

COMET Hertsmere 2036 Local Plan Scenarios

September 2018

AECOM

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Context & Objectives

Context

- HBC (Hertsmere Borough Council) is in the process of preparing a new Local Plan for the district. This will cover the period up to 2036. This involves looking at different growth level options and alternative spatial scenarios for this growth.
- It is currently anticipated that the new Local Plan will seek to meet an Objectively Assessed Need for housing of around 700 dwellings pa, compared to a currently adopted target of 266 dwellings pa. The spatial distribution of this new development across the borough has not yet been determined

Context

The Issues and Options consultation undertaken in Autumn 2017 envisaged a combination of several approaches being required, namely:

- Urban infill;
- New garden suburbs attached to existing towns providing up to c500 homes in any one location;
- Growth of larger rural communities of up to 500 homes each;
- Expansion of smaller villages of up to 300 homes each; and
- New Garden village providing initially for up to 4000 new homes, with the potential for at least a further 2000 in the longer term.

Objectives

- The task objective is to “*To assess the impact of a range of additional Local Plan allocation scenarios within Hertsmere up to 2036 in conjunction with anticipated transport infrastructure in the current version of the COMET transport model*”.
- The COMET model scenario created for this test will be referred to as the 2036 Hertsmere Local Plan Scenario.

Caveats

Caveats

- The 2036 scenario created for this scenario only includes 2036 housing development, initial employment sites and limited infrastructure in Hertsmere. All other housing, employment and infrastructure inputs remain at 2031 levels. AECOM wishes to highlight this from the start and caveat results accordingly. Additional trips on Hertsmere's highway and public transport networks generated by surrounding areas housing and employment growth between 2031 and 2036 are not represented. Growth in all other Hertfordshire Districts and surrounding areas is limited to 2031 levels. This may mask the true impacts of the developments proposed.

Caveats

- Results in this presentation focus on the 2036 Baseline Scenario as this is the “worst” case scenario with all development sites included. It is acknowledged this scenario would not be implemented in reality, however its role is to help inform decisions on future transport within the Borough and the wider area including infrastructure (of all types) priorities and transport strategies for the area.
- The four Hertsmere scenarios created focus primarily on housing growth and future model runs and/or site specific modelling will be undertaken when the precise scale, type and location of growth becomes clearer.
- The aim of the modelling is not to pass judgement on the suitability of individual development sites.

Scenarios & Methodology

Scenarios & Methodology

- The COMET 2031 HCC Local Plan V3 scenario formed the base from which the 2036 Hertsmere Local Plan Scenarios were created. This included:
 - 2031 unconstrained employment and housing growth within all Hertfordshire Districts;
 - NTEM (National Trip End Model) growth outside Hertfordshire; and
 - Wide range of desired infrastructure schemes within Hertfordshire and those confirmed in neighbouring counties close to the county border.

Scenarios & Methodology

4 infrastructure schemes included in Hertsmere in the 2031 HCC Local Plan V3 scenario :

- M25: J18 – J25 smart motorway
- Stirling Corner – signal improvements
- Borehamwood – Station Road/Theobald Street/Allum Lane junction signalisation
- Borehamwood – Elstree Way corridor

Scenarios & Methodology

The 4 Hertsmere 2036 scenarios tested were:

- Baseline Scenario - All strategic sites submitted (15,410 additional houses, 6,000 jobs);
- Scenario 1 - Currently accessible locations only in Borehamwood, front runner sites elsewhere (11,600 additional houses, 6,000 jobs);
- Scenario 2 - As Scenario 2 plus reduced Bushey growth, front runner sites elsewhere (10,200 additional houses, 6,000 jobs); and
- Scenario 3 - As Scenario 3 plus reduced housing growth in Potters Bar, South Mimms, Elstree and Shenley (8,600 additional houses, 6,000 jobs).

Scenarios & Methodology

- 2036 highway network in Hertsmere was amended to include development access points prescribed by HBC. A new link road through the Tyttenhanger Estate was added for use by buses only. Minor changes were made to signals at strategic motorway junctions to reduce delays observed in the 2031 HCC Local Plan V3 scenario.
- 2036 public transport network in Hertsmere was amended to route bus service 84 via the new Tyttenhanger Estate link road and provide an express bus connection to Potters Bar Railway Station.
- 2 development zones added for Tyttenhanger/Redwell Garden Village and Wrotham Park West Baker Street/West of Potters Bar.

2036 Hertsmere Local Plan Scenarios Highway & Public Transport Analysis

Highway Analysis - Caveats

- COMET is a strategic countywide model and has not been developed to represent traffic conditions in urban areas.
- The model's main purpose is to simulate inter-urban movements in Hertfordshire, and the calibration/validation process has been conducted accordingly. This has an implication on the level of confidence that can be placed on results in urban areas.
- The highway assignment component of the COMET model suite is in SATURN. SATURN is a tool that suits the strategic geographical scale of COMET, however, does not enable investigation of detailed sections of the highway network (e.g. detailed junction or corridor assessment).
- Further evidence may be required to underpin and understand specific network issues as well as specific development impacts as they come forward. At this stage, therefore, the results presented here should be interpreted as high level indications of likely traffic conditions.

Highway/Public Transport Analysis- Caveats

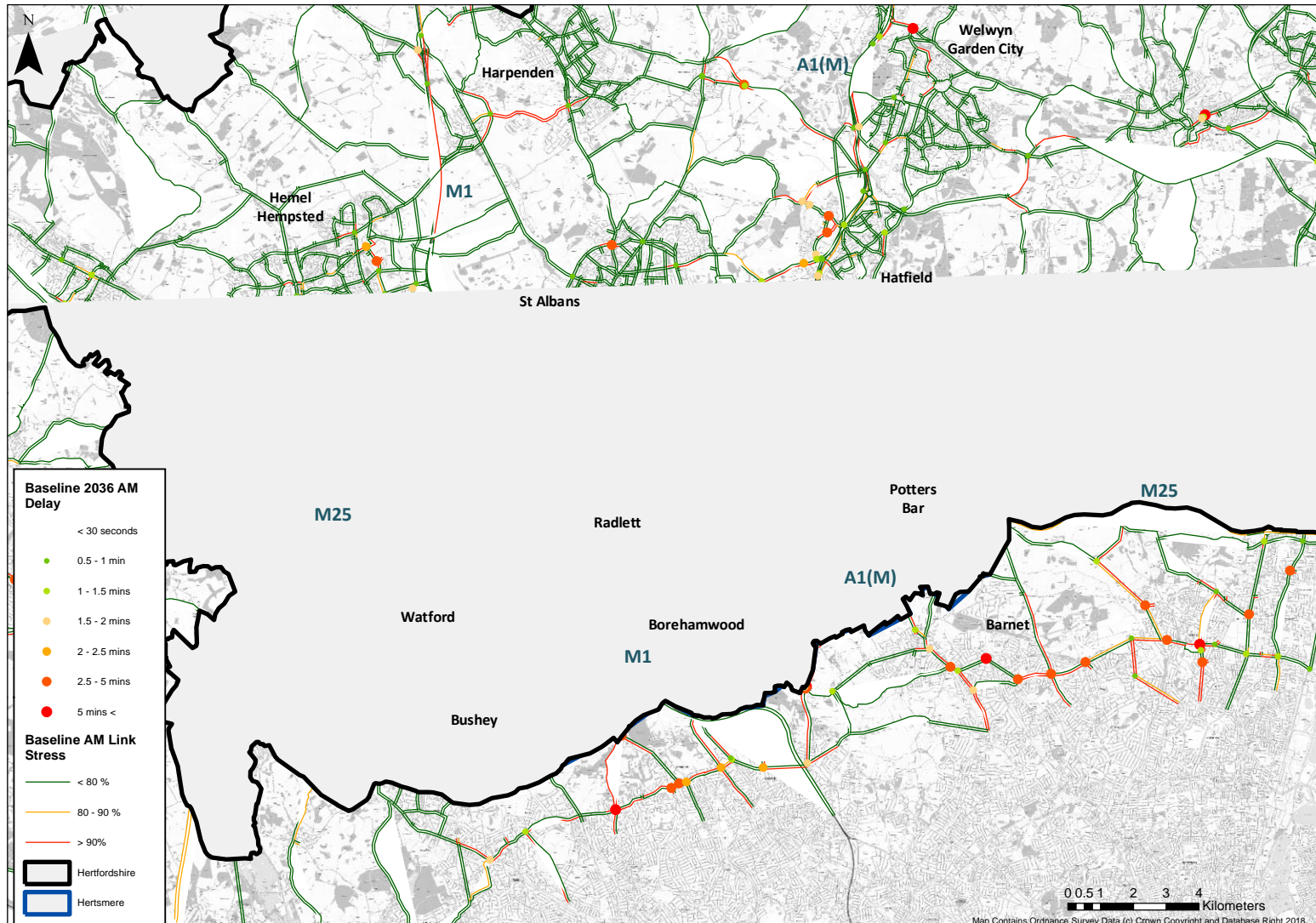
- Hertsmere is located very close to the COMET model boundaries. The simulation network ends just south of Hertsmere and buffer network starts. The buffer represents limited network coverage compared to the simulation area and network coverage/detail diminishes. This may limit the route choices into/out of Hertsmere.
- COMET assumes that any demand for public transport can be met – i.e. no account of capacity on trains or buses is made. Timetable frequencies are adhered to, however it is assumed that any buses or trains have infinite capacity.

Highway Analysis

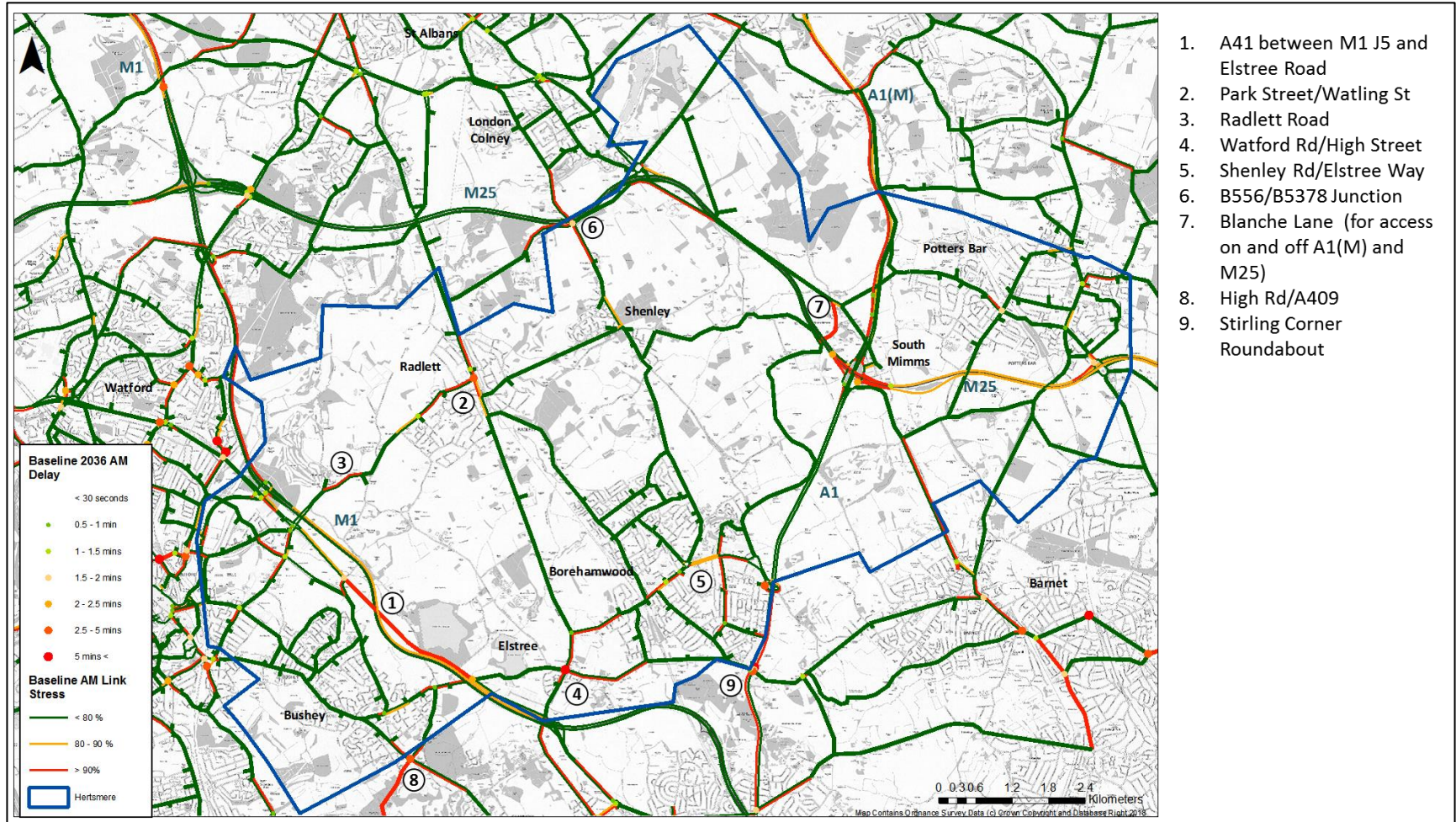
- Following slides detail the volume over capacity and node delay results from the 2036 Hertsmere Local Plan Scenario. Volume over capacity is an indication of how congested a road is. Under 80% (green) is relatively free flowing, 80% - 90% (amber) is a sign that speeds will lower and queuing at junctions will start. Over 90% (red) indicates slow moving traffic and long queues would develop at junctions.
- Node (junction) delay is an indication of how much delay each vehicle passing through a junction is expected to experience. This is regardless of which approach they use and is averaged across flows.
- Results concentrate on AM (8am – 9am) and PM (5pm – 6pm) peak periods. Key areas of delay/congestion are highlighted

West Hertfordshire Delays and V/C - AM Peak 2036

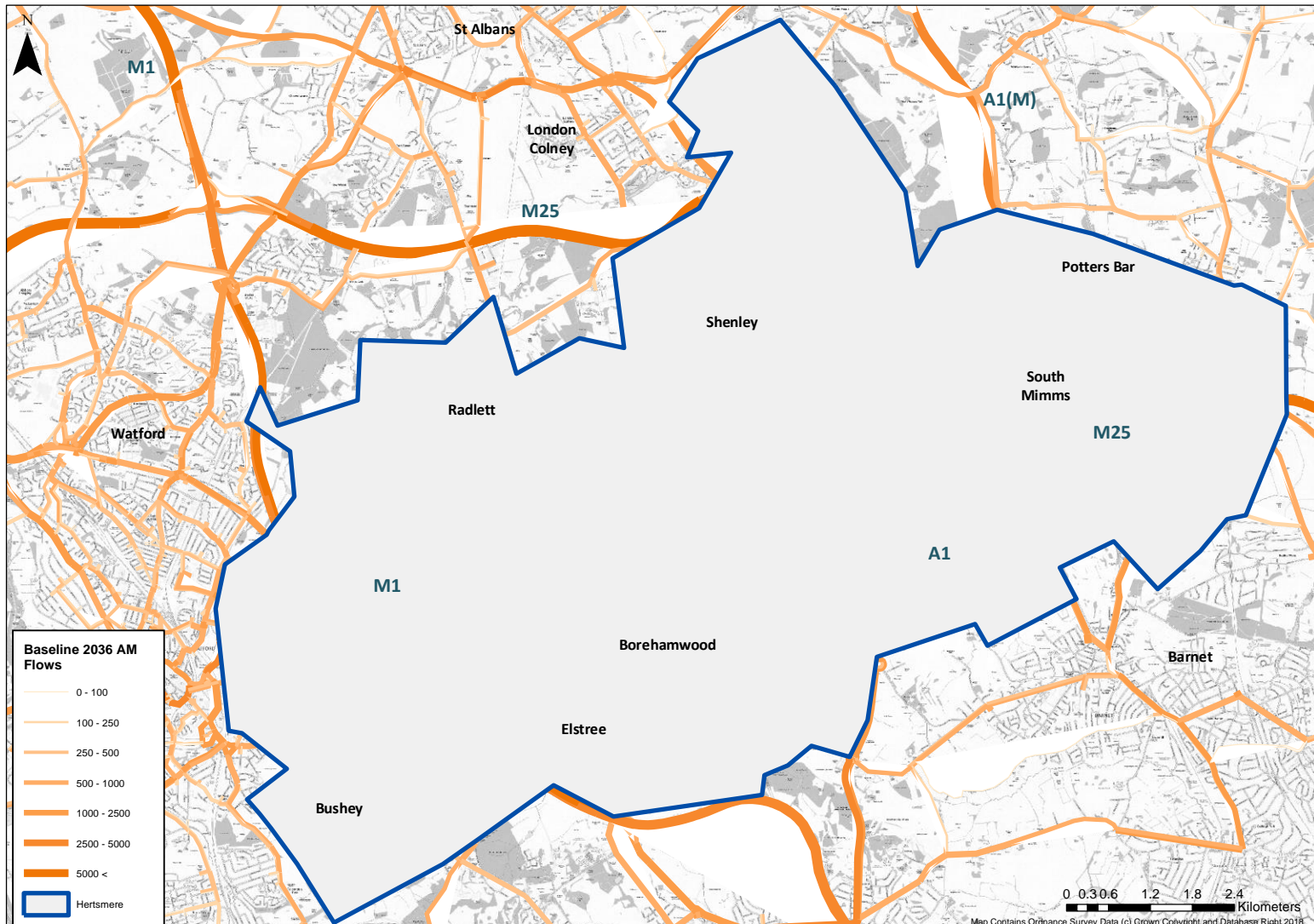
Hertsmere Baseline Local Plan



Hertsmere Delays and V/C - AM Peak 2036 Hertsmere Baseline Local Plan

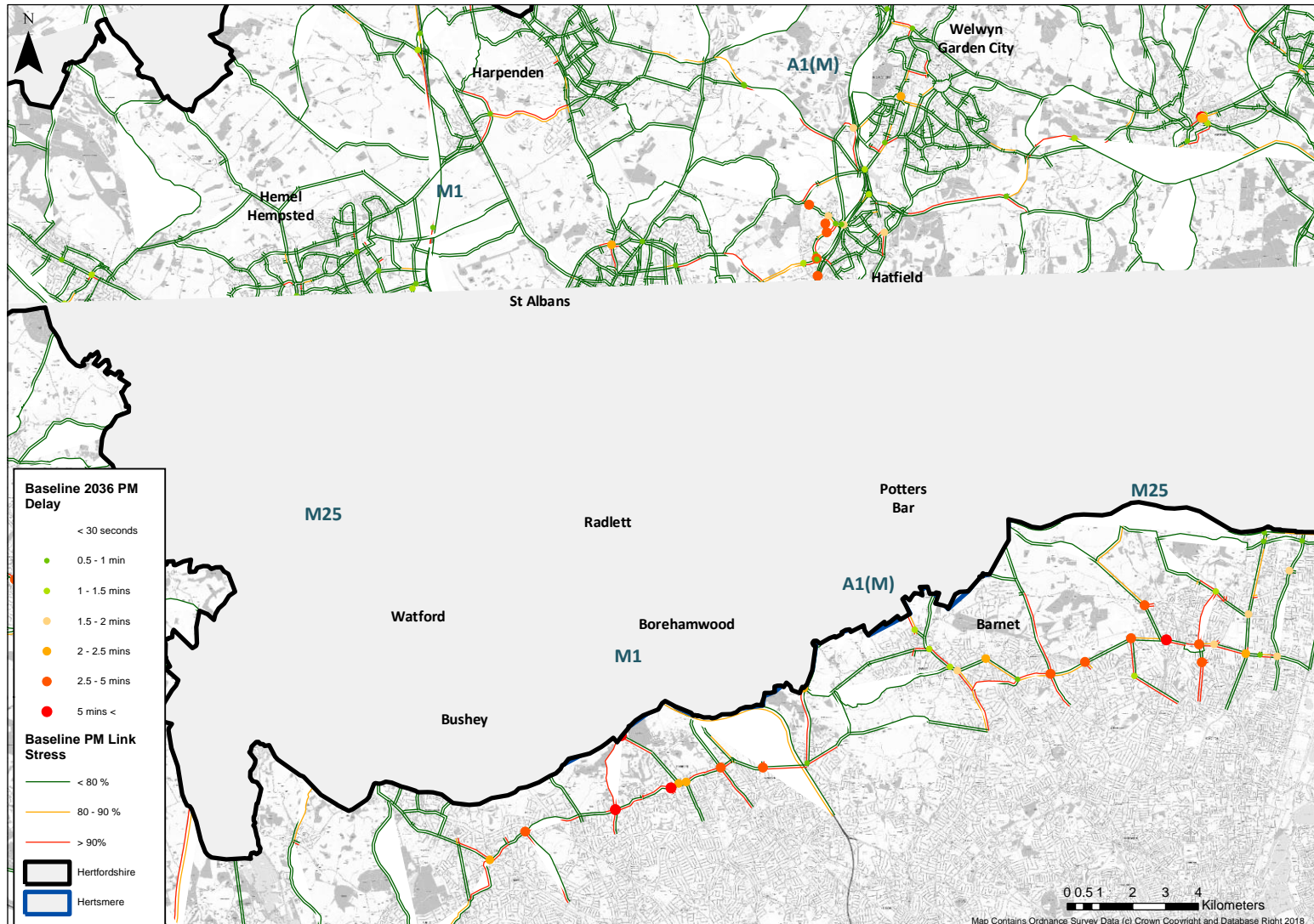


Hertsmere Flows - AM Peak 2036 Hertsmere Baseline Local Plan



West Hertfordshire Delays and V/C - PM Peak 2036

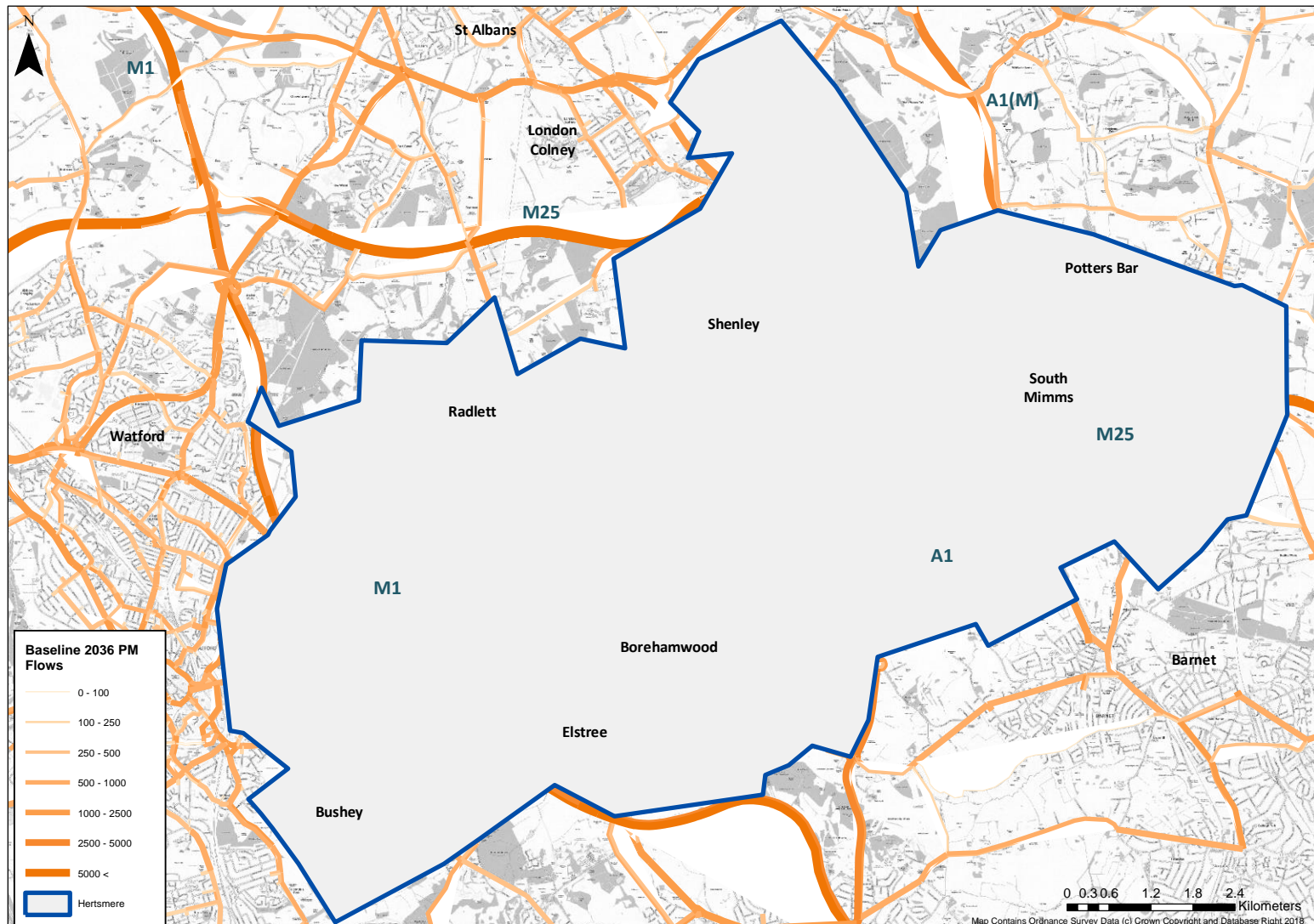
Hertsmere Baseline Local Plan



Hertsmere Delays and V/C - PM Peak 2036 Hertsmere Baseline Local Plan



Hertsmere Flows - PM Peak 2036 Hertsmere Baseline Local Plan



Highway Analysis Summary

- Key Strategic routes around/through Hertsmere (M25/M1/A1) suffer from congestion and delays in 2036. Routes to/from Hertsmere from neighbouring counties suffer congestion and delays – i.e. routes from Barnet, Stanmore, Watford and the A1 corridor all experience congestion and delays
- Emphasises motorway network surrounding Hertsmere is critical
- A41 corridor adjacent to the M1 is congested and experiences delays
- Delays at the key junctions in Elstree, Borehamwood and Radlett in Hertsmere

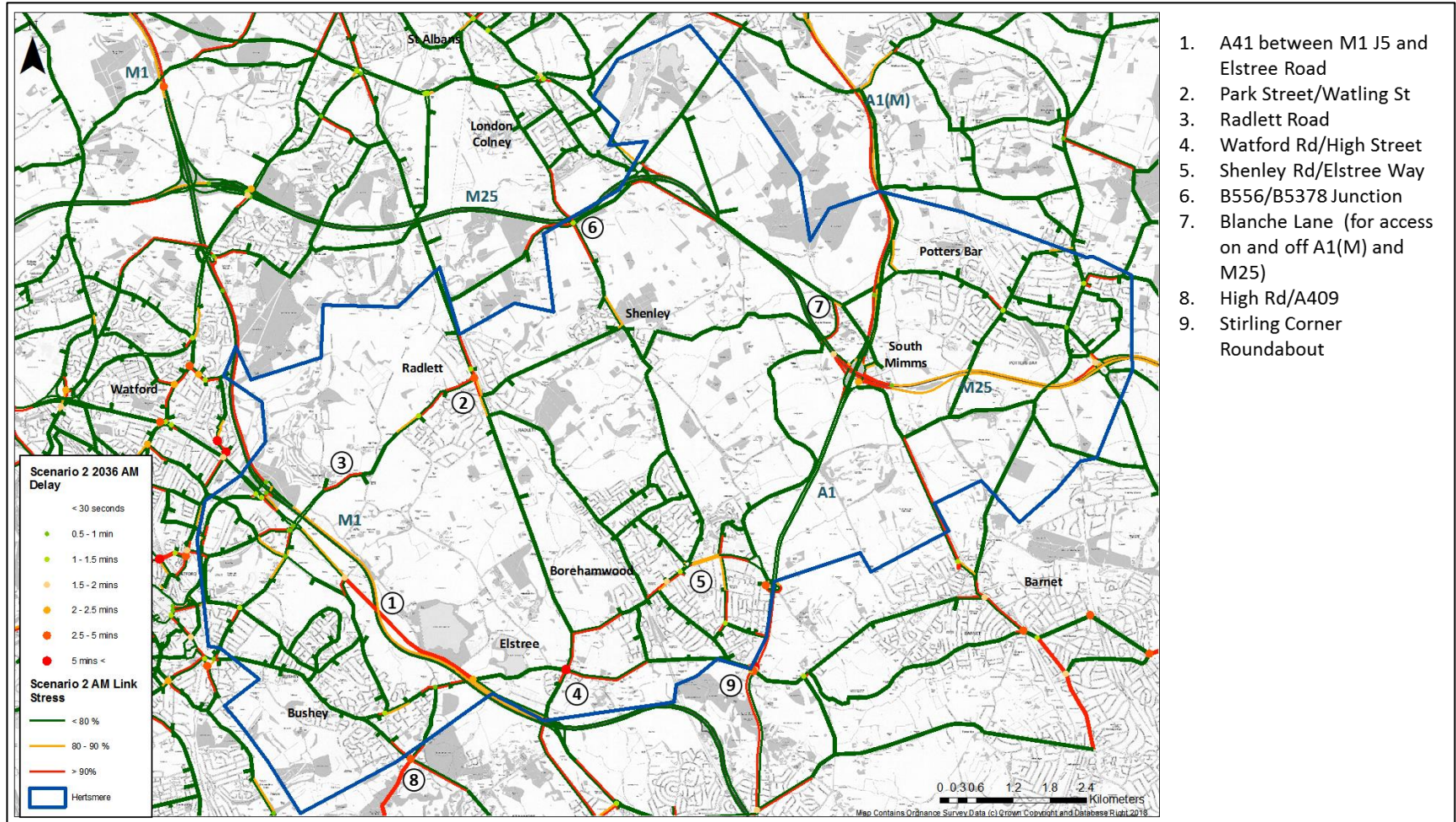
Highway Analysis – Scenarios 1, 2 & 3

- The following slides detail the volume over capacity and node delay results from the 2036 Hertsmere Local Plan Scenarios 1, 2 and 3.
- Key areas of congestion (link stress) and delays are highlighted on each map. The results indicate that common areas of congestion and delay exist in all scenarios. Whilst there are small differences in the length of delays and congestion levels, the same areas experience congestion across Hertsmere with the additional planning data in the borough.

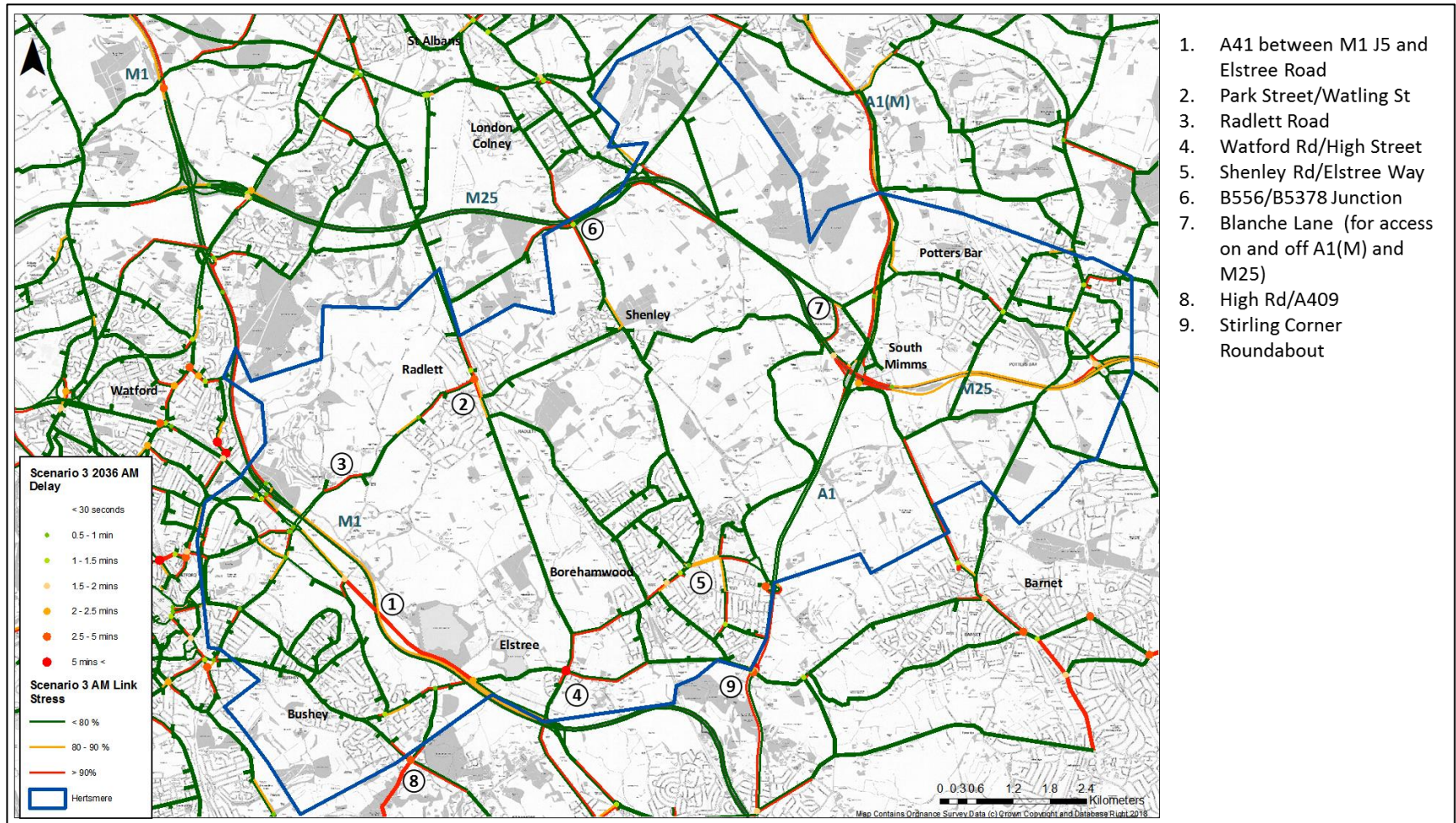
Hertsmere Delays and V/C - AM Peak 2036 Hertsmere Scenario 1 Local Plan



Hertsmere Delays and V/C - AM Peak 2036 Hertsmere Scenario 2 Local Plan



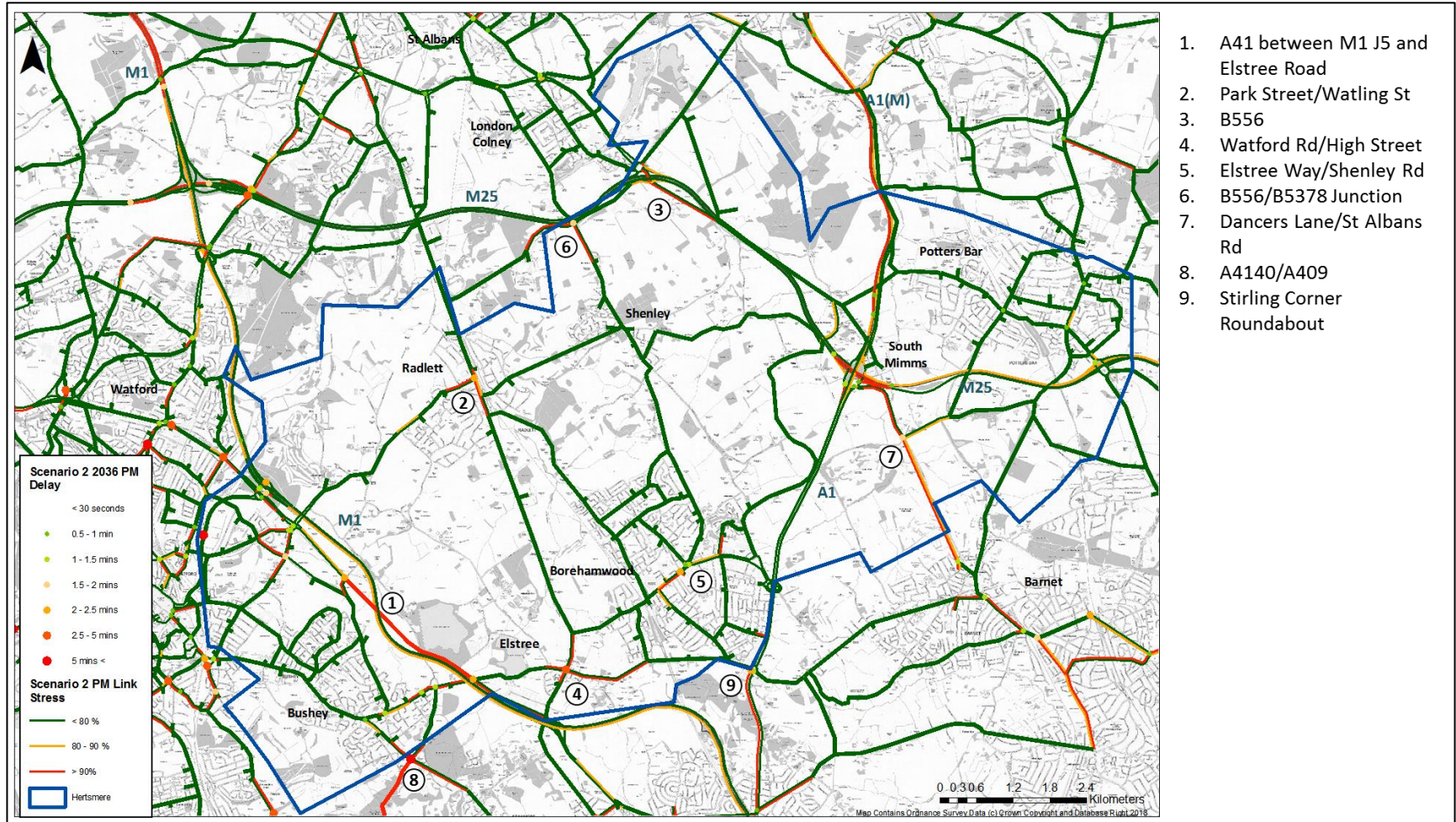
Hertsmere Delays and V/C - AM Peak 2036 Hertsmere Scenario 3 Local Plan



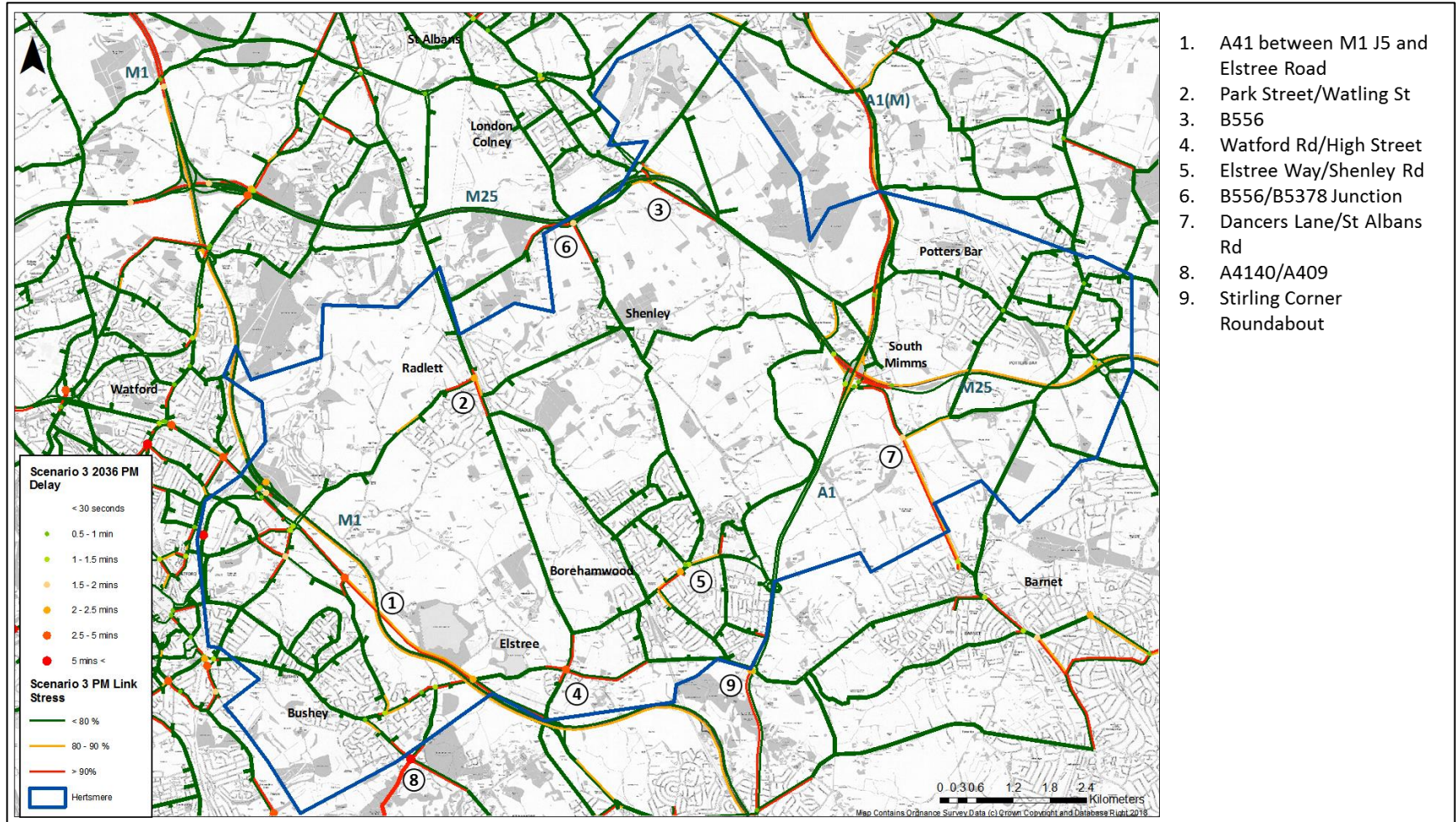
Hertsmere Delays and V/C - PM Peak 2036 Hertsmere Scenario 1 Local Plan



Hertsmere Delays and V/C - PM Peak 2036 Hertsmere Scenario 2 Local Plan



Hertsmere Delays and V/C - PM Peak 2036 Hertsmere Scenario 3 Local Plan

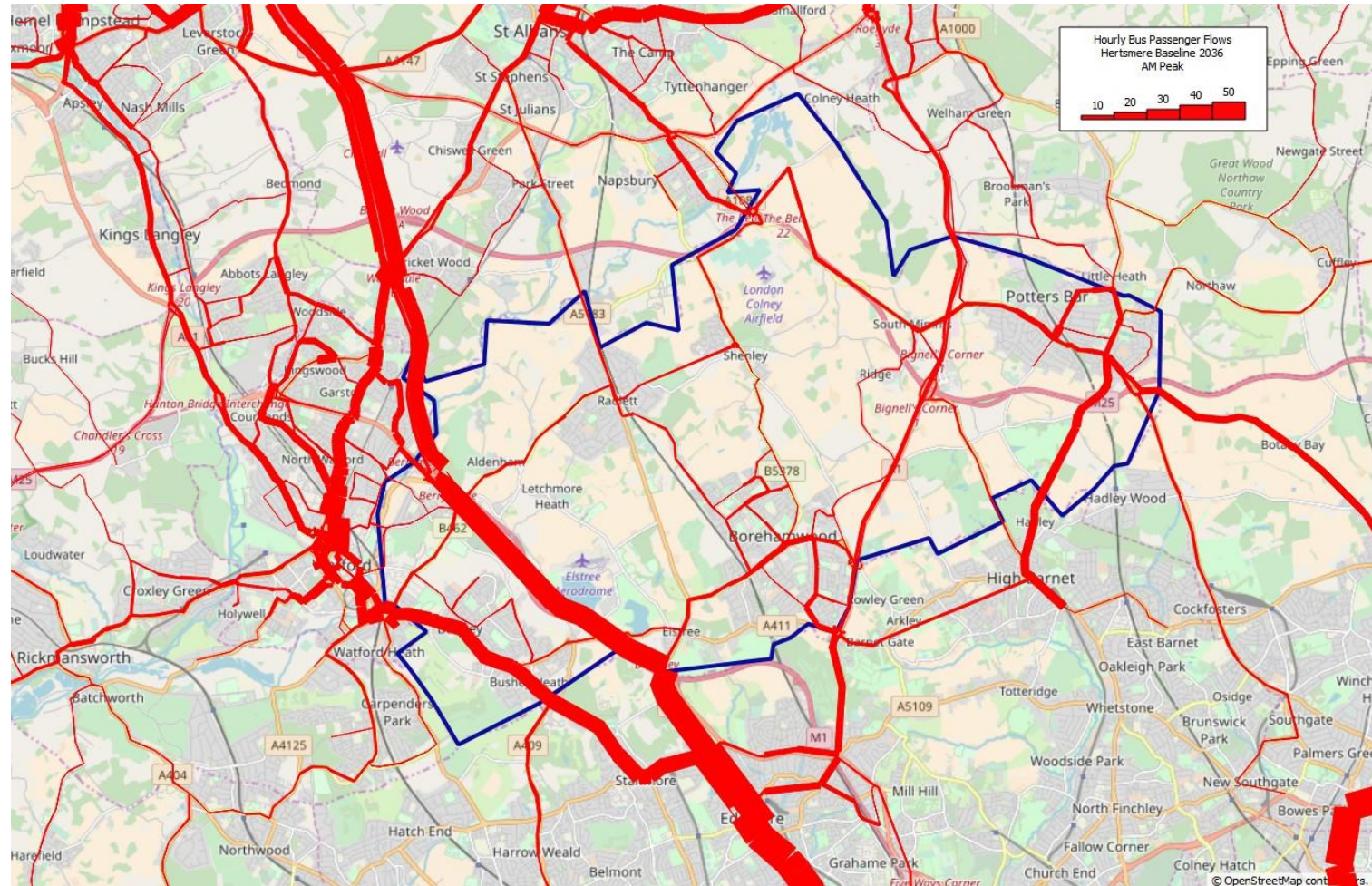


Public Transport Analysis

- Following slides detail the public transport bus and rail flows from the 2036 Hertsmere Baseline Local Plan Scenario.
- The thicker the band, the greater the demand. Results concentrate on AM (8am – 9am) and PM (5pm – 6pm) peak periods.
- N.B. COMET forecast models predict a reduction in bus patronage as incomes rise faster than bus fares therefore bus travel decreases in attractiveness and travelling by other modes (car, rail, active modes) increases.

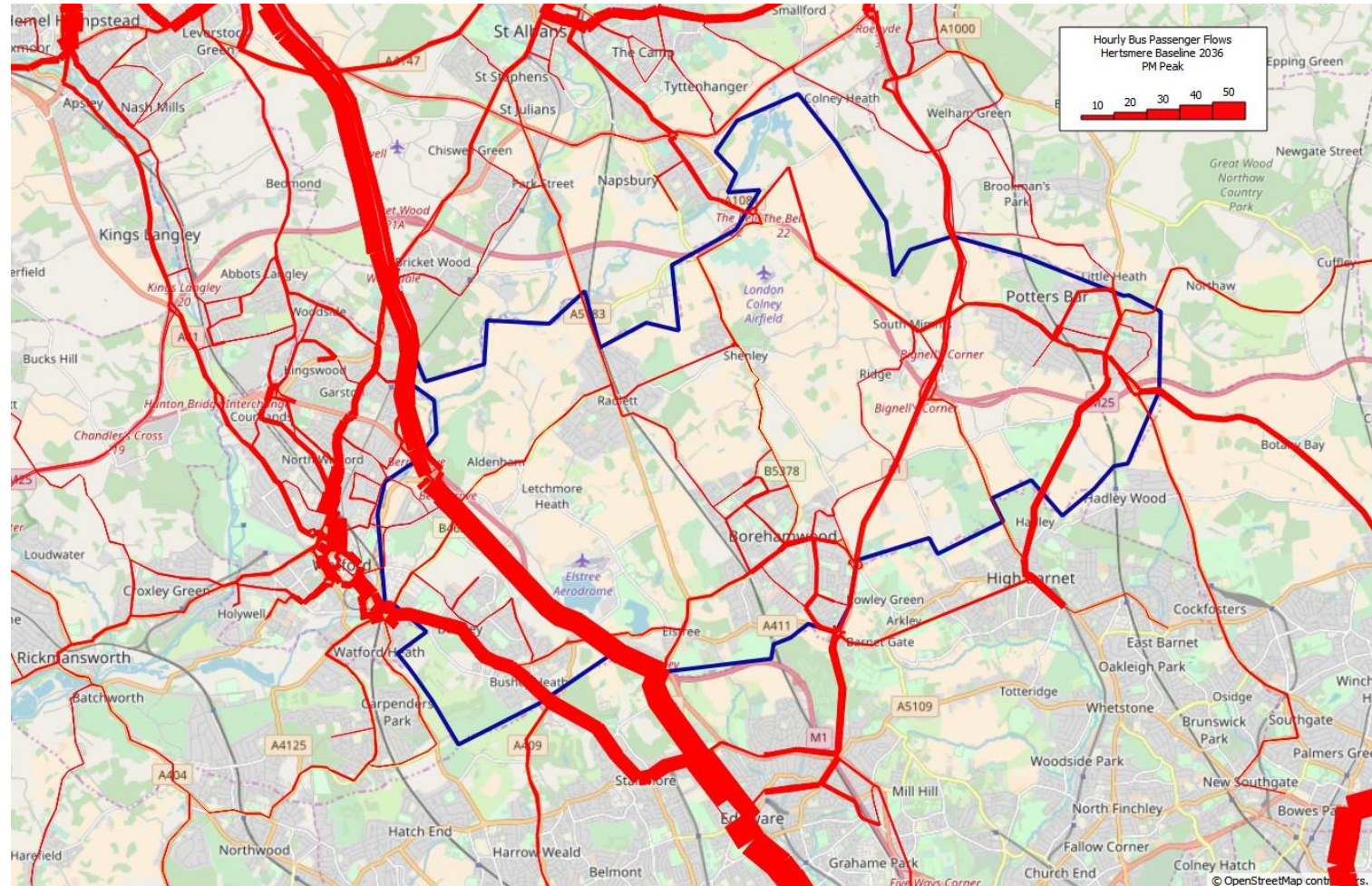
Hertsmere Bus Passenger Demand - AM Peak 2036

Hertsmere Baseline Local Plan Scenario



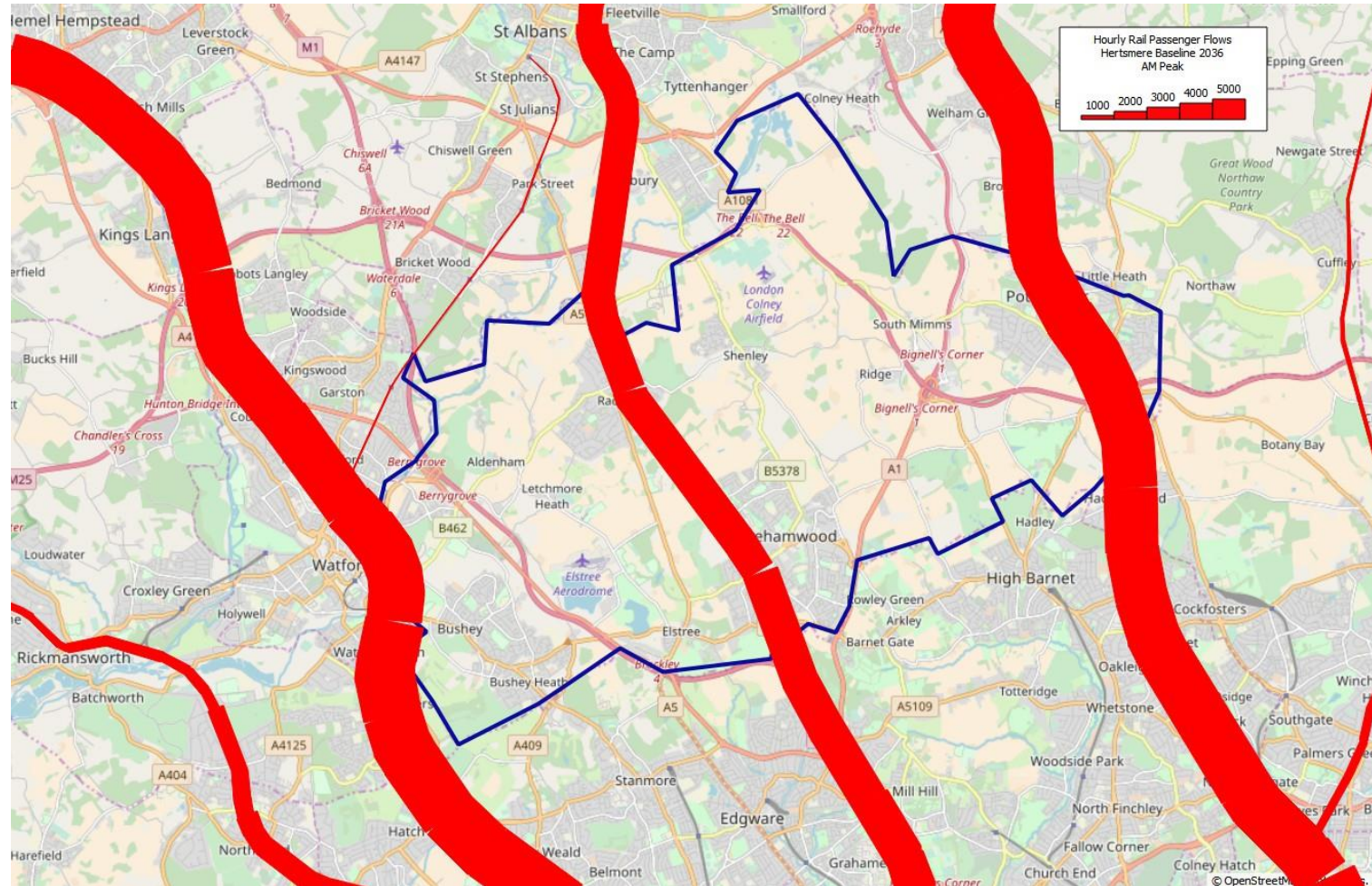
Hertsmere Bus Passenger Demand - PM Peak 2036

Hertsmere Baseline Local Plan Scenario



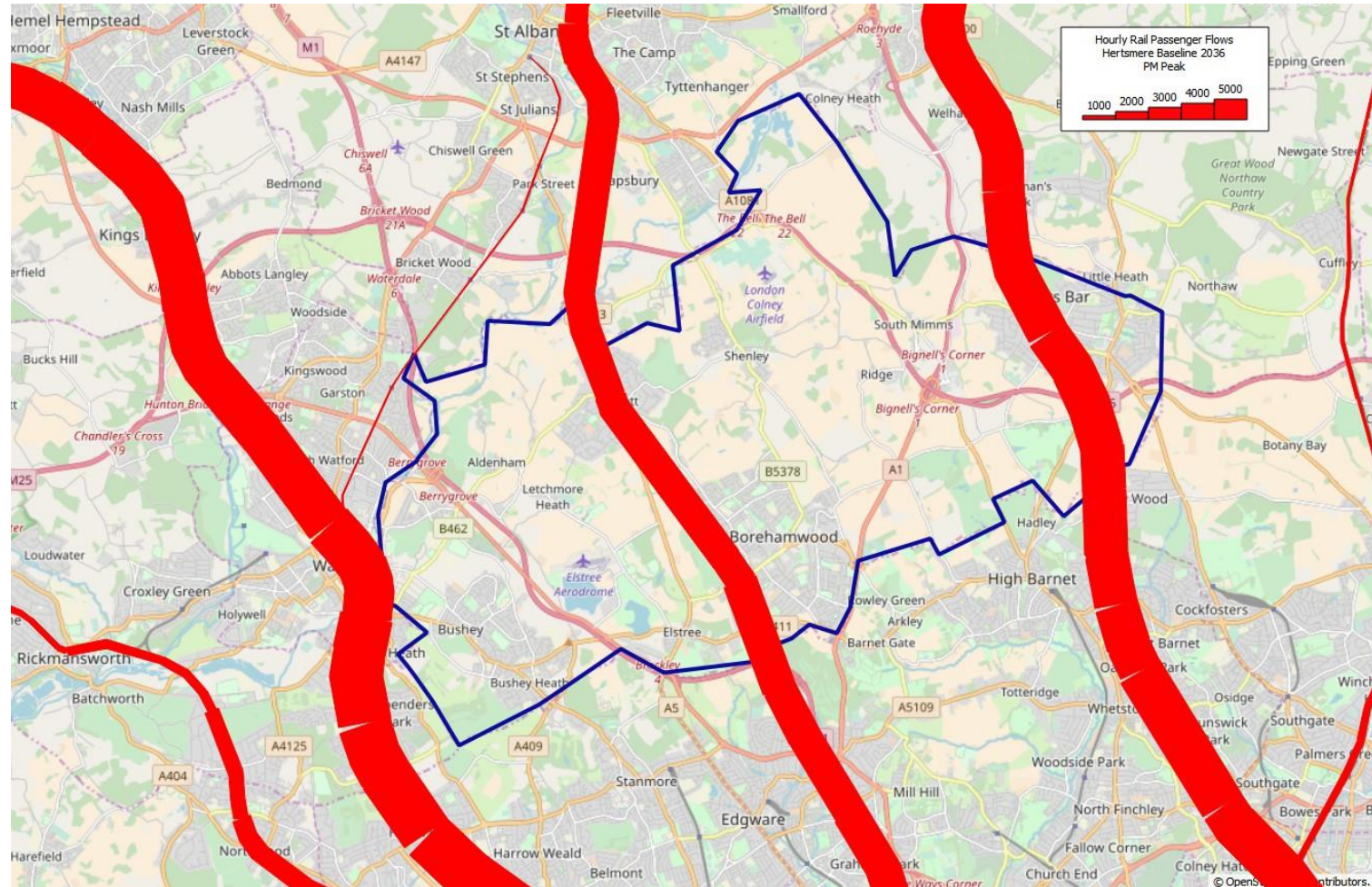
Hertsmere Rail Passenger Demand - AM Peak 2036

Hertsmere Baseline Local Plan Scenario



Hertsmere Rail Passenger Demand - PM Peak 2036

Hertsmere Baseline Local Plan Scenario



Scenario Comparison (Highways & Public Transport)

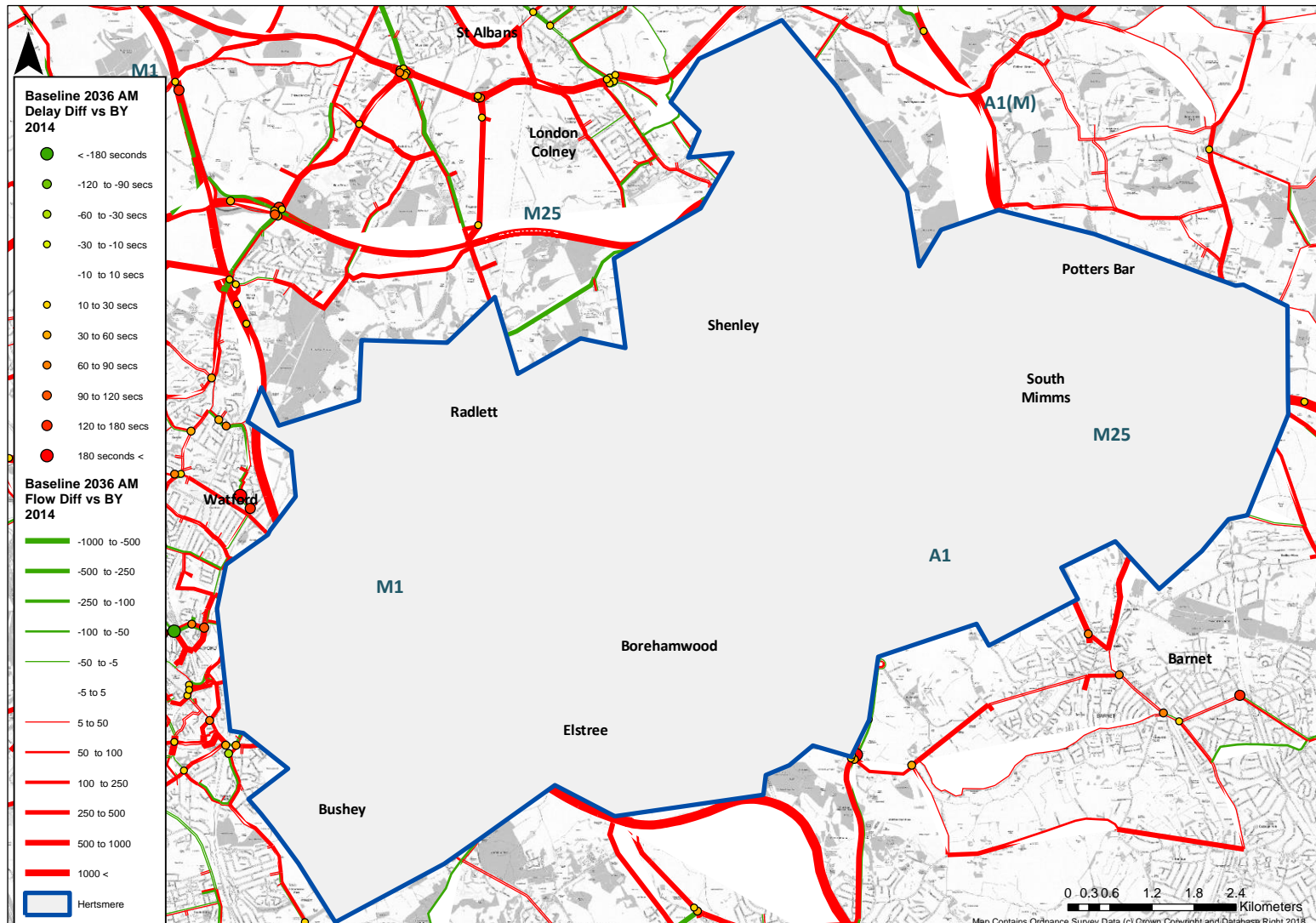
2036 Hertsmere Baseline Local Plan vs 2014
Base Model

2036 Hertsmere Baseline Local Plan vs 2031
HCC Local Plan V3

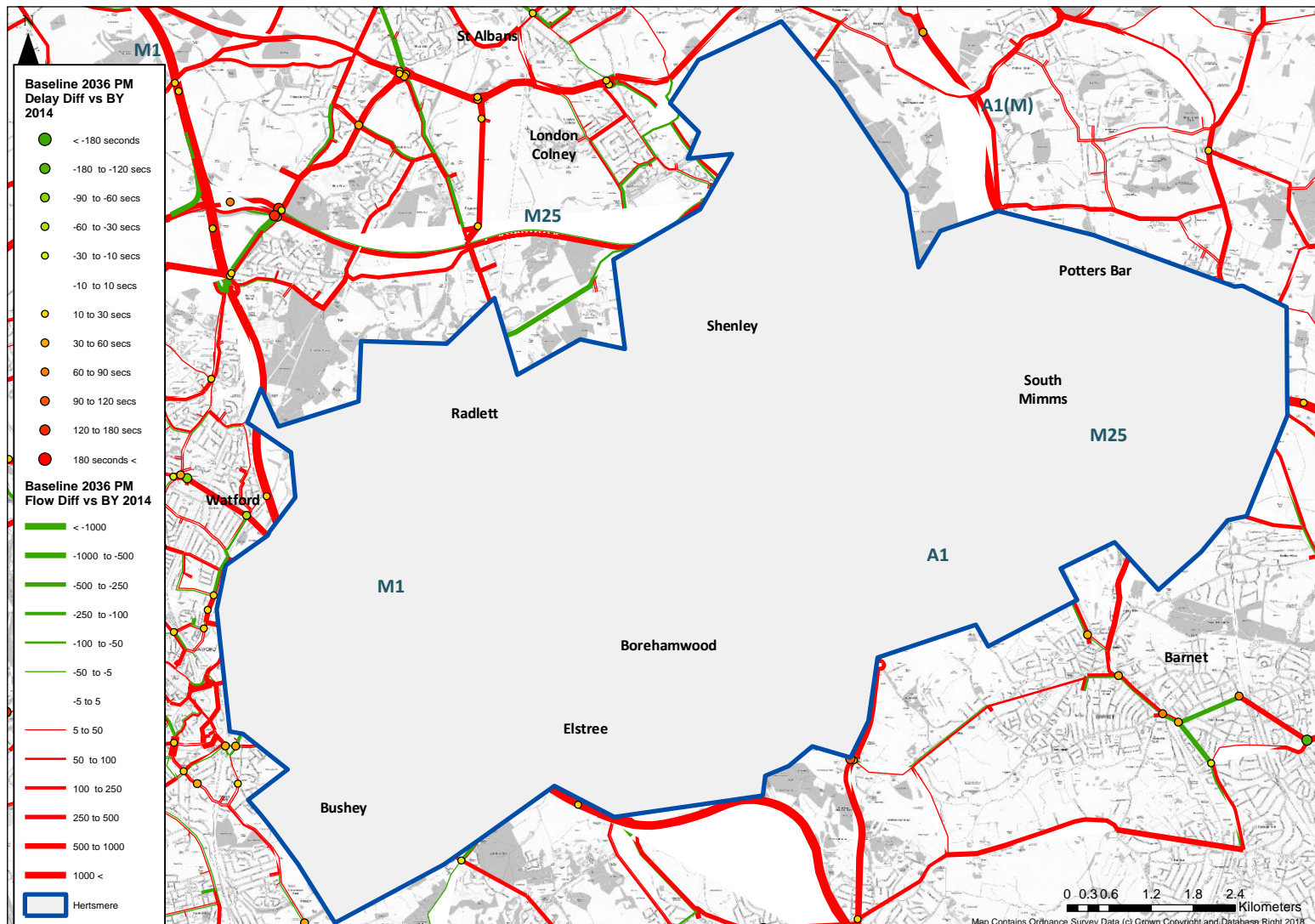
Scenario Comparison

- The following slides detail the flow and delay changes in the 2036 Hertsmere Baseline Local Plan Scenario compared to the:
 - 2014 Base Model
 - 2031 HCC Local Plan V3
- Link “equivalents” have been made where new links have been introduced in the later year scenarios. This ensures flow differences are realistic.
- Results concentrate on AM (8am – 9am) and PM (5pm – 6pm) peak periods. Small changes (+/- 5 in flow and +/- 10 seconds delay) are excluded.

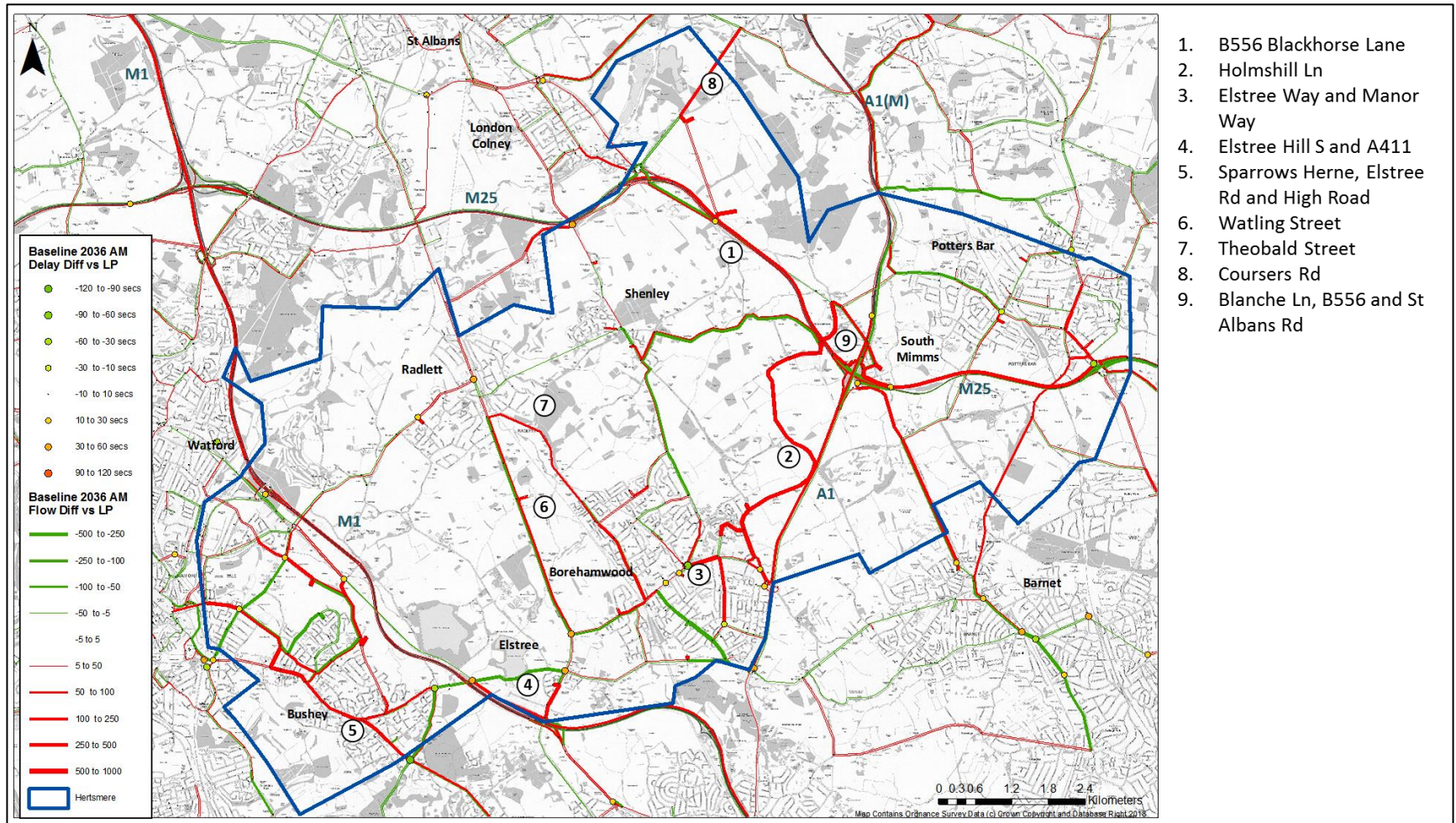
Difference in Delays and Flows - AM Peak 2014 Base year vs 2036 Baseline Hertsmere Local Plan



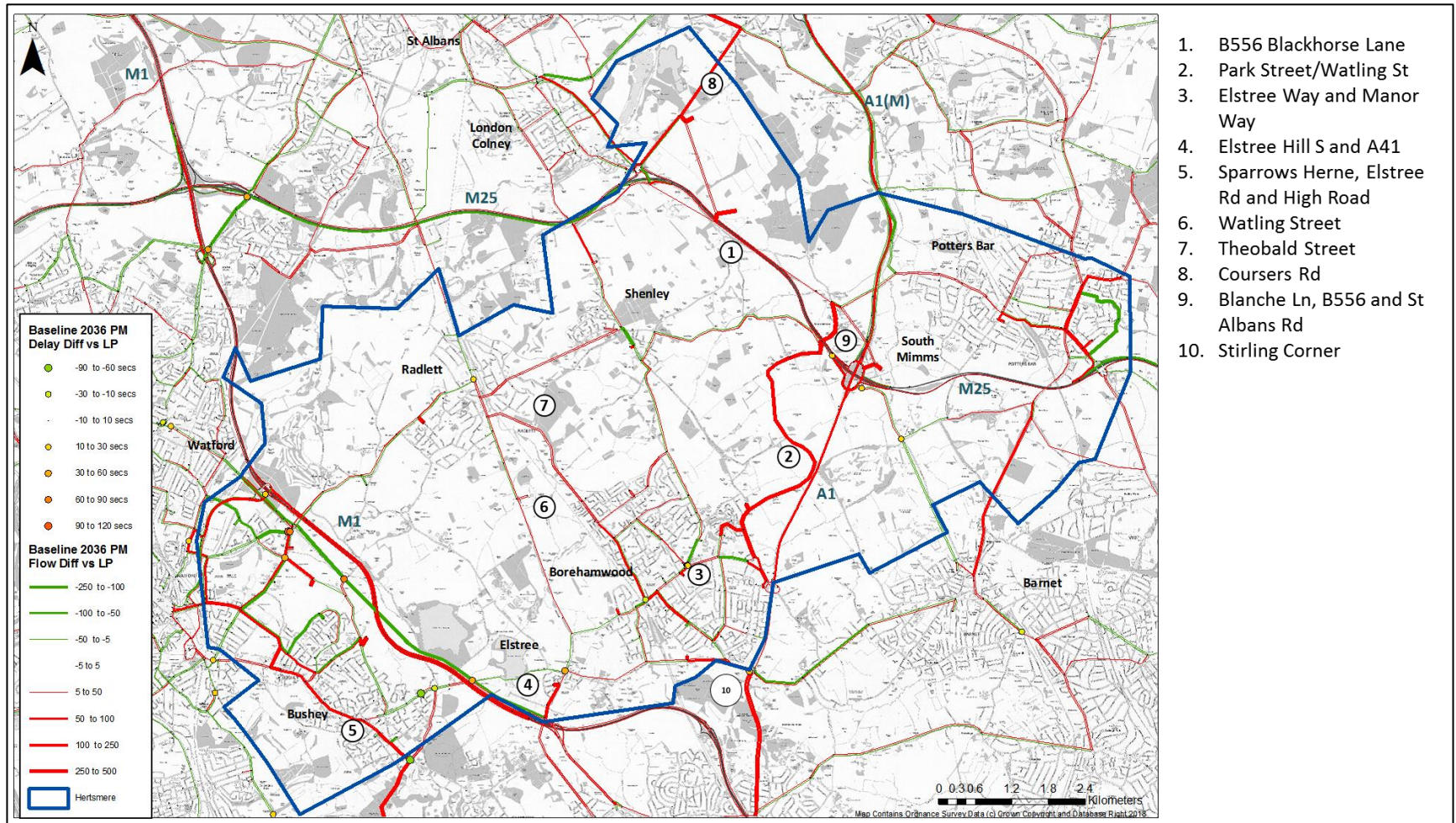
Difference in Delays and Flows - PM Peak 2014 Base year vs 2036 Baseline Hertsmere Local Plan



Difference in Delays and Flows – AM Peak 2031 HCC Local Plan V3 vs 2036 Hertsmere Baseline Local Plan



Difference in Delays and Flows – PM Peak 2031 HCC Local Plan V3 vs 2036 Hertsmere Baseline Local Plan



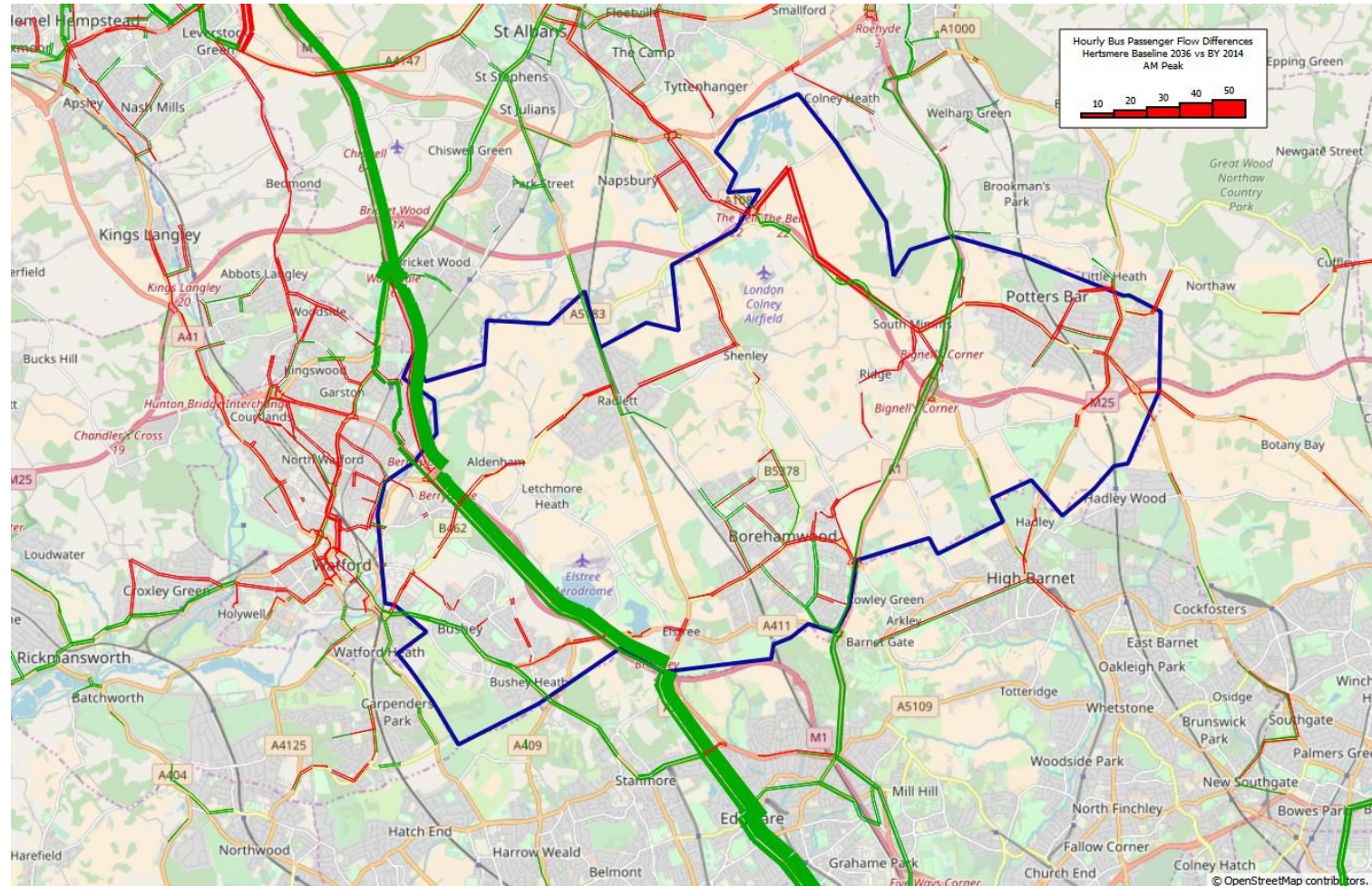
Highways Scenario Comparison - Summary

- The main differences between 2036 Hertsmere Local Plan scenario and previous scenarios are:
 - Compared to the 2014 base year model traffic flows have steadily increased across Hertsmere with the majority of increases seen on the strategic routes of the M1, M25 and A41 through/around the District.
 - Routes to and from the urban areas in Hertsmere show consistent increase in flows compared to the base year model.
 - Compared to the 2031 HCC Local Plan V3 there are increased flows to/from Bushey, Borehamwood, Potters Bar and South Mimms. The impact of the new garden village and South Mimms developments can be clearly seen. Flows on the M1, A1 and M25 through Hertsmere also increase. Delays at junctions in town centres also increase due to the additional growth.

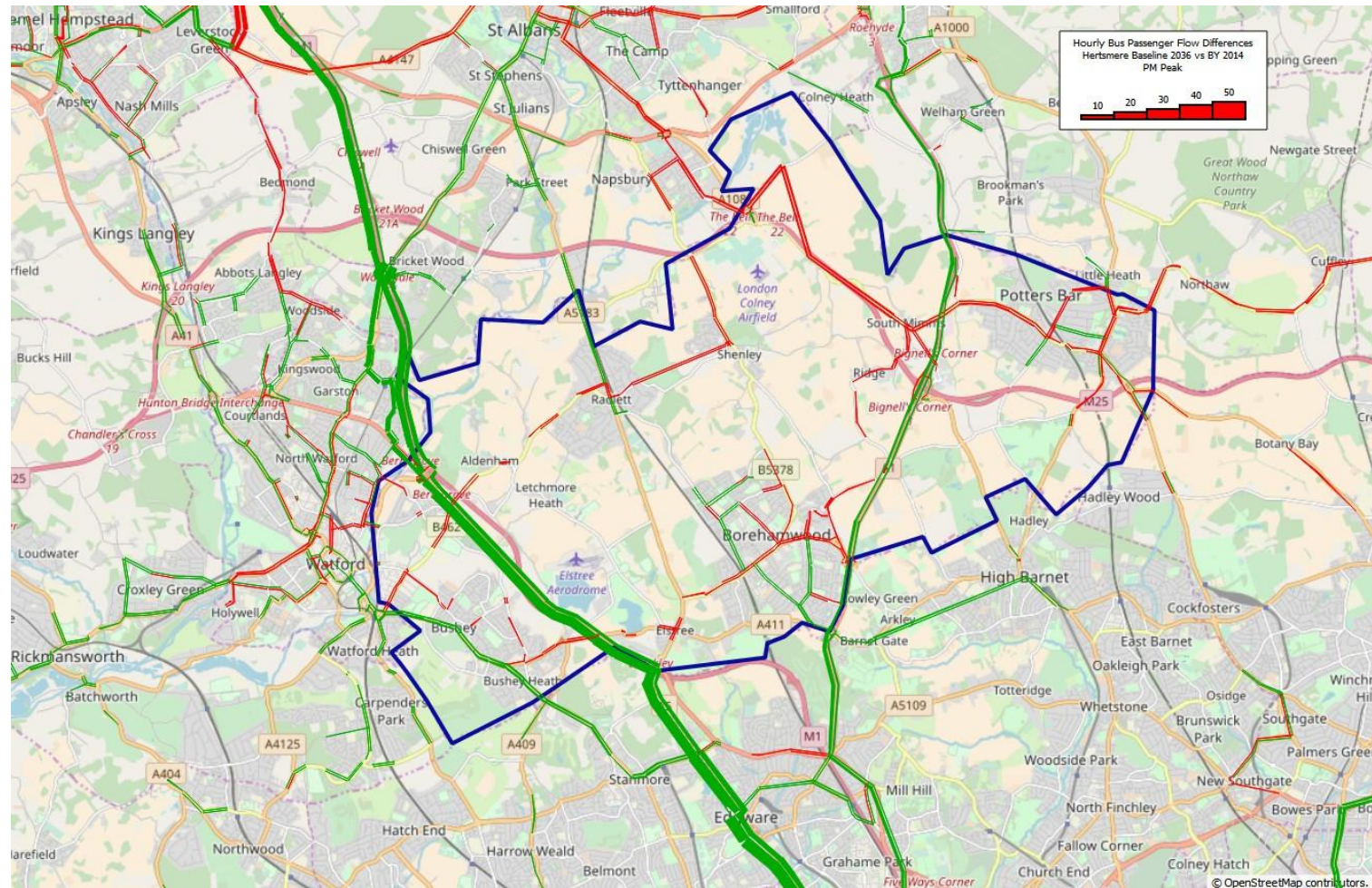
Public Transport Scenario Comparison

- The following slides detail the bus and rail demand changes in the 2036 Hertsmere Baseline Local Plan Scenario compared to the:
 - 2014 Base Model
 - 2031 HCC Local Plan Do Something
- Results concentrate on AM (8am – 9am) and PM (5pm – 6pm) peak periods.

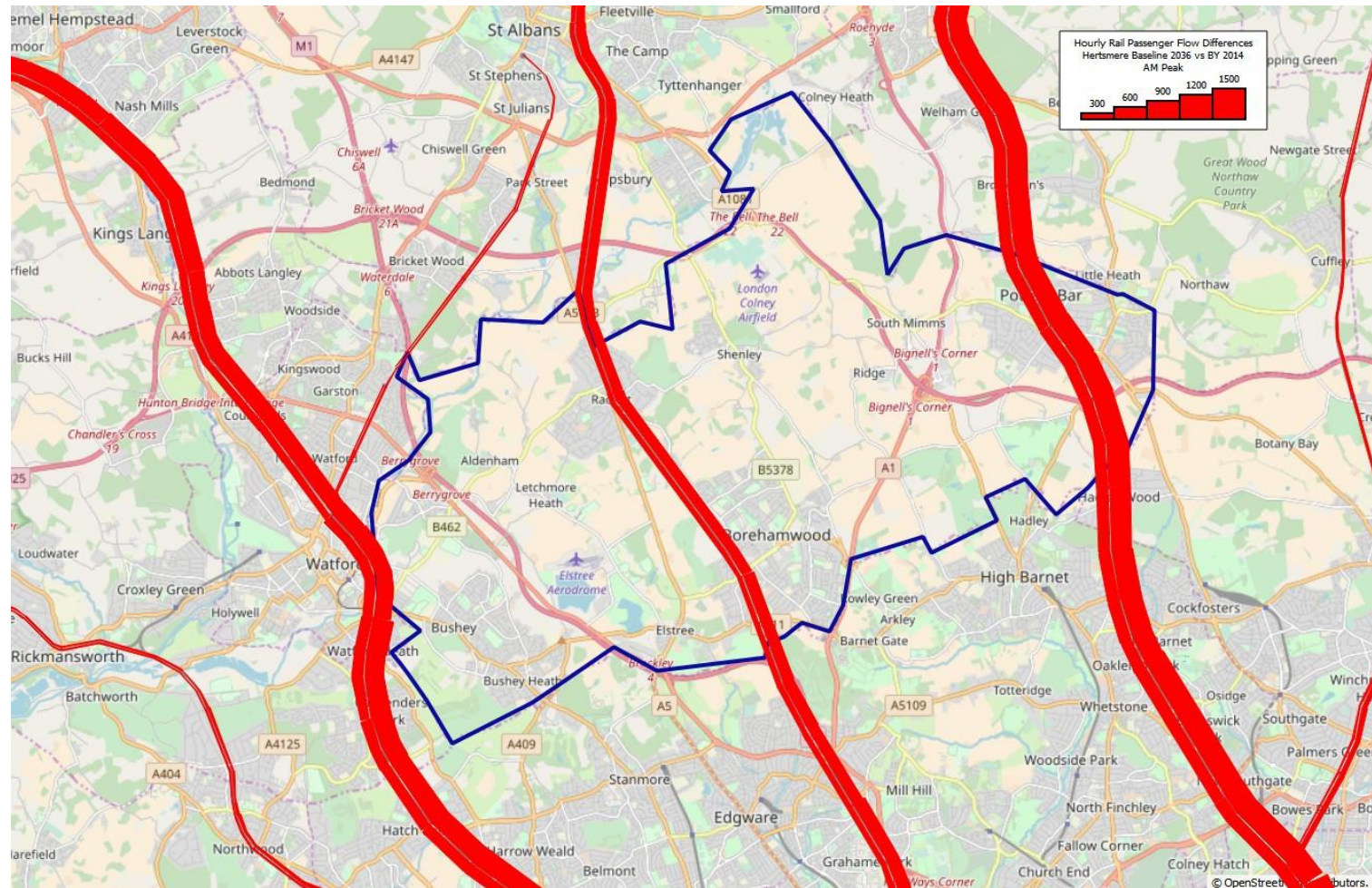
Difference in Bus Passenger Demand - AM Peak 2014 Base Model vs 2036 Hertsmere Baseline Local Plan



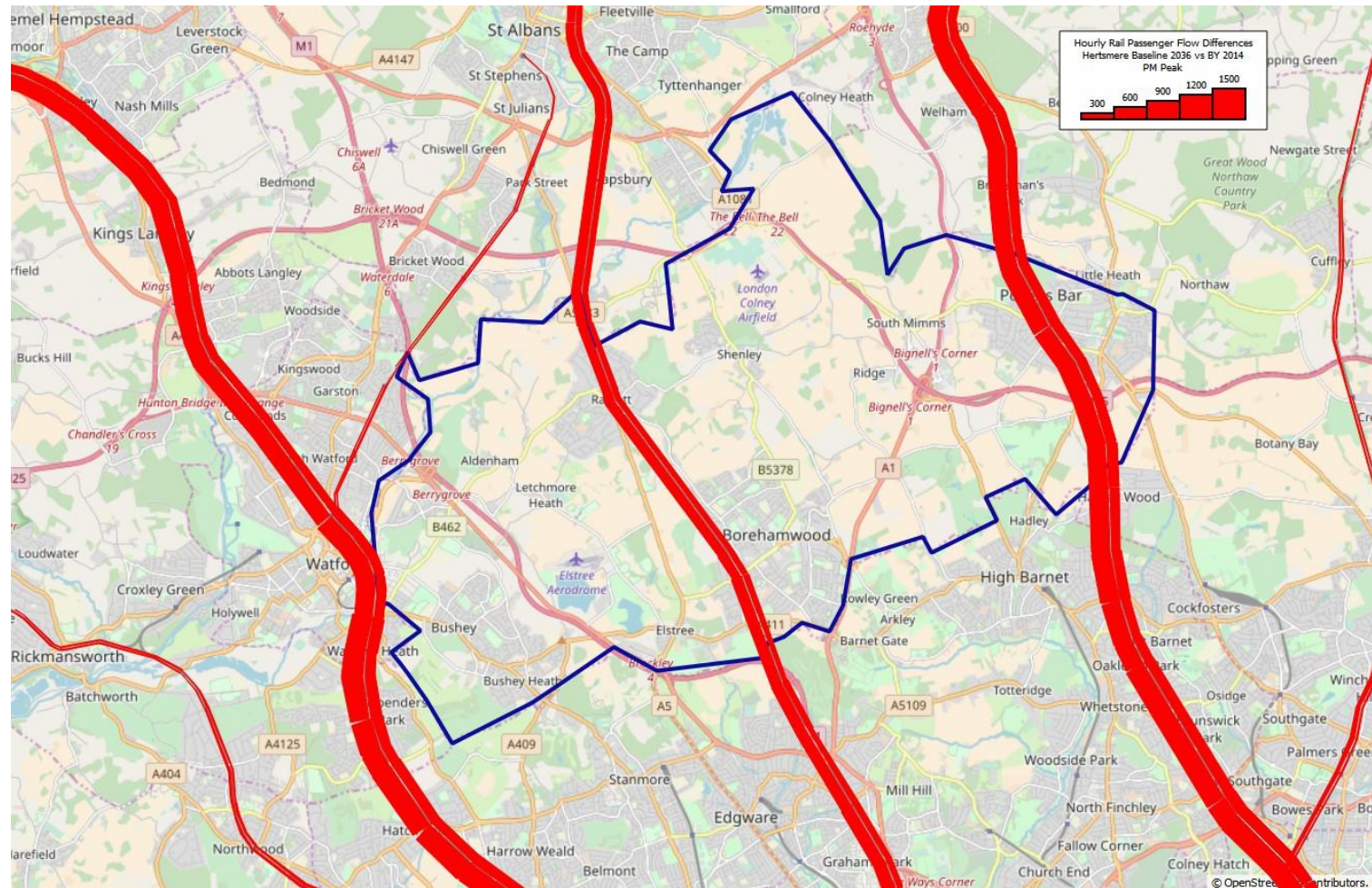
Difference in Bus Passenger Demand - PM Peak 2014 Base Model vs 2036 Hertsmere Baseline Local Plan



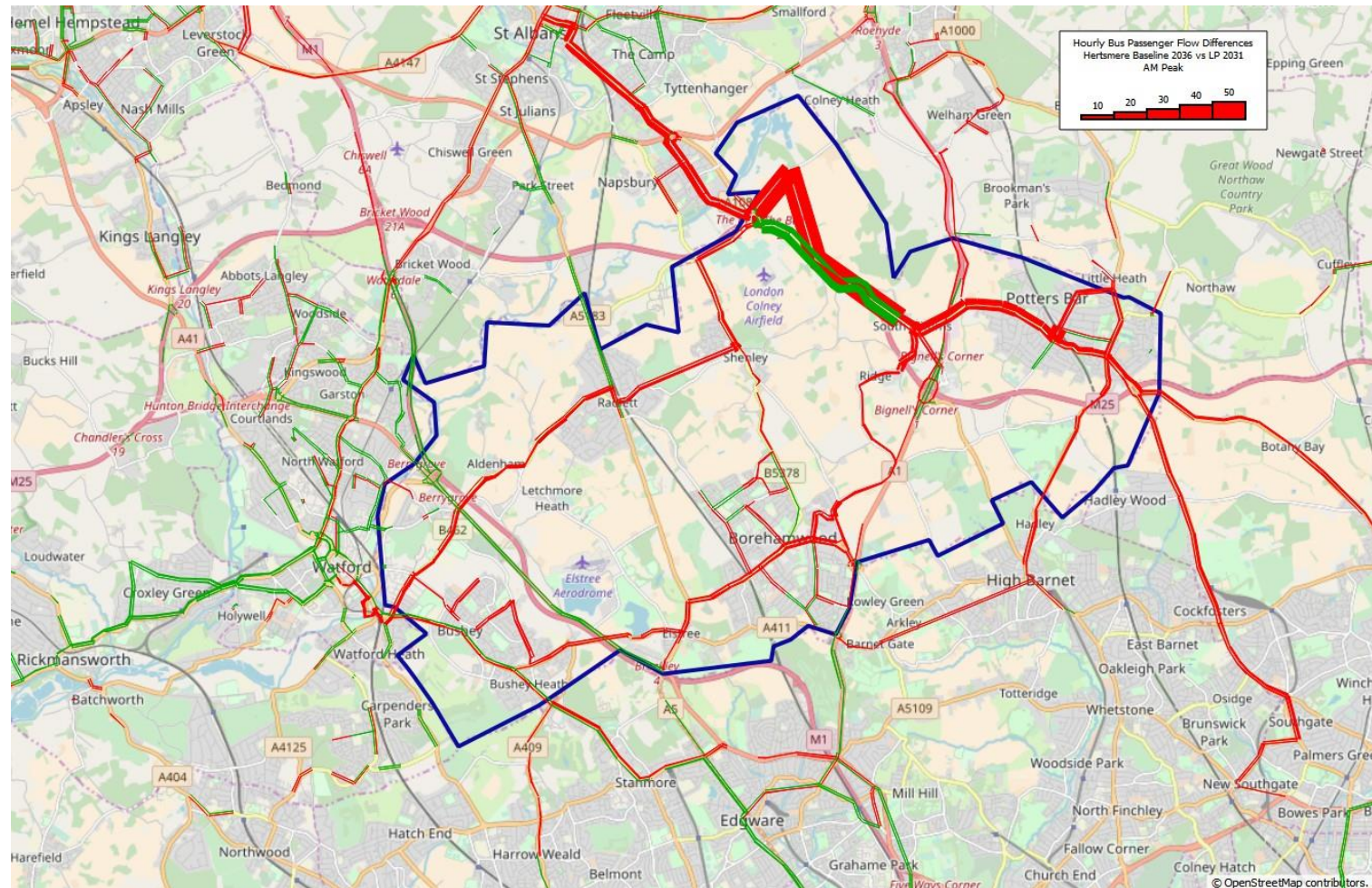
Difference in Rail Passenger Demand - AM Peak 2014 Base Model vs 2036 Hertsmere Baseline Local Plan



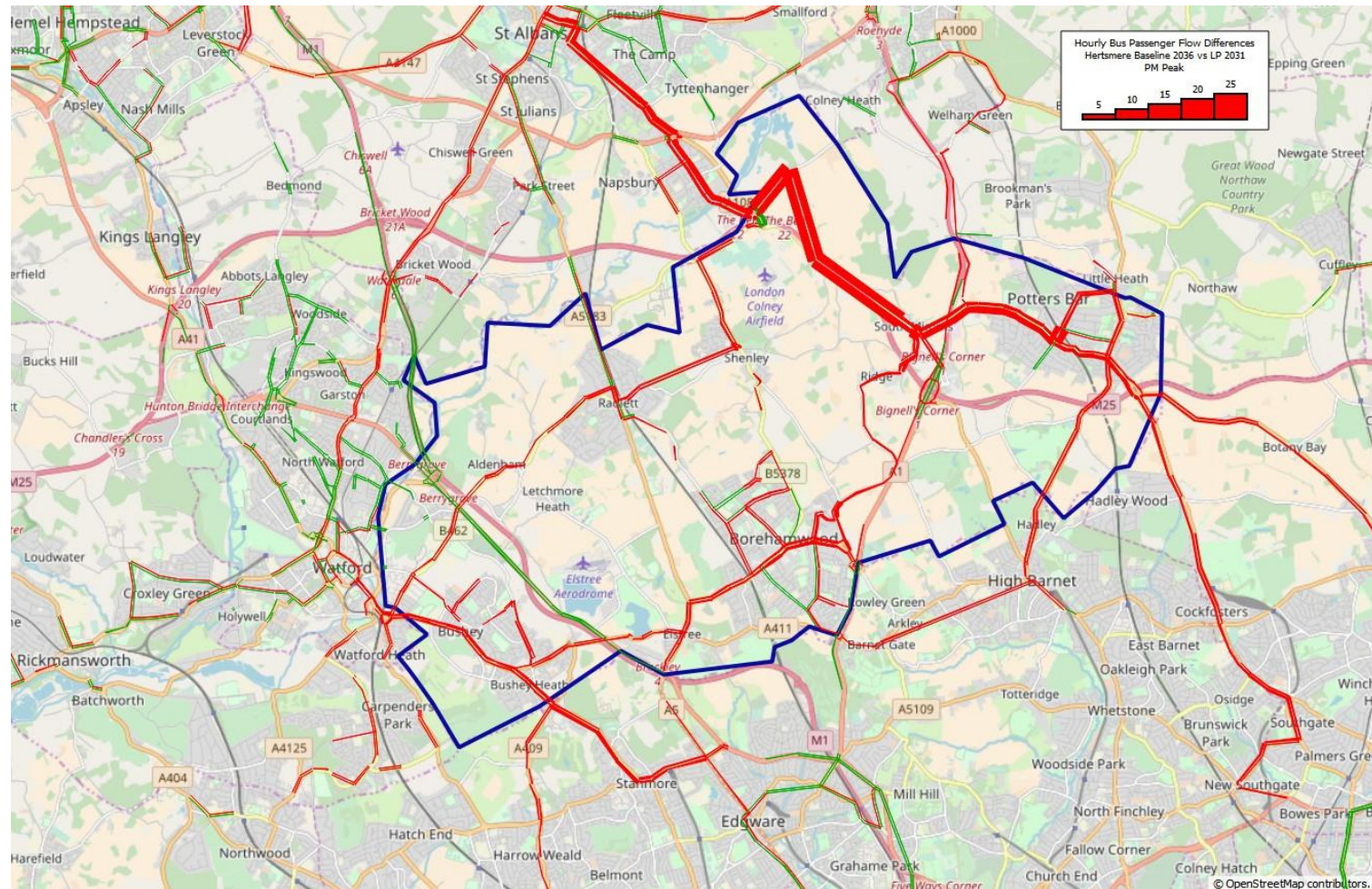
Difference in Rail Passenger Demand - PM Peak 2014 Base Model vs 2036 Hertsmere Baseline Local Plan



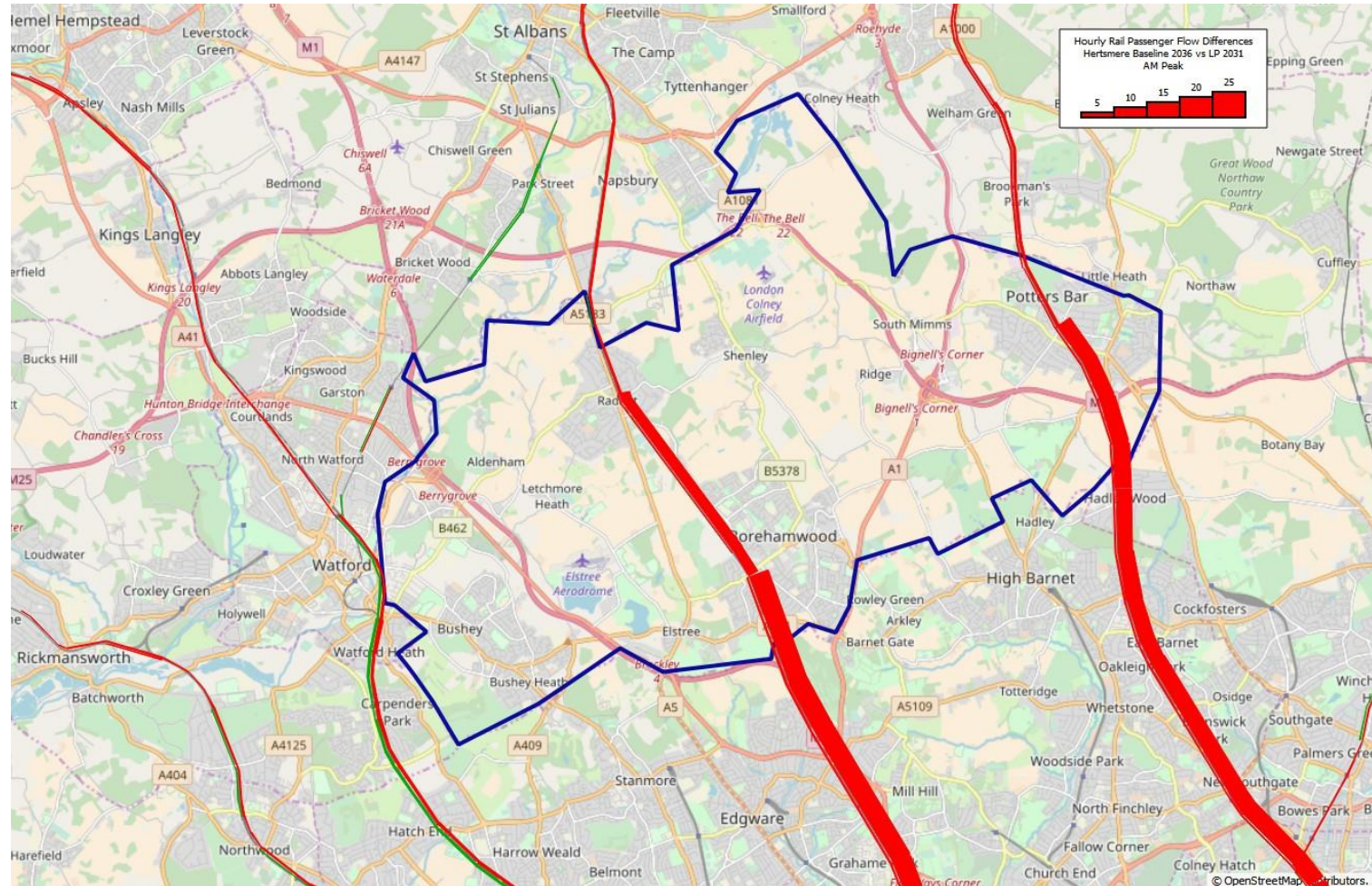
Difference in Bus Passenger Demand - AM Peak 2031 HCC Local Plan V3 vs 2036 Hertsmere Baseline Local Plan



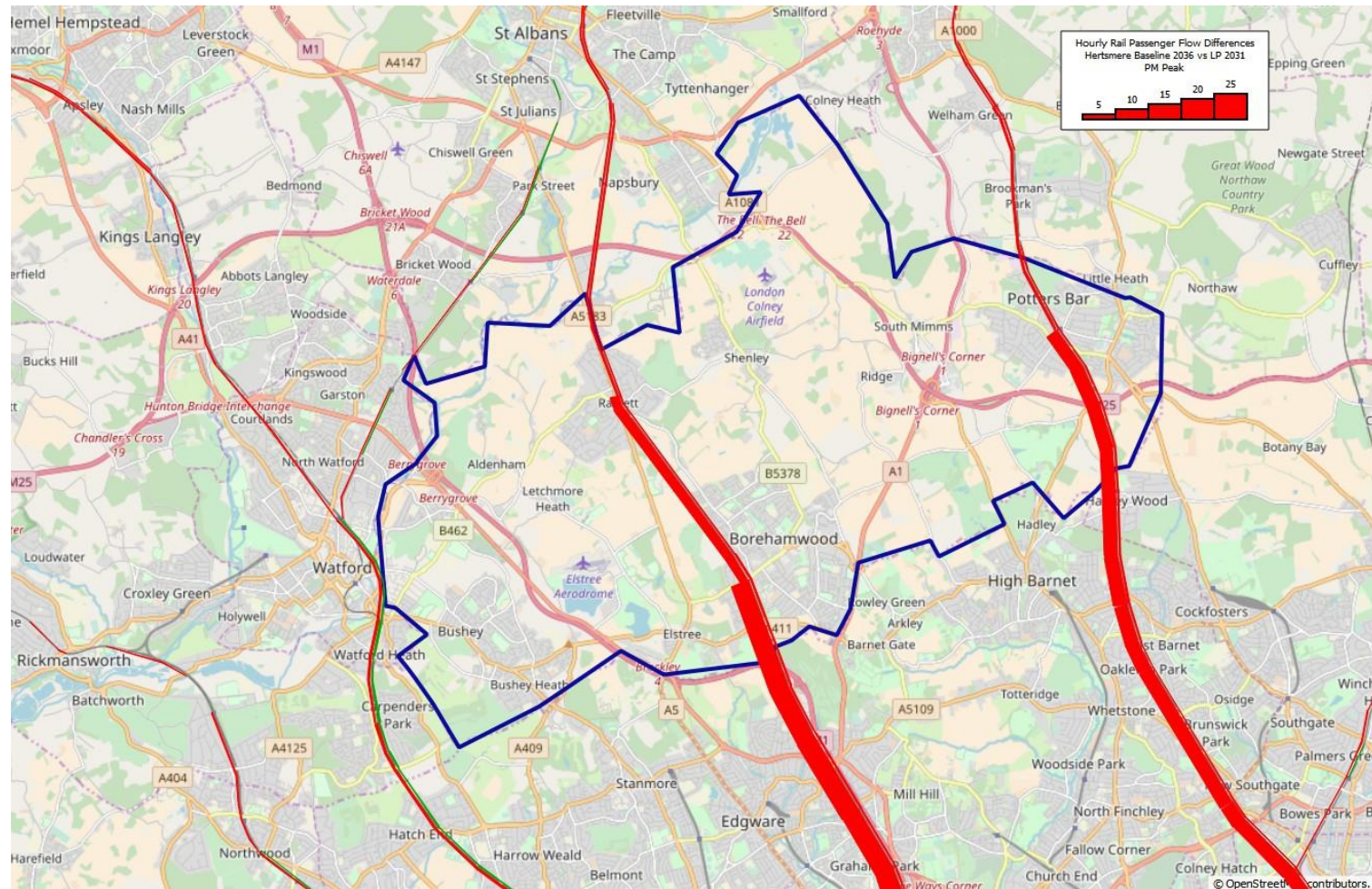
Difference in Bus Passenger Demand - PM Peak 2031 HCC Local Plan V3 vs 2036 Hertsmere Baseline Local Plan



Difference in Rail Passenger Demand - AM Peak 2031 HCC Local Plan V3 vs 2036 Hertsmere Baseline Local Plan



Difference in Rail Passenger Demand - PM Peak 2031 HCC Local Plan V3 vs 2036 Hertsmere Baseline Local Plan



High Level Assessment of Mitigation Measures

Mitigation Measures

Location	Issue	Possible Mitigation
A409 Common Road/A4140 High Road (on Hertsmere border south of Bushey)	Delays at the signalised junction	Rephasing of signals. Little other options due to extents of highway boundary
Sandy Lane/A41 junction, Bushey	Delays at the signalised junction	Rephasing of signals. Little other options due to extents of highway boundary
A41 corridor parallel to M1	High levels of link stress and delays	Possible signalisation strategy to link junctions
A4008/Radlett Road roundabout	Delays at the junction	Convert to a signalised junction and optimise timings
Elstree Crossroads – A411 Watford Road, A5183 Elstree Hill	Delays at the junction	Ensure new junction layout is reflected in COMET

Mitigation Measures

Location	Issue	Possible Mitigation
Park Road/Watling Street Roundabout in Radlett.	Delays at the junction	Convert to a signalised junction and optimise timings
B556/B5378 roundabout (north of Shenley, south of M25 J22)	Delays at the junction	Convert to a signalised junction and optimise timings. Possible option to widen approaches to the junction
A1081/Trotters Bottom/Dancers Hill Road roundabout (Dancers Hill)	Delays at the junction	Convert to a signalised junction and optimise timings
B556/Baker Street/Drakes Lane (south of Potters Bar Railway Station)	Delays at the signalised junction	Rephasing of signals. Little other options due to extents of highway boundary

Mitigation Measures

Location	Issue	Possible Mitigation
A1/A5135 Borehamwood junction	Delays at the signalised junction	Rephasing of signals. Little other options due to extents of highway boundary

Strategic junctions under HE control in/bordering Hertsmere where delays are recorded but no mitigation measures have been investigated:

- M25 Junction 24 eastbound off slip
- M25 Junction 23 westbound off slip & westbound on slip
- M25 Junction 21A northbound approach
- M1 junction 5 all approaches congested
- Stirling Corner

Mitigation Measures

Due to “rural” nature of Hertsmere’s road network, traditional highways schemes may not be feasible. The limits of the highway boundary and adjacent properties result in little carriageway space to implement schemes. Radical and expensive schemes may be required and their feasibility/cost could be called into question.

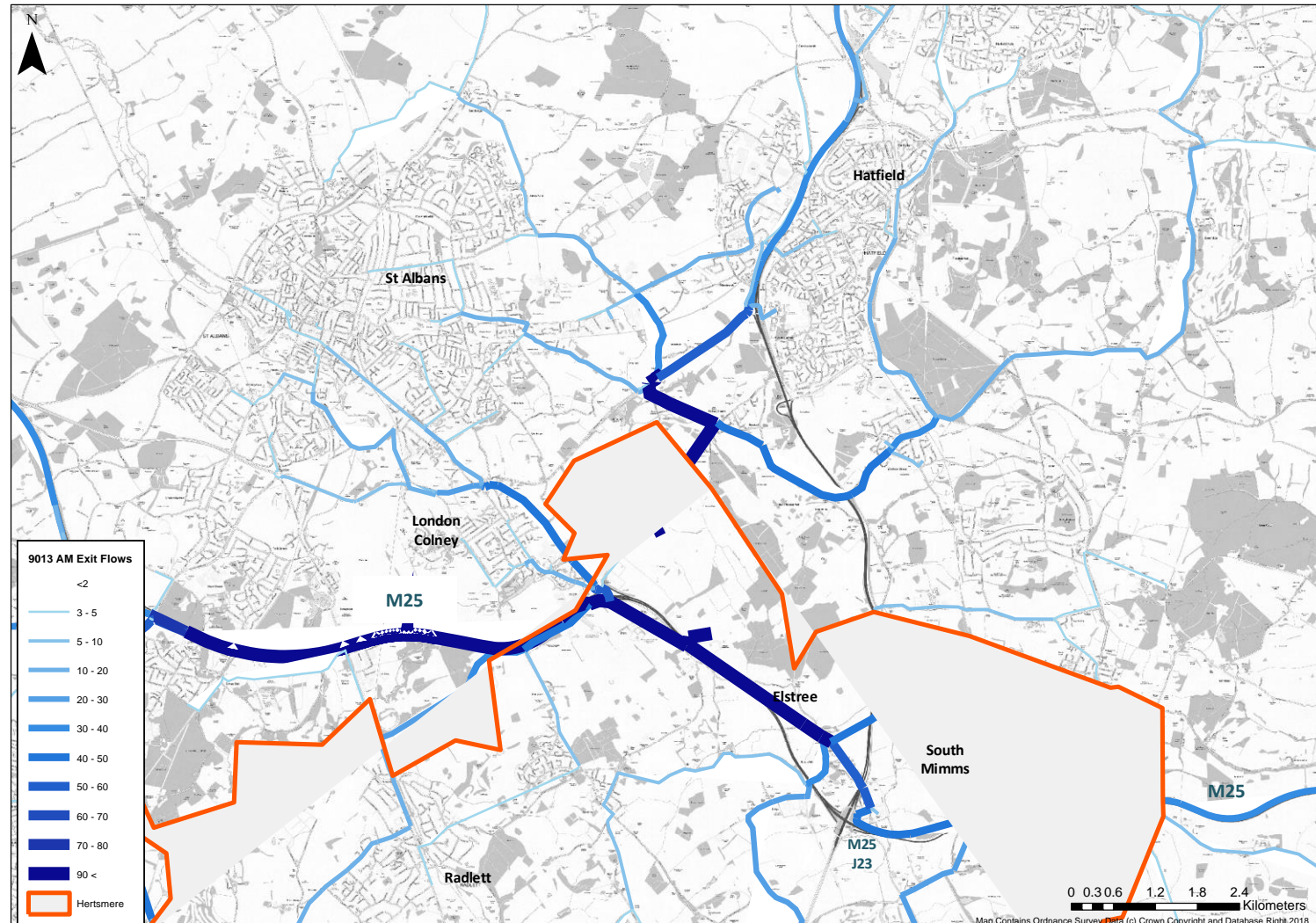
Wider transport strategies to help relieve congestion may have to be implemented – e.g. MAAS, working from home, car clubs, cycle hire etc.

Development Flow Analysis

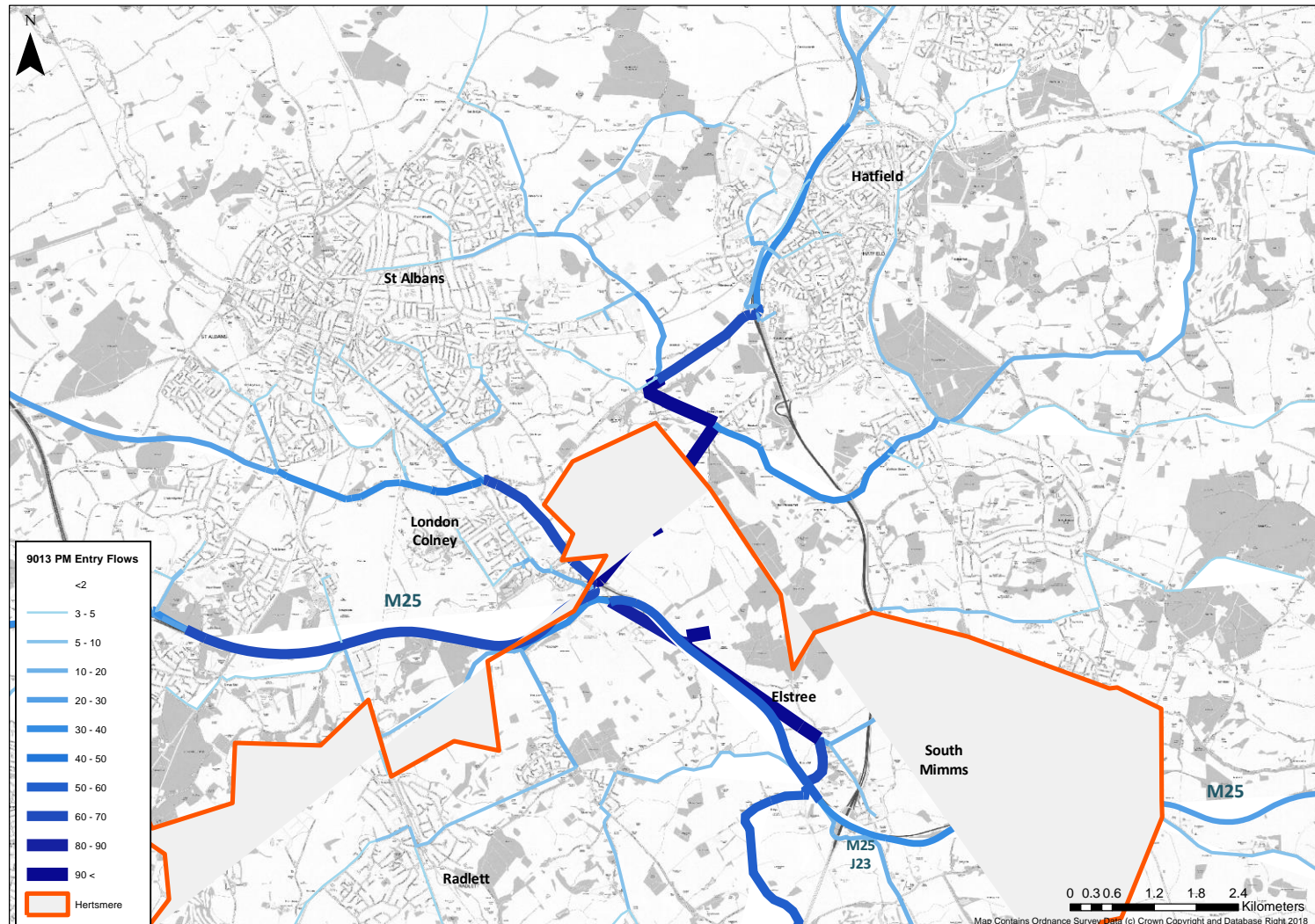
Development Flow Analysis

- This section identifies the routing of traffic from/to the two major development sites in Hertsmere District. These are:
 - Tyttenhanger Estate (COM01 and COMEMP1)
 - South Mimms (COM14 and COMEMP5)
- The full Variable Demand Model has been run in these scenarios which may impact the movements out of and into developments due to cost/time/demand changes during model assignment. Results reported are from the 2036 Hertsmere Baseline Local Plan scenario.

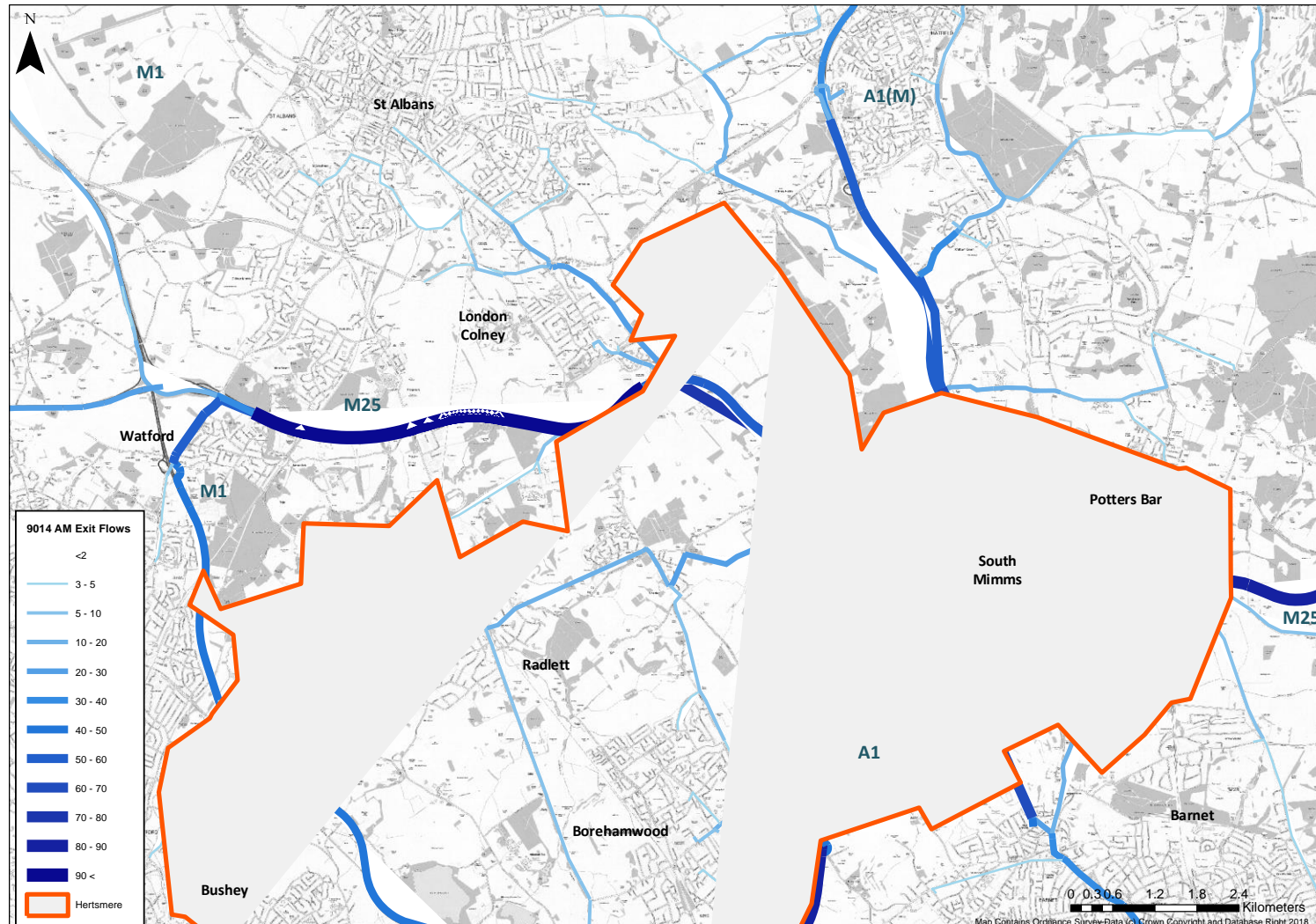
Development Flows Analysis – AM Outbound from Tyttenhanger Estate



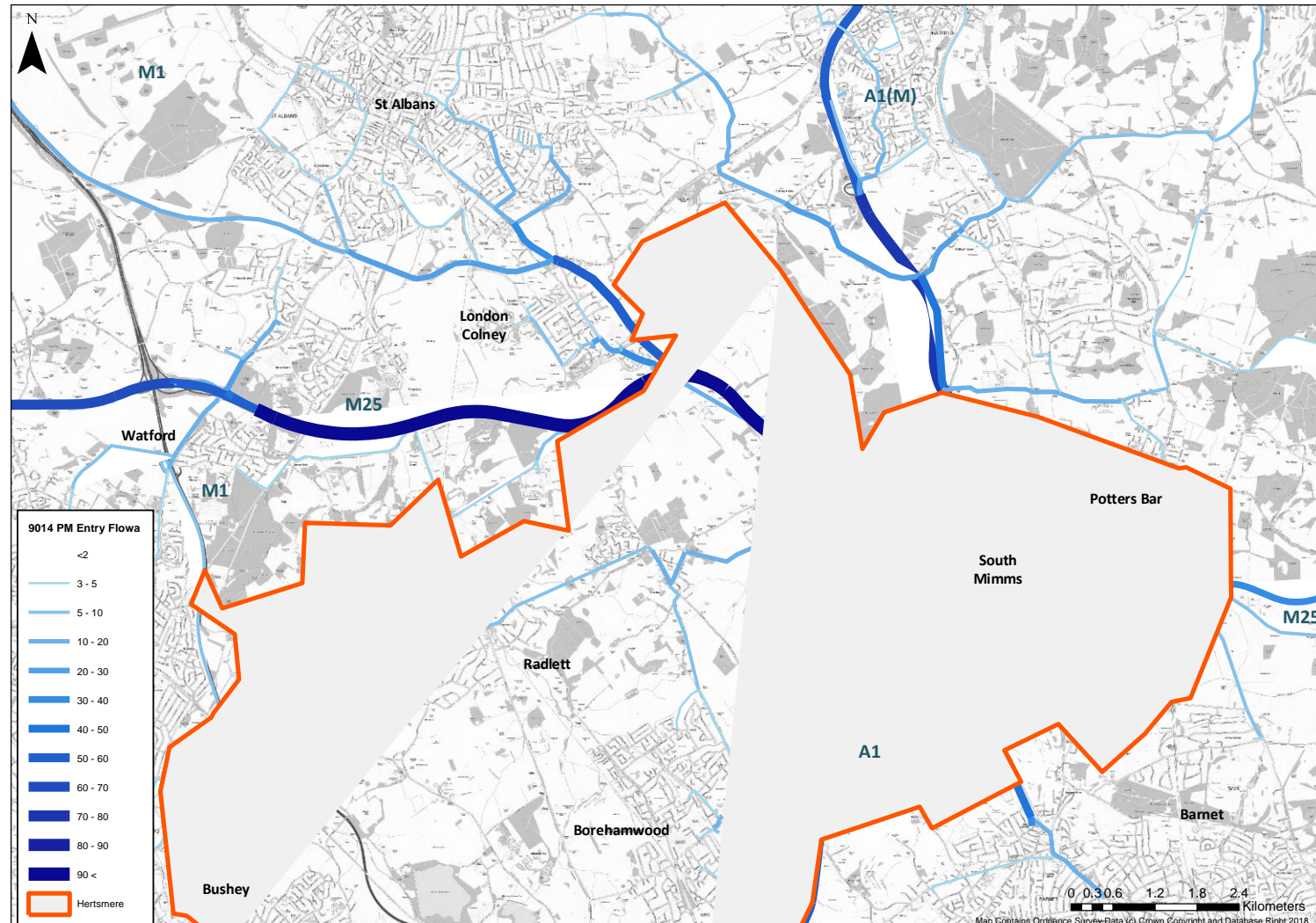
Development Flows Analysis – PM Inbound to Tyttenhanger Estate



Development Flows Analysis – AM Outbound from South Mimms



Development Flows Analysis – PM Inbound to South Mimms



Journey Time Analysis

Journey Time Analysis

- Hertsmere identified a number of towns between which journey time changes should be analysed in the 2036 Hertsmere Baseline Local Plan scenario.
- The strategic nature of COMET should be considered when viewing these results as not all local roads/junctions are included in the model. These results are purely indicative. Urban areas in Hertsmere have not been subject to a speed limit review which would be applied if the model was enhanced further.
- Results are shown for the AM peak (0800 – 0900) and PM peak (1700 – 1800)

Journey Time Analysis – AM Peak (minutes)

2036 BaseLine AM (min)

Town	Bushey	Radlett	Borehamwood	South Mimms	Shenley	Elstree Village	Potters Bar	Watford	St Albans	Hatfield	Barnet
Bushey	0	18	22	30	22	15	36	10	37	39	38
Radlett	15	0	12	15	7	17	21	17	24	22	26
Borehamwood	29	17	0	15	12	22	23	31	35	24	28
South Mimms	29	15	13	0	8	29	10	30	24	12	14
Shenley	21	10	8	8	0	21	14	23	23	18	19
Elstree Village	10	14	9	18	11	0	25	15	33	27	25
Potters Bar	35	20	18	9	14	35	0	35	29	14	8
Watford	11	20	27	30	23	20	37	0	34	38	39
St Albans	31	22	30	23	22	31	27	31	0	18	34
Hatfield	35	21	21	11	18	37	13	36	21	0	20
Barnet	33	21	15	10	17	26	10	36	31	19	0

2036 BaseLine - LP FY18 AM (min)

Town	Bushey	Radlett	Borehamwood	South Mimms	Shenley	Elstree Village	Potters Bar	Watford	St Albans	Hatfield	Barnet
Bushey	0	1	1	2	1	1	1	1	1	2	1
Radlett	1	0	0	1	0	1	-1	1	1	1	0
Borehamwood	3	3	0	4	3	3	2	3	4	4	2
South Mimms	2	0	-1	0	0	-2	-1	2	0	0	-1
Shenley	2	2	0	0	0	0	-1	2	2	1	0
Elstree Village	1	3	1	3	2	0	1	1	3	3	1
Potters Bar	2	0	-1	0	0	0	0	1	0	0	0
Watford	1	1	0	1	1	0	0	0	0	1	1
St Albans	1	0	0	0	0	1	0	0	0	0	0
Hatfield	1	0	-1	0	0	1	0	1	0	0	0
Barnet	1	0	-1	1	1	0	1	1	1	1	0

Journey Time Analysis – AM Peak (minutes)

2036 BaseLine AM - BY AM (min)

Town	Bushey	Radlett	Borehamwood	South Mimms	Shenley	Elstree Village	Potters Bar	Watford	St Albans	Hatfield	Barnet
Bushey	0	6	6	8	7	5	8	2	10	10	7
Radlett	3	0	0	3	1	3	4	4	3	3	4
Borehamwood	9	7	0	7	5	8	6	10	8	8	7
South Mimms	6	3	0	0	1	4	0	7	2	1	0
Shenley	6	4	-2	1	0	4	1	7	3	1	2
Elstree Village	1	6	2	5	2	0	3	3	5	6	2
Potters Bar	6	4	0	1	1	7	0	8	2	1	1
Watford	4	7	7	11	7	6	11	0	9	11	7
St Albans	4	3	-1	1	1	3	1	4	0	0	2
Hatfield	6	3	1	1	2	5	0	7	1	0	1
Barnet	7	6	2	4	4	7	3	11	6	4	0

Journey Time Analysis – PM Peak (minutes)

2036 BaseLine PM (min)											
Town	Bushey	Radlett	Borehamwood	South Mimms	Shenley	Elstree Village	Potters Bar	Watford	St Albans	Hatfield	Barnet
Bushey	0	27	28	36	31	19	42	8	44	42	33
Radlett	14	0	11	14	6	11	17	13	23	23	19
Borehamwood	23	17	0	20	16	13	24	28	38	26	18
South Mimms	25	12	13	0	8	19	7	21	22	12	6
Shenley	18	7	8	8	0	12	12	17	22	17	14
Elstree Village	10	15	11	20	15	0	26	15	33	26	17
Potters Bar	30	18	15	9	13	22	0	26	27	13	7
Watford	10	32	36	40	35	27	44	0	39	44	41
St Albans	28	20	28	23	21	30	26	25	0	18	28
Hatfield	31	18	18	11	17	25	13	28	19	0	16
Barnet	32	22	19	14	20	24	13	31	32	24	0

2036 BaseLine - LP FY18 PM (min)											
Town	Bushey	Radlett	Borehamwood	South Mimms	Shenley	Elstree Village	Potters Bar	Watford	St Albans	Hatfield	Barnet
Bushey	0	0	1	1	0	0	1	0	2	0	1
Radlett	1	0	1	1	0	1	1	0	0	1	1
Borehamwood	0	0	0	0	0	0	0	0	0	0	-1
South Mimms	1	0	0	0	0	1	0	0	0	0	0
Shenley	1	0	0	0	0	0	0	0	0	0	1
Elstree Village	1	2	2	1	2	0	3	0	-2	1	1
Potters Bar	1	1	1	0	1	1	0	1	0	0	0
Watford	1	1	1	2	1	0	1	0	0	2	1
St Albans	1	0	1	0	0	0	0	0	0	0	0
Hatfield	2	0	1	0	0	0	0	0	0	0	0
Barnet	1	1	2	1	1	1	0	1	1	1	0

Journey Time Analysis – PM Peak (minutes)

2036 BaseLine - BY PM (min)

Town	Bushey	Radlett	Borehamwood	South Mimms	Shenley	Elstree Village	Potters Bar	Watford	St Albans	Hatfield	Barnet
Bushey	0	4	3	7	4	3	8	1	4	7	6
Radlett	3	0	2	2	1	3	2	1	-1	3	3
Borehamwood	8	7	0	10	9	7	9	8	10	10	6
South Mimms	3	1	1	0	1	2	0	3	2	0	1
Shenley	4	2	1	1	0	2	1	2	1	1	2
Elstree Village	2	4	2	4	3	0	6	2	-1	4	3
Potters Bar	4	1	2	1	0	3	0	4	1	1	1
Watford	2	3	5	8	3	4	8	0	1	6	7
St Albans	3	0	2	1	1	3	1	1	0	0	2
Hatfield	4	1	2	1	2	4	1	3	0	0	2
Barnet	8	5	5	5	5	6	4	8	6	6	0

Summary and Next Steps

Summary & Next Steps

- The 2036 Hertsmere scenarios have indicated the additional trips generated by the development locations impact the transport network, however there are no obvious “showstoppers” where delays or link stress increase dramatically (e.g. 5 mins)
- It is a cumulative growth across the borough which increase congestion and lengthen delays. Journey times across the borough increase on average by a minute.
- Mitigation measures may relieve junction hotspots, however a more thorough and coordinated set of mitigation measures may be required across Hertsmere.

Summary & Next Steps

- Impacts of sites on HE network as well as local road network should be considered (i.e. M25/A1).
- Hertsmere/HCC to liaise internally and compile feedback to AECOM on the presentation. Please could Ann/Mark compile all feedback and liaise with AECOM.
- AECOM will review all comments received and provide responses
- More detailed analysis can be provided as appendices in the main report if required by Hertsmere (currently not scoped)

Thank You

September 2018

AECOM