

Hertfordshire County Council

# elstree and borehamwood

Transport Study

Results of Option Testing - EWC Master Plan



April 2011

# Elstree and Borehamwood Transport Study

## Results of Option Testing with EWC Master plan

20 Eastbourne Terrace,  
London,  
**W2 6LG**

Prepared by:

Approved by:

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David Battershill & Shripad Korantak

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Faiz Nassiri

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# 1 Introduction

## 1.1 Introduction

1.1.1 Hertfordshire County Council (HCC) and Hertsmere Borough Council (HBC) have commissioned Colin Buchanan (CB) to investigate opportunities to improve the transport network for all road users in Borehamwood Town Centre (BTC) in conjunction with considering the transport impact of master plan options for redevelopment of the Elstree Way Corridor (EWC) (see section 1.2 below).

1.1.2 As part of this study, CB developed an area wide traffic model of Elstree and Borehamwood town centre known as BHM together with a more detailed microsimulation model of Borehamwood town centre known as BTM. The development of these models were reported in a Local Model Validation Report (LMVR) dated November 2010.

1.1.3 This report has been prepared in connection with the testing of the proposed scenarios and in response to the project progress meeting, held on 7<sup>th</sup> October with Hertfordshire County Council (HCC). The report outlines the methodology for traffic forecasting and includes the results obtained from various scenarios in conjunction with the transport impact of master plan options for the redevelopment of the EWC using the SATURN BHM and Paramics BTM models. The structure of the report is as below:

- Base SATURN and Paramics Models;
- Forecasting Methodology;
- Scenarios;
- Results of AM and PM Scenario Testing; and
- Summary of the results

## 1.2 Background – Elstree Way Corridor Feasibility Study

1.2.1 The EWC is the main access to the centre of Borehamwood from the A1(M) and forms part of the main commercial area of the town. A previous study, the Elstree Way Corridor Feasibility Study (2010), was undertaken by Colin Buchanan on behalf of HBC to examine redevelopment options for a number of sites along Elstree Way and produce a development-led master plan. The master plan sets out a strategy for comprehensive regeneration of a number of sites in the study area, underpinned by a high quality design approach to the wider public realm.

1.2.2 A key component of the final master plan is the removal of the Shenley Road/Elstree Way roundabout. This is a key part of the vision for redevelopment of the EWC area, as it:

- Releases land for future development;
- Improves the physical appearance of this important gateway into the town;
- Enables the provision of a high quality town square and improved frontage for the Elstree Film Studios; and
- Improves pedestrian movement along the corridor, better linking the EWC area with Borehamwood town centre.

1.2.3 The final master plan option proposed the replacement of the roundabout with two junctions; one at Elstree Way/Shenley Road, and another at Brook Road/Shenley Road (east). In addition a new link road was proposed to the rear of the HBC offices to provide a connection between Shenley Road (east) and Elstree Way, creating a new junction with Elstree Way/Maxwell Road. The master plan option is illustrated below.

Figure 1.1: Elstree Way Corridor Feasibility Study – Final Master Plan



- 1.2.4 The study suggested that the highways approach for the proposed road layout should be either:
- A shared space design along the EWC, including at the junction of Shenley Road/Brook Road/Elstree Way, and the junction of the new link road with Elstree Way/Maxwell Road (preferred approach); or
  - Signalised junctions at Shenley Road/Brook Road/Elstree Way, and at the junction of the new link road with Elstree Way/Maxwell Road, and a simplified streetscape approach along the rest of the EWC.
- 1.2.5 One of the objectives of the Elstree and Borehamwood Transport Study is therefore to test the proposed highways layout illustrated in the master plan, including both shared space and signalised highway designs.
- 1.2.6 It should be noted that although the master plan option does not show any modification to the Tesco access road junction, on consideration it was felt that signalisation of this junction would be necessary to enable the removal of the Shenley Road/Elstree Road roundabout. This has therefore been included in the model tests summarised in this report.
- 1.2.7 The master plan option has also been tested with highways improvements at other locations in the wider Borehamwood area, in order to understand how complementary measures might help achieve a more balanced town-wide traffic solution.
- 1.3 Model Audit
- 1.3.1 The calibrated and validated SATURN BHM and Paramics BTM models were submitted to HCC on August 2010. The Paramics model was fully audited by Hertfordshire County Council (HCC) and following comments made during the audit process, further amendments were made to the BTM model to improve its calibration and validation. The model was finally signed off by HCC confirming that the model was fit for the purpose and could be used for the purpose of scenario testing.
- 1.4 Structure of this Report
- 1.4.1 After a short introduction, **Chapter 2** provides a description of the base SATURN and Paramics model. **Chapter 3** outlines the forecasting methodology used to develop the 2026 reference case.
- 1.4.2 The details of each scenario test and its variants are included in **Chapter 4**.
- 1.4.3 **Chapter 5** details the scenario results and findings from the AM scenario modeling assessment.
- 1.4.4 **Chapter 6** describes the implications of the model results.
- 1.4.5 **Chapter 7** contains the conclusions.
- 1.4.6 In addition to this the following appendices have been included:
- **Appendix A:** AM peak summary of key findings
  - **Appendix B:** PM peak summary of key findings – Option 2B and 4B
  - **Appendix C:** Paramics Screenshots



## 2 Base Models: Saturn and Paramics

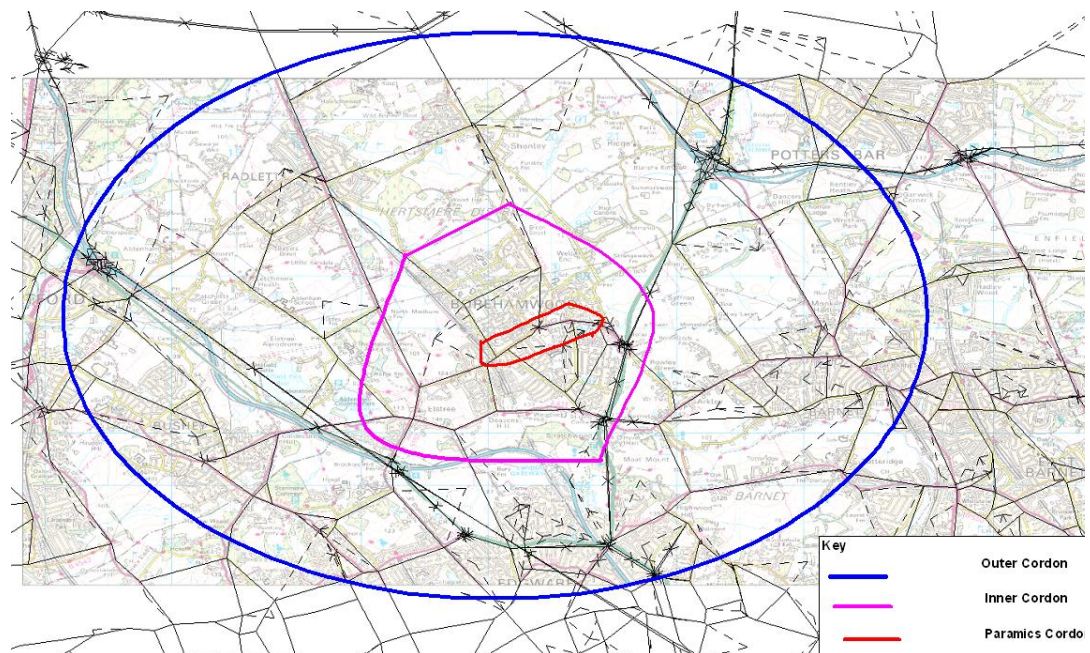
### 2.1 Base Models- Calibration and Validation

2.1.1 The base SATURN BHM and Paramics BTM models were calibrated and validated in accordance with the criteria set in DMRB (Design Manual for Roads and Bridges), Vol.12. The model periods were 0800-0900 and 1700-1800. A separate detailed LMVR (Local Model Validation Report) was prepared and submitted to HCC in November 2010. It should be noted that the SATURN BHM was developed from a cordon of the North London Highway Assignment Model (NoLHAM) which was developed by Transport for London. The final base year SATURN BHM and Paramics BTM files are as follows:

- BHM Model:
  - AM Network: *Boreham\_AM\_cordon\_v38.DAT*
  - AM Matrix: *MATAM\_ALL\_REP6\_V2.UFM*
  - Assigned AM model: *Boreham\_AM\_cordon\_v38.UFS*
  - PM Network: *Boreham\_PM\_cordon\_v15.DAT*
  - PM Matrix: *MATPM\_ALL\_REP6\_V1.UFM*
  - Assigned PM model: *Boreham\_PM\_cordon\_v15.UFS*
- BTM Model:
  - AM Base Folder: *AM Peak/Base\_AM Peak*
  - PM Base Folder: *PM Peak/Base\_PM Peak*

2.1.2 Figure 2.1 and Figure 2.2 show the extent of the SATURN and PARAMICS models respectively.

**Figure 2.1: Extent of SATURN BHM model**



**Figure 2.2: Borehamwood Town Centre in BHM and Paramics BTM**





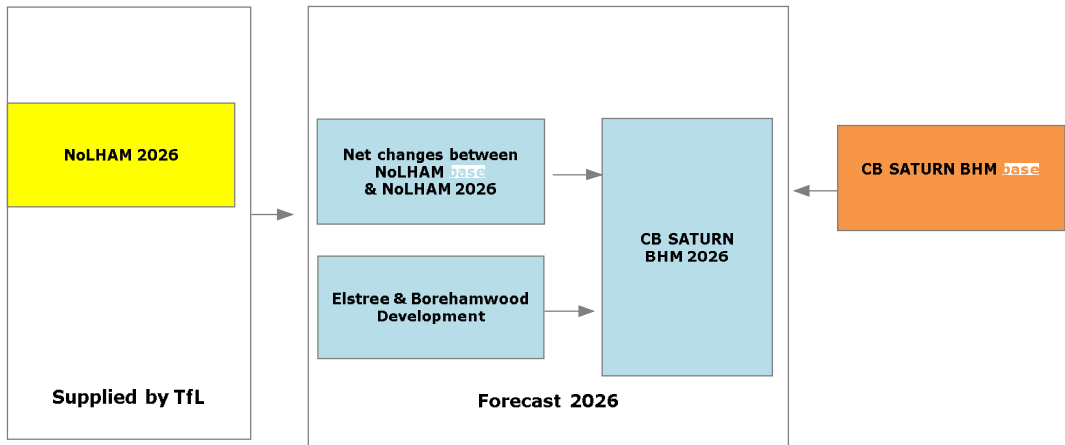
### 3 Forecasting Methodology

#### 3.1 Forecasting methodology and future years

3.1.1 Figure 3.1 shows the outline methodology for producing the forecast trip matrices. As can be seen in Figure 3.1, the forecasting methodology involves taking the net changes between the base North London Highway Assignment Model (NoLHAM) and future 2026 NoLHAM and adding them to the calibrated Base SATURN model.

3.1.2 In addition, a list of all committed and planned developments were supplied by HCC planning and these together with the proposed redevelopments of the Elstree Way Corridor area (EWC) were added to the NoLHAM forecast to produce the final 2026 forecast. It should be noted that this incremental method is appropriate for this study as it takes account of both the wider area impacts as well as the developments inside and outside of Elstree and Borehamwood.

**Figure 3.1: Forecasting Methodology**



3.1.3 As part of this assessment it was necessary to estimate the trip generation from the proposed developments based on TRICS database before producing the final forecasts. Table 3.1 shows the list of all the developments included in Elstree and Borehamwood together with the associated trip generation. Figure 3.2 and 3.3 shows the location of these developments.

**Table 3.1: Developments in Elstree and Borehamwood**

					Trip Generation			
					AM (08:00-09:00)		PM (17:00-18:00)	
Zones	Sites	Land Use	Type	GfA/Units	In	Out	In	Out
8001	EWC master plan area - east, petrol station	Residential	3C	80	4	11	9	5
8003	Studio Plaza	Residential	3C	85	4	12	10	5
8004	EWC master plan area - north, Ibis hotel, school, Oaklands College site	Residential	3C	125	6	18	14	8
8020	EWC master plan area - west, roundabout	Residential	3C	220	10	31	25	14
8020	EWC master plan area - west, roundabout	offices	B1	5400	40	8	5	31
8036	EWC master plan area - south, Maxwell Park	Residential	3C	45	2	6	5	3
8042	EWC master plan area – north, car park	Residential	3C	85	4	12	7	4
8043	EWC master plan area - south, Job Centre, Police Station	Residential	3C	375	17	54	5	3
8031	Arundel Drive 10 town house and 12 flats	Residential	3C	12	1	2	1	1
8046	Glenhaven AV	Residential	3C	8	0	1	1	1
8008	Station Road	Residential	3C	12	1	2	1	1
8029	BBC Elstree, Clarendon Road	Residential	3C	308	14	44	34	19
8028	Old Haberdashers Association, Croxdale Road	Residential	3C	107	5	15	12	7
8008	Land south of Elstree and Borehamwood station	Residential	3C	60	2	6	7	3
8009	Allum Lane (next to Borehamwood Station)	Residential	3C	46	2	7	5	3
8008	Station Road Gas Holder	Residential	3C	44	2	6	5	3
8030	43-47 Theobald Street	Residential	3C	30	1	4	3	2
8031	10-16 Arundel Drive	Residential	3C	18	1	3	2	1
8013	Instalcom site, Manor Way	Residential	3C	17	1	2	2	1
8029	Stratfield Road Estate	Residential	3C	17	1	2	2	1
8041	61-73 Shenley Road	Residential	3C	16	1	2	2	1
8030	East Side of Glenhaven Avenue Borehamwood	Residential	3C	15	1	2	2	1
Total					118	251	158	117

### Table 3.2: Base and Future Year Traffic

Model Time Period	Base	Future	Difference
AM	53376	55767	4%
PM	52117	54413	4%

### Figure 3.2: BWM Master Plan Area Development



**Figure 3.3: Residential Sites in Borehamwood 2010 -2021**





## 4 Scenarios

### 4.1 Introduction

4.1.1 In consultation with HCC and HBC, a number of traffic scenarios were developed and considered for option testing. These options were grouped into five main scenarios. Within each of these scenario groups additional scenario test variants, which contained minor network alterations, were assessed.

4.1.2 The five main scenario groups are summarised as follows:

- Scenario 1: EWC master plan (shared space) plus Tesco roundabout
- Scenario 2: EWC master plan (signalised) plus Tesco roundabout
- Scenario 3: EWC master plan plus Station Road/Theobald Street junction
- Scenario 4: EWC master plan plus Elstree crossroads
- Scenario 5: Shenley Road one-way

4.1.3 In total eleven different scenario variants were assessed. The details of all of these scenario variants, as agreed with HBC and HCC, are stated within this section.

#### ***Scenario 1: EWC master plan (shared space) plus Tesco roundabout***

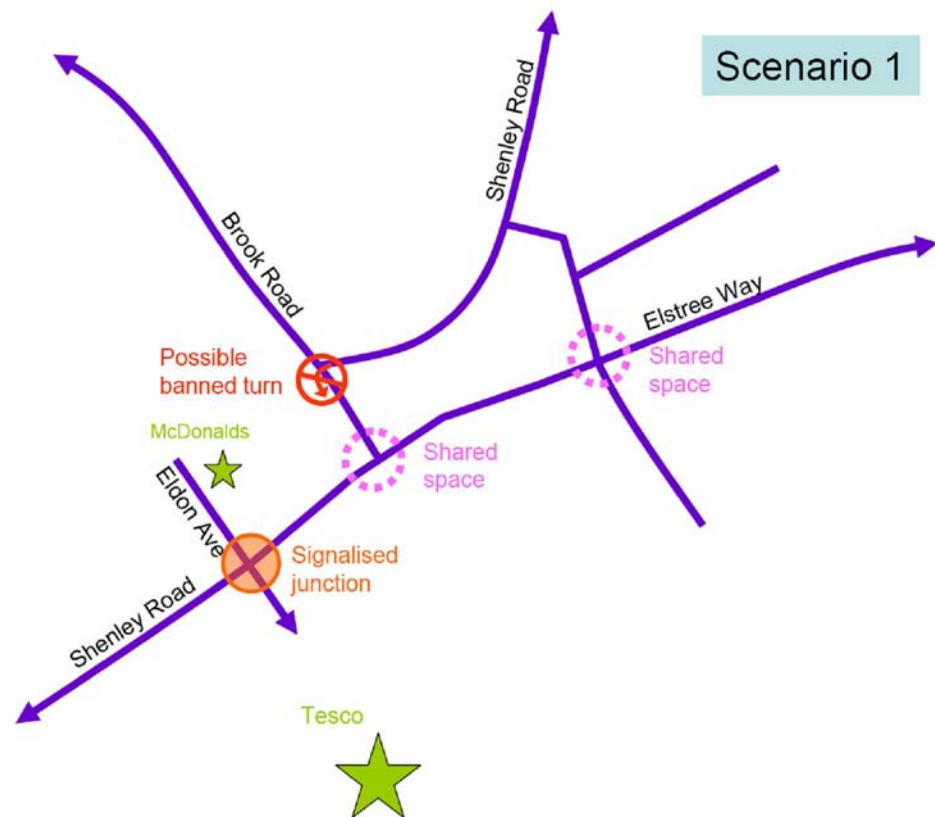
4.1.4 This scenario encompasses a version of the proposals included in the Elstree Way Corridor master plan, plus alterations to the Tesco access road junction (see Figure 4.1). It includes:

- Shenley Road roundabout removed and replaced with two junctions:
  - Priority working (give way) junction at Brook Road/Shenley Road (east).
  - Shared space (uncontrolled) junction at Elstree Way/Brook Road/Shenley Road (west).
- New link road between Shenley Road (east) and Elstree Way, including:
  - Priority working (give way) junction at new link road/Shenley Road (east).
  - Shared space (uncontrolled) junction at new link road/Elstree Way/Maxwell Road.
  - Priority working (give way) junction of new link road and access road (no through route) to proposed development and replacement car park east of new link road (behind Ibis Hotel).
- Carriageway width of Shenley Road (west) between junction with Tesco access road, and junction Elstree Way/Brook Road reduced to one lane plus cycle lanes in each direction.
- Bus stops retained in Shenley Road (west).
- Vehicle access to Film Studios removed from Shenley Road and reprovided via a new access point from either Maxwell Road, or Tesco access road.
- Tesco roundabout removed and replaced with signalised junction.
- Access to/from McDonalds via Eldon Avenue only (no direct access from Shenley Road).
- On-road cycle lanes to be provided in both directions on Elstree Way and Brook Road.
- New pedestrian crossings.

4.1.5 Two further alternative scenario variants were completed in addition to scenario 1, these are listed as follows:

- Increase to two lanes of general traffic on Shenley Road (west) - (**scenario 1A**).
- Banned left turn from Shenley Road into Brook Road - (**scenario 1B**).

**Figure 4.1: Scenario 1**



**Scenario 2: EWC master plan (signalised) plus Tesco roundabout**

4.1.6 This scenario encompasses an alternative version of the proposals included in the Elstree Way Corridor master plan, plus alterations to the Tesco access road junction as shown in Figure 4.2. It includes:

- Shenley Road roundabout removed and replaced with two junctions:
  - Priority working (give way) junction at Brook Road/Shenley Road (east).
  - Signalised junction at Elstree Way/Brook Road/Shenley Road (west).
- New link road between Shenley Road (east) and Elstree Way, including:
  - Priority working (give way) junction at new link road/Shenley Road (east).
  - Signalised junction at new link road/Elstree Way/Maxwell Road.
  - Priority working (give way) junction of new link road and access road (no through route) to proposed development and replacement car park east of new link road (behind Ibis Hotel).

- Carriageway width of Shenley Road (west) between junction with Tesco access road, and junction Elstree Way/Brook Road reduced to one lane of general traffic in each direction, plus eastbound cycle lane, and westbound bus lane.
- Bus stops retained in Shenley Road (west).
- Vehicle access to Film Studios removed from Shenley Road and reprovided via new access point from either Maxwell Road, or Tesco access road.
- Tesco roundabout removed and replaced with signalised junction and bus lanes both into and out of Tesco site.
- Access to/from McDonalds via Eldon Avenue only (no direct access from Shenley Road).
- On-road cycle lanes to be provided in both directions on Elstree Way and Brook Road.
- New pedestrian crossings.

4.1.7 Two further alternative scenario variants were completed in addition to scenario 2, these are listed as follows:

- Increase to two lanes of general traffic on Shenley Road (west) - **(scenario 2A)**.
- Banned left turn from Shenley Road into Brook Road - **(scenario 2B)**.

**Figure 4.2: Scenario 2**



### **Scenario 3: EWC master plan plus Station Road/Theobald Street junction**

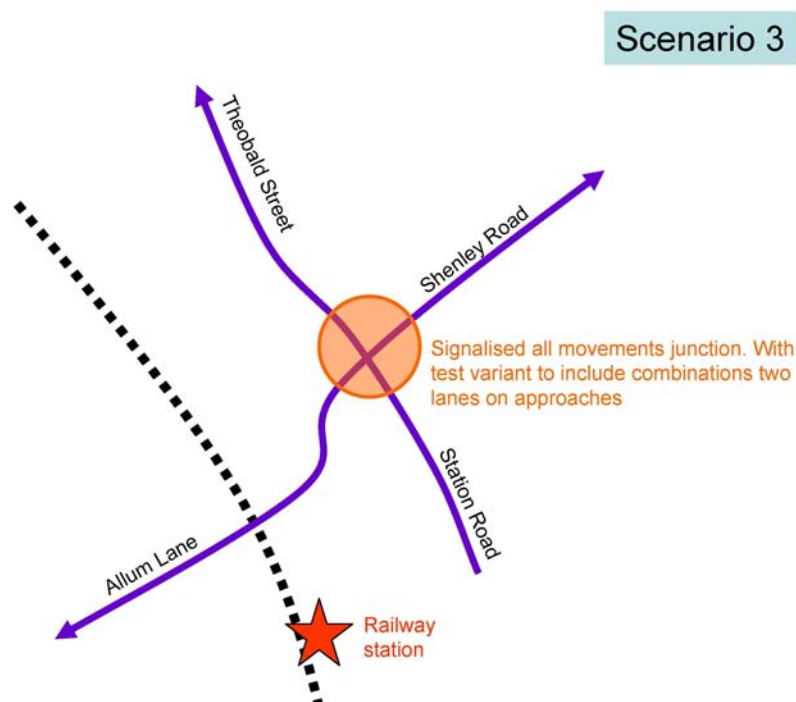
4.1.8 Scenario 3 was developed incrementally from scenario 1 and 2, based upon the preferred scenario (as per the modelling assessment). In addition to this, scenario 3 also includes the replacement of the mini-roundabout at Station Road/Allum Lane/Shenley Road/Theobald Street junction with traffic signals as shown in Figure 4.3, including:

- One lane on each approach.
- Pedestrian crossings on each arm.
- Advance Stop Lines (ASLs) for cyclists provided on each arm.
- All turning movements allowed.

4.1.9 A further alternative scenario variant was completed in addition to scenario 3 as follows:

- with two lanes including dedicated right hand turning lanes (**Scenario 3A**)

**Figure 4.3: Scenario 3**



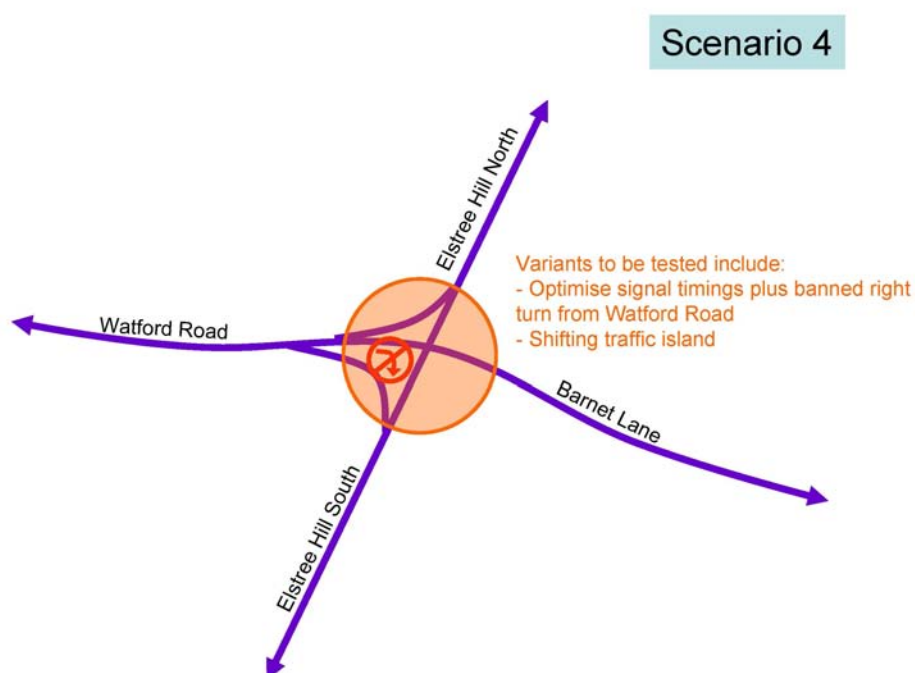


### **Scenario 4: EWC master plan plus Elstree Crossroads**

4.1.10 Scenario 4 was developed incrementally from scenario 3, based upon the preferred scenario (as per the modelling assessment). In addition to this scenario 4 also includes Elstree Crossroads (i.e. the junction of Elstree Hill North/Elstree Hill South/Watford Road/Barnet Lane) as shown in Figure 4.4. Three further alternative scenario variants were completed in addition to scenario 4, all scenarios are listed below as follows:

- Optimise signal timings and ban right turn from Watford Road to Elstree Hill South (**Scenario 4**).
- As scenario 4 plus introduction of flare for right turn traffic from Elstree Hill South to Barnet Lane (**Scenario 4A**).
- As scenario 4A but with extra flares on Brook Road approach (**Scenario 4B**).

**Figure 4.4: Scenario 4**

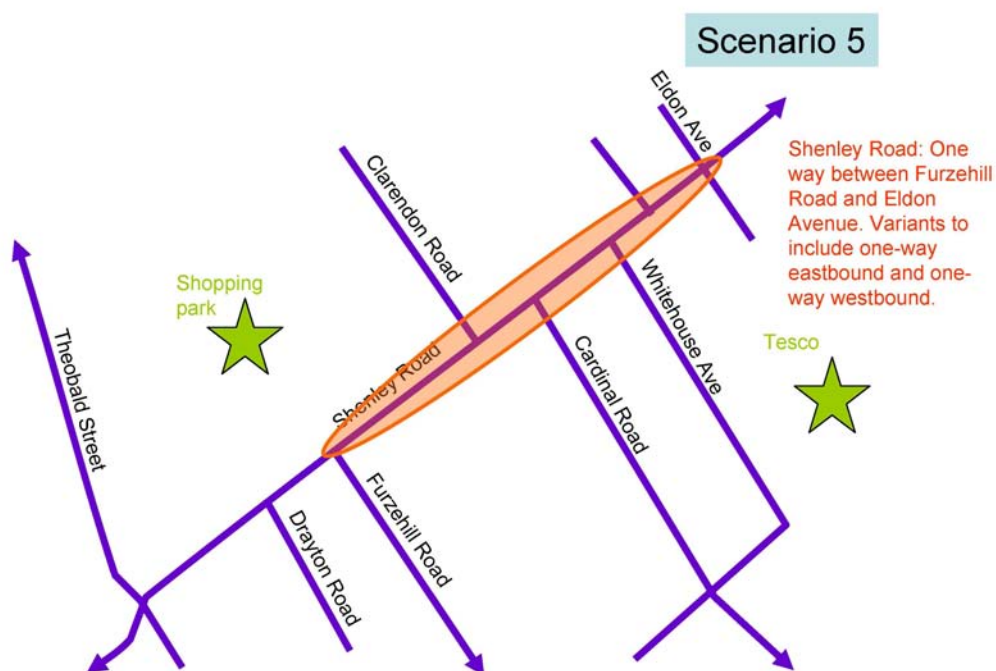


### Scenario 5: Shenley Road one-way

4.1.11 Scenario 5 is a standalone test of the one-way operation of Shenley Road between Furzehill Road junction and Eldon Avenue/Tesco access road junction as shown in Figure 4.5. Two variants of scenario 5 were tested; these are listed below as follows:

- One-way eastbound (**Scenario 5**).
- One-way westbound (**Scenario 5A**).

**Figure 4.5: Scenario 5**



## 5 Scenario Results

### 5.1 Criteria for Evaluation of Scenarios

5.1.1 In order to evaluate the impact of each scenario in terms of the town centre network operation, journey time, benefits to buses and pedestrians, together with the wider impact of the scheme a set of criteria were used as the basis for comparing the scenarios. The impacts of the scenarios and the key findings were considered under two main headings as follows:

- ***Impact on the Town Centre***

Comments on flows, journey times, junction operations compared with the reference case (i.e. existing network with 2026 forecast traffic) plus a general comment on the impact of the scenario on pedestrians, cyclists and buses

- ***Impact on Local and Wider Network***

Comments on diversions, rat runs, wider reassignment and junction operations outside the town centre.

5.1.2 The following sets out the results of each scenario during the AM peak hour only. Due to the large number of tests considered, it was decided to undertake the tests on the AM model first and then repeat the same during the PM peak for the preferred options only. A summary of the key findings from each scenario test is included in Appendix A and B, for the AM and PM peak hours respectively.

### 5.2 Reference Case 2026

#### ***Existing network***

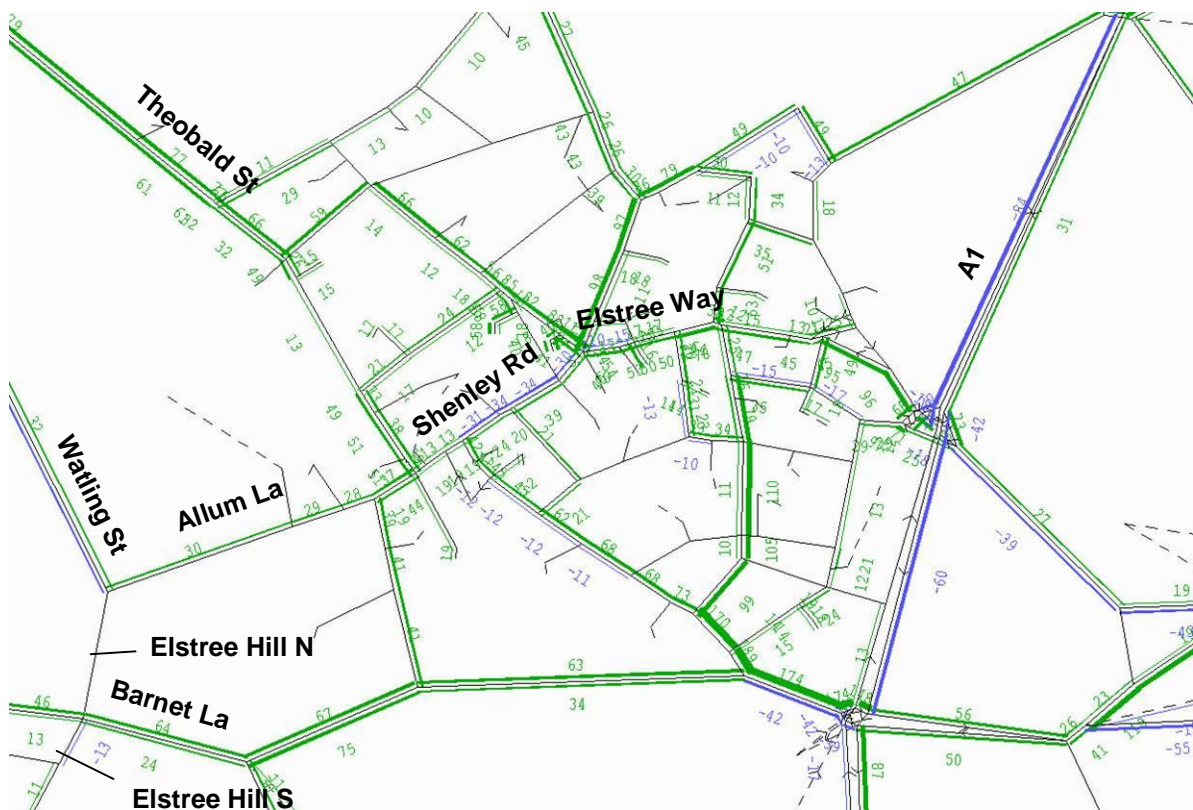
5.2.1 The reference case scenario is the existing network with the forecasted future year traffic flow.

#### ***Traffic Impacts – Town Centre, Local and Wider Area***

5.2.2 The modelling results show that there is an increase of traffic on the Shenley Road/Elstree Way corridor as well as on the other local roads when compared to the base traffic flow. As a result of this, the traffic entering the town centre from Shenley Road (west) and Elstree Way has been increased by some 5% from 3150 to 3323 vehicles. In addition to this the traffic accessing the Theobald Street/Station Road junction has increased by approximately 5% from 2100 to 2212 when compared with the base case. The model predicts an increase in network delays compared to the base and also an increase in queuing on Shenley Road east and Elstree Way eastbound.

5.2.3 Figure 5.1 shows difference in traffic flows between the reference case and the base existing condition case. The green bands shows an increase in traffic flows, whereas the blue band shows a reduction.

**Figure 5.1: Traffic flow difference (Reference Case 2026 and Base 2010) \_AM**



### 5.3 Scenario 1

#### ***Shared Space - One lane approach on Shenley Road***

- 5.3.1 Scenario 1 encompasses a shared space concept design of the Brook Road/Elstree Way/Shenley Road (west) and the Elstree Way/Maxwell Road/new link road junctions. It also includes: signalisation of the Tesco access road junction; reduction of carriageway width to a single lane in each direction on Shenley Road (west); and a new link road between Elstree Way and Shenley Road (east). The shared space has been coded as a series of signalised pedestrian junctions to simulate traffic frequently stopping for pedestrian movements.

#### ***Traffic Impacts – Town Centre, Local and Wider Area***

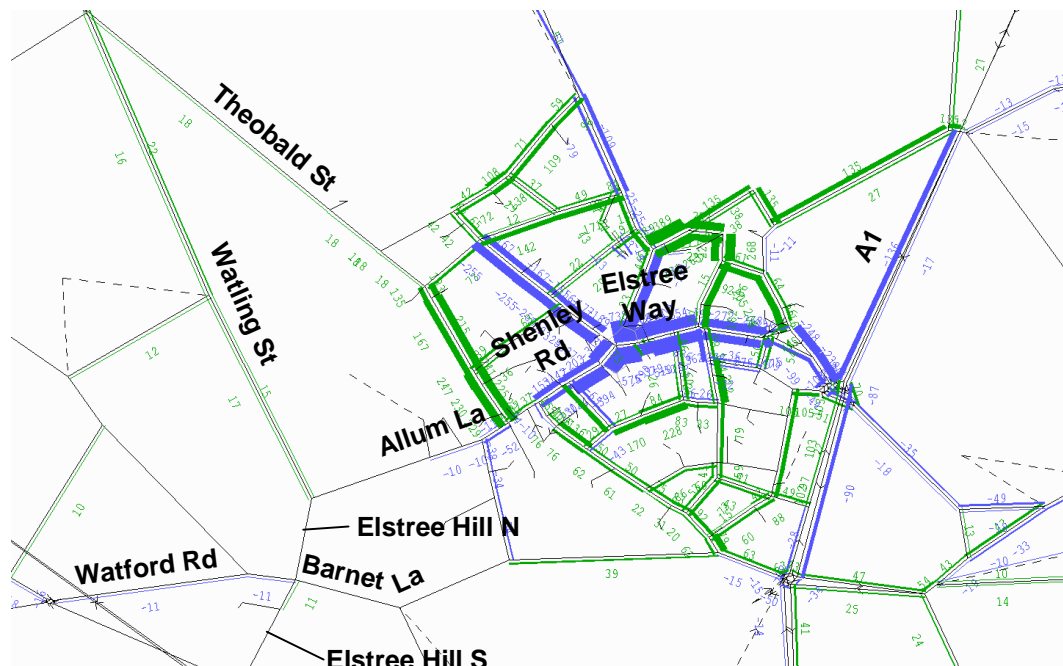
- 5.3.2 The modelling results show that there is a significant reassignment of traffic away from the Shenley Road/ Elstree Way corridor to the wider area. As a result of this, the traffic entering the town centre from Shenley Road (west) and Elstree Way has been reduced by some 45% from 1805 to 995 vehicles, and by 43% from 2264 to 1287 vehicles respectively when compared with the reference case. Therefore, the model predicts



significant improvement to operation of Shenley Road and Elstree Way. The model also indicates that there will be a moderate improvement in journey times along the town centre corridor except for a slight increase in delay on Shenley Road eastbound approach.

- 5.3.3 The reassignment of traffic to the wider area, away from the Shenley Road/ Elstree Way corridor, results in a significant increase in rat running along local roads such as Theobald Street, Studio Way southbound, Furzehill Road, Cardinal Avenue, Hillside Avenue and Rowley Lane northbound. It also causes moderate delays at Theobald Street/entrance of Borehamwood Shopping Park.
- 5.3.4 The reason for reassignment of traffic to roads in the local and wider area is largely due to the fact that the implementation of shared space removes capacity away from the Shenley Road/Elstree Way corridor. The impact on other more strategic roads such as the A1 and M25 is not considered to be significant.
- 5.3.5 Figure 5.2 shows difference in traffic flows between Scenario 1 and the reference case. The green bands shows an increase in traffic flows, whereas the blue band shows a reduction.

**Figure 5.2: Traffic flow difference (Scenario 1 and Reference Case 2026)**



- 5.3.6 Overall although the shared space approach provides a high quality pedestrian environment with increased crossing opportunities and high quality environment for cyclist, its benefits will need to be judged against the negative impact on other local roads and the wider network. This scenario, if implemented in its entirety all at once, is unlikely to be feasible due to its adverse traffic impact on the local area.

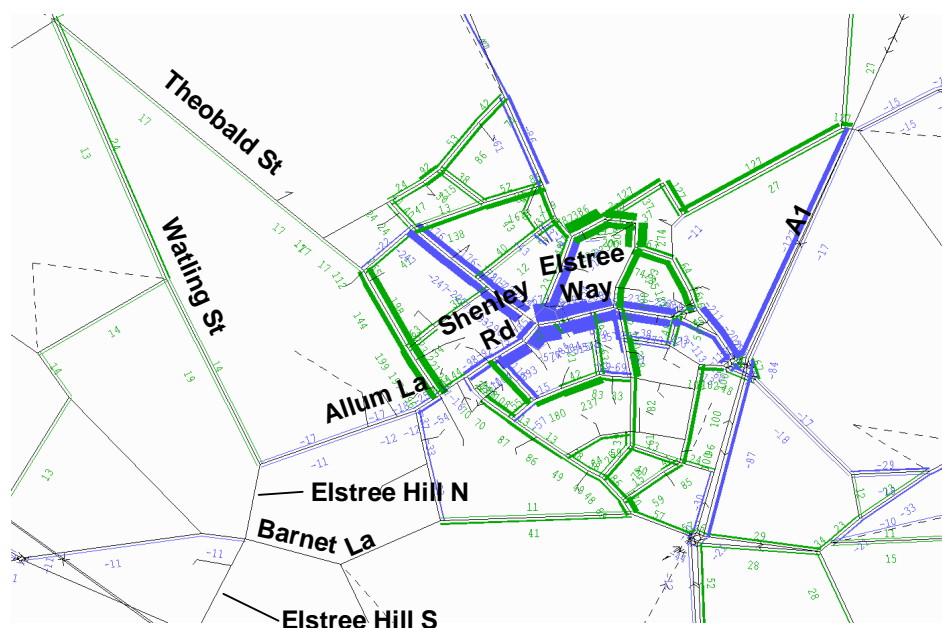
#### 5.4 Scenario 1A *Shared Space- Two lane approach on Shenley Road*

- 5.4.1 Scenario 1A is the same as scenario 1 except Shenley Road (west) includes two lanes of traffic in each direction.

***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.4.2 As with scenario 1, the traffic has been reassigned away from the town centre on to roads in the local and wider area. The results show traffic flows entering into the town centre from Shenley Road (west) and Elstree Way have been reduced from 1805 to 1136 vehicles (reduction of approximately 37%), and from 2264 to 1347 vehicles (reduction of 40%) respectively when compared against the reference case scenario.
- 5.4.3 The modelling assessment shows that approximately 40% of the traffic diverts away from the Shenley Road junction. This results in a significant increase in rat running along local roads such as Theobald Street, Studio Way southbound approach, Furezhill Road, Cardinal Avenue, Hillside Avenue and Rowley Lane northbound approach. It also causes moderate delays at Theobald Street/entrance of Borehamwood Shopping Park. As with Scenario 1, this scenario variant is also not considered to be feasible due to its adverse impact on the local area.
- 5.4.4 Figure 5.3 shows the actual flow difference between Scenario 1A and the reference case.

**Figure 5.3: Traffic flow difference (Scenario 1A and Reference Case 2026)**

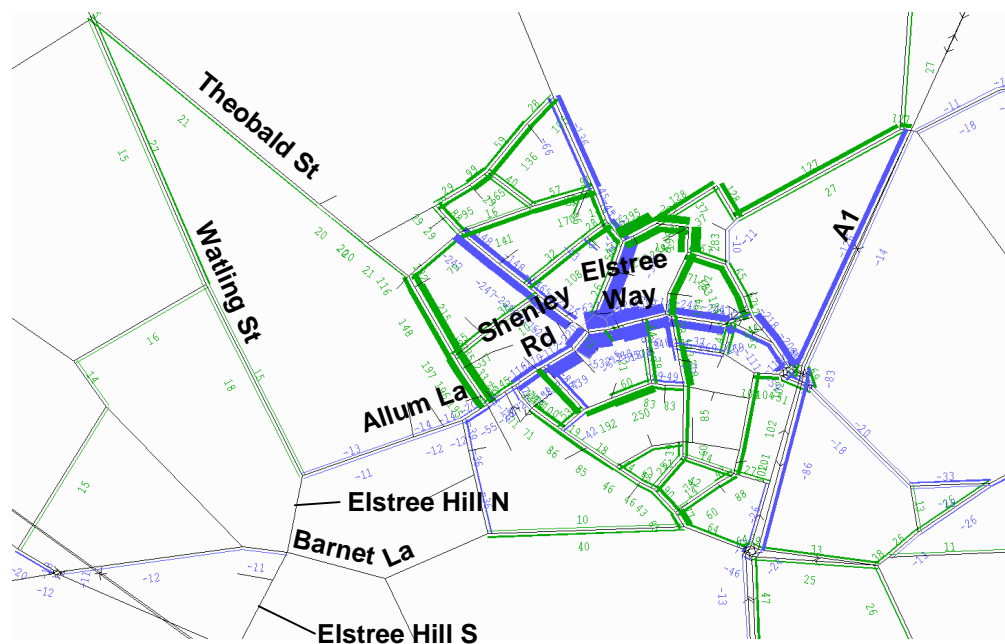


- 5.5 Scenario 1B  
***Shared Space- Two lane approach on Shenley Road with banned left turn from Shenley Road into Brook Road***
- 5.5.1 Scenario 1B is similar to scenario 1A except for the addition of a banned left turn from Shenley Road into Brook Road. The reason for banning the left movement is to calm traffic conditions on Brook Road.

### ***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.5.2 Banning the left turn from Shenley Road into Brook Road reduces the delays and queuing at the junction. Removing the left turn also allows the junctions operation to be re-optimised with different signal stages and timings. However, the impact of this scenario is very similar to Scenario 1A as there is a significant reassignment of traffic from the town centre on to local roads. Therefore, for the same reason, this scenario is not considered to be feasible. Figure 5.4 shows the actual flow difference between Scenario 1B and the reference case.

**Figure 5.4: Traffic flow difference (Scenario 1B and Reference Case 2026)**



- 5.6 Scenario 2  
***Signalised plus bus lane in/out of Tesco and single lanes each direction on Shenley Road (west)***

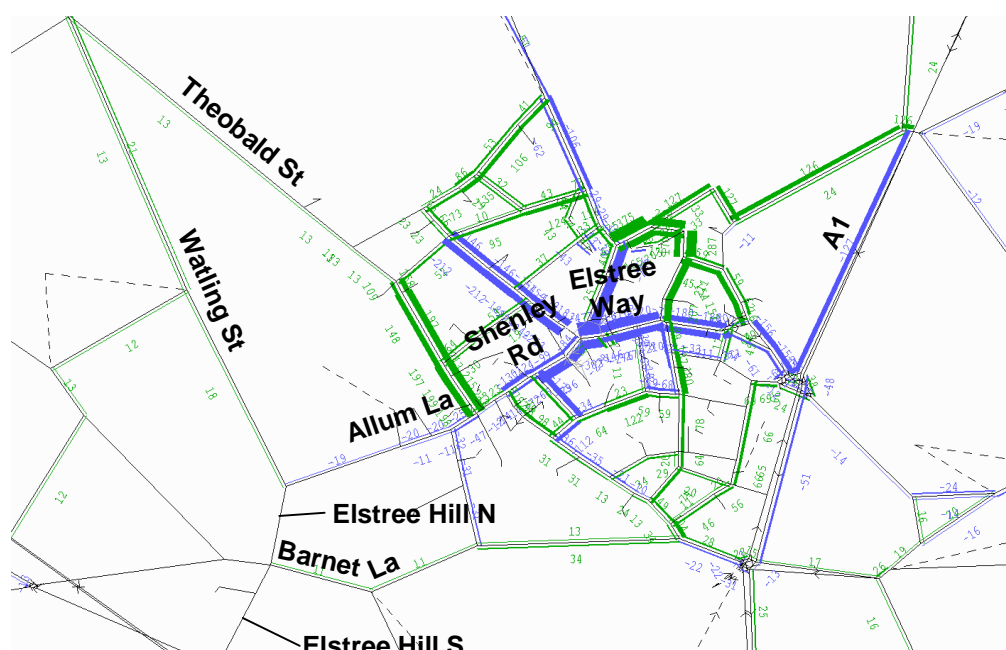
- 5.6.1 Scenario 2 includes the conversion of Brook Road/Elstree Way/Shenley Road (west) and the Elstree Way/Maxwell Road/new link road junctions into signalised junctions. It also includes the reduction of carriageway width to a single lane in each direction for general traffic, plus a bus lane in/out of Tesco.

### ***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.6.2 The modelling results show a moderate reduction of traffic on Shenley Road (west) and Elstree Way from 1805 to 1443 vehicles (reduction of approximately 20%) and from 2264 to 1673 vehicles (reduction of 27%) respectively when compared against the reference case scenario. Analysis of the journey time results also shows that there is an increase in congestion along Shenley Road (eastbound), Elstree Way (eastbound) and at the Elstree Way/Maxwell Road junction. Shenley Road also shows moderate delays in the westbound direction due to the provision of only one lane.

- 5.6.3 The operation of Brook Road/Elstree Way/Shenley Road (west) junction shows long queues on Elstree Way (westbound) (approximately 35 vehicles). It should also be noted that the section of highway between Tesco junction and Brook Road/Elstree Way/Shenley Road (west) junction is congested in the westbound direction due to insufficient capacity (i.e. only one lane for vehicles). The Theobald Street/Shenley Road junction seems to operate within capacity except for some minor delays at Theobald Street northbound approach.
- 5.6.4 The modelling assessment indicates that approximately 30% of the traffic will choose to divert away from the Shenley Road junction. This results in an increase in rat running through other local/distributor roads. Specifically, in this scenario, there is a substantial increase in rat running along Studio Way, Deacon's Hill Road and Rowley Lane. The model also shows a slight increase in traffic on strategic roads (i.e. A1 and M25) and also along Barnet Lane and Watling Street.
- 5.6.5 Figure 5.5 shows the difference in traffic flows between Scenario 2 and the Reference case.

**Figure 5.5: Traffic flow difference (Scenario 2 and Reference Case 2026)**



- 5.6.6 The results of this scenario indicate that, relative to scenario 1 variants, the negative impact due to traffic diverting from the town centre onto local roads is slightly diminished. However this scenario is not considered as a feasible option due to the increases in delay and queuing along the Elstree Way corridor, as well as the increase in rat running on local roads.

## 5.7 Scenario 2A

***Signalised plus bus lane in/out of Tesco and two lanes each direction on Shenley Road (west)***



- 5.7.1 Scenario 2A is the same as scenario 2 except that there are two lanes for general traffic in each direction on Shenley Road (west).

***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.7.2 As with scenario 2, the traffic has been reassigned to the local and wider area resulting in less traffic entering the town centre. In this scenario there is a moderate reduction in traffic flows entering into the town centre from Shenley Road west (from 1805 to 1498 vehicles, a reduction of approximately 20%) and Elstree Way (from 2264 to 1796 vehicles, a reduction of 26%) compared with to the reference case scenario.
- 5.7.3 Therefore the model predicts that approximately 27.5% of the existing traffic will choose to divert away from the Shenley Road junction. This re-assignment in traffic causes an increase in rat running through other local/distributor roads. However it should be noted that the increase in rat running on local roads in scenario 2A is less than the amount predicted by the model in scenarios 1, 1A, 1B and 2. Figure 5.6 shows the difference in traffic flows between Scenario 2A and the Reference case.

**Figure 5.6: Traffic flow difference (Scenario 2A and Reference Case 2026)**



- 5.7.4 In general, scenario 2A shows a moderate improvement to Shenley Road and Elstree Way, as well as an improvement in pedestrian and bus access to Tesco, relative to scenario 2. However, as shown in Figure 5.5, there is some increase in rat running along local roads.

5.8 Scenario 2B

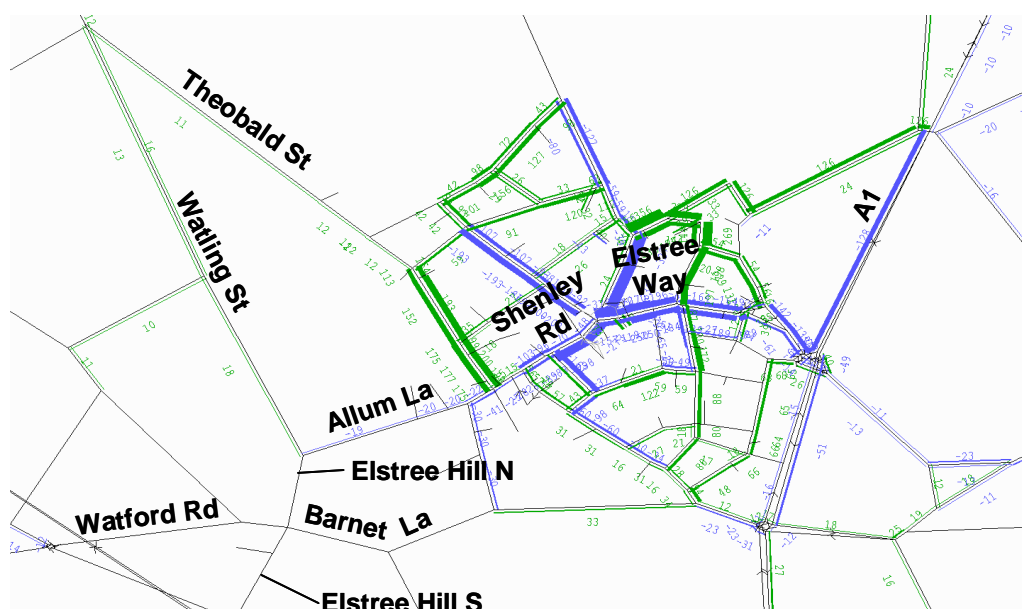
***Signalised plus bus lane in/out of Tesco, two lanes each direction on Shenley Road (west), and banned left turn from Shenley Road (east) into Brook Road***

- 5.8.1 Scenario 2B is similar to scenario 2A except that the left turn from Shenley Road (east) into Brook Road is banned.

***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.8.2 The impact of this scenario is very similar to Scenario 2A as it results in a significant reassignment of traffic to local roads. However, this scenario is considered to be preferable to scenarios 1, 1A, 1 B 2 and 2A as it reduces traffic along the Shenley Road and Elstree Way corridor but does not cause a substantial increase in rat running compared to the other scenarios. Figure 5.7 shows the actual flow differences between Scenario 2B and the reference case.

**Figure 5.7: Traffic flow difference (Scenario 2B minus Reference Case 2026)**

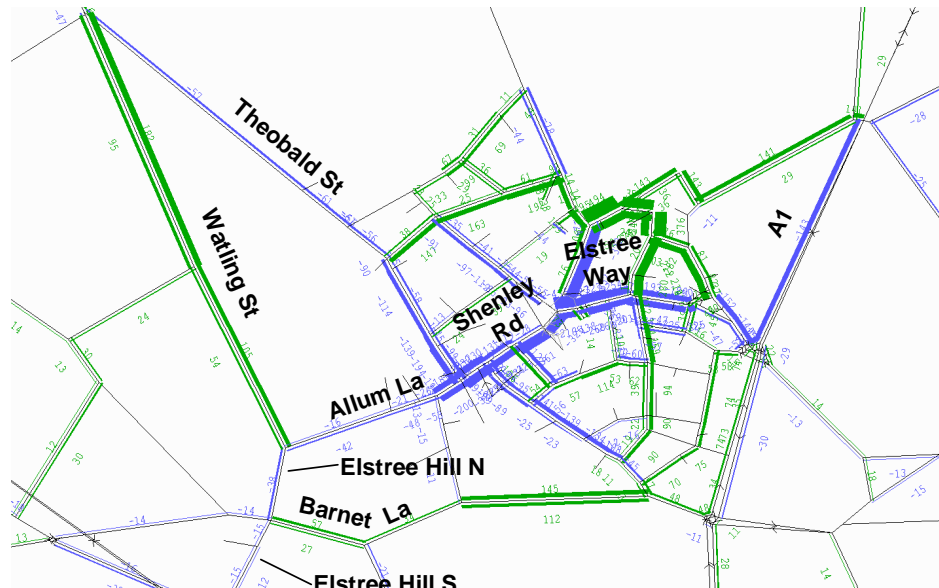


- 5.9 Scenario 3  
*As scenario 2B plus signalisation of Station Road/Theobald Street Junction with a one lane approach on each arm*

***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.9.2 Figure 5.8 shows the actual flow differences between Scenario 3 and the Reference case.

**Figure 5.8: Traffic flow difference (Scenario 3 minus Reference Case 2026)**



- 5.9.3 In general, this scenario shows a similar impact to scenario 2B but with longer delays on Theobald Street due to limited capacity on approaching the junction. In addition it should be noted that analysis of Figure 5.8 indicates that there will be some re-assignment away from Theobald Street. Furthermore analysis shows an increase in traffic flows on Barnet Lane.

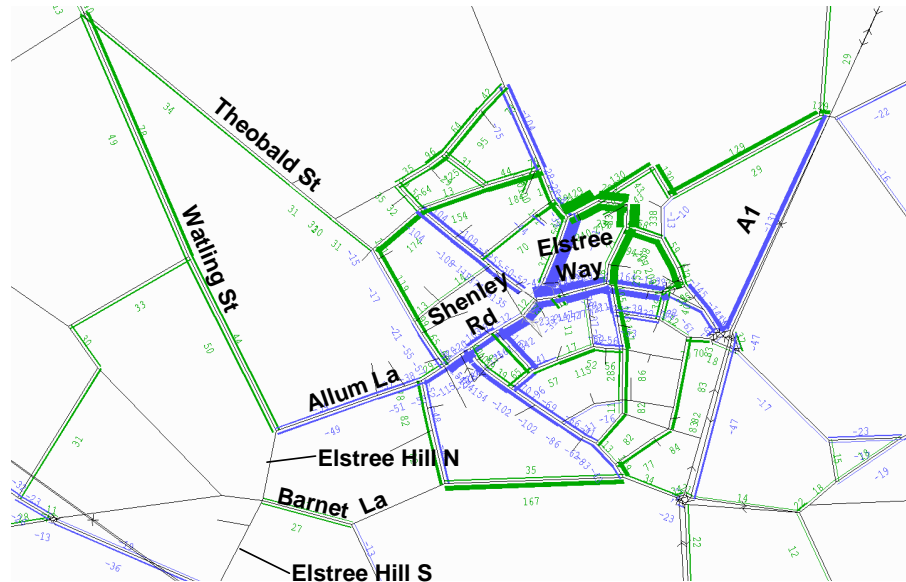
## 5.10 Scenario 3A

***As scenario 2B plus signalisation of Station Road/Theobald Street Junction with a one lane approach plus flare on each arm***

### ***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.10.1 Compared with the reference case there is a reduction in traffic flows entering into the town centre on Shenley Road (west) and Elstree Way, in scenario 3A, from 1805 to 1504 vehicles (reduction of approx. 20%), and 2264 to 1698 vehicles (reduction of approx 33%) respectively. The SATURN/PARAMICS modelling also predicts a slight improvement in journey times along Shenley Road/ Elstree Way in the eastbound direction. However, there is an increase in queuing along Elstree Way/ Maxwell Road in the westbound direction, which results in a significant increase in journey times. Figure 5.9 shows the actual flow differences between Scenario 3A and the Reference case.

**Figure 5.9: Traffic flow difference (Scenario 3A minus Reference Case 2026)**



- 5.10.2 In summary, analysis of scenario 3A shows an improvement in the operation of the signalised Shenley Road/Theobald Street junction, as the flare on Theobald Street adds some capacity to the junction. This will improve the journey time reliability along Theobald Street. Overall scenario 3A is preferable to scenario 3 as it provides a feasible traffic solution that incorporates the EWC master plan option (with signalised junctions) plus the signalisation of Shenley Road/Theobald Street junction.

## 5.11 Scenario 4

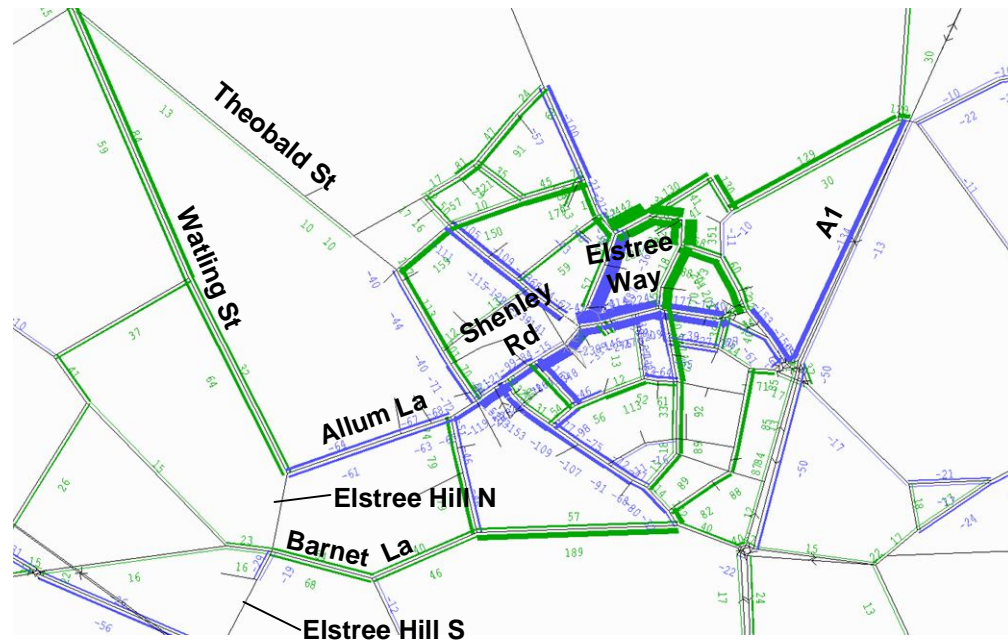
***As scenario 3A but with no bus lanes in/out of Tesco, plus optimised signal timing at Elstree Crossroads, and a banned right turn on Watford Road approach***

- 5.11.1 This scenario tests the banning of the right turn from Watford Road to add additional capacity to the Elstree Crossroads. In accordance the network signal timings were altered and stages revised to optimise the junction performance.

### ***Traffic Impacts – Town Centre, Local and Wider Area***

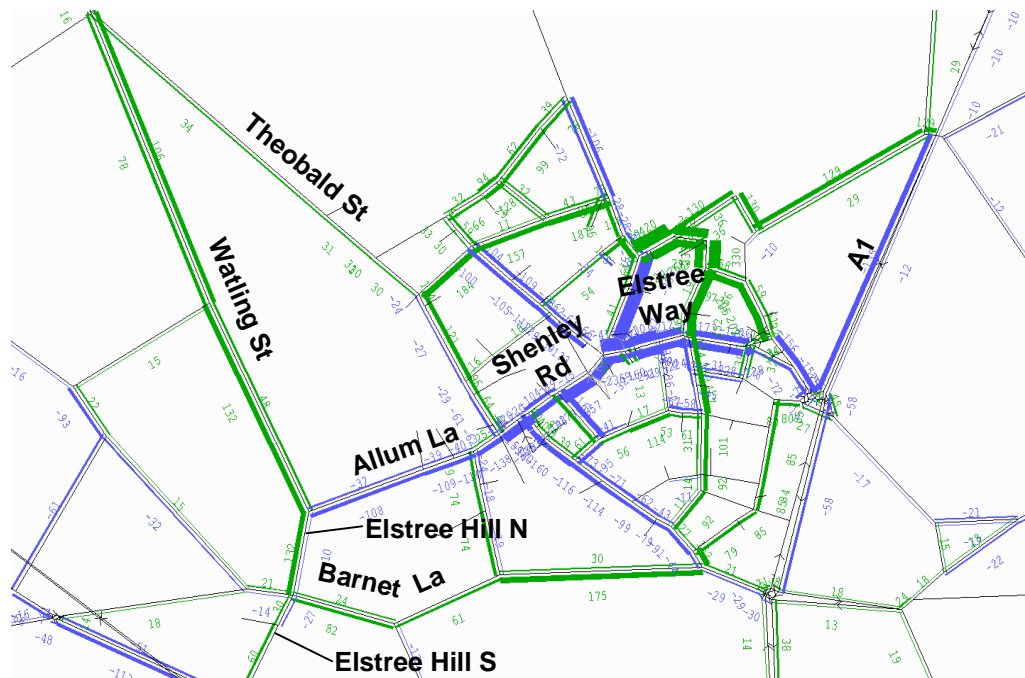
- 5.11.2 In general, analysis of scenario 4 indicates that the operation of the network has not significantly changed from scenario 3A, apart from a small increase in traffic using Dagger Lane and Butterfly Lane. Figure 5.10 shows the actual flow difference between Scenario 4 and the reference case.

**Figure 5.10: Traffic flow difference (Scenario 4 minus Reference Case 2026)**





**Figure 5.11: Traffic flow difference (Scenario 4A minus Reference Case 2026)**



### 5.13 Scenario 4B

***As scenario 4A but increased flare at Brook Road and the new link road approach at Maxwell Road***

- 5.13.1 The flare (of 4 PCU) on Brook Road was added due to excessive queuing on the approach with Elstree Way/Shenley Road junction similarly adding flare on the approach at Maxwell Road (5 PCU) to reduce the excessive queues compared to option 4A.

#### ***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.13.2 Figure 5.12 shows the actual flow difference between Scenario 4B and the reference case.
- 5.13.3 Comparing scenario 4A with scenario 4B shows that there is no significant alteration to the pattern of traffic accessing the Elstree Crossroads junction. However, due to the increase in capacity on Brook Road and Maxwell Road, analysis of the modelling results indicates that there is some improvement in the traffic conditions in the town centre. Specifically there is a slight increase in traffic flow along the Shenley Road/Elstree Way corridor of approximately 100 PCU (2-way) and a decrease in rat running along local roads.
- 5.13.4 Overall, the analysis of scenario 4B indicates that it is preferable to scenarios 1 through to 4A in terms of the traffic impact. Scenario 4B shows that it would be feasible to implement the EWC master plan proposals in conjunction with improvements to the Elstree Crossroads and Station Road/Theobald Street junction.

**Figure 5.12: Traffic flow difference (Scenario 4B minus Reference Case 2026)**



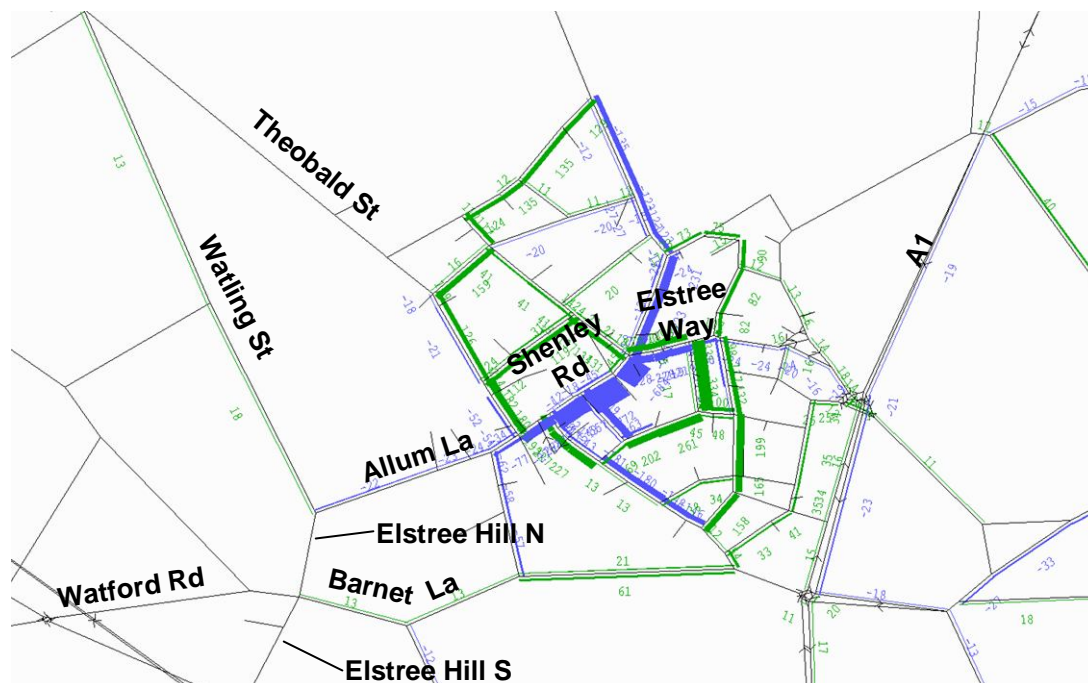
#### 5.14 Scenario 5

***Shenley Road one way eastbound, between Furzehill Road and Eldon Avenue, with a contra-flow lane for buses.***

##### ***Traffic Impacts – Town Centre, Local and Wider Area***

- 5.14.2 One-way operation along Shenley road between Furzehill Road and Eldon Avenue produces a significant reduction in traffic entering into the town centre along Shenley Road (west) (1166 vehicles, a reduction of 639 from the reference case). However the amount of traffic entering the town centre from Elstree Way has not significantly changed (i.e. reduced from 2264 to 2235 vehicles).
- 5.14.3 Due to the implementation of one-way operation along Shenley Road, traffic consequently has to divert onto alternative routes. As a result of this traffic diversion, analysis of the model shows that there is a significant increase in rat running through the residential areas. In addition to this, the diversion of the Shenley Road traffic also has a negative impact on strategic routes.
- 5.14.4 Figure 5.13 shows the actual flow difference between Scenario 5 and the reference case.

**Figure 5.13: Traffic flow difference (Scenario 5 minus Reference Case 2026)**



5.14.5 Analysis of Figure 5.13 shows a significant diversion of traffic away from the town centre. In summary this scenario is not considered to be a viable traffic option, as it causes a large increase in traffic on residential roads.

#### 5.15 Scenario 5A

***Shenley Road one way westbound, between Furzehill Road and Eldon Avenue, with a contra-flow lane for buses.***

##### ***Traffic Impacts – Town Centre, Local and Wider Area***

5.15.2 This scenario is the same as scenario 5 except that the one-way operation has been implemented in the westbound direction as opposed to the eastbound direction.

5.15.3 As a result of the one way westbound operation of part of Shenley Rd, analysis of the model indicates that the traffic flow entering the town centre from the Tesco access road junction has significantly decreased (from 1805 to 1314 vehicles) compared to the reference case scenario. However the amount of traffic entering the town centre from Elstree Way has not significantly changed (i.e. reduced from 2264 to 2165).

5.15.4 Figure 5.14 shows the actual flow difference between Scenario 5A and the reference case.

**Figure 5.14: Traffic flow difference (Scenario 5A minus Reference Case 2026)**



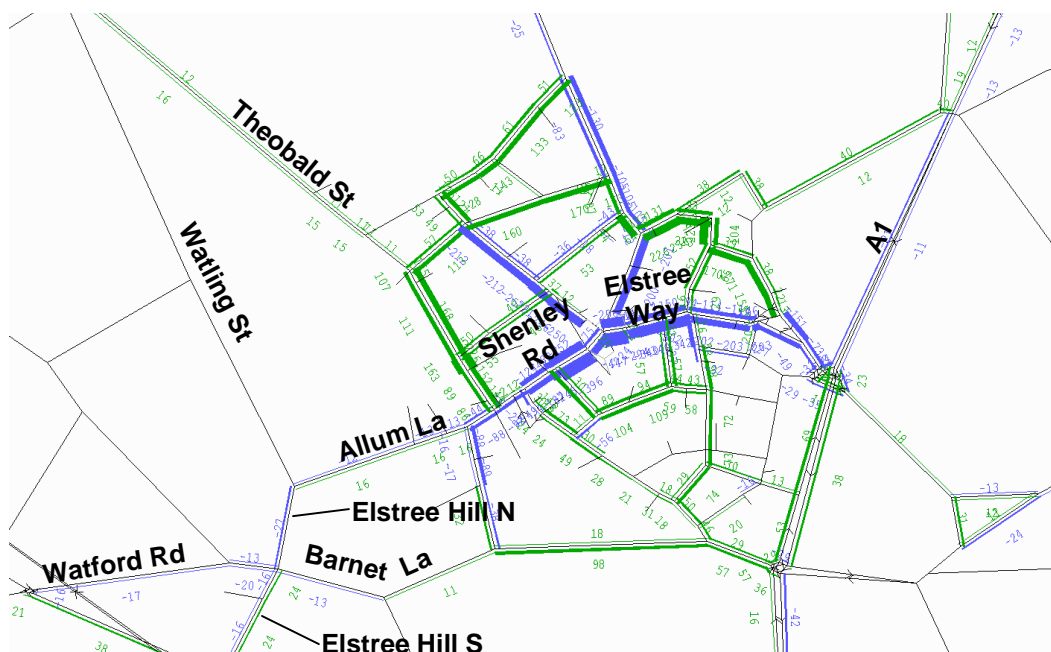
- 5.15.5 Similar to scenario 5, the diversion of traffic away from the town centre due to the one-way westbound operation of part of Shenley Road in scenario 5A has caused an increase in traffic rat running through residential areas and a deterioration in traffic conditions in the wider network. Specifically, analysis of Figure 5.14 shows an increase in traffic using the A1 North.
- 5.15.6 In summary this scenario is not considered to be a viable traffic option, as it causes a large increase in traffic on residential roads.
- 5.16 PM peak period assessment
- 5.16.1 The most feasible AM peak period scenarios, 2B and 4B, were selected for additional assessment in the PM period.
- 5.16.2 Scenarios 2B and 4B were then further refined to accommodate for the PM traffic flows. These changes included two traffic lanes for the Tesco exit as well as the provision of flare lanes on Brook Road, plus flare lanes on the new link road approaches to the Elstree Way/Maxwell Road junction.

## 5.17 Scenario 2B - PM

### ***Traffic Impacts – Town Centre, Local and Wider Area***

5.17.2 Figure 5.15 shows the actual flow difference between Scenario 2B and the reference case.

**Figure 5.15: Traffic flow difference (Scenario 2B minus Reference Case 2026) - PM**



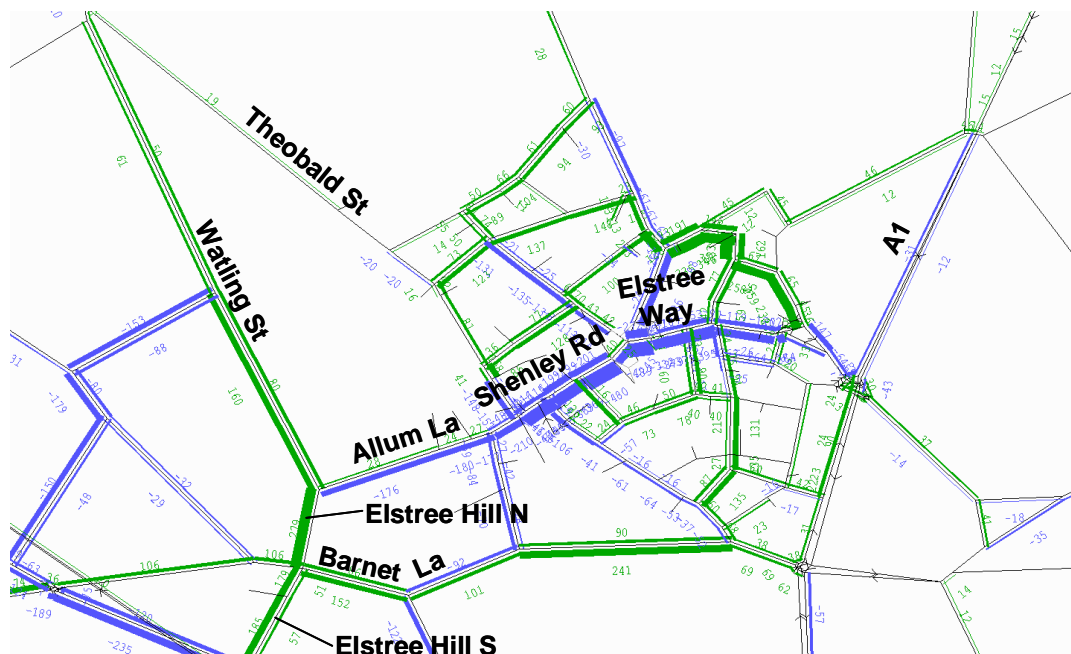
5.17.3 The modelling assessment of scenario 2B demonstrates that the traffic measures adopted in this assessment are feasible in the PM peak period. This supports the analysis of the AM peak, which indicated that scenario 2B was feasible. Analysis of Figure 5.15 shows that traffic flows on Shenley Road (west) and Elstree Way have decreased by about 300 and 500 vehicles respectively compared to the reference case.

## 5.18 Scenario 4B - PM

### ***Impact on the Town Centre, Impact on Local and Wider Network***

5.18.2 Figure 5.16 shows the actual flow differences between Scenario 4B and the reference case.

**Figure 5.16: Traffic flow difference (Scenario 4B minus Reference Case 2026) - PM**



5.18.3 The modelling assessment of scenario 4B demonstrates that the traffic measures adopted in this assessment are feasible in the PM peak period. This supports the analysis of the AM peak, which indicated that scenario 4B was feasible. Analysis of Figure 5.16 shows that traffic flows on Shenley Road (West) and Elstree Way have decreased by about 200 and 500 vehicles respectively compared to the reference case. In addition, the analysis shows an increase of over 400 trips through Elstree Crossroads as well as increase on Manor Way.

## 5.19 Preferred Scenarios

5.19.1 From the evaluation of scenarios 1 through to 4 the following conclusions can be made:

- **Scenarios 1 and 2:** Of these scenarios and variants, scenario 2B represents the preferred solution for EWC master plan proposal.
- **Scenario 3:** Of the scenario 3 variants, 3A is the preferred solution.
- **Scenario 4:** Of the scenario 4 variants, 4B is the preferred solution

5.19.2 Of all the scenario tests and combinations, 4B presents the optimum solution. We recommend that Scenario 4B should be considered as the preferred option; this presents the preferred network alterations which best complement the EWC master plan proposals.

5.19.3 Analysis of scenario 5 cannot be considered relative to scenarios 1 to 4 as it does not include any incremental changes from the previous scenarios. Therefore the modelling assessment for scenario 5 should be considered as a separate piece of analysis.

5.19.4 The qualitative and quantitative assessment for all of the scenarios can be found in tabular form under Appendix A and Appendix B. In addition to this, Paramics screenshots of the key scenarios can be seen in Appendix C. Further consideration of the implications of these results on the EWC master plan is provided below.



## 6 Implications of Model Results

### 6.1 EWC Master Plan Road Layout

- 6.1.1 Overall, the option testing results indicate that the road layout illustrated in the EWC master plan can realistically form the basis for a highways engineering solution that adequately provides for movement of general traffic, buses, cyclists and pedestrians. The option variants that have been tested show that different permutations clearly have different impacts, most notably in terms of the displacement of traffic onto other routes.
- 6.1.2 The shared space option variants (Scenarios 1, 1a and 1b) show the most significant displacement of traffic from the Elstree Way corridor to other roads. The signalised junction option variants (Scenarios 2, 2a, 2b) show a smaller displacement of traffic. Both solutions work within the town centre context, however the high displacement of traffic to the wider area in the shared space option is likely to be considered unacceptable. In our view the level of traffic displacement generated by the signalised junction option variants is more acceptable. With some adjustments to signal timings and junction design these options could be made even more effective and reduce localised issues with queuing and congestion that have been highlighted in the model results.
- 6.1.3 In light of these results we consider that the removal of the Elstree roundabout and replacement with junctions, plus a new secondary access road (as illustrated in the master plan) is achievable. A signalised junction option for this road layout is the most suitable design solution and should be pursued as part of future master plan development.
- 6.1.4 However we also consider that the shared space option tests show that a future shared space solution should not be disregarded. Some modal shift may occur as a consequence of replacing the roundabout with signalised junctions, as people adjust their travel behaviour due to perceived 'difficulty' of driving through the town centre. If this occurs a shared space approach could be tested on a trial basis through a traffic light 'switch-off'. If this trial showed that the corridor could still operate effectively on a shared space basis, then a more permanent solution could be pursued through simply removing the traffic lights.
- 6.1.5 CB has recently undertaken and monitored the impact of switching off traffic lights at the Cabstand junction in Portishead for North Somerset Council. This trial demonstrated that unregulated traffic management can result in improved junction performance and reduced delays without affecting pedestrian and cyclist amenity or road safety.
- 6.1.6 We suggest that the signalised scheme is pursued. Following implementation, monitoring should take place of the operation of the scheme, particularly of impacts on the wider town. Depending on the outcomes of the monitoring, a shared space option could then potentially be pursued as a longer term solution.

### 6.2 Comprehensive Measures

- 6.2.1 The EWC masterplan proposed road layout has been developed to help achieve an overall future vision for redevelopment of the EWC area, by:
- Releasing land for future development;
  - Improving the physical appearance of this important gateway into the town;
  - Enabling the provision of a high quality town square and improved frontage for the Elstree Film Studios; and
  - Improving pedestrian movement along the corridor, better linking the EWC area with Borehamwood town centre.

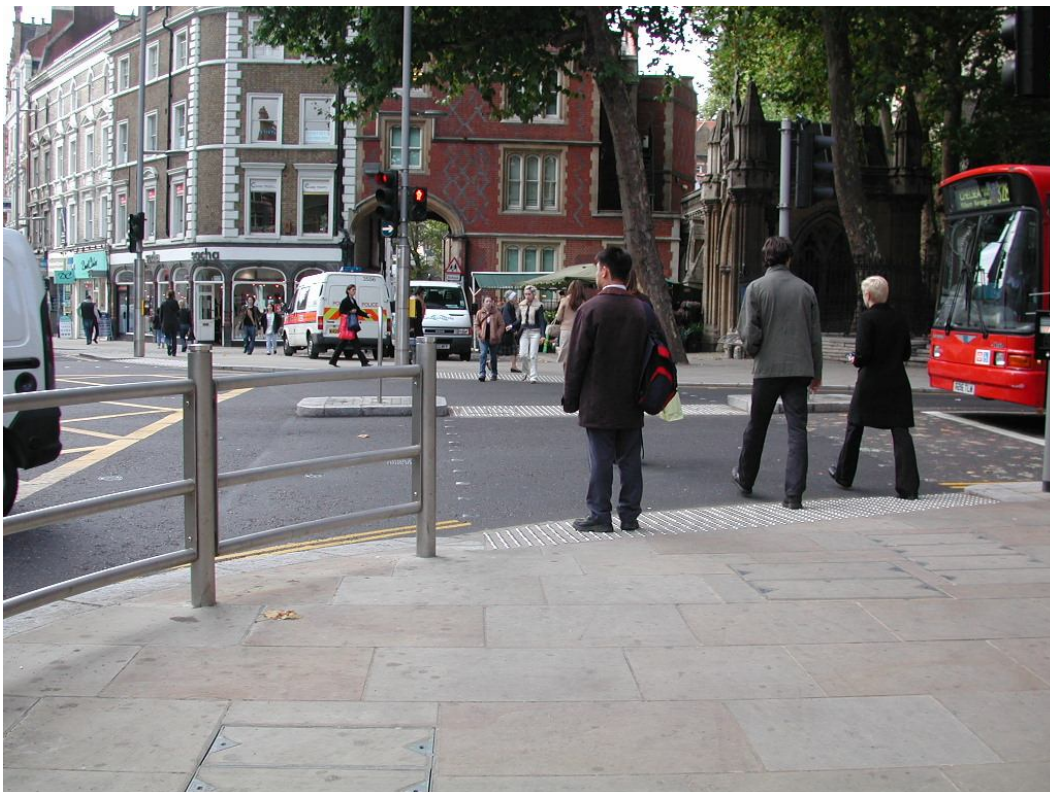
- 6.2.2 The removal of the Shenley Road roundabout and replacement with either a shared space or signalised junction is critical to achieving this vision. The design options help achieve this by:
- Providing more and better pedestrian crossing opportunities along and across Shenley Road and Elstree Way;
  - Reducing the amount of space given over to highways whilst still maintaining adequate traffic flow, and thereby freeing up land for development and new public space;
  - Using a simplified streetscape approach to calm traffic;
  - Providing an attractive high quality streetscape;
  - Offering infrastructure improvements to enhance cycle movement along Shenley Road and Elstree Way.
- 6.2.3 The implementation of these changes to the highway network - as tested in the various scenarios - results in changed traffic patterns across the town and in the wider Borehamwood area to varying degrees. As explained in section 5.19, scenario 4B presents the optimum solution of all the scenario tests and combinations. This scenario presents a set of comprehensive measures including the signalised EWC master plan road layout plus enhancements at the junction of Theobald Street/Station Road and at Elstree Crossroads. These additional enhancements form part of the preferred package of measures in order to:
- Help balance traffic displaced from the EWC area across the wider network;
  - Provide formal pedestrian crossings on all arms at the Theobald Street/Station Road junction;
  - Provide an all-red pedestrian phase at the Theobald Street/Station Road junction;
  - Reduce traffic delay at Elstree Crossroads; and
  - Contribute to air quality improvements at Elstree Crossroads by smoothing traffic flow.
- 6.2.4 Ultimately the Scenario 4B package of measures will help achieve the best possible traffic solution for the EWC as well as offering improvements at Elstree Crossroads and the junction of Theobald Street/Station Road.
- 6.2.5 As the above indicates, a key focus in the scenarios tested was improving pedestrian movement. This includes an all-red phase for pedestrians at the Theobald Street/Station Road junction as well as other signalised junctions in the town centre except for Elstree Crossroads during the PM peak hour due to lower level of pedestrian demand. However the measures offered all help vastly improve pedestrian movement in locations considered.
- 6.3 Design considerations
- 6.3.1 As outlined in section 6.1 the signalised option is the most preferable for the EWC redevelopment, at least in initial stages. Given the number of new signals included in the preferred scenario a natural concern is these can be introduced effectively whilst simultaneously achieving a high quality, and uncluttered streetscape.
- 6.3.2 Fortunately there are now many examples of 'simplified' streets which incorporate traditional traffic controls such as signals, whilst also achieving a decluttered and high quality appearance. This can be achieved through:
- Removing excessive and unrequired street furniture and clutter, particularly guardrailling.
  - Limiting "signing and lining" (road markings) to only what is absolutely essential and statutorily required.
  - Using high quality carriageway and pavement surfacing materials.
  - Using a co-ordinated and attractive suite of street furniture;

- Creating a clear pedestrian movement zone by aligning street furniture, planting etc. at the back of the kerb; and
- Combining multiple items of street furniture to reduce number of items where possible. E.g. attaching signal heads, signage, bins etc to lamp columns, as has been done in High Street Kensington.

6.3.3 There are several pieces of guidance which advocate this approach to streets, and set out such principles in more detail, most notably Manual for Streets, Manual for Streets 2, and LTN 3/08 Mixed Priority Routes: Practitioner's Guide.

6.3.4 Examples of simplified design approaches to streets are illustrated in the photos below.

**Figure 6.1: Photo of High Street Kensington**





**Figure 6.2: Photo of High Street Kensington**



**Figure 6.3: Photo of Ashford Ring Road**



**Figure 6.4: Example of combined signal and lamp column**



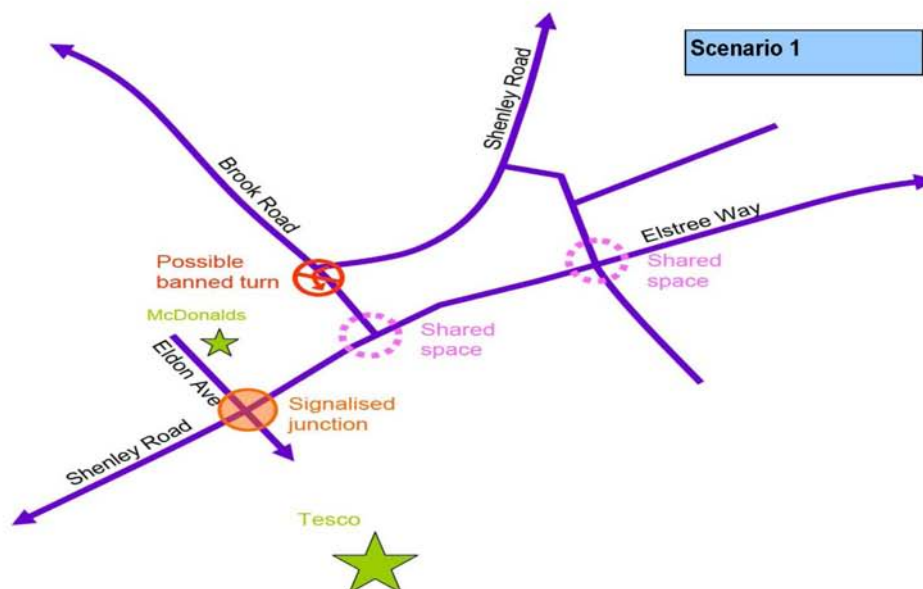
## 7 Conclusion

- 7.1.1 In consultation with HCC and HBC, a number of traffic scenarios have been developed and considered for option testing. These options were grouped into five main scenarios. Within each of these scenario groups additional scenario test variants, which contained minor network alterations, were assessed.
- 7.1.2 The five main scenario groups are summarised as follows:
- Scenario 1: EWC master plan (shared space) plus signalisation of Tesco roundabout
  - Scenario 2: EWC master plan (signalised) plus signalisation of Tesco roundabout
  - Scenario 3: EWC master plan plus Station Road/Theobald Street junction improvements
  - Scenario 4: EWC master plan plus Elstree crossroads improvements
  - Scenario 5: Shenley Road one-way
- 7.1.3 In total eleven different scenario variants were assessed. The impact of each scenario was tested on the SATURN BHM and the Paramics BTM. The results of these scenario tests were assessed in terms of the town centre network operation, journey time, benefits to buses and pedestrians together with the wider impact.
- 7.1.4 In summary the following conclusions can be drawn from the SATURN and PARAMICS modelling of scenarios 1- 5:
- **Scenarios 1 and 2:** Scenario 2B is the preferred solution for EWC master plan proposal.
  - **Scenario 3:** 3A is a complementary scheme to Scenario 2B with signalisation of Station Road/ Theobald Street .
  - **Scenario 4:** 4B includes additional improvements to Scenario 3A with further improvements at Elstree Crossroads and is considered to be the best performing option.
- 7.1.5 Ultimately the Scenario 4B package of measures is recommended as the preferred option. It achieves a comprehensive traffic solution for the EWC along with improvements at Elstree Crossroads and the junction of Theobald Street/Station Road which:
- Help balance traffic displaced from the EWC area across the wider network;
  - Provide formal pedestrian crossings on all arms at the Theobald Street/Station Road junction;
  - Provide an all-red pedestrian phase at the Theobald Street/Station Road junction;
  - Reduce traffic delay at Elstree Crossroads; and
  - Contribute to air quality improvements at Elstree Crossroads by smoothing traffic flow.
- 7.1.6 It is considered that a simplified streetscape design approach can be used to ensure that traffic signals can be incorporated whilst also achieving a high quality, attractive, and uncluttered streetscape. Such an approach can include:
- Removing excessive and unrequired street furniture and clutter, particularly guardrailing.
  - Limiting “signing and lining” (road markings) to only what is absolutely essential and statutorily required.
  - Using high quality carriageway and pavement surfacing materials.
  - Using a co-ordinated and attractive suite of street furniture;
  - Creating a clear pedestrian movement zone by aligning street furniture, planting etc. at the back of the kerb; and
  - Combining multiple items of street furniture to reduce number of items where possible. E.g. attaching signal heads, signage, bins etc to lamp columns, as has been done in High Street Kensington.



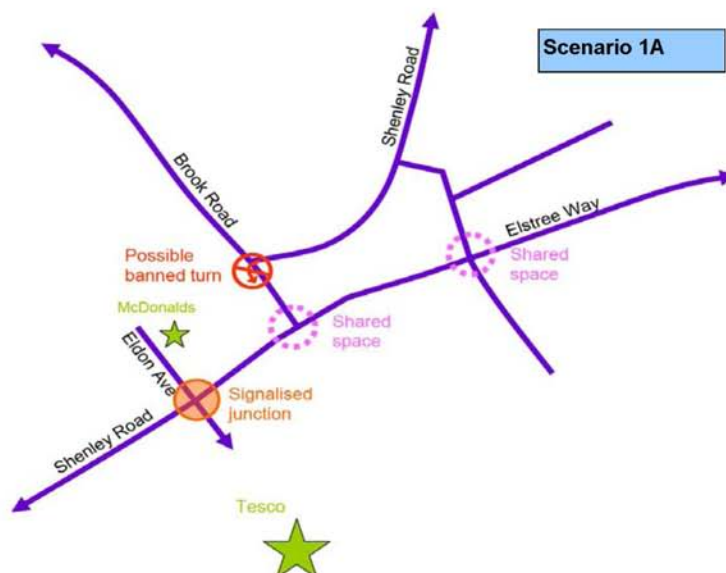
- 7.1.7      Following implementation of a signalised scheme, monitoring of traffic impacts should take place. Depending on the outcomes of the monitoring, a shared space option could then potentially be pursued as a longer term solution.

## Appendix A- AM Peak



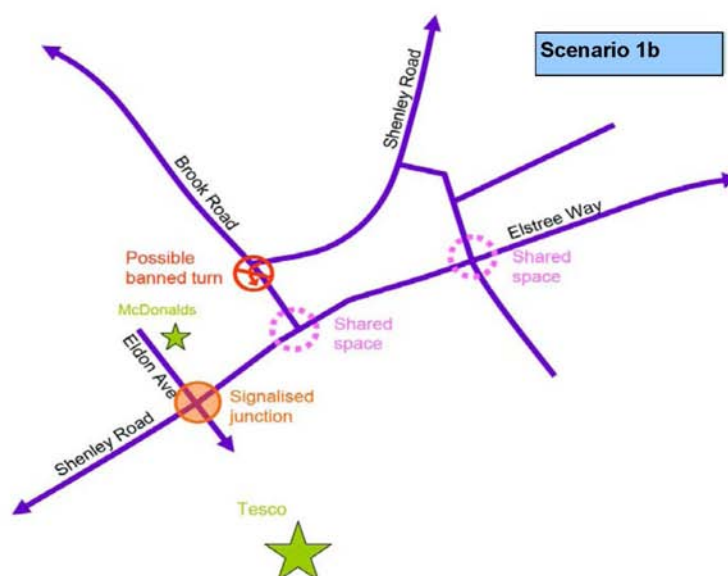
Scenario 1\_ Shared Space one lane approach on Shenley Rd west with no banned left turn from Shenley Rd into Brook Rd

	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
<b>Impact on Town centre</b>						
Flows	Shenley Road West Elstree Way	995 1287	-810 -977	High High		Significant improvement to operation of Shenley Road & its environment Significant improvement to operation of Elstree Way
Journey Time	Shenley Road EB Elstree Way EB Elstree Way WB Shenley Road WB			Low Medium Medium Low		Overall improved journey times however slight junction delay on Shenley Road Eastbound. Moderate improvement in journey times Moderate improvement in journey times Overall improved journey times however slight junction delay on Shenley Road Eastbound.
Operation of Junctions	Shenley Road/Elstree Way Elstree Way/Maxwell Rd Tesco Access Theobald St/ Shenley Rd	1203 1447 1345 2430	-2120 -732 -658 218	Low Medium Medium Low		Vehicle queuing on Eastbound approach up to Tesco junction. Vehicle queuing on Eastbound approach approx. 25 vehicles. Operates with no significant queues. No changes.
Impact on Pedestrian				High		Shared space approach provides a higher quality pedestrian environment with increased crossing opportunities.
Impact on Cyclists				Medium		Shared space approach provides a higher quality cycle environment, with cyclists benefiting from increased driver awareness and slower traffic speeds.
Impact on Buses						No impact on bus movement.
<b>Impact on Local and Wider Network</b>						
Local Diversion	Shenley Road/Elstree Way Other roads	1855 5227	-1468 1079	Very High		Over 44% traffic are forced to divert away from Shenley Rd junction. Significant rat running and more delays locally
Wider Reassignment				Low		Low impact on strategic roads (e.g. A1, M25)
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junctions	2163	3	None None		Low impact Low impact
<b>Comment on General Performance</b>						
Scenario 1_ Significant reduction in traffic along Shenley Road plus significant improvements for pedestrians. The schemes causes a high number of diversion and rat runs on local roads in particular Theobald Street, Studio Way SB, Furzehill Rd, Cardinal Avenue, Hillside Avenue and Rowley Lane NB. It also causes moderate delays at Theobald Street/entrance of Borehamwood Shopping Park. In summary the impact of the scheme is considered as <b>high benefit on the town centre</b> but with <b>high disbenefit to other local roads</b> .						



Scenario 1A\_ Shared Space two lane approach on Shenley Rd West with no banned left turn from Shenley Rd into Brook Rd

	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
<b>Impact on Town centre</b>						
Flows	Shenley Road West Elstree Way	1136	-669	High		Significant improvement but less than scenario 1
		1347	-917	High		Significant improvement but less than scenario 2
Journey Time	Shenley Road EB			Medium		Overall improved journey times.
	Elstree Way EB			Medium		Overall improvement in journey times.
	Elstree Way WB			Medium		Overall improvement in journey times.
	Shenley Road WB			Medium		Overall improved journey times.
Operation of Junctions	Shenley Road/Elstree Way	1337	-1986	Medium		Vehicle queuing on Brook Road approach.
	Elstree Way/Maxwell Rd	1506	-673	Medium		Vehicle queuing on eastbound approach.
	Tesco Access	1479	-524	High		Operates with no significant queues.
	Theobald St/ Shenley Rd	2401	189	Low		No changes.
Impact on Pedestrian				Medium		Shared space approach provides a higher quality pedestrian environment with increased crossing opportunities. Two lane approach increases crossing time for pedestrians crossing Shenley Road West.
Impact on Cyclists				Medium		Shared space approach provides a higher quality cycle environment, with cyclists benefiting from increased driver awareness and slower traffic speeds
Impact on Buses						No impact on bus movement.
<b>Impact on Local and Wider Network</b>						
Local Diversion	Shenley Road/Elstree Way Other Roads	1983 5144	-1340 996		Very High	Nearly 40% traffic are forced to divert away from Shenley Rd junction. Significant rat run and more delays locally but less negative impact than Scenario 1
Wider Reassignment					Low	Low impact on strategic roads (e.g. A1, M25)
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junctions	2158	-2		None None	Low impact Low impact
<b>Comment on General Performance</b>						
Scenario 1A_ Significant reduction in traffic along Shenley Road plus significant improvements for pedestrians and no delays to bus journey times. The schemes causes a high number of rat runs and the use of other local road in particular Theobald Street, Studio Way SB, Furzehill Road, Cardinal Avenue, Hillside Avenue and Rowley Lane NB. It also causes moderate delays at Theobald Street/entrance of Borehamwood Shopping Park. In summary the impact of the scheme is considered as <b>medium to high benefit to the town centre</b> but with <b>high disbenefit to other local roads</b> .						



Scenario 1B\_ Shared Space 2 lane approach on Shenley Rd West with banned left turn from Shenley Rd into Brook Rd

				Impact			
		Location	Flows	Changes	Positive	Negative	Comment
<b>Impact on Town centre</b>							
Flows	Shenley Road West Elstree Way	1058	-747	High		Improvement to operation of Shenley Road & its environment	
		1320	-944	High			
Journey Time	Shenley Road EB	169	0	Medium	Low Medium	Overall improvement in journey times.	
	Elstree Way EB	135	-36			Overall improvement in journey times.	
	Elstree Way WB	146	17			Overall improved journey times.	
	Shenley Road WB	220	41				
Operation of Junctions	Shenley Road/Elstree Way	1344	-1979	Medium		No significant queuing.	
	Elstree Way/Maxwell Rd	1522	-657	Medium		Vehicle queuing on eastbound approach approx. 16-20 vehicles.	
	Tesco Access	1399	-604	High		Operates with no significant queues.	
	Theobald St/ Shenley Rd	2399	187	Low		No changes.	
Impact on Pedestrians				Medium		Shared space approach provides a higher quality pedestrian environment with increased crossing opportunities. Two lane approach increases crossing time for pedestrians crossing Shenley Road West.	
Impact on Cyclists				Medium		Shared space approach provides a higher quality cycle environment, with cyclists benefiting from increased driver awareness and slower traffic speeds	
Impact on Buses						Buses will benefit from improved journey times.	
<b>Impact on Local and Wider Network</b>							
Local Diversion	Shenley Road/Elstree Way Other Roads	1936	-1387		High	Nearly 42% traffic are forced to divert away from Shenley Rd junction.	
		5175	1027			Significant rat run and more delays locally negative impact than Scenario 1	
Wider Reassignment					Low	Low impact on strategic roads (e.g. A1, M25)	
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junctions	2162	2		None None	Low impact	
						Low impact	
<b>Comment on General Performance</b>							
Scenario 1B_ Significant reduction in traffic along Shenley Road plus significant improvements for pedestrians and no delays to buses. The schemes causes a relatively high number of rat runs and the use of other local roads in particular Theobald Street, Studio Way, Furzehill Road, Cardinal Avenue, Hillside Avenue and Rowley Lane NB. In summary the impact of the scheme is considered <b>ashigh benefit on the town centre</b> but <b>with medium disbenefit to other local roads</b> .							



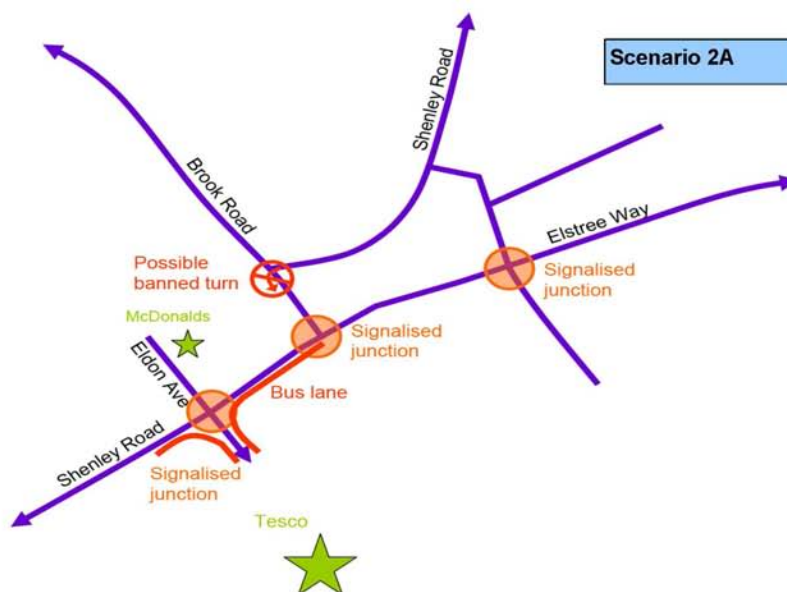
Scenario 2\_ Signalised plus bus lane in/out of Tesco (one lane approach on Shenley Rd west)  
with no banned left turn from Shenley Rd into Brook Rd

Impact on Town centre	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
Flows	Shenley Road West	1443	-362	Medium		Moderate improvement to operation of Shenley Road & its environment
	Elstree Way	1673	-591	Medium		Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd junction
Journey Time	Shenley Road EB				Medium	Moderate increase to journey time due to provision of 1 lane approach
	Elstree Way EB				Medium	Moderate increase to journey time due to provision of 1 lane approach
	Elstree Way WB				High	Significant increase in Journey time due to queuing at Elstree Way/Maxwell Rd Junction-WB
	Shenley Road WB				Medium	Moderate increase to journey time due to provision of 1 lane approach
Operation of Junctions	Shenley Road/Elstree Way	1796	-1527		Medium	Long queues on Brook Road/Shenley Road & Elstree Way- Consider flare at the approaches
	Elstree Way/Maxwell Rd	1860	-319		Low	Long queue on westbound approach approx.
	Tesco Access	1677	-326		Low	Longer queue to provision of 1 lane approach
	Theobald St/ Shenley Rd	2389	177		Low	Longer delay and queues due to increased in traffic on Theobald Street
Impact on Pedestrian				High		New signalised pedestrian crossings improve ease of movement along and across the corridor.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLS.
Impact on Buses				High		Buses benefit from improved journey times as a result of bus lane
Impact on Local and Wider Network						
Local Road/Rat Runs	Shenley Road/Elstree Way	2338	-985		Medium	Nearly 30% traffic are forced to divert away from Shenley Rd junction.
	Other roads	4991	843		Medium	Some rat running still takes place but less than other scenarios
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane and Watling Street
Operation of Junctions	Elstree Hill N/ Elstree Hill S	2163	3	None		No Impact
	Other Junctions				None	No Impact

**Comment on General Performance**

Scenario 2\_ A moderate improvement to Shenley Road and Elstree Way with the benefit of better pedestrian and bus lanes to/from Tesco. The scheme causes a relatively medium to high number of rat runs and the use of other local roads in particular Studio Way, Deacon's Hill and Rowley Lane. Shenley Road/Elstree Way junction is subject to longer delays and queues due to single lane approach. Longer delays at Theobald Street junction due to increased traffic on Theobald Street. Similarly Elstree Way/Maxwell Rd junction suffers delays, which could be addressed with increased flare on all approaches. In summary the impact of the scheme is considered as **medium benefit on the town centre** but with **medium disbenefit to other local roads**.





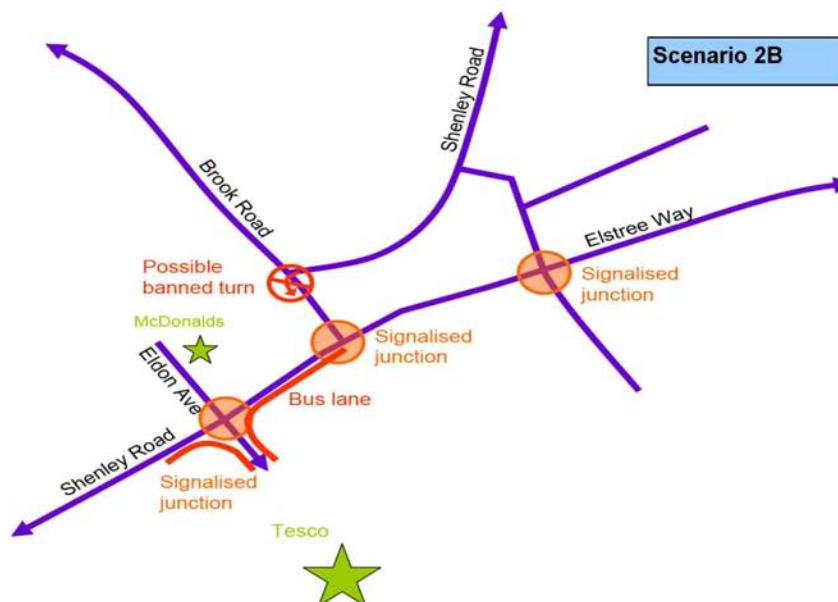
Scenario 2 A \_ Signalised plus bus lane in/out of Tesco (2 lane approach on Shenley Rd west)  
with NO Banned left turn from Shenley Rd into Brook Rd

				Impact		
	Location	Flows	Changes	Positive	Negative	Comment
<b>Impact on Town centre</b>						
Flows	Shenley Road West Elstree Way	1498	-307	Medium		Moderate improvement to operation of Shenley Road & its environment
		1796	-468	Medium		Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd junction
Journey Time	Shenley Road EB	161	-8	Low		Slight improvement in journey time.
	Elstree Way EB	128	-43	Medium		Moderate improvement in Journey times.
	Elstree Way WB	430	301		High	Significant increase in journey time due to queuing at Elstree Way/Maxwell Rd Junction-WB
	Shenley Road WB	195	16	Low		Slight improvement in journey time.
Operation of Junctions	Shenley Road/Elstree Way	1888	-1435		Medium	Long queues on Brook Road - Consider banning the left turn from Shenley Road
	Elstree Way/Maxwell Rd	1907	-272		Low	Long queue on westbound approach approx.
	Tesco Access	1730	-273	Medium		Operate better than Base.
	Theobald St/ Shenley Rd	2367	155		Low	Longer delay and queues due to increased in traffic on Theobald Street
Impact on Pedestrians				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. Two lane approach increases crossing time for pedestrians crossing Shenley Road West.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses				High		Buses benefit from improved journey times as a result of bus lane
<b>Impact on Local and Wider Network</b>						
Local Road/Rat Runs	Shenley Road/Elstree Way Other roads	2411	-912		Medium	Nearly 27.5% traffic are forced to divert away from Shenley Rd junction. Some rat running still takes place but less than other scenarios
		4926	778		Medium	
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane and Watling Street
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junctions	2164	4	None		No Impact
					None	No Impact

**Comment on General Performance**

Scenario 2A\_ A moderate improvement to Shenley Road and Elstree Way with benefits from better pedestrian access and bus lanes to/from Tesco. The schemes causes a relatively low to medium number of rat runs and the use of other local roads in particular Studio Way, Deacon's Hill and Rowley Lane. Brook Road approach could be improved with banning the left turn from Shenley Road. Longer delay at Theobald Street junction due to increased traffic on Theobald Street. Similarly Elstree Way/Maxwell junction suffers delay and could be improved with increased flare on all approaches. In summary the impact of the scheme is considered as **medium benefit on the town centre** but with **medium to low disbenefit to other local roads**.





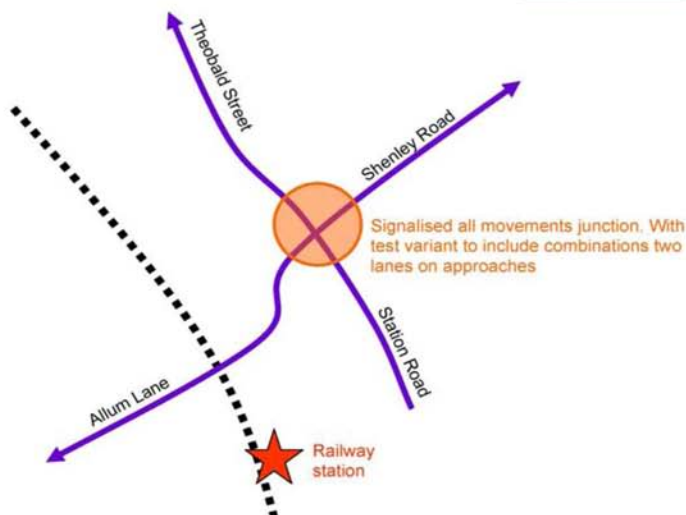
Scenario 2B\_ Signalised plus bus lane in/ out of Tesco (2 lane approach on Shenley Rd west)  
with Banned left turn from Shenley Rd into Brook Rd

				Impact		
	Location	Flows	Changes	Positive	Negative	Comment
<u>Impact on Town centre</u>						
Flows	Shenley Road West Elstree Way	1484	-321	Medium		Moderate improvement to operation of Shenley Road & its environment
		1745	-519	Medium		Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd junction
Journey Time	Shenley Road EB	161	-8	Low		Slight improvement in journey time.
	Elstree Way EB	118	-53	Medium		Moderate improvement in Journey times.
	Elstree Way WB	247	118		High	Significant increase in journey time due to queuing at Elstree Way/Maxwell Rd Junction-WB
	Shenley Road WB	198	19	Low		Slight improvement in journey time.
Operation of Junctions	Shenley Road/Elstree Way	1969	-1354		Medium	Long queues on Brook Road - Needs more flare on Brook Rd approach.
	Elstree Way/Maxwell Rd	2029	-150		Low	Vehicle queuing on westbound approach approx. 35 vehicles.
	Tesco Access	1710	-293	Medium		Operate better than Base.
	Theobald St/ Shenley Rd	2363	151		Low	Longer delay and queues due to increased in traffic on Theobald Street
Impact on Pedestrian				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. Two lane approach increases crossing time for pedestrians crossing Shenley Road West.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses				High		Buses benefit from improved journey times as a result of bus lane
<u>Impact on Local and Wider Network</u>						
Local Road/Rat Runs	Shenley Road/Elstree Way Other roads	2428	-895		Medium	Nearly 27% traffic are forced to divert away from Shenley Rd junction.
		4947	799		Medium	Some rat running still takes place but less than other scenarios
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane Watling Street
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junctions	2159	-1	None		No Impact
					None	No Impact

**Comment on General Performance**

Scenario 2B\_ A moderate improvement to Shenley Road and Elstree Way with benefits for pedestrian access and bus lanes to/from Tesco. The scheme causes a relatively low to medium number of rat runs and the use of other local road in particular Studio Way, Deacon's Hill and Rowley Lane. Brook Road approach could be improved with a short flare. Longer delays at Theobald Street junction due to increased traffic on Theobald Street. Similarly Elstree Way/Maxwell Road junction suffers delays which could be improved with increased flare on all approaches. In summary the impact of the scheme is considered as **medium benefit on the town centre** but with **medium to low disbenefit to other local roads**.

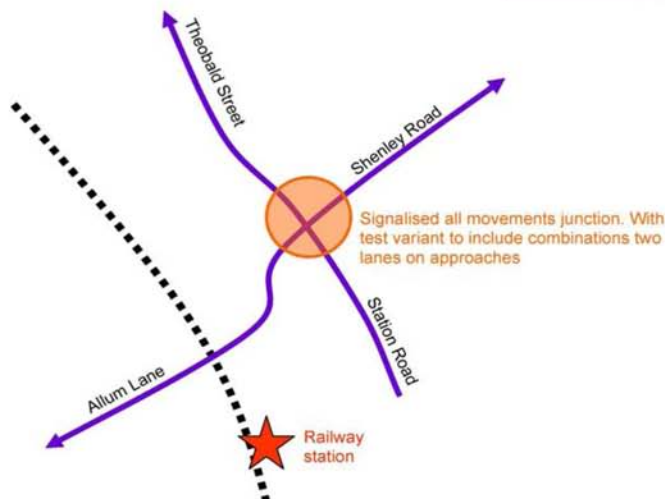
### Scenario 3



**Scenario 3\_ As Scenario 2B plus Station Rd/ Theobald St with one lane approach with banned left turn from Shenley Rd into Brook Rd**

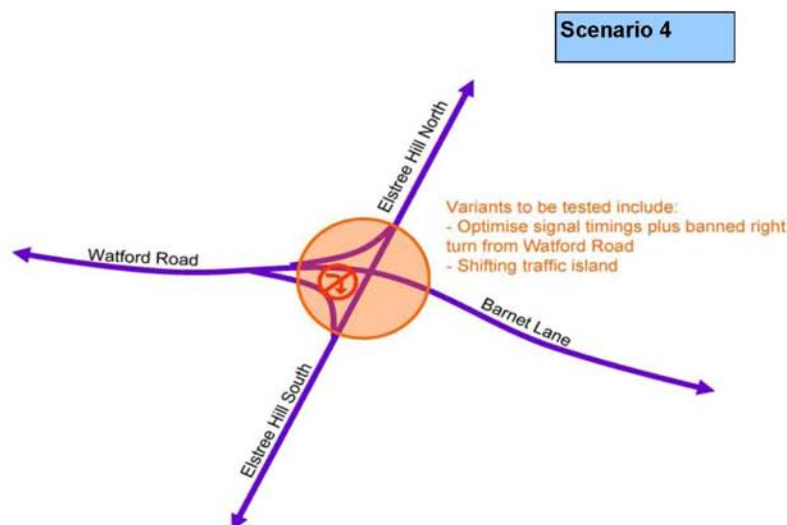
Impact on Town centre	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
Flows	Shenley Road West Elstree Way	1549	-256	Medium		Moderate improvement to operation of Shenley Road & its environment Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd junction
		1670	-594	Medium		
Journey Time	Shenley Road EB Elstree Way EB Elstree Way WB Shenley Road WB			Low		Slight improvement in journey time.
				Medium		Moderate improvement in Journey times.
					High	Significant increase in journey time due to queuing at Elstree Way/Maxwell Rd Junction-WB
				Low		Slight improvement in journey time.
Operation of Junctions	Shenley Road/Elstree Way Elstree Way/Maxwell Rd Tesco Access Theobald St/ Shenley Rd	1982	-1341		Medium	Long queues on Brook Road. - Needs more flare on Brook Rd approach
		1946	-233		Low	Vehicle queuing on westbound approach approx. 35 vehicles.
		1699	-304	Medium		Operate better than Base.
		1614	-598		Low	Longer queue and delay than base, needs flare on approaches
Impact on Pedestrian				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. One lane approach improves crossing time for pedestrians crossing at Theobald Road.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses				High		Buses benefit from improved journey times as a result of bus lane
Impact on Local and Wider Network						
Local Road/Rat Runs	Shenley Road/Elstree Way Other roads	2492	-831		Medium	Nearly 25% traffic are forced to divert away from Shenley Rd junction. Some rat running still takes place but less than other scenarios
		4945	797		Medium	
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane Watling Street
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junctions	2161	1	None		No Impact
					None	No Impact
Comment on General Performance						
Scenario 3_ A moderate improvement to Shenley Road and Elstree Way with benefits of better pedestrian access and bus lanes to/from Tesco. The scheme causes a relatively low to medium number of rat runs and the use of other local roads in particular Studio Way, Deacon's Hill and Rowley Lane. Delays on Brook Road approach can be addressed with a short flare. Longer delays at occur at Theobald Street but could also be improved with a short flare on approaches. Similarly Elstree Way/Maxwell Road junction delays can be addressed with increased flare on all approaches. In summary the impact of the scheme is considered as <i>medium benefit to the town centre</i> but with <i>low disbenefit to other local roads</i> .						

Scenario 3A



Scenario 3A\_ As Scenario 2B plus Station Rd/ Theobald St with 2 lane approach (dedicated right flare)  
with banned left turn from Shenley Rd into Brook Rd

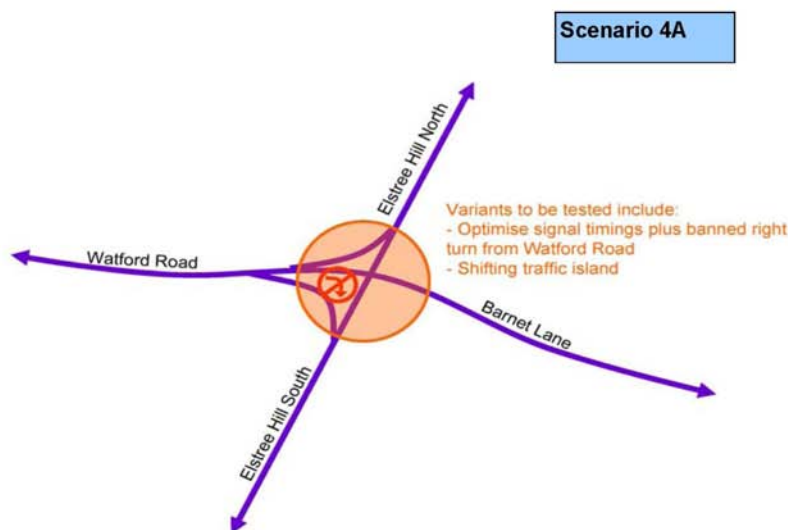
	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
<b>Impact on Town centre</b>						
Flows	Shenley Road West	1504	-301	Medium		Moderate improvement to operation of Shenley Road & its environment
	Elstree Way	1698	-566	Medium		Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd junction
Journey Time	Shenley Road EB	179	10		Low	Slight increase in journey time.
	Elstree Way EB	121	-50	Medium		Moderate improvement in Journey times.
	Elstree Way WB	202	73		High	Significant increase in journey time due to queuing at Elstree Way/Maxwell Rd Junction-WB
	Shenley Road WB	178	-1	Low		Slight improvement in journey time.
Operation of Junctions	Shenley Road/Elstree Way	1962	-1361		Medium	Long queues on Brook Road- Needs more flare on Brook Rd approach.
	Elstree Way/Maxwell Rd	1955	-224		Low	Vehicle queuing on westbound approach approx. 35 vehicles.
	Tesco Access	1729	-274	Medium		Operate better than Base.
	Theobald St/ Shenley Rd	2023	-189	Medium		Operate better than Base.
Impact on Pedestrian				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. Two lane approach increases crossing time for pedestrians crossing Shenley Road West and at Theobald Street.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses				High		Buses benefit from improved journey times as a result of bus lane
<b>Impact on Local and Wider Network</b>						
Local Road/Rat Runs	Shenley Road/Elstree Way	2454	-869		Medium	Nearly 26% traffic are forced to divert away from Shenley Rd junction.
	Other roads	4841	693		Medium	Some rat running still takes place but less than other scenarios
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane Watling Street
Operation of Junctions	Elstree Hill N/ Elstree Hill S	2170	10	None		No Impact
	Other Junctions				None	No Impact
<b>Comment on General Performance</b>						
Scenario 3A_ A moderate improvement to Shenley Road and Elstree Way with benefits of better pedestrian access and bus lanes to/from Tesco. The scheme causes a relatively low to medium number of rat runs and the use of other local roads in particular Studio Way, Deacon's Hill and Rowley Lane. Delays on Brook Road approach could be addressed with a short flare. Similarly delays at Elstree Way/Maxwell Road junction could be addressed with increased flare on all approaches. In summary the impact of the scheme is considered as <b>medium benefit on the town centre</b> but with <b>low disbenefit to other local roads</b> .						



**Scenario 4\_ As Scenario 3A with optimised signal timing and banned right turn from Watford Rd plus banned left turn from Shenley Rd into Brook Rd**

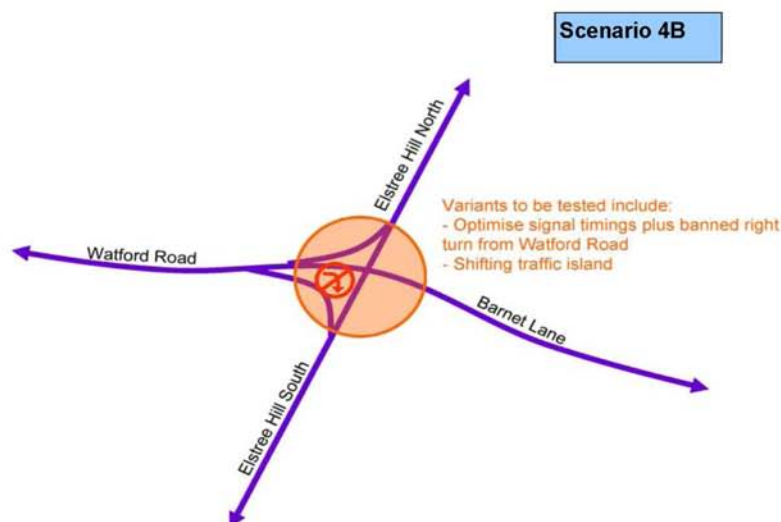
	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
<b>Impact on Town centre</b>						
Flows	Shenley Road West Elstree Way	1495 1674	-310 -590	Medium Medium		Moderate improvement to operation of Shenley Road & its environment Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd junction.
Journey Time	Shenley Road EB Elstree Way EB Elstree Way WB Shenley Road WB			Medium	Low High Low	Slight increase in journey time. Moderate improvement in journey times. Significant increase in journey time due to queuing at Elstree Way/Maxwell Rd junction-WB Slight increase in journey time.
Operation of Junctions	Shenley Road/Elstree Way Elstree Way/Maxwell Rd Tesco Access Theobald St/ Shenley Rd	1962 1934 1719 2001	-1361 -245 -284 -211		Medium Low Medium Medium	Long queues on Brook Road- Needs more flare on Brook Rd approach. Vehicle queuing on westbound approach approx. 35 vehicles. Operate better than Base. Operate better than Base.
Impact on Pedestrian				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. One lane approach improves crossing time for pedestrians crossing Shenley Road West and at Theobald Street.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses				High		Buses benefit from improved journey times as a result of bus lane.
<b>Impact on Local and Wider Network</b>						
Local Road/Rat Runs	Shenley Road/Elstree Way Other roads	2440 4813	-883 665		Medium Medium	Nearly 26.5% traffic are forced to divert away from Shenley Rd junction. Some rat running still takes place but less than other scenarios
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane Watling Street
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junctions	2209	49	Low	None	Slight improvement to the operation of the junction with small increase in traffic Low impact
<b>Comment on General Performance</b>						
Scenario 4_ A moderate improvement to Shenley Road and Elstree Way with the benefits of better pedestrian access and bus lanes to/from Tesco. The scheme causes a relatively low to medium number of rat runs and the use of other local roads in particular Studio Way, Deacon's Hill and Rowley Lane. Delays on the Brook Road approach can be addressed with a short flare. Similarly delays at Elstree Way/Maxwell Road junction can be addressed with increased flare on all approaches. There are slight improvements to operation of Elstree Hill N/ Elstree Hill S junction. In summary the impact of the scheme is considered as <i>medium benefit to the town centre</i> but with <i>low disbenefit to other local roads</i> .						





**Scenario 4A \_ As Scenario 4 with introduction of Flare to to Right turn from Elstree Hill South into Barnet Lane  
with Banned left turn from Shenley Rd into Brook Rd**

				Impact		
	Location	Flows	Changes	Positive	Negative	Comment
<b>Impact on Town centre</b>						
Flows	Shenley Road West Elstree Way	1485	-320	Medium		Moderate improvement to operation of Shenley Road & its environment. Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd junction.
		1673	-591	Medium		
Journey Time	Shenley Road EB	165	-4		Low	Slight increase in journey time.
	Elstree Way EB	122	-49	Medium		Moderate improvement in journey times.
	Elstree Way WB	225	96		High	Significant increase in journey time due to queuing at Elstree Way/Maxwell Rd junction-WB
	Shenley Road WB	168	-11	Low		Slight improvement in journey time.
Operation of Junctions	Shenley Road/Elstree Way	1956	-1367		Medium	Long queues on Brook Roa.- Needs more flare on Brook Rd approach.
	Elstree Way/Maxwell Rd	1938	-241		Low	Vehicle queuing on westbound approach approx. 35 vehicles.
	Tesco Access	1709	-294	Medium		Operate better than Base.
	Theobald St/ Shenley Rd	1994	-218	Medium		Operate better than Base.
Impact on Pedestrian				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. One lane approach improves crossing time for pedestrians crossing Shenley Road West and at Theobald Street.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses				High		Additional Bus lane on Tesco approaches with improved journey times.
<b>Impact on Local and Wider Network</b>						
Local Road/Rat Runs	Shenley Road/Elstree Way Other Roads	2439	-884		Medium	Nearly 26.6% traffic are forced to divert away from Shenley Rd junction. Some rat running still takes place but less than other scenarios
		4949	801		Medium	
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane Watling Street
Operation of Junctions	Elstree Hill N/ Elstree Hill S	2278	118	Medium		Moderate improvement to the operation of the junction with increased traffic Low impact
	Other Junctions				None	
<b>Comment on General Performance</b>						
Scenario 4A _ A moderate improvement to Shenley Road and Elstree Way with benefits of better pedestrian access and bus lanes to/from Tesco. The scheme causes a relatively low to medium number of rat runs and the use of other local roads in particular Studio Way, Deacon's Hill and Rowley Lane. Delays on the Brook Road approach can be addressed with a short flare. Similarly delays at the Elstree Way/Maxwell Road junction can be addressed with increased flare on all approaches. Moderate improvement occurs to operation of Elstree Hill N/Elstree Hill S junction. In summary the impact of the scheme is considered as <b>medium benefit to the town centre</b> but with <b>low disbenefit to other local roads</b> .						



**Scenario 4B\_ As Scenario 4A but with increased flare at Brook Road and on new link road approach at Maxwell Road junction with banned left turn from Shenley Rd into Brook Rd**

Impact on Town centre	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
Flows	Shenley Road West	1555	-250	Medium		Moderate improvement to operation of Shenley Road & its environment
	Elstree Way	1705	-559	Medium		Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd junction
Journey Time	Shenley Road EB	169	0	Low		Slight improvement in journey time.
	Elstree Way EB	120	-51	Medium		Moderate improvement in journey times.
	Elstree Way WB	179	50		Low	Slight increase in journey time but no major queuing.
	Shenley Road WB	159	-20	Low		Slight improvement in journey time.
Operation of Junctions	Shenley Road/Elstree Way	2060	-1263		Low	Short queue on Brook Road.
	Elstree Way/Maxwell Rd	1987	-192		Low	Vehicle queuing on westbound approach approx. 35 vehicles.
	Tesco Access	1776	-227	Medium		Operate better than Base.
	Theobald St/ Shenley Rd	1986	-226	Medium		Operate better than Base.
Impact on Pedestrian				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. One lane approach improves crossing time for pedestrians crossing Shenley Road West and at Theobald Street.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses						No impact on buses.
<b>Impact on Local and Wider Network</b>						
Local Road/Rat Runs	Shenley Road/Elstree Way	2530	-793		Medium	Nearly 23.8% traffic are forced to divert away from Shenley Rd junction.
	Other Roads	4724	576		Medium	Some rat running still takes place but less than other scenarios.
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane Watling Street.
Operation of Junctions	Elstree Hill N/ Elstree Hill S	2278	118	Medium		Moderate improvement to the operation of the junction with increased traffic
	Other Junctions				None	Low impact
<b>Comment on General Performance</b>						
Scenario 4B_ A moderate improvement to Shenley Road and Elstree Way with the benefits of better pedestrian access and bus lanes to/from Tesco. The scheme causes a relatively low to medium number of rat runs and the use of other local roads in particular on Studio Way, Deacon's Hill and Rowley Lane. Brook Road approach delays improved with a short flare. Moderate improvement occurs to operation of Elstree Hill N/ Elstree Hill S junction. In summary the impact of the scheme is considered as <b>medium benefit on the town centre</b> but with <b>low disbenefit to other local roads</b> .						





**Scenario 5\_ Shenley Road one way between Furzehill Road and Eldon Avenue, one-way eastbound and contra flow for buses**

Impact on Town centre	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
Flows	Shenley Road West Elstree Way	1166 2235	-639 -29	High	None	Moderate improvement to operation of Shenley Road. Low impact on Elstree Way.
Journey Time	Shenley Road EB Elstree Way EB Elstree Way WB Shenley Road WB			Low	Low Low None	Slight increase in journey times. Increase journey time due to increase traffic. Slight improvement in journey times. Improved journey times for bus due to ban traffic.
Operation of Junctions	Shenley Road/Elstree Way Elstree Way/Maxwell Rd Tesco Access Theobald St/ Shenley Rd	2927 2120 1274 2083	-396 -59 -729 -129		Low None None Low	Vehicle queuing on Brook Rd. Operates with no significant queues. Vehicles queuing on Theobald Street.
Impact on Pedestrian						None
Impact on Cyclists						None
Impact on Buses				Low		Improves the journey time for WB direction contra flow.
Impact on Local and Wider Network						
Local Road/Rat Runs	Shenley Road/Elstree Way Other roads	2927 4384	-396 236		Medium	Nearly 12% traffic are forced to divert away from Shenley Rd junction. Rat run will take place and significant diversion.
Wider Reassignment					Medium	An increase in traffic flow on the north and south of Elstree Way corridor more wider Medium impact on strategic roads.
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junction	2160	0		None None	Low impact Low impact
Comment on General Performance						
Scenario 5_ A reduction in traffic along Shenley Road occurs with no improvements to pedestrian and cyclists, and some improvements to buses travelling WB. The schemes causes a significant number of rat runs and the use of local roads in particular Studio Way, Manor Way, Hillside Avenue, Bullhead Road, Theobald Street, Furzehill Road, Stratfield Road and Gateshead Road. In summary the impact of the scheme is considered as significant diversion and no noticeable benefit on the town centre but with medium disbenefit to other local roads. A relatively high queuing of vehicles occurs in the network compared to other scenarios.						



Scenario 5A\_ Shenley Road one way between Furzehill Road and Eldon Avenue, one-way westbound and contra flow for buses

	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
<b>Impact on Town centre</b>						
Flows	Shenley Road West Elstree Way	1314 2165	-491 -99	Medium	Low	Moderate improvement to operation of Shenley Road. Low impact on Elstree Way.
Journey Time	Shenley Road EB Elstree Way EB Elstree Way WB Shenley Road WB			Low	None Low Low	improved journey times for bus due to ban traffic Slight improvement in journey times. Increase journey time due to increase traffic. Increase journey time due to increase traffic.
Operation of Junctions	Shenley Road/Elstree Way Elstree Way/Maxwell Rd Tesco Access Theobald St/ Shenley Rd	2924 2062 1400 2177	-399 -117 -603 -35		Medium None	Vehicle queuing on Brook Rd. Vehicle queuing on westbound approach. Operates with no significant queues. Operates with no significant queues.
Impact on Pedestrian						None
Impact on Cyclists						None
Impact on Buses				Low		Improves the journey time for EB direction contra flow.
<b>Impact on Local and Wider Network</b>						
Local Road/Rat Runs	Shenley Road/Elstree Way Other roads	2924 4391	-399 243		Medium	Nearly 12% traffic are forced to divert away from Shenley Rd junction. Rat run will take place and significant diversion
Wider Reassignment					Medium	An increase in traffic flow on the north and south of Elstree Way corridor more wider
Operation of Junctions	Elstree Hill N/ Elstree Hill S Other Junction	2111	-49		Low None	Medium impact on strategic roads.

**Comment on General Performance**

**Scenario 5A\_** A reduction in traffic along Shenley Road occurs with no improvements to pedestrian and cyclists, and some improvements to buses travelling EB. The scheme causes a relatively medium number of rat runs and the use of use of other local's road in particular Studio Way, Theobald Street, Furzehill Road SB, and Hillside Avenue. It puts more traffic on A1 north. In summary the impact of the scheme is considered *as no noticeable benefit to the town centre* but with *medium disbenefit to other local roads*. A relatively high queuing of vehicles occurs in the network compared to other scenarios.

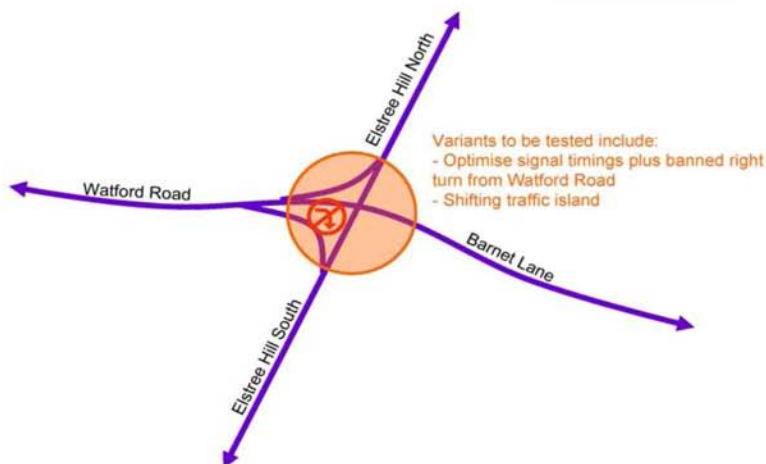
## Appendix B – PM Peak : Option 2B and Option 4B



Scenario 2B\_ Signalised plus bus lane in/ out of Tesco (2 lane approach on Shenley Rd west)  
with Banned left turn from Shenley Rd into Brook Rd

				Impact		Comment
	Location	Flows	Changes	Positive	Negative	
<b>Impact on Town centre</b>						
Flows	Shenley Road West	1770	-299	Medium		Moderate improvement to operation of Shenley Road & its environment
	Elstree Way	1767	-487	Medium		Reduction in traffic but slow moving traffic due to Elstree Way/Maxwell Rd Junction
Journey Time	Shenley Road EB	171	-10	Low		Slight improvement in journey time.
	Elstree Way EB	135	-9	Low		Slight improvement in journey time.
	Elstree Way WB	132	-3	Low		Slight improvement in journey time.
	Shenley Road WB	245	19		Low	Slight increase in journey time.
Operation of Junctions	Shenley Road/Elstree Way	2195	-1092		Low	Less queues on Brook Road due to introduction of Flare on Brook Rd approach
	Elstree Way/Maxwell Rd	1912	-364		Low	Vehicle queuing on Eastbound approach approx 15
	Tesco Access	2032	-427	Medium		Operates better than base.
	Theobald St/ Shenley Rd	2253	13			Slight queues on Theobald Street.
Impact on Pedestrian				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. Two lane approach increases crossing time for pedestrians crossing Shenley Road West.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses						No impact on bus movement.
<b>Impact on Local and Wider Network</b>						
Local Road/Rat Runs		2455	-832		Medium	Nearly 25% traffic are forced to divert away from Shenley Rd junction.
		5044	593		Medium	Some rat running still takes place but less than other scenarios
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane Watling Street
Operation of Junctions	Elstree Hill N/Elstree Hill S	2565	-34	None		No Impact
	Other Junctions				None	No Impact
<b>Comment on General Performance</b>						
Scenario 2B_ A moderate improvement to Shenley Road and Elstree Way with the benefit of better pedestrian crossing facilities. The schemes causes a relatively low to medium number of rat runs and the use of other local road in particular on Studio way, Deacon's Hill and Rowley lane. Brook Road has been improved. Longer delay at Theobald Street junction due to increased traffic on Theobald Street. Elstree Way/Maxwell Road/new link road junction has improved. In summary the impact of the scheme is considered as <i>medium benefit on the town centre</i> but with <i>medium to low disbenefit to other local roads</i> .						

### Scenario 4B

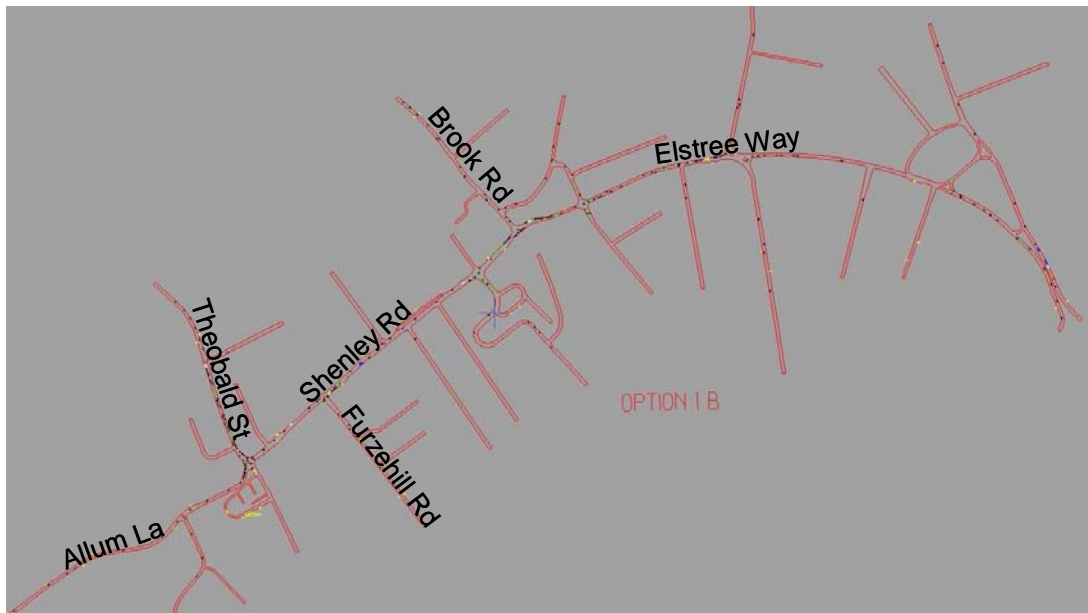


Scenario 4B\_ As Scenario 4A but with increased flare at Brook Road and on new link road approach at Maxwell Road junction with banned left turn from Shenley Rd into Brook Rd

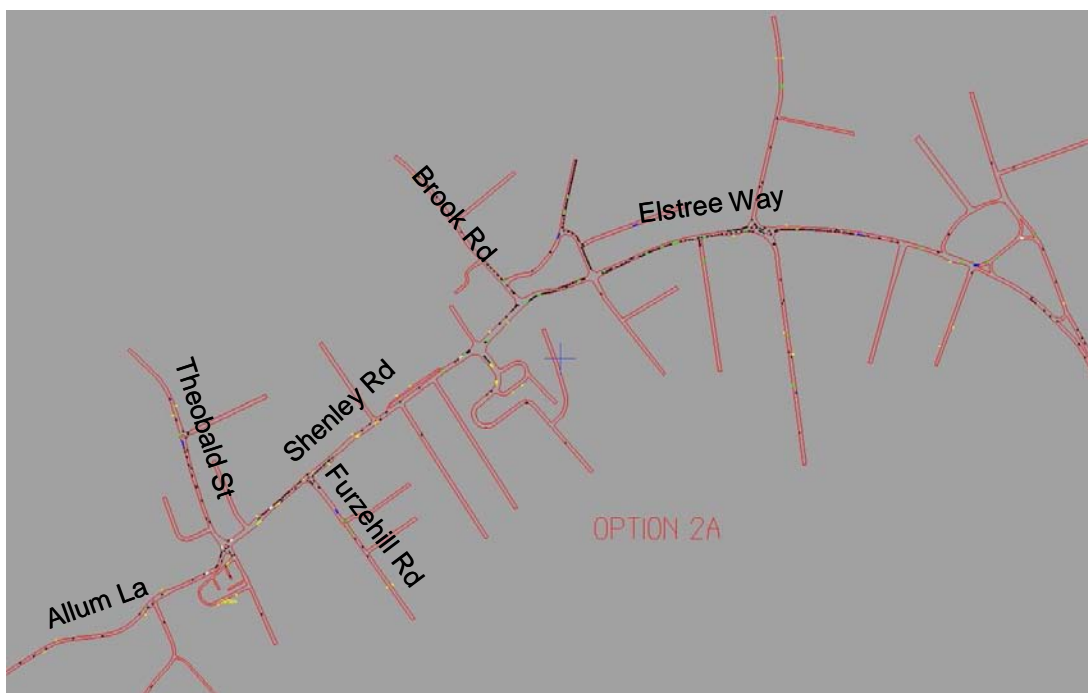
Impact on Town centre	Location	Flows	Changes	Impact		Comment
				Positive	Negative	
Flows	Shenley Road West Elstree Way	1864	-205	Medium		Moderate improvement to operation of Shenley Road & its environment
		1768	-486	Medium		Reduction in traffic but relatively slow moving traffic for short period due to Elstree Way/Maxwell Rd Junction
Journey Time	Shenley Road EB	193	12		Low	Slight increase in journey time.
	Elstree Way EB	128	-16	Low		Slight improvement in journey time.
	Elstree Way WB	129	-6	Low		Slight improvement in journey time.
	Shenley Road WB	225	-1	Low		Slight improvement in journey time.
Operation of Junctions	Shenley Road/Elstree Way	2297	-990	Low		No queues on Brook Road due to introduce Flare on Brook Rd approach
	Elstree Way/Maxwell Rd	1914	-362	Low		Less vehicles queuing on westbound approximately about 10 vehicle for short period
	Tesco Access	2189	-270	Medium		Operates with no significant queues.
	Theobald St/ Shenley Rd	1765	-475	Medium		Operate better than Base
Impact on Pedestrian				Medium		New signalised pedestrian crossings improve ease of movement along and across the corridor. One lane approach improves crossing time for pedestrians crossing Shenley Road West and at Theobald Street.
Impact on Cyclists				Medium		Cyclists will benefit from additional cycle lanes and ASLs.
Impact on Buses						No impact on bus movement.
Impact on Local and Wider Network						
Local Road/Rat Runs		2571	-716		Medium	Nearly 21.7% traffic are forced to divert away from Shenley Rd junction.
		5182	731		Medium	Some rat running still takes place but less than other scenarios
Wider Reassignment					Low	Slight increase in traffic along Barnet Lane Watling Street
Operation of Junctions	Elstree Hill N/Elstree Hill S Other Junctions	3007	408	Medium		Moderate improvement to the operation of the junction with increased traffic
					None	Low impact
Comment on General Performance						
Scenario 4B - A moderate improvement to Shenley Road and Elstree Way with a benefit of better pedestrian access and cycling facilities. The schemes causes a relatively low to medium number of rat runs and the use of other local road in particular on Studio Way, Manor Way and Rowley Lane. Brook Road approach improved significantly. Moderate improvement to operation of Elstree Hill N / Elstree Hill S junction. In summary the impact of the scheme is considered as <b>medium benefit on the town centre</b> but with <b>low disbenefit to other local roads</b> .						



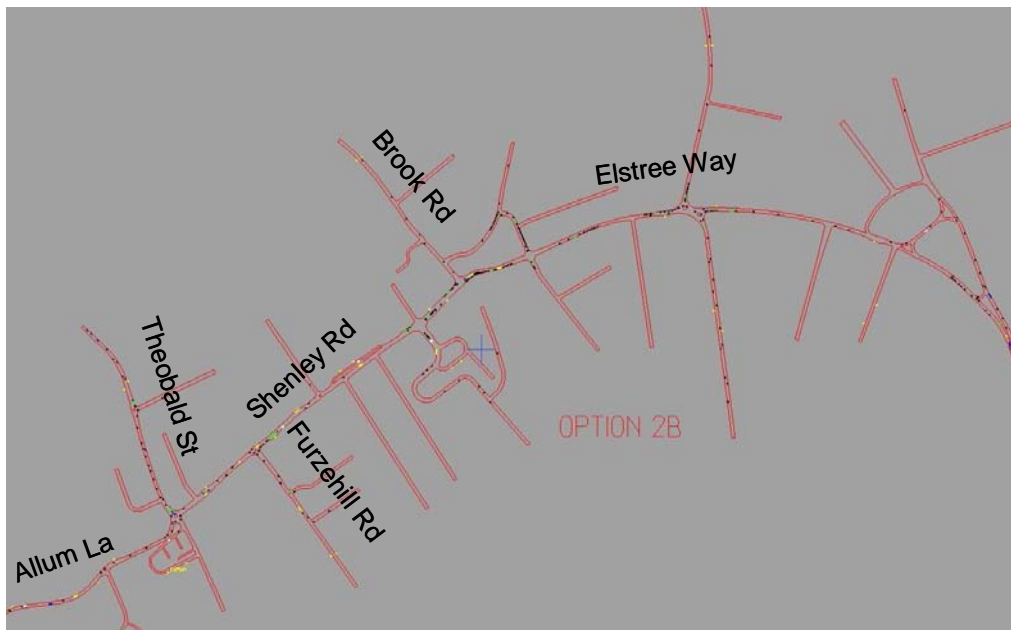
## Appendix C: Paramics Network Snapshots



Option 1B: Paramics model at approximately 08:30



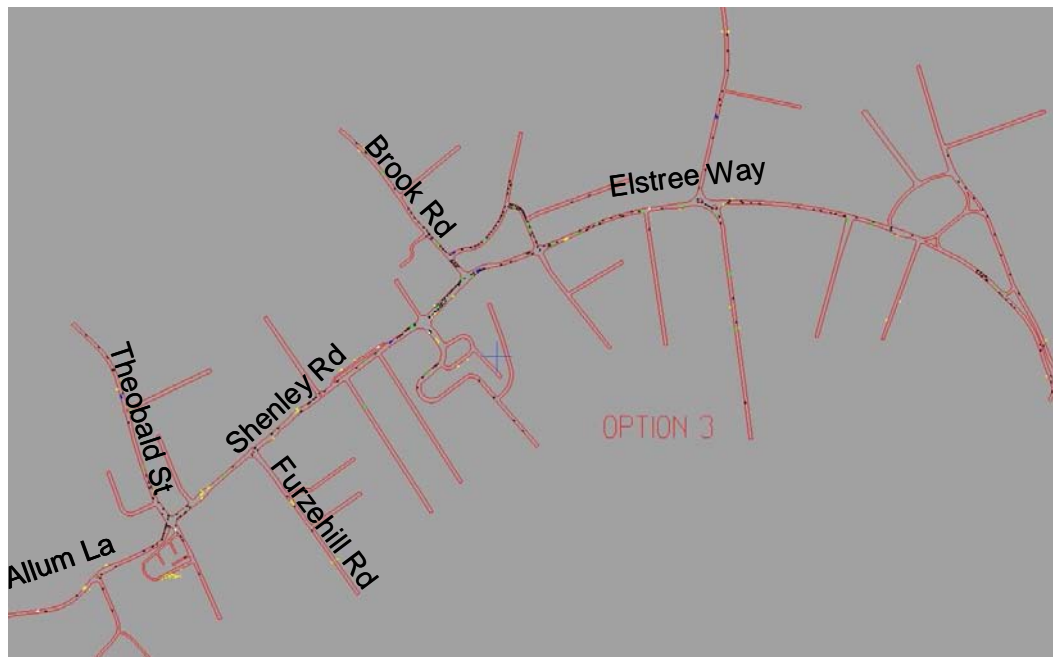
Option 2A: Paramics model at approximately 08:30



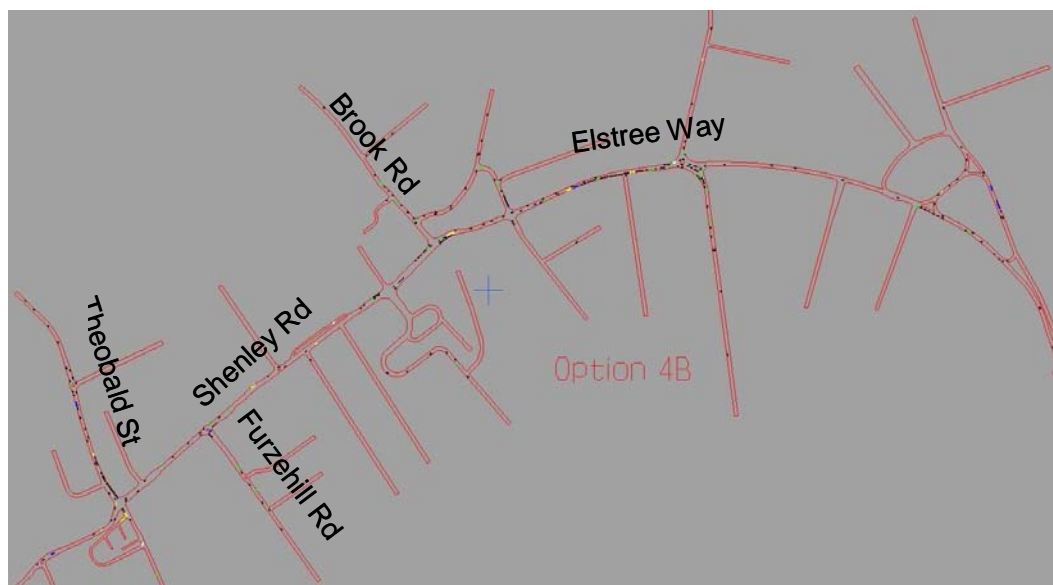
Option 2B: Paramics model at approximately 08:30



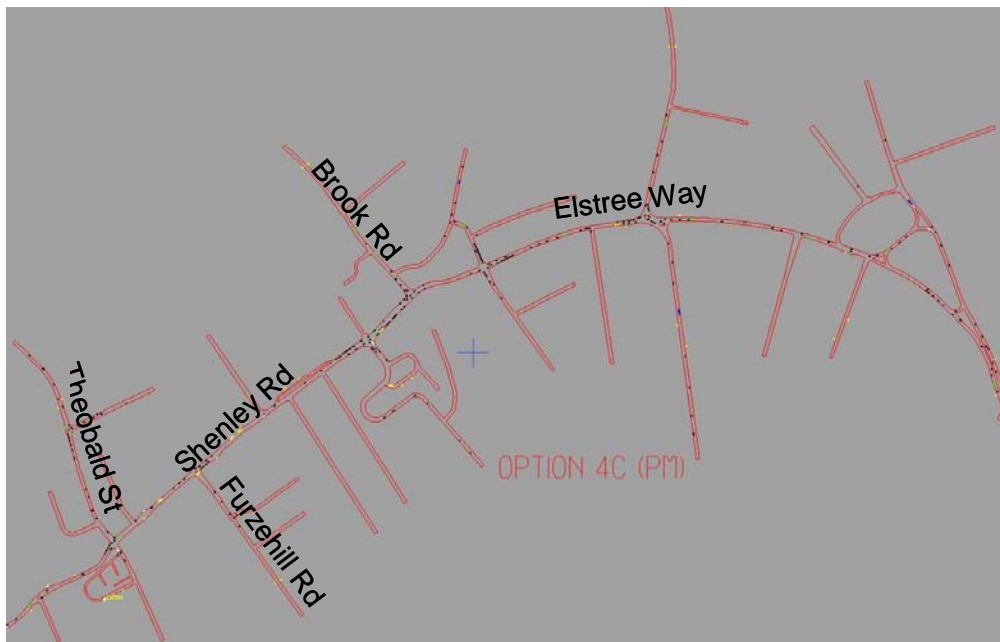
Option 2B: Paramics model at approximately 17:30



**Option 3: Paramics model at approximately 08:30**



**Option 4B: Paramics model at approximately 08:30**



**Option 4B: Paramics model at approximately 17.30**

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MANCHESTER  
SHANGHAI

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Colin Buchanan  
20 Eastbourne Terrace  
London  
W2 6LG  
T 020 7053 1300  
E [london@cbuchanan.co.uk](mailto:london@cbuchanan.co.uk)  
W [colinbuchanan.com](http://colinbuchanan.com)