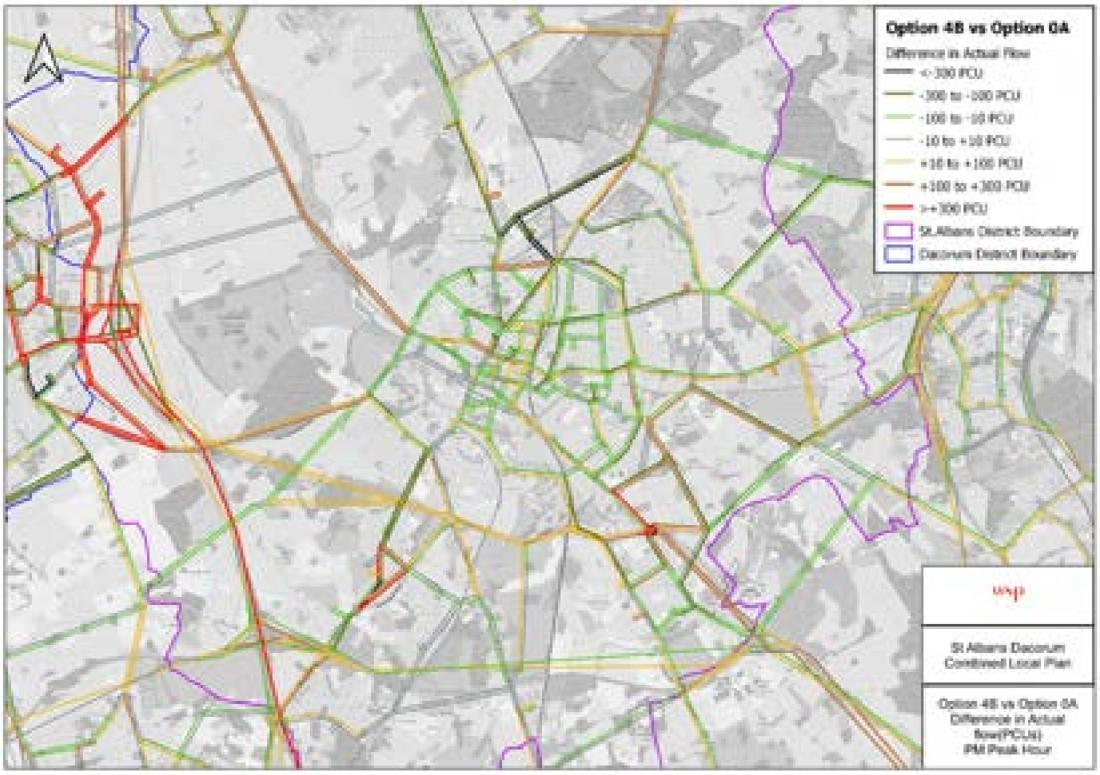


Figure 7-69: Changes in Traffic Flow between Option 4b and Option 0A, St Albans, PM Peak

Traffic Flows at M1 Junction 8 (Select Link Analysis)

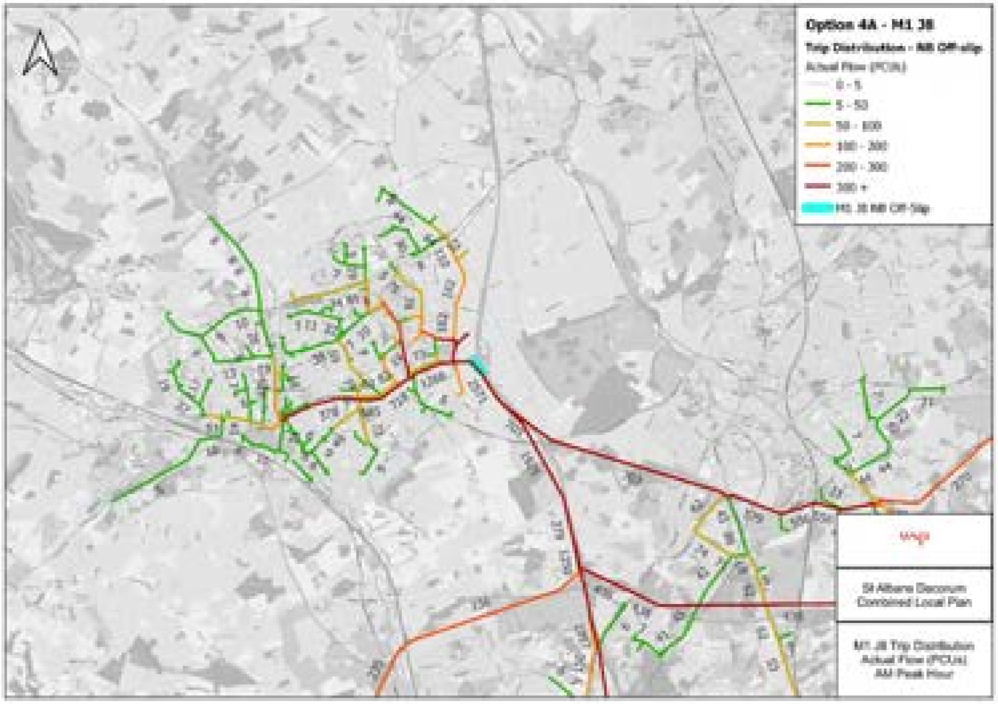
7.3.20. Figure 7-70 to Figure 7-77 show the traffic travelling through M1 Junction 8 in Option 4a and Option 4b in the AM and PM peaks.

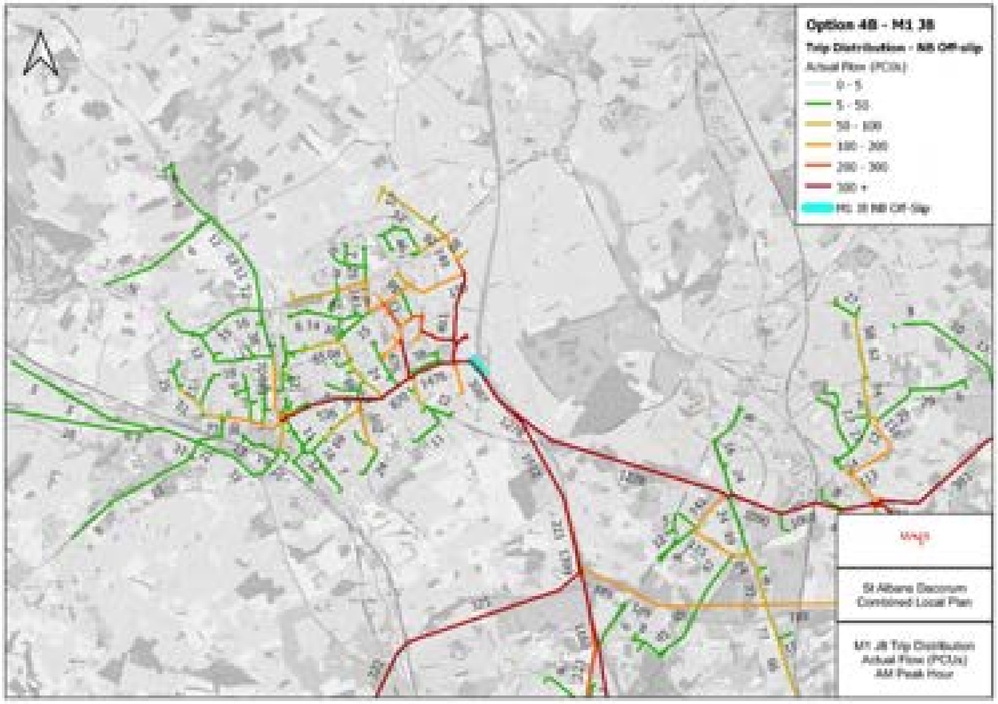
7.3.21. These figures demonstrate the forecast traffic flows through M1 Junction 8 with and without the M1 Junction 8 upgrade. This gives an indication of the likely routes used by those travelling through the junction and any differences that the junction upgrade causes. All results have been extracted from Option 4a and Option 4b. It is important to note that the scale used for the traffic plots is the same for each option to allow easy comparison.

7.3.22. The select link plots for Option 4a show that M1/A414 traffic from / to Hemel Hempstead is forecast to travel via A414 Breakspear Way, Green Lane and Maylands Avenue to access M1 Junction 8. This pattern has caused stress on the Breakspear Way / Green Lane roundabout and Breakspear Way / Maylands Avenue roundabout in Option 4a, as shown in previous analysis.

7.3.23. In Option 4b, the select link plots show how Hemel Hempstead traffic re-routes to the M1 Junction 8 when the improvement scheme is added. As shown in the plots, the M1 Junction 8 scheme increases the M1 northbound traffic to route through the new M1 Junction 8 roundabout to access East Hemel Spine Road or North Hemel Link Road, bypassing the busy A414 Breakspear Way and the congested Maylands Avenue and Green Lane roundabouts.

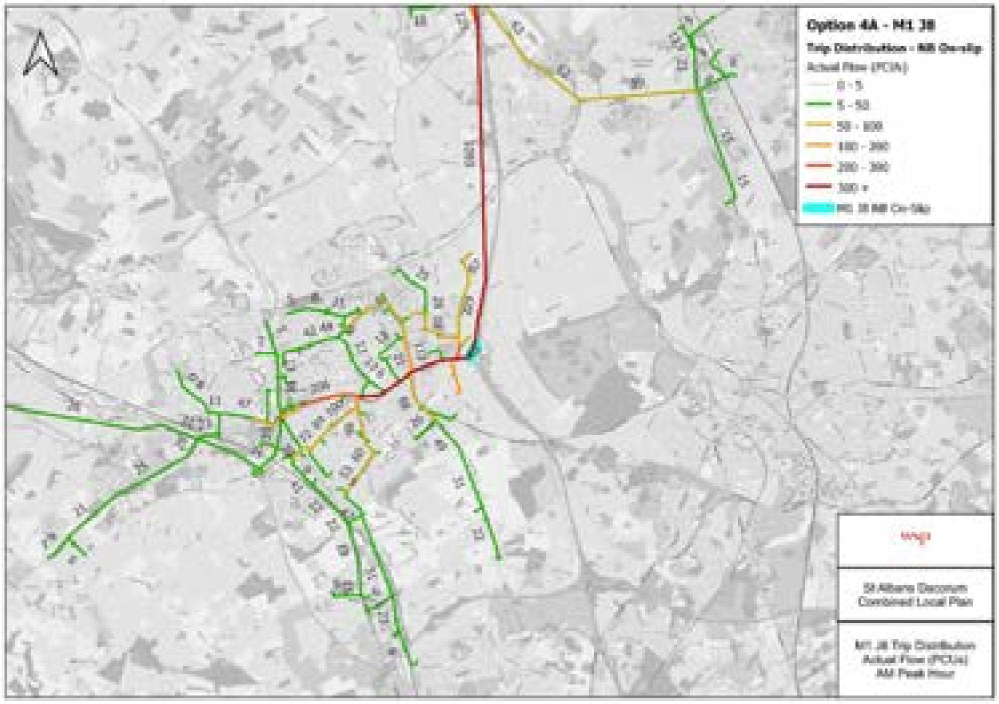
7.3.24. The southbound / London-bound traffic from HGC / Boundary Way is forecast to access M1 Junction 8 via the new link road and new roundabout. This traffic will eventually join the traffic from A414 Breakspear Way at the M1 Junction 8 southbound on-slip signalised junction.

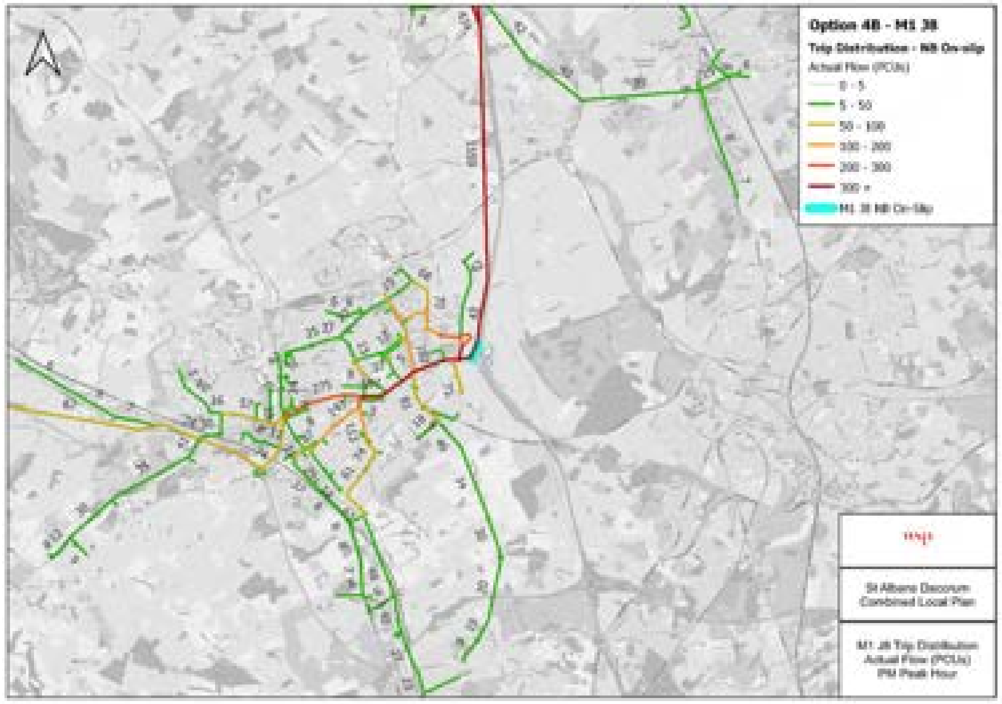




Option 4a **Option 4b**

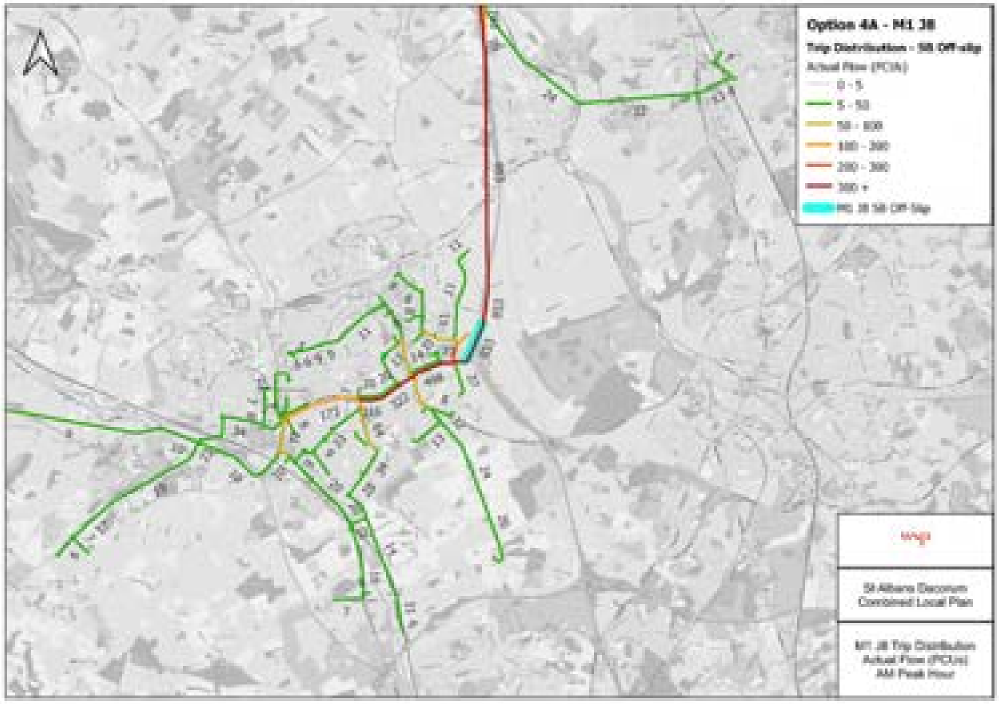
Figure 7-70: Traffic travelling through M1 Junction 8 Northbound Off-Slip in AM Peak



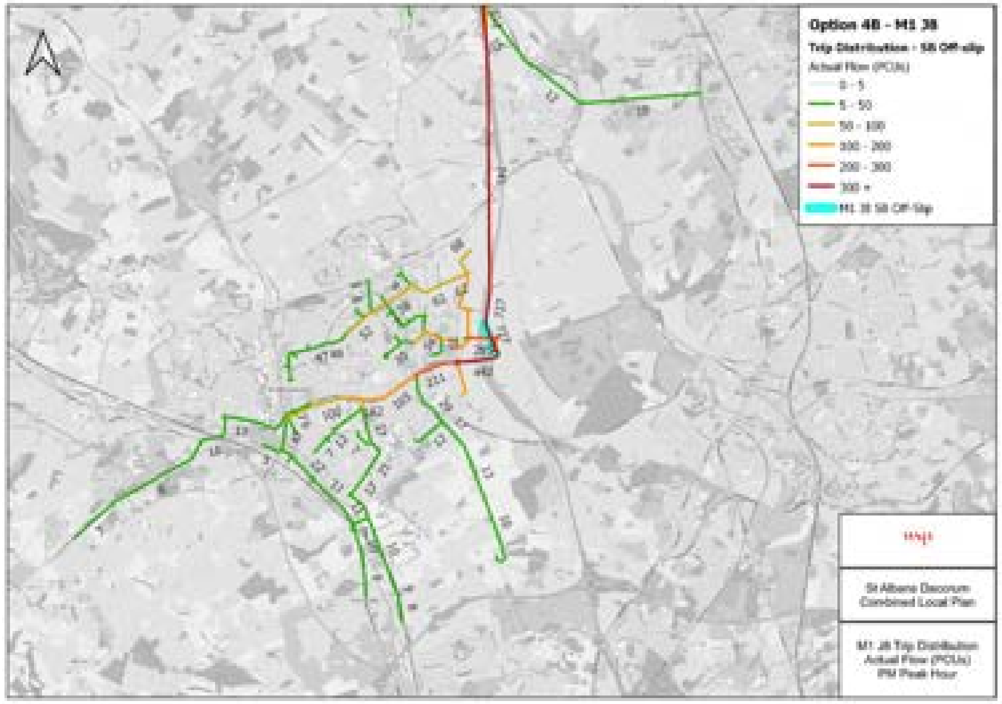


Option 4a **Option 4b**

Figure 7-71: Traffic travelling through M1 Junction 8 Northbound On-Slip in AM Peak

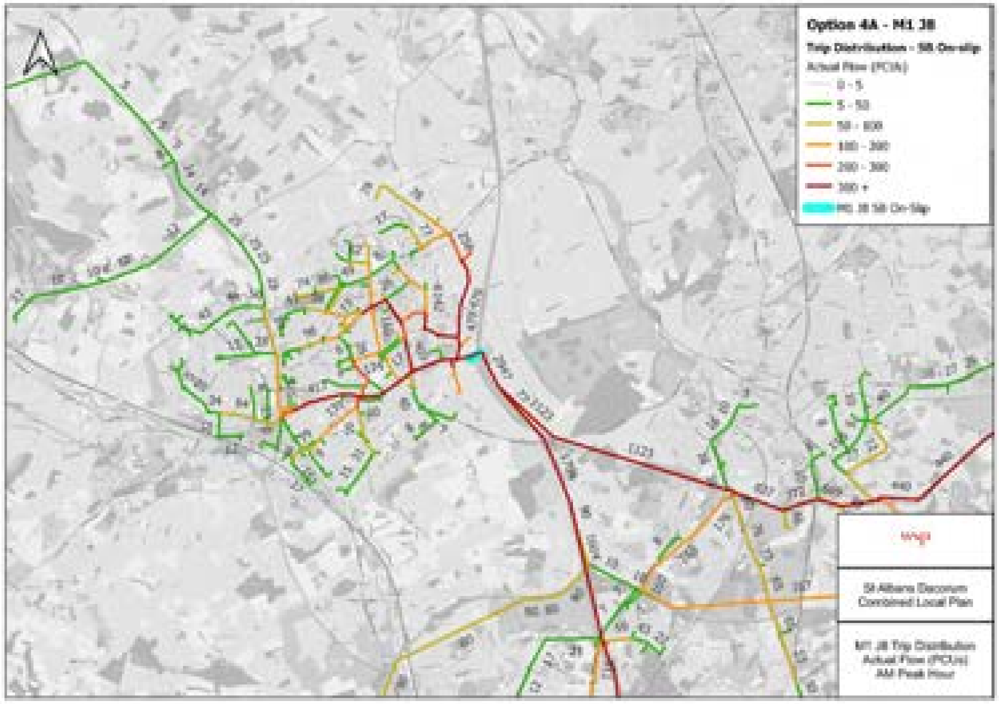


Option 4a

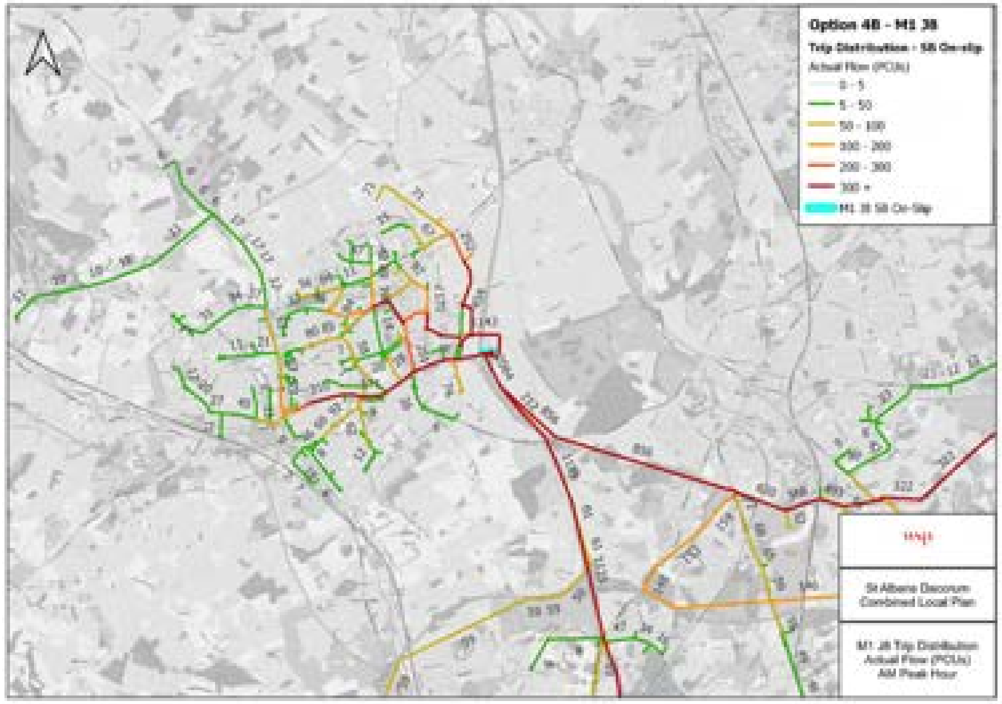


Option 4b

Figure 7-72: Traffic travelling through M1 Junction 8 Southbound Off-Slip in AM Peak

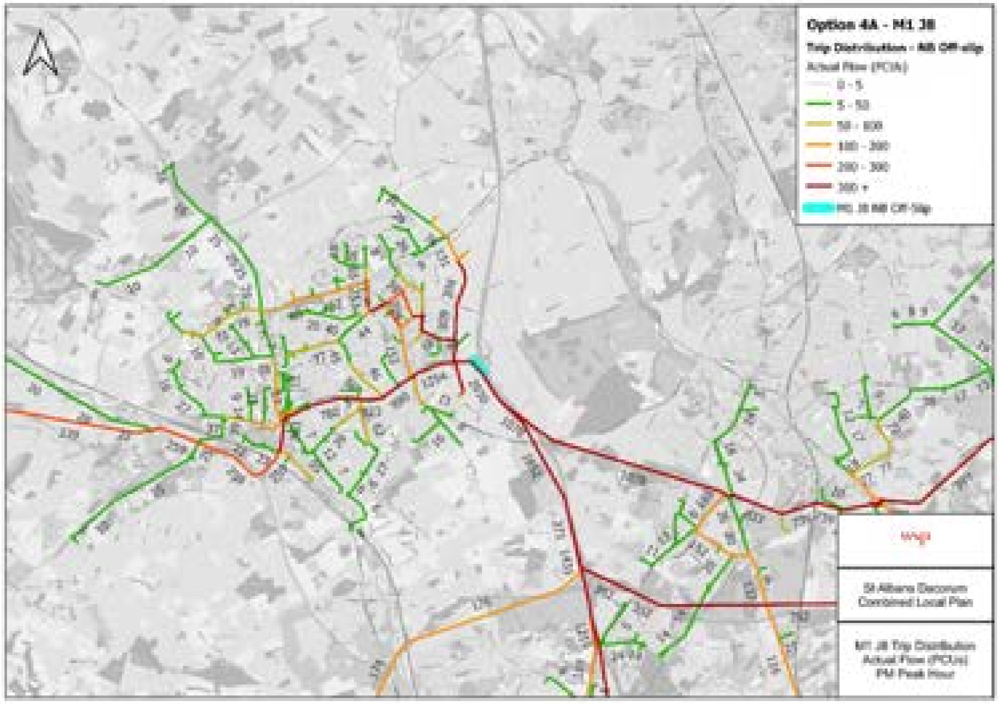


Option 4a

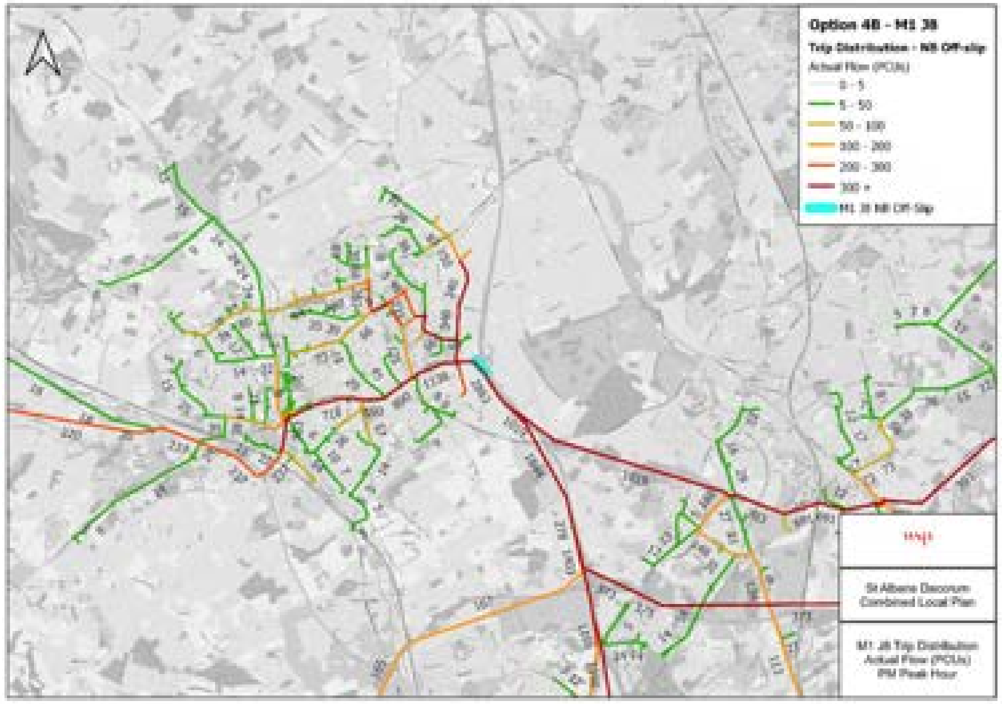


Option 4b

Figure 7-73: Traffic travelling through M1 Junction 8 Southbound On-Slip in AM Peak

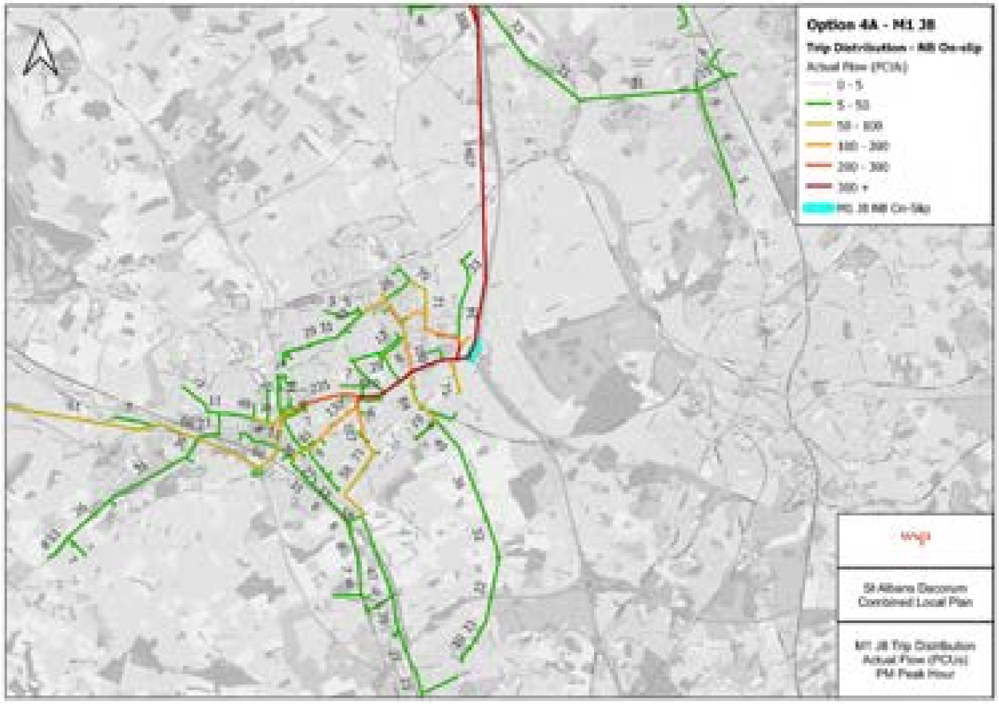


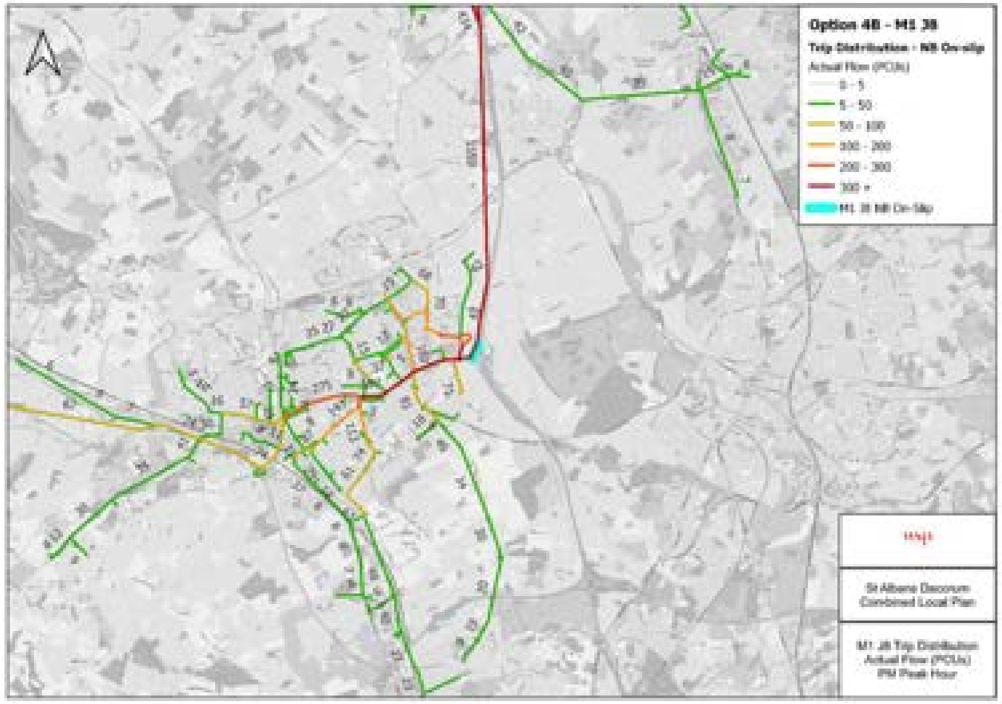
Option 4a



Option 4b

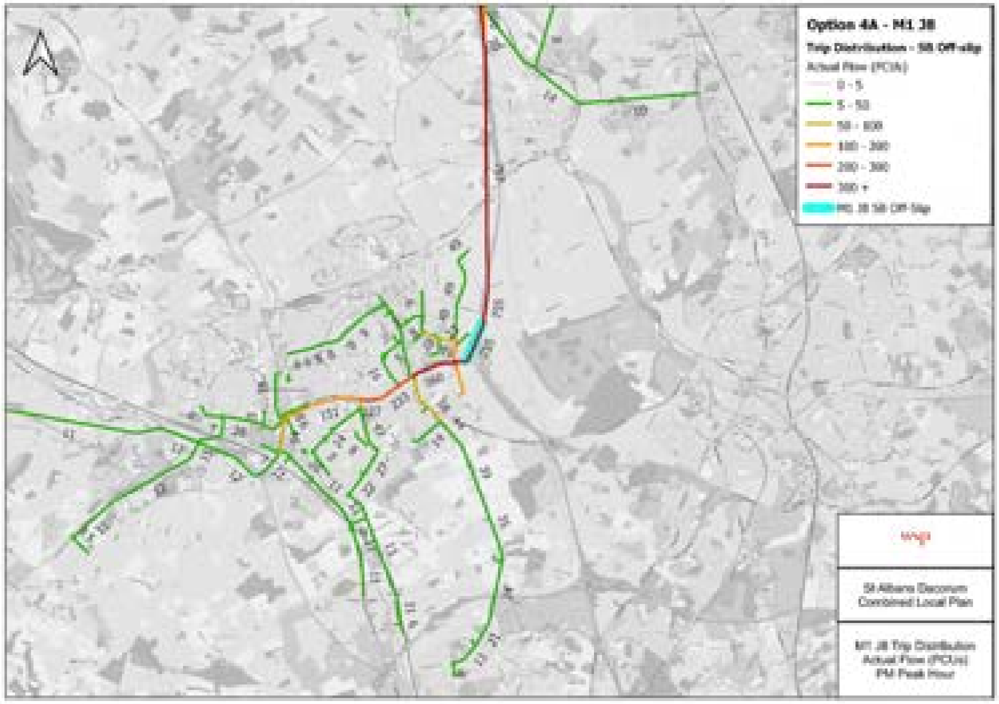
Figure 7-74: Traffic travelling through M1 Junction 8 Northbound Off-Slip in PM Peak

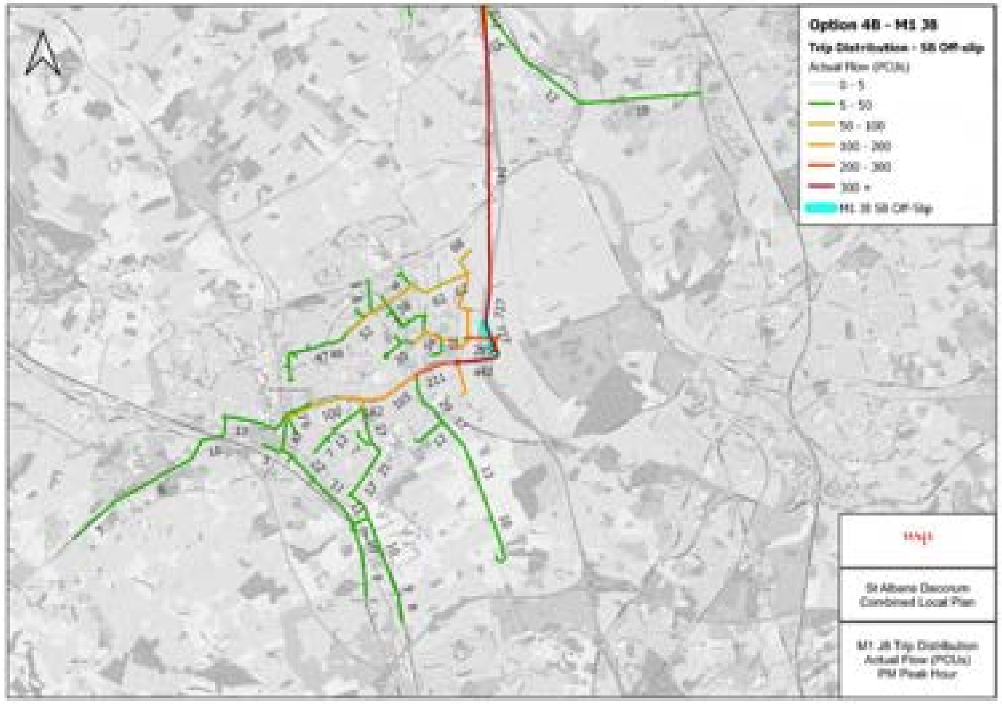




Option 4a **Option 4b**

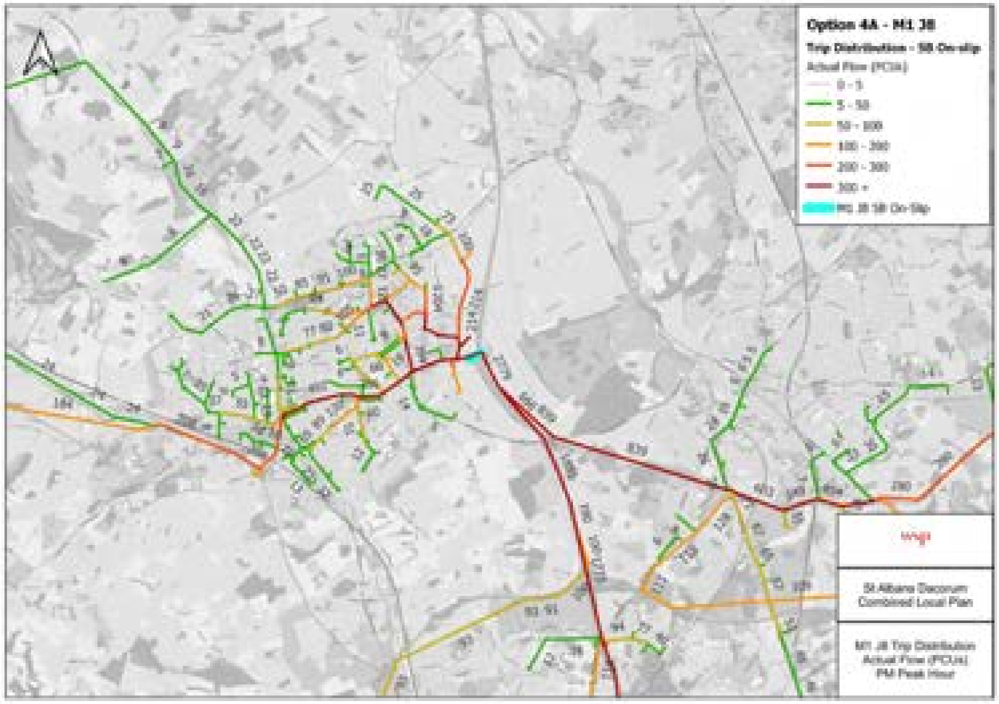
Figure 7-75: Traffic travelling through M1 Junction 8 Northbound On-Slip in PM Peak



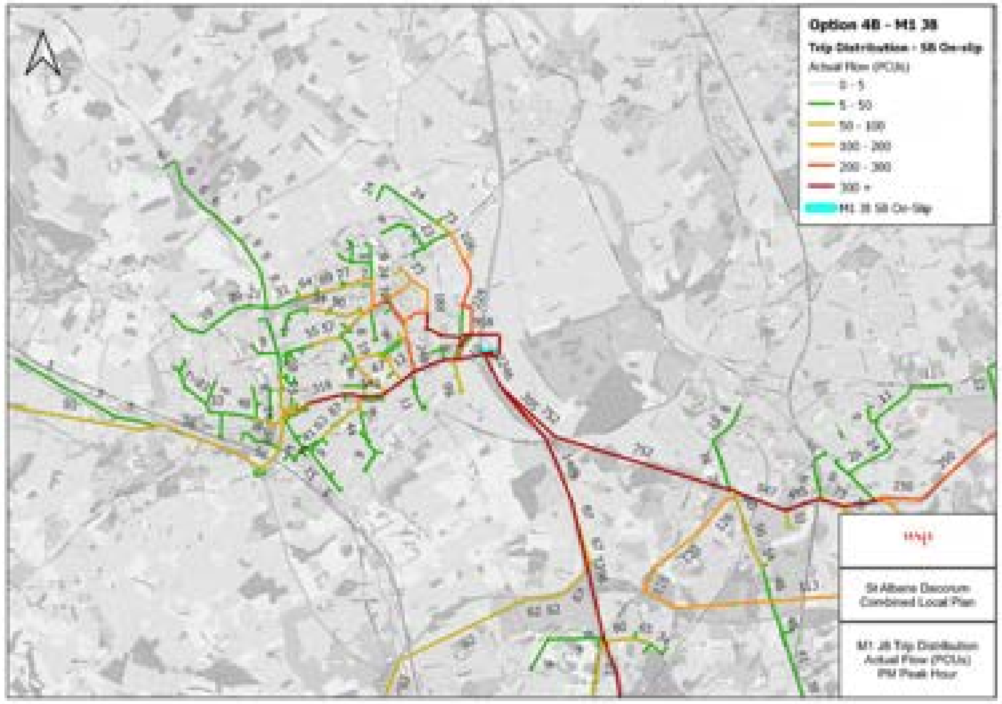


Option 4a **Option 4b**

Figure 7-76: Traffic travelling through M1 Junction 8 Southbound Off-Slip in PM Peak



Option 4a



Option 4b

Figure 7-77: Traffic travelling through M1 Junction 8 Southbound On-Slip in PM Peak

Local Plan Development Trip Distribution

7.3.25. Figures showing the distribution of development trips for the HGC developments in the AM and PM peaks are provided in Appendix I.

7.4 Junction Performance

7.4.1. Node delay difference plots have been generated to illustrate the changes in delays which occur between scenarios as outlined in section 7.1. The delay that is calculated is the flow-weighted average delay over all turning movements at a simulation node.

Junction Delay Differences - Option 4a vs Option 0A

7.4.2. Junction delay differences between Option 4a and Option 0A in the AM and PM peaks are presented in Figure 7-78 to Figure 7-81. Junctions where the delay change is under a minute are not shown in the figures.

7.4.3. In the AM peak, delay increases of 2-5 minutes are predicted at Redbourn Road / Three Cherry Trees Lane and A41 approach at M25 Junction 20 and Durrants Hill Road / Ebberns Road. A delay decrease of more than 2 minutes is predicted at A1081 Harpenden Road / Childwick Green.

7.4.4. In the PM peak, delays increase by 2-5 minutes at Wood End Lane / Mark Road. This is due to blocking back from the Maylands Avenue / Wood End Lane junction, where increased flows through that junction increases delays. Delay decreases of more than 2 minutes are predicted at St Peter's Street / Grange Street.

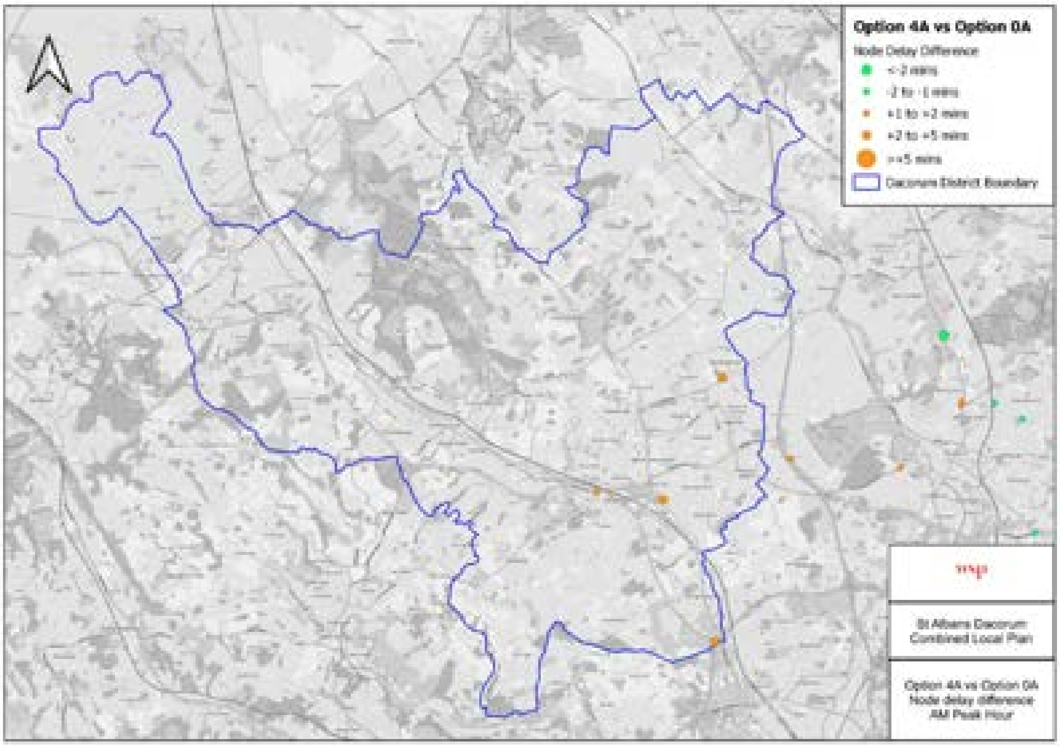


Figure 7-78: Node Delay Difference Option 4a vs Option 0A, Dacorum, AM Peak

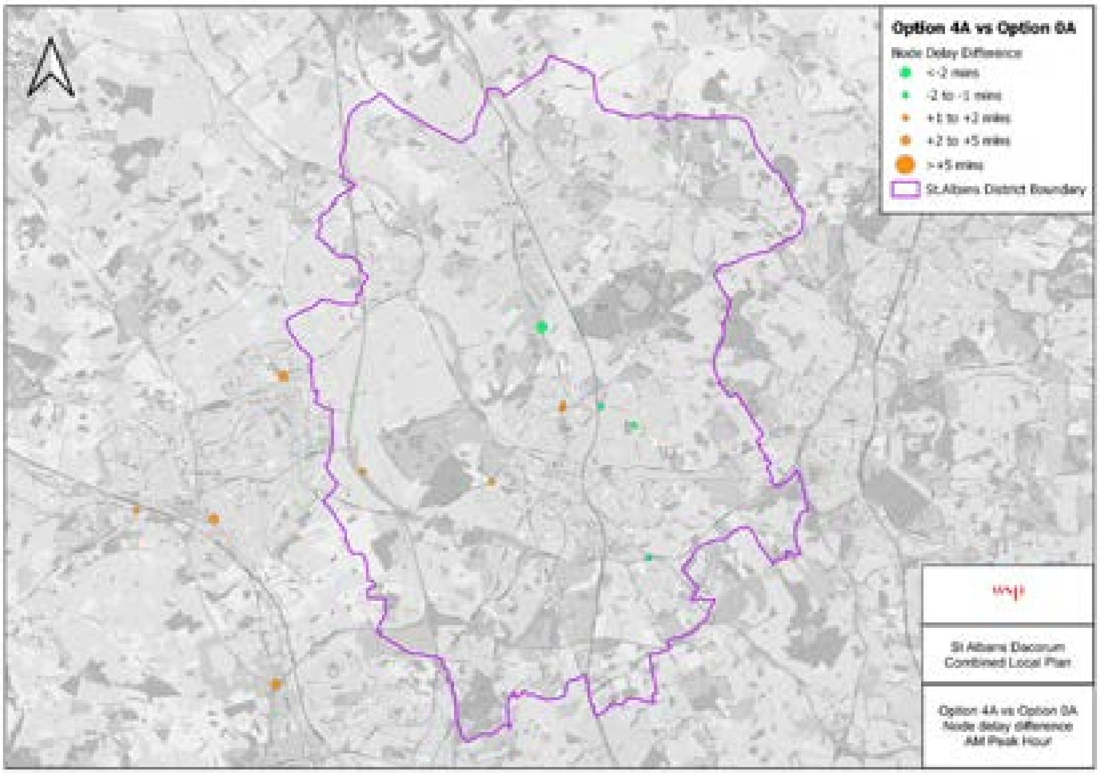


Figure 7-79: Node Delay Difference Option 4a vs Option 0A, St Albans, AM Peak

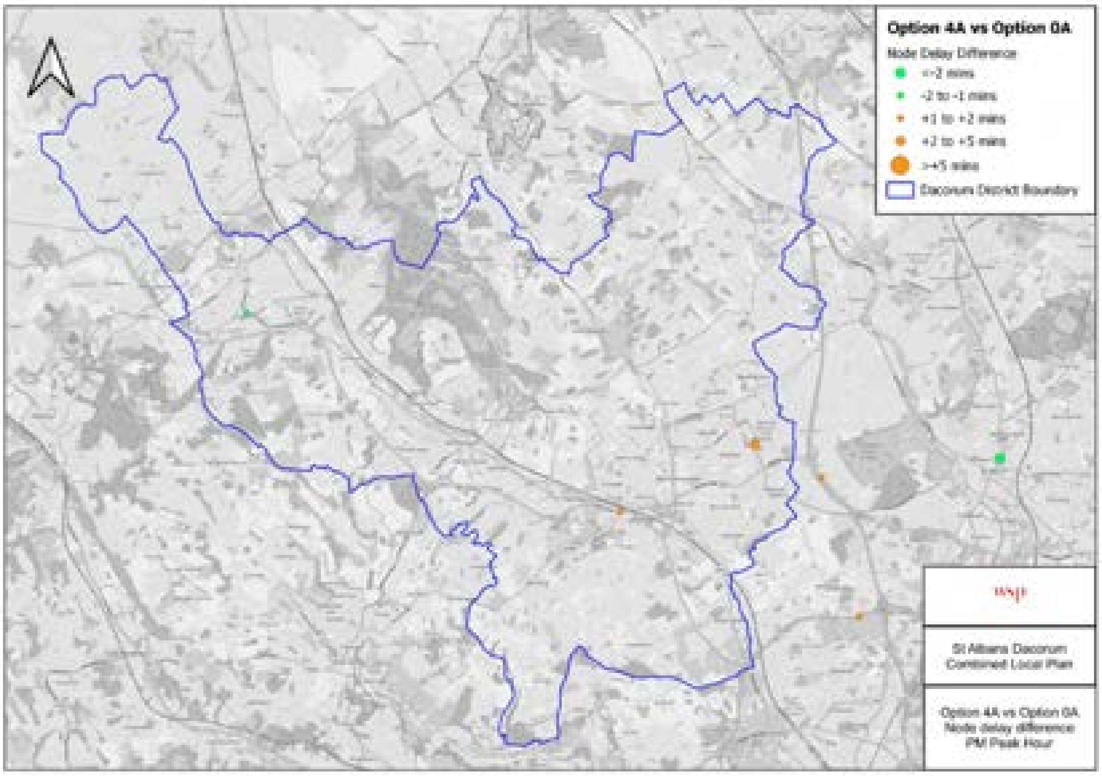


Figure 7-80: Node Delay Difference Option 4a vs Option 0A, Dacorum, PM Peak

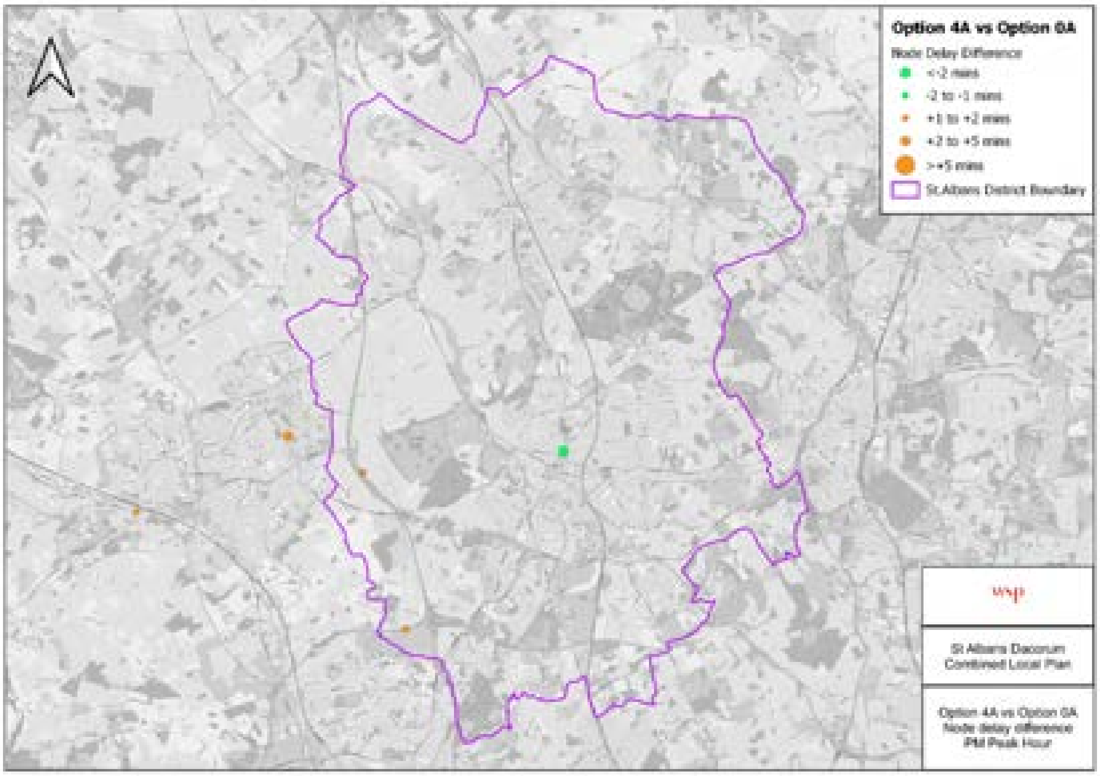


Figure 7-81: Node Delay Difference Option 4a vs Option 0A, St Albans, PM Peak

Junction Delay Differences - Option 4b vs Option 4a

7.4.5. The impact of the M1 Junction 8 upgrade on the junction delays is presented in Figure 7-82 to Figure 7-85 in the AM and PM peaks respectively.

7.4.6. In the AM peak, a delay decrease of over 2 minutes is predicted Durrants Hill Road / Ebberns Lane. Delay decreases of 1-2 minutes are predicted at the junctions of A414 / Green Lane, A414 / M1 Junction 8, on M1 Junction 8 southbound on slip, and Redbourn Road / North Hemel Link Road access.

7.4.7. In the PM peak, there are no delay differences of over 1 minute in either Dacorum or St Albans.

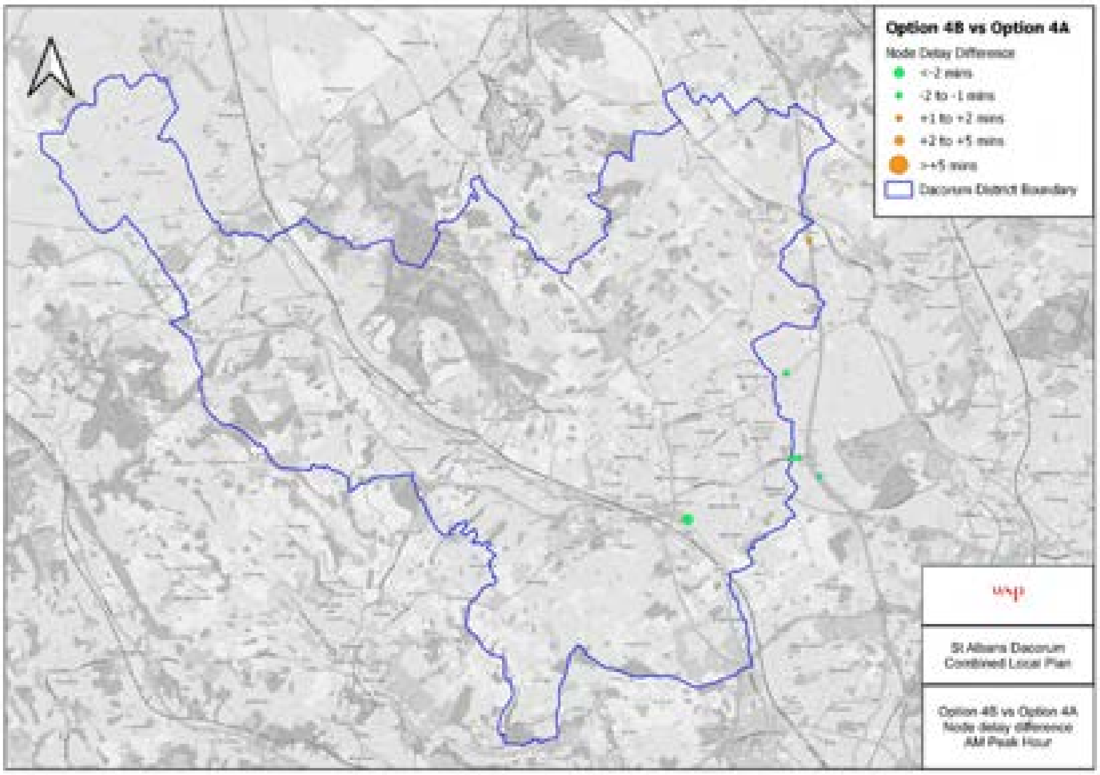


Figure 7-82: Node Delay Difference Option 4b vs Option 4a, Dacorum, AM Peak

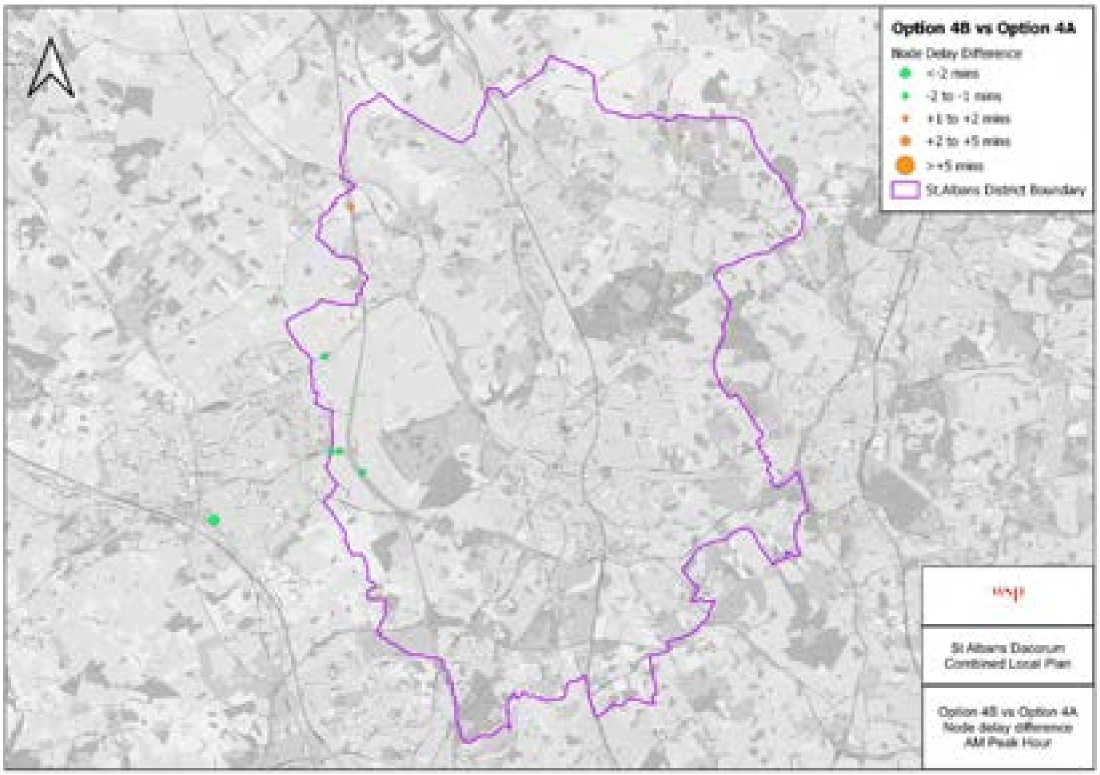


Figure 7-83: Node Delay Difference Option 4b vs Option 4a, St Albans, AM Peak

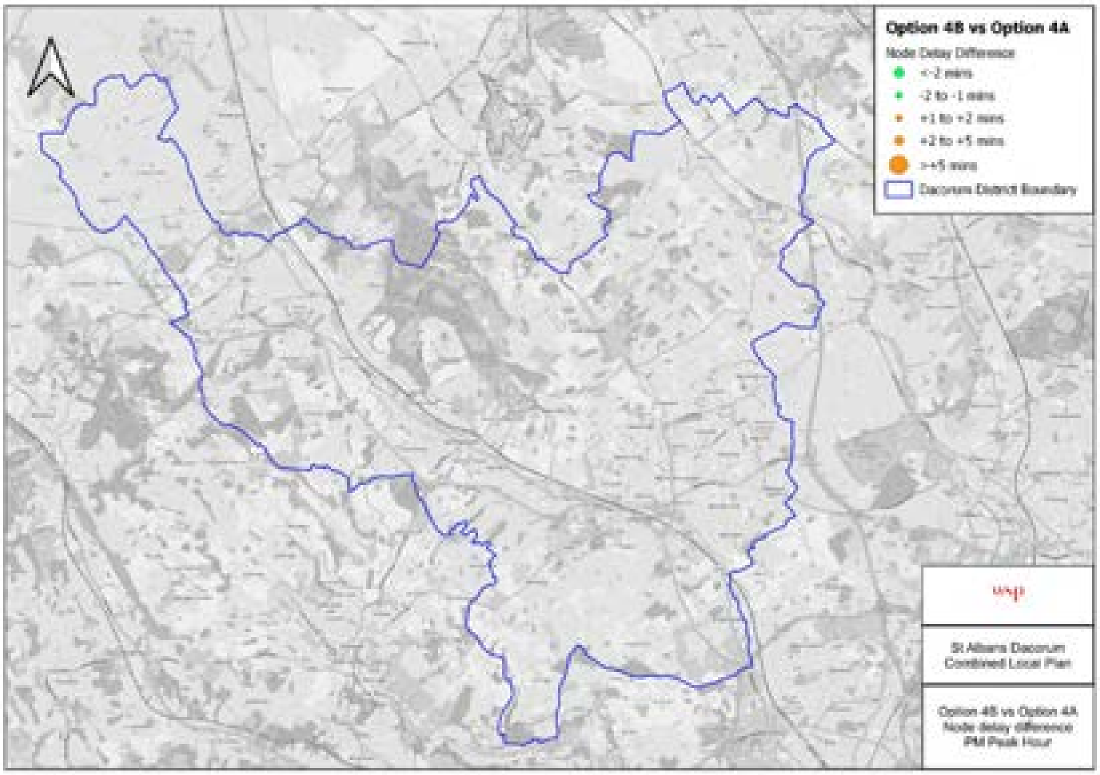


Figure 7-84: Node Delay Difference Option 4b vs Option 4a, Dacorum, PM Peak

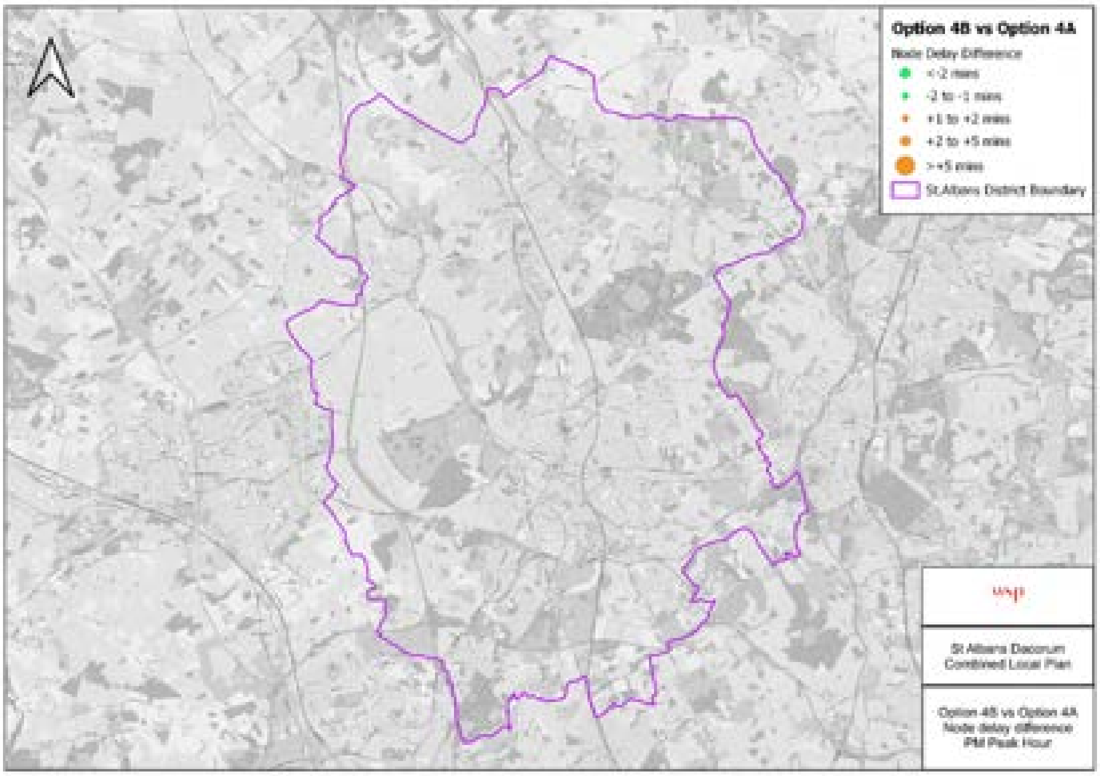


Figure 7-85: Node Delay Difference Option 4b vs Option 4a, St Albans, PM Peak

Junction Delay Differences - Option 4b vs Option 0A

7.4.8. The impact of the Local Plan developments and the M1 Junction 8 upgrade on the junction delays is presented in Figure 7-86 to Figure 7-89 in the AM and PM peaks.

7.4.9. In the AM peak, there are delay increases of 2-5 minutes are predicted at the junctions of Redbourn Road / Three Cherry Trees Lane, Durrants Hill Road / Ebberns Road and A41 approach at M25 Junction 20. A delay decrease of more than 2 minutes is predicted at A1081 Harpenden Road / Childwick Green.

7.4.10. In the PM peak, a delay increase of 2-5 minutes is predicted at the junction Wood End Lane / Mark Road. A delay decrease of more than 2 minutes is predicted at St Peter’s Street / Grange Street.

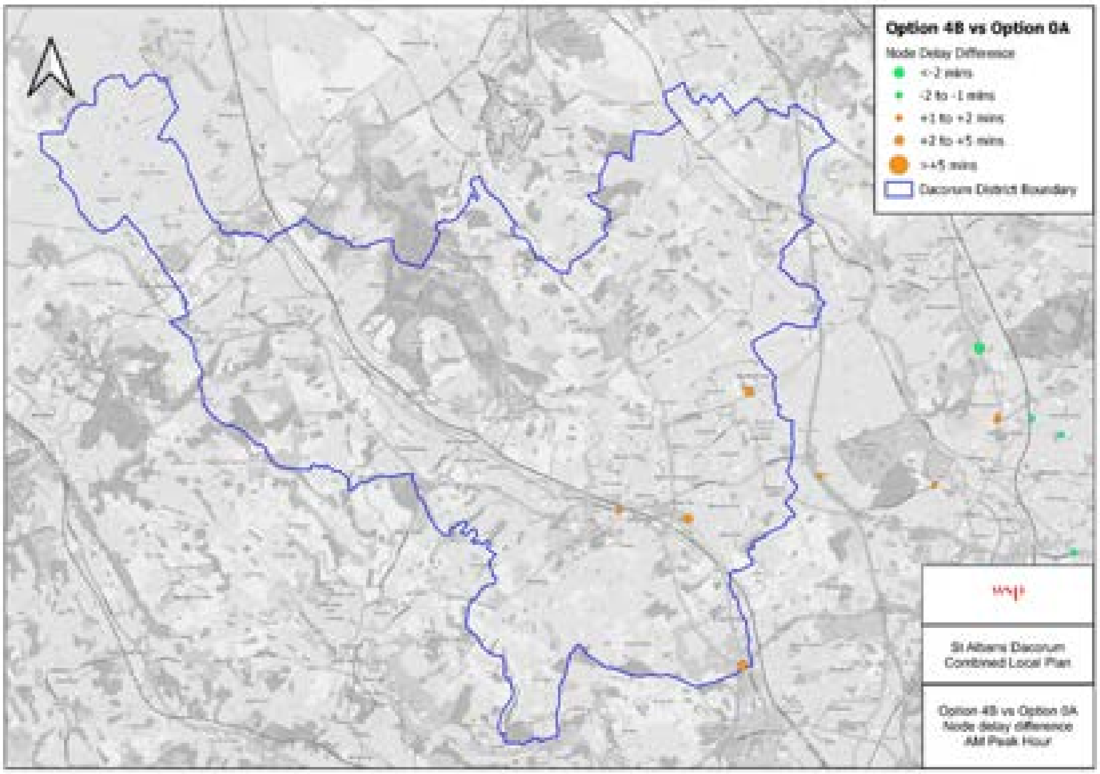


Figure 7-86: Node Delay Difference Option 4b vs Option 0A, Dacorum, AM Peak

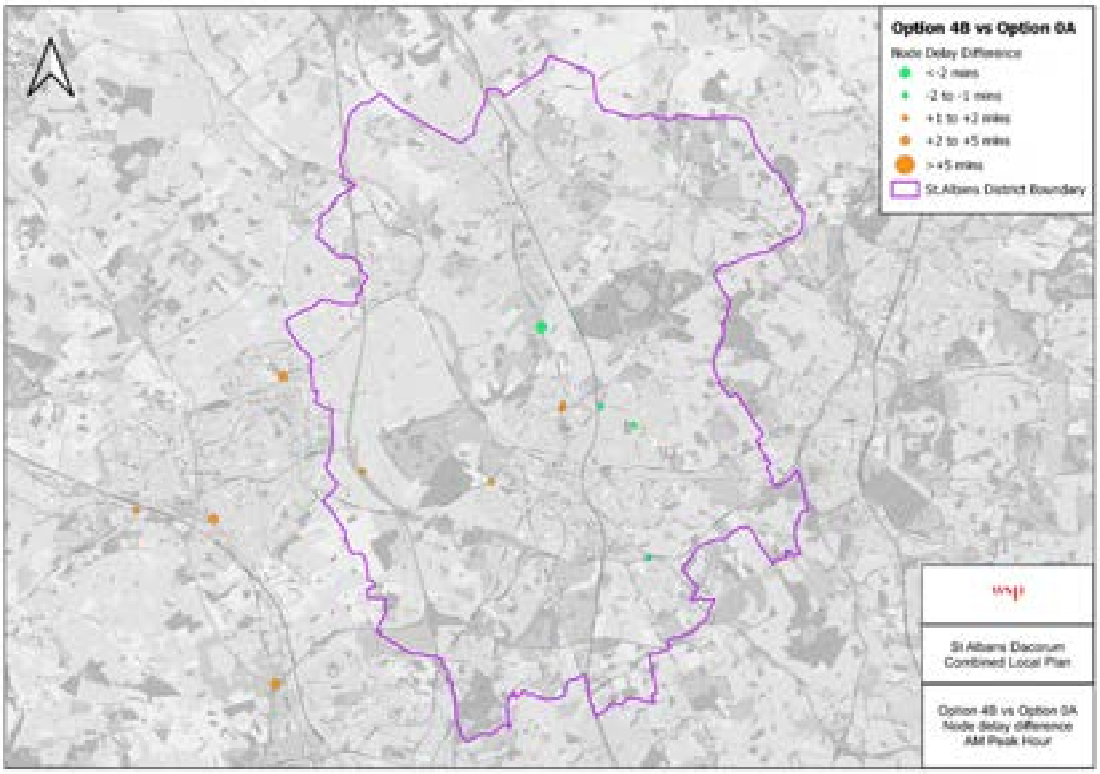


Figure 7-87: Node Delay Difference Option 4b vs Option 0A, St Albans, AM Peak

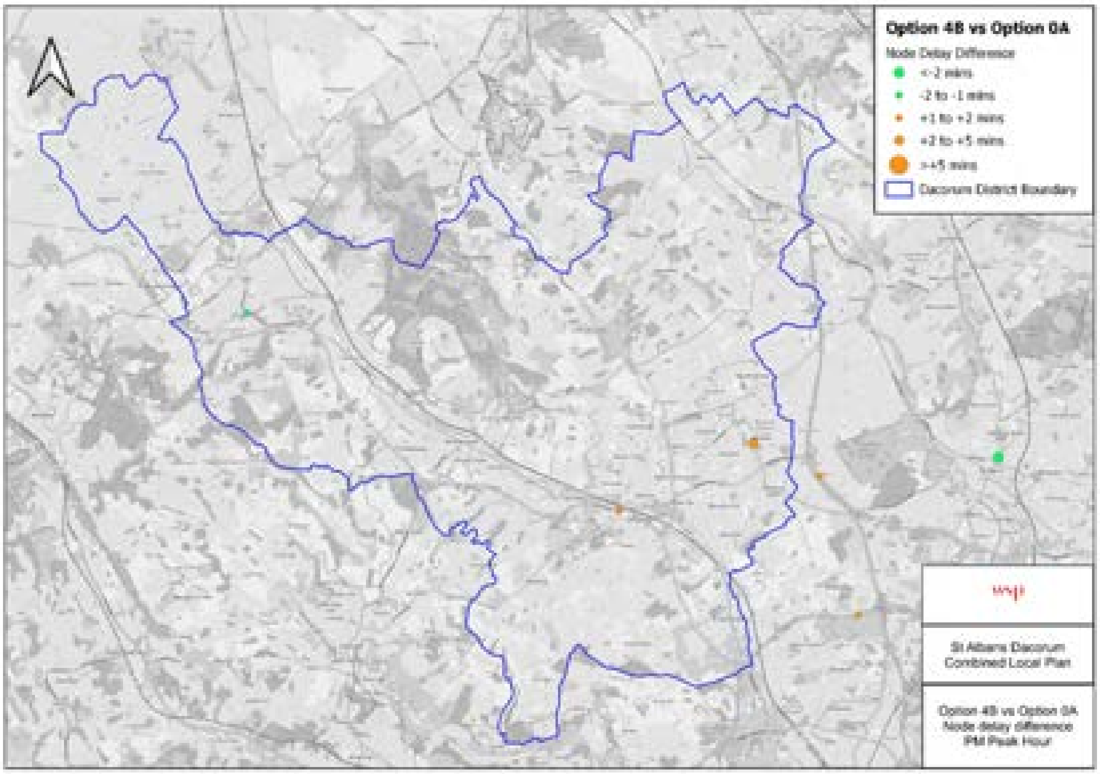


Figure 7-88: Node Delay Difference Option 4b vs Option 0A, Dacorum, PM Peak

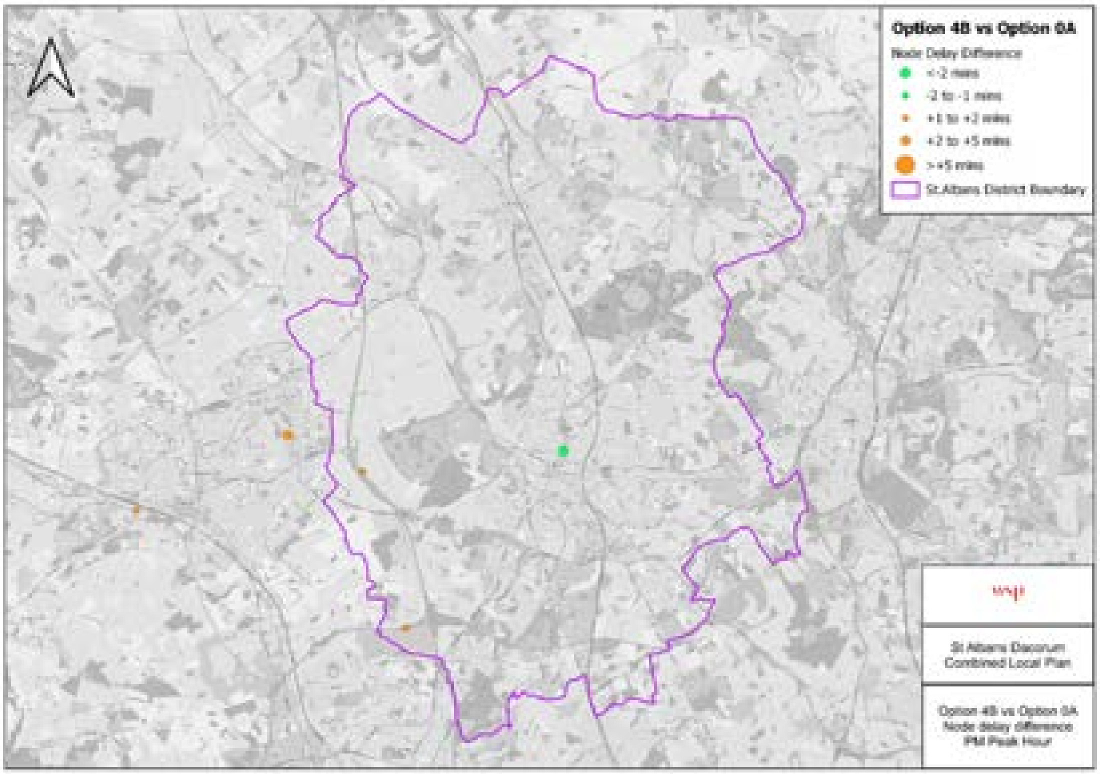


Figure 7-89: Node Delay Difference Option 4b vs Option 0A, St Albans, PM Peak

Performance of Key Junctions

7.4.11. Nine junctions have been identified as key junctions in the area around M1 Junction 8 as shown in Figure 7-90. 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 7-90: Key Junctions around the Hemel Hempstead Area

Summary of Flows at Key Junctions

7.4.12. Table 7-3 and Table 7-4 summarise the change in total entry flow at each of the key junctions across each of the scenarios.

7.4.13. The changes in total flow have been analysed by comparing the following scenarios:

- Option 4a vs Option 0A
- Option 4b vs Option 4a

7.4.14. 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.

7.4.15. In general traffic flows at junctions increase between Option 4a and Option 0A as a result of the Local Plan developments, with the largest flow increase at the A414 / Green Lane junction (3207 pcu in AM peak and 3,338 pcu in PM peak). At the junction of Redbourn Road / Link Road the flow decreases by 1151pcus in the AM peak and around 335 pcus in the PM peak. This is due to the reduced traffic flow along Redbourn Road due to the IDP scheme at the Redbourn Road / Three Cherry Trees Lane junction. At the Leighton Buzzard Road / Queensway junction there is a reduction in both peak periods, reflecting the reduced traffic flow on Leighton Buzzard Road. At the A414 / Leighton Buzzard Road / Two Waters Way / Station Road junction there is reduced traffic, most significantly in the PM peak with a reduction of nearly 224 pcus, mainly due to the IDP scheme at the junction.

7.4.16. Between Option 4b and Option 4a, in the AM peak, there is an increase in flow of around 217 pcus through M1 Junction 8 due to the proposed scheme, and at Redbourn Road/Link Road junction by 213 pcus. The traffic flow decreases by 1,478 pcus through the A414 / Green Lane junction and at A414/Maylands Avenue/ Leverstock Green Way by 284 pcus.

7.4.17. Between Option 4b and Option 4a, in the PM peak, mostly there is a reduction in flow, with main reduction in flows at M1 Junction 8 traffic flows by 221 pcus, at A414 / Green Lane where flows decrease by nearly 1,446 pcus and at A414/Maylands Avenue/ Leverstock Green Way by 207 pcus. The flow increase is at Leverstock Green Road / Bedmond Road by 111 pcus.

Table 7-3: Summary of Total Entry flow (PCUs) at Key Junctions by Scenario (AM Peak)

Ref	Junction Name	Option 0A	Option 4a	Option 4b
1	M1 Junction 8	6023	8297	8514
2	M1 Junction 9	4315	4854	4862
3	A414 / Green Lane	4827	8034	6556
4	A414 / Maylands Avenue / Leverstock Green Way	4612	6354	6070
5	Redbourn Road / A1583 Redbourn Bypass	3394	3436	3461
6	Redbourn Road / Link Road	3913	2762	2975
7	Leverstock Green Road / Bedmond Road	1802	1843	1822
8	Leighton Buzzard Road / Queensway	3359	3269	3208
9	A414 / Leighton Buzzard Road / Two Waters Way / Station Road	6114	6086	6133

Table 7-4: Summary of Total Entry flow (PCUs) at Key Junctions by Scenario (PM Peak)

Ref	Junction Name	Option 0A	Option 4a	Option 4b
1	M1 Junction 8	6815	9345	9124
2	M1 Junction 9	4477	5181	5153
3	A414 / Green Lane	5005	8343	6897
4	A414 / Maylands Avenue / Leverstock Green Way	5018	5824	5617
5	Redbourn Road / A1583 Redbourn Bypass	3227	3605	3595
6	Redbourn Road / Link Road	3951	3616	3580
7	Leverstock Green Road / Bedmond Road	1772	1821	1932
8	Leighton Buzzard Road / Queensway	3669	3125	3121
9	A414 / Leighton Buzzard Road / Two Waters Way / Station Road	6584	6360	6319

Summary of Delays at Key Junctions

7.4.18. Table 7-5 and Table 7-6 summarise the performance of the key junctions in each of the scenarios assessed in the AM and PM peak hours respectively. The delays shown are the average delays per vehicle across all movements at each junction.

7.4.19. The tables show that there is an increase in the proportion of junctions with delays between 30-60 seconds in Option 4a compared to 0A in both peak periods, but there is a reduction in delays of over 60 seconds in PM peak. 22% of junctions have over 30 seconds delay in Option 0A whilst 33% have over 30 seconds delay in Option 4a. In Option 4b, there is no difference in the proportions compared to Option 4a in the AM peak. However in the PM peak, the proportion of junctions with over 30 seconds delay decreases in Option 4b compared to Option 4a. Overall delays increase in Option 4a compared to Option 0A as a result of the increased traffic flow, but there is an improvement in Option 4b in the PM peak, where the delays are improved compared to Option 4a.

Table 7-5: Summary of Average Delay at Key Junctions (AM Peak)

Average Delay per Vehicle	Rating	Proportion of key junctions in Option 0A	Proportion of key junctions in Option 4a	Proportion of key junctions in Option 4b
0 – 30 sec	Green	78%	67%	67%
30 – 60 sec	Amber	0%	11%	22%
> 60 sec	Red	22%	22%	11%

Table 7-6: Summary of Average Delay at Key Junctions (PM Peak)

Average Delay per Vehicle	Rating	Proportion of key junctions in Option 0A	Proportion of key junctions in Option 4a	Proportion of key junctions in Option 4b
0 – 30 sec	Green	78%	67%	89%
30 – 60 sec	Amber	0%	22%	0%
> 60 sec	Red	22%	11%	11%

7.4.20. Table 7-7 and Table 7-8 present the change in delays which occurs as a result of Option 4a and 4b at each of the key junctions, noting that this does not take into consideration the delays which are experienced on links. The changes in delay have been analysed by comparing the following scenarios:

- Option 4a vs Option 0A
- Option 4b vs Option 4a
- Option 4b vs Option 0A

7.4.21. 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.

7.4.22. In general, the delay per vehicle increases in Option 4a compared to Option 0A, due to the increased traffic from the Local Plan developments. The greatest increases in the AM peak are at M1 Junction 8 (12s), M1 Junction 9 (14s), A414 / Green Lane and A414 / Two Waters Way (17s), whilst in the PM peak the largest increases are A414 / Maylands Avenue / Leverstock Green Way (18s) and Leverstock Green Road / Bedmond Road (10s).

7.4.23. In Option 4b compared to Option 4a, at M1 Junction 8, the delay increases by 6 seconds in the AM peak, and 8 seconds in the PM peak. There is a decrease in delay of 72 seconds in the AM peak and 11 seconds in the PM peak at A414 / Green Lane. There is an increase in delay of 20 seconds at M1 Junction 9 in AM peak, and an increase of 20 seconds at

Leverstock Green Road / Bedmond Road in PM peak, due to the increased flow through the junctions.

7.4.24. Comparing Option 4b to Option 0A, shows that the combination of the Local Plan development and M1 Junction 8 upgrade increases in average delays at the junctions of M1 Junction 8, M1 junction 9 and A414 / Two Waters Way in the AM peak whilst in the PM peak increases are seen at M1 Junction 8, A414 / Maylands Avenue / Leverstock Green Way and Leverstock Green Road / Bedmond Road. A414/Green Lane junction shows a reduction in delays of almost a minute in both AM and PM peak.

Table 7-7: Change in Average Delay per vehicle (seconds) at Key Junctions by Scenario (AM Peak Hour)

Reference	Junction Name	Option 4a vs Option 0A	Option 4b vs Option 4a	Option 4b vs Option 0A
1	M1 Junction 8	12	6	18
2	M1 Junction 9	14	20	34
3	A414 / Green Lane	11	-72	-61
4	A414 / Maylands Avenue / Leverstock Green Way	5	-4	1
5	Redbourn Road / A1583 Redbourn Bypass	3	1	4
6	Redbourn Road / Link Road	-7	0	-7
7	Leverstock Green Road / Bedmond Road	-15	11	-4
8	Leighton Buzzard Road / Queensway	0	0	0
9	A414 / Leighton Buzzard Road / Two Waters Way / Station Road	17	-3	14

Table 7-8: Change in Average Delay per vehicle (seconds) at Key Junctions by Scenario (PM Peak Hour)

Reference	Junction Name	Option 4a vs Option 0A	Option 4b vs Option 4a	Option 4b vs Option 0A
1	M1 Junction 8	6	8	14
2	M1 Junction 9	6	-1	5
3	A414 / Green Lane	-44	-11	-55
4	A414 / Maylands Avenue / Leverstock Green Way	18	-5	13
5	Redbourn Road / A1583 Redbourn Bypass	2	0	2
6	Redbourn Road / Link Road	-4	0	-4
7	Leverstock Green Road / Bedmond Road	10	20	30
8	Leighton Buzzard Road / Queensway	0	0	0
9	A414 / Leighton Buzzard Road / Two Waters Way / Station Road	4	-2	2

7.5 Highway Journey Times

7.5.1. Five journey time routes in the area around M1 Junction 8 have been examined. The routes are shown in Figure 7-91.

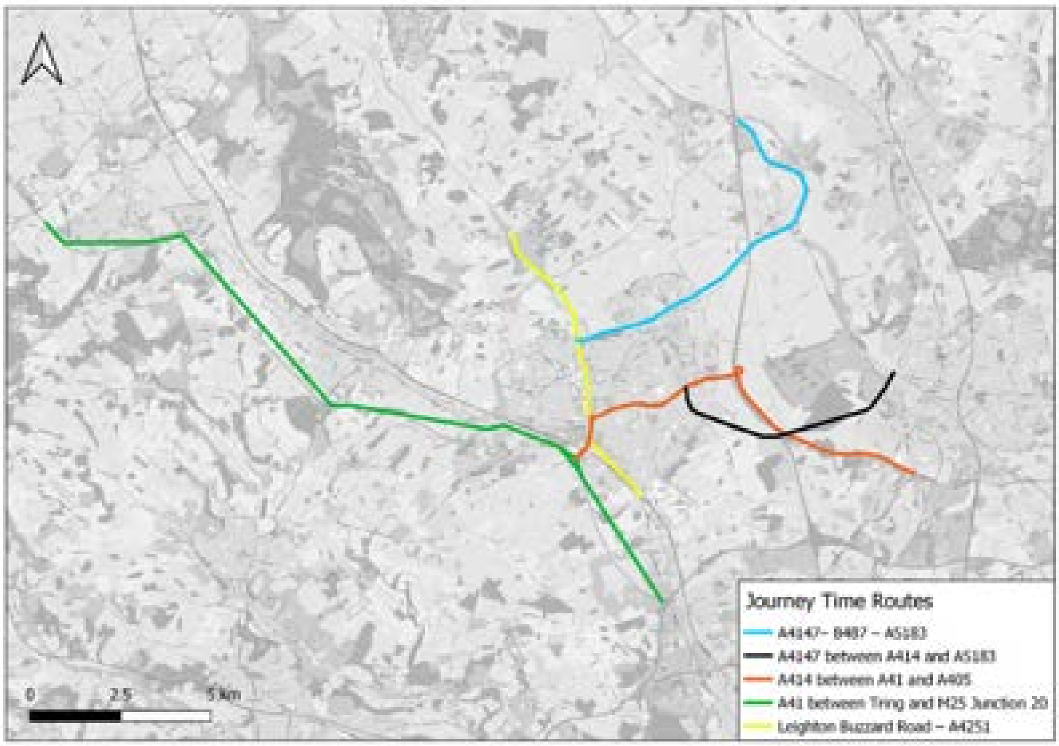


Figure 7-91: Location of Journey Time Routes

7.5.2. Table 7-9 and Table 7-10 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 4a column, cells are orange where times in Option 4a are greater than Option 0A.
- For Option 4b column, cells are orange where times in Option 4b are greater than Option 4a.

7.5.3.

7.5.4. Table 7-11 and Table 7-12 present the percentage changes in journey times between the scenarios. They have also been colour coded in a similar way to Table 7-9 and Table 7-10, with journey time increases shown in orange and decreases shown in green.

7.5.5. On the A414 route (orange), the journey time increases in both directions in Option 4a compared to Option 0A. The greatest increases are in the westbound direction, with an increase of 6 minutes in the AM peak and 4 minutes in the eastbound direction. In Option 4b compared to Option 4a, the journey time is reduced westbound in the AM peak by around 4 minutes.

7.5.6. On the A41 route (green), the travel time is increased in Option 4a compared to Option 0A by less than a minute in both directions. The proposed upgrade to M1 Junction 8 does not have an impact on this route, shown by the almost identical journey times in Option 4a and Option 4b.

7.5.7. On the Leighton Buzzard Road – A4251 route (yellow), in Option 4a compared to Option 0A, the journey time increases by around 2.5 minutes southbound and around 4.5 minutes northbound in the AM peak and by around 1 minute in each direction in the PM peak, due to the increased traffic flow from the Local Plan developments. In Option 4b compared to Option 4a, there are only small changes in journey time of less than 1 minute, as the M1 Junction 8 upgrade does not directly affect the route.

7.5.8. On the A4147 route (black), in Option 4a compared to Option 0A, the journey time increases by around 2 minutes eastbound and around 4 minutes westbound in the AM peak and by around 3 minutes westbound in the PM peak. This is mainly due to the increased traffic from the Local Plan developments and the impact of the IDP scheme at A414 / Green Lane. In Option 4b compared to Option 4a, the journey time increases by around 1 minute in each direction in the AM peak and by around 1 minute eastbound in the PM peak.

7.5.9. On the A4147-B487-A5183 route (blue), in Option 4a compared to Option 0A, the journey time increases by around 5.5 minutes eastbound and around 8 minutes westbound in the AM peak and by around 0.5 minutes eastbound and 3 minutes westbound in the PM peak. This is mainly due to the increased traffic from the Local Plan developments and IDP schemes. In Option 4b compared to Option 4a, the journey time is about the same eastbound and decreases by around 2 minutes westbound in the AM peak and stays very similar in the PM peak as a result of the change in flows due to the M1 Junction 8 upgrade.

Table 7-9: Summary of Journey Times (mins:secs) AM Peak

Route Name	Route Direction	Option 0A	Option 4a	Option 4b
A414 between A41 and A405 (Orange)	Eastbound	19:09	23:21	26:03
A414 between A41 and A405 (Orange)	Westbound	13:41	19:58	15:28
A41 between Tring and M25 Junction 20 (Green)	Eastbound	14:58	15:51	15:47
A41 between Tring and M25 Junction 20 (Green)	Westbound	14:13	14:36	14:35
Leighton Buzzard Road – A4251 (Yellow)	Southbound	18:13	20:50	21:04
Leighton Buzzard Road – A4251 (Yellow)	Northbound	16:47	21:10	20:32
A4147 between A414 and A5183 (Black)	Eastbound	10:52	12:17	14:00
A4147 between A414 and A5183 (Black)	Westbound	10:38	14:20	13:27
A4147– B487 – A5183 (Blue)	Eastbound	13:56	18:30	18:06
A4147– B487 – A5183 (Blue)	Westbound	13:35	20:19	18:36

Table 7-10: Summary of Journey Times (mins:secs) PM Peak

Route Name	Route Direction	Option 0A	Option 4a	Option 4b
A414 between A41 and A405 (Orange)	Eastbound	19:09	18:59	20:22
A414 between A41 and A405 (Orange)	Westbound	14:27	16:15	16:17
A41 between Tring and M25 Junction 20 (Green)	Eastbound	14:06	14:16	14:14
A41 between Tring and M25 Junction 20 (Green)	Westbound	16:28	17:34	17:25
Leighton Buzzard Road – A4251 (Yellow)	Southbound	16:26	17:28	17:33
Leighton Buzzard Road – A4251 (Yellow)	Northbound	19:13	20:47	20:32
A4147 between A414 and A5183 (Black)	Eastbound	10:12	10:10	11:12
A4147 between A414 and A5183 (Black)	Westbound	11:36	11:30	11:43
A4147– B487 – A5183 (Blue)	Eastbound	17:48	18:03	18:20
A4147– B487 – A5183 (Blue)	Westbound	13:11	16:23	16:25

Table 7-11: Percentage Changes in Journey Times AM Peak

Route Name	Route Direction	Option 4a vs Option 0A	Option 4b vs Option 4a	Option 4b vs Option 0A
A414 between A41 and A405 (Orange)	Eastbound	22%	12%	36%
A414 between A41 and A405 (Orange)	Westbound	46%	-23%	13%
A41 between Tring and M25 Junction 20 (Green)	Eastbound	6%	0%	6%
A41 between Tring and M25 Junction 20 (Green)	Westbound	3%	0%	3%
Leighton Buzzard Road – A4251 (Yellow)	Southbound	14%	1%	16%
Leighton Buzzard Road – A4251 (Yellow)	Northbound	26%	-3%	22%
A4147 between A414 and A5183 (Black)	Eastbound	13%	14%	29%
A4147 between A414 and A5183 (Black)	Westbound	35%	-6%	26%
A4147– B487 – A5183 (Blue)	Eastbound	33%	-2%	30%
A4147– B487 – A5183 (Blue)	Westbound	50%	-8%	37%

Table 7-12: Percentage Changes in Journey Times PM Peak

Route Name	Route Direction	Option 4a vs Option 0A	Option 4b vs Option 4a	Option 4b vs Option 0A
A414 between A41 and A405 (Orange)	Eastbound	-1%	7%	6%
A414 between A41 and A405 (Orange)	Westbound	12%	0%	13%
A41 between Tring and M25 Junction 20 (Green)	Eastbound	1%	0%	1%
A41 between Tring and M25 Junction 20 (Green)	Westbound	7%	-1%	6%
Leighton Buzzard Road – A4251 (Yellow)	Southbound	6%	0%	7%
Leighton Buzzard Road – A4251 (Yellow)	Northbound	8%	-1%	7%
A4147 between A414 and A5183 (Black)	Eastbound	0%	10%	10%
A4147 between A414 and A5183 (Black)	Westbound	-1%	2%	1%
A4147– B487 – A5183 (Blue)	Eastbound	1%	2%	3%
A4147– B487 – A5183 (Blue)	Westbound	24%	0%	24%

7.6 Impact on SRN

7.6.1. The impacts of the Local Plans and the M1 Junction 8 upgrade on SRN junctions around the area are examined in detail in the following section. Figures showing the actual flow difference, percentage flow difference and delay difference at each of the junctions, in each peak, are provided in Appendix H.

M1 Junction 8

Option 4a vs Option 0A

7.6.2. Due to the additional demand generated by the Local Plan allocations in Option 4a, the AM peak model estimates increased traffic flow on all approach arms of M1 Junction 8 compared with Option 0A. Traffic flow increases by 667 pcus (33%) on the M1 northbound off-slip and by 629 pcus 132%) on the M1 northbound on-slip. Traffic flow also increases by 386 pcus (82%) on the M1 southbound off-slip and by 1,083 pcus (59%) on the M1 southbound on-slip.

7.6.3. In the PM peak, the model also estimates similar increases on almost all M1 Junction 8 slip roads. Traffic flow increases by 759pcus (33%) on the M1 northbound off-slip and increases by 702 pcus (90%) on the M1 northbound on-slip. Traffic flow increases by 312 pcus (68%) on the M1 southbound off-slip and by 1172 pcus (73%) on the M1 southbound on-slip.

7.6.4. As a result of the overall increase in flow, the AM model estimates an increased delay of 243 seconds on the A414 westbound approach of the adjacent A414 Breakspear Way/ Green Lane junction. The westbound queue at the Green Lane junction causes further delays (69s) at the signal junction between M1 J8 southbound off-slip and northbound off-slip to the east. A delay of 104 seconds is also forecast on M1 southbound slip at the point where it splits to A414 and M1 due to increased southbound traffic.

7.6.5. The increase in delays are lower in the PM peak model compared to the AM peak, with reductions in delay on Green Lane southbound with A414.

Option 4b vs Option 4a

7.6.6. The M1 Junction 8 upgrade introduces a new roundabout and a new link road to allow direct access for HCG traffic to M1 Junction 8. The model has shown that the upgrade diverts a proportion of traffic away from the A414 Breakspear Way / Green Lane junction. This change has relieved the congestion on A414 westbound approach to the Green Lane signal junction, but it introduces delay at the M1 Junction 8 new roundabout's approach and circulatory links.

7.6.7. In the AM peak, in Option 4b compared to Option 4a, the traffic flow increases on M1 northbound off-slip by 570 pcus (21%), on-slip by 174 pcus (16%) and southbound off-slip by 194 pcu (22%) due to reduced congestion at the Green Lane junction, resulting in increased vehicle throughput. Traffic flow at the southbound on-slip decreases by 548 pcus (-14%) because of the delay estimated at the new M1 Junction 8 roundabout.

7.6.8. Due to the relief of congestion at the Breakspear Way / Green Lane junction, the model estimates a reduction of delay on the northbound off-slip (-220s). However, the M1 Junction 8 upgrade has introduced new delays (446s) on the Breakspear Way approach to the M1 Junction 8 roundabout and 138 seconds of delays on the circulatory link. Further examination has suggested the signalised junction between the northbound circulatory and A414 eastbound approach has insufficient capacity. Sensitivity testing has been carried out which demonstrates widening the circulatory link to two lanes can mitigate the delay.

7.6.9. No delay increase of over 30 seconds is forecast on the remaining slip-roads.

7.6.10. In the PM peak model, an increase of delay (247s) is also forecast on the A414 eastbound approach arm to the M1 Junction 8 roundabout similar to the AM model. An increase in delay of 53 seconds is forecast on the northbound on-slip. No delay increase of over 30 seconds is forecast on the remaining slip-roads.

Option 4b vs Option 0A

7.6.11. Due to the additional demand generated by the Local Plan allocations in Option 4b, the AM peak model estimates increased traffic flow on all approach arms of M1 Junction 8 compared with Option 0A. Traffic flow increases by 1238 pcus (62%) on the M1 northbound off-slip and by 803 pcus (168%) on the M1 northbound on-slip. Traffic flow increases by 271 pcus on the M1 southbound off-slip and by 185 pcus on the M1 southbound on-slip.

7.6.12. In the PM peak, the model also estimates similar increases on all M1 Junction 8 slip roads. Traffic flow increases by 638 pcus (30%) on the M1 northbound off-slip and increases by 826 pcus (106%) on the M1 northbound on-slip. Traffic flow increases by 100 pcus on the M1 southbound off-slip and by 430 pcus on the M1 southbound on-slip.

7.6.13. As a result of the overall increase in flow, the AM model estimates delay on the A414 westbound approach (29s) of the adjacent A414 Breakspear Way/ Green Lane junction, as well as the A414 eastbound approach (447s) and circulatory link (138s) of the M1 Junction 8 roundabout. No delay increase of over 30 seconds is forecast on slip roads.

7.6.14. Increases in delay are also forecast in the PM peak model at the A414 Breakspear Way / Green Lane junction and M1 Junction 8. The PM model estimates delay on the A414 westbound approach (34s) of the adjacent A414 Breakspear Way/ Green Lane junction, as well as the A414 eastbound approach (247s) and circulatory link (128s) of the M1 Junction 8 roundabout. The delays on the northbound off-slip and the southbound slip road where it splits to M1 and A414 decrease by 18 seconds and increase by 41 seconds respectively.

M1 Junction 9

Option 4a vs Option 0A

7.6.15. In the AM peak, in Option 4a compared to Option 0A, there is an increase in flow on almost all approaches to M1 Junction 9. The A5183 London Road (west) increases by 119 pcu (9%), westbound on A5183 Dunstable Road (east) increases by 79 pcus (7%), the M1 northbound off-slip increases by 258 pcus (31%) and Watery Lane increases by 71 pcus (22%), whilst the M1 south off-slip increases by 31 pcus (4%). The traffic flows exiting the junction increase on all arms, with the A5183 London Road eastbound increasing by 302 pcu (35%), M1 northbound on-slip increasing by 89 pcus (13%), M1 southbound on-slip increasing by 115 pcus (7%) and the A5183 Dunstable Road decreases by 21 pcus (2%).

7.6.16. In the PM peak, in Option 4a compared to Option 0A, there is an increase in flow on almost all approaches to M1 Junction 9. The A5183 London Road (west) increases by 373 pcu (30%), the M1 northbound off-slip increases by 129 pcus (9%) and the M1 south off-slip increases by 201 pcus (30%), whilst the A5183 Dunstable Road (east) westbound decreases by -21 pcus (-2%). The traffic flows exiting the junction increase on all arms, with the A5183 London Road eastbound increasing by 101 pcu (8%), M1 northbound on-slip increasing by 85 pcus (5%), M1 southbound on-slip increasing by 179 pcus (16%), the A5183 Dunstable Road increasing by 189 pcus (22%) and Watery Lane increasing by 90pcus (41%).

7.6.17. Although there are no increases in delay at the junction itself in Option 4a compared to 0A in the AM peak, there is an increased delay predicted at the point where the M1 southbound on-slip merges with the mainline. The M1 southbound mainline has an increased delay of 40 seconds and the on-slip has an increased delay of 102 seconds.

7.6.18. In the PM peak, there are only delay increases of over 30 seconds at the M1 northbound on slip with a delay of 34 seconds, at the junction in Option 4a compared to Option 0A.

Option 4b vs Option 4a

7.6.19. In Option 4b compared to Option 4a, the traffic flow increases on the M1 northbound off-slip by 81 pcus (7%). This flow exits the junction roughly equally to all other approaches. The increase is caused by re-routing due to the M1 Junction 8 upgrade.

7.6.20. In the PM peak, the effect of the M1 Junction 8 upgrade is minimal. Comparing Option 4b with Option 4a, there are only small changes in traffic flow, all less than 10%.

7.6.21. In Option 4b compared to 4a in the AM peak, there is an increased delay predicted at the point where the M1 southbound on-slip merges with the mainline. The M1 southbound mainline has an increased delay of 45 seconds and the on-slip has an increased delay of 122 seconds. In the PM peak, there is no change in delay at the junction.

Option 4b vs Option 0A

7.6.22. In the AM peak, in Option 4b compared to Option 0A, there is an increase in flow on almost all approaches to M1 Junction 9. The A5183 London Road (west) increases by 138 pcu (10%), westbound on A5183 Dunstable Road (east) increases by 105 pcus (10%), the M1 northbound off-slip increases by 339 pcus (40%) and Watery Lane increases by 35 pcus (11%), whilst the M1 south off-slip decreases by -54 pcus (-6%). The traffic flows exiting the junction increase on almost all arms, with the A5183 London Road eastbound increasing by 312 pcu (36%), M1 northbound on-slip increasing by 103 pcus (15%), M1 southbound on-slip increasing by 121 pcus (7%) whilst the A5183 Dunstable Road decreases by -20 pcus (-2%).

7.6.23. In the PM peak, in Option 4b compared to Option 0A, there is an increase in flow on almost all approaches to M1 Junction 9. The A5183 London Road (west) increases by 373 pcu (29%), the M1 northbound off-slip increases by 153 pcus (11%) and the M1 south off-slip increases by 148 pcus (22%), whilst the A5183 Dunstable Road (east) westbound decreases by -16 pcus (-1%). The traffic flows exiting the junction increase on all arms, with the A5183 London Road eastbound increasing by 94 pcu (7%), M1 northbound on-slip increasing by 81 pcus (5%), M1 southbound on-slip increasing by 189 pcus (17%), the A5183 Dunstable Road increasing by 156 pcus (18%) and Watery Lane increasing by 103 pcus (47%).

7.6.24. Although there are no increases in delay at the junction itself in Option 4b compared to 0A in the AM peak, there is an increased delay predicted at the point where the M1 southbound on-slip merges with the mainline. The M1 southbound mainline has an increased delay of 84 seconds and the on-slip has an increased delay of 224 seconds. This is caused by the increase in the traffic flow both on the mainline and on the on-slip.

7.6.25. In the PM peak, there are no delay increases of over 30 seconds at the junction in Option 4b compared to Option 0A.

M25 Junction 20

Option 4a vs Option 0A

7.6.26. In the AM peak, in Option 4a compared to Option 0A, there is increased flow on the M25 eastbound off-slip of 31 pcus (3%) and an increase of 176 pcus (16%) on the M25 westbound off-slip. The M25 westbound on-slip decreases by -145 pcus (-21%) and the M25 westbound through traffic decreases by -130 pcus (-3%). The increased flow through the junction from the M25 routes to the A41 northbound (which has a 89 pcus, 5% increase) and A41 southbound (which has a 232 pcus, 24% increase).

7.6.27. In the PM peak, in Option 4a compared to Option 0A, there is increased flow on the M25 eastbound off-slip of 39 pcus (3%) and an increase of 124 pcus (215%) on the M25 westbound off-slip. The M25 westbound through traffic decreases by -124 pcus (-2%). The increased flow through the junction from the M25 routes to the A41 northbound (which has a 107 pcus, 4% increase) and the A4251 northbound (which has a 105 pcus, 15% increase).

7.6.28. As a result of the increased flows through the junction the delays increase in both peak periods. In the AM peak, delays increase by 212 seconds on the A41 southbound approach, by 385 seconds on the A4251 southbound approach and by 70 seconds on the M25 westbound off-slip. In the PM peak, delays decrease by 34 seconds on the A41 southbound approach, by 6 seconds on the A4251 southbound approach, the increase by 18 seconds on the M25 westbound off-slip and by 7 seconds on the M25 eastbound off-slip. The increases in delay occur due to the junction already being overcapacity in Option 0A.

Option 4b vs Option 4a

7.6.29. In Option 4b compared to Option 4a, in the AM peak, traffic flows generally decrease through the junction. The flow on the M25 eastbound off-slip decreases by 71 pcus (-7%), resulting in decreases on both A41 northbound and A41 southbound. In the PM peak, only small traffic flow changes of less than 60 pcus occur.

7.6.30. All delay differences at M25 junction 20 are predicted to be less than 30 seconds in both peaks in Option 4b compared to Option 4a, the only exception to this is the A41 southbound which experiences increase of 35 seconds in the AM peak and 57 seconds in the PM peak. The A4251 southbound also experiences increases in delay in the PM peak of 50 seconds.

Option 4b vs Option 0A

7.6.31. In the AM peak, in Option 4b compared to Option 0A, there is increased flow of 167 pcus (15%) on the M25 westbound off-slip. The M25 westbound on slip decreases by -174 pcus (-11%) and the M25 westbound through traffic decreases by -132 pcus (-3%). The decreased flow through the junction from the M25 routes to the A41 northbound (which has 21 pcus, 1% decrease) and A41 southbound increases (which has 167 pcus, 18% increase).

7.6.32. In the PM peak, in Option 4b compared to Option 0A, there is increased flow on the M25 eastbound off-slip of 43 pcus (3%) and an increase of 134 pcus (16%) on the M25 westbound off-slip. The M25 westbound through traffic decreases by 134 (-3%). The increased flow through the junction from the M25 routes to the A41 northbound (which has a 133 pcus, 5% increase) and the A4251 northbound (which has 91 pcus, 13% increase).

7.6.33. As a result of the increased flows through the junction the delays increase in both peak periods. In the AM peak, delays increase by 247 seconds on the A41 southbound approach, by 367 seconds on the A4251 southbound approach and by 49 seconds on the M25 westbound off-slip. In the PM peak, delays increase by 28 seconds on the M25 westbound off-slip. The increases in delay occur due to the junction already being overcapacity in Option 0A.

M25 Junction 21 and 21A

Option 4a vs Option 0A

7.6.34. There are some changes in traffic flow through M25 Junction 21 and 21A in both peak periods due to the Local Plan developments. In the AM peak, there is a decrease in flow to and from the North Orbital Road north of Junction 21A, but an increase on all other arms of the junction. Most of the differences are however less than 10%, with the exceptions being a -17% (-92 pcus) decrease on the M25 Junction 21A eastbound on-slip and a 11% increased on the M1 southbound main carriageway.

7.6.35. In the PM peak period, there is an increase in flow on the M1 southbound mainline of 711 pcus (16%), as well as increases on the North Orbital Road south of Junction 21A of 57 pcus northbound (3%). However, there are some minor decreases in flow on the M1 northbound mainline of and on the North Orbital Road north of Junction 21A. The flow from M1 southbound to M25 eastbound decreases by 35 pcus (-24%).

7.6.36. In the AM peak, link delays increase by 35 seconds on the Junction 21A eastbound off-slip and by 545 seconds on the Junction 21 westbound merge. In the PM peak, link delays increase by 85 seconds at the Junction 21 westbound merge.

Option 4b vs Option 4a

7.6.37. The upgrade of M1 Junction 8 causes some traffic flow changes at M25 Junction 21 and 21A in both peak periods but these are all mainly less than 10%. The model shows some higher percentage differences in traffic flow due to the choice of lane at the M25 to M1 northbound merge.

7.6.38. In the AM peak, link delays increase by 35 seconds on the Junction 21A westbound off-slip and decrease by 19 seconds on the Junction 21 westbound merge. In the PM peak, link delays decrease by 13 seconds at the Junction 21 eastbound off slip towards the North Orbital road.

Option 4b vs Option 0A

7.6.39. In Option 4b compared to Option 0A, in the AM peak, there is a 94 pcus (10%)increase in flow on the M25 Junction 21A eastbound off-slip, a -389 pcu (-120%)decrease in flow on the M25 Junction 21 westbound to M1 northbound slip and a 19% decrease in flow on the M25 junction 21A eastbound on slip. In the PM peak, there is a 134 pcu (7%) increase in flow on North Orbital Road southbound from Junction 21A, a 150 pcu (18%) increase in flow on the northern part of the M21A roundabout circulatory, a -30 pcu (-21%) decrease in flow from M1 southbound to M25 eastbound.

M25 Junction 22

Option 4a vs Option 0A

7.6.40. In the AM peak, there are mostly only small traffic flow differences in Option 4a compared to 0A (up to around 50 pcus) in traffic flows on the M25 Junction 22 arms. The exception, and the largest change in flow, is on the M25 eastbound on-slip which has an increase of 191 pcus (19%).

7.6.41. In the PM peak, the traffic flow differences are higher than in the AM peak in Option 4a compared to Option 0A. On the A1081, there is a 202 pcu (17%) increase southbound and 288 pcus (25%) increase northbound. There is a 111pcu (7%) increase in flow on the M25 westbound off-slip. There are decreases in flow of up to -7% on Coursers Way and Barnet Road, whilst the M25 eastbound off-slip has a decrease of -94 pcus (-14%).

7.6.42. In the AM peak, the A1081 southbound has an increase in delay of 98 seconds (due to the increased traffic flow) and Coursers Way southbound is predicted to experience an increase in delay of 87 seconds. All other links have delay changes of less than 30 seconds.

7.6.43. In the PM peak, there is an increase in delay on A1081 northbound of 33 seconds. All other links have delay changes of less than 30 seconds.

Option 4b vs Option 4a

7.6.44. The impact of the M1 Junction 8 upgrade can be seen by comparing Option 4b with Option 4a. In the AM peak, the traffic flow on A1081 increases by 133 pcus (12%) southbound and 174 pcus (13%) northbound. The flow on the M25 westbound off-slip increases by 180 pcus (11%) and on Ridge Way eastbound it increases by 109 pcus (22%). This indicates that the M1 Junction 8 upgrade causes traffic to use the A414 and A1081 from the M25 east, rather than the M1 and M25. This is also evidenced by the fact that the flow on the M25 mainline westbound under Junction 22 has a decrease in flow of 177 pcus.

7.6.45. In the PM peak, there is no significant impact on the traffic flows at M25 Junction 20. Flow differences are all less than 40 pcus and under 10% change.

7.6.46. The only change in delay in Option 4b compared to Option 4a is in the AM peak, where the A1081 southbound has a decrease in delay of -30 seconds. All other links have delay changes of less than 30 seconds.

Option 4b vs Option 0A

7.6.47. Comparing Option 4b with Option 0A in the AM peak, the greatest changes are in the traffic flow on A1081 which increases by 185 pcus (17%) southbound and 224 pcus (18%) northbound. The flow on the M25 westbound off-slip increases by 291 pcus (19%), flow on the M25 eastbound on-slip increases by 163 pcus (16%), and on Ridge Way eastbound it increases by 165 pcus (37%).

7.6.48. In the PM peak, on the A1081, there is a 211 pcu (18%) increase southbound and 290 pcus (25%) increase northbound. There is a 148pcu (10%) increase in flow on the M25 westbound off-slip and increase of 65 pcus (8%) on the M25 westbound on-slip. There are decreases in flow of up to 12% on Coursers Way and Barnet Road, whilst the M25 eastbound off-slip has a decrease of 89 pcus (-13%).

7.6.49. In the AM peak, the A1081 southbound has an increase in delay of 69 seconds (due to the increased traffic flow), Coursers Way southbound is predicted to experience an increase in delay of 70 seconds and A1081 south has a 49 second delay. All other links have delay changes of less than 30 seconds. In the PM peak Coursers Road southbound has a delays of 36 seconds and all other links have delay changes of less than 30 seconds.

M25 Junction 23

Option 4a vs Option 0A

7.6.50. In the AM peak, there are only small traffic flow differences between Option 4a and Option 0A at M25 Junction 23, with traffic flow differences of less than 119 pcus and 5%. In the PM peak, there is an increase of 135 pcus (2%) on the M25 westbound and an increase of 82 pcus (12%) on Bignells Corner eastbound. All flow differences in PM peak at M25 Junction 23 are less than 10%.

7.6.51. All delay differences at M25 junction 23 are predicted to be less than 30 seconds in both peaks in Option 4a compared to Option 0A.

Option 4b vs Option 4a

7.6.52. Comparing Option 4b to Option 4a, in the AM peak, there is an increase in flow of 140 pcus (8%) on the M25 eastbound on-slip, which comes mainly from increased flow on the St Albans Road approach where there is an increase of 123 pcus (27%). All other flow differences are less than 10%. In the PM peak, all flow differences in Option 4b compared to Option 4a are 1% or less.

7.6.53. All delay differences at M25 junction 23 are predicted to be less than 30 seconds in both peaks in Option 4b compared to Option 4a.

Option 4b vs Option 0A

7.6.54. Comparing Option 4b to Option 40A, in the AM peak, there is an increase in flow of 132 pcus (13%) on the M25 eastbound off-slip, and an increase of 226 pcus (14%) on the M25 eastbound on-slip and an increase of 155 pcus (24%) from Bignells Corner. All other flow differences are less than 10%. In the PM peak, there is an increase of 132 pcus (9%) on the M25 eastbound off-slip and an increase of 74 pcus (11%) on Bignells Corner eastbound. All flow differences in PM peak are less than 10%.

7.6.55. All delay differences at M25 junction 23 are predicted to be less than 30 seconds in both peaks in Option 4b compared to Option 0A.

A1(M) Junction 3

Option 4a vs Option 0A

7.6.56. In the AM peak, there are only small traffic flow differences between Option 4a and Option 0A, with differences of less than 70 pcus and 6%. In the PM peak, there is an increase in traffic flow to the A414 North Orbital Road of 247 pcus (15%), mainly coming from the A1(M) southbound. There is a decrease in flow of -44pcus (-2%) from the A414 North Orbital Road and a decrease of -109 pcus (-10%) to A1001 Comet Way.

7.6.57. There are only small increases in delay of less than 30 seconds at the junction in the AM peak. In the PM peak, there is an increased delay of 65 seconds on College Road southbound. All other delay differences at the junction are less than 30 seconds.

Option 4b vs Option 4a

7.6.58. In Option 4b compared to Option 4a, there are only very small traffic flow and delay differences at A1(M) Junction 3 in both peak periods, showing that the M1 Junction 8 upgrade does not affect this junction.

Option 4b vs Option 0A

7.6.59. In the AM peak, there are only small traffic flow differences between Option 4a and Option 0A, with differences of less than 60 pcus and 5%. In the PM peak, there is an increase in traffic flow to the A414 North Orbital Road of 215 pcus (13%), mainly coming from the A1(M) southbound. There is a decrease in flow of -65pcus (-3%) from the A414 North Orbital Road and a decrease of -112 pcus (-11%) to A1001 Comet Way.

7.6.60. There are only small increases in delay of less than 35 seconds at the junction in the AM peak. In the PM peak, there is an increased delay of 64 seconds on College Road southbound. All other delay differences at the junction are less than 30 seconds.

8 Conclusions

8.1.1. WSP were commissioned by Hertfordshire County Council (HCC) on behalf of Dacorum Borough Council (DBC) and St Albans District Council (SADC) to undertake transport modelling work to assess the combined impact of DBC's and SADC's Local Plan proposals and the proposed upgrade to M1 Junction 8. This report provides the impacts of the combined Local Plan growth on the highway network, especially in the context of Hemel Garden Community development which lies in both the two planning authorities. The report also assesses whether a major upgrade to M1 Junction 8 is necessary to accommodate the expected growth during the Local Plan period.

8.2 Findings

8.2.1. This report has presented the results of three 2041 future year scenarios:

- **Option 0A:** 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 Dacorum and St Albans.
- **Option 4a:** This builds on Option 0A by including the Dacorum Local Plan and St Albans Local Plan Allocations (including all growth within the Hemel Garden Community) along with the proposed IDP mitigation in each area and including the impact of the Opportunity to Shift Mode tool assessment in each area, but not including the proposed scheme at M1 Junction 8.
- **Option 4b:** This builds on Option 4a by including the proposed scheme at M1 Junction 8.

8.2.2. The main findings from the modelling shows that for:

- **Option 4a vs Option 0A**: There is an increase of 0.4-2% in overall vehicle trips and increase in vehicle travel times (11% in AM and 10% in PM) due to impacts of Local Plan allocations and infrastructure schemes.
- **Option 4b vs Option 4a:** Compared with Option 4a, the introduction of M1 Junction 8 upgrade is forecast to lower the AM peak total travel time by 3% because of the delay reduction. However, the capacity constraints in the proposed M1 Junction 8 upgrade have introduced new delay at the gyratory system with the PM peak's overall travel time increased by 1%.
- **A sensitivity test** has been undertaken to assess the impacts of a widened M1 Junction 8 roundabout to mitigate delays. The results of this test demonstrates that the delay forecasted in Option 4b can be relieved if such an arrangement is assumed and could be delivered. Detailed results are presented in Appendix J.

8.2.3. In general, the forecast results in terms of delay, V/C and journey time show similar patterns as the above network statistics.

8.2.4. The DBC and SADC Local Plan allocations are forecast to generate increased traffic pressure (V/C and delay) as shown in Option 4a. It is clear from the results that to support the Local Plan growth, improvements in infrastructure in Option 4a are required to mitigate against the impact of the proposed developments to ensure the highway network operates effectively. Overall, the model estimates increase traffic pressure and delay on key roads including A414 Breakspear Way, Redbourn Road, Hemel Hempstead Road, East Hemel Spine Road, A41 near Berkhamsted, A414 in London Colney due to the development traffic.

8.2.5. The proposed mitigation measure at M1 Junction 8, as shown in the Option 4b, can relieve the traffic pressure at the congestion hotspots, such as A414/ Green Lane junction, A414 /Maylands Avenue roundabout and M1 Junction 8 as traffic is diverted to the proposed link road between East Hemel Spine Road and M1 Junction 8 roundabout. However, the model also forecasts increases of delays on this link road and circulatory links of M1 Junction 8 new roundabout. Further investigation has shown this is as a result of insufficient capacity at the new M1 Junction 8 southbound on-slip signalised junction causing delay on both circulatory link and A414 Breakspear Way eastbound approach.

8.2.6. Sensitivity testing has been conducted to assess the impacts of a widened M1 Junction 8 roundabout to mitigate the delays. The result of this test demonstrates that the delay forecasted in Option 4b can be relieved if such arrangement is assumed.

8.2.7. The impacts on the SRN junctions that are likely to be impacted by the Local Plan growth have also been assessed. This includes M1 Junction 8 and Junction 9, M25 Junction 20, Junction 21A, Junction 22 and Junction 23 and A1(M) Junction 3.

8.2.8. The results have shown there are increases of traffic flow on the SRN as a result of both Local Plan and the M1 Junction 8 upgrade and there are increases of delay at some access points of the SRN and slip roads where further investigation could be considered. The analysis has indicated that M1 Junction 8, M1 Junction 9, M25 Junction 20 and Junction 22 have shown impacts because of the Local Plan allocations and M1 Junction 8 upgrade.

8.2.9. Apart from M1 Junction 8, the M1 Junction 9 also shows impacts as additional demand estimated in Option 4a is projected to increase the delays on the M1 southbound mainline and southbound on-slip in AM. The M1 Junction 8 upgrade causes additional delays on these links due to increased traffic on M1 as shown in Option 4b.

8.2.10. Delay increases are also forecast at M25 Junction 20 and Junction 22 due to additional demand predicted in Option 4a and 4b. However further assessment has shown that these junctions are already near or over-capacity in Option 0a. The additional demand in Option 4a and 4b exacerbate the congestion and causes additional delays.

Appendix A

Option 0A Committed Large Developments

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	N/A
9018	4/02539/16/MOA	SPENCERS PARK PHASE 2, LAND BETWEEN, THREE CHERRY TREES LANE AND CHERRY TREE LANE,, HEMEL HEMPSTEAD	Dacorum	357	N/A
9024	17/00862/OPM	Land to N of Stevenage, Weston Road, Stevenage, SG1 4DE	Stevenage	557	N/A
9030	6/2018/0171/MAJ	Former Shredded Wheat Factory, Welwyn Garden City, AL8 6UN	Welwyn Hatfield	1454	N/A
9034	4/03266/18/MFA	LA3, Land At West Hemel Hempstead, Hemel Hempstead	Dacorum	1145	N/A
9044	3/15/0300/OUT	Former Sainsburys Distribution Depot, London Road, Buntingford, SG9 9JR	East Hertfordshire	316	N/A
9045	3/13/0804/OP	Land At Bishops Stortford North, Bishops Stortford	East Hertfordshire	1606	N/A
9046	3/17/2588/OUT	Bishops Stortford Goods Yard, Station Road, Bishops Stortford, CM23 3BL	East Hertfordshire	617	N/A
9049	EOS1	East of Gresley Way, Stevenage	East Hertfordshire	453	N/A
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	N/A
9065	14/00559/OPM	Matalan Retail Park, Danestrete, Stevenage, SG1 1XB	Stevenage	526	N/A
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	N/A
9079	18/00703/NONMAT	Land To The East Of, Ascot Road, Watford	Watford	486	N/A
9082	MU05	Land and Buildings at 94-98 St. Albans Road	Watford	1265	N/A
9087	6/2018/0873/OUTLINE	Land to North East of Welwyn Garden City Panshanger Welwyn Garden City AL7 2QJ	Welwyn Hatfield	656	N/A
9098	6/2015/2043/OUTLINE	Plots 4100, 5000, 5600, 6000,, Hatfield Business Park, Hatfield, AL10 9UH	Welwyn Hatfield	N/A	825
9100	PP1	Park Plaza West - Release of Green Belt Land to meet medium and long term employment needs	Broxbourne	N/A	4000
9104	CH1b	Delamare Road/Cheshunt Lakeside	Broxbourne	N/A	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	N/A	1000
9110	5/2016/3006	Proposed Rail Freight, North Orbital Road, Chiswell Green	St Albans	N/A	4095
9112	07/00810/OP	Town Centre, Stevenage	Stevenage	N/A	2917
9113	20/00726/NMA	Airbus Defence And Space, Gunnels Wood Road, Stevenage, SG1 2DB	Stevenage	N/A	1127
9115	18/00935/FULM	Gresham House 53, Clarendon Road, Watford, WD17 1LA	Watford	N/A	830
9116	16/00076/VAR	Charter Place, Watford, WD17 2RN	Watford	N/A	2687
9118	17/00558/FULM	Land at 64 &, 73-77 Clarendon Road, Watford, WD17 1DS	Watford	N/A	2451
9119	21/00934/VARM	Hanny House, 37 And 39 Clarendon Road, Watford, WD17 1JA	Watford	N/A	1276
9123	MFW	Maxwells Farm West & Rush Meadow (500 new jobs)	Broxbourne	N/A	500
9126	4/00064/17/MFA	MAYLANDS GATEWAY, MAYLANDS AVENUE, HEMEL HEMPSTEAD, HP2 4FQ	Dacorum	N/A	504
9127	4/03355/14/MFA	LIBRARY AND ADJACENT LAND, COMBE STREET, HEMEL HEMPSTEAD	Dacorum	N/A	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	N/A	631
9141	15/1427/FUL	Building 1 & 2, Marlins Meadow, Watford	Three Rivers	N/A	724
9146	07/17/0352/O	Land North and South of Andrew's Lane and, South of Peakes Way, Cheshunt, EN7 6SP	Broxbourne	366	N/A
9150	19/00474/FPM	Land To The West Of, Lytton Way, Stevenage, SG1 1AG	Stevenage	576	N/A
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	N/A
9159	07/22/0287/F	Theobalds Park Farm, Great Cambridge Road, Goffs Oak, EN8 8EU	Broxbourne	N/A	2653
9161	6/2021/2125/MAJ	Hertfordshire Constabulary, Stanborough Road, Weleyn Garden City, AL8 6XF	Welwyn Hatfield	N/A	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	N/A	1055
9163	21/04352/MFA	Unit 4 The Hub, Paradise, Hemel Hempstead, HP2 4TF	Dacorum	N/A	718
9166	5/2020/1773	Civic Centre Opportunity Site (South), Victoria Street, St Albans	St Albans	N/A	620
9167	12/0646/FUL	Unit B Imagination Technologies, Home Park Industrial Estate, Station Road, Kings Langley, Kings Langley, WD4 8LZ	Three Rivers	N/A	501
9168	6/2019/1411/MAJ	Plot 5100, Mosquito Way, Hatfield Business Park, Hatfield, AL10 9WN	Welwyn Hatfield	N/A	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	N/A	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			
9174	20/0315/FUL EI	Land East of Rowley Lane, Borehamwood	Hertsmere	N/A	1205
9175	22/0491/FUL	Hanny House, 37 And 39 Clarendon Road, Watford, WD17 1JA	Three Rivers	N/A	1314
9176	20/00663	Demolition of existing building and development of two linked buildings comprising hotel (C1) and office (B1) with flexible Use (B1/A1/A3) at ground floor level, including basement and surface level car and cycle parking and associated access changes (AME	Watford	N/A	515
9179	5/21/3194	Land North of Chiswell Green Lane	St Albans	330	

Appendix B

Residential Local Plan Development Sites in Dacorum

Reference	Address	Number of dwellings	Zone Number
HH01/HH02 (2023)	North Hemel	1,500	9013
HH06 (2023, 2020)	Civic Zone, Marlowes	200	1566
HH03 / HH05 (2023, 2020)	Hemel Hempstead Hospital / Market Square	450	9035
HH04 (2023, 2020)	Paradise	350	9036
NEW1 (2023)	Riverside	300	9170
HH09 (2023, 2020)	National Grid and 339-353 London Road	480	9038
HH10 (2023, 2020)	Symbio Site, Whiteleaf Road	100	1619
HH08 (2023, 2020)	Hemel Hempstead Station Gateway	390	9147
NEW2 (2023)	Apsley Mills Retail Park	500	9169
NEW3	Shendish Manor and Fairfields	500	9178
NEW4	Polehanger Lane	750	9041
GNP Allocation (2023)	Grovehill Local Centre (Henry Wells Square)	200	1651
HH18 (2023, 2020)	Plots 2/3 Kier Park, Maylands Avenue	234	1585
HH22 (2023, 2020)	Marchmont Farm	350	9033
HH23 (2023, 2020)	Old Town	90	1662
HH26 (2023, 2020)	Site to the south of Green Lane	80	1598
N/A	Hemel Hempstead Windfall	2,385	N/A
Bk01 (2023, 2020)	South of Berkhamsted	775	9014
Bk03 , 2020)	Haslam Playing Fields	100	1536
Bk02 (2020)	British Film Institute	100	1536
N/A	Berkhamsted Windfall	302	N/A

Reference	Address	Number of dwellings	Zone Number
Tr01 (2023, 2020)	Dunsley Farm	250	9124
Tr02 (2020)	New Mill	400	9015
Tr03 (2020)	Land East of Tring	1,400	9180
N/A	Tring Windfall	201	N/A
Bv01	Grange Farm	217	1625
N/A	Bovingdon Windfall	31	N/A
N/A	Kings Langley Windfall	67	N/A
Mk01 (2020)	London Road	150	1642
N/A	Markyate Windfall	31	N/A
N/A	Rest of Borough Windfall	336	N/A
N/A	**Total**	**13,219**	N/A

Appendix C

Employment Local Plan Development Sites in Dacorum

Reference	Description	Number of jobs	Zone Number
MG	Maylands Gateway	389	1666
SL	Service area, Stoney Lane	111	1628
DF	Dunsley Farm	680	9124
NS_T	New Schools - Tring	288	9180
NS_B	New Schools - Berkhamsted	288	9014
NS_HH_1	New Schools Hemel Hempstead (part)	473	9013
NS_HH_2	New Schools Hemel Hempstead (part)	237	1555
Cy02	Bovingdon Brickworks (expansion)	62	1628
HH04	Paradise/ Wood Lane	40	9036
HH05	Market Square	40	9035
HH08	Hemel Hempstead Station Gateway	80	9147
AE44	Spencers Park Phase 2 (Land between Three Cherry Trees Lane and Cherry Tree Lane)	150	1670
DEU1	Dacorum Employment Uplift	5600	N/A
NS_SM	Shendish Manor - new school	288	9178
NS_PL	Polehanger Lane - new school	50	9041
-	**Total**	**8,776**	-

Appendix D

Residential Local Plan Developments Sites in St Albans

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

Reference	Address	Number of dwellings	Zone Number
M25	Baulk Close, Harpenden, AL5 4LY	8	3605
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

Reference	Address	Number of dwellings	Zone Number
M1	East and West of Miriam Lane, Chiswell Green, AL2 3NY	98	3516
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

Reference	Address	Number of dwellings	Zone Number
U4	Greenwood United Reformed Church, AL2 3HG	5	3515
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

Reference	Address	Number of dwellings	Zone Number
UC16	Garage Block west of Thirlestane, St Albans, AL1 3PE	17	3510
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

Reference	Address	Number of dwellings	Zone Number
UC33	Land Rear of 53 Snatchup, Redbourn, AL3 7HF	7	3579
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

Reference	Address	Number of dwellings	Zone Number
UC9	Keyfield Terrace Car Park, Keyfield Terrace, St Albans, AL1 1PD	25	3555
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

Reference	Address	Number of dwellings	Zone Number
UC48	Car Park adj. to 42-46 Adelaide Street, St Albans, AL3 5BH	5	3564
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	N/A
Windfall	Harpenden	432	N/A
Windfall	Chiswell Green	29	N/A
Windfall	How Wood	29	N/A
Windfall	London Colney	88	N/A
Windfall	Park Street/Frogmore	29	N/A
Windfall	Redbourn	59	N/A
Windfall	Wheathampstead	29	N/A
Windfall	Sandridge	29	N/A
Windfall	Metropolitan Green Belt	398	N/A
-	**Total**	**14,417**	-

Appendix E

Employment Local Plan Development Sites in St Albans

Confidential

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
N/A	South of HGC Secondary School	An 8FE secondary school to serve the new and existing communities	135	3503
-	-	**Total**	**9,589**	-

Appendix F

Dacorum IDP Schemes (2024)

ID	Name	Description
LS-16	Plough Roundabout Link Break	Converting a section of the Plough Roundabout to Bus Only, e.g. Seldon Hill-St Albans Road section only, in either or both clockwise and anticlockwise directions. This improvement would eventually facilitate the HERT system.
LS-17	A414 St Albans Road (town centre approach) bus priority	Bus priority lane on the A414 westbound approaching the Plough Roundabout including bus gate signals to enable buses to move from the nearside to the offside lane. Assume that general traffic speed is reduced to a single lane.
LS-18	Bus Only Traffic Filter - Adeyfield area	Introduction of a Bus Only traffic filter (in a single direction or both directions) in the Adeyfield area, for the purpose of preventing through traffic. Could be in operation throughout the day, or at peak times only. It could benefit Bus Routes 1, 20, 302 and/or 320 depending on its eventual location.
LS-19	Bus Only Traffic Filter - Station Road	A Bus Only traffic filter (in both directions) on A4146 Station Road, east of St John's Road, to prevent through traffic. Could be in operation throughout the day, or at peak times only. It would benefit Bus Routes 1, 2, 4, 20, 302, 352, 501, ML1 and X5.
LS-38	A414 Dual Carriageway gap closure - Rant Meadow	Closure of the central reservation gap to right turning traffic - traffic will be diverted to the next roundabout or an alternative route
LS-41	Buncefield Lane Quietway	Quietway, indicated by signs and some physical measures at entry points, on Buncefield Lane between Boundary Way to Three Cherry Trees Lane.
LS-42	Cherry Tree Lane Quietway	Quietway, indicated by signs and some physical measures at entry points, on Cherry Tree Lane between Three Cherry Trees Lane to Redbourn Road.
LS-43	Punchbowl Lane Quietway	Quietway, indicated by signs and some physical measures at entry points, on Punchbowl Lane. The section of the lane west of the M1 will be subsumed within East Hemel Hempstead

ID	Name	Description
		development and may therefore be subject to alteration.
LS-44	Hogg End Lane Quietway	Quietway, indicated by signs and some physical measures at entry points, on Hog End Lane. The section of the lane west of the M1 will be subsumed within East Hemel Hempstead development and may therefore be subject to alteration.
LS-45	Green Lane Quietway	Quietway, indicated by signs and some physical measures at entry points, on Green Lane between Breakspear Park office complex access and junction with Westwick Row. The section of Green Lane adjacent to Breakspear Park may be subject to alteration resulting from the East Hemel Hempstead development and changes to the A414 Phoenix Gateway Roundabout
LS-46	Bunkers Lane Quietway	Quietway, indicated by signs and some physical measures at entry points, on Bunkers Lane between Longdean Park and Bedmond Road.
LS-48	Berkhamsted Road Gateway Corridor	Alterations to Berkhamsted Road adjacent to the proposed Poleshanger Lane development which will include a vehicular access onto this road. Comprising a reduction in the speed limit from National Speed limit to 30 or 40mph between the access to Boxted Farm and the existing settlement boundary.
LS-54	A4147 Hemel Hempstead Road Gateway Corridor	Alterations to the A4147 Hemel Hempstead Road between the existing settlement boundary and the junction with Beechtree Lane and Appspond Lane (between M1 and A414), comprising: 1) speed limit changes 30mph along most of the length, with a buffer 40mph section at the eastern most end up to Beechtree Lane and Appsond Lane; 2) provision of upgraded shared use pedestrian and cycle route along the full length (northern side of the road); 3 crossings including 1 signal-controlled pedestrian/cycle crossing (for access to proposed secondary school on southern side)

ID	Name	Description
		and a crossing to link with the Blackwater Lane Green Loop; raised M1 bridge parapet (northern side) to facilitate cycling. Upgrades may be influenced by where proposed vehicle accesses will be created into the East Hemel Hempstead development site and school entrance.
LS-61	B487 Hemel Hempstead Road Gateway Corridor	Alterations to the B487 Hemel Hempstead Road between the existing settlement boundary and the M1 overbridge, comprising: 1) speed limit changes 30mph along the frontage of the proposed East Hemel Hempstead development, with a buffer 40mph section at the eastern; 2) provision of new cycle and pedestrian route on at least one side of the road to link with existing footway provision west of Cherry Tree Lane; 3) at least 1 controlled pedestrian/cycle crossing (to connect sections of the East Hemel Hempstead development on either side; 4) alteration to the B487-Cherry Tree Lane-Holtsmere Lane junction in line with the Quietway treatments proposed to the two lanes (including signage and kerbed build outs to discourage through traffic); 5) upgraded bus stops. It is anticipated there will be at least one junction serving access to the proposed East Hemel Hempstead development on either side.
LS-64	B440 Leighton Buzzard Road Gateway Corridor	Alterations to the B440 Leighton Buzzard Road in conjunction with the North Hemel Hempstead proposed development (which could potentially provide a vehicle access onto this road). Measures include reducing the current 50mph section to 40mph (matching the 40mph section to the north); reducing the current 60mph section leading out of Hemel Hempstead to 40mph; installing a signal-controlled Toucan crossing adjacent to Public Footpath 'Hemel Hempstead 013'); provision LTN standard cycle and footway (replacing the existing narrow footway) on the western side of the road (approx 680m): provision of signal-controlled crossing on Galley Hill at southern end of corridor, east of the B440-A4147 roundabout.

ID	Name	Description
LS-70	A414 Maylands Avenue - Green Lane bus priority lanes	Maylands Avenue to Green Lane - eastbound and westbound bus lanes (approx.335m in length) with signal-controlled bus gate at the terminating end. No reduction in general carriageway space
LS-71	A414 Maylands Avenue Roundabout Signalisation	Partial signalisation of Maylands Avenue roundabout - northern and eastern arms and opposing circulatories. Removal of left-turn bypass lane from north to east. Provide two lane exit onto A414 eastbound with widened central reserve to create more stacking space on southbound circulatory.
LS-72	A414 Rant Meadow to Bennetts End Road bus priority lane	Westbound only bus lane between Rant Meadow and Bennetts End Road roundabout with signal controlled bus gate. No reduction in general carriageway space
SG2-2	20mph speed limit zone including Fishery Road	(SG2-2) Investigate the introduction of a 20 mph speed limit zone in this area, including Fishery Road, Kingsland Road and Horsecroft Road
SG5-4	A4251-A4146 Junction Reconfiguration including provision for cyclists and buses	(SG5-4) Major junction improvement - convert to signal controlled crossroads with cycle priority at A4251/A4146 including advance stop lines or bicycle boxes. Include hurry call detection for buses travelling between London Road (west) and Station Road.
SG6-6	20mph speed limit on London Road	(SG6-6) Introduce 20mph speed limit between Featherbed Lane and Weymouth Street
SG11-3	20mph zone covering roads including Woolmer Drive, Green Lane, Mickleford Road and Datchworth Turn	(SG11-3) 20mph zone covering all roads leading off the A4147 and as far south as Green Lane up to and including junction with Kingcup Avenue (3 external entry points). Assume provision of additional traffic calming features to help ensure compliance with speed limit, c. x20 pairs of speed cushions
SG14-2	Redbourn Road-Three Cherry Trees Junction Enhancement	(SG14-2) Redbourne Road-Three Cherry Trees Lane-Shelby Road Junction Enhancement - signalisation scheme incorporating controlled crossings for pedestrians on all sides

ID	Name	Description
SG15-1	Maylands Avenue Segregated Cycle Corridor	(SG15-1) Provision of a high quality, segregated cycle route along the full length between the A414 Breakspear Way and A4147 Swallowdale Lane (eastern side of the road). Expected to comprise widening of the existing shared-use path to meet standards including replacing areas of grass verge and localised reduction in carriageway space (e.g. removal of additional lanes at some junctions (access to Aldi/Nuffield Health/McDonalds; junction with Wood Lane End). Assume cyclist priority on some side arms (Eaton Road; Maxted Road; x3 accesses to Hosking Court). Also provision of a Toucan crossing at location of existing uncontrolled crossing with refuge islands just north of the Travelodge vehicle access). Include upgrade to the existing shared use route between the A414 at-grade signal crossing to the proposed Toucan crossing on Maylands Avenue. Also provide additional signal-controlled crossing points on Maylands Avenue in the vicinity of Dixons Turn and Eaton Road
SG25-1	Marlowes 20mph zone	(SG25-1) Consider 20mph on entire length of the segment
SG25-2	Hillfield Road-Marlowes junctions reconfiguration	(SG25-2) Convert King Harry Street-Hillfield Road junction to a conventional T-junction. Reduce the Hillfield Road approach to Marlowes to a Single lane, widen the footway adjacent to the crossing.
SG25-3	Marlows carriageway reconfiguration - Hillfield Road-Combe Street	(SG25-3) a) Remove the landscaped central reservation on Marlowes between Hillfield Road and Combe Street. b) Reduce the northbound carriageway to a single lane and widen the footway on western side. c) Install an additional controlled crossing adjacent to the Wetherspoon public house, on a raised speed table.
SG25-4	Marlows carriageway reconfiguration - Combe Street-Midland Road	(SG25-4) a) Remove landscaped central reservation on Marlowes between Combe Street and Midland Road and widen the footway on eastern side. Reduce the southbound carriageway to a single lane. b) Install an

ID	Name	Description
		additional controlled crossing adjacent to the library, on a raised speed table.
Bi74	Shootersway Corridor Intervention	Bi40.a Existing footway to be widened and turned into a shared use facility from the junction with Cross Oak Road until the junction with Oxfield Close. From the junction with the A416 until the roundabout with Chesham Road, widen existing footway on the northern side of Shootersway and provide a shared use facility. Bi40.b Provide a new uncontrolled crossing at Tower Close. Bi40.c Provide a new 2m wide footway on the southernside of Shootersway from the junction with Cross Oak Road and just west of Tower Close junction. Bi68.a Provide a 3.2m wide Puffin crossing on Shootersway west of the junction with Tower Close. Provide tactile paving, dropped kerbs, roads signs and signals apparatus. Bi74.a Provide an informal crossing just east of the roundabout with Cross Oak Road (dropped kerbs and tactile paving required). Bi74.b Provide a new footway along the northern side of Shootersway between Bell Lane and Durrants Lane.
Bi8	Major junction enhancement at the Durrants Lane, Durrants Road and Westfield Road roundabout	Bi8.a Remove the roundabout and provide a signalised junction. Provide 3.2m wide formal crossings on all arms (dropped kerbs and tactile paving). Kerb line to be moved to create more footway space and reduce junction area.
Bi15	Standalone road crossing on the A4521 between Queens Road and Stag Lane	Bi15.a Reduce guard-railing to maximise footway width. Bi15.b Existing crossings on the A4251 and on Stag Lane to be changed to a Toucan crossing. This would require widening existing crossings to a minimum of 4m. Bi15.c Kerbed buildout at junction with Stag Lane to increase footway width (existing radius are too large). Bi15.d Resurface carriageway and remove metallic studs

ID	Name	Description
Bi52	20mph zone bounded by A4251 N, Mill Street Castle Street, Station Road, Ellesmere Road, Bank Mill Lane	This scheme is already in development by Hertfordshire County Council Bi52.a Provide the following road signs at the following locations: - entry to Castle St and Station Road from Lower Station Road: provide 20mph road signs and 30mph road signs for the exit into Lower Kings Road; - south of St. Michaels Church in Ivy House Lane (after entrance to private property): provide 20mph road signs for vehicles travelling southbound and 30mph road signs for the northbound direction; - just north of the existing bridge on Gravel Path: provide 20mph road signs for vehicles travelling southbound and 30 mph road signs for vehicles travelling northbound; - entry to Bank Mill Lane from London Road: provide 20mph road signs for traffic entering Bank Mill Lane and 30mph road signs for traffic getting into London Road.
Bi53	20mph zone along a short section of A4251 and Lower Kings Road	Bi53.a Provide an entry treatment at the junction of Lower Kings Road and Waitrose entrance to car park. Include an uncontrolled crossing with dropped kerbs and tactile paving. Bi53.b Provide an entry treatment at the junction of Lower Kings Road and Broadwater Bi53.c Provide speed cushions before and after the bridge. Bi53.d Provide an uncontrolled crossing with a pedestrian refuge island west of Berkhamsted Station. Dropped kerbs, tactile paving and bollards required. Crossings to be 2.4m wide. This would be subject to recorded vehicle speeds falling below the required threshold for implementing 20mph speed limits as specified in HCC's Speed Management Strategy.
Bi68	Standalone crossings on Shootersway near southern Berkhamsted development sites	Bi68.a Provide a 3.2m wide Puffin crossing on Shootersway west of the junction with Tower Close. Provide tactile paving, dropped kerbs, roads signs and signals apparatus. This crossing will connect the existing footway with the proposed 2m wide footway on the southern side of Shootersway (Bi40).

ID	Name	Description
Bi44	Standalone road crossing on A4251 outside Swing Gate School	Bi44.a Provide a 3.2m wide puffin crossing on the A4251, east of the roundabout and west of the bus stop, to allow better and safer access to Swing Gate School. Provide dropped kerbs, tactile paving and pedestrian crossing signs. Bi44.b Kerbed build-out to fill in bus layby, widen pavement. Provision of bus cage on main carriageway and shift the location of the new bus stop slightly eastwards to keep separation from the new crossing
Bi92	30mph speed limit along London Road between Broadway Farm and Esso Fuel Garage (reduced from 40mph)	Bi92.a Convert area to 30mph zone, consisting of the length of the Bank Mill development north-west of Bullbeggars Lane with new gateway marked by signs and road markings. Section of 40mph to remain to the south west as a buffer. Bi92b Remove existing 40/30mph road sign gateway outside Esso Fuel Garage (consideration could be given to 30mph repeater signs if permitted Bi92.c Widening the non-controlled crossing across London Road at Hall Park to 2.4m on both directions and relocate the lighting column. Extend the ped refuge island. Bi92.d Widening the footway into the grassed verge to accommodate a 3m min shared path from Esso Garage to Bourne End. Bi92.e Provide tactile paving on across Hall Park Hill and island. LC possibly require relocation. Bi92.f New 2.4m wide uncontrolled crossing south of Hall Park Hill at the splitter island position. Provide 2.4m crossing with tactile and dropped kerbs. Extend the ped refuge island. Bi92.g New 2.4m wide uncontrolled crossing south of Hall Park Gate, at splitter island south of position. provide 2.4m crossing with tactile and dropped kerbs. Extend the ped refuge island. Bi92.h Widening the crossing to 2.4m at Bank Mill Lane and Townsend Gate. Bi92.i Widening the crossing to 2.4m at Bullbeggars Lane and cut back vegetation.

ID	Name	Description
Bi64	Improve operation of Billet Lane corridor between Gossoms End and Bridgewater Road	UTP scheme no.19
Bi91	Footway and bus improvements to New Road	Bi91.a Improved footway (length and width to be determined). Bi91.b Move back the give-way line to accommodate informal crossing in front, approximately 1-2m. Bi91.c Uncontrolled pedestrian crossing on raised speed table (suitable for buses) approximately 2m wide incorporating tactile pavings. Bi91.d Informal crossing with dropped kerb incorporating tactile pavings on southern side (opposite entrance to the canal towpath). Bi91.e Potential extra bus stops. Location and feasibility dependent upon new footway being constructed on the northern side of New Road and further discussion with HCC. Bi91.f New widened footway on both sides, removing central hatched area and removing some parking spaces to accommodate a new uncontrolled 2m wide crossing incorporating tactile pavings on raised table (suitable for buses). Bi91.g New widened footway on both sides, removing central hatched area and removing some parking spaces to accommodate a new informal crossing on raised table (suitable for buses).
Ti14	Major junction enhancement at the Western Road, Christchurch Road, High Street and Langdon Street roundabout	Ti14.a Signalise existing junction. Existing uncontrolled crossings to be replaced by formal crossings (tactile paving and dropped kerbs required). Ti14.b Remove existing island on High St. and provide a 1m footway build-out on the northern side. Recommendation: Pavement condition survey on all arms.

ID	Name	Description
Ti75	Standalone crossing between Station Road/London Road T junction and the Brook Street/High Street/London Road mini roundabout	Ti75.a Replace the existing uncontrolled crossing which is situated between the Station Road T-junction and the Brook Street roundabout with a Puffin crossing. Tactile paving and dropped kerbs required (minimum width 3.2m).
Ti55	Provide improved Pedestrian Crossing facilities on Frogmore Street Tring	UTP scheme no.45
Ti26	Standalone crossing outside Tesco Superstore in Tring	Ti26.a Remove existing uncontrolled crossing on B4635 and provide a new 3.2m wide puffin crossing (no central reserve). This would require dropped kerbs, tactile paving and widening the footways. Ti26.b Footway on the northern side of B4635 to be widened to 2m to accommodate the new formal crossing. Consideration could be given to implementing a Toucan crossing which would tie in with the cycle route across Pound Meadow and if additional cycle parking was provided at Tesco. Cyclists would however need to dismount if entering via the existing pedestrian ramp access as this would not be suitable for shared use. Alternatively, a section of shared use footway/cycleway could be designated between the crossing and Tesco vehicle access however a suitable and safe crossing facility that would enable cyclists to join/exit the road entrance to Tesco would be required. There may not be sufficient visibility around the bend of the road to provide a suitable crossing.
Ti34	Footway/cycleway route improvement along the A4251 between Tesco Superstore and London Road/Cow Lane junction	Ti34.a Provide a segregated shared facility on the northern side of the A4251 from the junction with Cow Lane and along the existing path - widen to 2.5-3m. Provide appropriate shared use signs and road markings (surface colour treatment for cycle lane). Ti34.b Provide a 4m wide toucan crossing across B4635 just east of the eastbound bus stop "Tesco". Dropped kerbs, tactile paving and road markings required. Ti34.c Turn the existing footway on the southern

ID	Name	Description
		side of the B4635 up to Tesco Superstores into a shared use facility.
Ti42	20mph speed limit area in central and western Tring	This scheme is already in development by Hertfordshire County Council Ti42.a Implement a 20mph speed limit area covering a large area of central and western Tring incorporating Miswell Lane, Christchurch Road (and all roads leading off these two roads including Ash Road and The Greenway), Aylesbury Road east of its junction with Park Road, Woodland Close, Park Road and High Street (and all roads leading off these two roads), Frogmore Street and a section of Dundale Road south of St Peters Hill.
Ti74	20mph speed limit in north-east Tring, east of Dundale Road to Brook Street in the west, bounded just inside Icknield Way in the north and High Street in the south.	Ti74 Extension of the HCC-developed 20mph speed limit area to cover the remaining section of Dundale Road, Silk Mill Way, Nathanial Walk, Eight Acres, Drummond Ride, Manor Road, Faversham Close, St Peter's Hill, Meadow Close, Kingsley Walk. This would be subject to recorded vehicle speeds falling below the required threshold for implementing 20mph speed limits as specified in HCC's Speed Management Strategy.
Ti61	Segregated cycle/footway along A4251 from Tring to Northchurch along existing neglected footway	Ti61.a Widen to 2.5m-3m existing segregated footway on the southern side of the A4251 from the junction with Newground Road and convert it into a shared use facility. Ti61.b Buildout and reduce speed limit to accommodate shared path (2.5-3m) where the exisitng path becomes non-segregated until the Cow Roast Inn old pub. Reduce central hatching on main carriageway to accommodate the shared use facility. Ti61.c New uncontrolled crossing 4m wide.

ID	Name	Description
		Dropped kerbs and tactile paving required. Ti61.d Build-out at junction with Newground Road. Vehicle tracking required. Ti61.e - New uncontrolled crossing to connect with the southern proposed shared use facility. Dropped kerbs and tactile paving required. Crossing to be 2.4m wide. Ti61.f - Build-out and reduce speed limit to Berkhamsted and Tring Sustainable Transport Study Prepared for: Dacorum Borough Council by AECOM Page 114 accommodate shared path (2.5-3m wide). Reduce central hatching on main carriageway to accommodate the shared use facility. Ti61.g - New uncontrolled crossing to connect with the proposed shared use facility. Dropped kerbs and tactile paving required. Crossing to be 2.4m wide. (1.2m as absolute minimum). Ti61.h - Build back from the kerb and remove vegetation to accommodate shared path (2.5-3m wide). Ti61.i - New uncontrolled crossing to connect with the proposed shared use facility. Dropped kerbs and tactile paving required. Crossing to be 2.4m wide. (1.2m as absolute minimum). Ti61.j - New non-standard shared use facility.

Appendix G

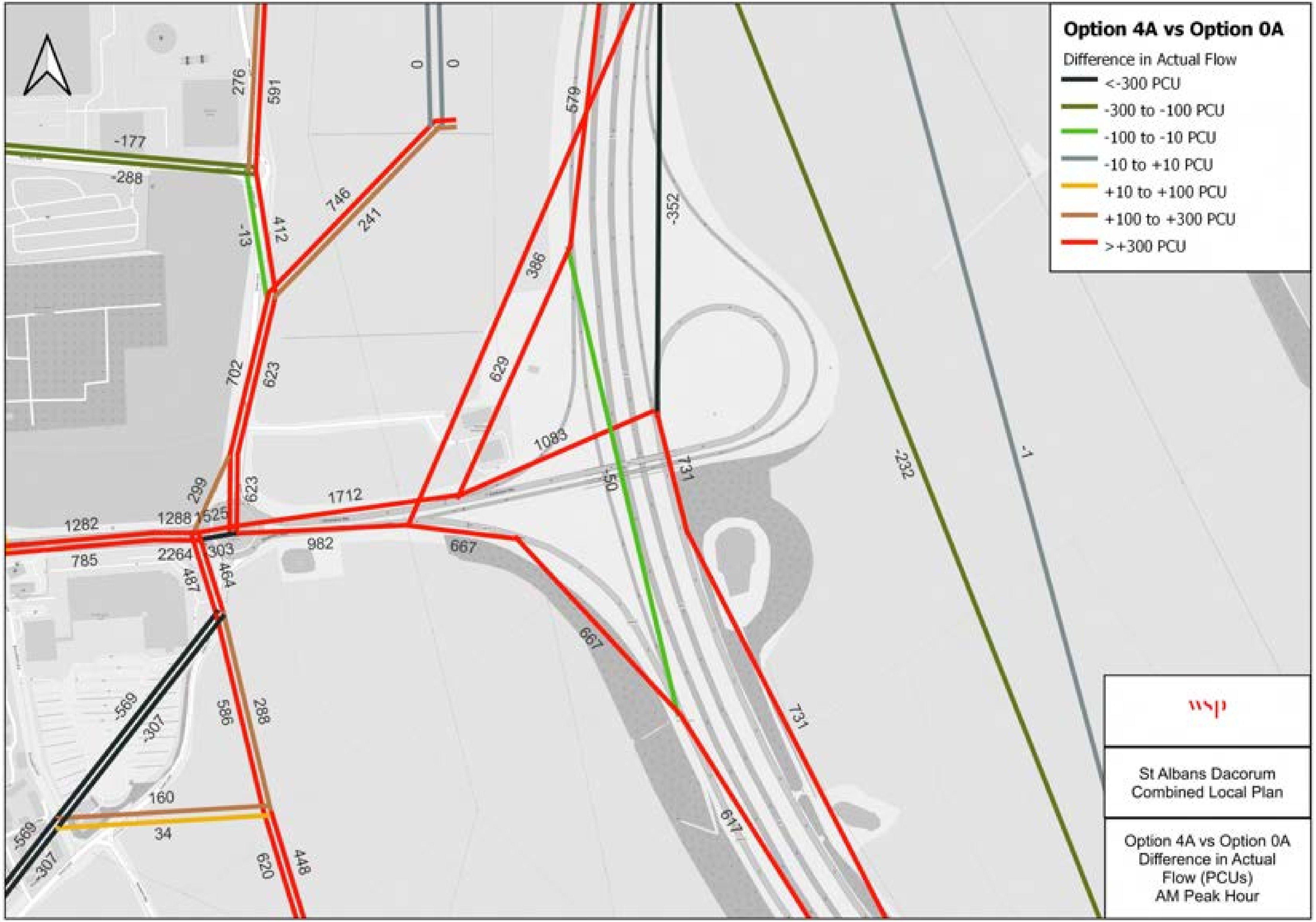
St Albans IDP Schemes (2024)

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
N/A	StAlb_14	Highway schemes associated with the North East Harpenden site
N/A	N_STAD	Highway schemes associated with the North St Albans site
N/A	10338_HL_07	Highway schemes associated with the North West Harpenden site
N/A	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

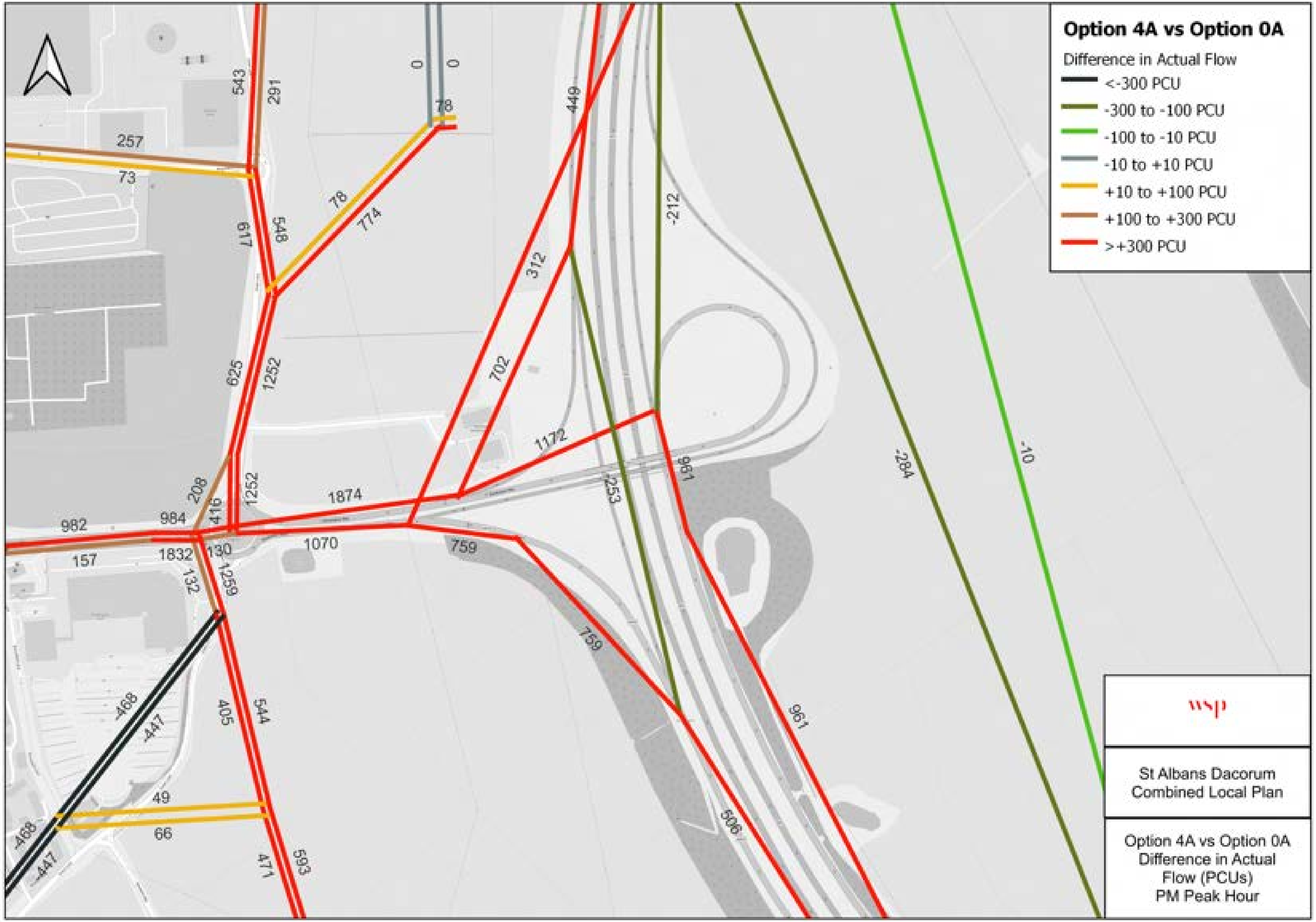
Appendix H

Impact on SRN Junctions - Figures

M1 Junction 8

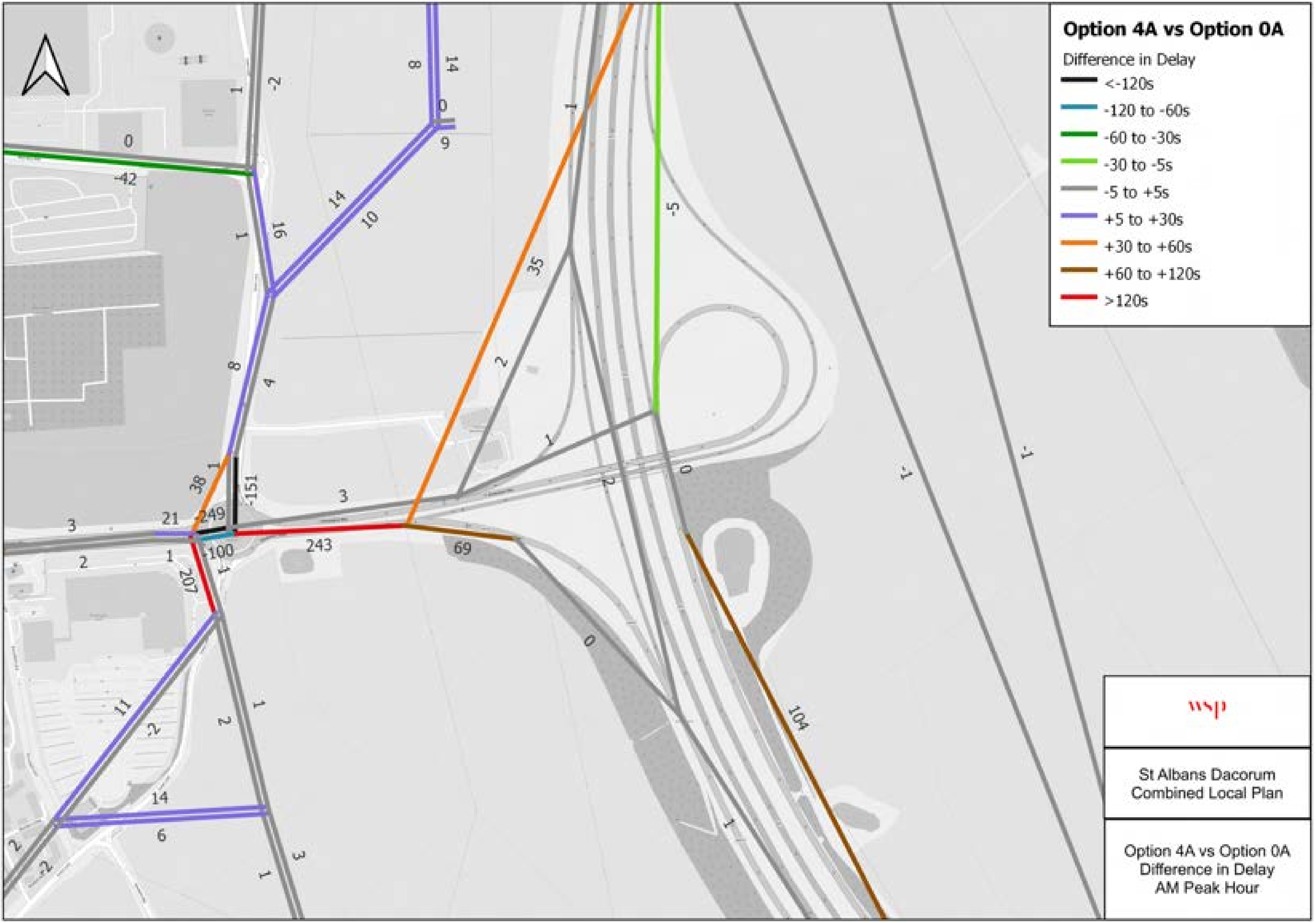


Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
0
0
276
591
-177
-288
746
241
-13
412
579
-352
386
629
702
623
1083
731
-232
-1
299
623
-50
1712
1282
1288
1525
982
667
785
2264
303
487
464
667
-569
-307
586
288
731
160
34
617
-569
-307
620
448
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
AM Peak Hour

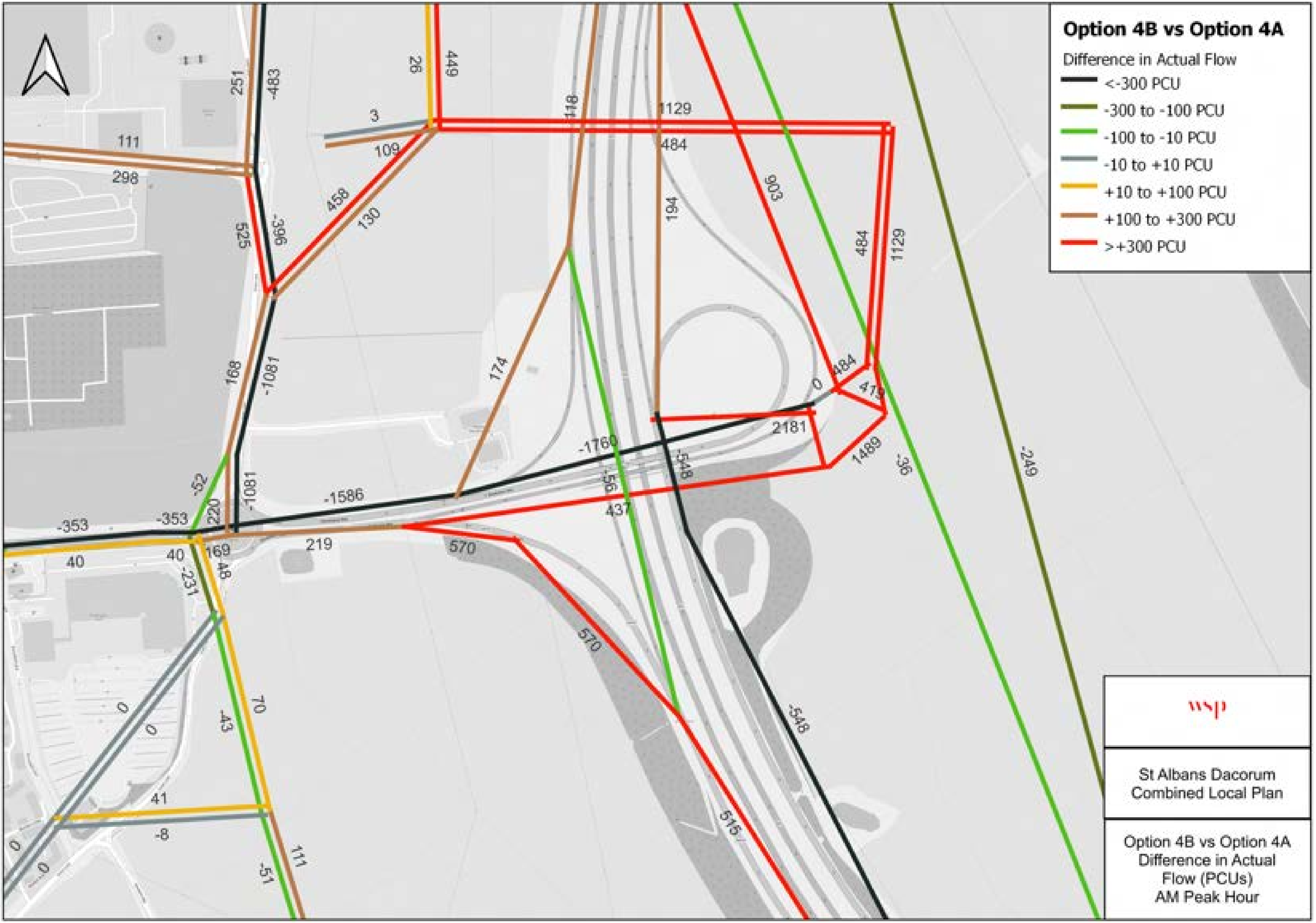

Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A Difference in Actual Flow (PCUs) PM Peak Hour
0
0
78
543
291
257
73
78
774
449
-212
617
548
312
702
625
1252
1172
961
-284
-10
208
1252
1874
253
416
982
984
1070
759
157
1832
130
132
1259
759
-468
-447
405
544
961
49
66
506
-468
-447
471
593

Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
942
-22
-35
-2
53
75
-29
82
132
86
80
59
49
80
74
110
111
131
-12
40
33
53
86
-17
24
-4
-0
33
24
27
-100
-99
-100
-99
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
AM Peak Hour

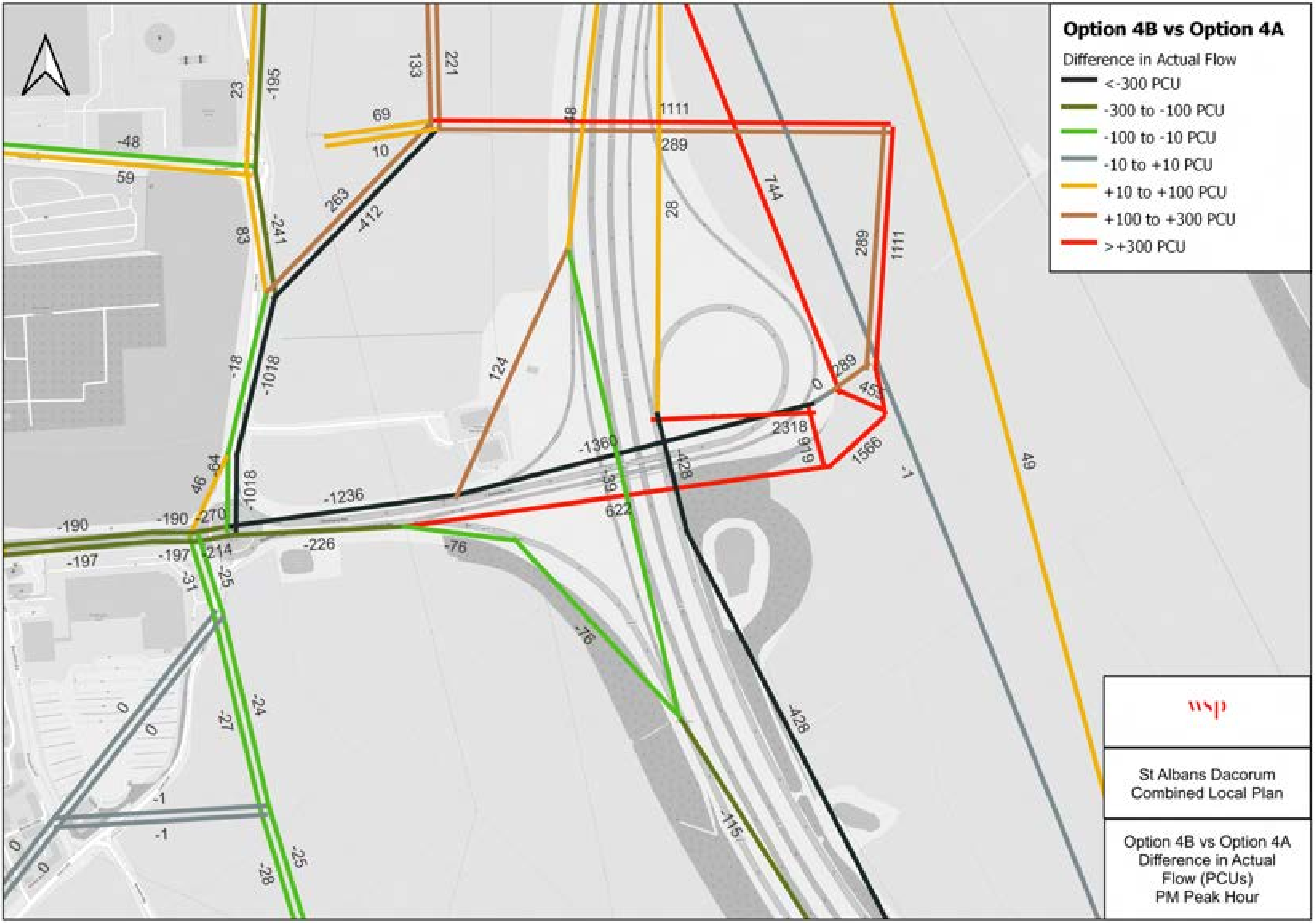
Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
5965
2612
46
11
95
100
68
90
96
228
32
-15
73
64
228
79
70
70
85
41
32
5
39
33
9
28
33
-5
-0
-100
-100
-100
-100
32
17
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
PM Peak Hour


Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
AM Peak Hour

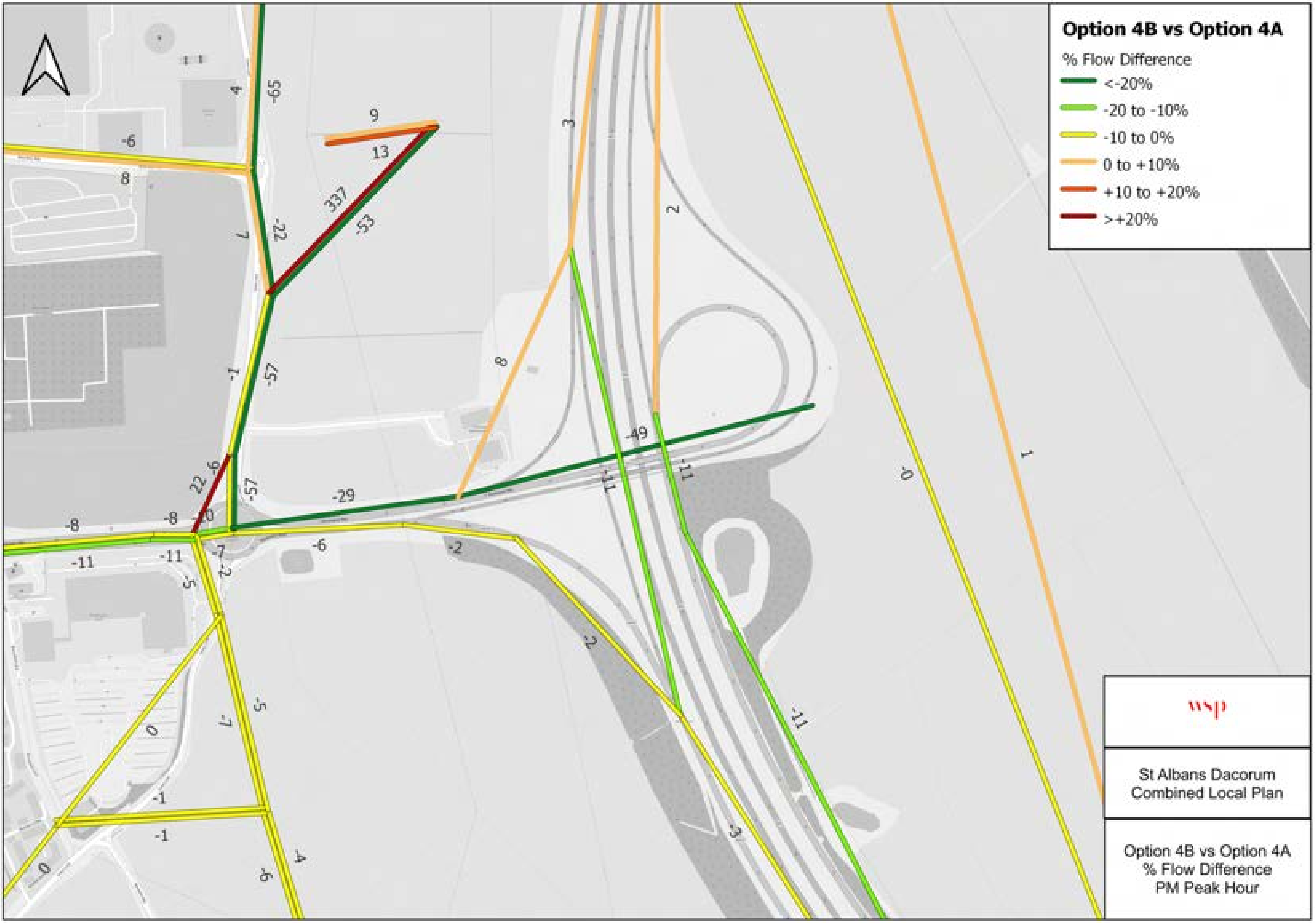

Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
PM Peak Hour

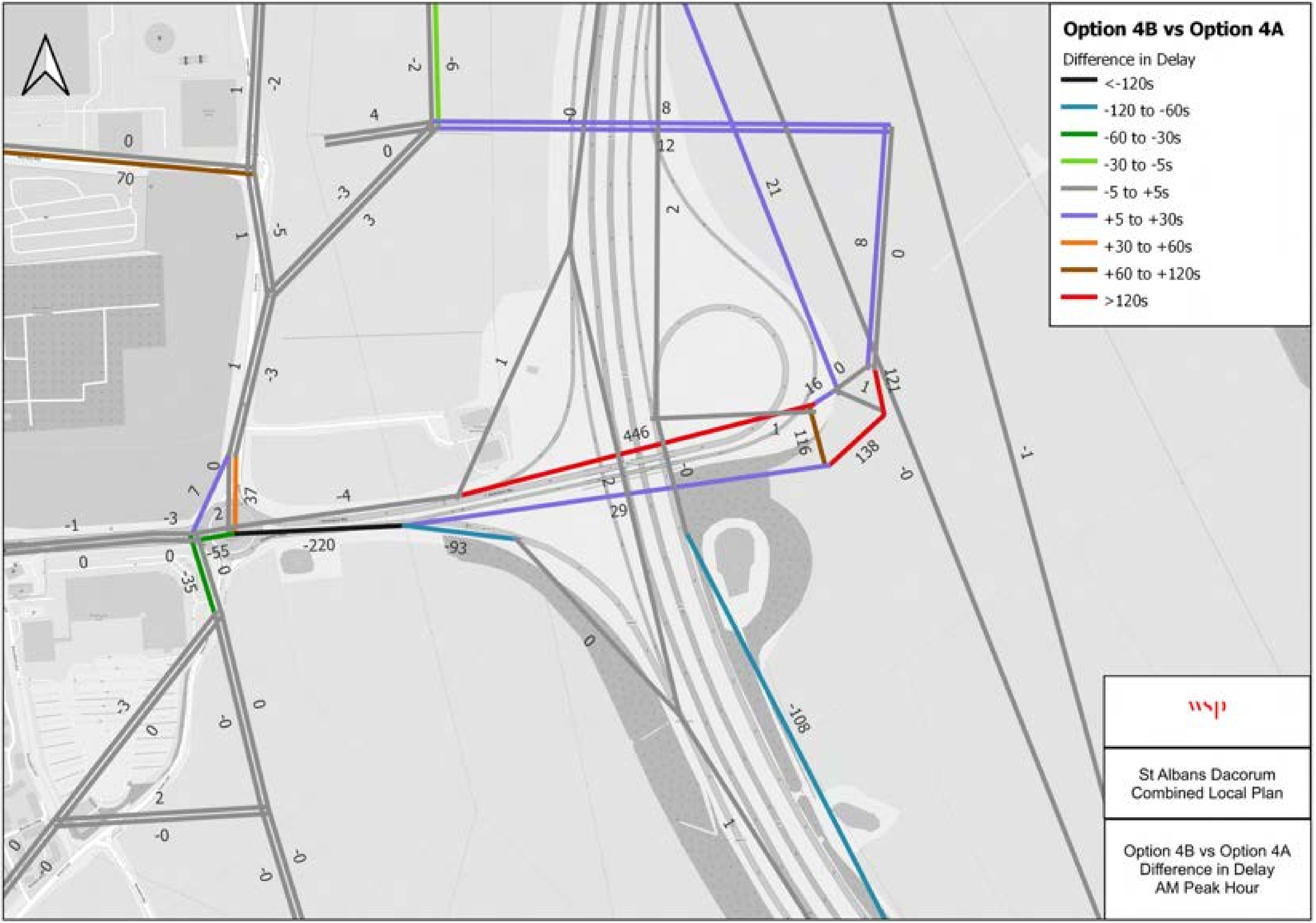


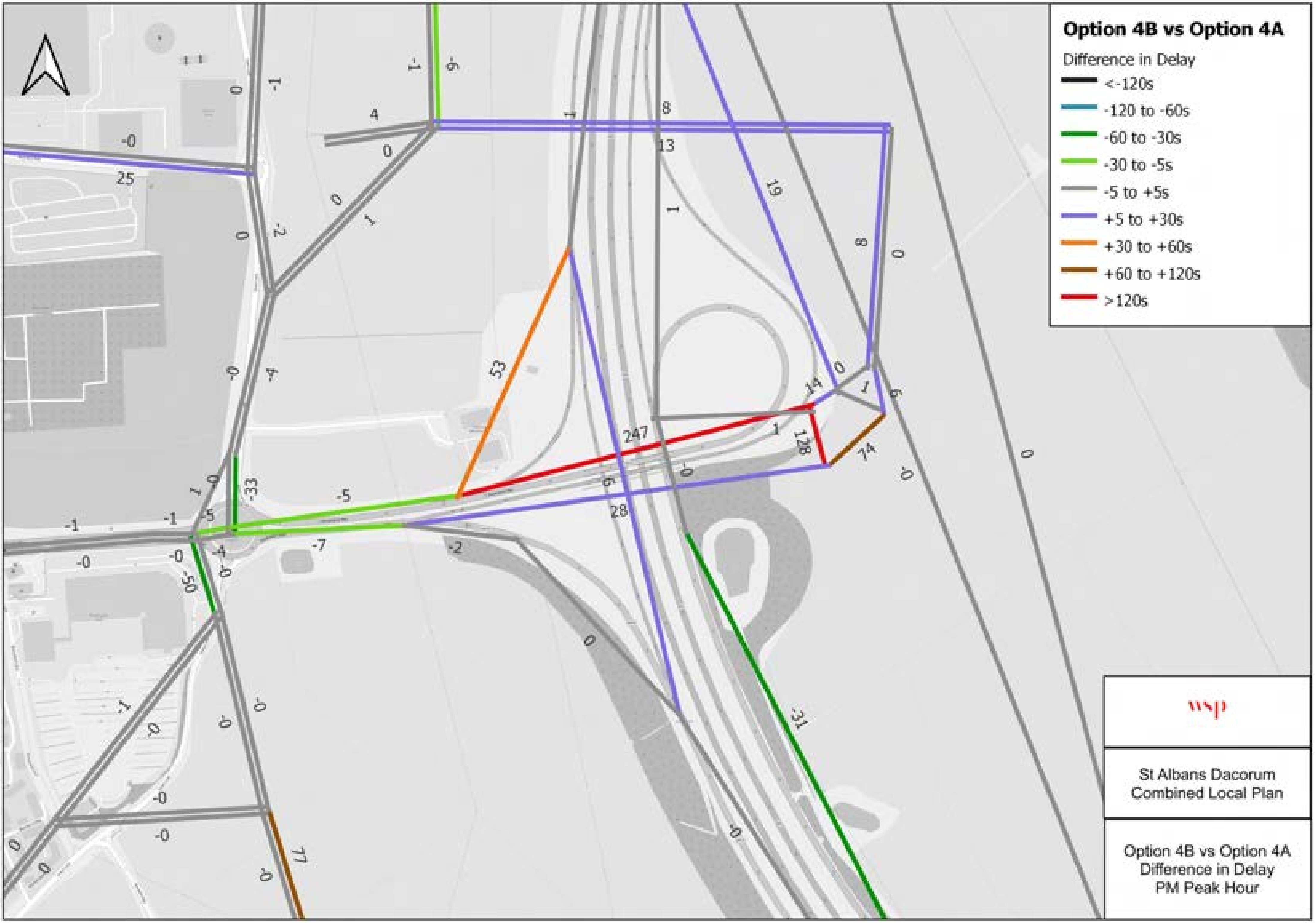
Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) AM Peak Hour

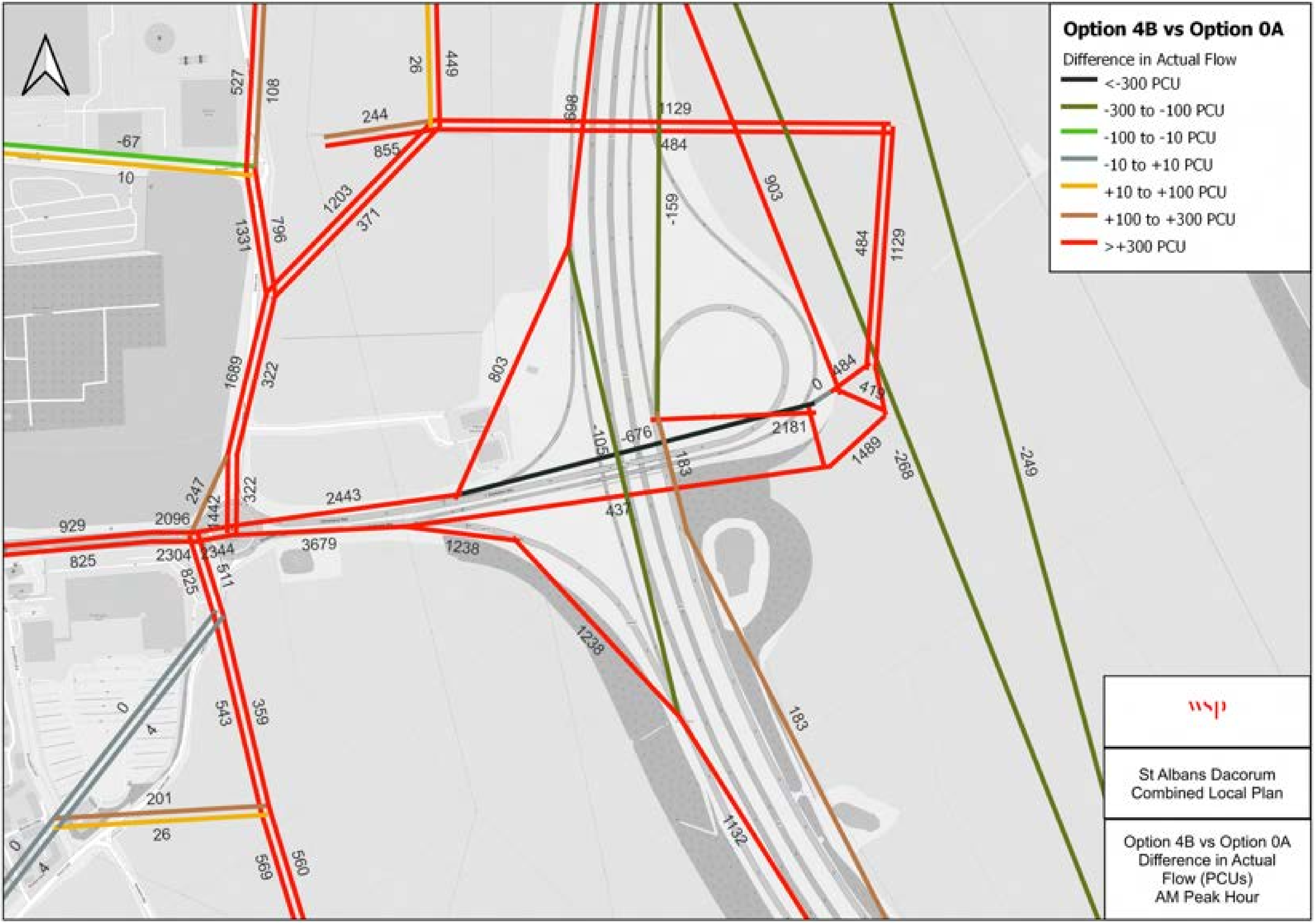

Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) PM Peak Hour
23
-195
133
221
69
10
-48
59
1111
289
48
744
28
263
-412
83
-241
289
1111
124
-18
-1018
0
289
453
2318
919
1566
-1360
-428
-39
622
49
-1
64
46
-1018
-1236
-190
-190
-270
-197
-197
-214
-226
-76
-31
-25
-76
0
0
-24
-27
-428
-1
-1
-115
0
0
-25
-28

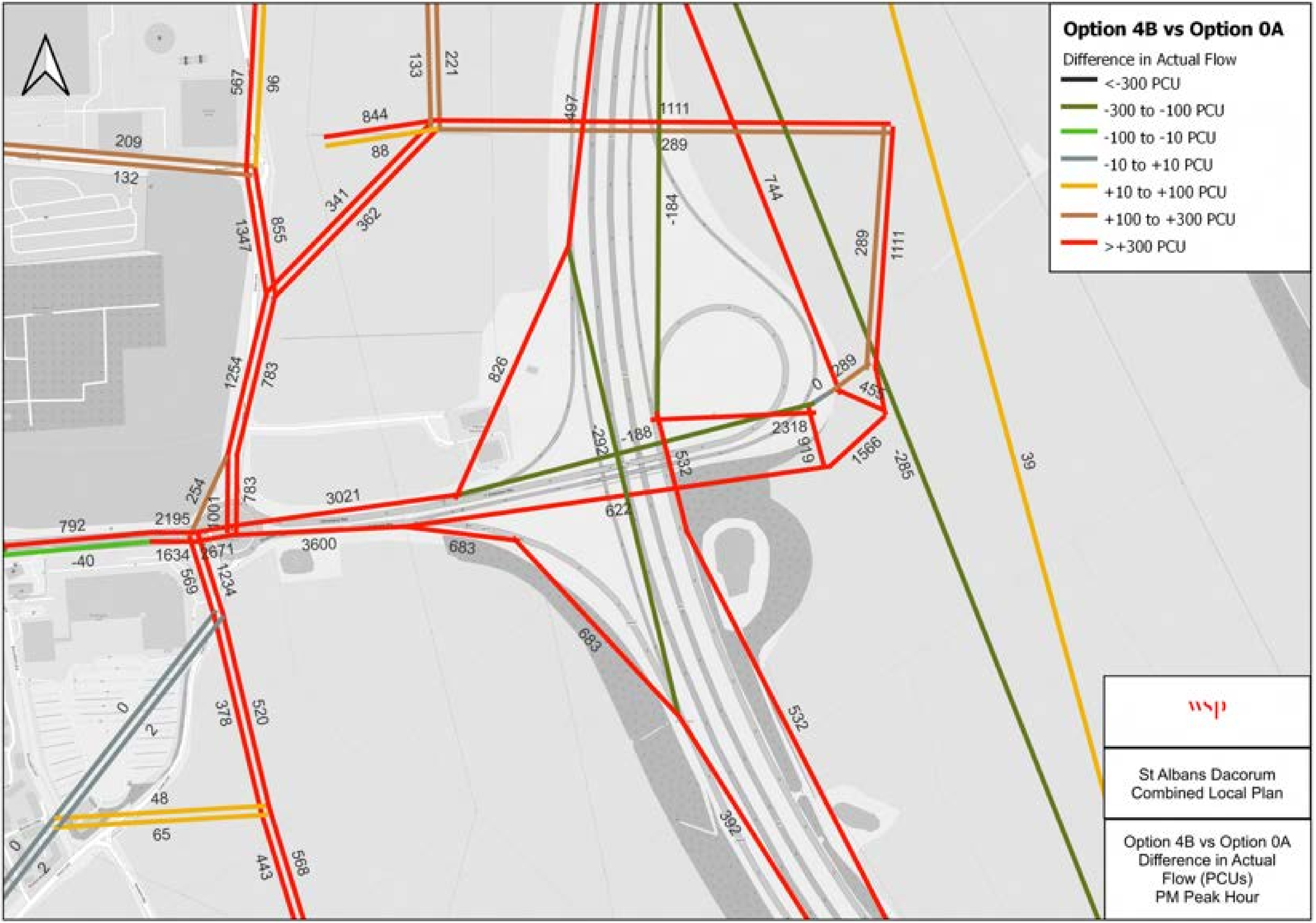

Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
AM Peak Hour
82
-81
17
1
15
55
9
22
61
54
65
-33
11
-77
16
-60
18
-17
-77
-39
-23
-14
-14
-14
-17
-1
-4
2
2
8
10
6
21
-22
21
24
-7
-7
26
-23
25
-8
0
18
-14


Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
PM Peak Hour


Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
AM Peak Hour

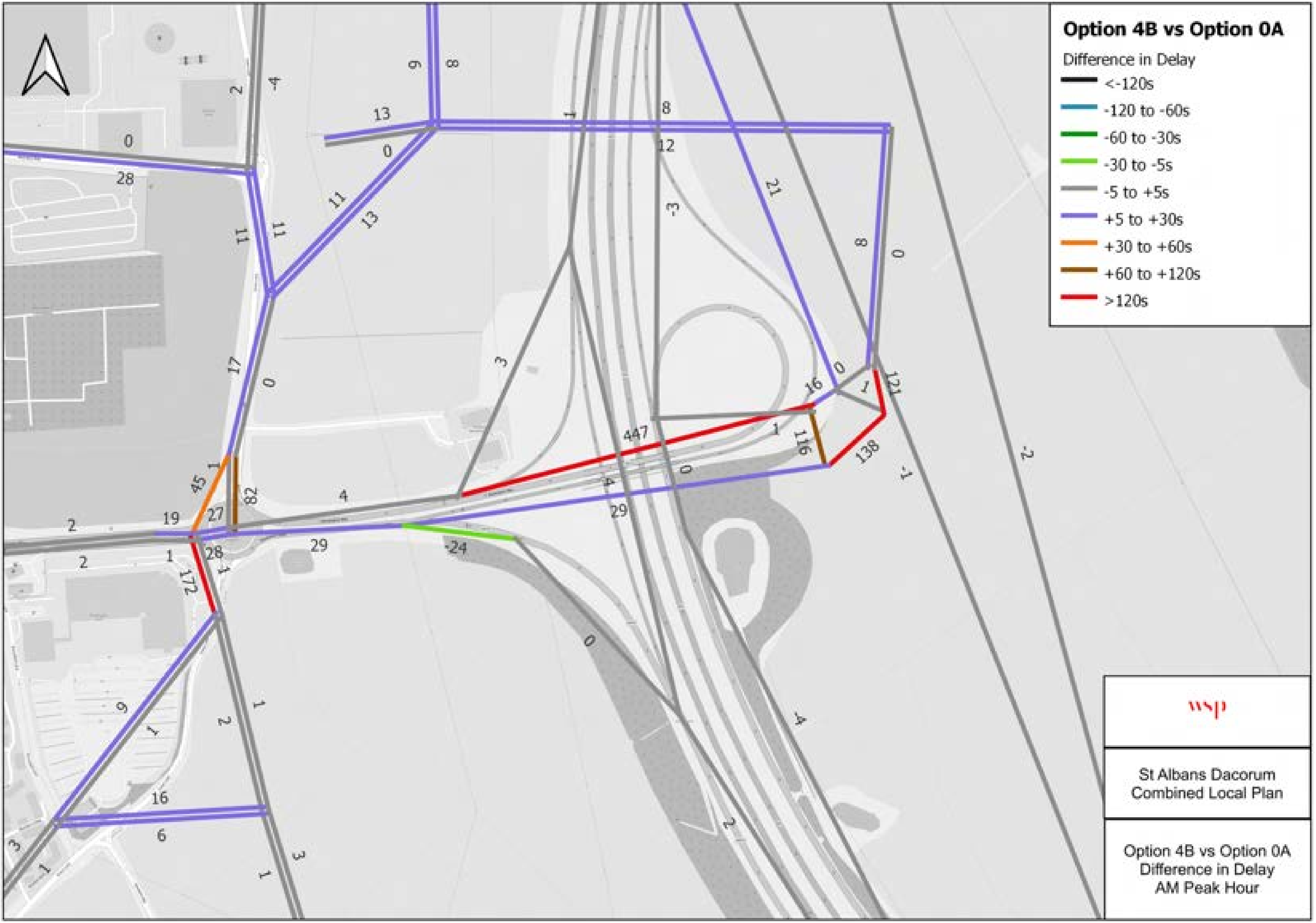

Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
PM Peak Hour


Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Actual Flow (PCUs) AM Peak Hour

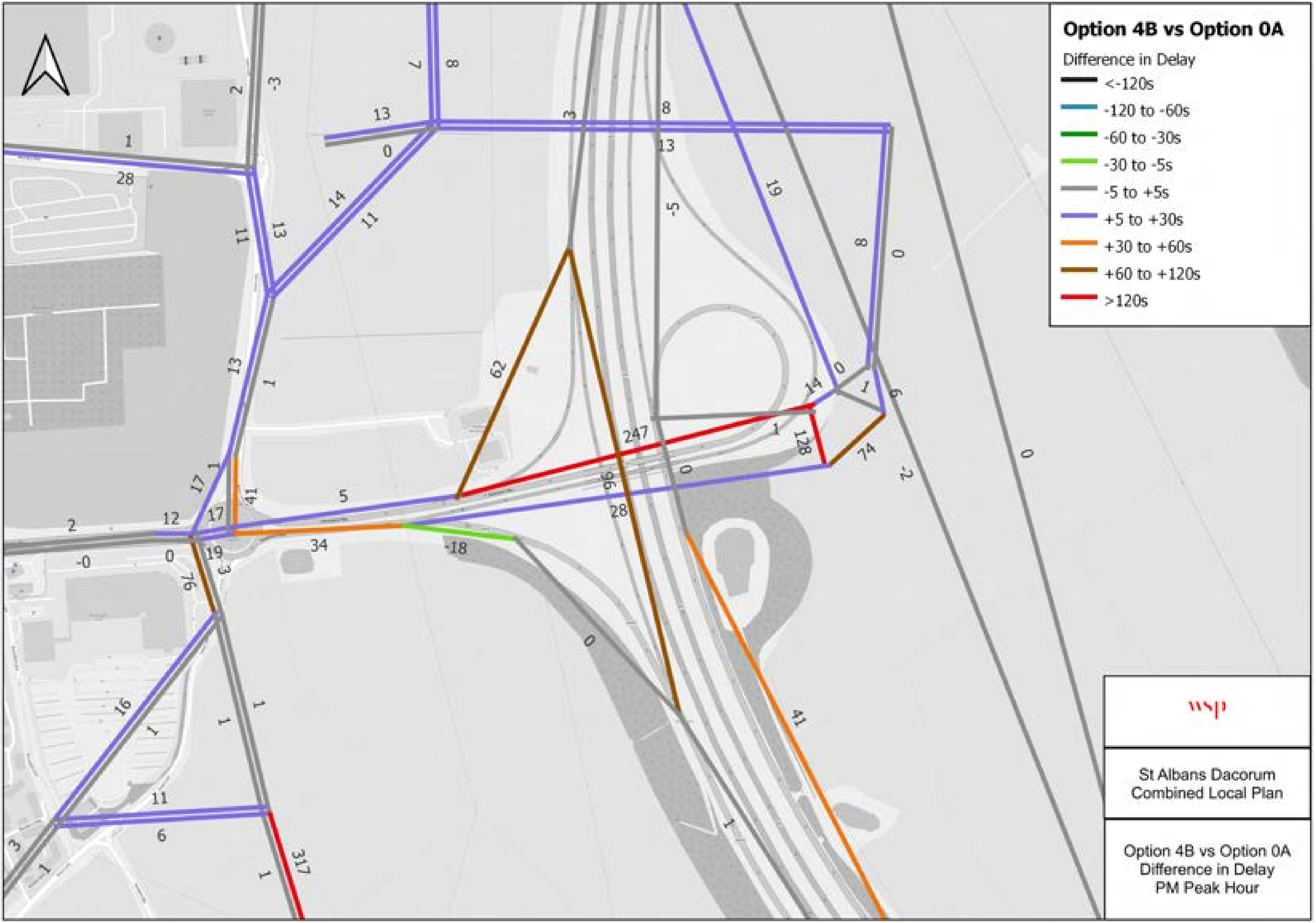

Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
567
96
133
221
844
88
209
132
341
362
1347
855
497
1111
289
-184
744
289
1111
1254
783
826
0
289
455
2318
919
1566
-285
-292
-188
532
39
254
1001
783
3021
622
792
2195
1634
2671
3600
683
-40
569
1234
683
0
2
378
520
532
48
65
392
0
2
443
568
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Actual
Flow (PCUs)
PM Peak Hour


Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
1798
1906
-8
1
91
-13
168
-37
-36
6
-4
-4
80
56
62
62
6
49
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
AM Peak Hour

Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
6219
863
37
20
36
-13
106
-12
-48
18
-5
1
56
-2
30
30
18
13
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
PM Peak Hour



Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
AM Peak Hour



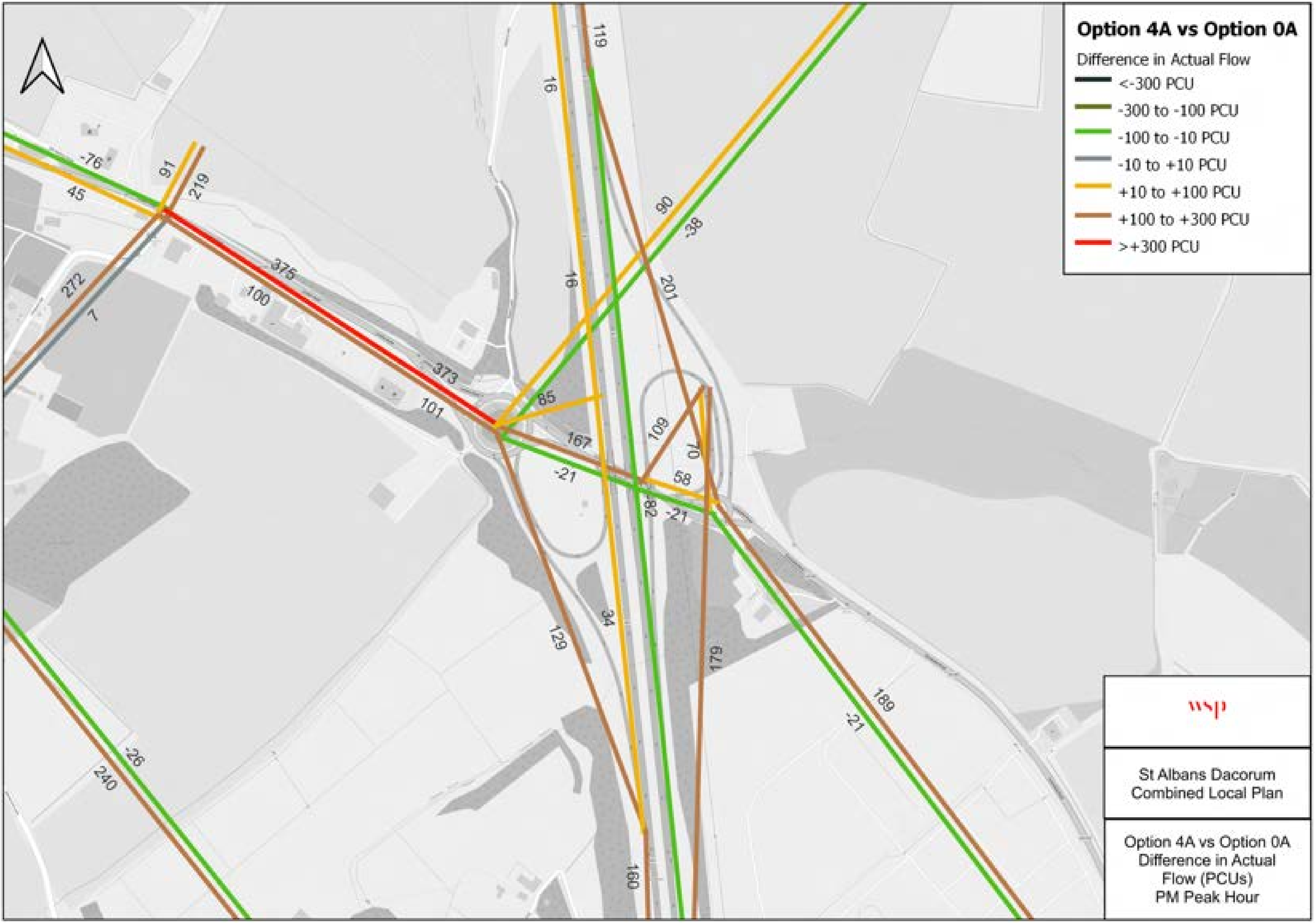
Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Delay PM Peak Hour

M1 Junction 9

wsp

St Albans Dacorum
Combined Local Plan

Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
AM Peak Hour

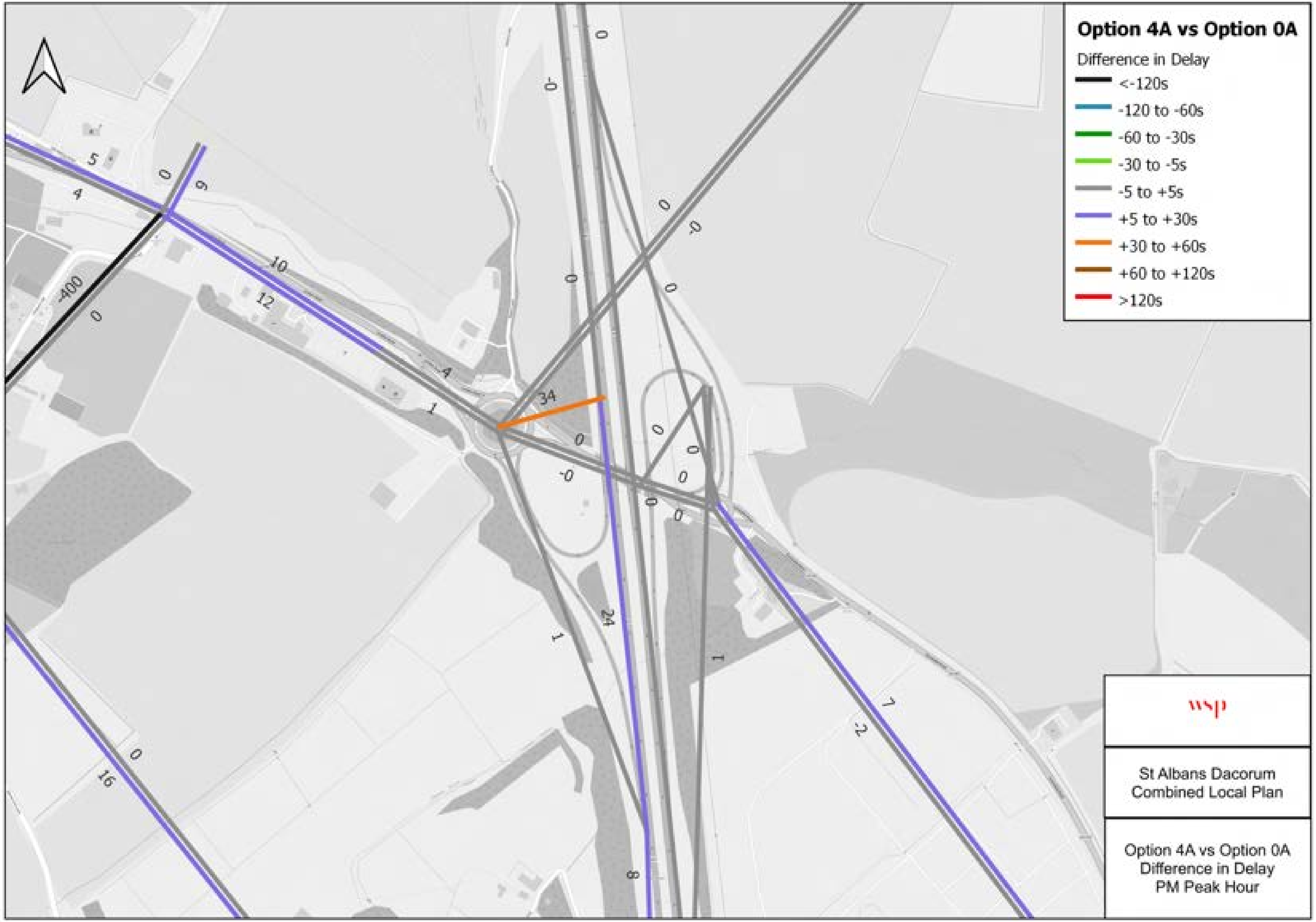


Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
119
16
16
-76
45
91
219
90
-38
201
272
7
375
100
373
101
85
167
109
70
-21
58
-82
-21
129
34
179
189
-21
-26
240
160
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
PM Peak Hour


Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
AM Peak Hour


Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
2
0
0
-6
4
41
-11
30
376
16
30
8
29
5
8
13
14
26
-2
17
-1
-2
4
9
16
22
-2
-25
255
2
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
PM Peak Hour


Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A Difference in Delay AM Peak Hour
20
2
6
4
0
8
2
12
-58
0
0
2
5
1
1
2
0
0
0
-0
40
0
0
0
0
102
1
1
4
1
0
6



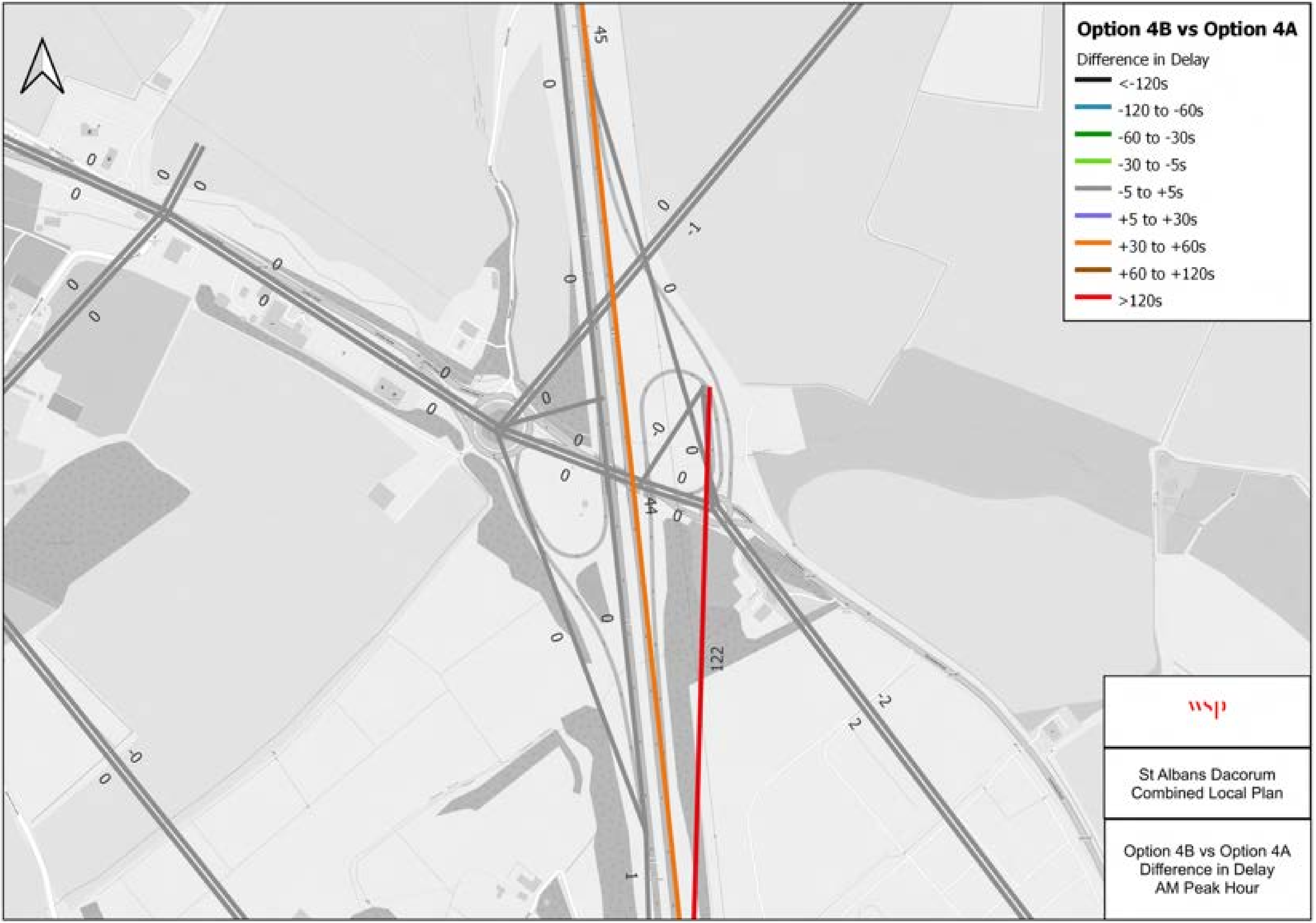
Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A Difference in Delay PM Peak Hour


Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Actual
Flow (PCUs)
AM Peak Hour

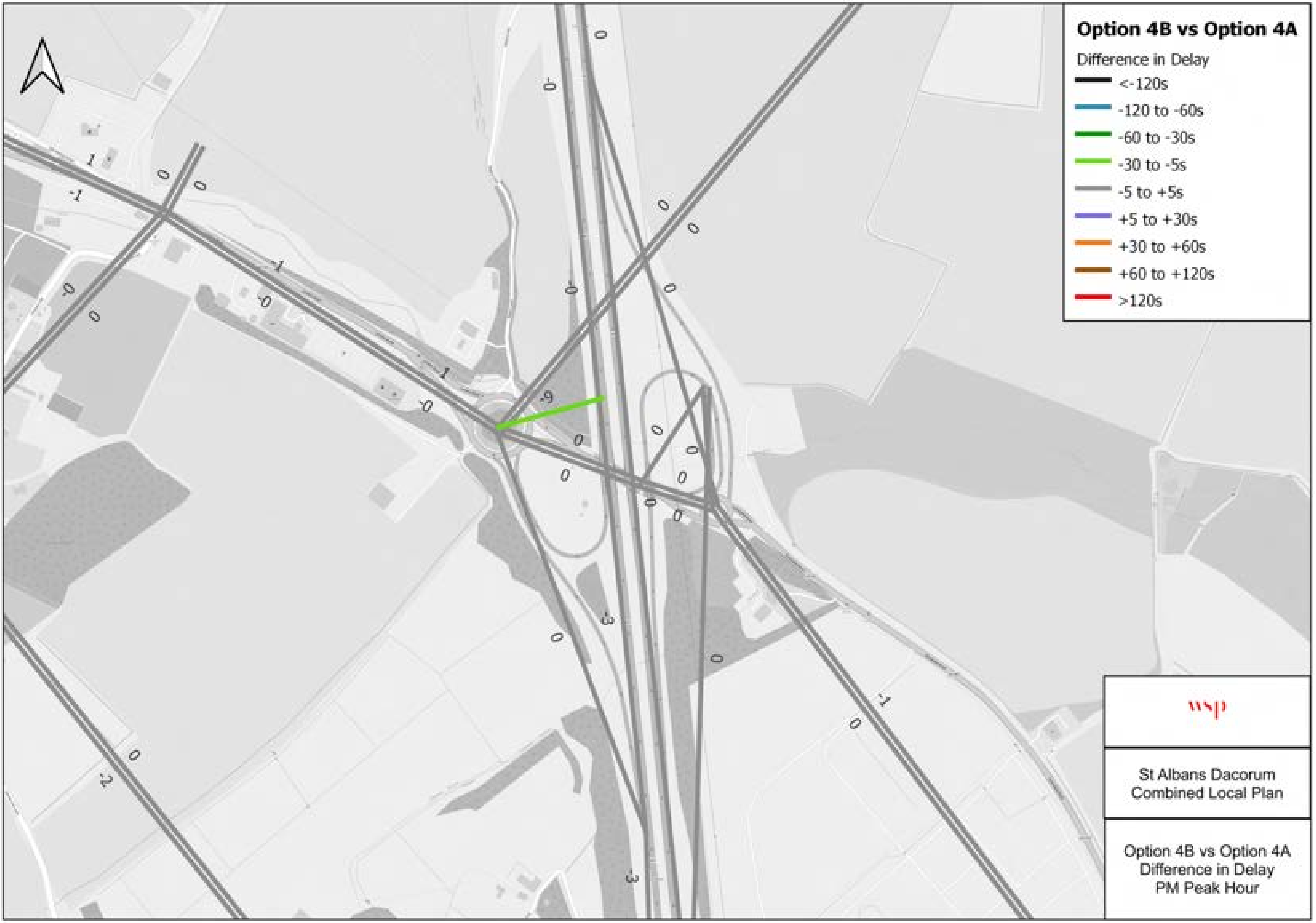

Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Actual
Flow (PCUs)
PM Peak Hour

Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
AM Peak Hour

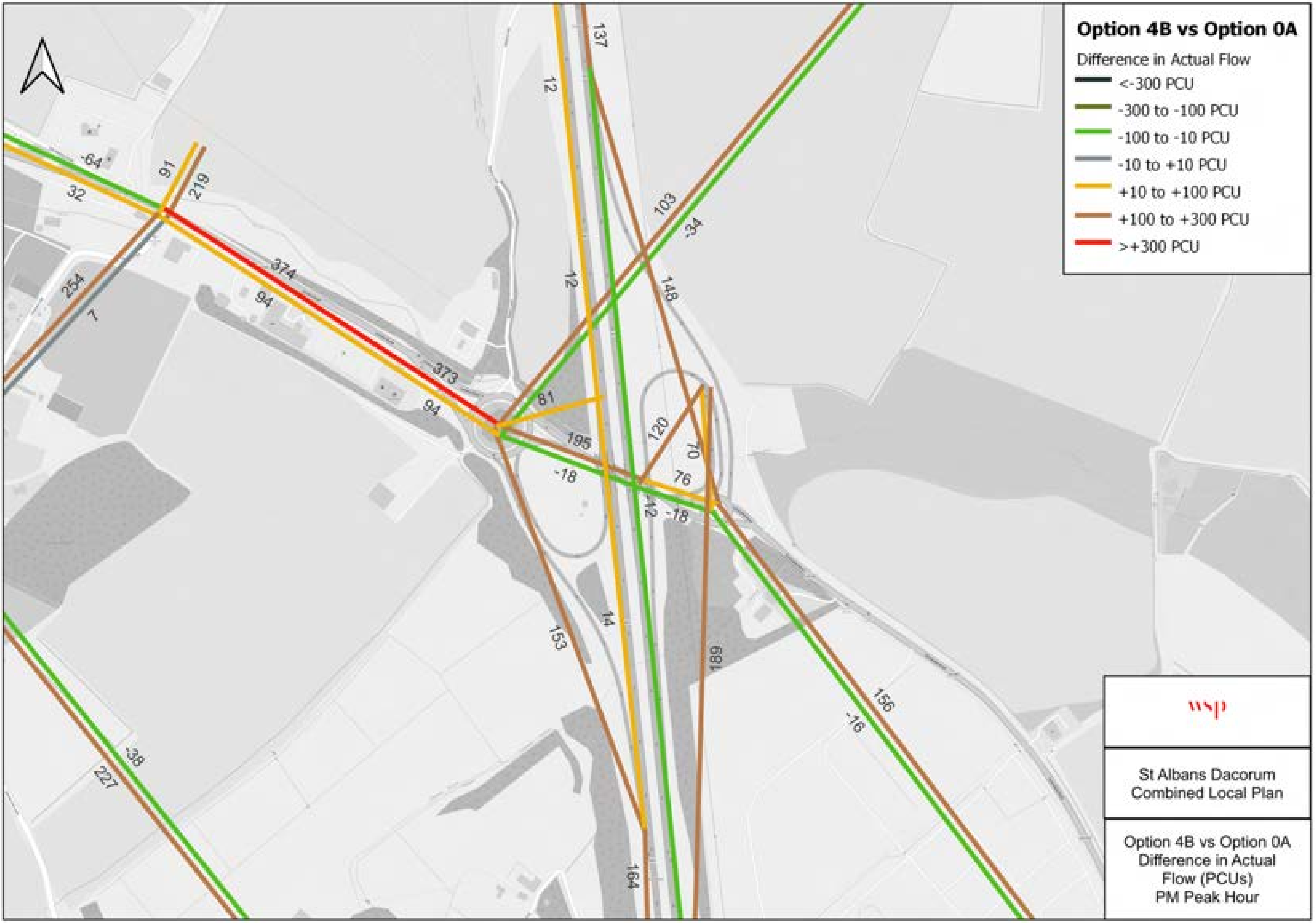
Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
PM Peak Hour



Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
45
44
122
-1
2
-2
1
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
AM Peak Hour


Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
PM Peak Hour


Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
261
195
195
46
35
-54
-41
168
162
125
138
312
18
22
138
312
103
234
184
69
51
165
98
184
91
339
121
-20
105
38
3
430
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Actual
Flow (PCUs)
AM Peak Hour



Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
137
12
-64
91
219
32
374
94
254
7
12
103
-34
148
373
81
94
195
120
70
-18
76
-12
-18
153
14
189
156
-16
-38
227
164
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Actual Flow (PCUs) PM Peak Hour

Option 4B vs Option 0A

% Flow Difference

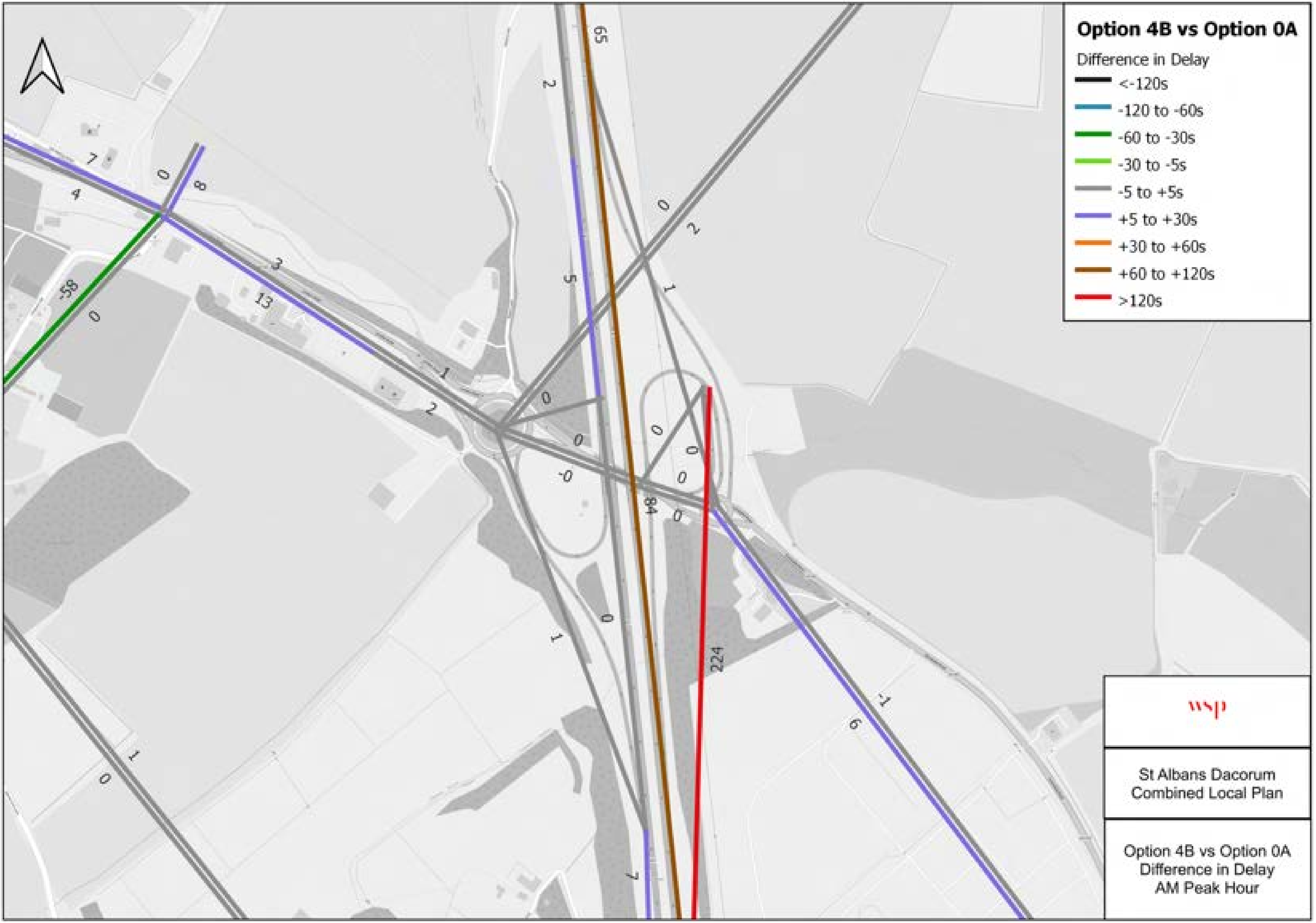
- <-20%
- -20 to -10%
- -10 to 0%
- 0 to +10%
- +10 to +20%
- >+20%

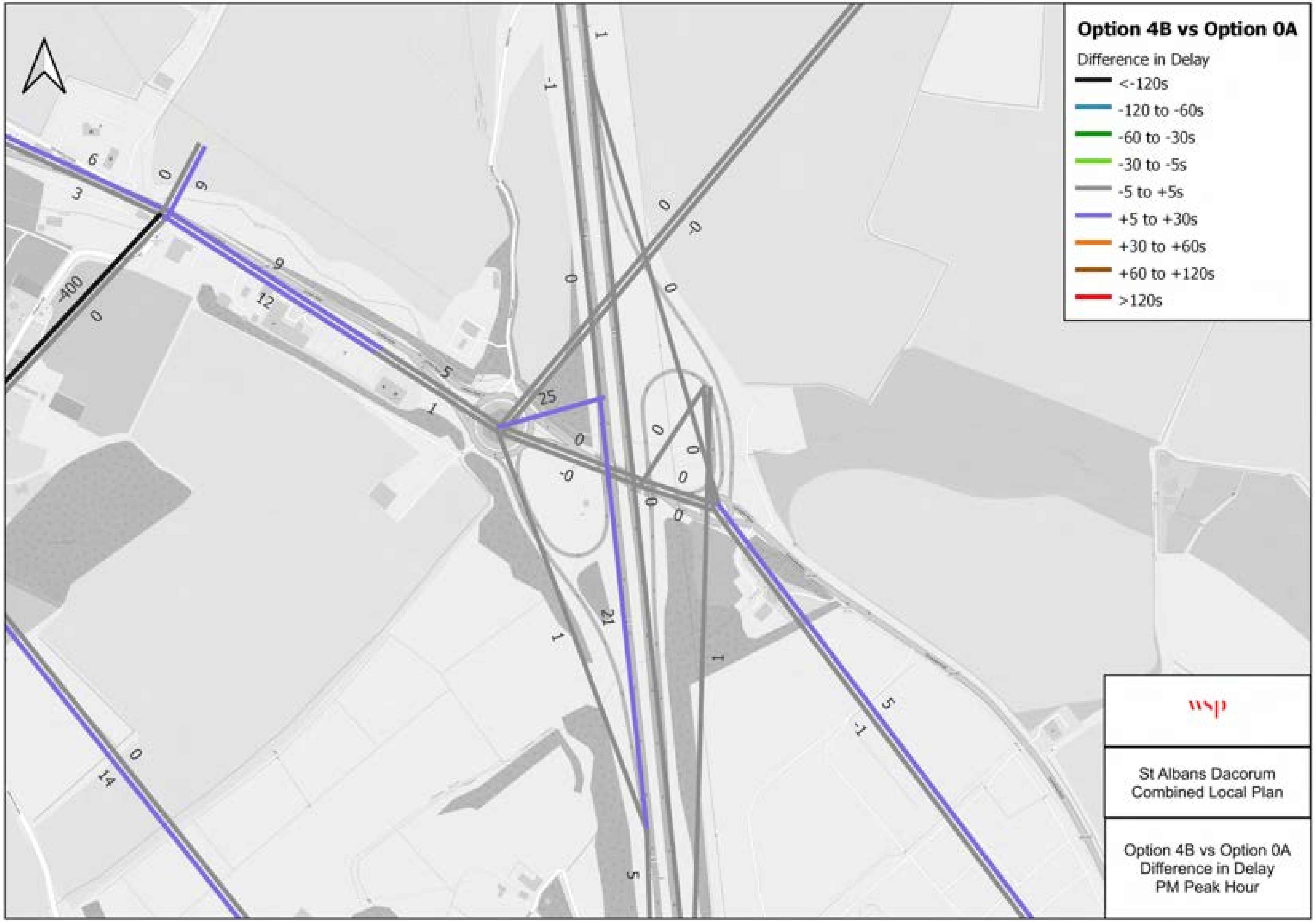
wsp

St Albans Dacorum Combined Local Plan

Option 4B vs Option 0A
% Flow Difference
AM Peak Hour

Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
2
0
-5
3
47
-10
30
0
22
351
7
17
29
5
7
14
17
26
-1
23
0
-1
0
11
17
18
-1
-36
241
2
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
PM Peak Hour

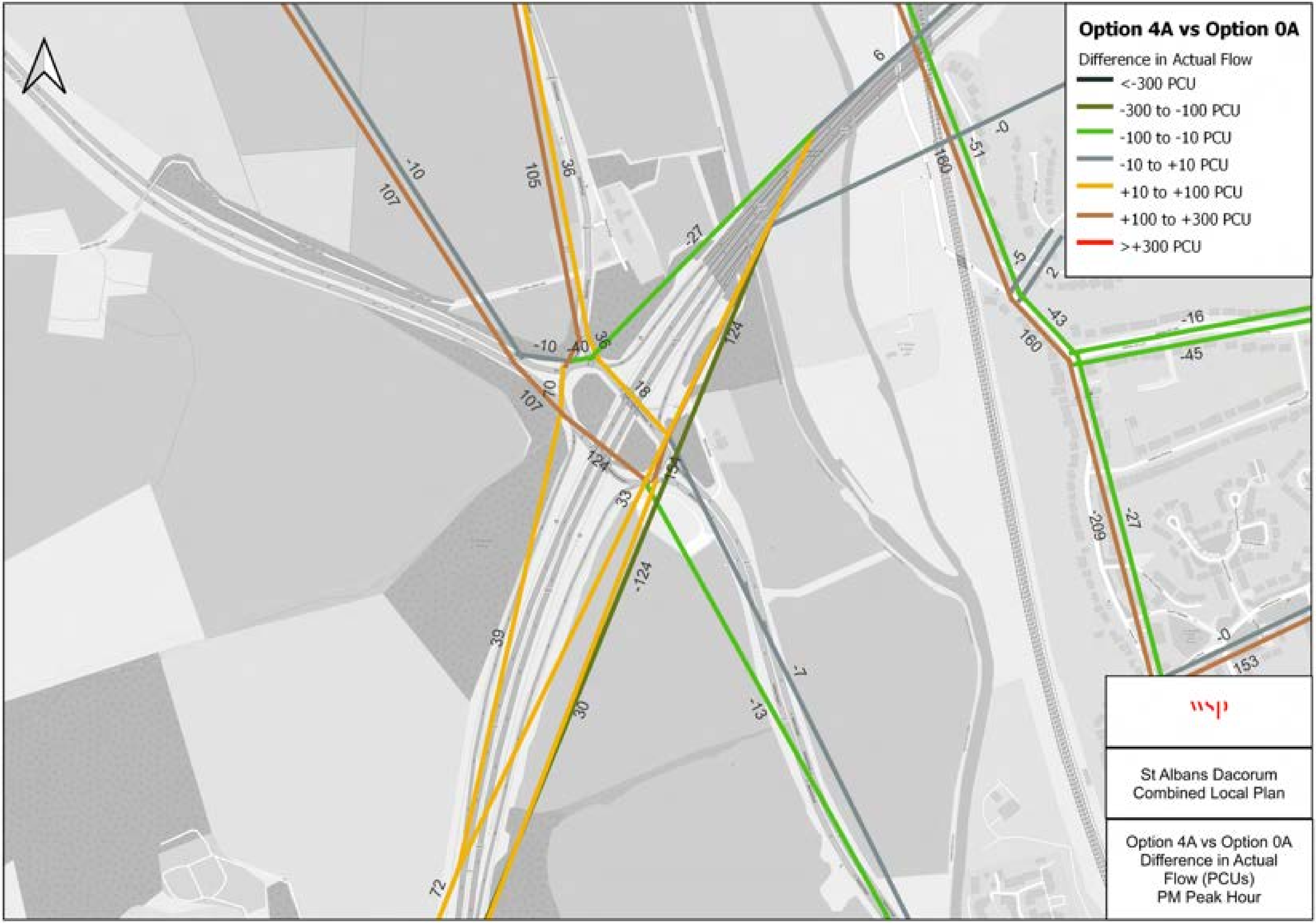

Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
AM Peak Hour



Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Delay PM Peak Hour

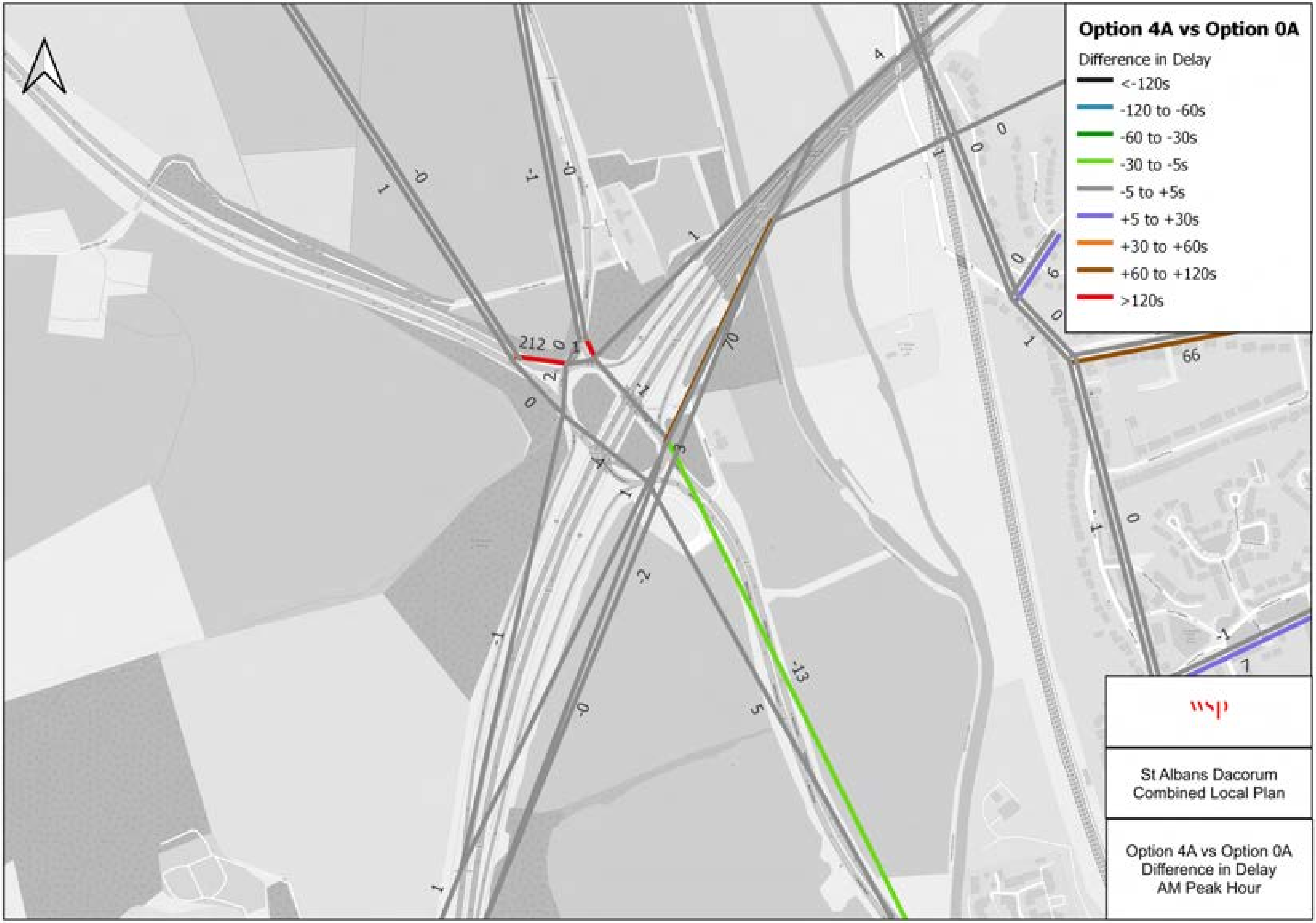
M25 Junction 20

Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
AM Peak Hour
-24
89
-67
-95
140
56
44
276
83
-9
-24
-67
-95
176
74
297
-3
-50
196
89
102
254
41
57
-120
-348
77
31
232
3
37
-130
83
88


Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A Difference in Actual Flow (PCUs) PM Peak Hour
-10
107
105
36
-27
6
180
-51
-5
2
-43
-16
160
-45
124
-10
-40
36
18
70
107
124
33
-124
39
30
72
-13
-7
209
-27
-0
153


Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
AM Peak Hour


Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
PM Peak Hour


Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
212
70
66
-13
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
AM Peak Hour

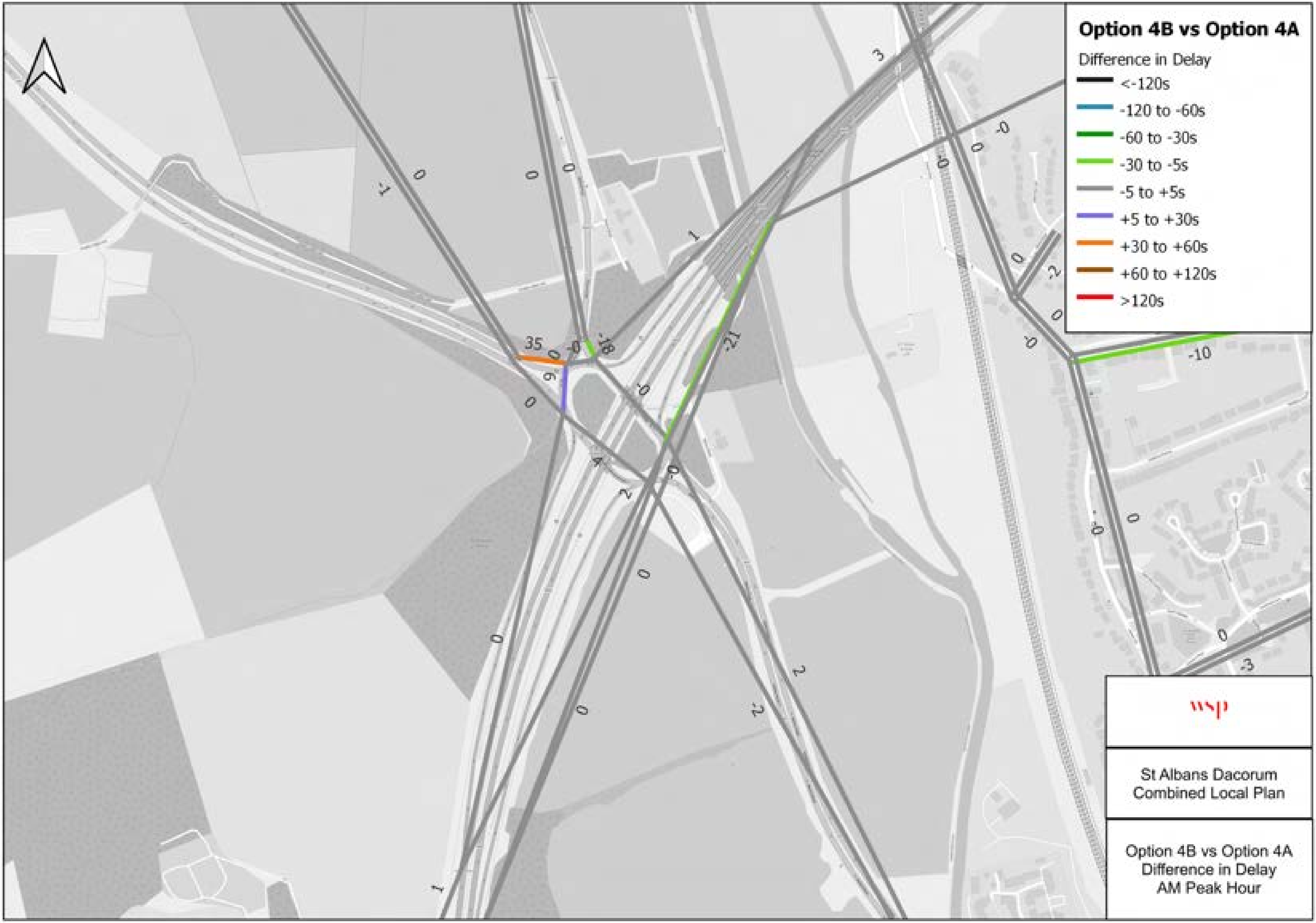
Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
PM Peak Hour

Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) AM Peak Hour
14
-109
11
38
35
97
-21
43
-79
1
-0
44
-77
16
17
14
11
38
-9
-46
-109
-73
-85
-8
62
-12
-94
28
-71
-66
56
-21
7
-64
-9


Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) PM Peak Hour


Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
AM Peak Hour


Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
PM Peak Hour



Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
AM Peak Hour

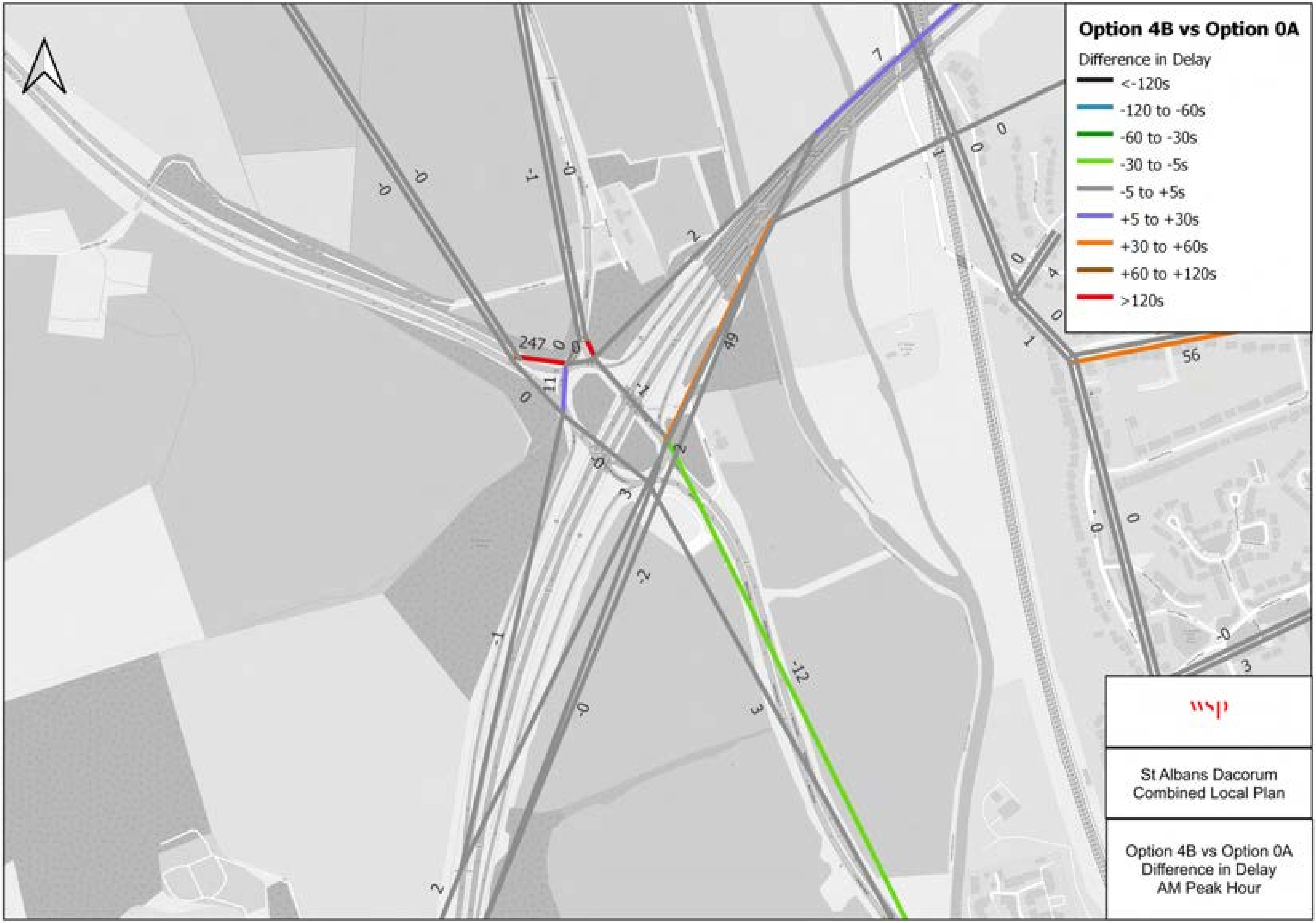

Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
PM Peak Hour

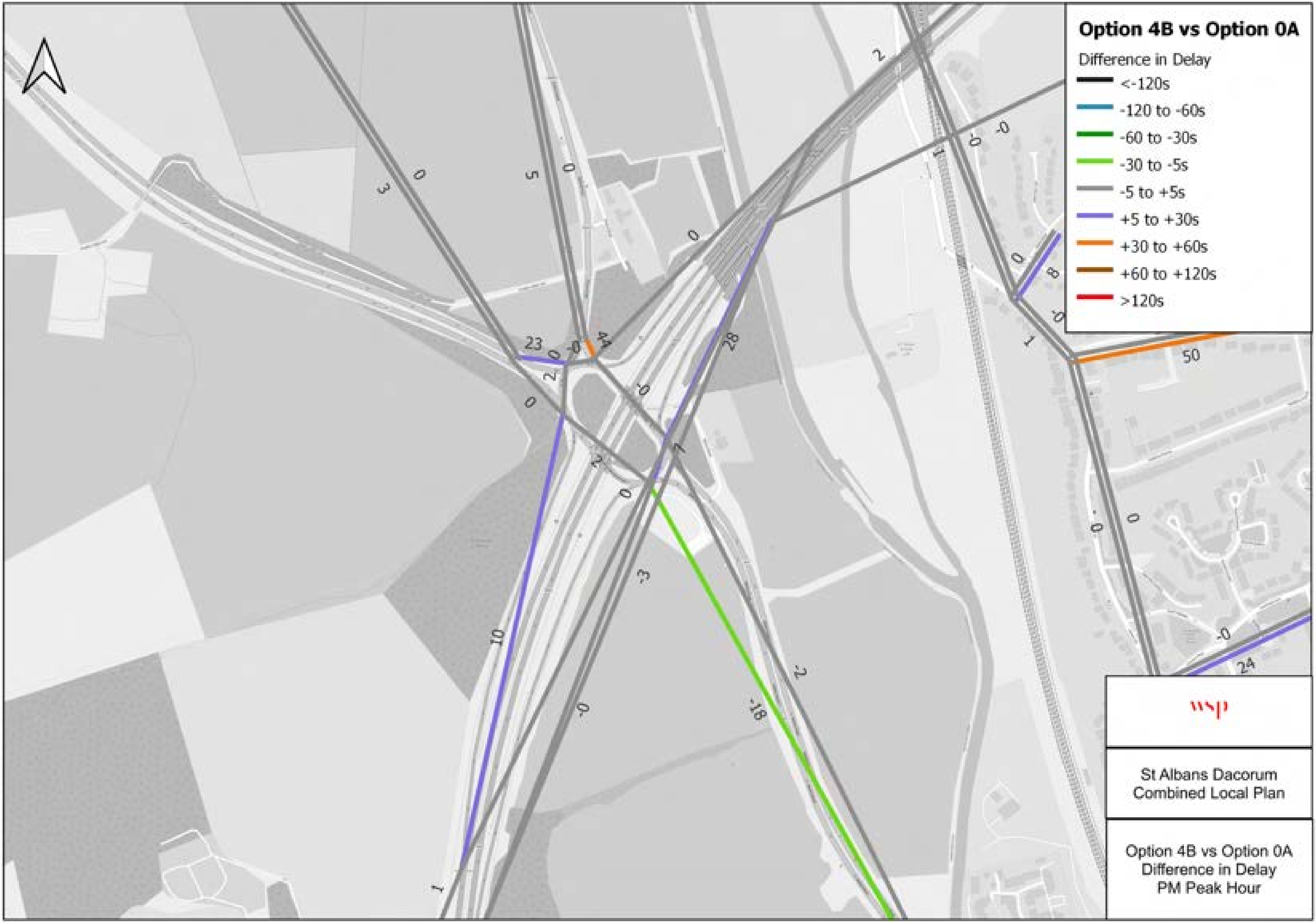

Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Actual Flow (PCUs) AM Peak Hour
-21
-9
-56
-58
118
237
35
87
198
-8
0
118
220
13
-33
167
-9
-56
-58
150
-21
29
169
119
-40
-132
-74
80
62
167
-254
105
9
-27

Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Actual Flow (PCUs) PM Peak Hour

Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
AM Peak Hour

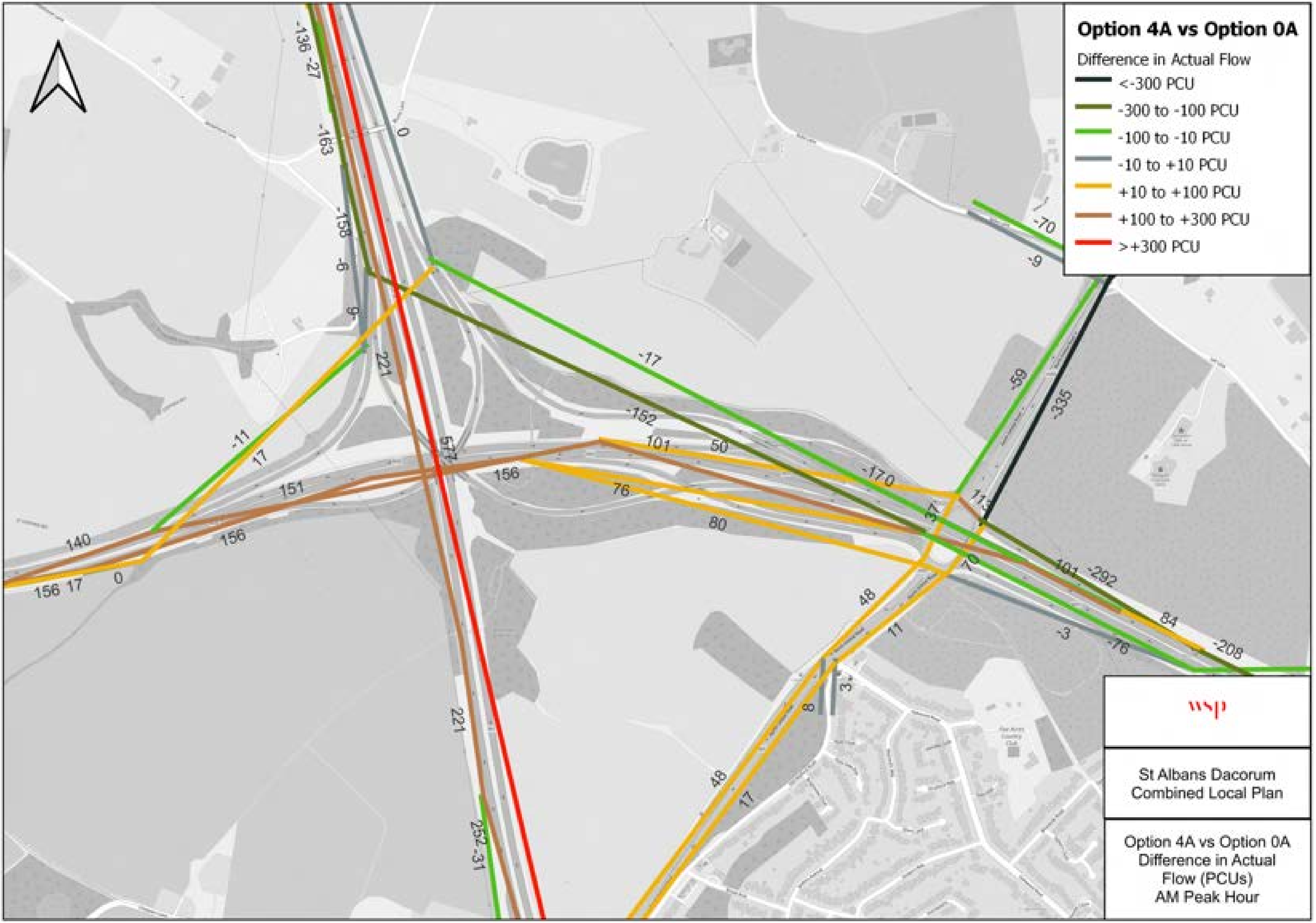

Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
PM Peak Hour

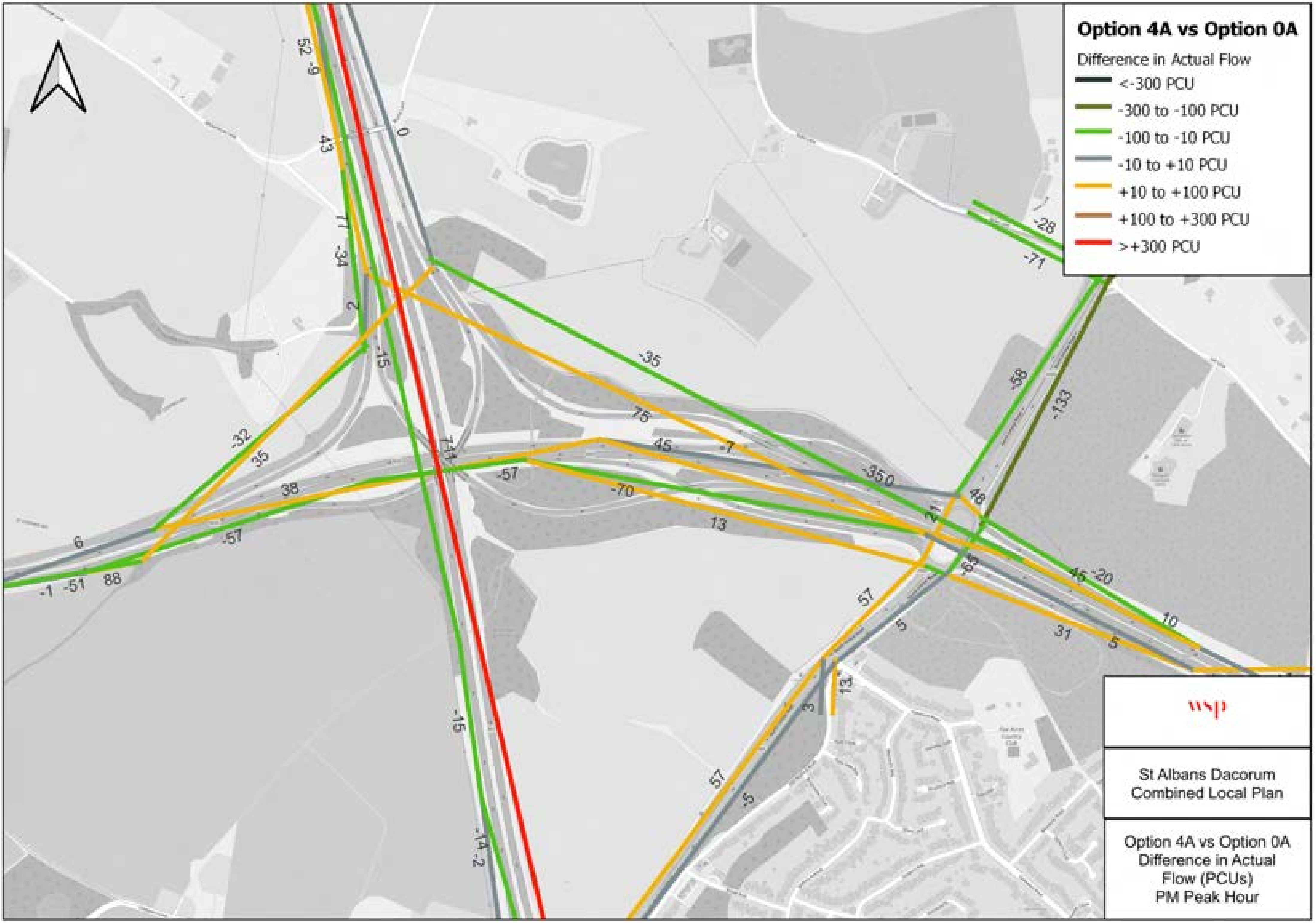

Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Delay AM Peak Hour

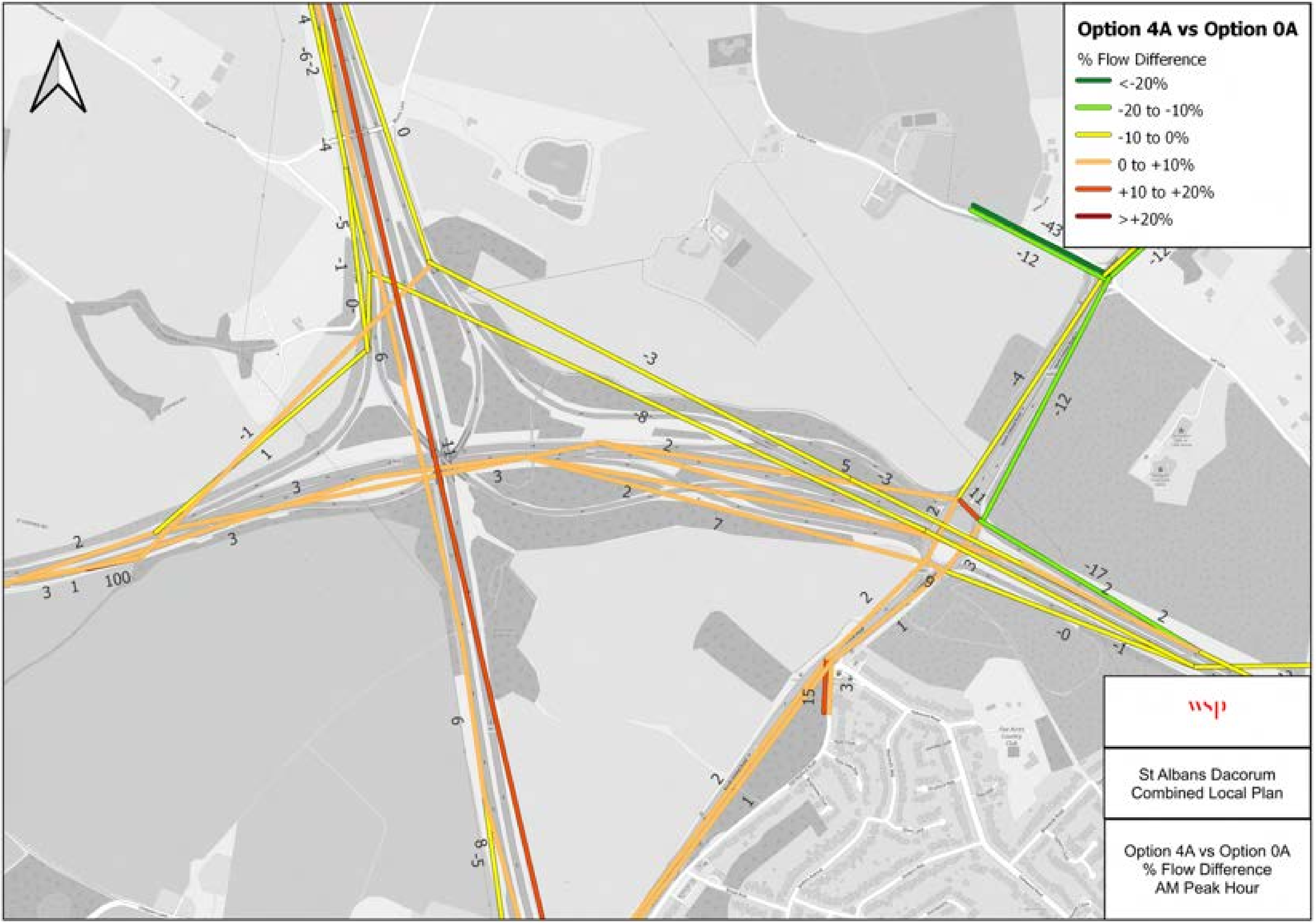


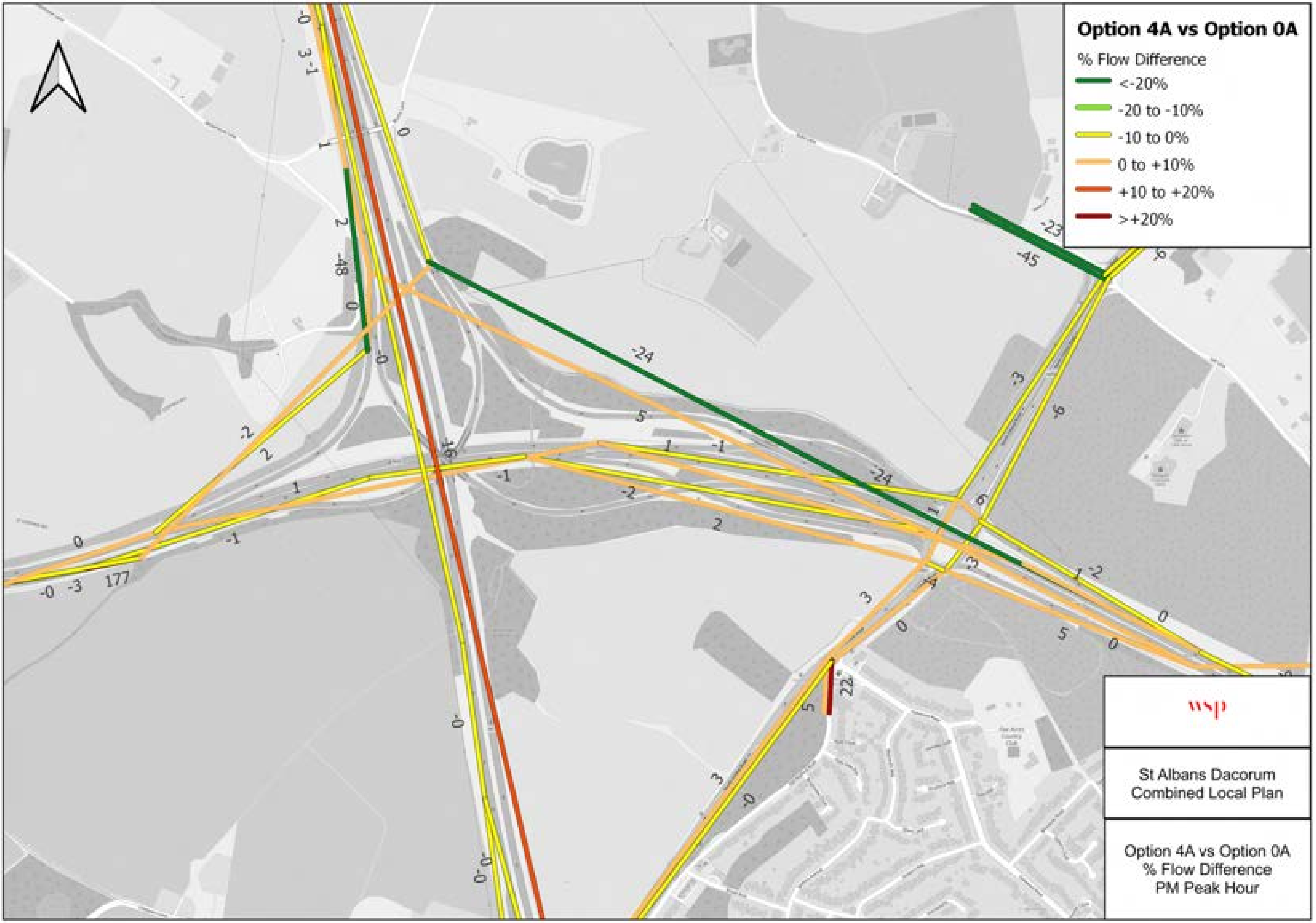
Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
PM Peak Hour

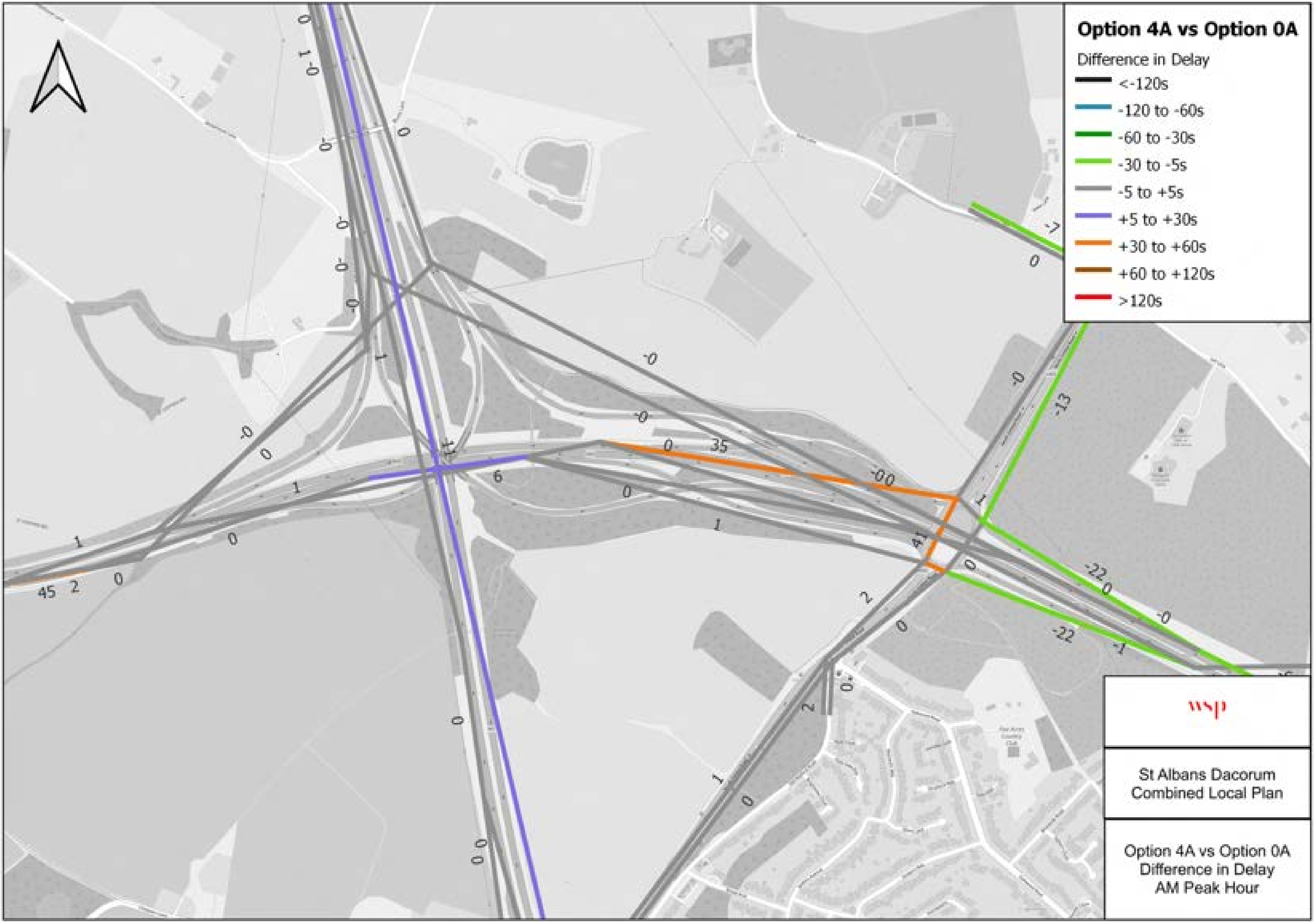
M25 Junction 21 and 21A

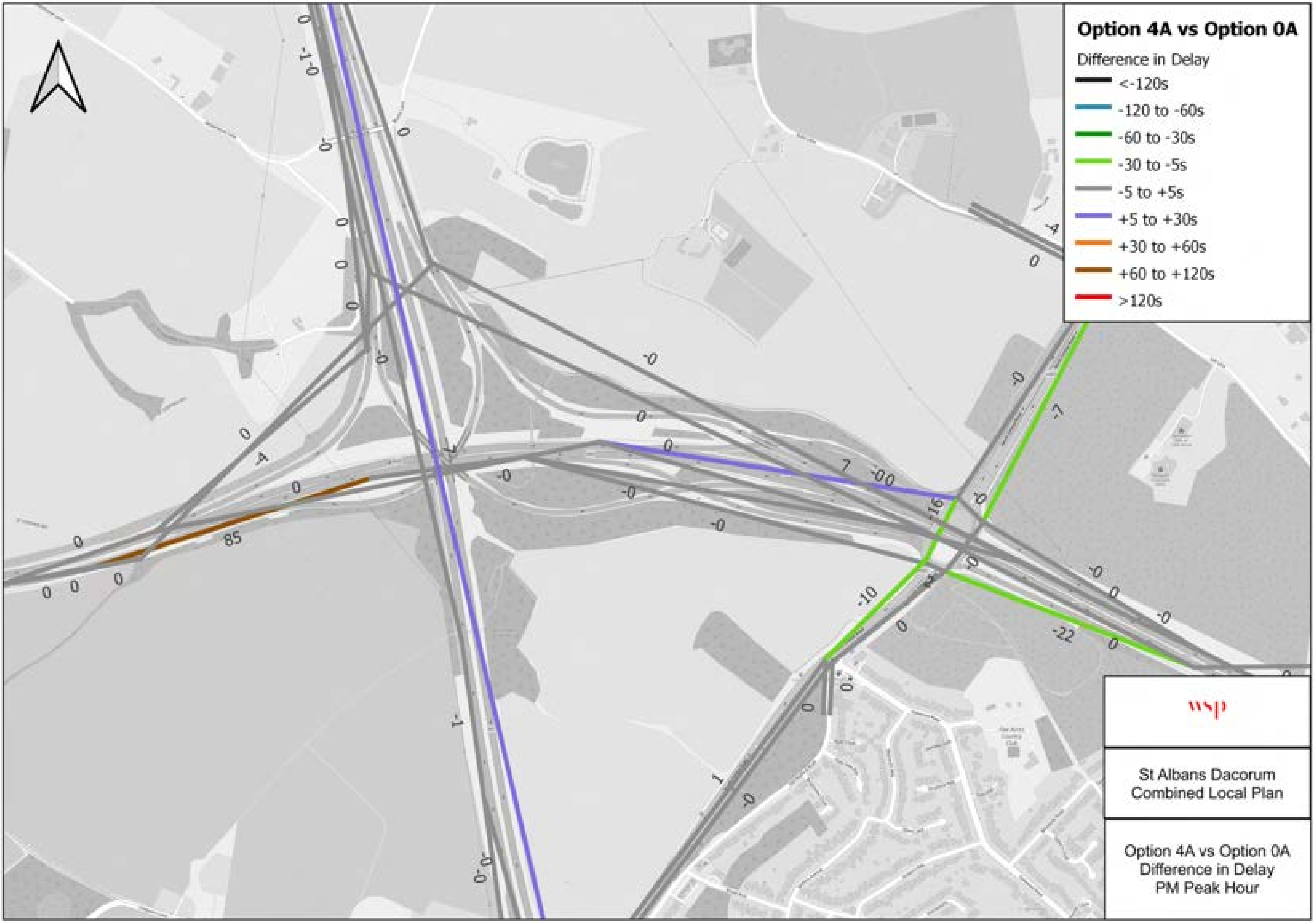

Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A Difference in Actual Flow (PCUs) AM Peak Hour

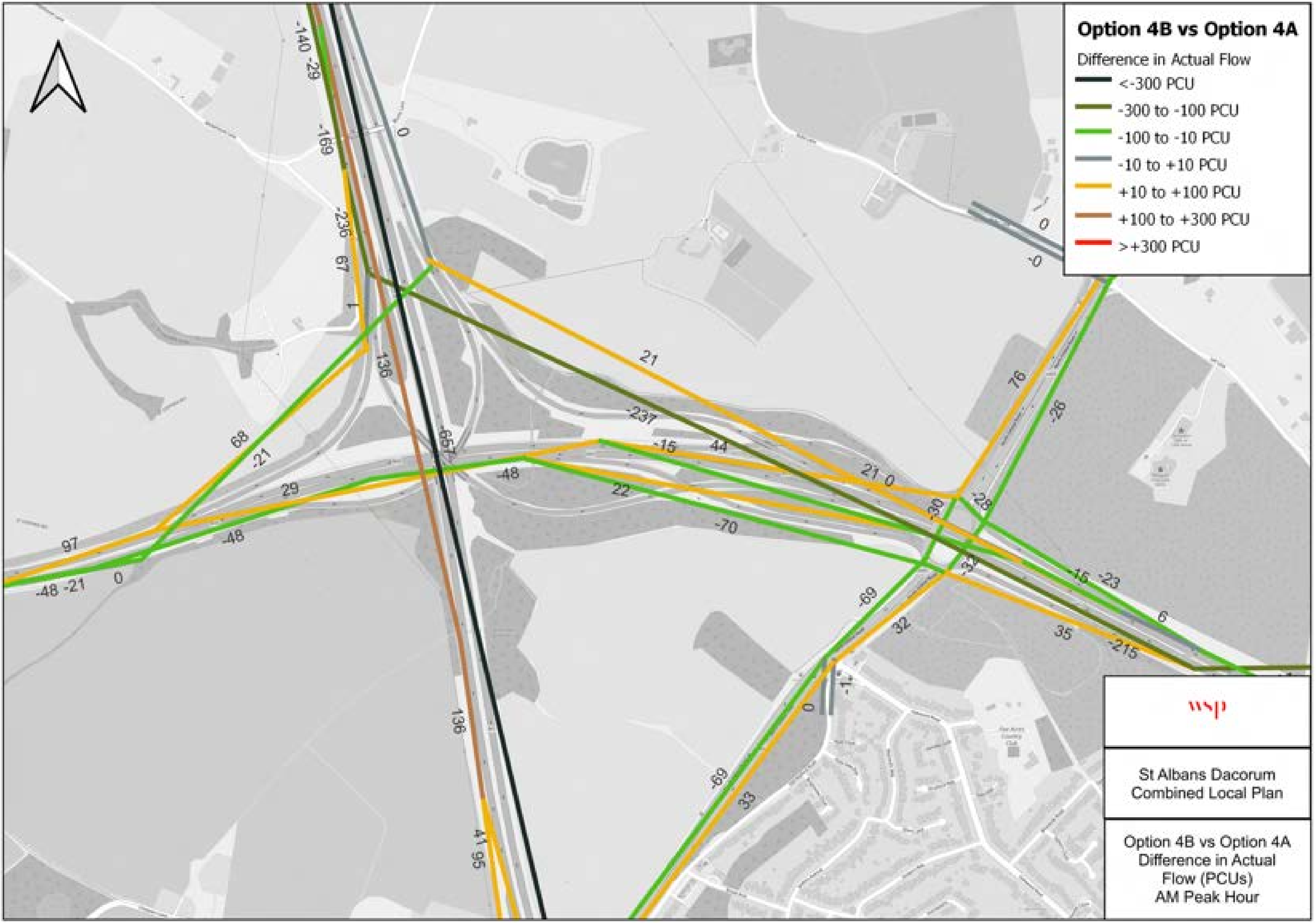

Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
PM Peak Hour

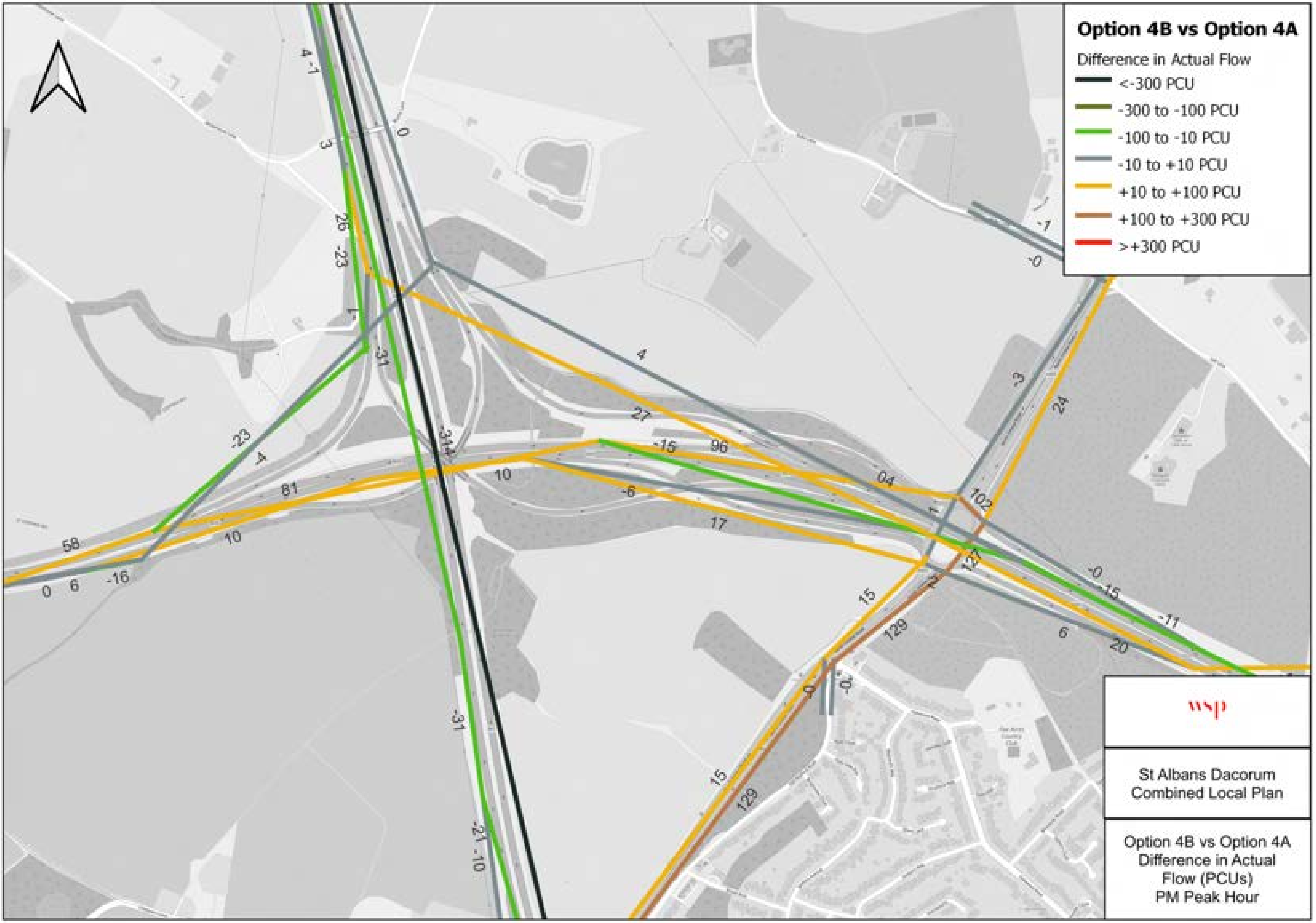

Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
AM Peak Hour

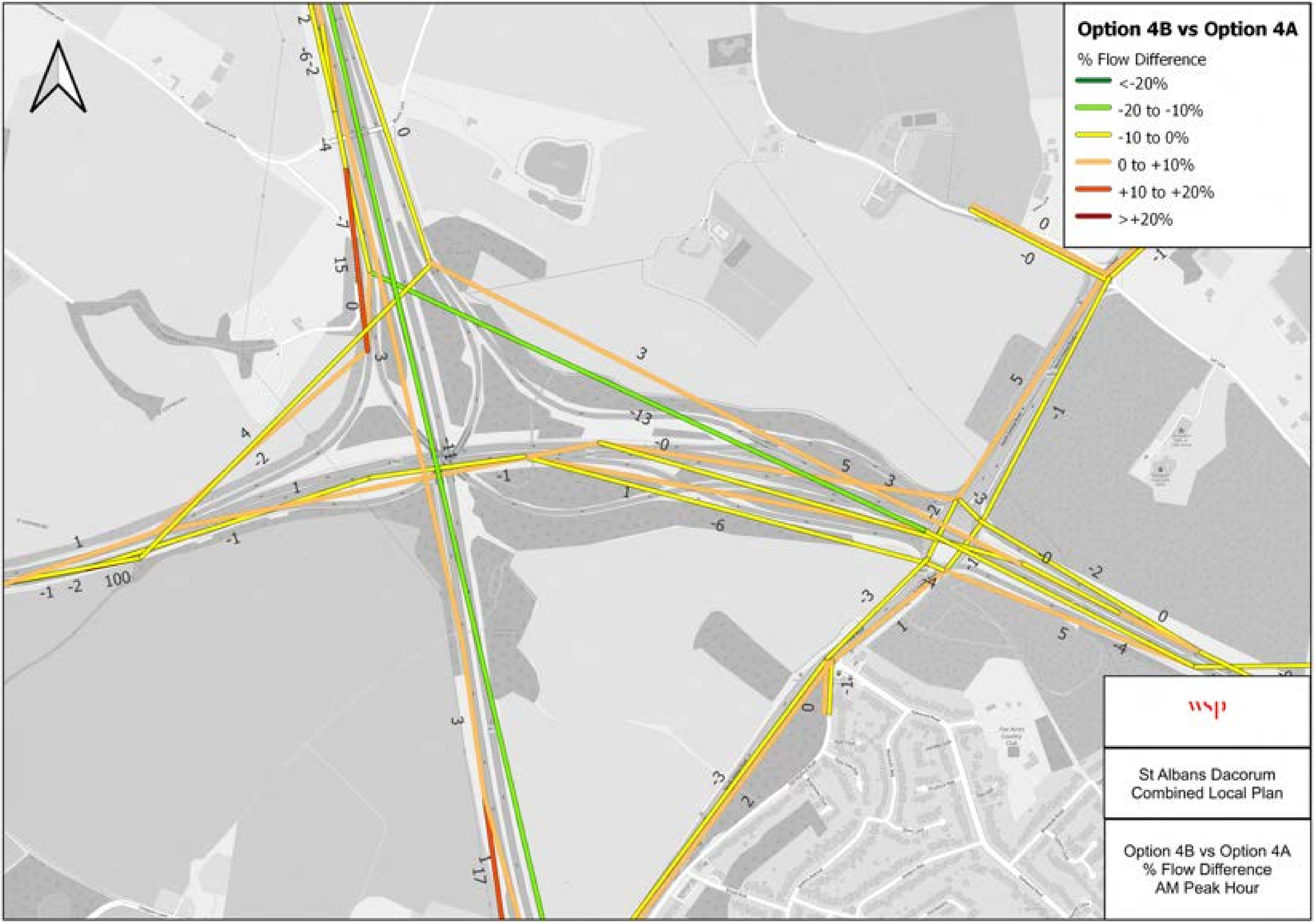

Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
PM Peak Hour

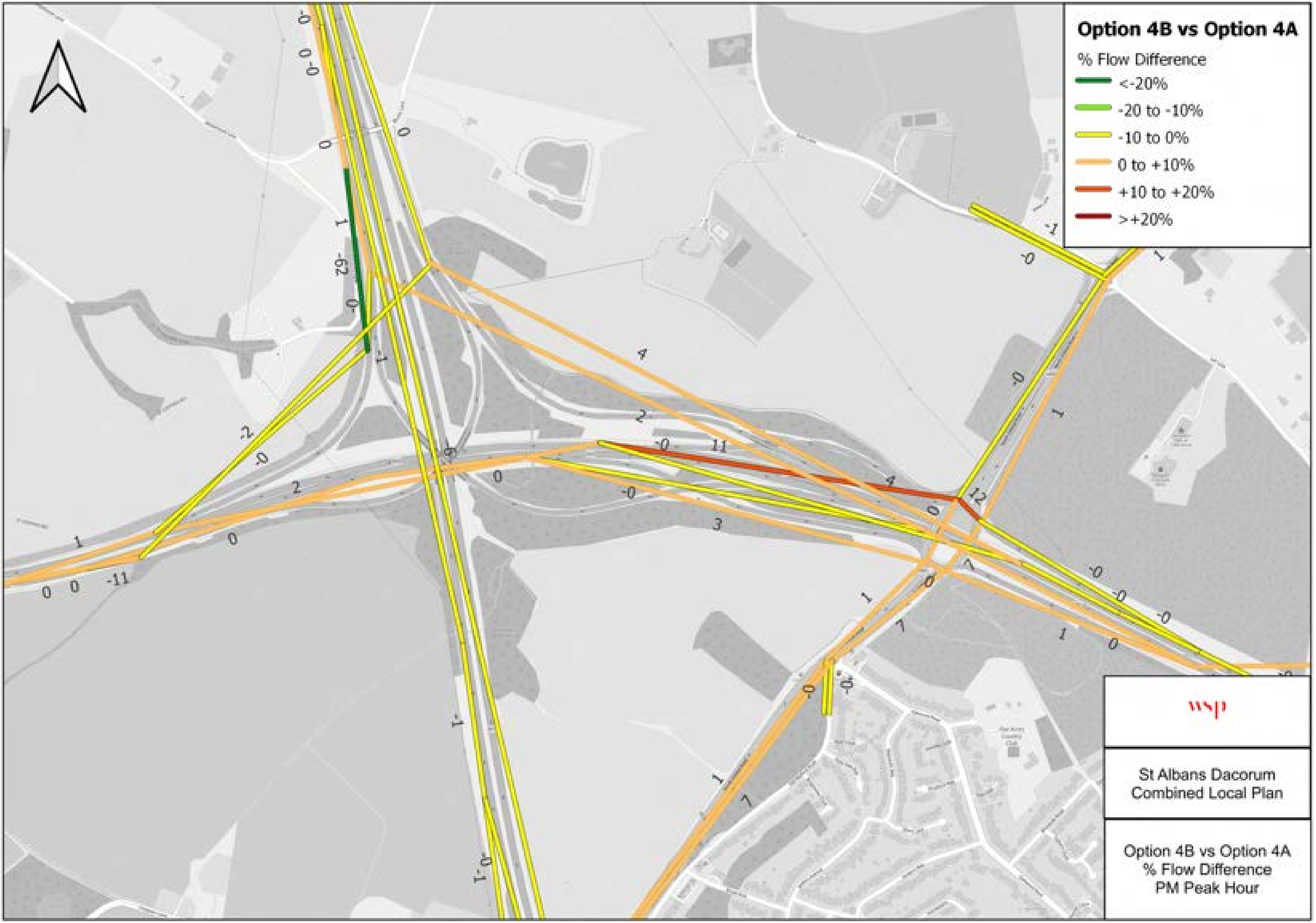

Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A Difference in Delay AM Peak Hour

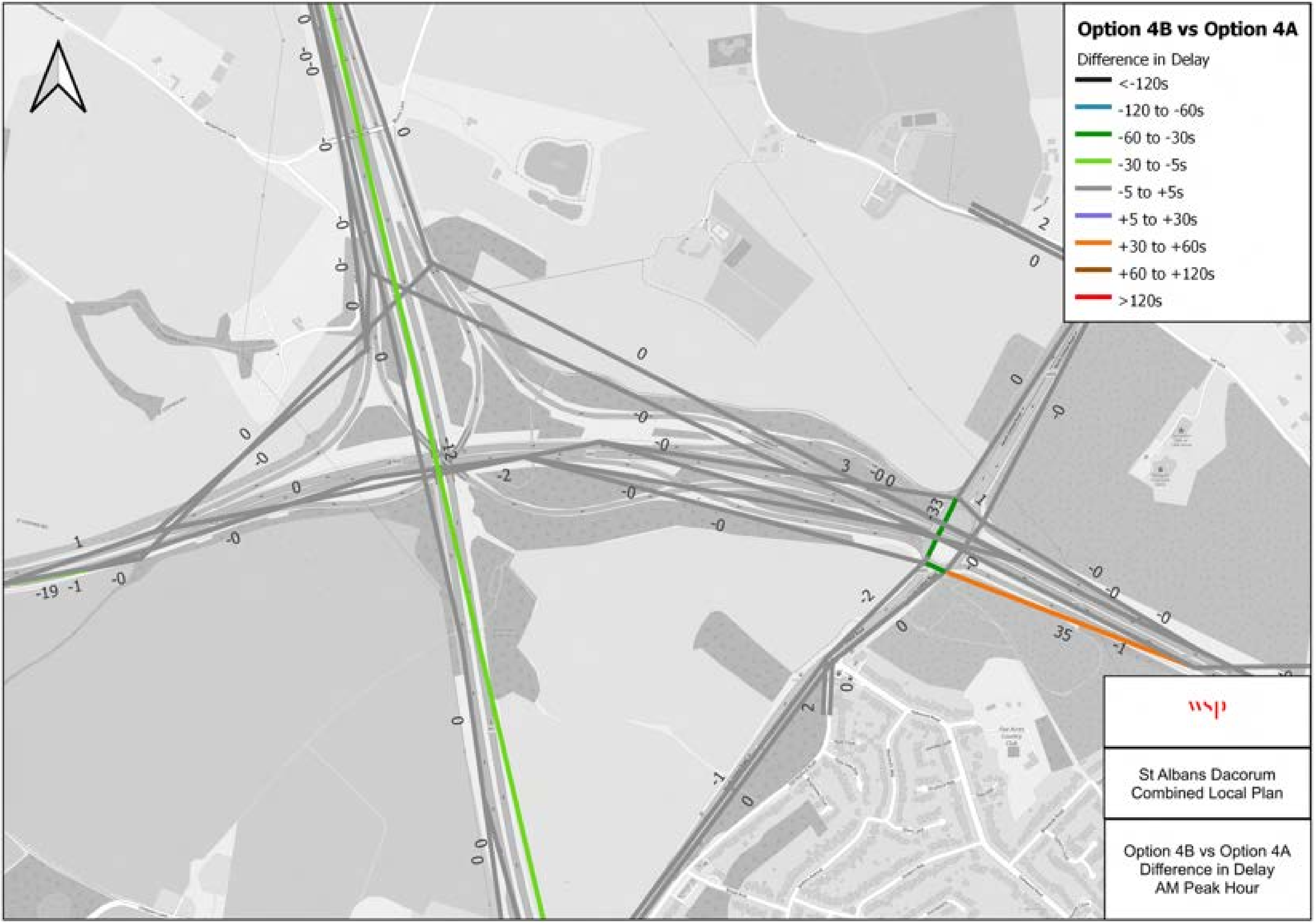

Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
PM Peak Hour

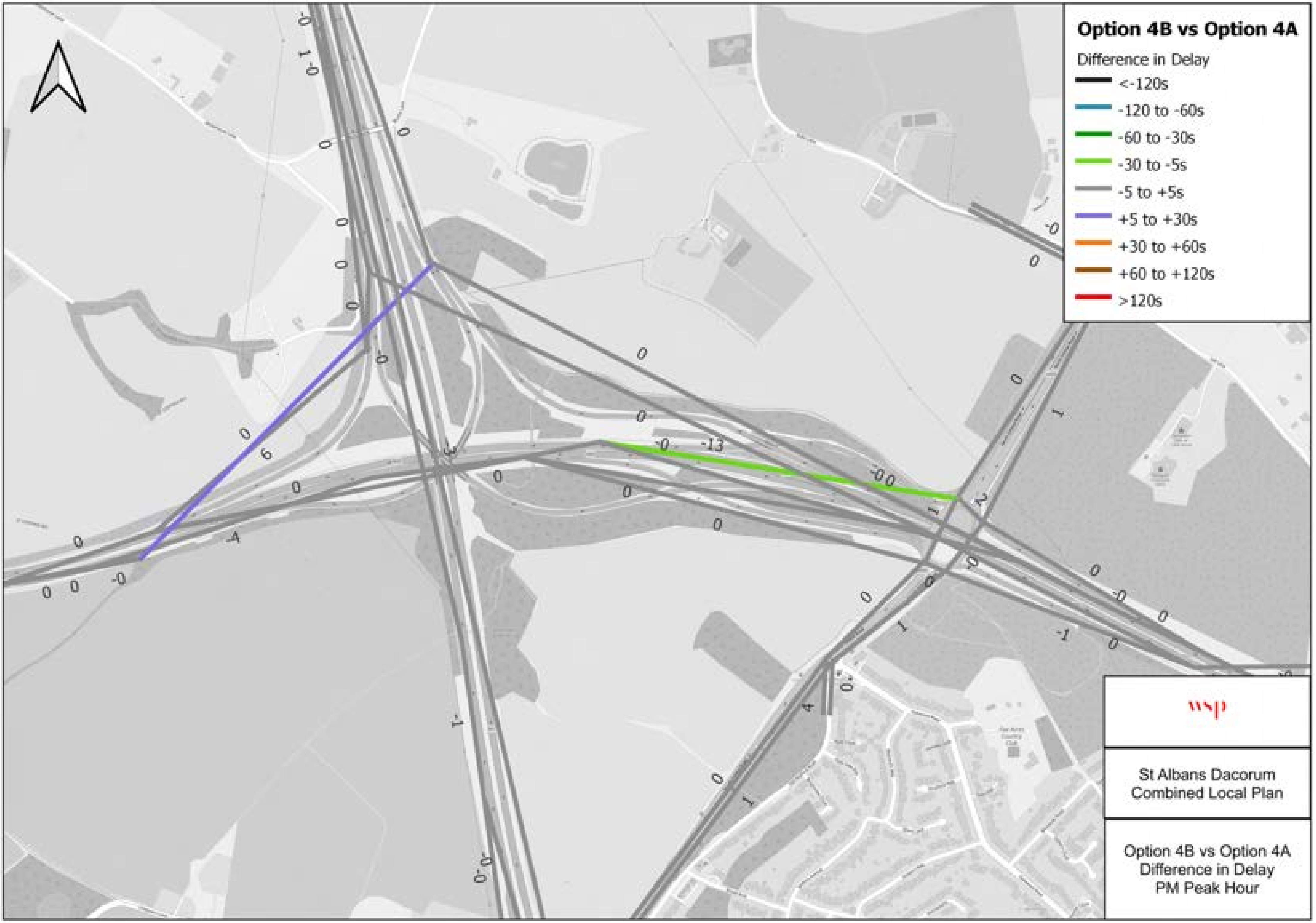

Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) AM Peak Hour

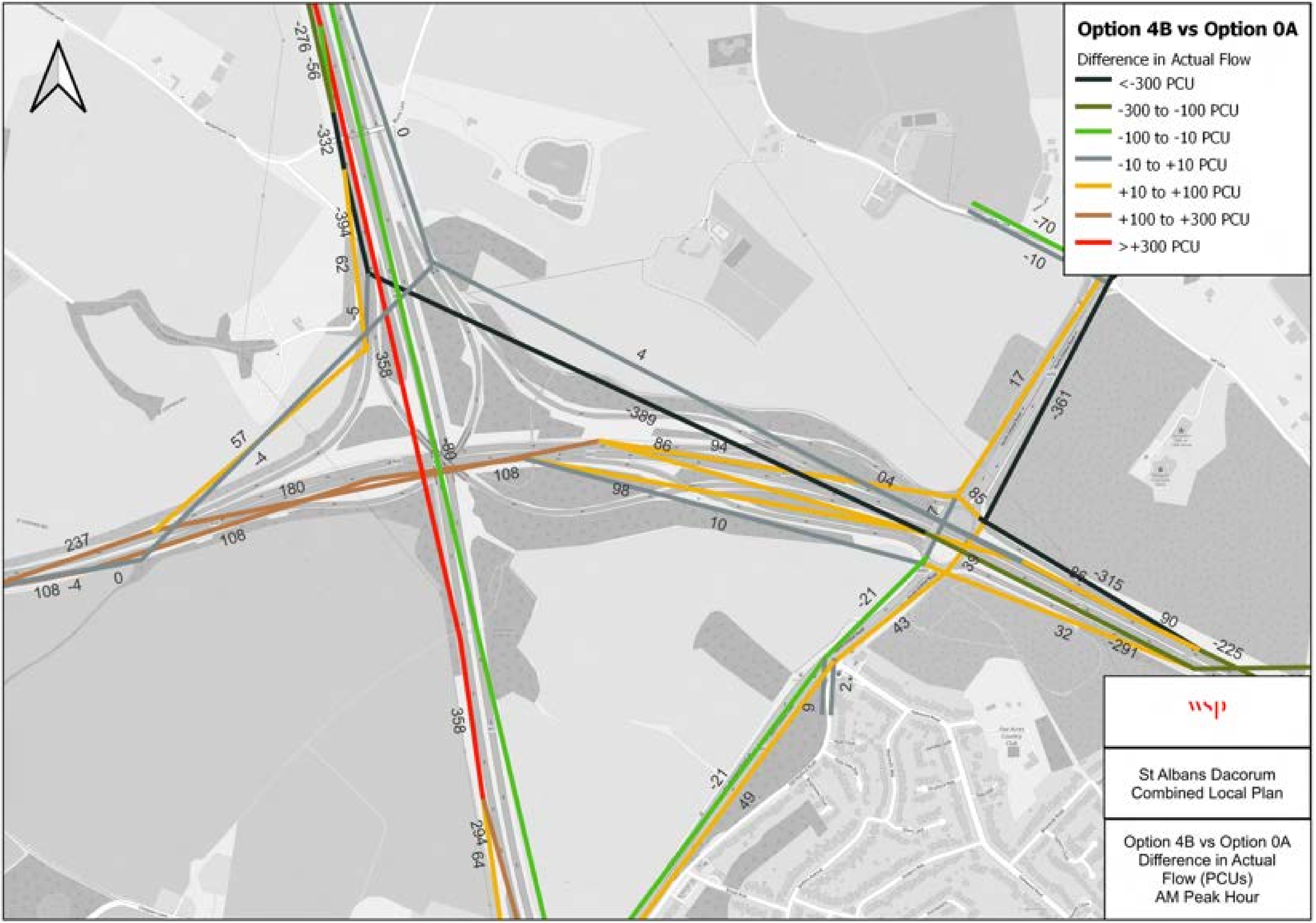

Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) PM Peak Hour

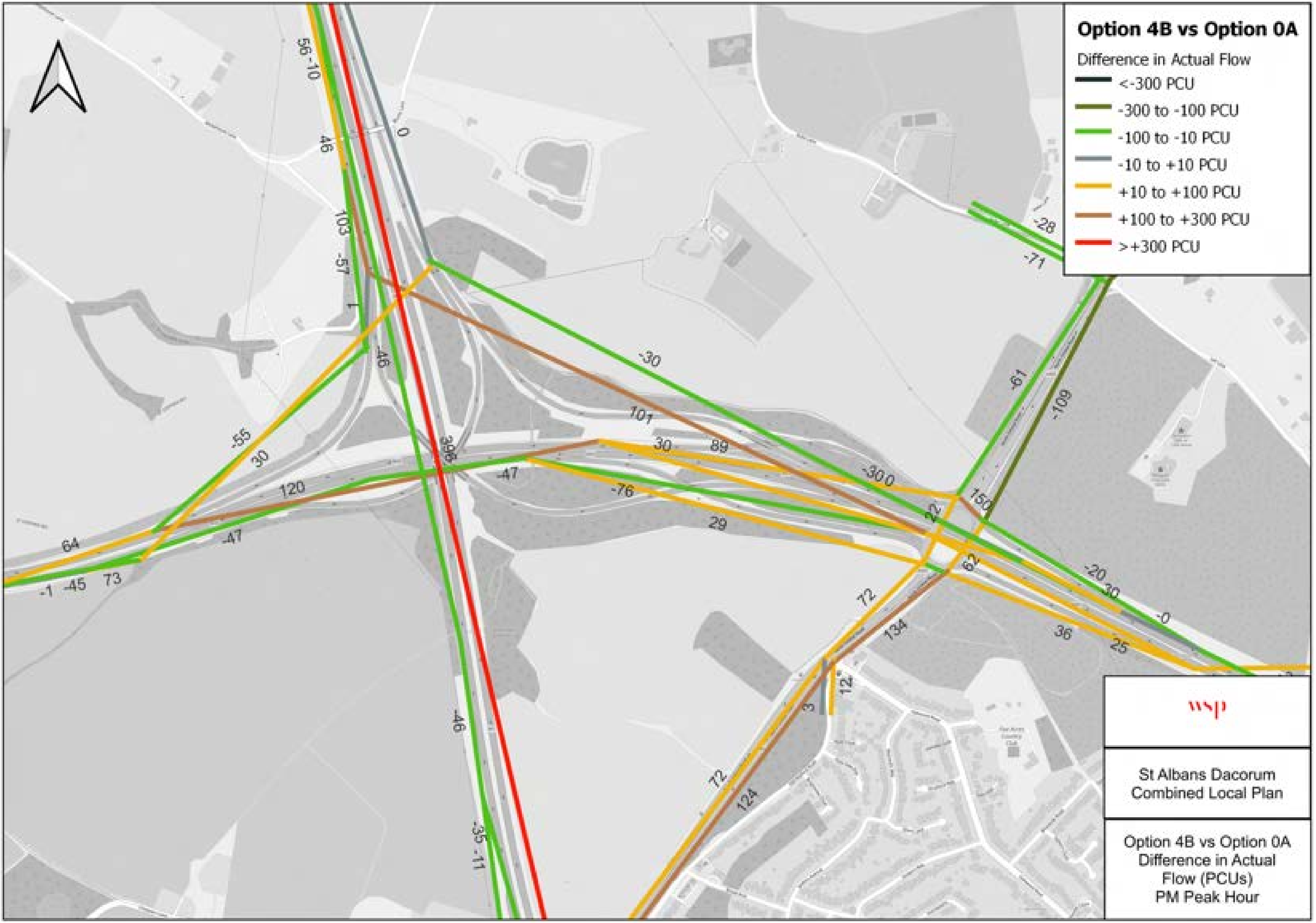

Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
AM Peak Hour

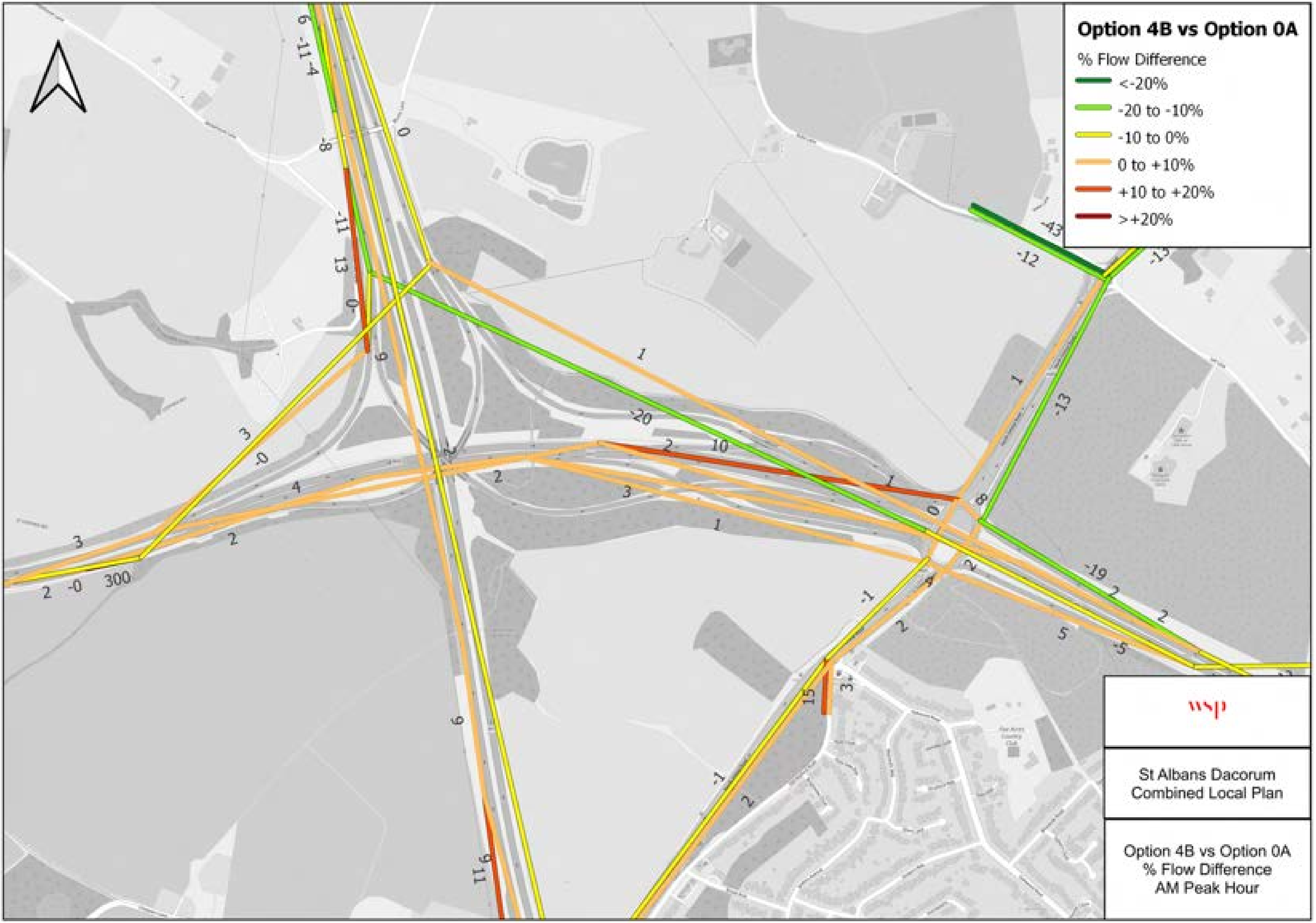

Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
PM Peak Hour

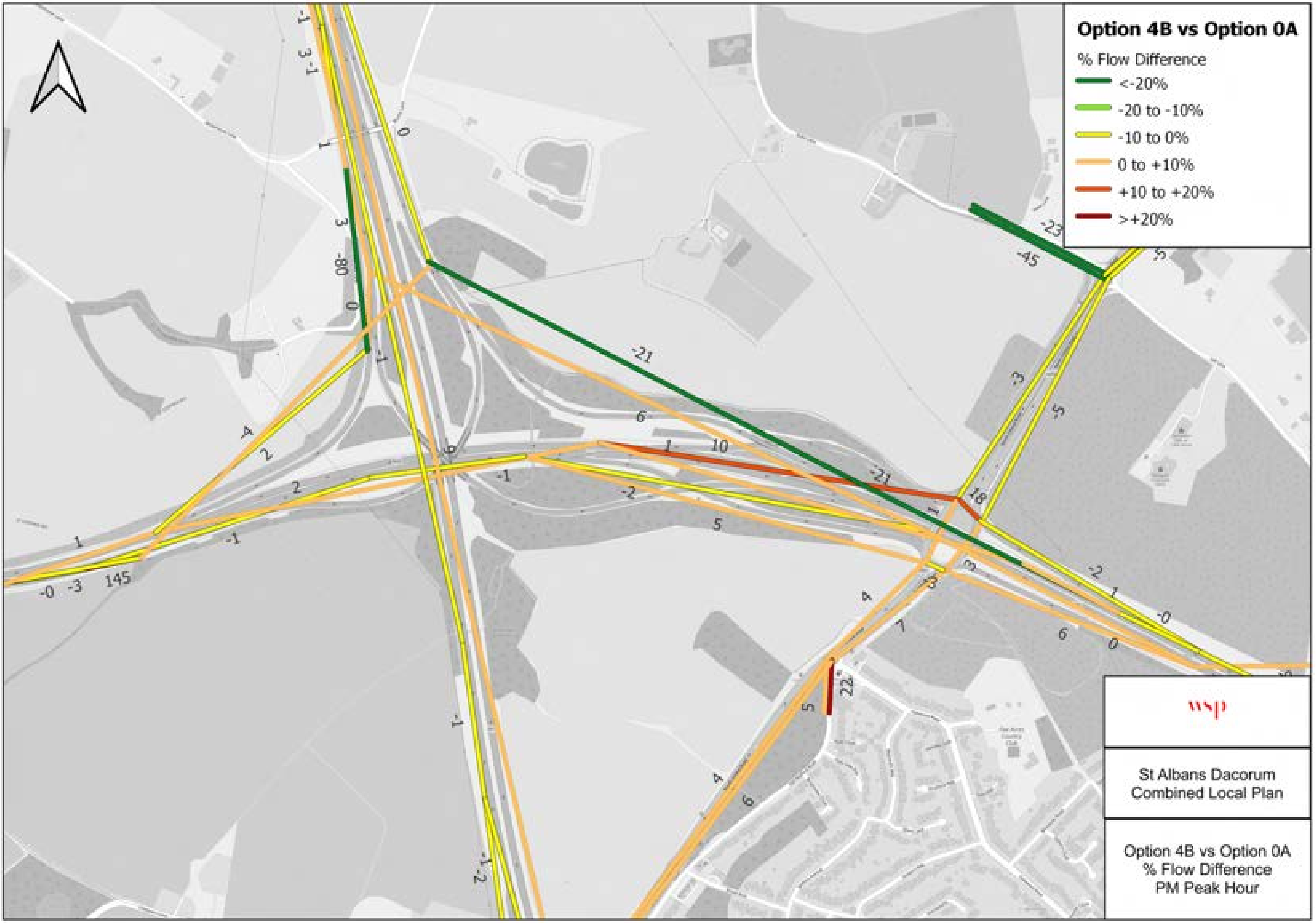

Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Delay AM Peak Hour

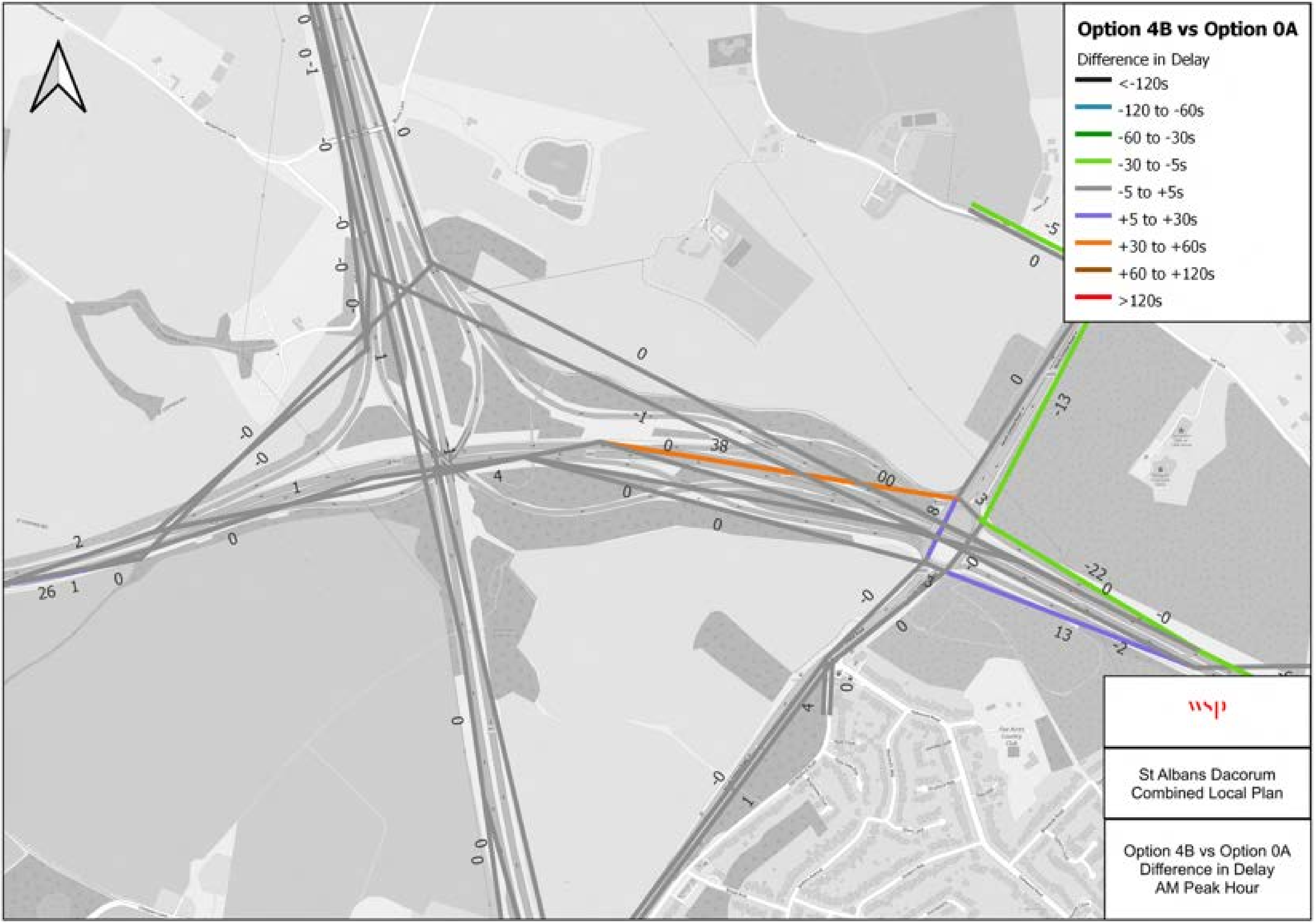

Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
PM Peak Hour


Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Actual Flow (PCUs) AM Peak Hour


Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Actual Flow (PCUs) PM Peak Hour

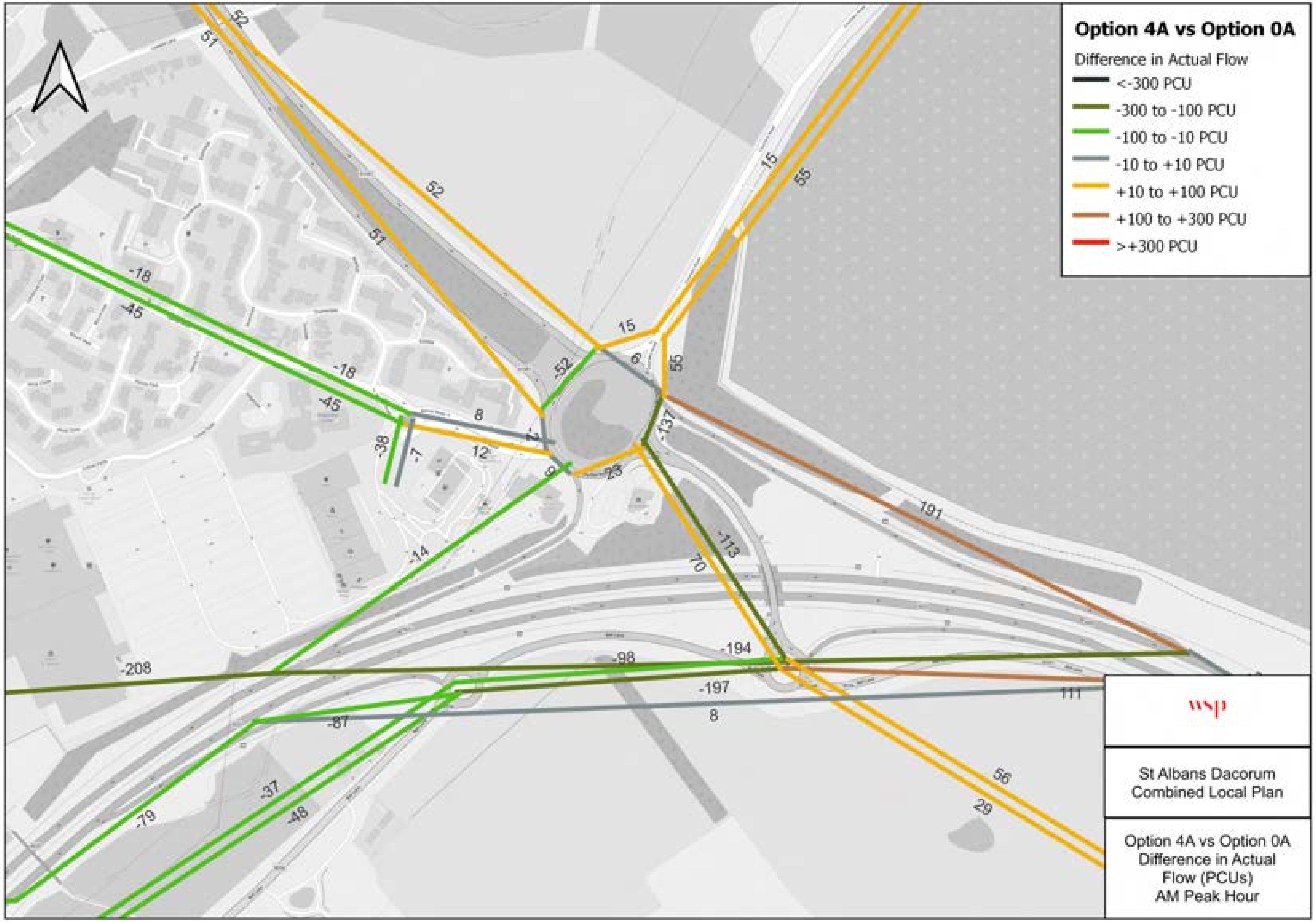

Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
AM Peak Hour

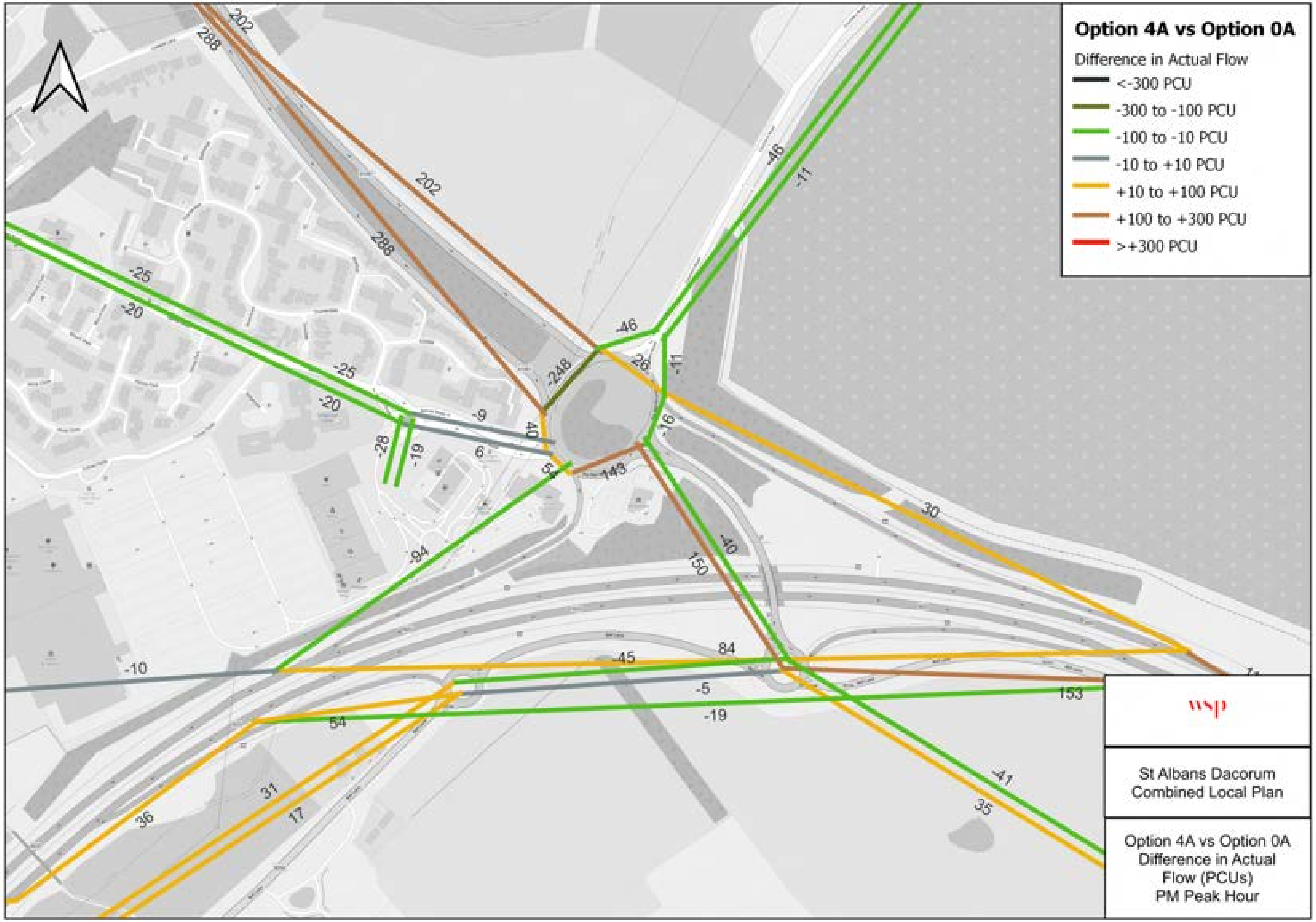

Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
PM Peak Hour


Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
AM Peak Hour


Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
PM Peak Hour

M25 Junction 22


Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
52
51
52
51
-18
-45
-18
-45
15
55
15
6
55
52
8
12
-38
-7
-137
29
191
-113
70
-14
-194
-98
-208
-197
111
8
-87
-37
-48
-79
56
29
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
AM Peak Hour



Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
202
288
202
288
-46
-11
-25
-20
-25
-20
-46
-248
26
-11
-9
40
6
-16
-28
-19
54
143
30
-94
-40
150
84
-10
-45
-5
153
-19
54
31
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17
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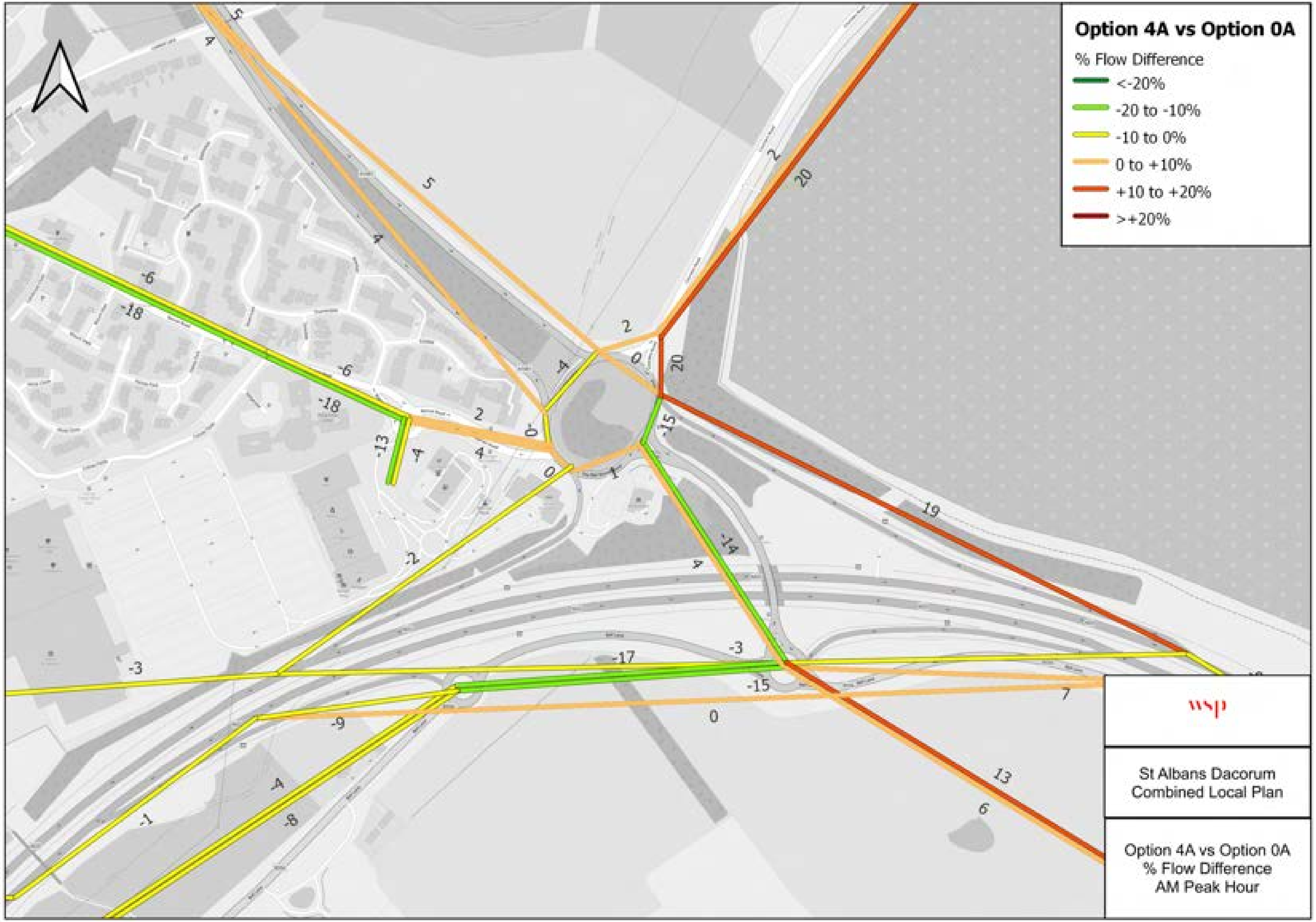
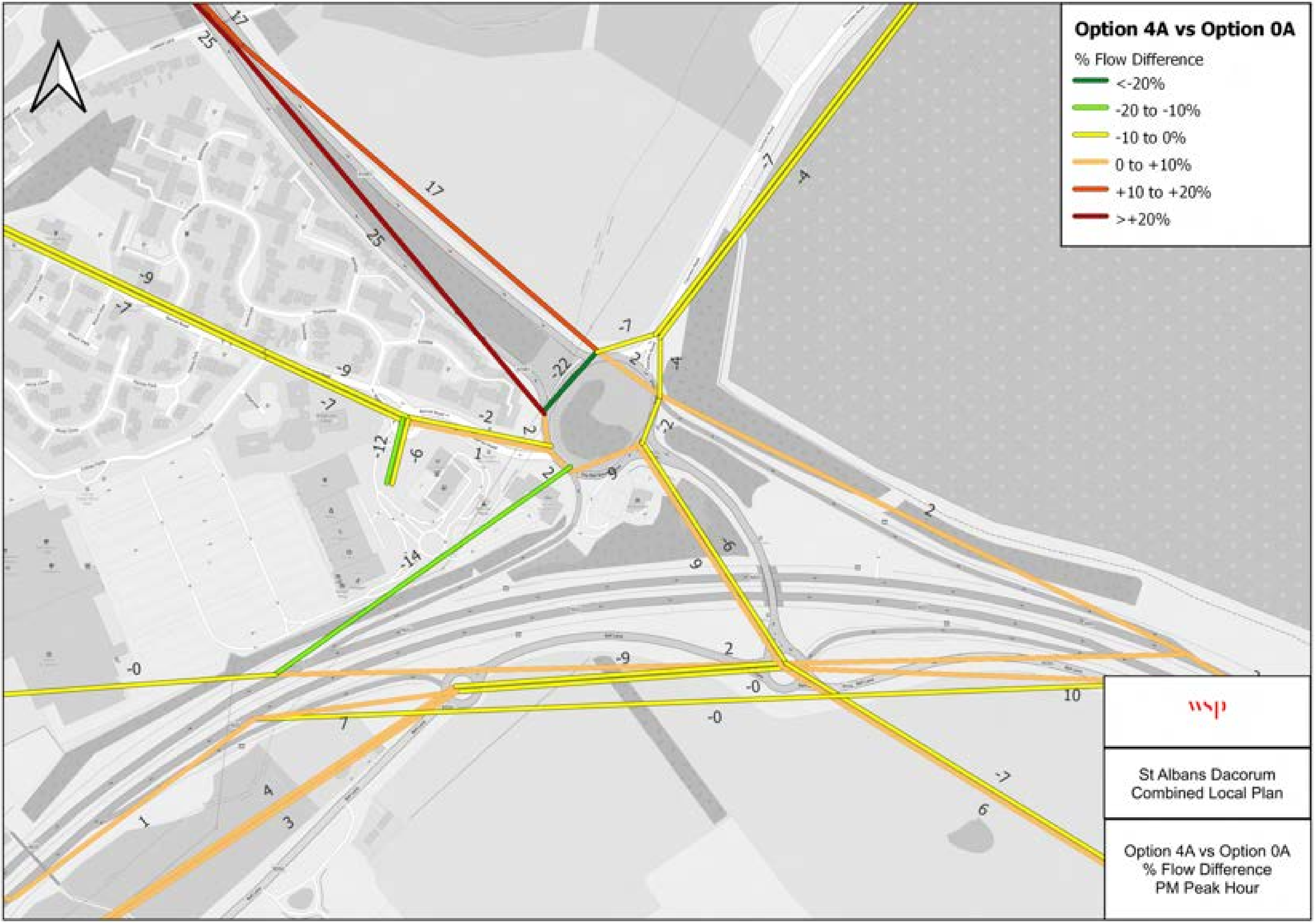
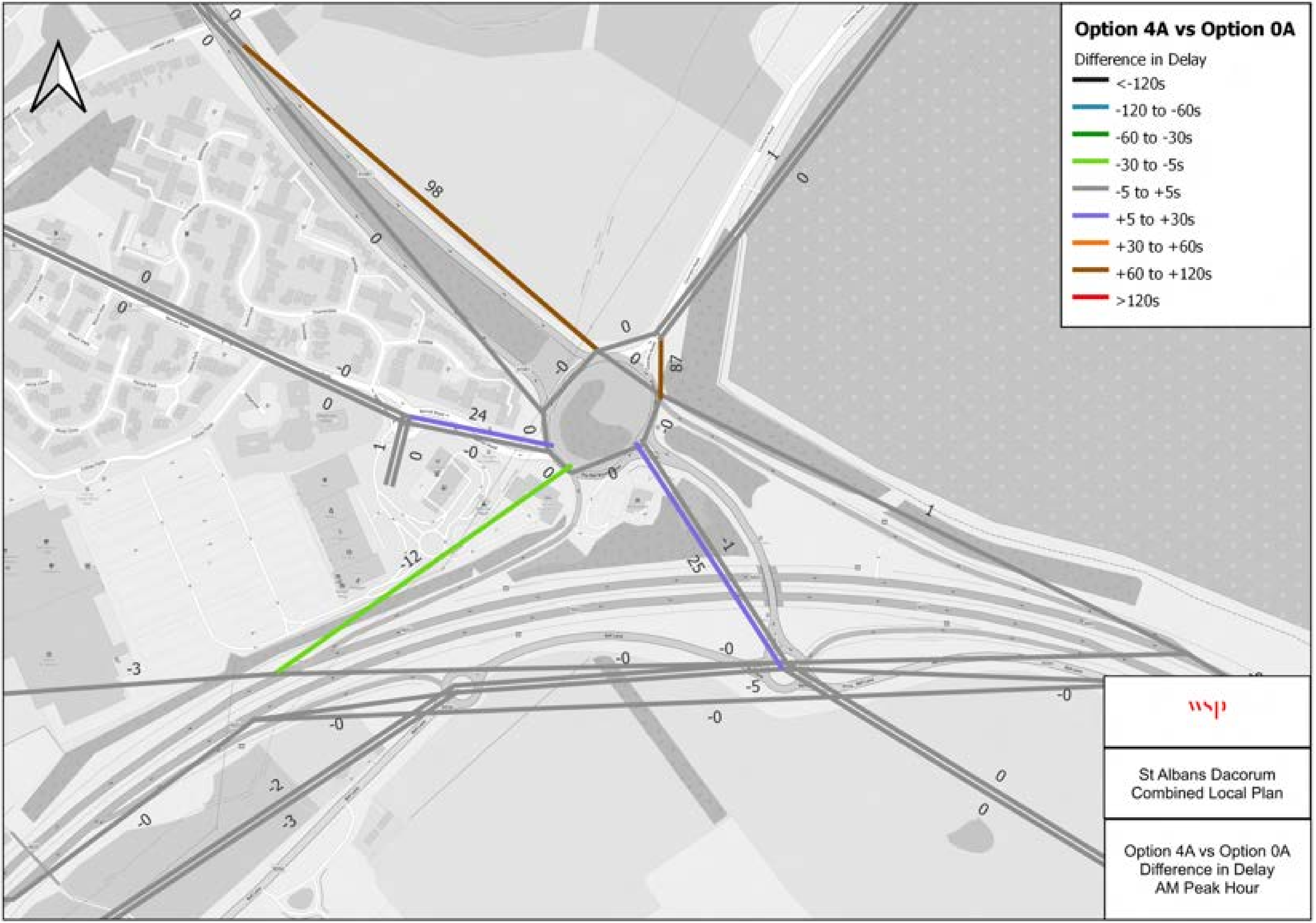
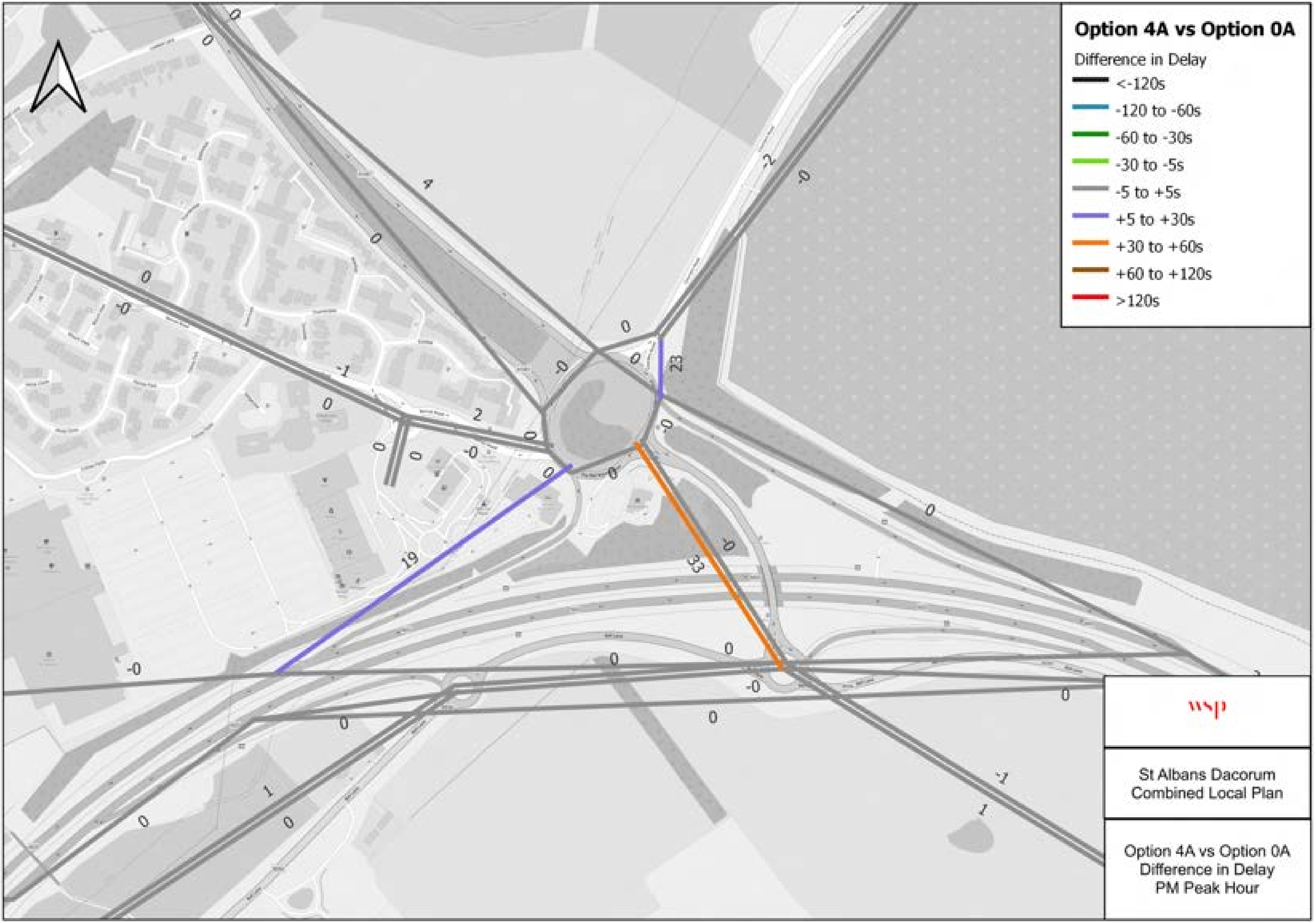
35
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
PM Peak Hour



Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
AM Peak Hour

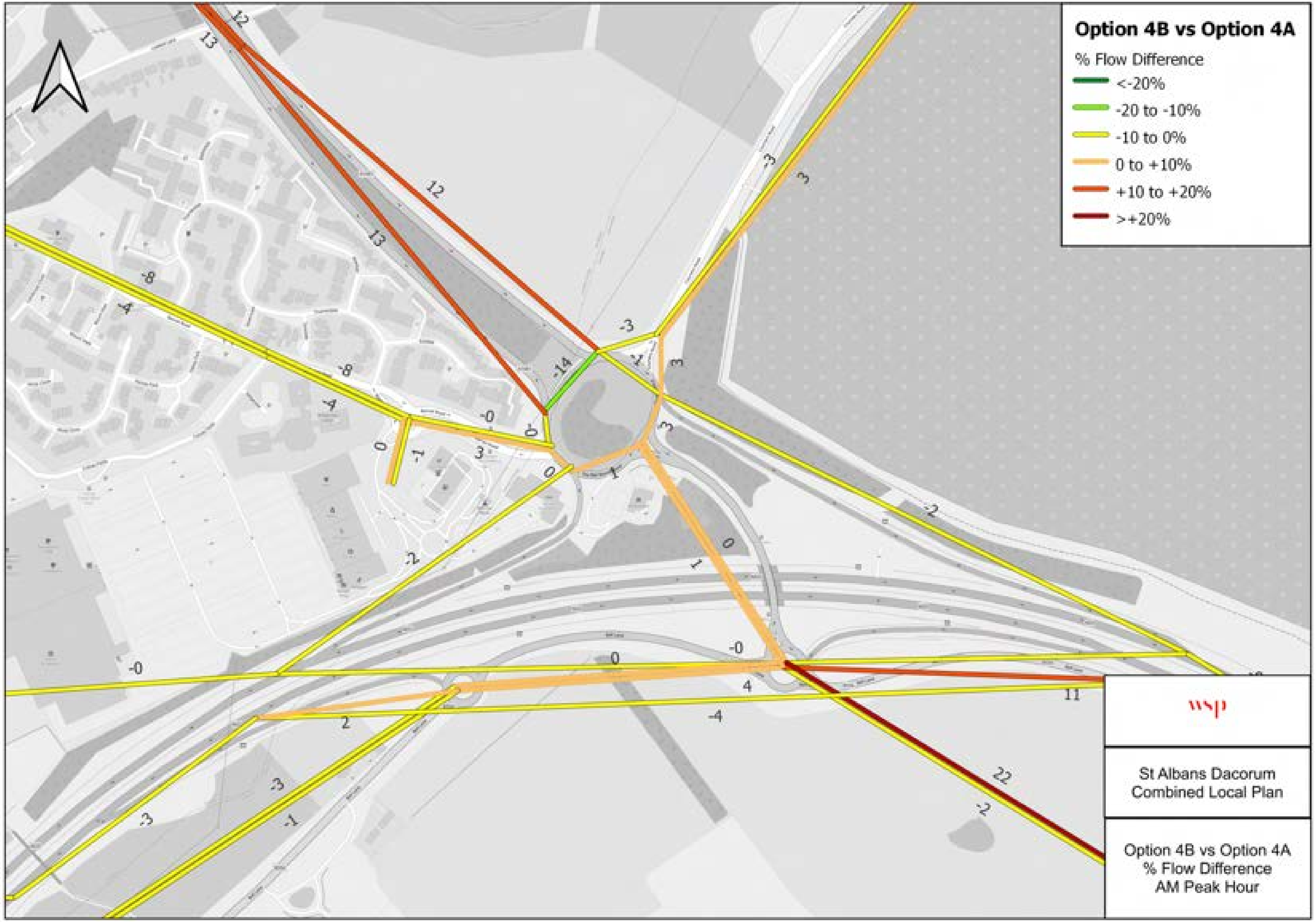

Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
PM Peak Hour


Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A Difference in Delay AM Peak Hour

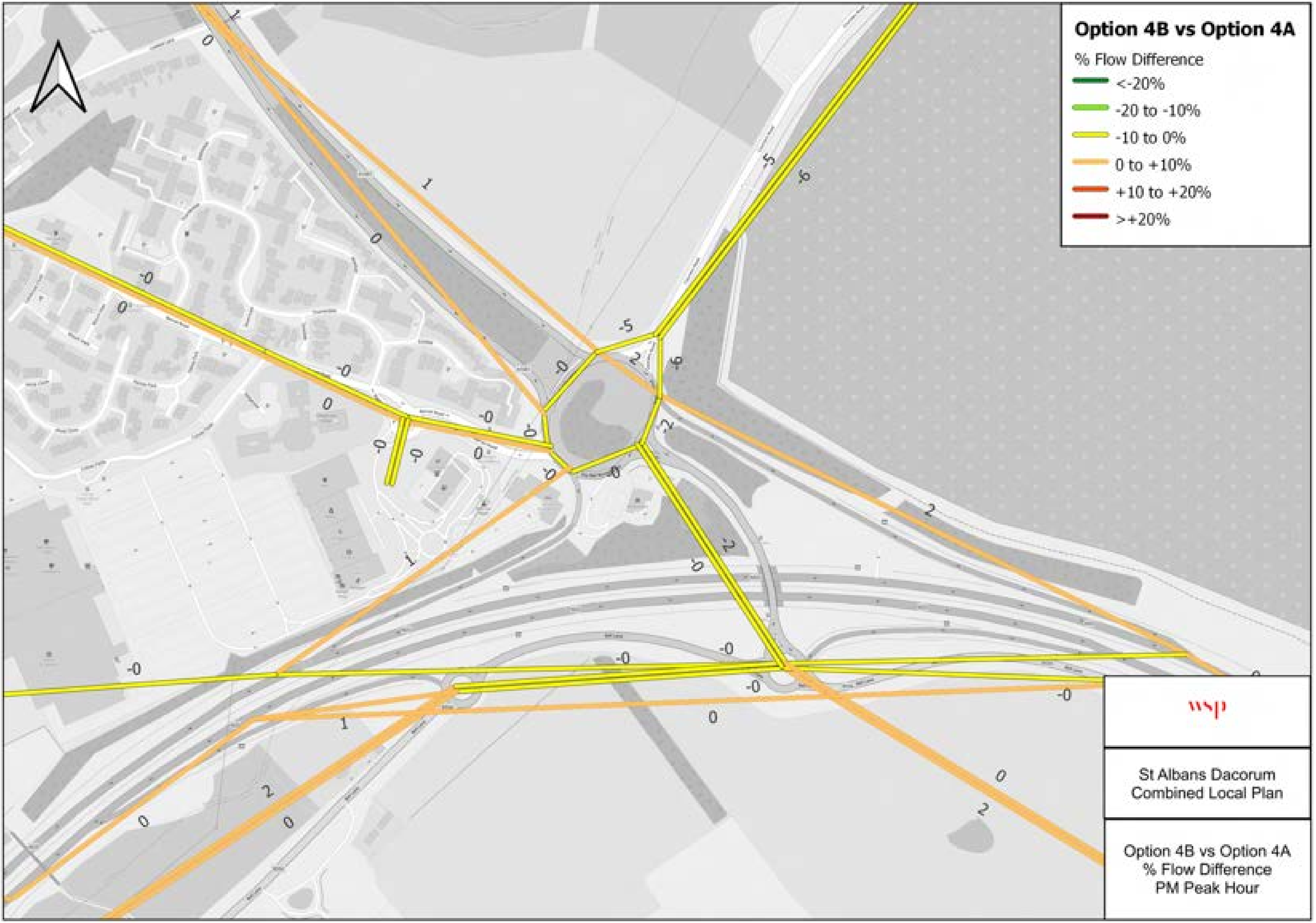

Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
PM Peak Hour

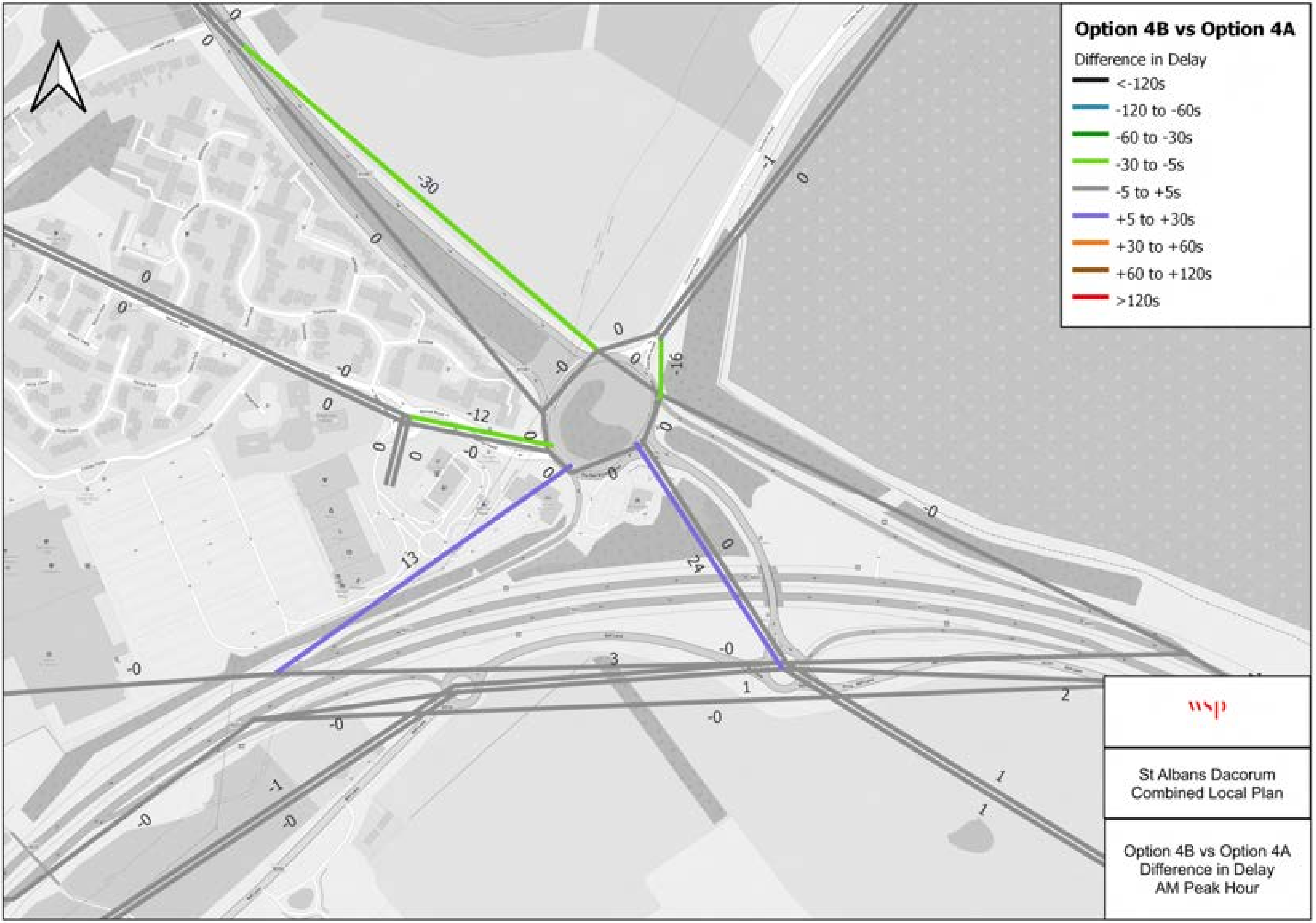

Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Actual
Flow (PCUs)
AM Peak Hour

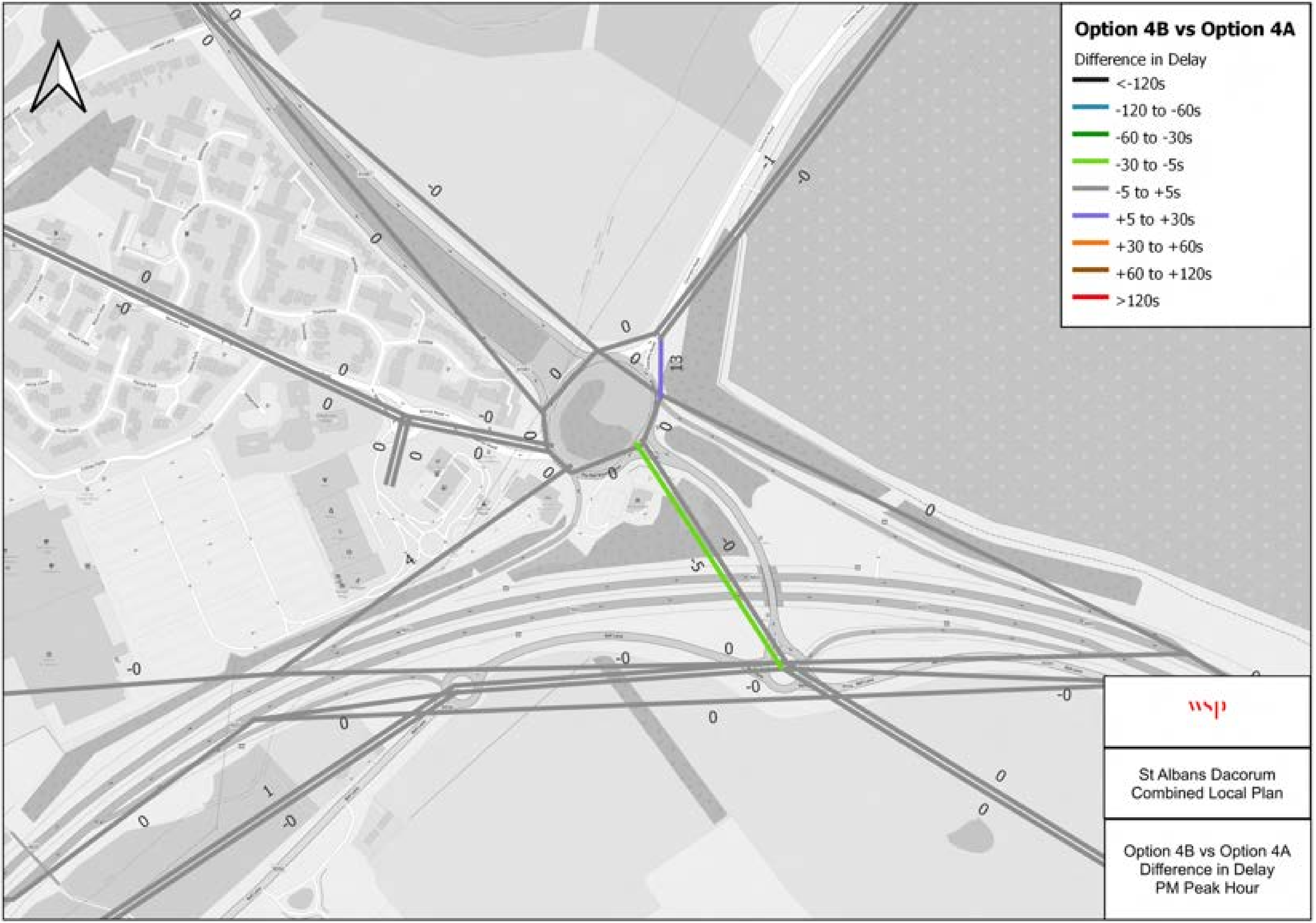

Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) PM Peak Hour



Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
AM Peak Hour

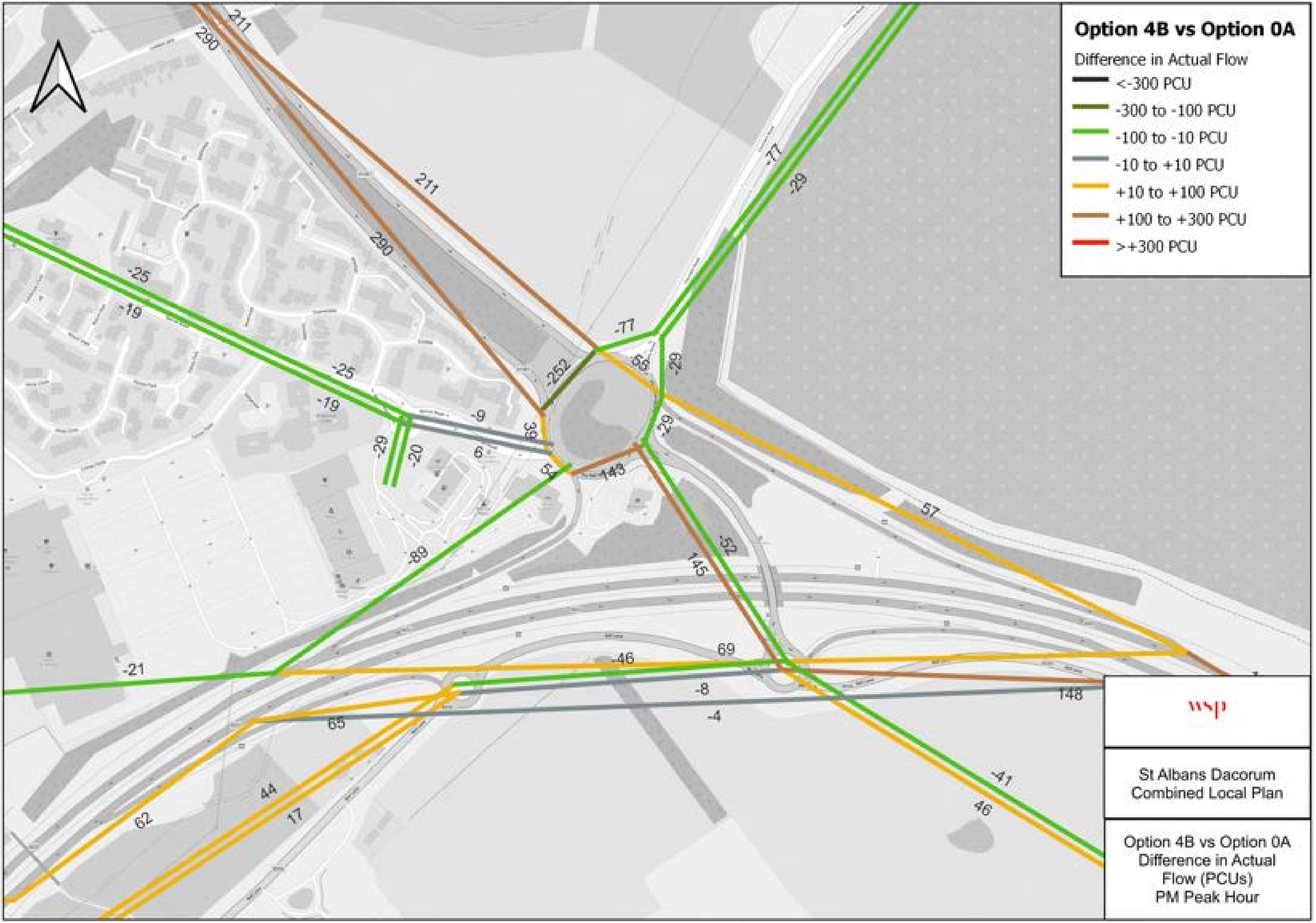

Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
PM Peak Hour

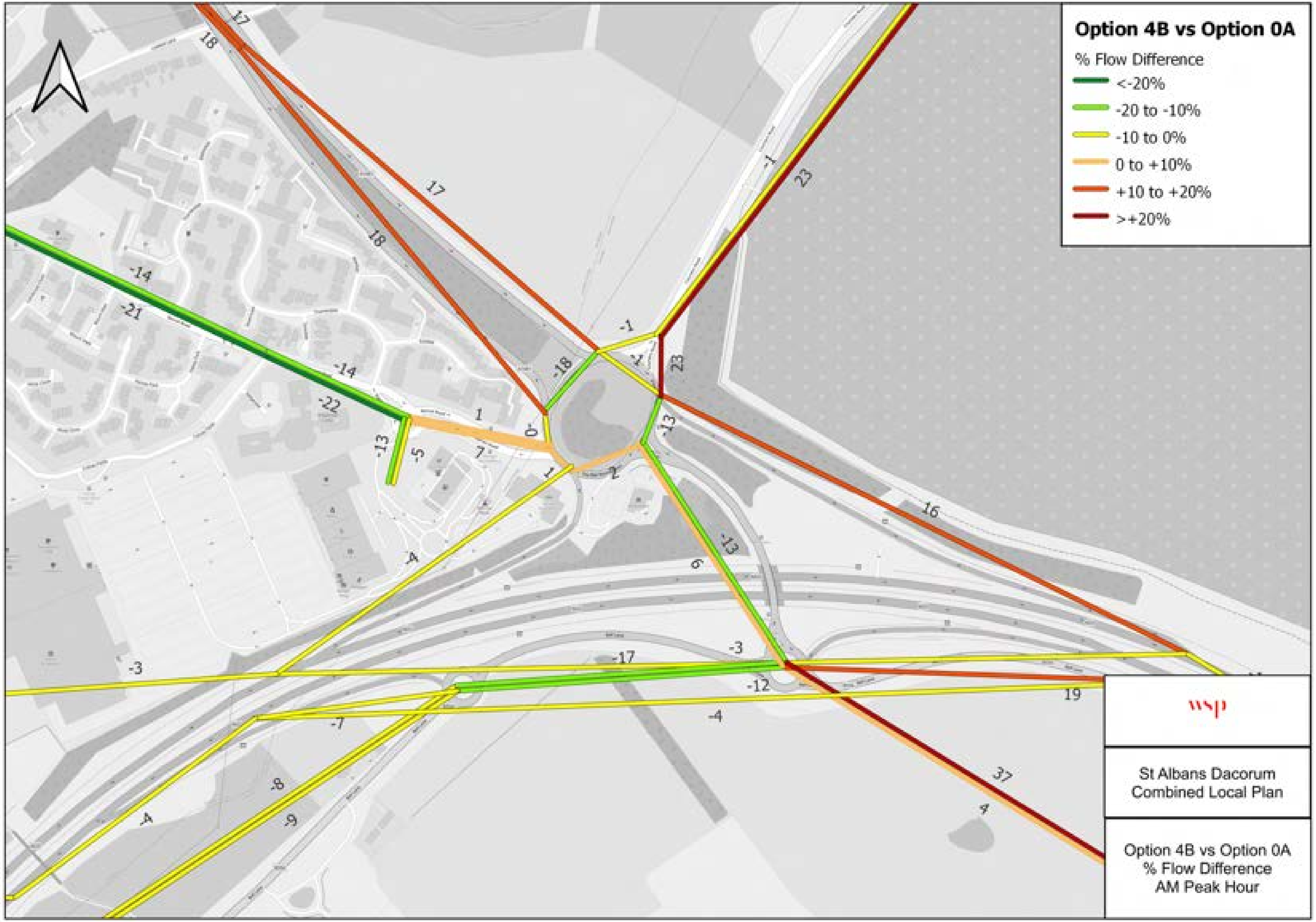

Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
AM Peak Hour

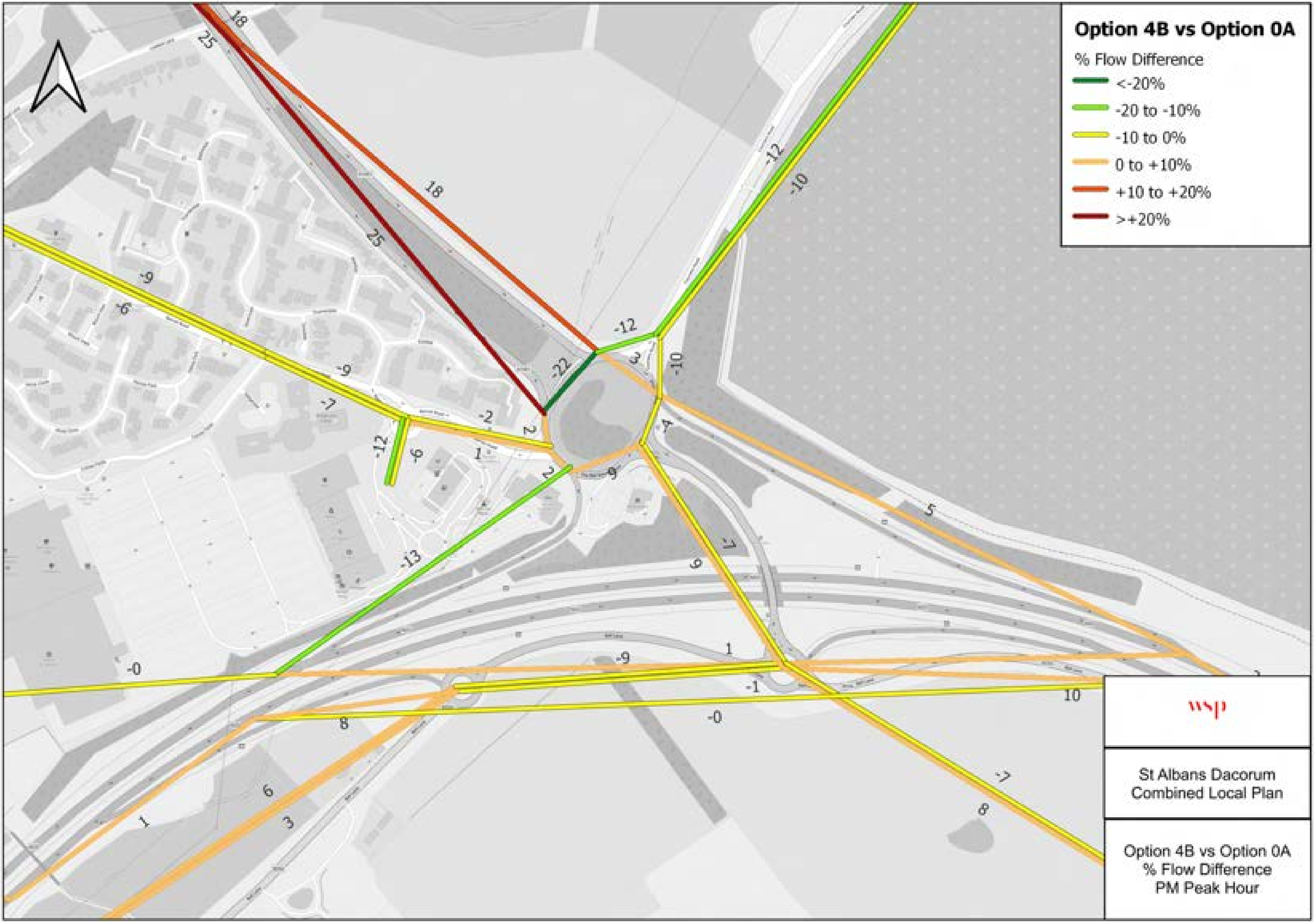

Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
PM Peak Hour

St Albans Dacorum Combined Local Plan

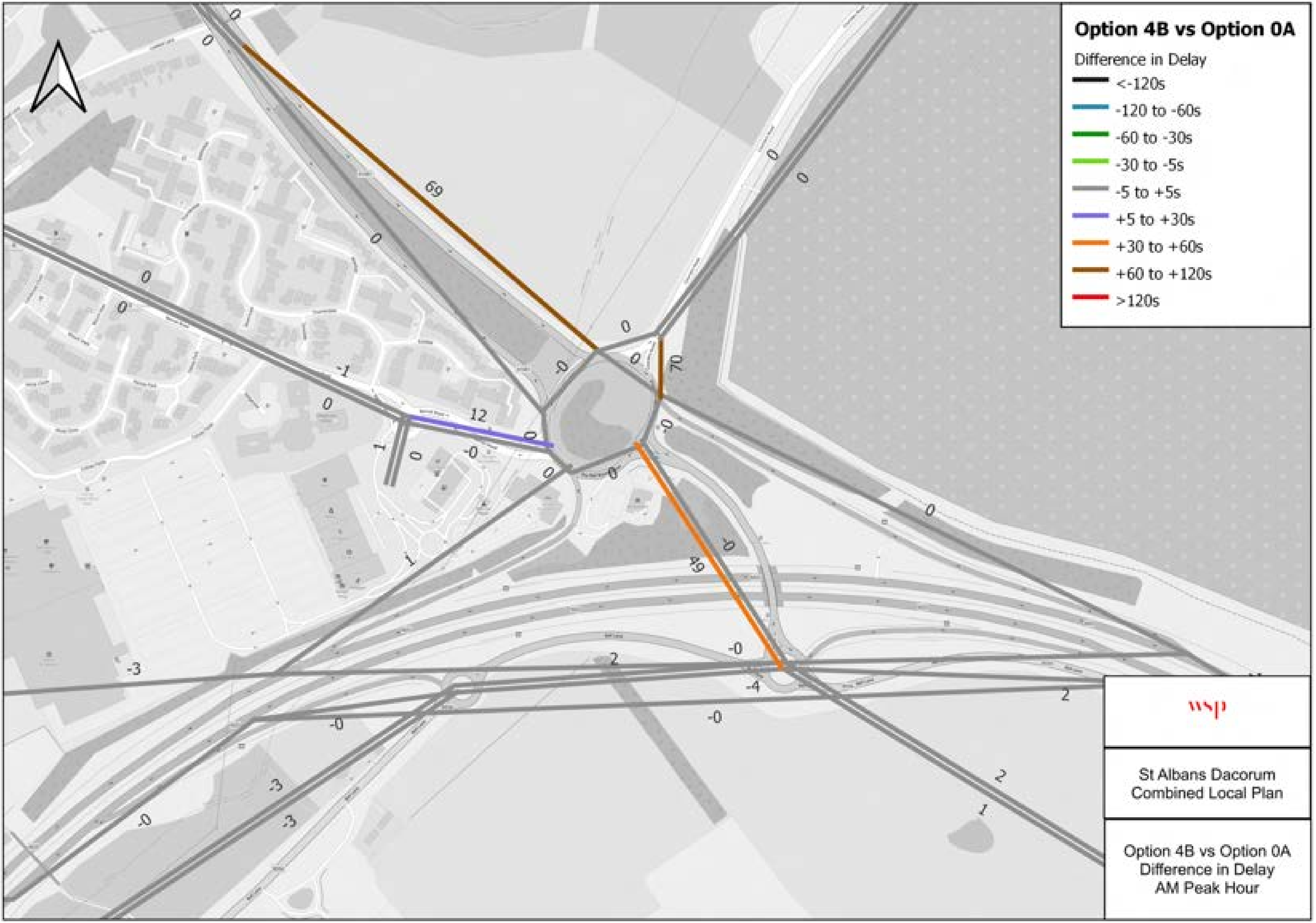
Option 4B vs Option 0A Difference in Actual Flow (PCUs) AM Peak Hour


Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
211
290
211
290
-77
-29
-25
-19
-25
-19
-77
-252
55
-29
-9
39
6
-29
-20
54
143
-29
57
-89
-52
145
-21
-46
69
-8
148
65
-4
44
62
17
-41
46
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Actual
Flow (PCUs)
PM Peak Hour


Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
AM Peak Hour

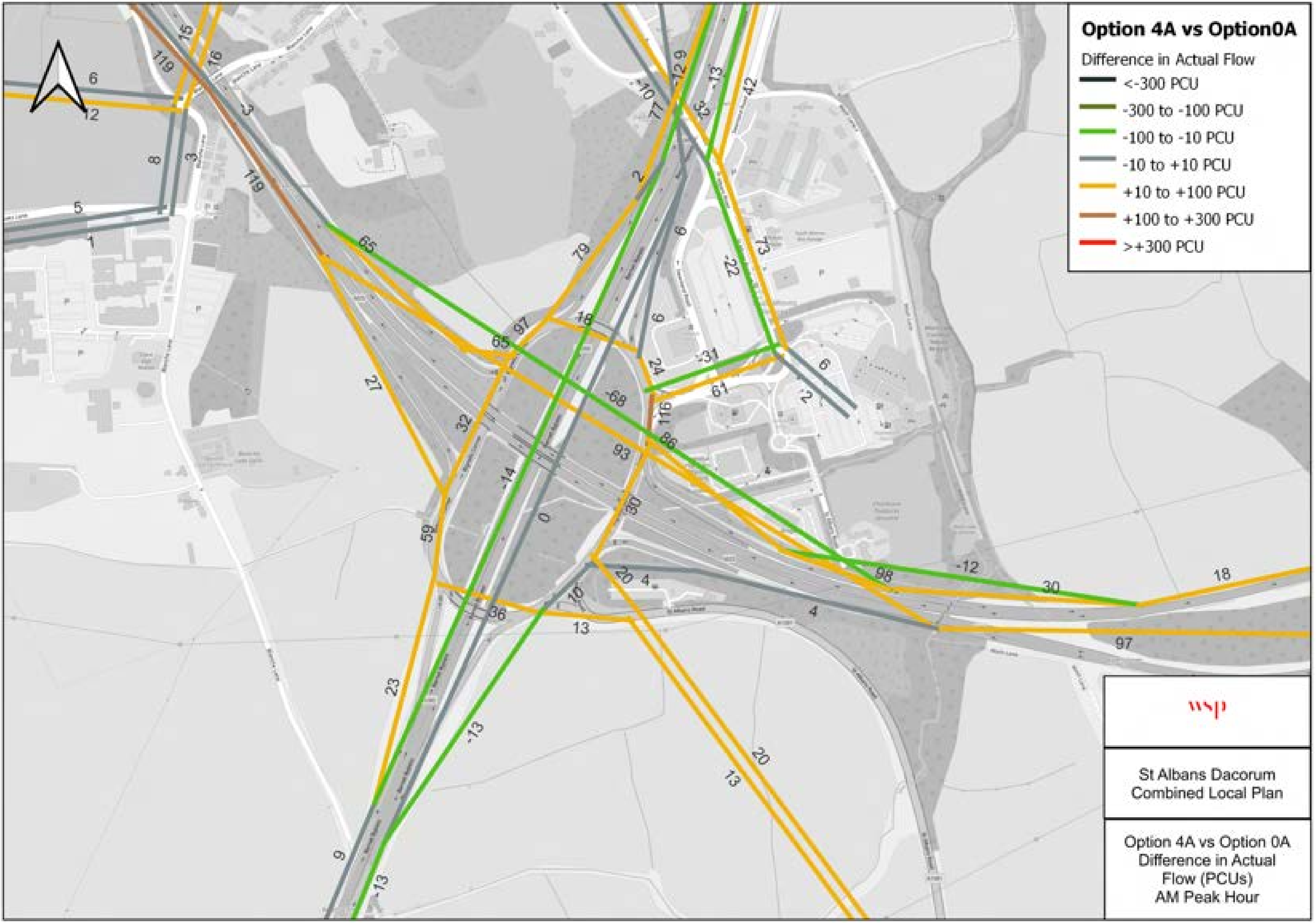


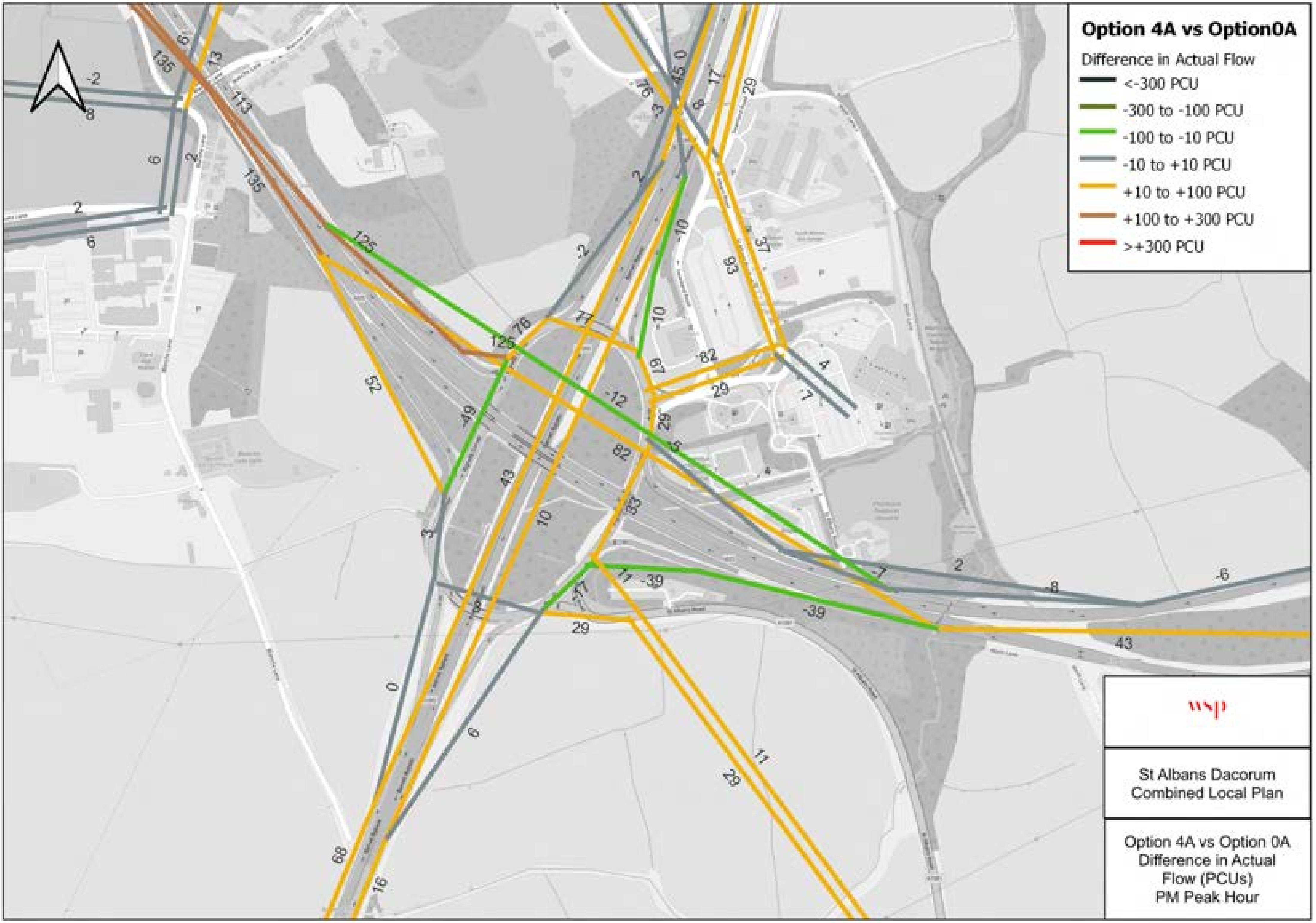
Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
PM Peak Hour


Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
AM Peak Hour

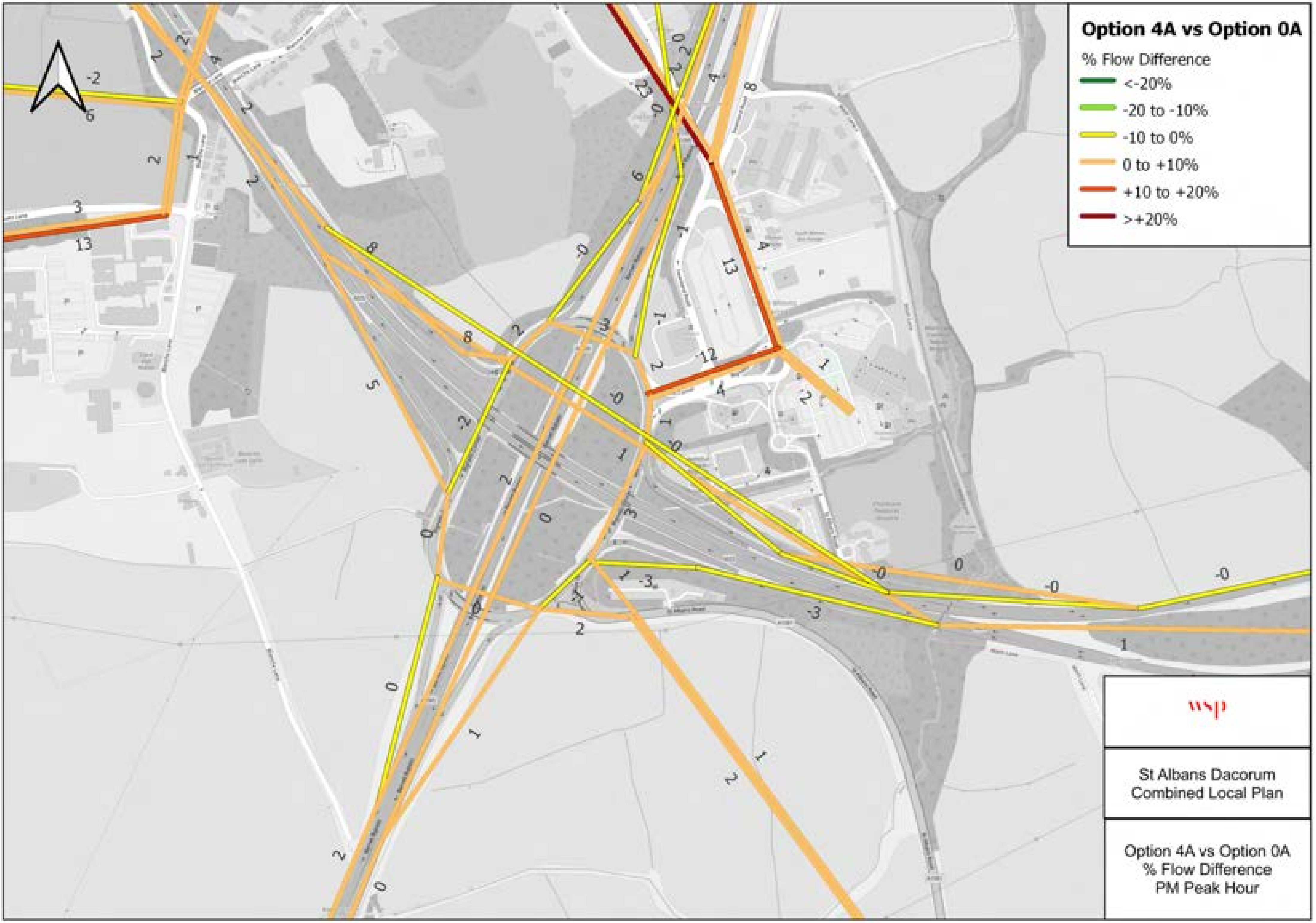
Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
36
23
28
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
PM Peak Hour

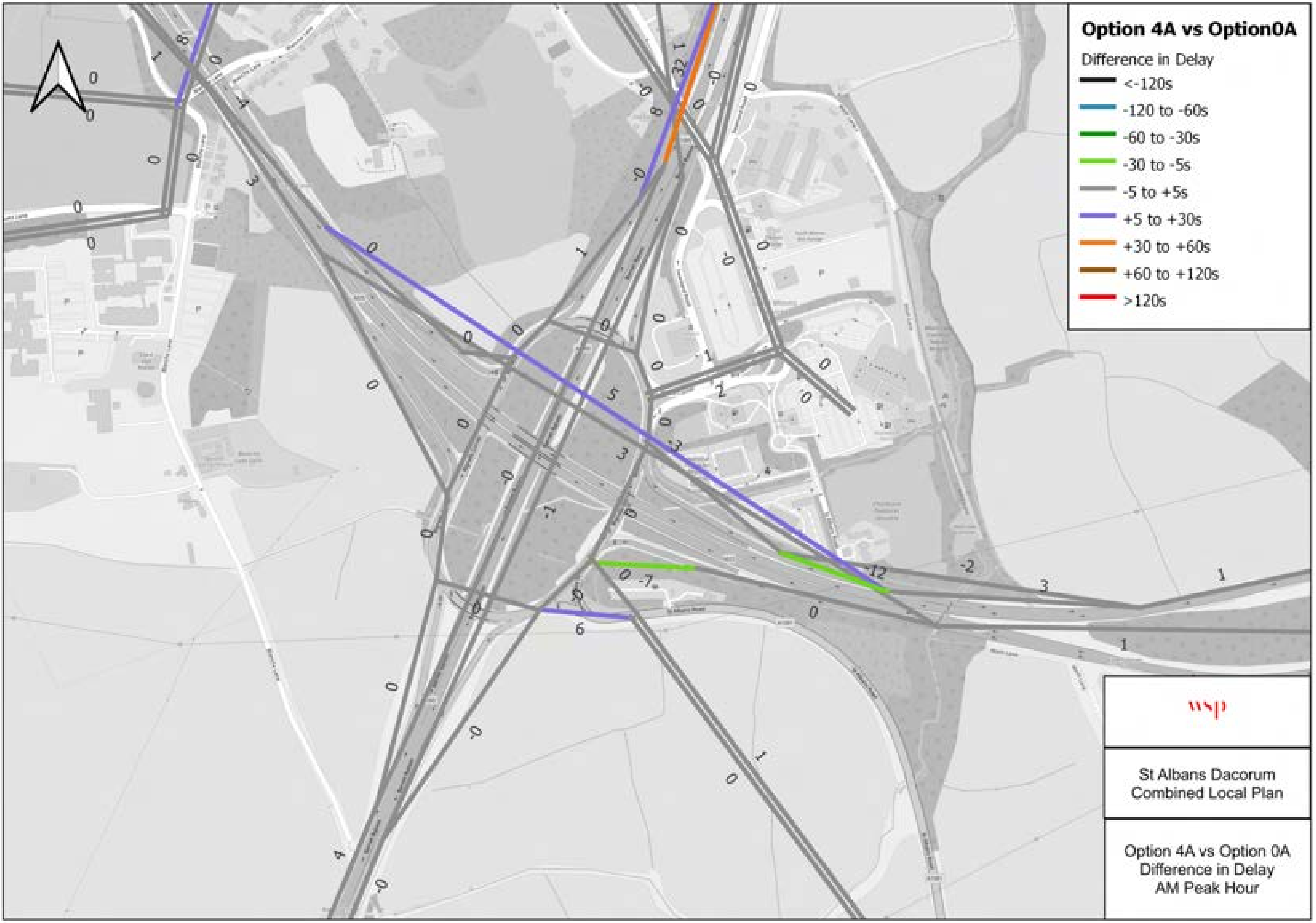
M 25 Junction 23

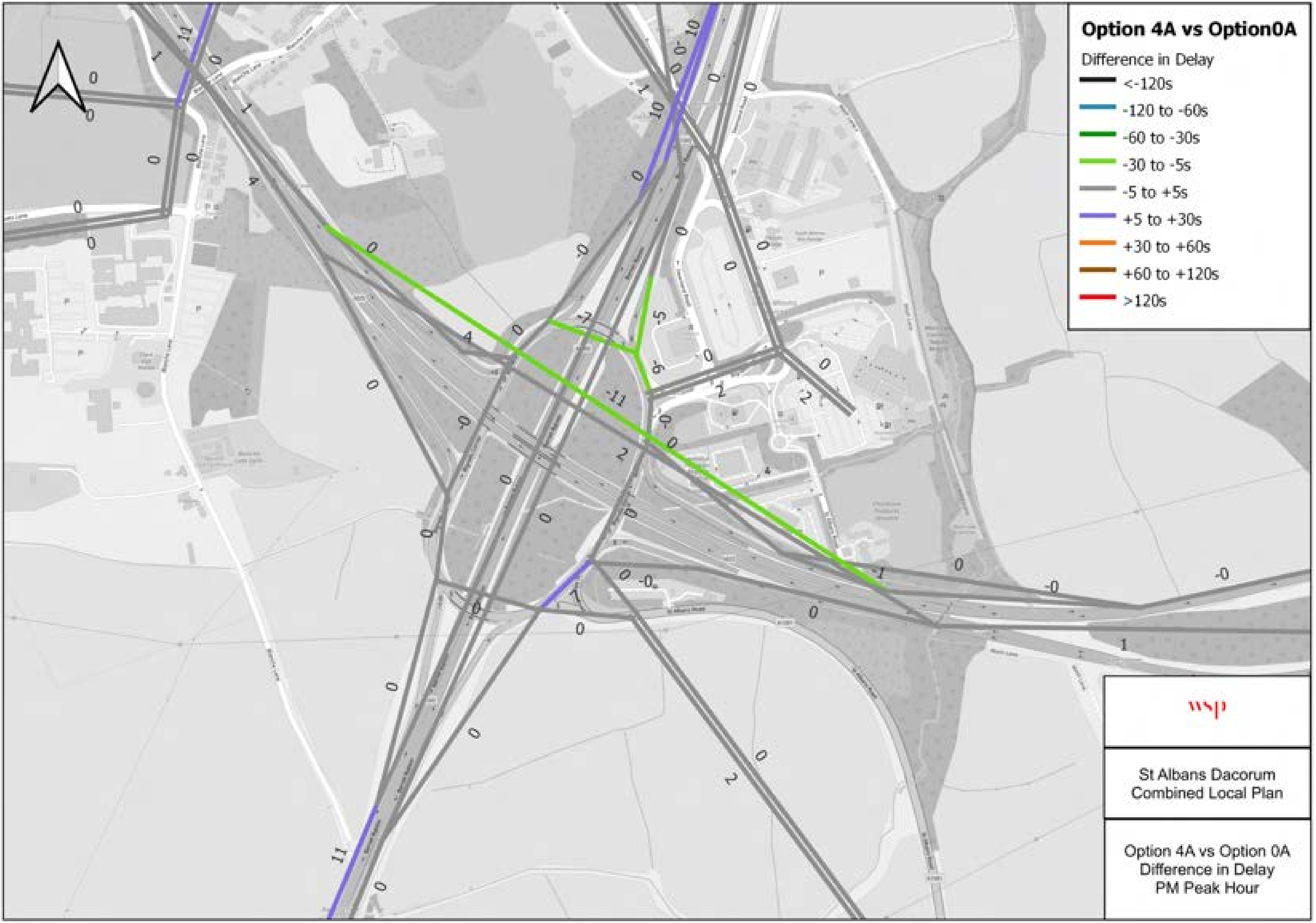

Option 4A vs Option0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A
Difference in Actual Flow (PCUs)
AM Peak Hour


Option 4A vs Option0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
PM Peak Hour


Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
AM Peak Hour

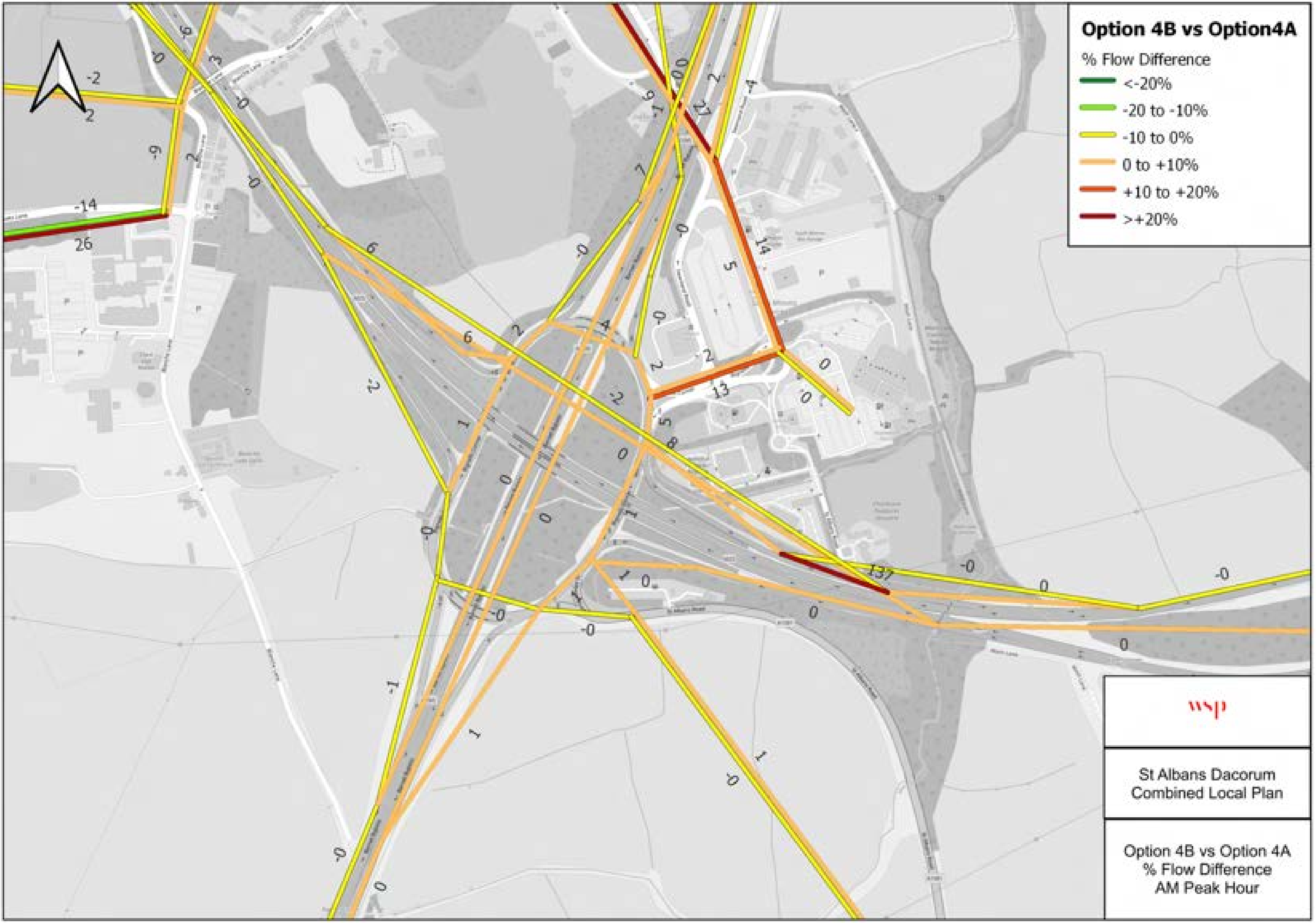

Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
PM Peak Hour


Option 4A vs Option0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
AM Peak Hour

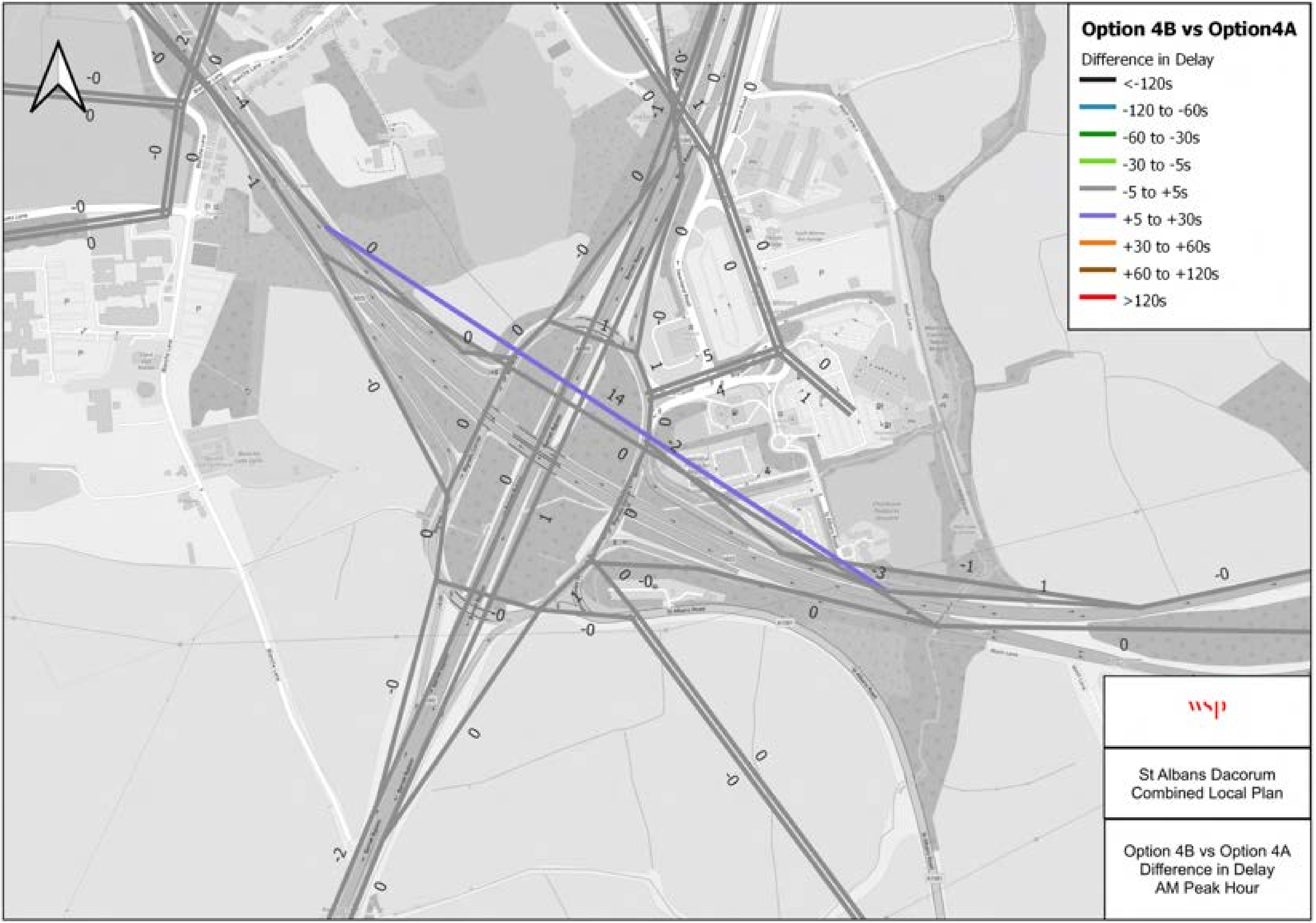

Option 4A vs Option0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
PM Peak Hour


Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Actual
Flow (PCUs)
AM Peak Hour


Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Actual
Flow (PCUs)
PM Peak Hour

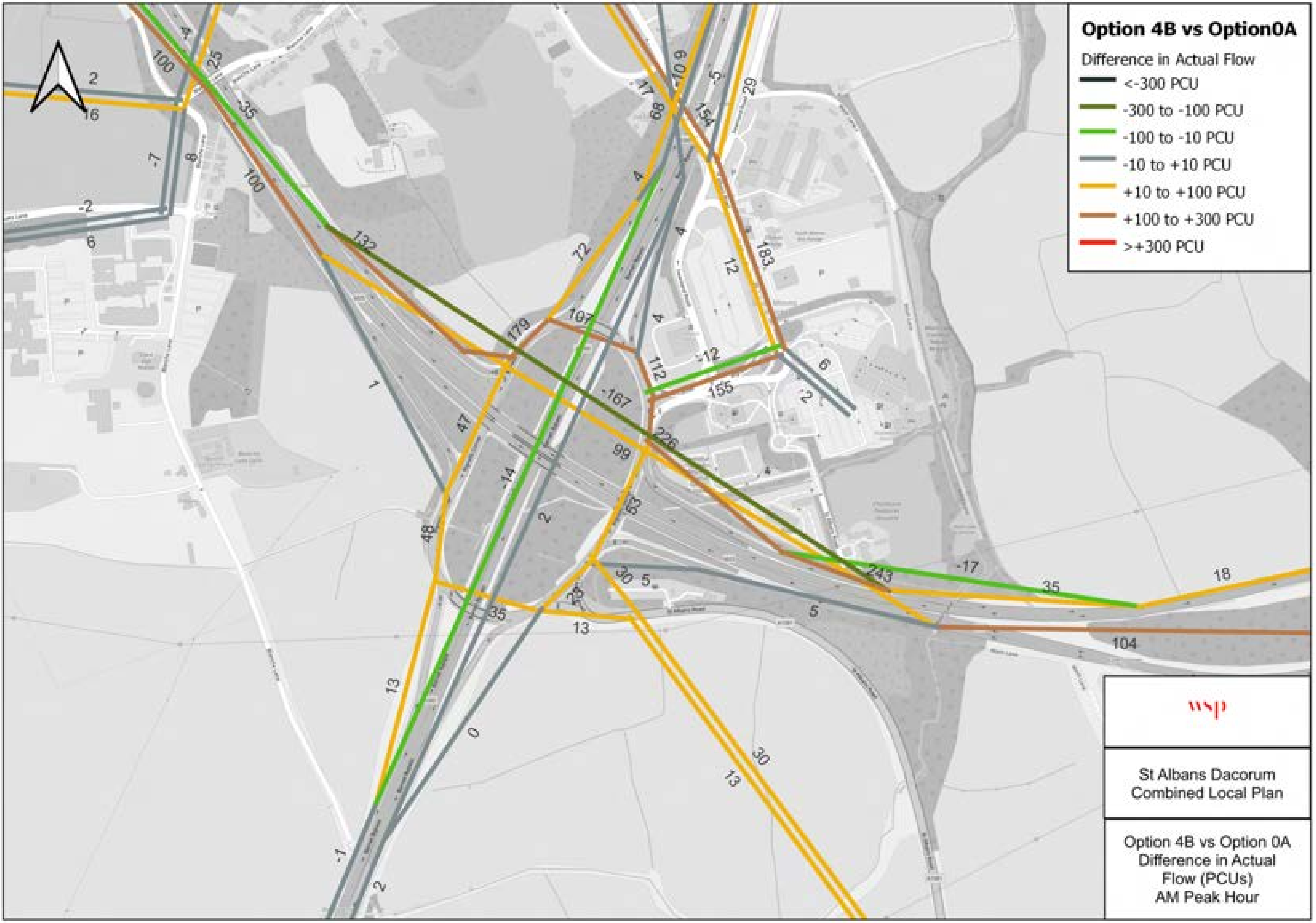

Option 4B vs Option4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
AM Peak Hour


Option 4B vs Option4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
PM Peak Hour

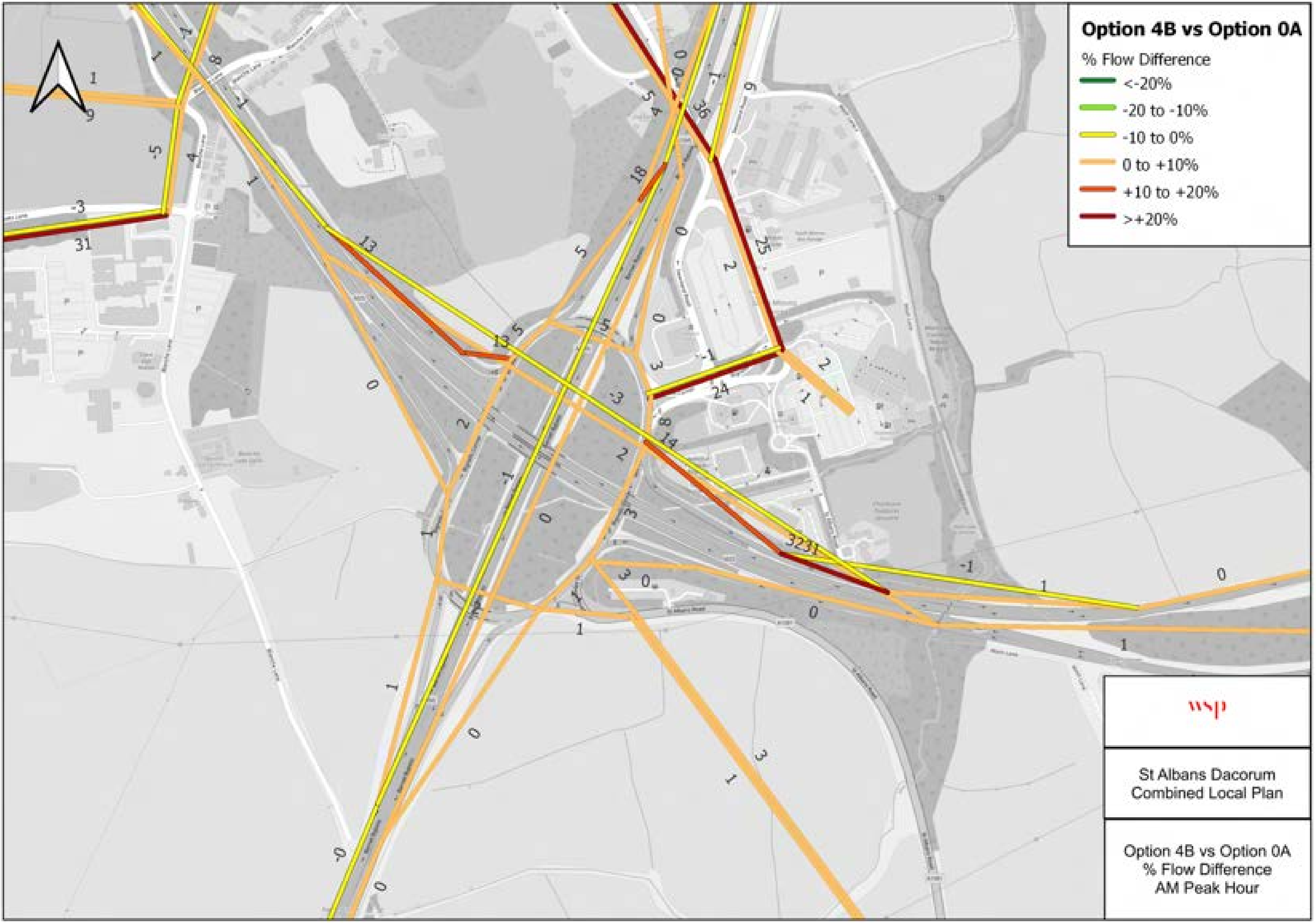


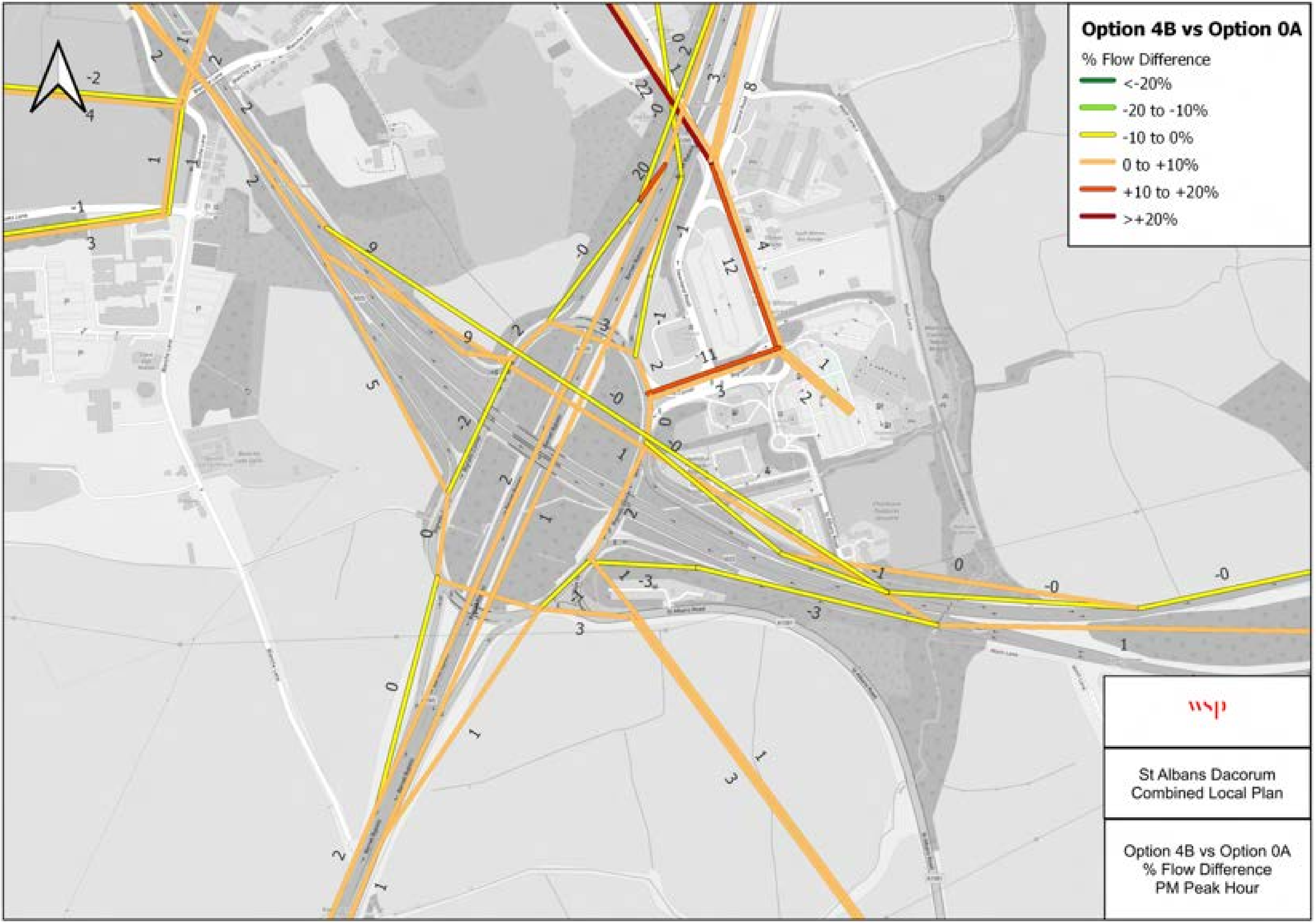
Option 4B vs Option4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
AM Peak Hour

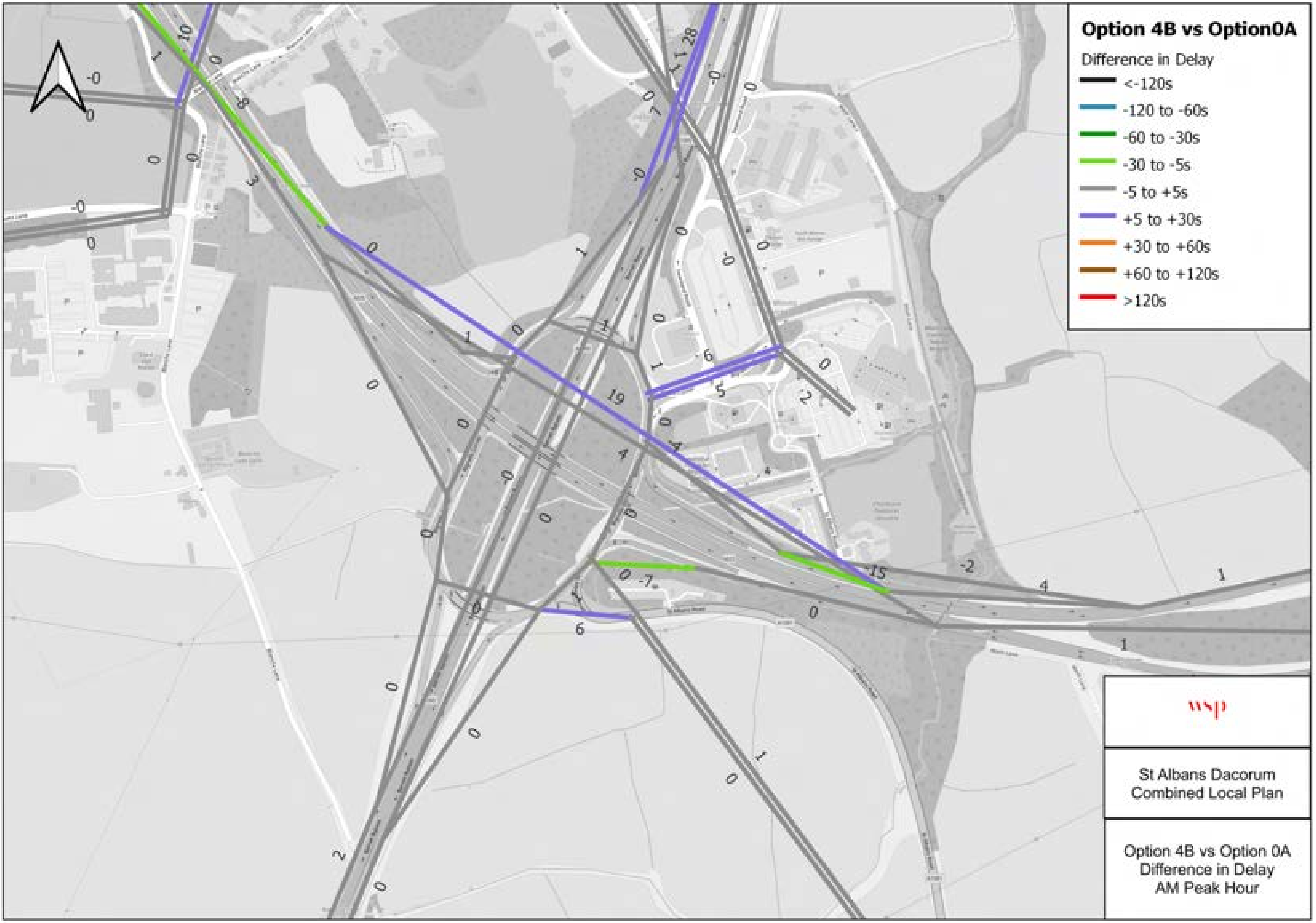

Option 4B vs Option4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
PM Peak Hour

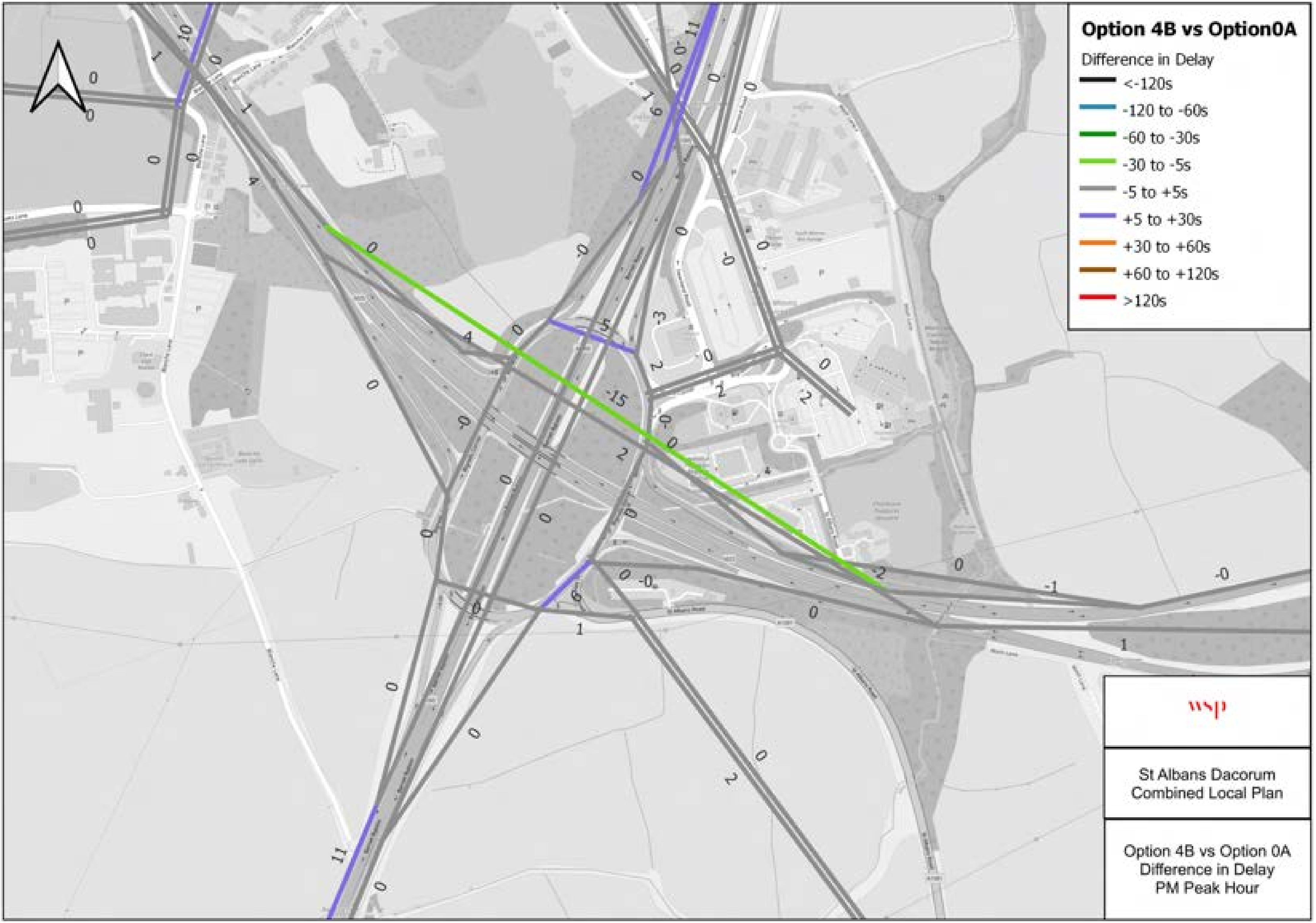

Option 4B vs Option0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Actual
Flow (PCUs)
AM Peak Hour


Option 4B vs Option0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Actual
Flow (PCUs)
PM Peak Hour


Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
AM Peak Hour


Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
PM Peak Hour

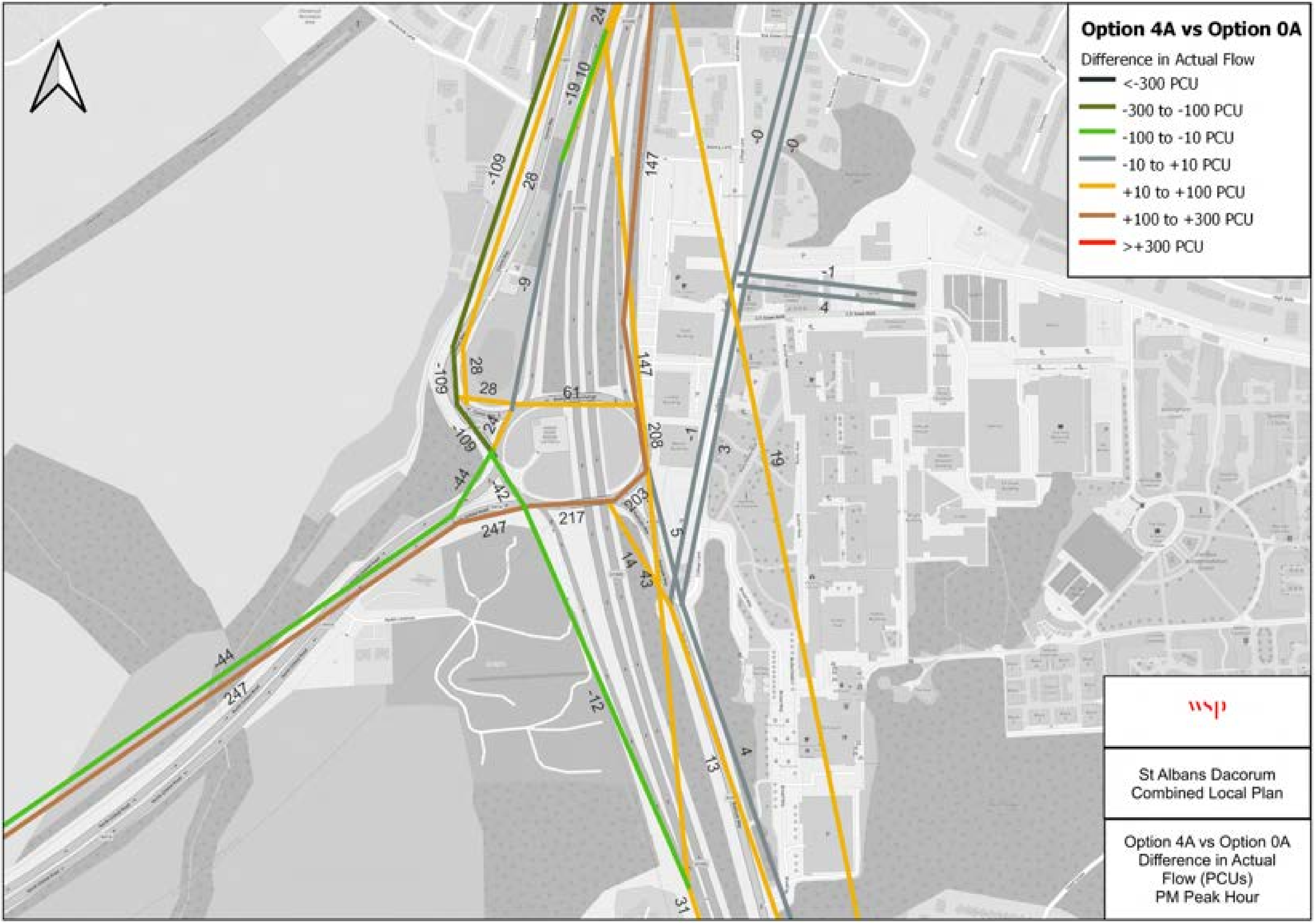

Option 4B vs Option0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
AM Peak Hour


Option 4B vs Option0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
PM Peak Hour

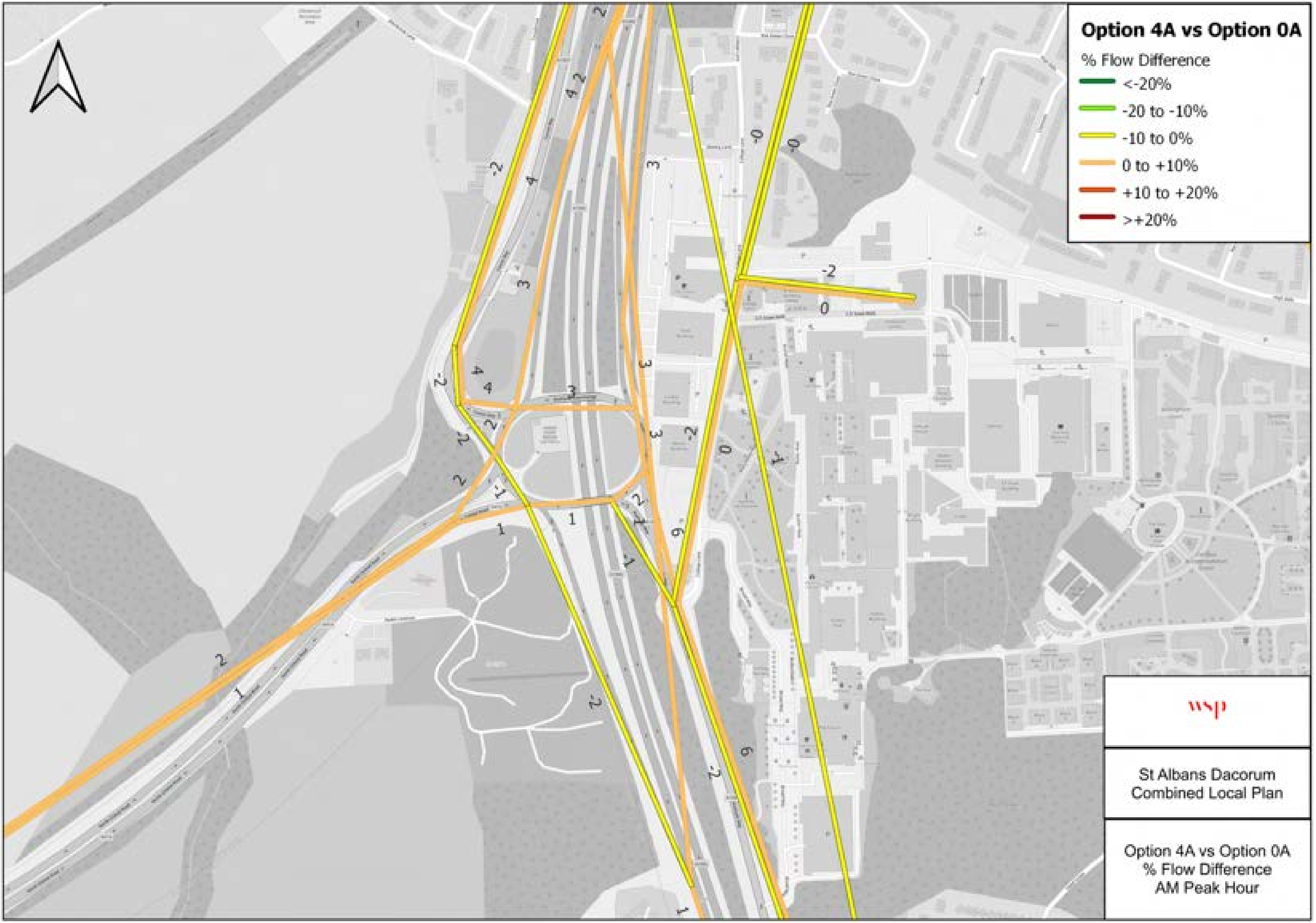
A1(M) Junction 3

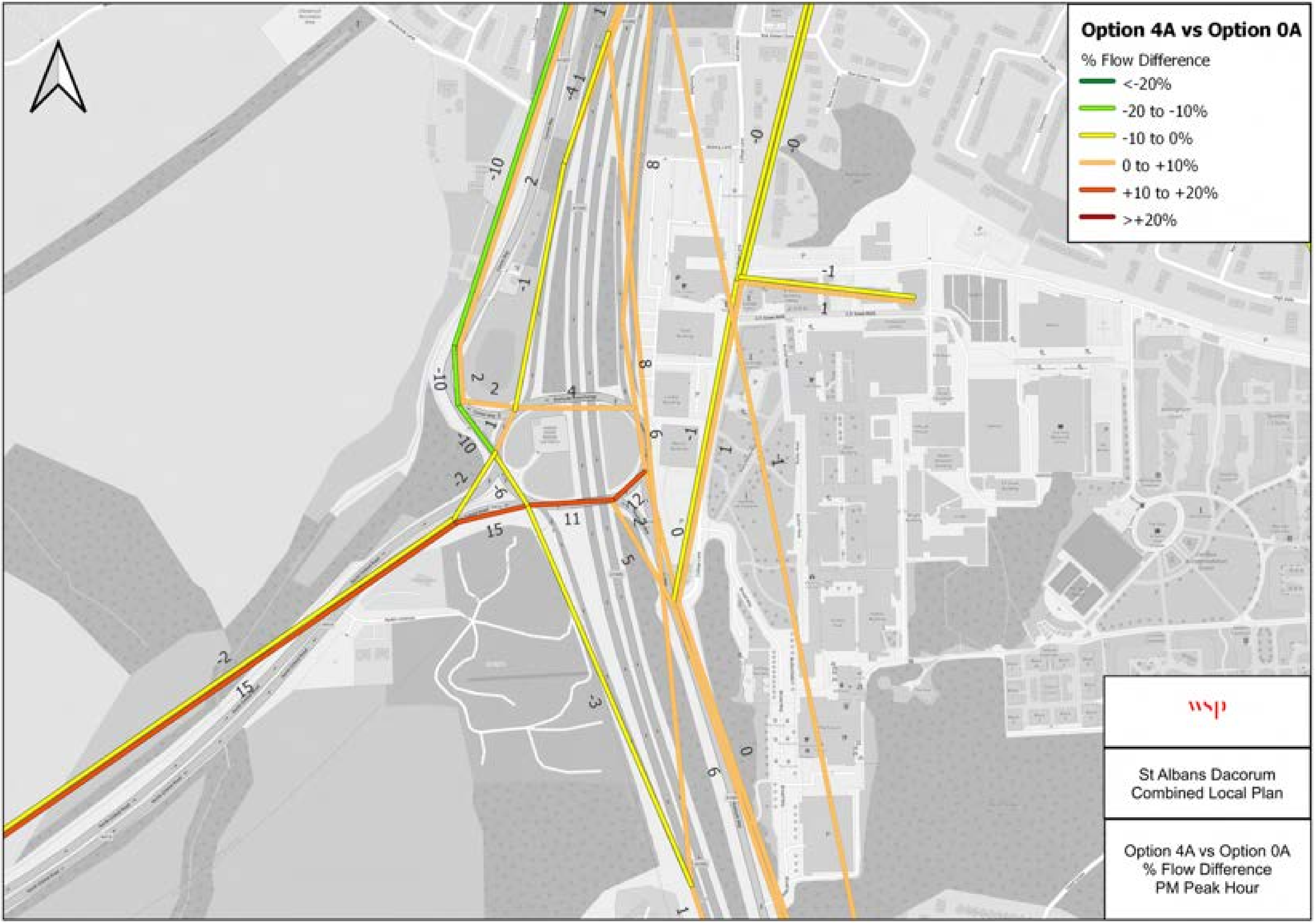
St Albans Dacorum
Combined Local Plan

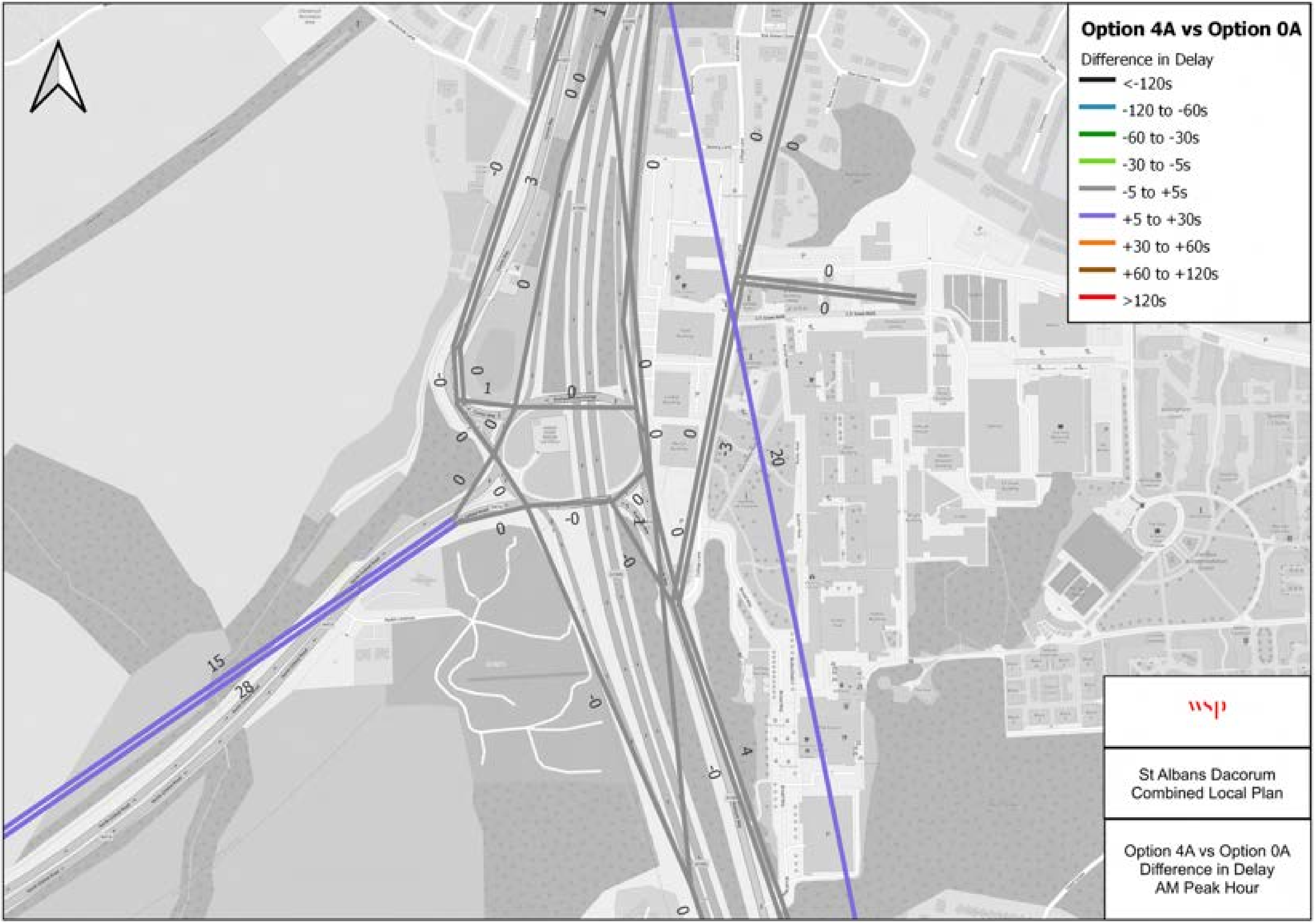
Option 4A vs Option 0A
Difference in Actual
Flow (PCUs)
AM Peak Hour

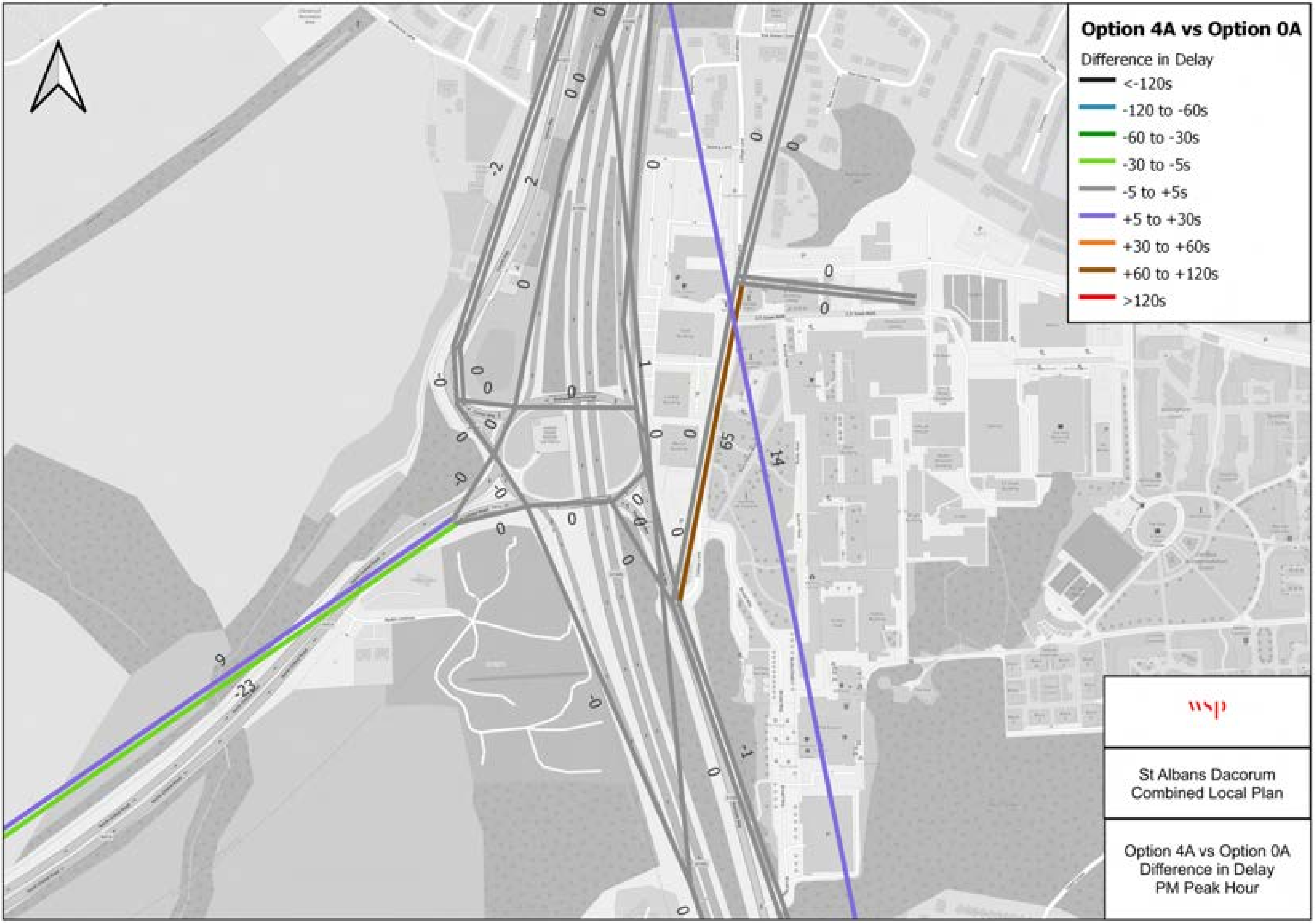


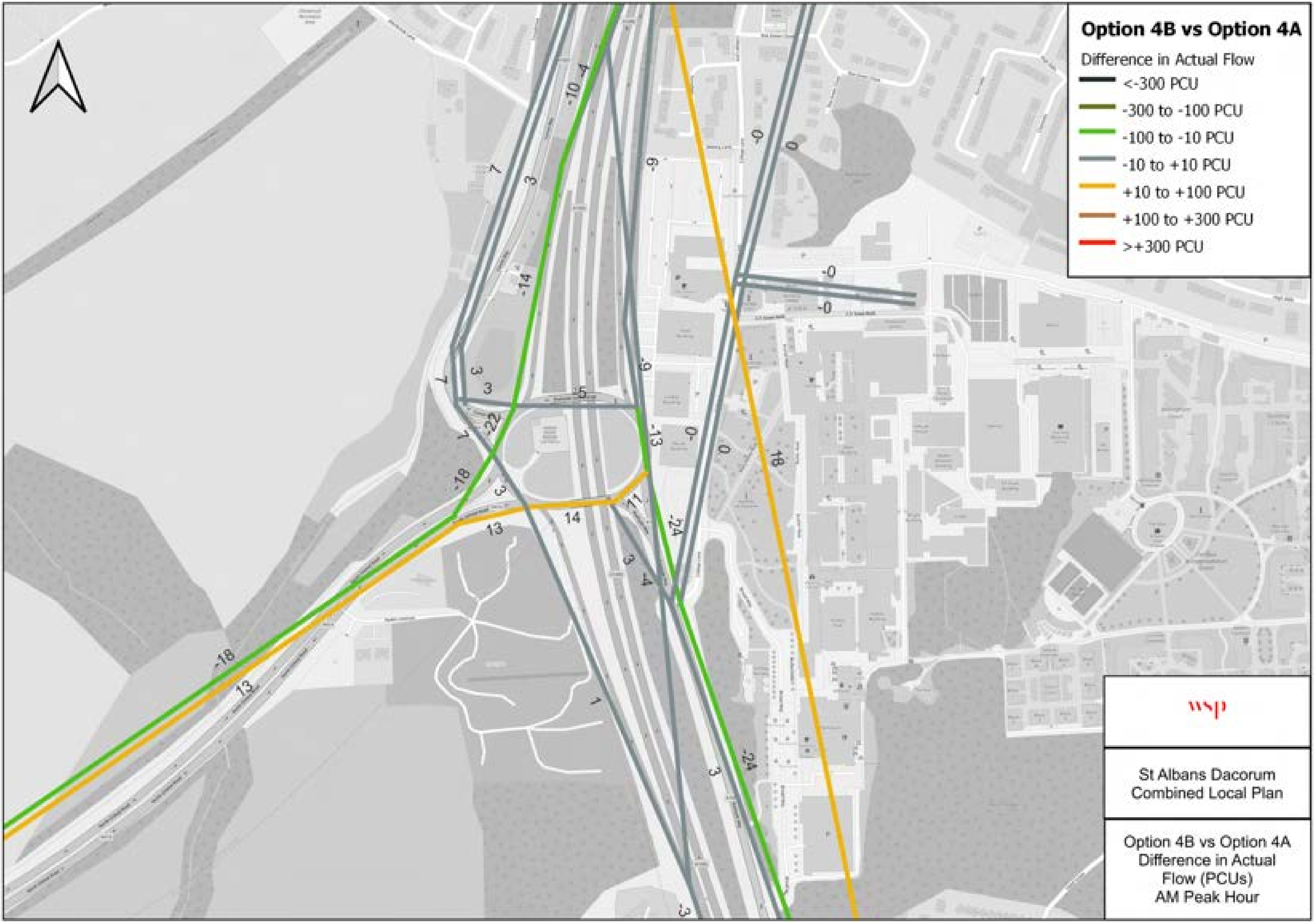
Option 4A vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A Difference in Actual Flow (PCUs) PM Peak Hour


Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
AM Peak Hour

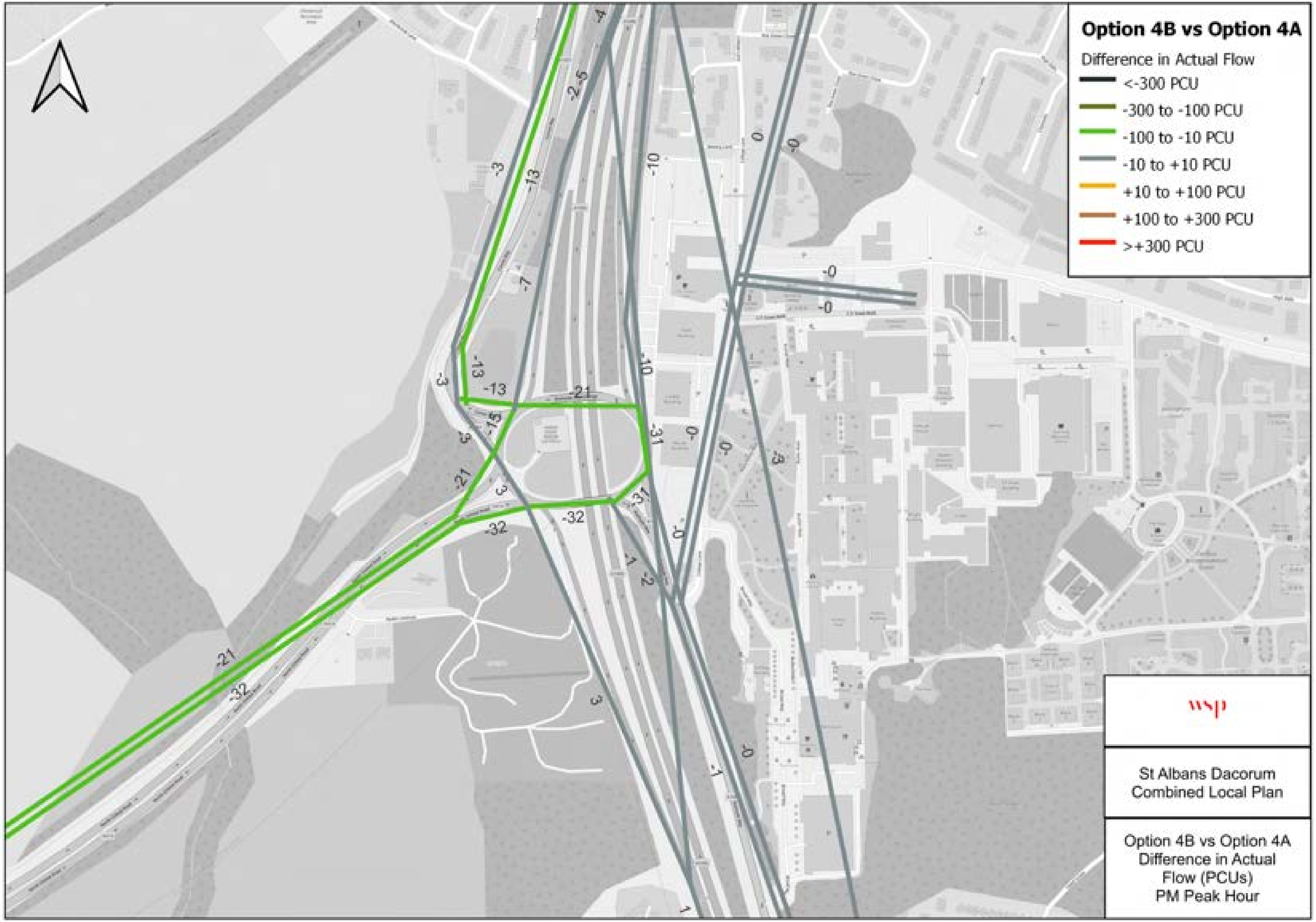

Option 4A vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
% Flow Difference
PM Peak Hour

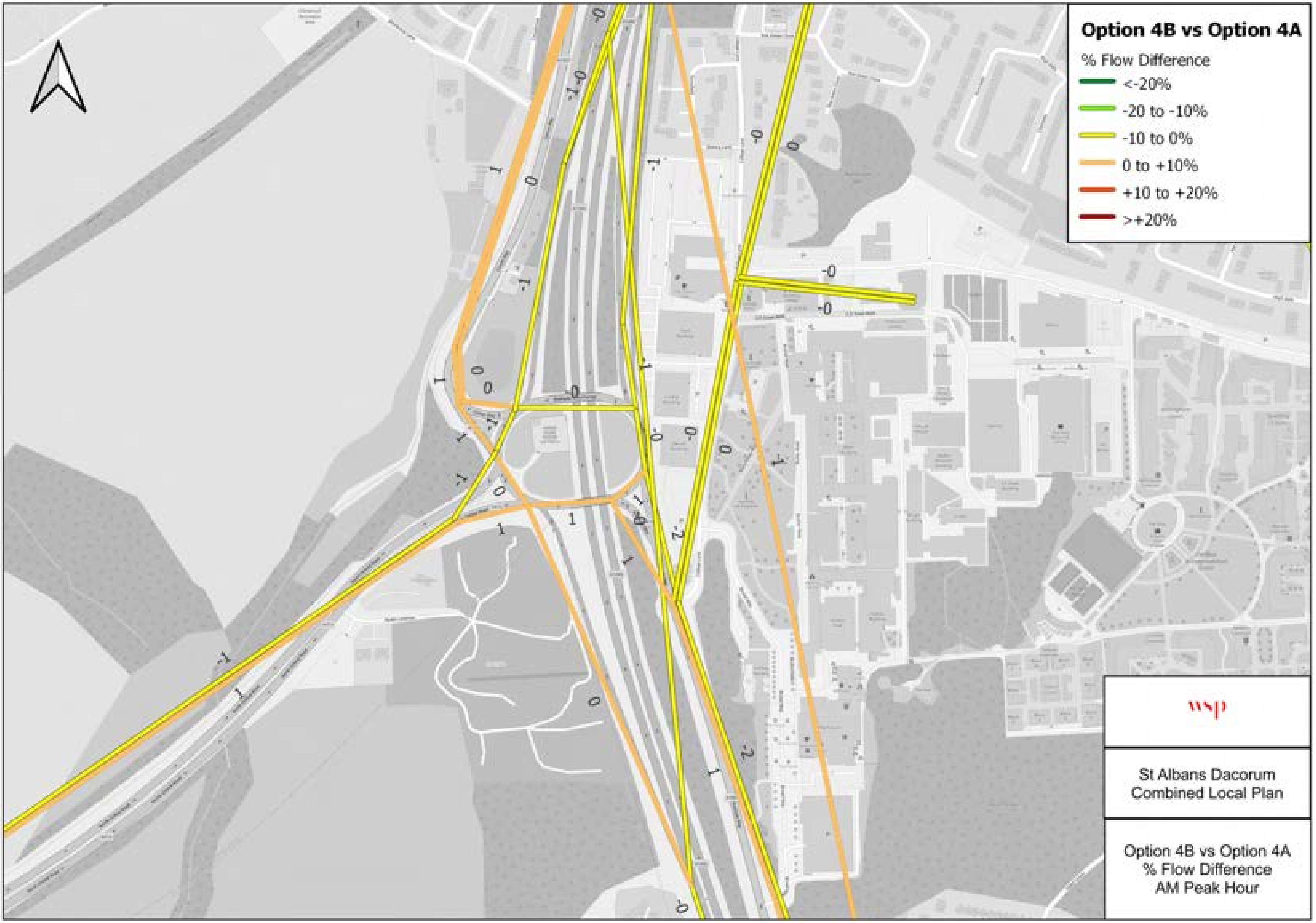

Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
AM Peak Hour

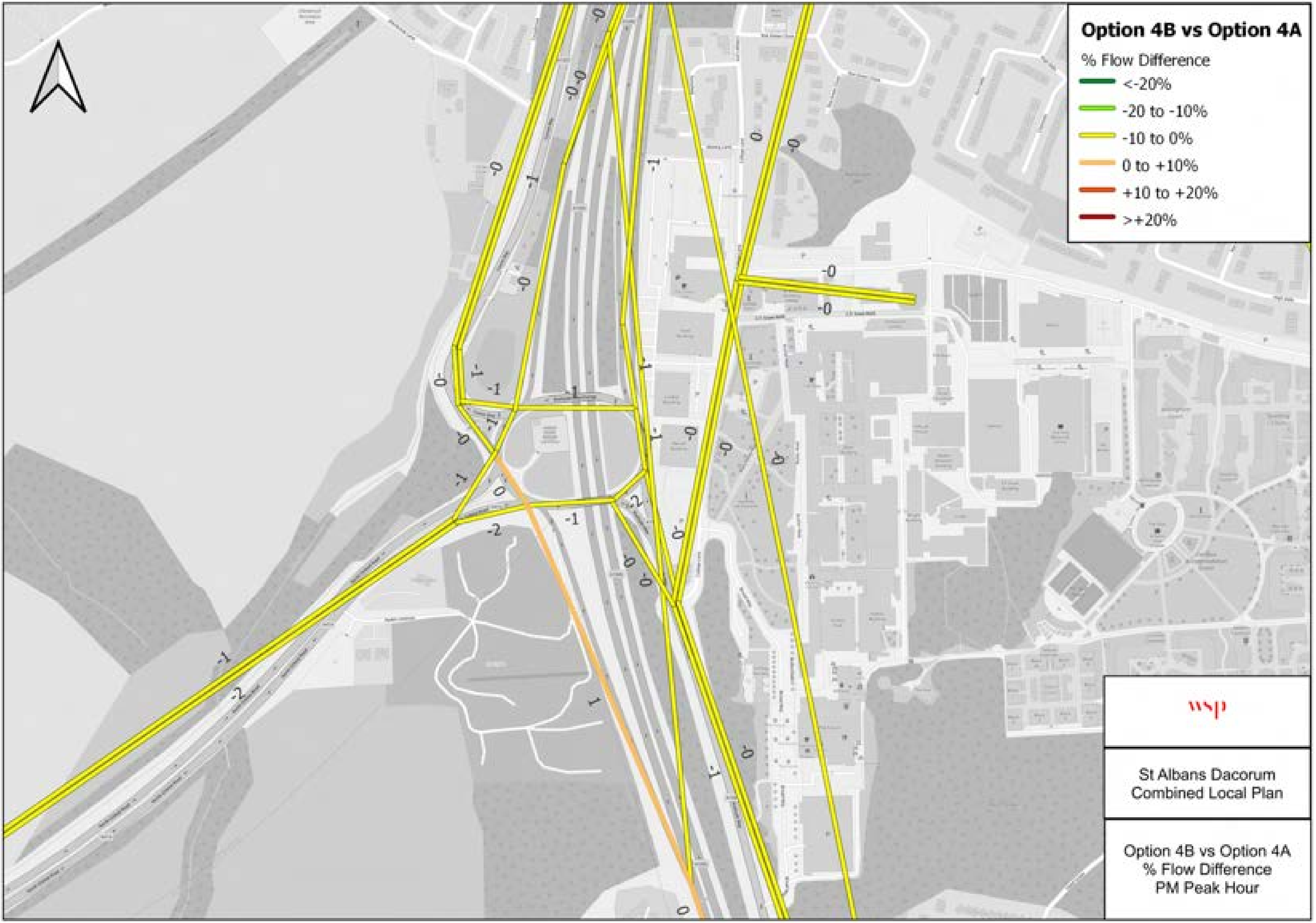

Option 4A vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4A vs Option 0A
Difference in Delay
PM Peak Hour



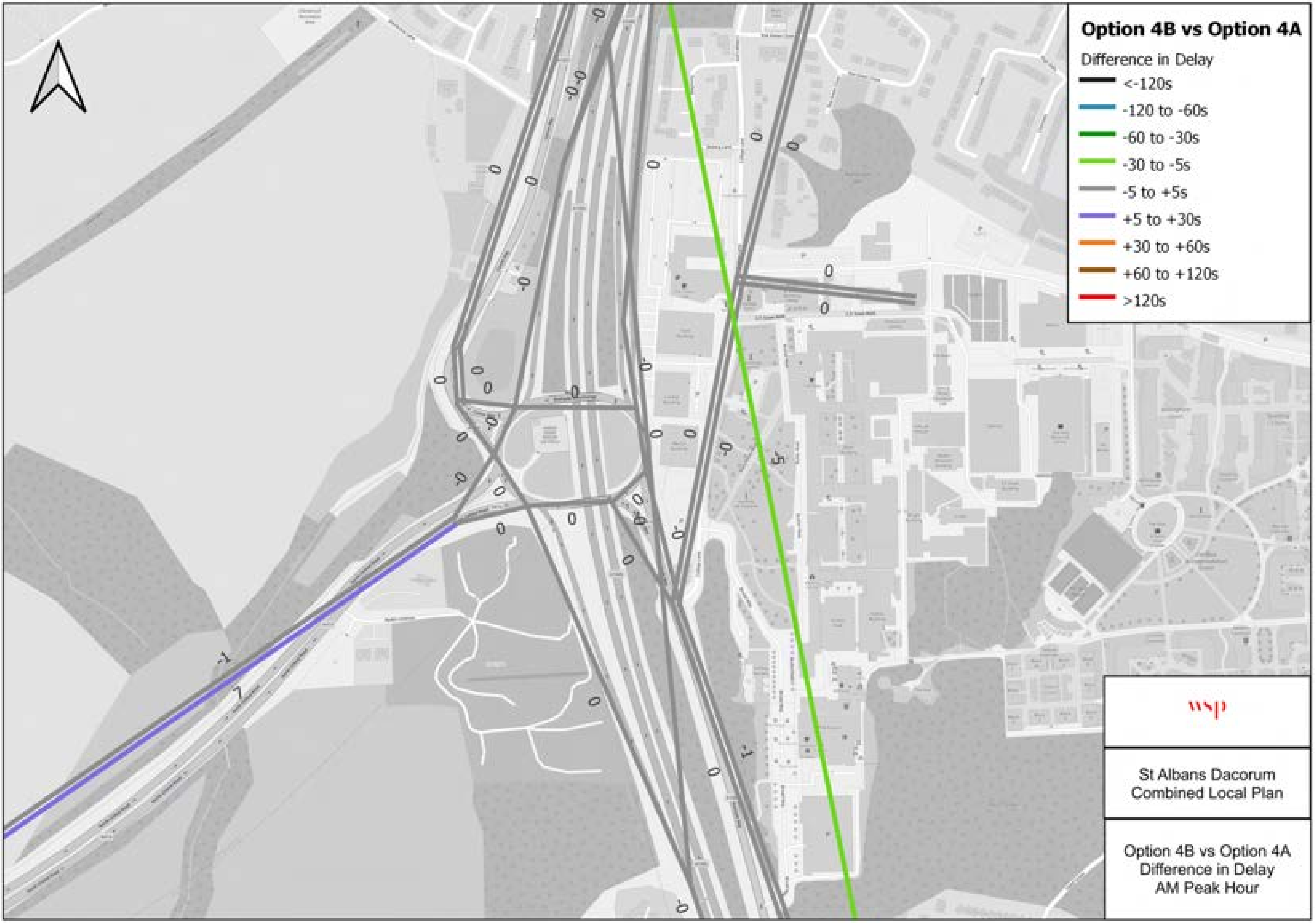
Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) AM Peak Hour

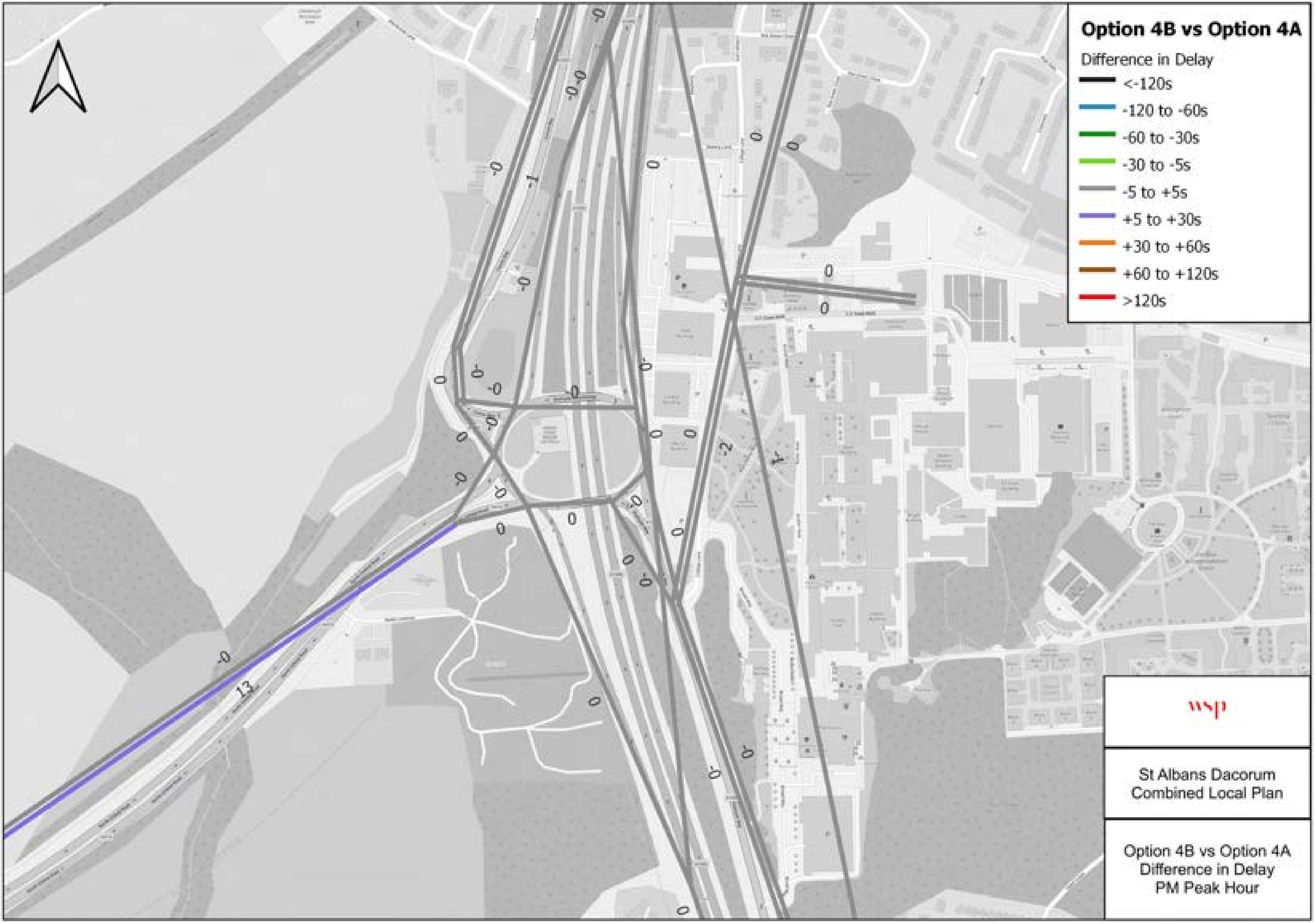

Option 4B vs Option 4A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 4A Difference in Actual Flow (PCUs) PM Peak Hour

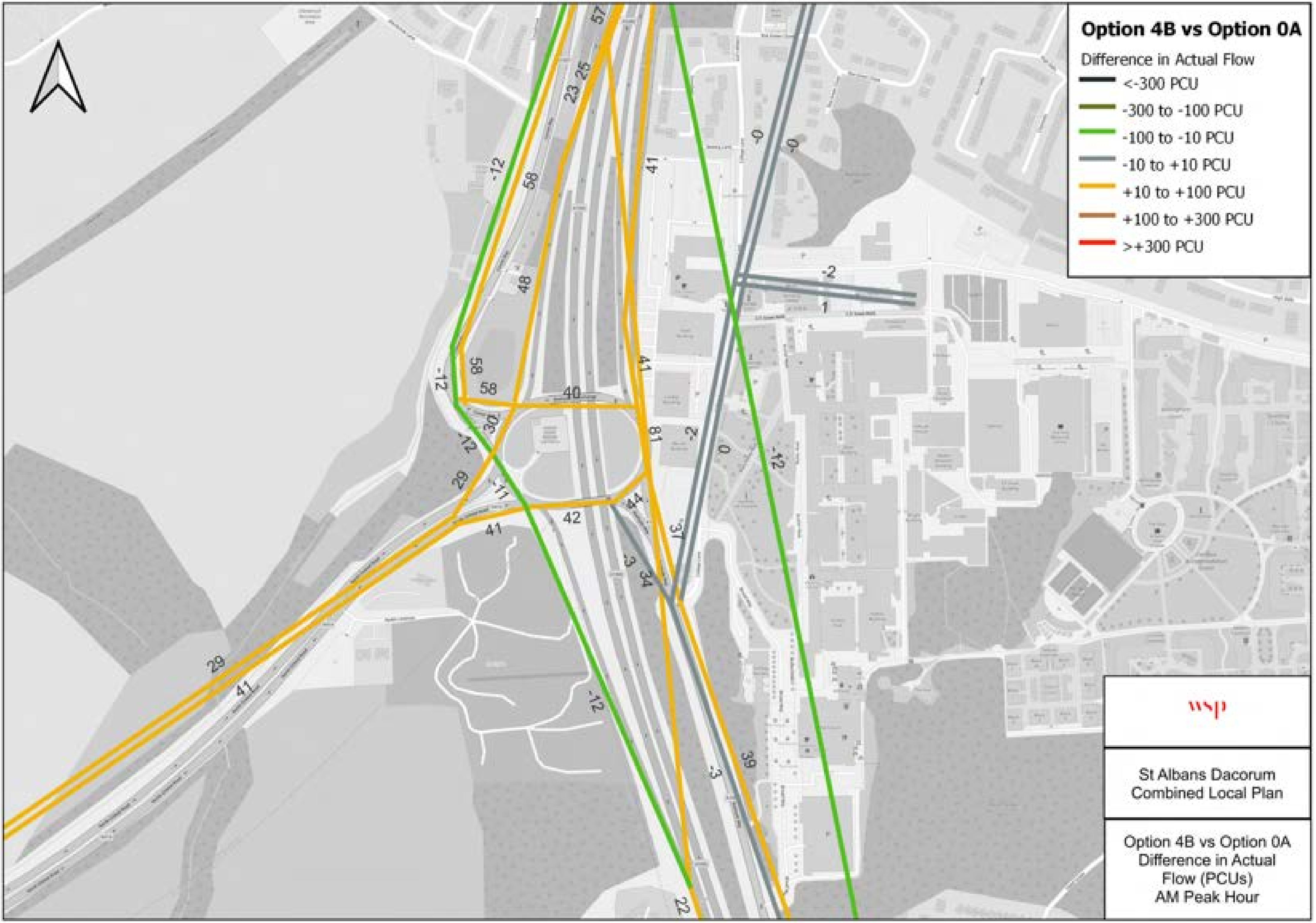

Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
AM Peak Hour

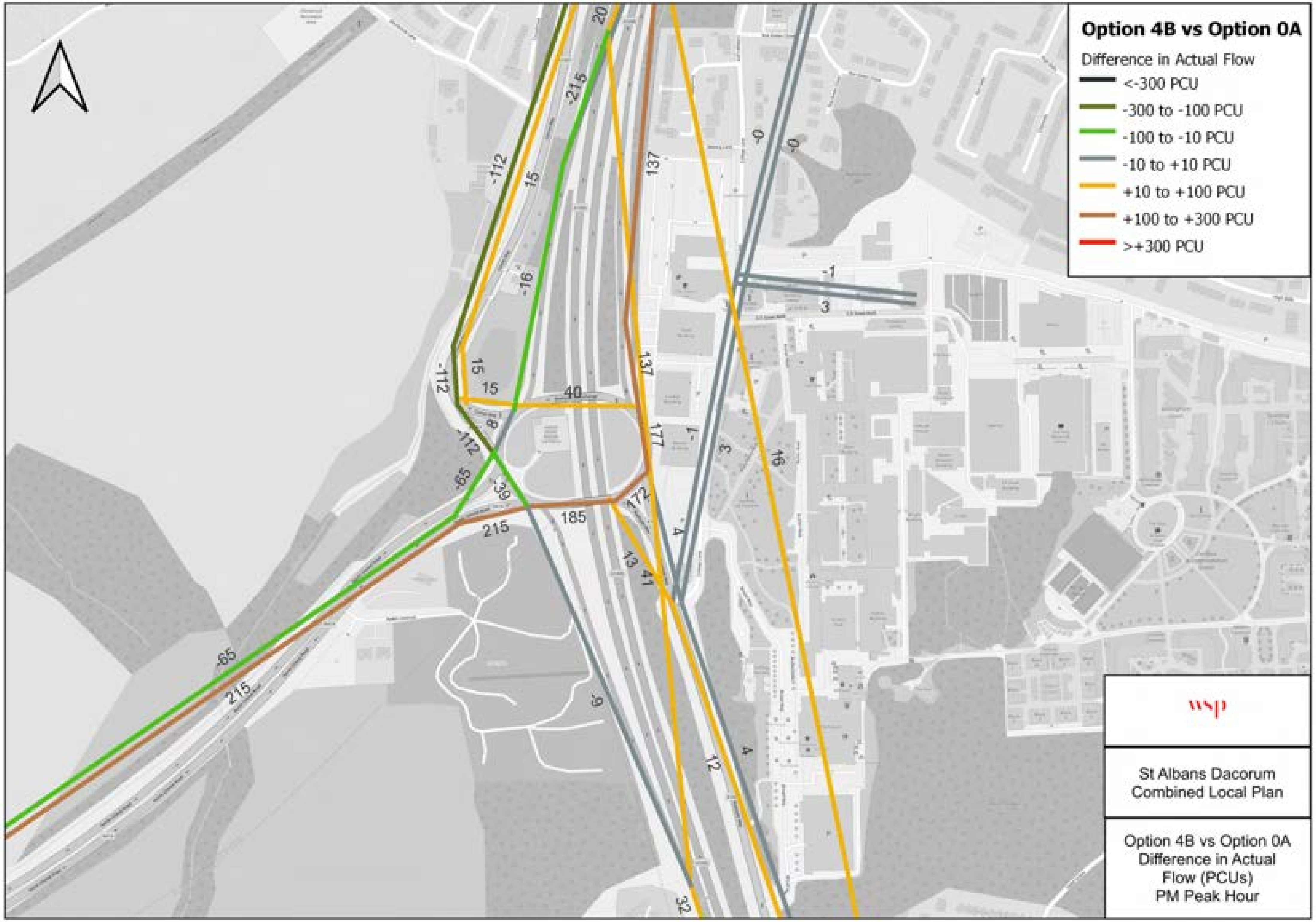


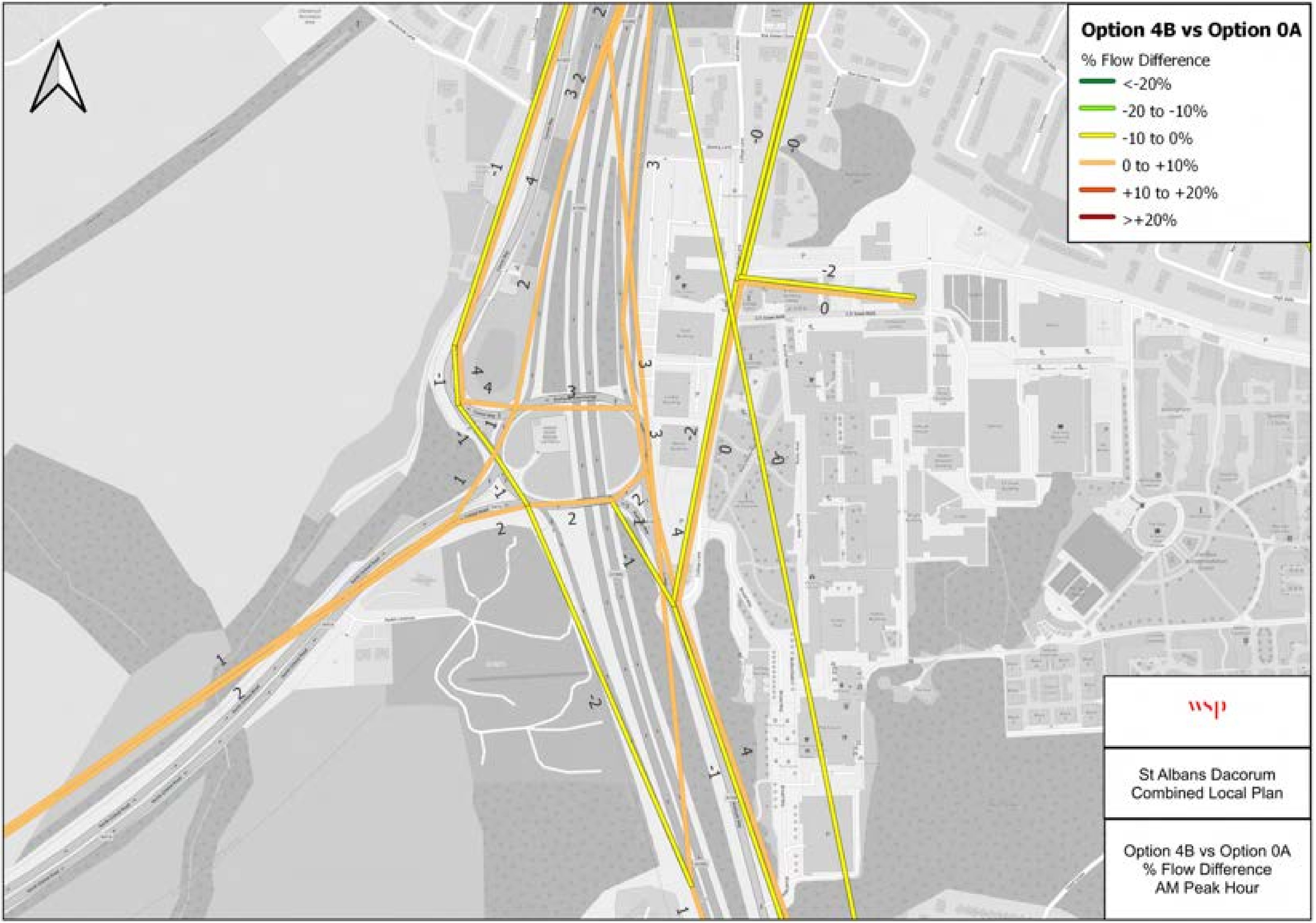
Option 4B vs Option 4A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
% Flow Difference
PM Peak Hour

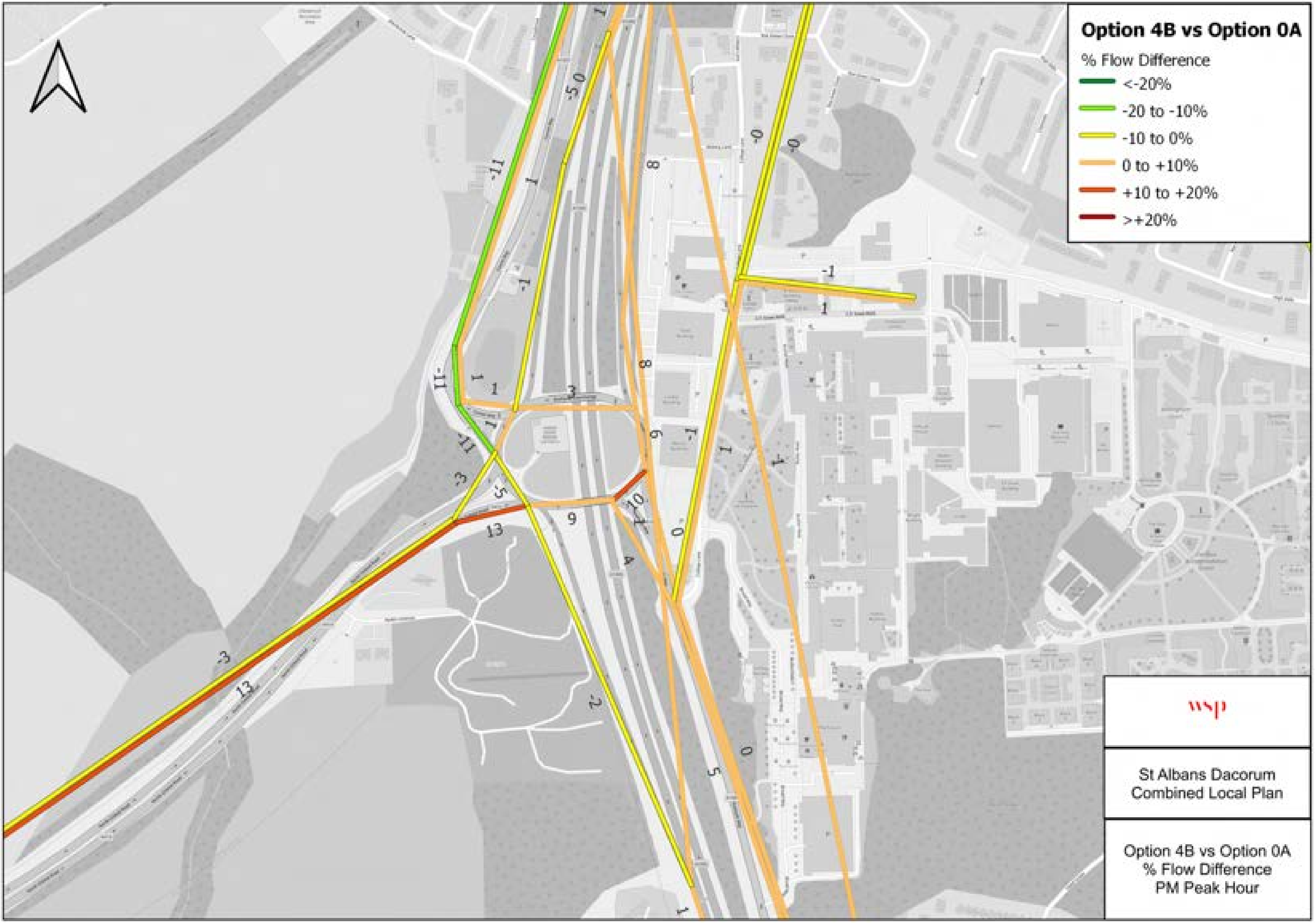

Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
AM Peak Hour

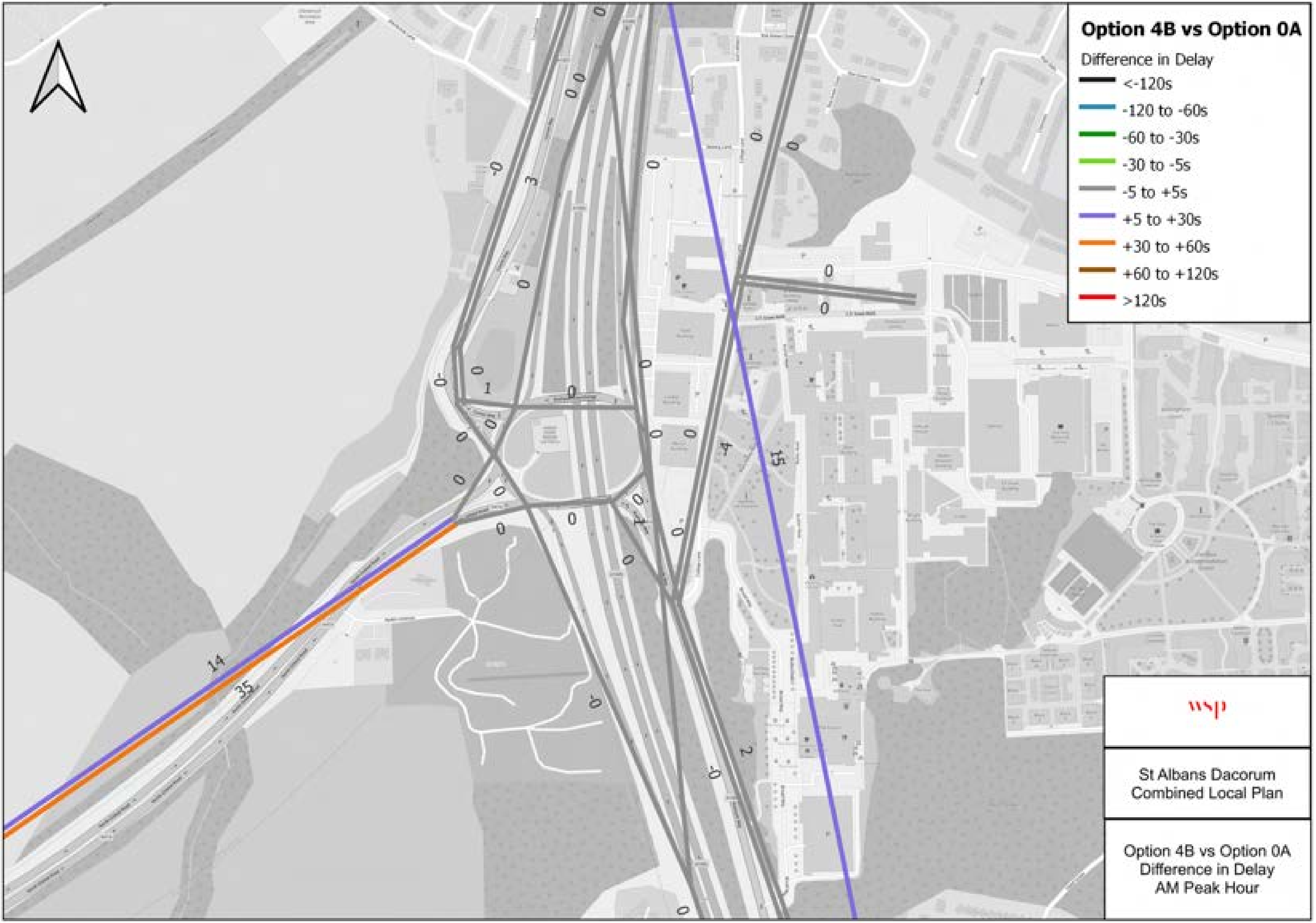

Option 4B vs Option 4A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 4A
Difference in Delay
PM Peak Hour

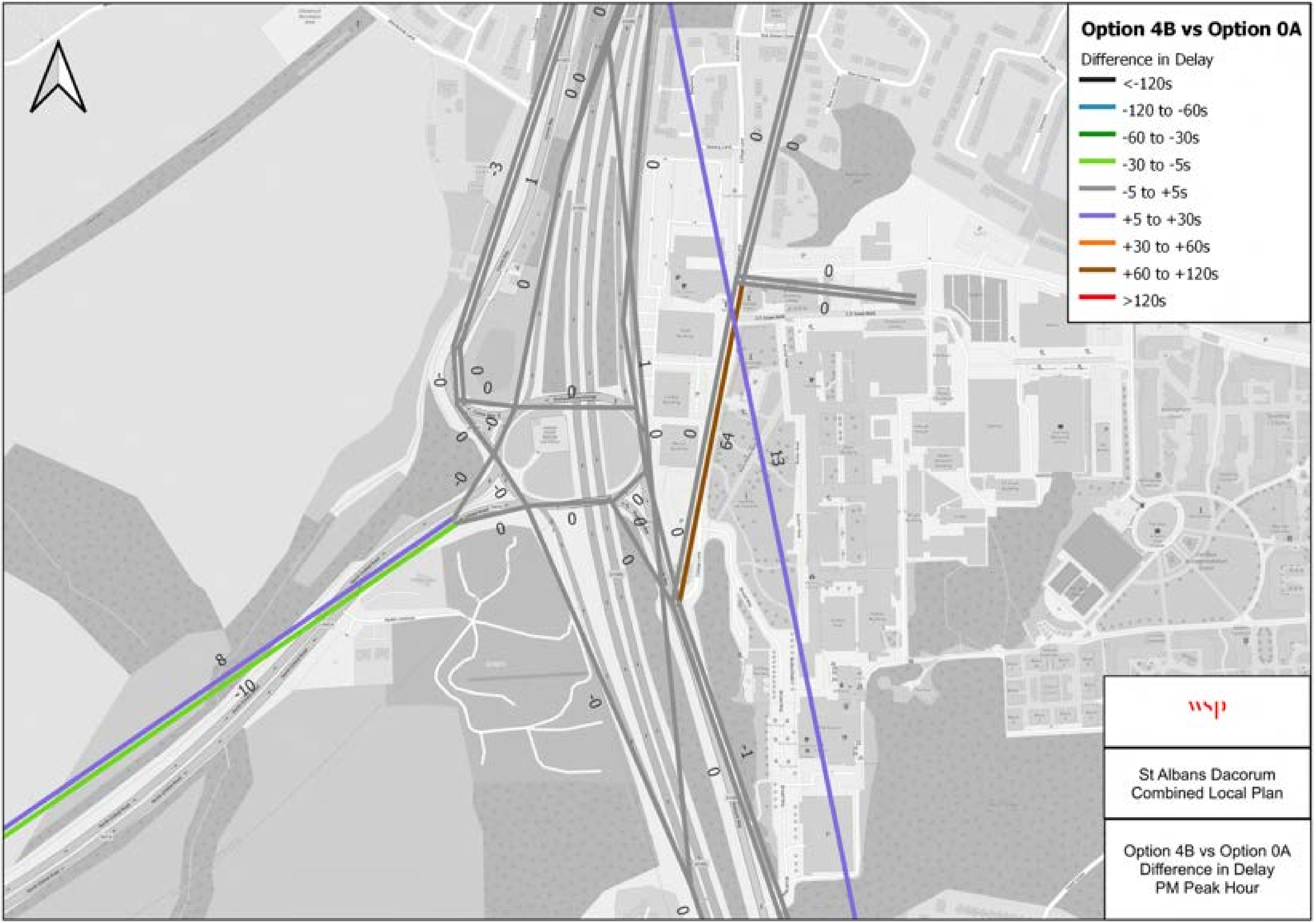

Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Actual Flow (PCUs) AM Peak Hour


Option 4B vs Option 0A
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Actual Flow (PCUs) PM Peak Hour
-112
15
-215
20
-16
137
-0
-0
-1
3
-112
15
15
40
8
177
-1
3
16
-112
-65
-39
172
185
215
4
13
41
-65
215
-9
12
4
32


Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
AM Peak Hour


Option 4B vs Option 0A
% Flow Difference
<-20%
-20 to -10%
-10 to 0%
0 to +10%
+10 to +20%
>+20%
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A
% Flow Difference
PM Peak Hour

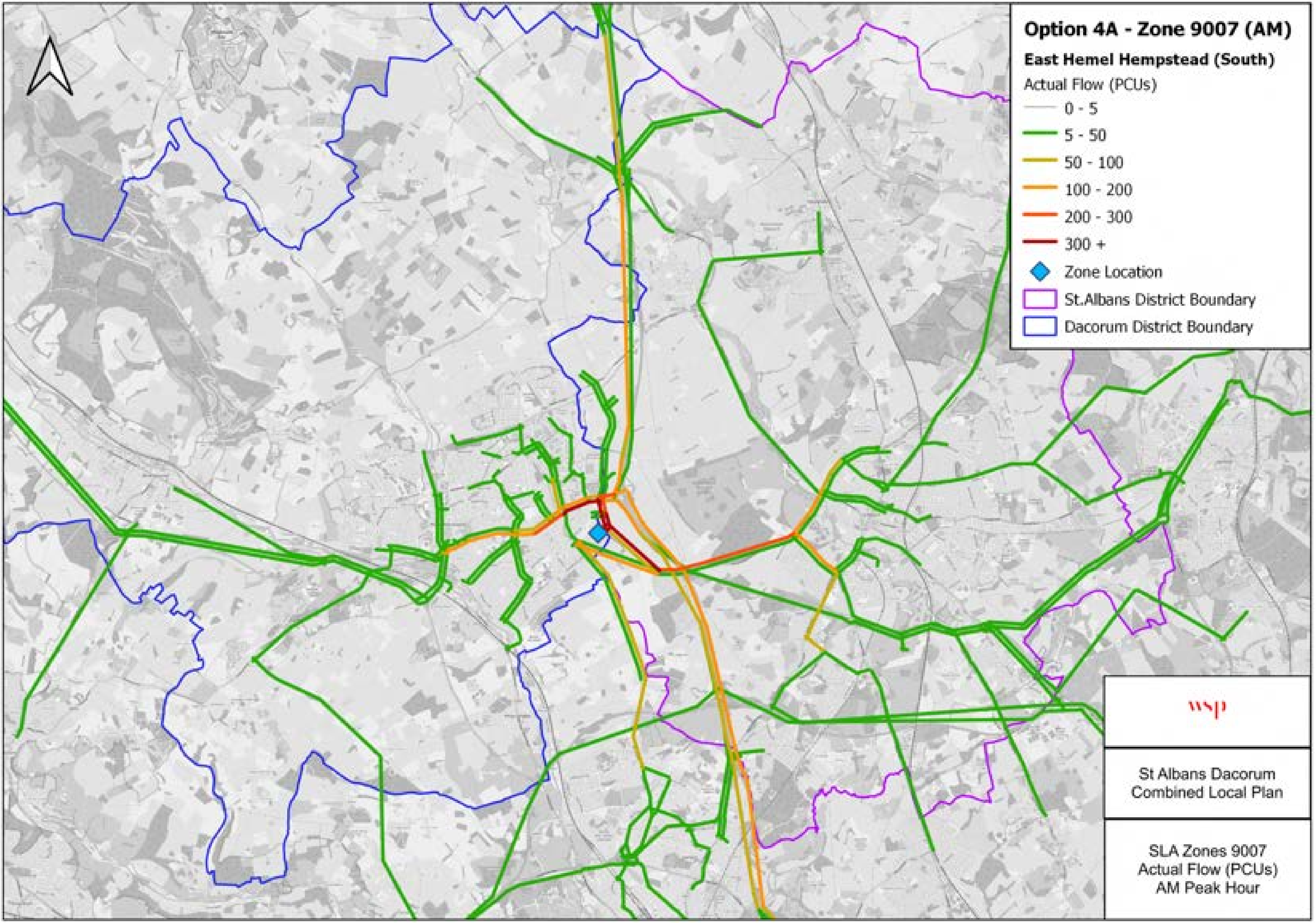

Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Option 4B vs Option 0A Difference in Delay AM Peak Hour

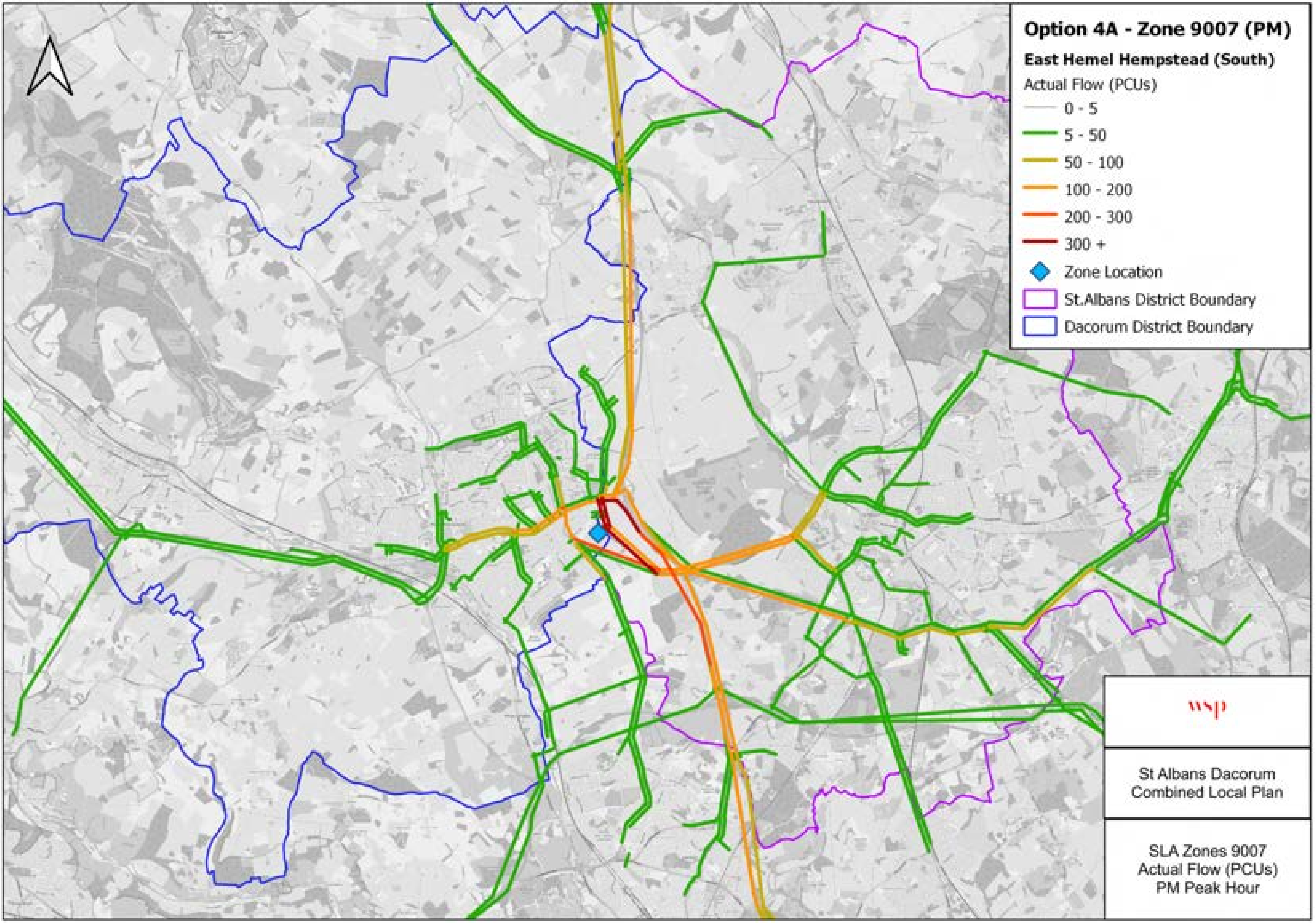


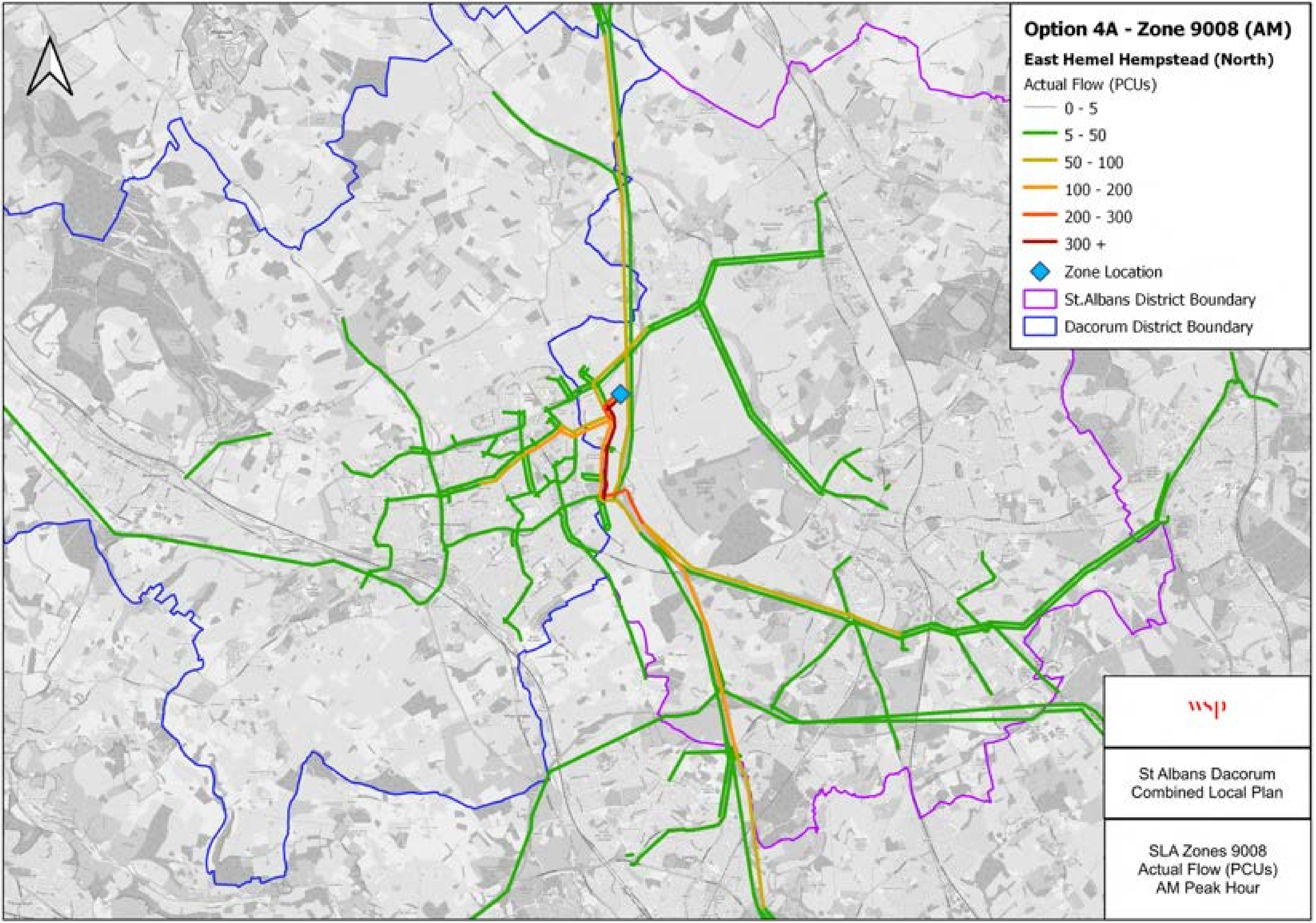
Option 4B vs Option 0A
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Option 4B vs Option 0A
Difference in Delay
PM Peak Hour

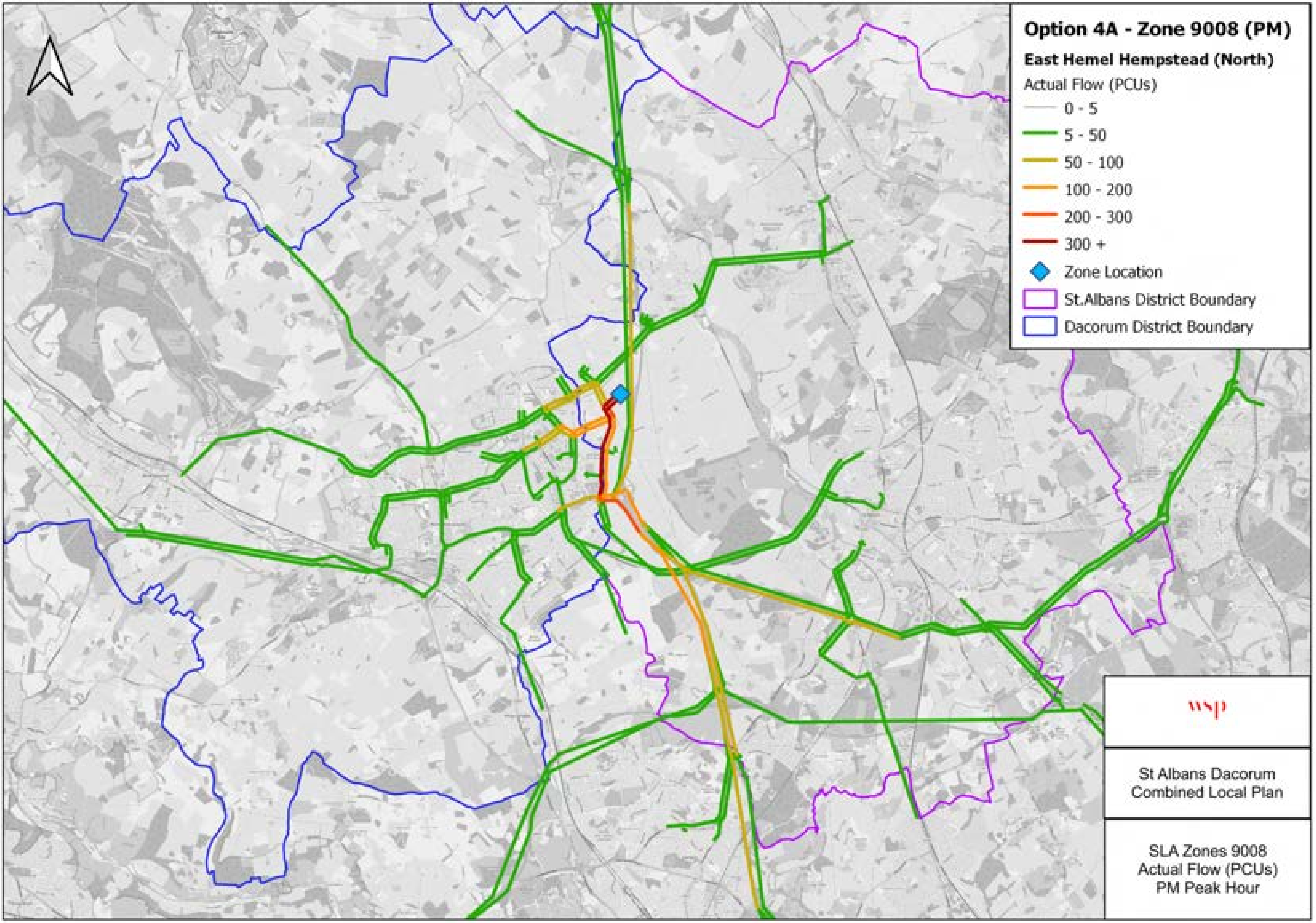
Appendix I

HGC Development Trip Distribution Figures

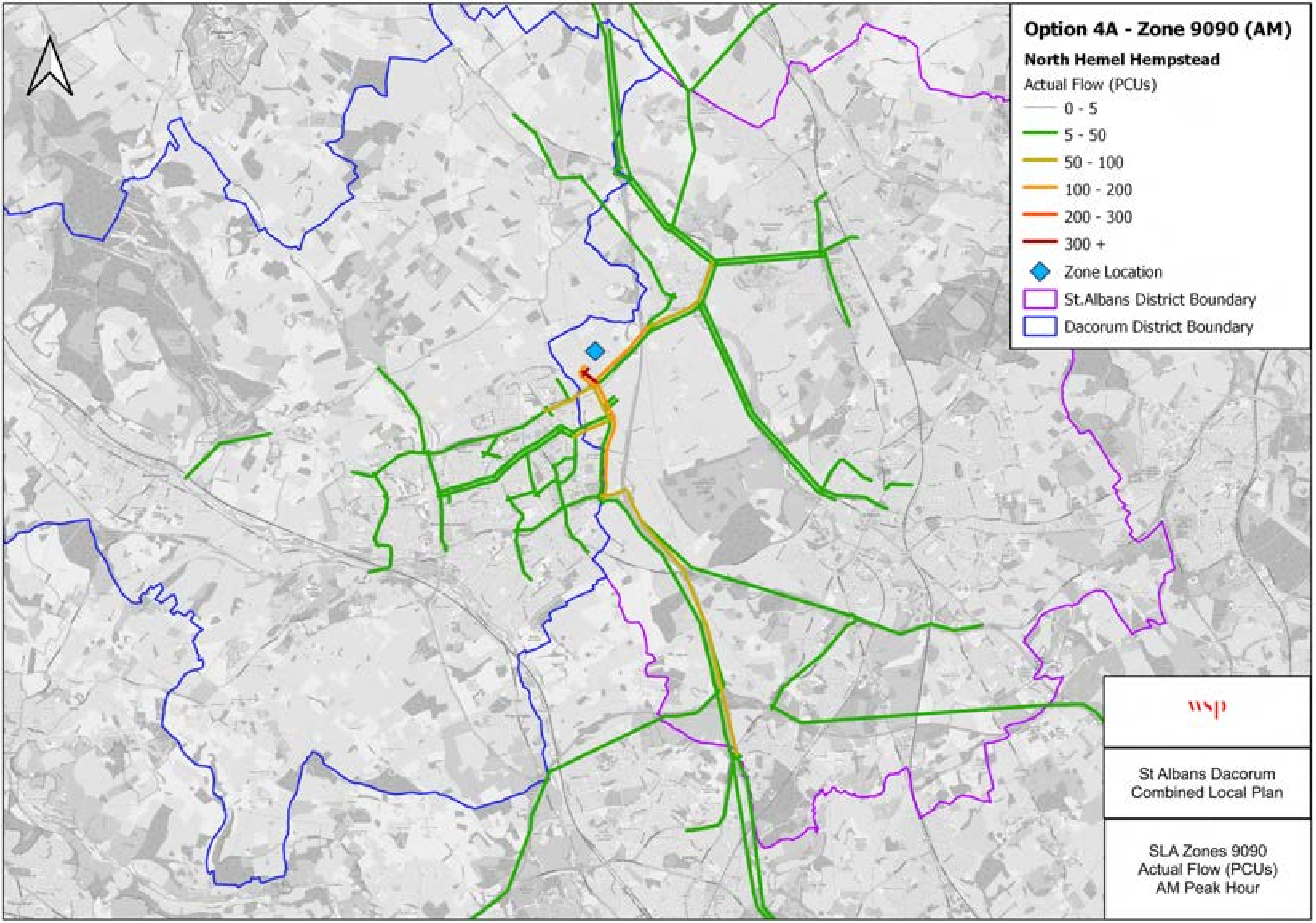

Option 4A - Zone 9007 (AM)
East Hemel Hempstead (South)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum
Combined Local Plan
SLA Zones 9007
Actual Flow (PCUs)
AM Peak Hour


Option 4A - Zone 9007 (PM)
East Hemel Hempstead (South)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum
Combined Local Plan
SLA Zones 9007
Actual Flow (PCUs)
PM Peak Hour

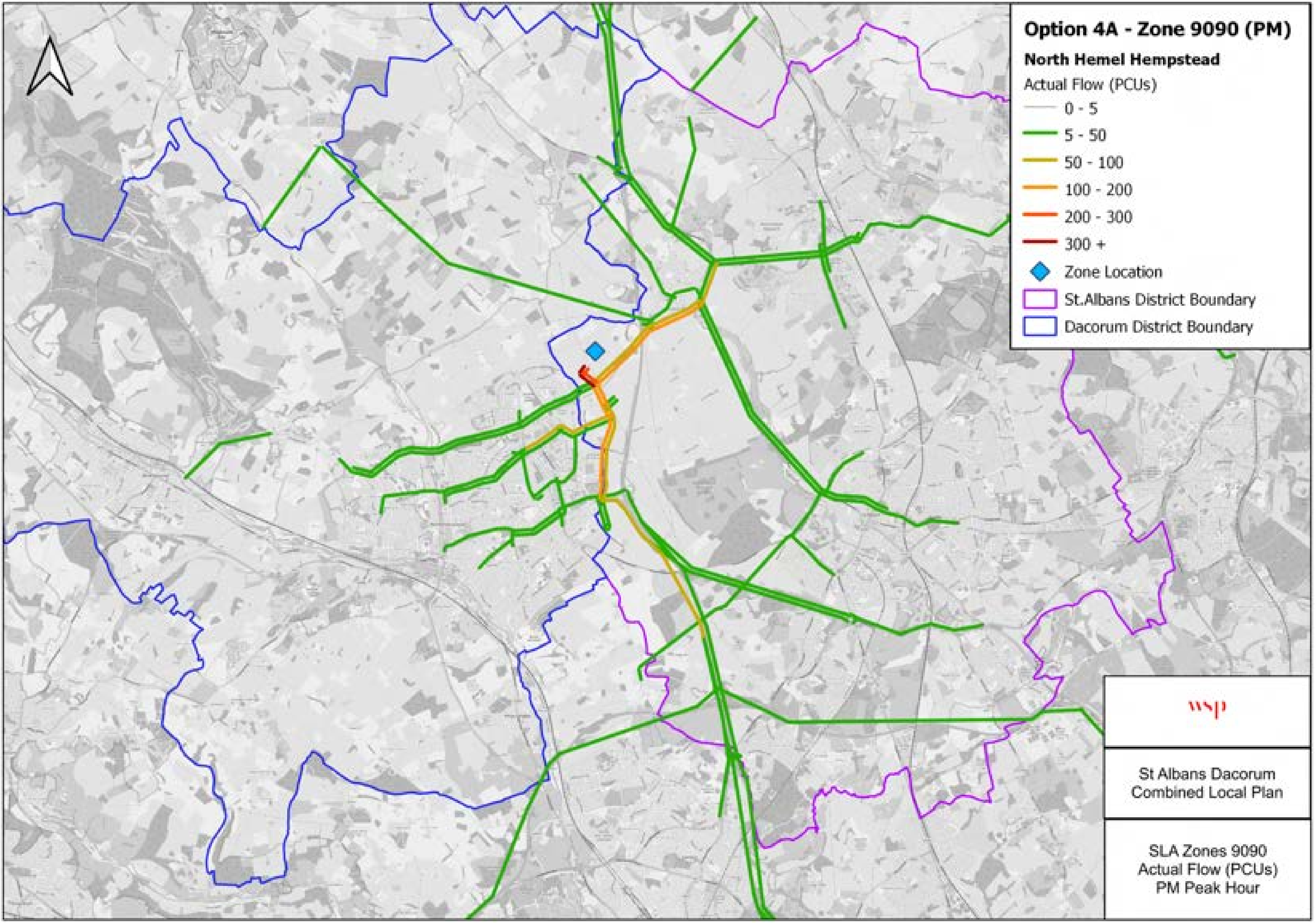

Option 4A - Zone 9008 (AM)
East Hemel Hempstead (North)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum
Combined Local Plan
SLA Zones 9008
Actual Flow (PCUs)
AM Peak Hour



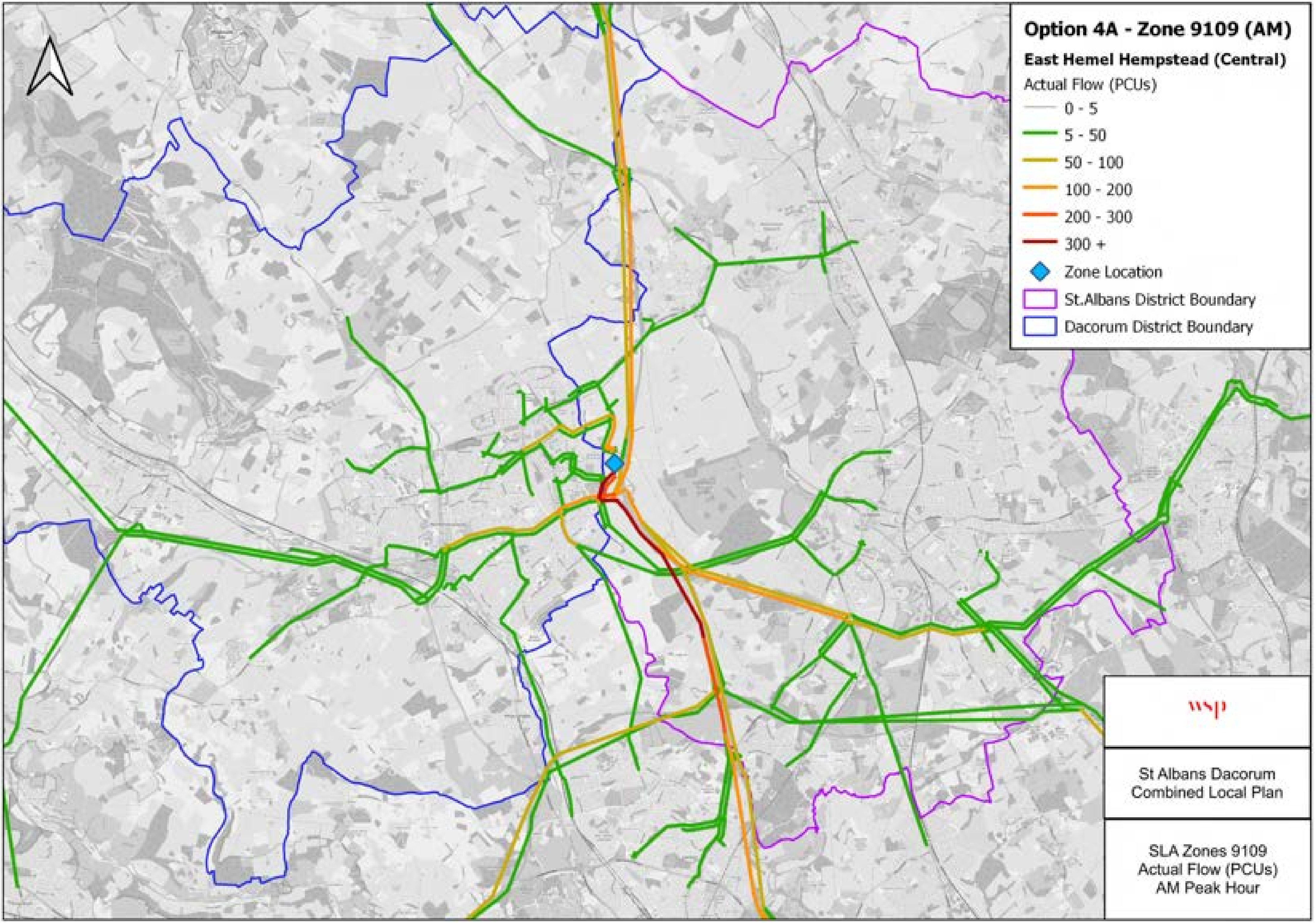
Option 4A - Zone 9008 (PM)
East Hemel Hempstead (North)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum
Combined Local Plan
SLA Zones 9008
Actual Flow (PCUs)
PM Peak Hour



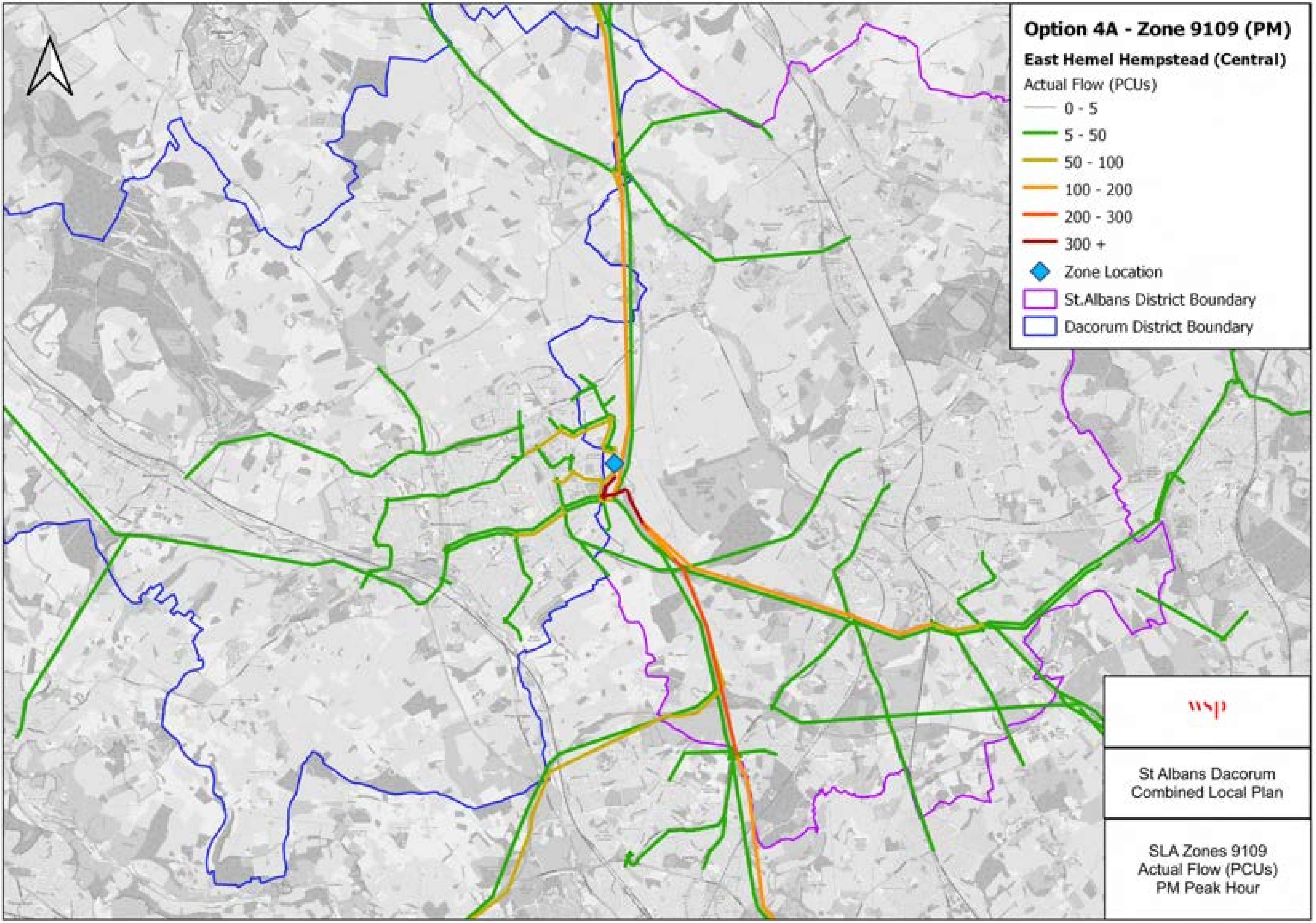
Option 4A - Zone 9090 (AM)
North Hemel Hempstead
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9090 Actual Flow (PCUs) AM Peak Hour

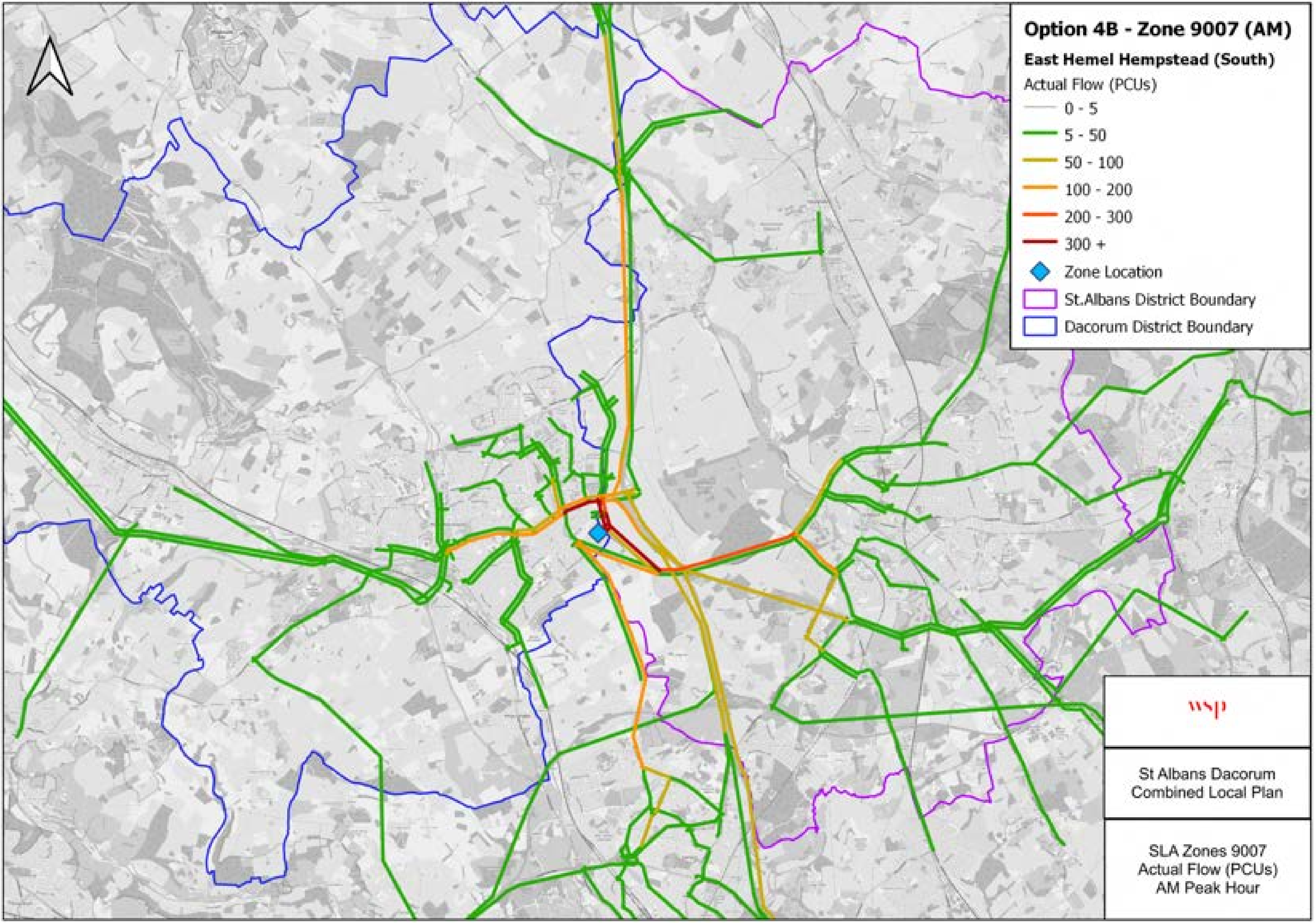


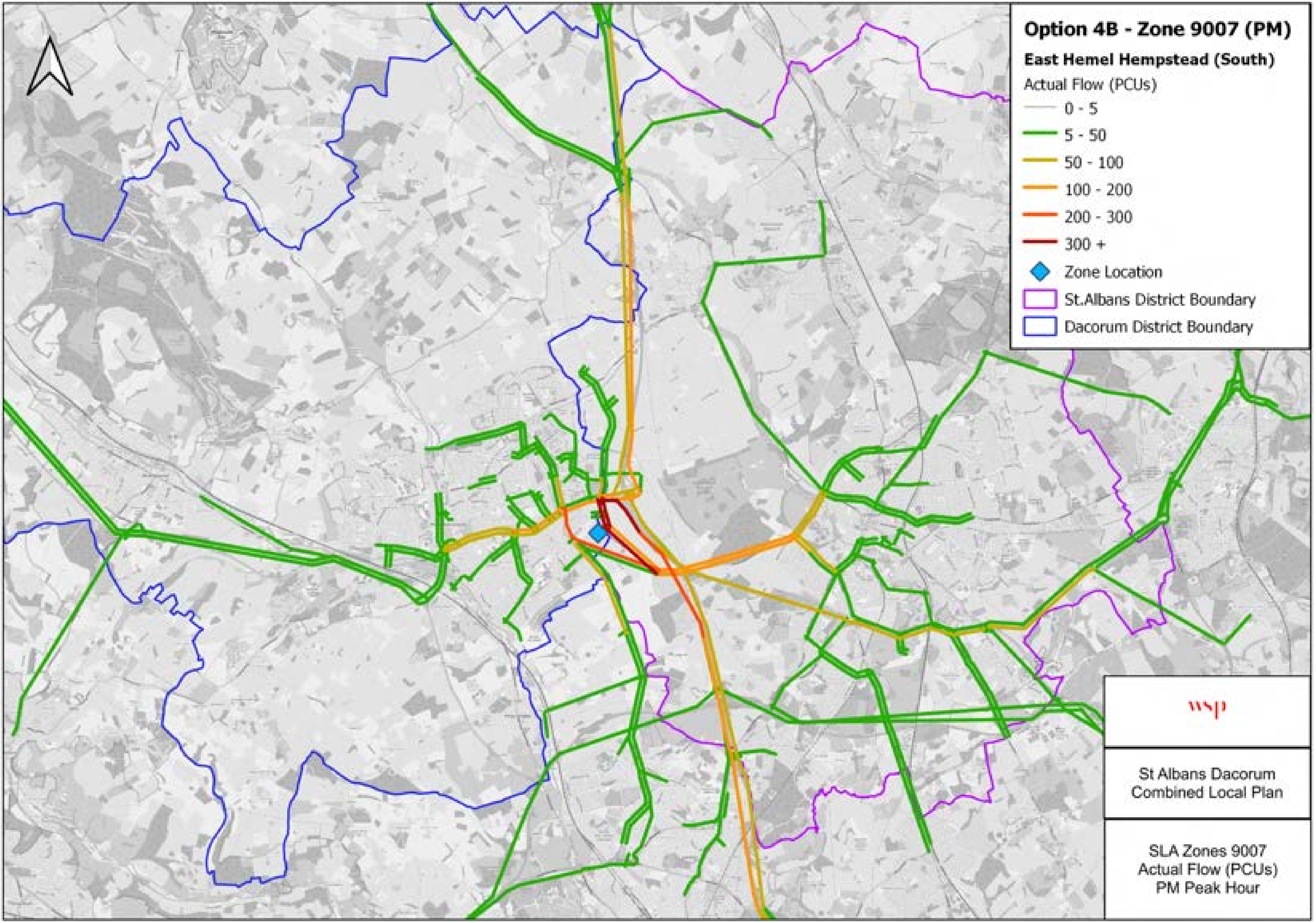
Option 4A - Zone 9090 (PM)
North Hemel Hempstead
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9090 Actual Flow (PCUs) PM Peak Hour

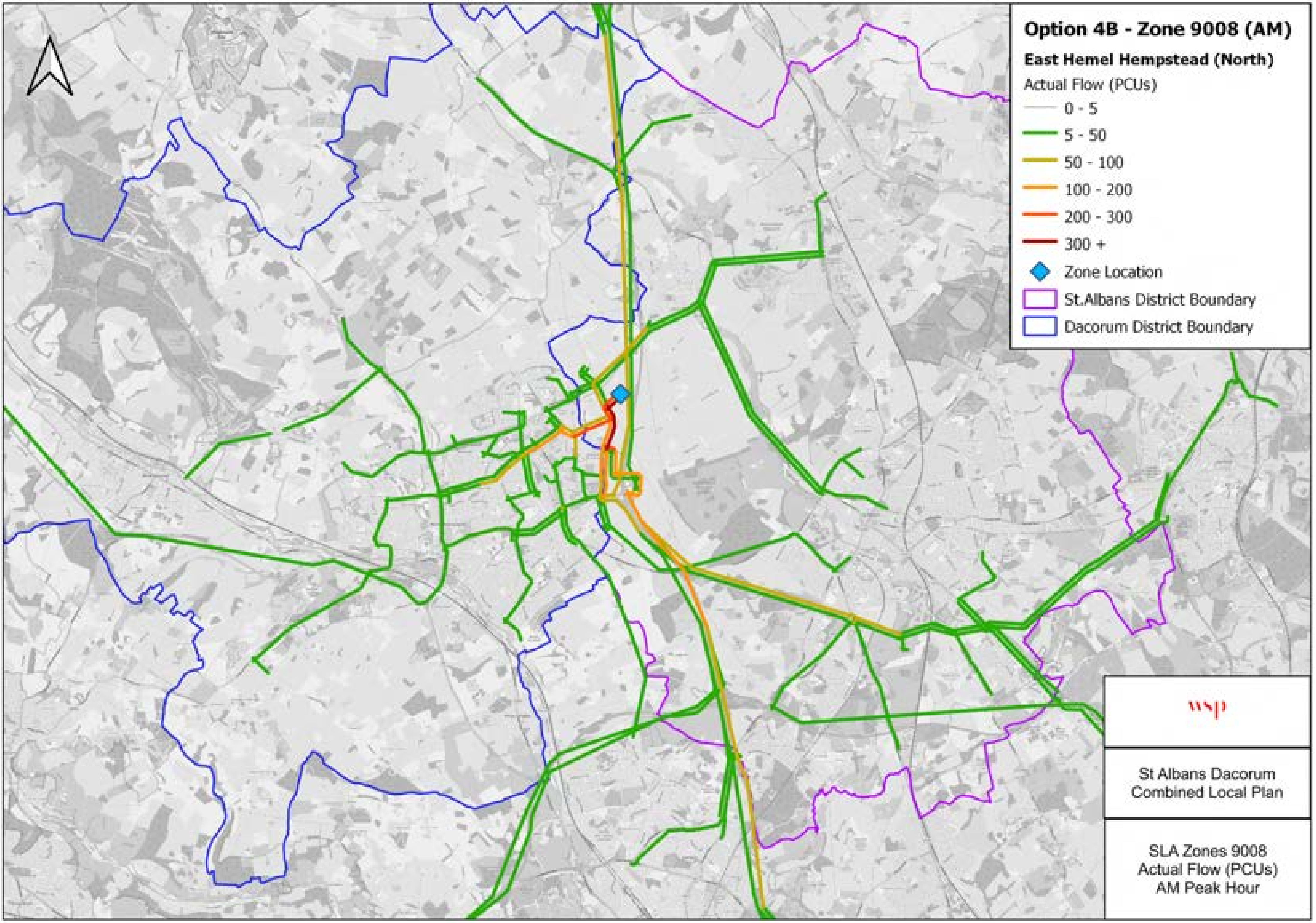


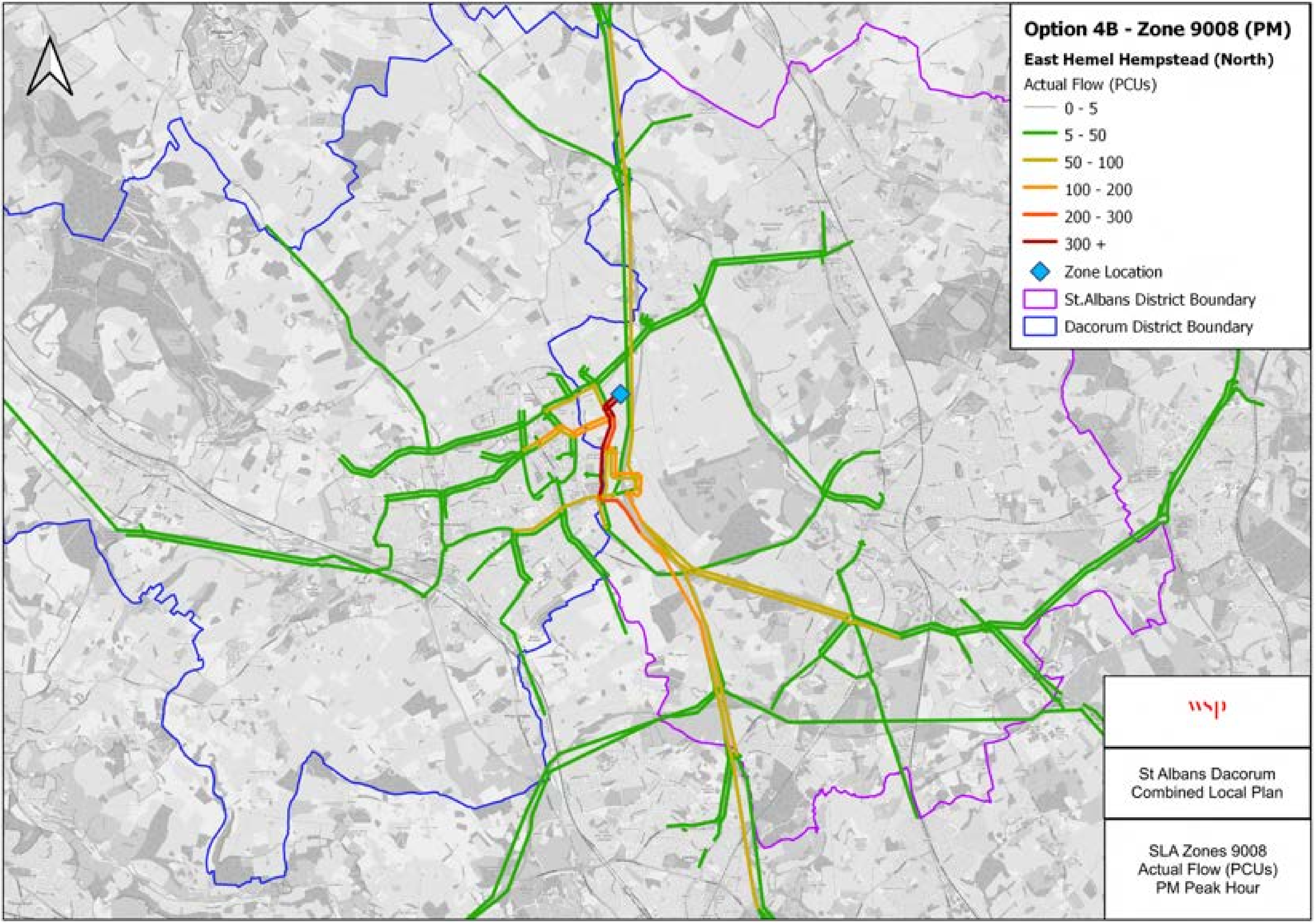
Option 4A - Zone 9109 (AM)
East Hemel Hempstead (Central)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum
Combined Local Plan
SLA Zones 9109
Actual Flow (PCUs)
AM Peak Hour

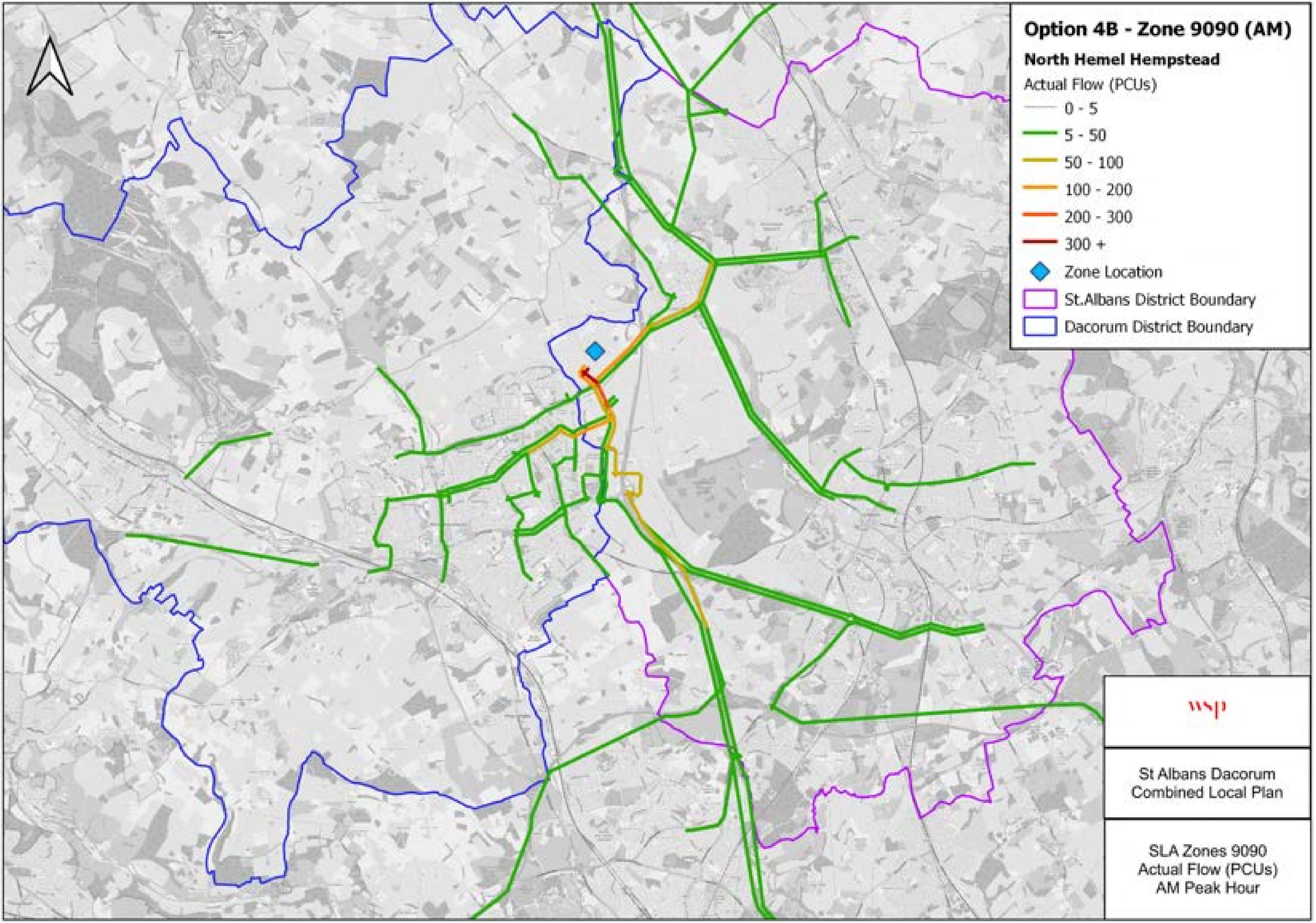

Option 4A - Zone 9109 (PM)
East Hemel Hempstead (Central)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9109 Actual Flow (PCUs) PM Peak Hour

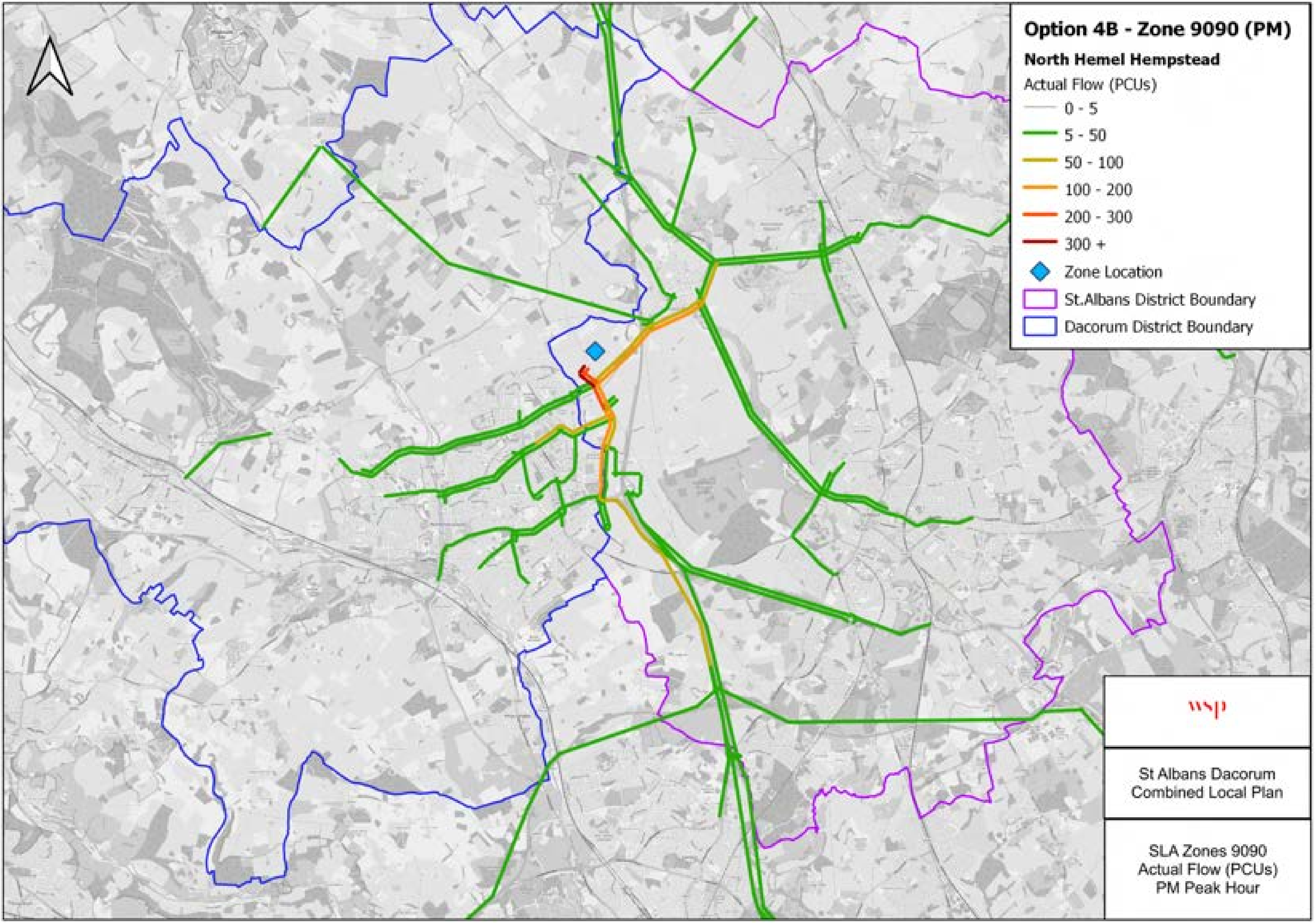

Option 4B - Zone 9007 (AM)
East Hemel Hempstead (South)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9007 Actual Flow (PCUs) AM Peak Hour

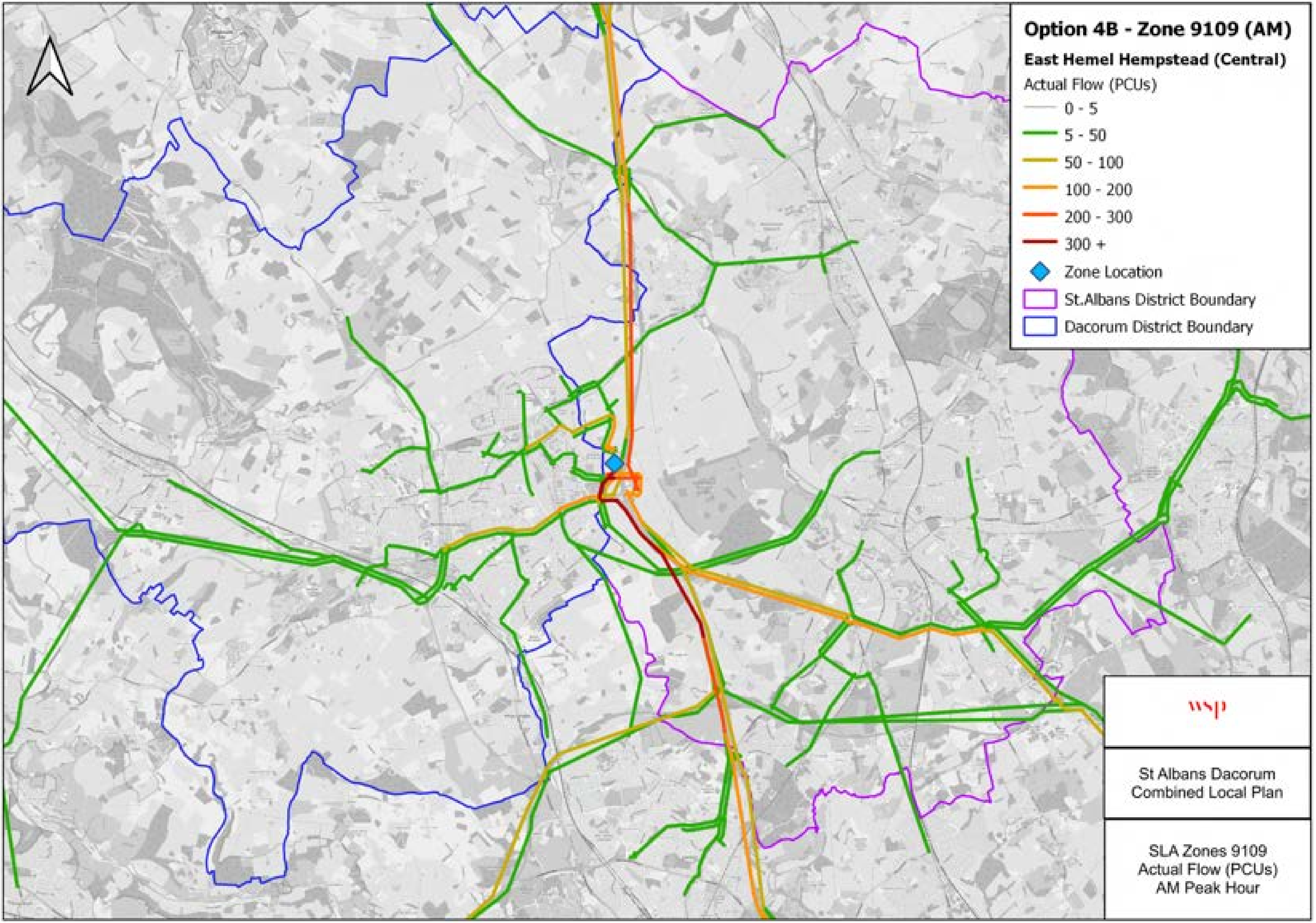

Option 4B - Zone 9007 (PM)
East Hemel Hempstead (South)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9007 Actual Flow (PCUs) PM Peak Hour


Option 4B - Zone 9008 (AM)
East Hemel Hempstead (North)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9008 Actual Flow (PCUs) AM Peak Hour

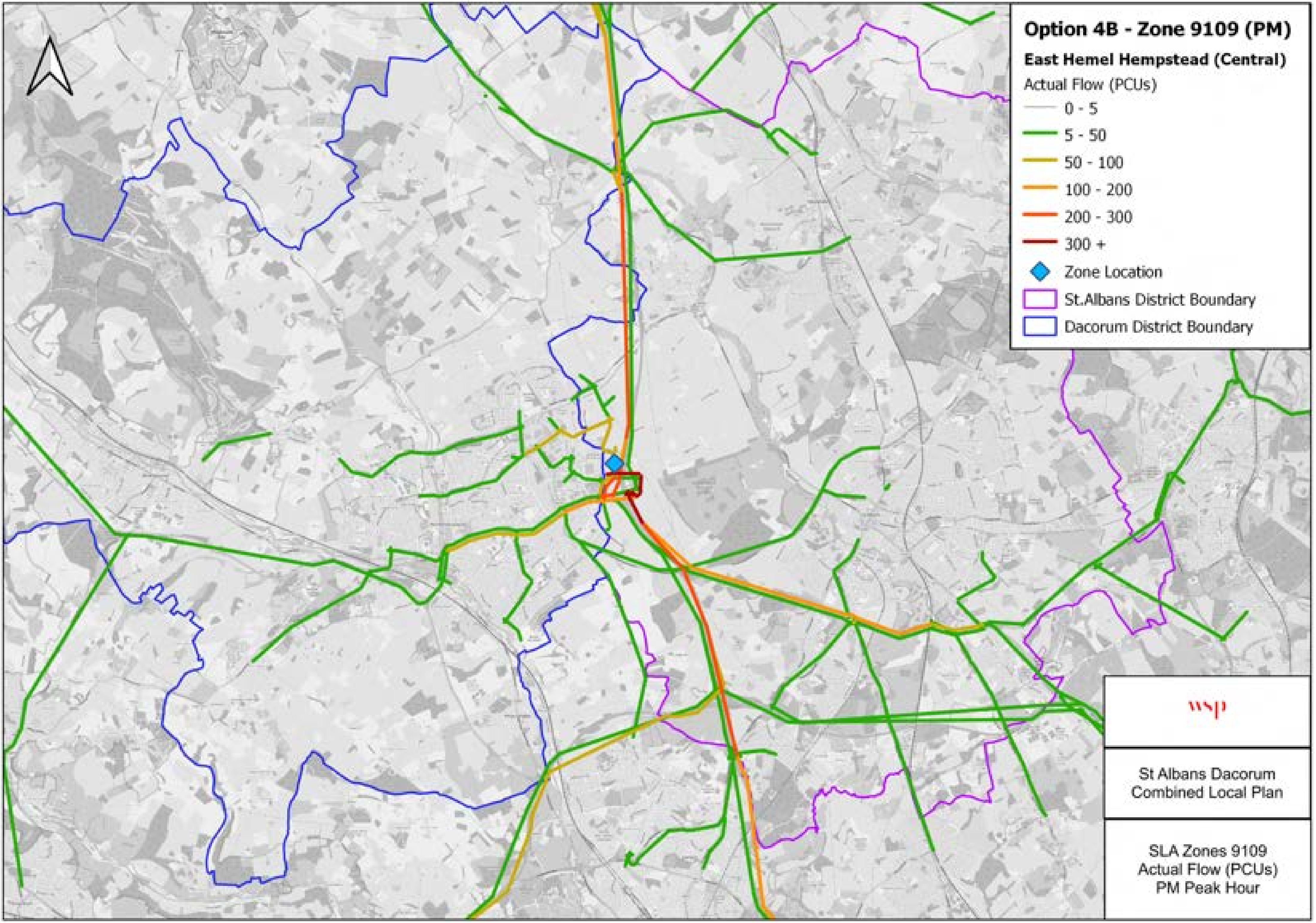

Option 4B - Zone 9008 (PM)
East Hemel Hempstead (North)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9008 Actual Flow (PCUs) PM Peak Hour


Option 4B - Zone 9090 (AM)
North Hemel Hempstead
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9090 Actual Flow (PCUs) AM Peak Hour


Option 4B - Zone 9090 (PM)
North Hemel Hempstead
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum Combined Local Plan
SLA Zones 9090 Actual Flow (PCUs) PM Peak Hour

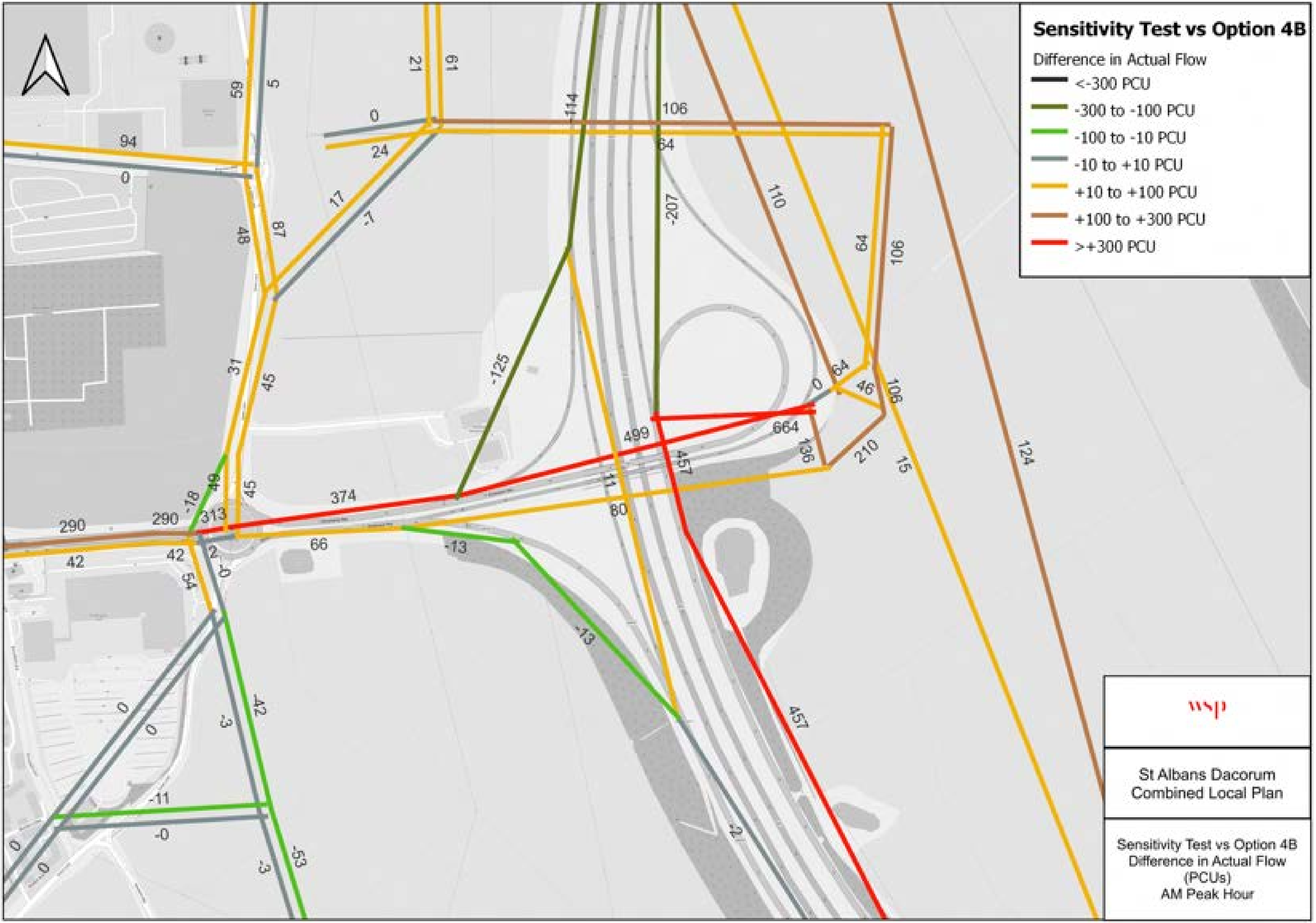


Option 4B - Zone 9109 (AM)
East Hemel Hempstead (Central)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum
Combined Local Plan
SLA Zones 9109
Actual Flow (PCUs)
AM Peak Hour

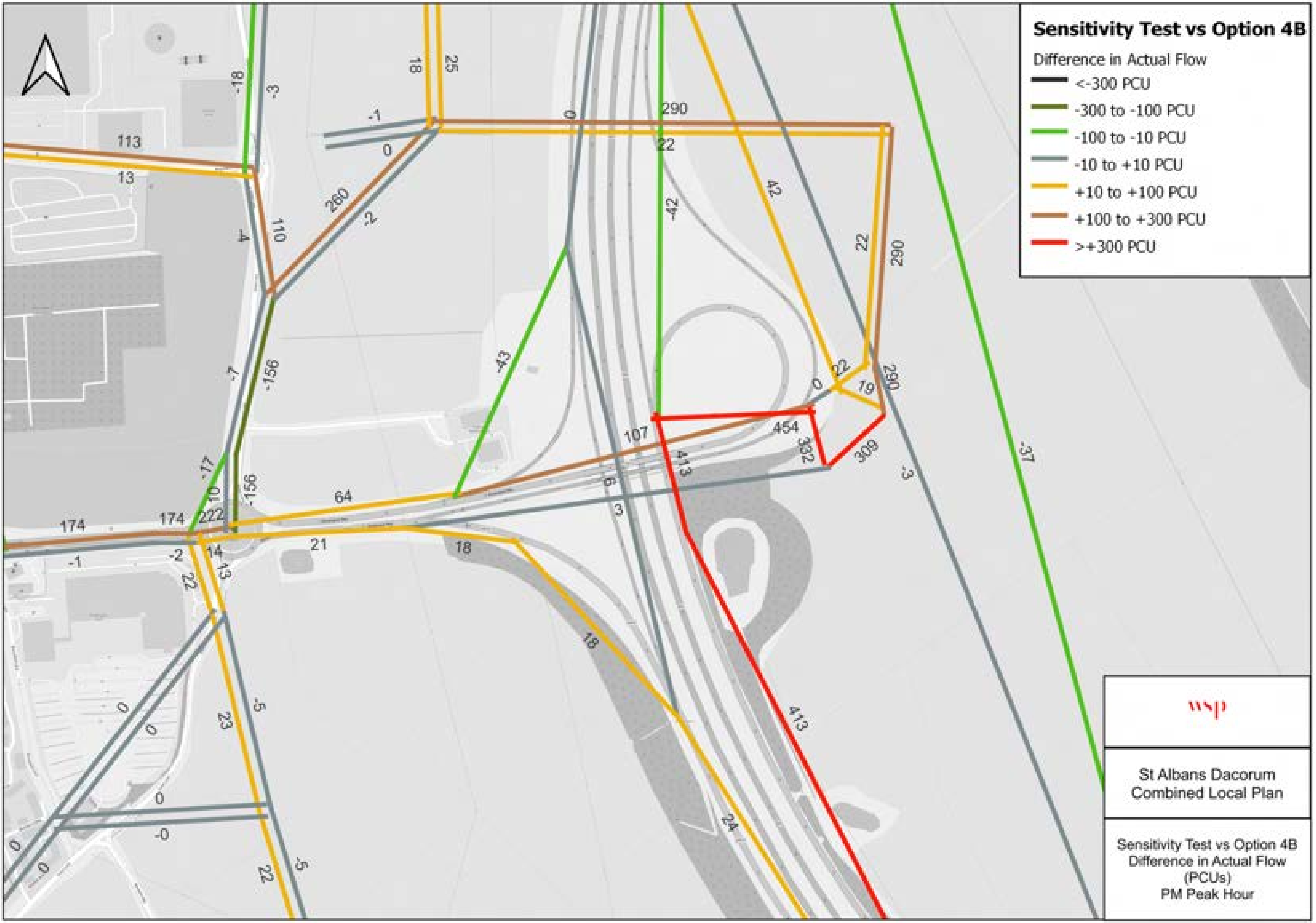

Option 4B - Zone 9109 (PM)
East Hemel Hempstead (Central)
Actual Flow (PCUs)
0 - 5
5 - 50
50 - 100
100 - 200
200 - 300
300 +
Zone Location
St.Albans District Boundary
Dacorum District Boundary
wsp
St Albans Dacorum
Combined Local Plan
SLA Zones 9109
Actual Flow (PCUs)
PM Peak Hour

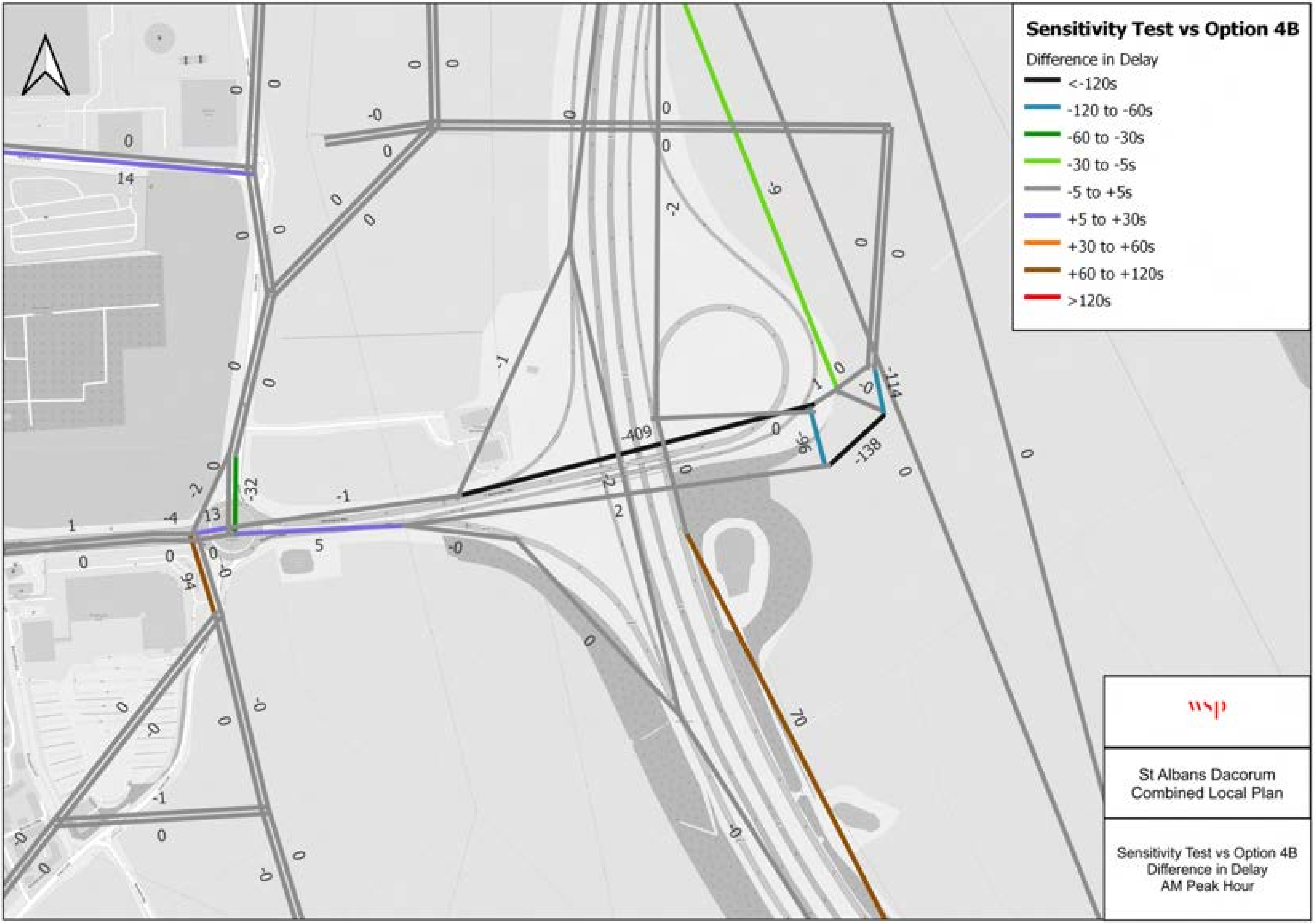
Appendix J

Sensitivity Test on M1 Junction 8

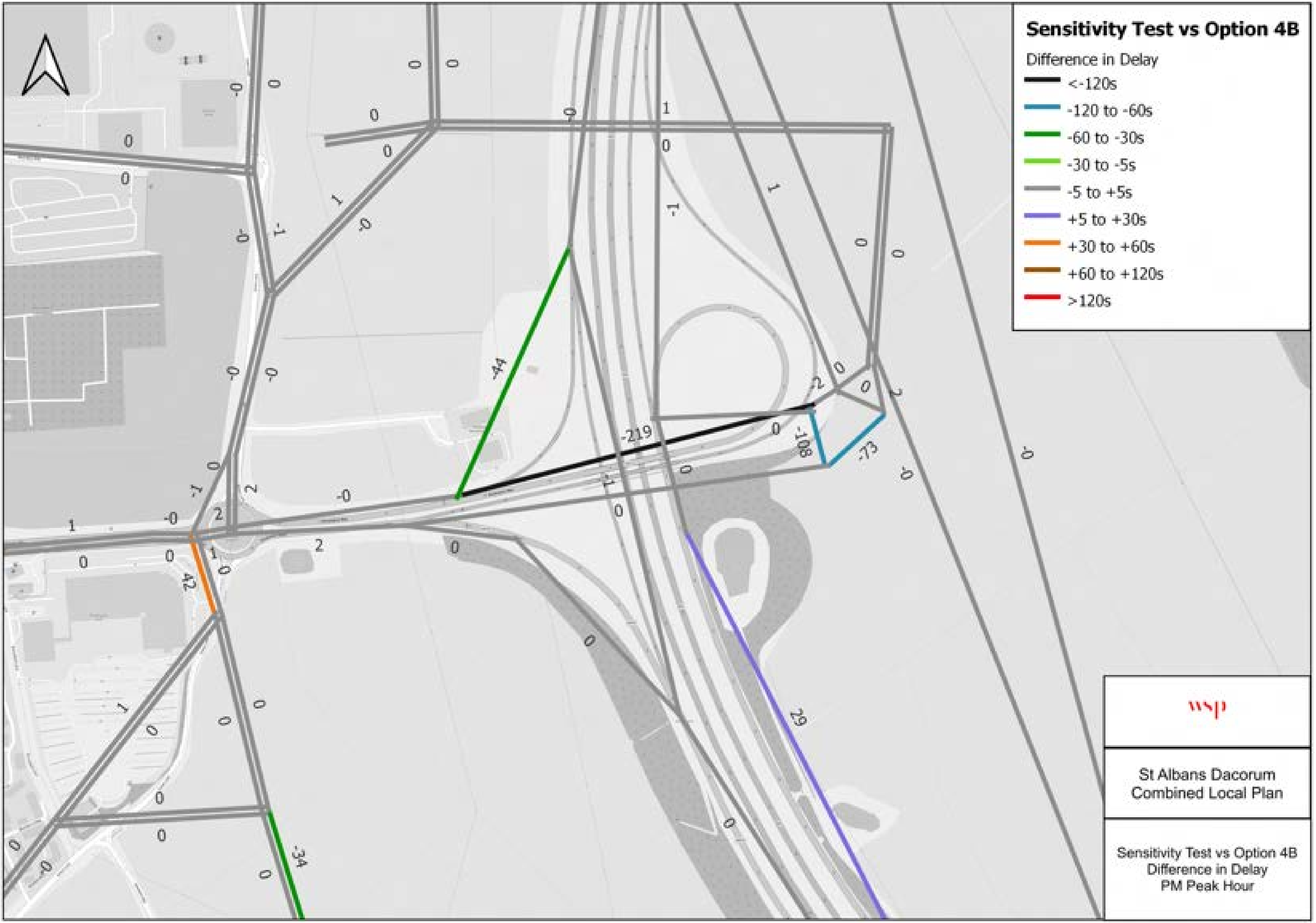


Sensitivity Test vs Option 4B
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Sensitivity Test vs Option 4B
Difference in Actual Flow
(PCUs)
AM Peak Hour


Sensitivity Test vs Option 4B
Difference in Actual Flow
<-300 PCU
-300 to -100 PCU
-100 to -10 PCU
-10 to +10 PCU
+10 to +100 PCU
+100 to +300 PCU
>+300 PCU
wsp
St Albans Dacorum
Combined Local Plan
Sensitivity Test vs Option 4B
Difference in Actual Flow
(PCUs)
PM Peak Hour



Sensitivity Test vs Option 4B
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum Combined Local Plan
Sensitivity Test vs Option 4B
Difference in Delay
AM Peak Hour


Sensitivity Test vs Option 4B
Difference in Delay
<-120s
-120 to -60s
-60 to -30s
-30 to -5s
-5 to +5s
+5 to +30s
+30 to +60s
+60 to +120s
>120s
wsp
St Albans Dacorum
Combined Local Plan
Sensitivity Test vs Option 4B
Difference in Delay
PM Peak Hour

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