Technical Note 5 – Preliminary Mitigation Measures Modelling

31st July 2014

Introduction

This technical note has been produced as an interim document to provide Epping Forest District Council (EFDC) and Essex County Council (ECC) with an early view of model outputs. It is envisaged that the contents of this note, will form part of a final report to be produced at the conclusion of the overall LDP study.

Technical Note 5 documents an initial investigation into possible junction infrastructure improvements to help mitigate the impact of Local Plan developments and the growth in background traffic across Epping Forest District up to 2036.

At this stage, infrastructure 'concepts' have been formulated through use of junction modelling packages (Junctions 8 and LINSIG) to appraise the *extent* of capacity upgrades potentially required for junctions to fully (or at least better) accommodate worst-case peak period future traffic flows. Concepts presented in this report are intended to illustrate the scale of possible capacity requirements, and are not intended to be definitive or exhaustive. No in-depth consideration has been given to the practical design, land take and cost implications of the junction concepts, and no junction drawings have been produced for this study.

Without junction drawings, geometric specifics such as entry radii and conflict angles have been estimated. The numbers of lanes per approach arm, lane allocation, entry lane widths, flare lengths and roundabout diameters have then been adjusted through an iterative modelling process to determine junction geometries broadly deemed necessary for a junction to function within or as close to capacity as practically possible.

It is therefore envisaged that this investigation should be the first part of a three stage process. The second stage would consider outline designs of junction proposals with which to more accurately determine design, land and cost constraints. The third stage would then consider designs in more detail, determining accurate junction geometries, statutory undertakers equipment and land ownership considerations.

Whilst it was planned to provide cost estimates for the junction proposals, it was subsequently recognised that large-scale works proposed outside of the existing highway boundaries would be difficult to cost with any degree of accuracy, and could prove misleading, without the provision of technical drawings. For this reason, it was deemed appropriate for outline costs to be considered at a latter point in the mitigation process.

Scheme concepts and capacity appraisal analysis are presented for each junction in turn, based on the sequencing established in the base-year modelling study (Technical Note 1 - Oct

2013). The seven LDP scenarios established in the forecast-year appraisal documented in Technical Note 4 (June 2014) have been taken forward for the mitigation modelling.

Where earlier forecast model outputs at particular junctions were shown to vary little between development scenarios, certain scenarios were subsequently dropped from the mitigation modelling. This prevented repetition in the presentation of data, and provided time to appraise additional scheme concepts along with those initially envisaged. Similarly, junctions that were shown to function well within capacity in earlier forecast modelling work, were modelled using a single, appropriate growth scenario in 2036 to confirm that they remained within capacity.

For the development of mitigation measures at roundabouts, the Junctions 8 'Entry Lane Analysis' tool was used as a more robust measure of capacity requirements. This tool simulates lane usage more accurately, and was deemed appropriate for the purpose of testing proposals as opposed to replicating an existing layout. It should, however, be noted that queue length outputs from the Entry Lane Analysis method and those from the standard/basic method are not directly comparable.

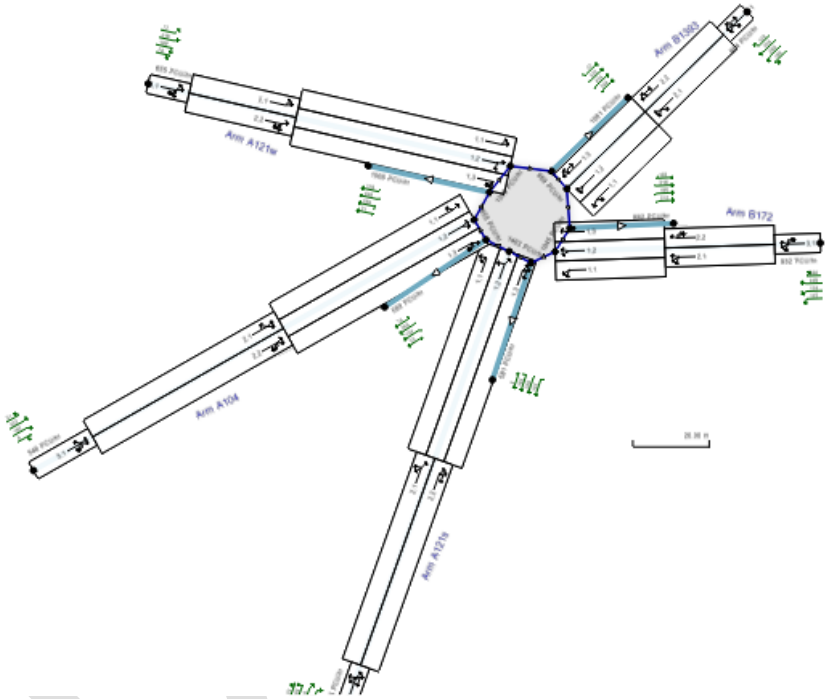
Model outputs can be found in the appendices of the report, whilst junction schematics - as presented in the Junctions 8 and LINSIG models - have been used to illustrate the scheme concepts in the report.

Mitigation Testing

Junction 1 – Wake Arms Roundabout, Epping Forest

Option Test:

- Increased the diameter of the roundabout to 85m and widened the circulatory carriageway to three lanes.
- Increased entry widths along all approach arms to three lanes with 5-10 vehicles storage in each.
- Widened junction approaches up to 120 metres back along the A121 south and A104 arms, 90 metres along the A121 west arm and 60 metres along the remaining arms.
- Assumed two-lane exits on all approach arms.



Evaluation: With significant carriageway widening and enlargement of the roundabout, it may be possible for the junction to accommodate a 54% growth in peak period traffic flow (averaged across all junctions arms) associated with the 2036 'Ambitious Growth A' scenario. Nevertheless, under the junction geometries modelled, a number of approach arms are shown to have reached capacity, suggesting that further roundabout enlargement and/or additional mitigation intervention may be required for the junction to fully accommodate peak period traffic flows further into the future.

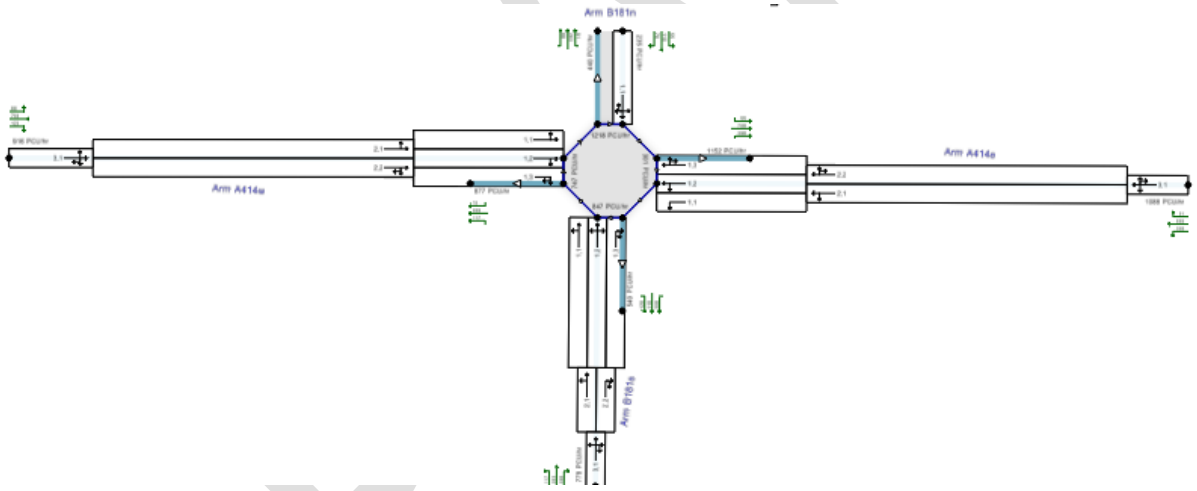
With the additional traffic associated with 'Ambitious Growth C' in 2036, both the A104 and A121 approach arms are shown with significant queuing in the PM peak.

The proposals for capacity enhancement would likely require a large quantity of land-take within Epping Forest. Potential issues surrounding access to the restaurant, petrol station and timber yard in the vicinity of the junction would need to be overcome at a design stage, or risk compromising the extent of carriageway widening that could be realised.

Junction 2 – Talbot Roundabout, North Weald

Option Test:

- Widened the two A414 approach arms to three lanes at the entry to the roundabout, with two lanes assigned for straight-ahead movements. Although not modelled as such, a left-turn lane from the A414 eastern approach into the B181 High Road could be designed as a filter lane.
- A three lane entry was also modelled on the B181 High Road approach arm.
- Junction approaches were widened up to 130 metres back along both A414 arms and 60 metres back along the B181 High Road.
- Assumed a three-lane circulatory carriageway and two-lane exits on all approach arms which will likely necessitate an enlargement of the roundabout, although this was not specifically modelled.



Evaluation: Provision of an additional entry lane on both the A414 approaches would help to accommodate the predicted 60-70% growth in traffic flow on the A414 under ambitious growth scenarios with high levels of development in Ongar. With the increased volume of east-west traffic channelled through the junction and the growth in traffic brought about by development in North Weald, it is likely that an additional lane on the B181 High Road would also be required in order for the junction to operate within capacity.

Land-take would likely be required to take forward the mitigation measures proposed. The nearby Talbot pub/restaurant and residential properties along the approach arms are likely to present challenges to the implementation of the road widening proposals.

Junction 3 – Crooked Mile Roundabout, Waltham Abbey

No mitigation measures are proposed at this junction. A test of the capacity of the junction under the 2036 'Ambitious Growth B' scenario revealed there to be sufficient capacity remaining on all approach arms in the future.

Junction 4 – Highbridge Street Roundabout, Waltham Abbey

The existing junction layout leaves the B194 Highbridge Street approach arm exceeding capacity in the PM peak under most 2026 development scenarios. However, it is noted that the full capacity of the roundabout is currently constrained by the use of road hatching which narrows the entry width of the junction approach. By removing the road markings and utilising the full width of carriageway, modelling suggests that the junction would likely operate within capacity in 2036 under an ambitious development scenario, on the assumption that a two-lane approach along the B194 Highbridge Street arm could be accommodated.

However, any such removal would be subject to a review by highways designers in the event that the road markings are currently in place as a road safety measure.

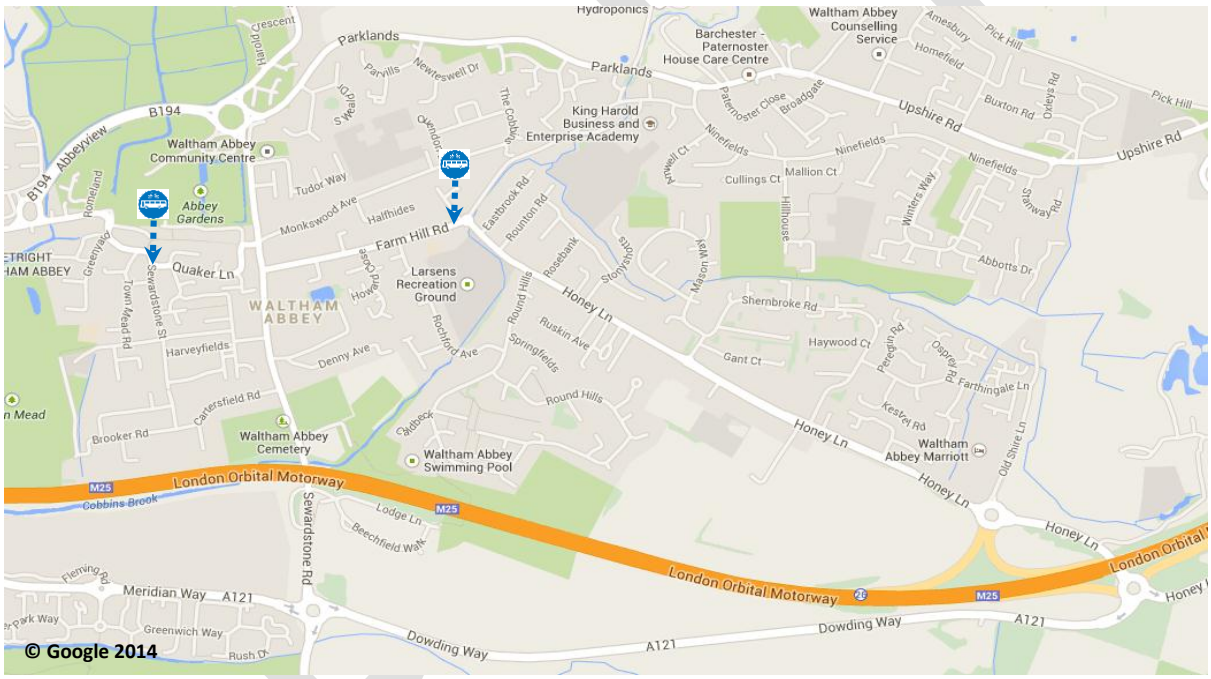
Junction 5 – Sewardstone Road Roundabout, Waltham Abbey

No mitigation measures are proposed at this junction. A test of the capacity of the junction under the 2036 'Ambitious Growth C' scenario revealed there to be sufficient capacity remaining on all approach arms in the future.

Junction 6 – Sewardstone Road / Sun Street Signals, Waltham Abbey

Option Test:

- Modelled the provision of a bus gate at the junction of Leverton Way and Quaker Lane to remove through-traffic along Sun Street, and a bus gate on Farm Hill Road at the roundabout junction of Honey Lane and Broomstick Hall Road.
- Also facilitated a right-turn movement in both lanes from Sun Street to Sewardstone Road at the signalised junction.



Evaluation: The central area of Waltham Abbey along Sun Street and Sewardstone Road is heavily built-up, providing little scope for capacity enhancement through road widening. As a result, mitigation measures for the two signalised junctions looked instead at redistributing traffic away from the centre of Waltham Abbey. The use of bus gates located on Quaker Lane and Farm Hill Road for example, would help to reduce the volume of through-traffic from the town centre and also directly alleviate congestion identified at the junction of Farm Hill Road and Sewardstone Road.

Modelled under the 2036 'Medium Growth B' scenario (which was shown to have the greatest impact on the junctions in the 2026 testing), the proposals would likely leave the Sewardstone

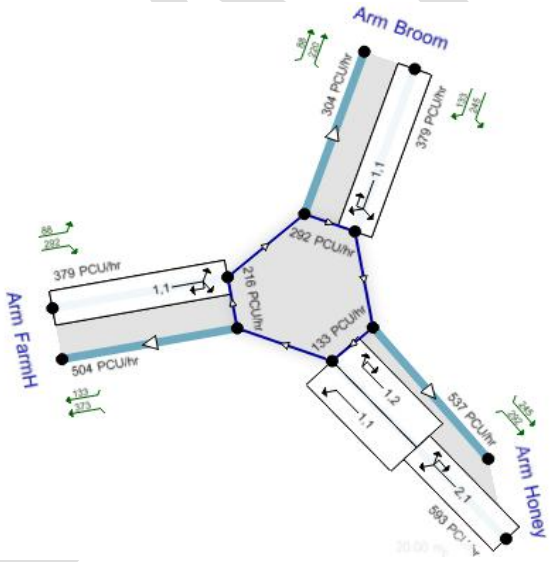
Road signals operating largely within capacity, with only a small amount of congestion left on the Sun Street approach arm. The results are based on an assumption that a third of peak hour trips on Sun Street / Quaker Lane would function as through-trips that could subsequently be diverted away from the route.

Whilst no further capacity upgrades would be required at the junction, the impact of the diverted traffic on the Crooked Mile Roundabout (J3) at the northern end of Sewardstone Road and the Sewardstone Road Roundabout (J5) at the southern end, would likely need to be reviewed. Furthermore, the priority junction of Broomstick Hall Rd with Ninefields and the mini roundabout at the junction of Ninefields and Paternoster Hill would also be impacted by diverted traffic and would likely require separate capacity appraisals.

Junction 7 – Honey Lane Mini-Roundabout, Waltham Abbey

Option Test:

- Widened the Honey Lane approach arm to two-lanes at the entry stop line, extending the two-lane approach 10 metres back along Honey Lane.

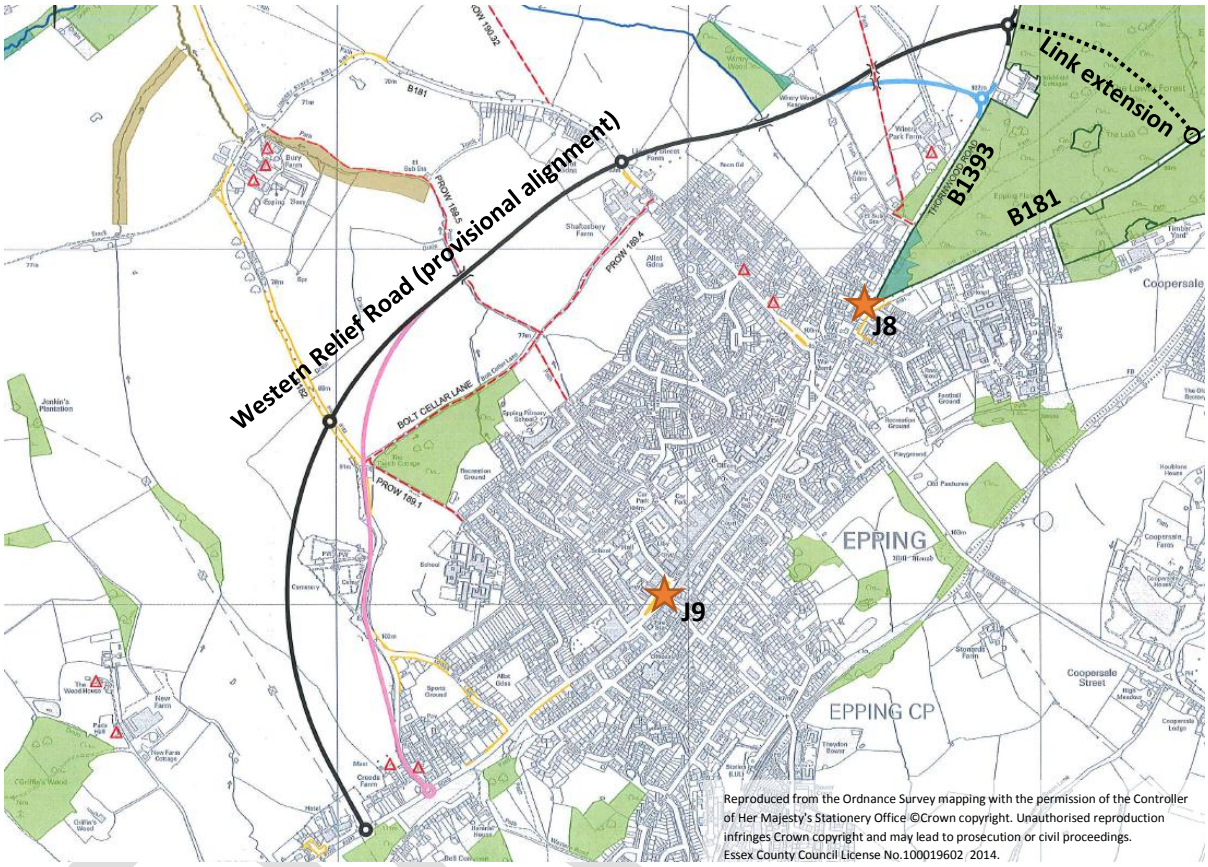


Evaluation: Widening of the Honey Lane approach would appear sufficient to accommodate traffic associated with all 2036 LDP development scenarios modelled. However, implementation of the concept would be subject to a number of considerations including possible bridge widening on the Honey Lane approach and the possible relocation of a nearby war memorial.

It should be noted that the implementation of a bus gate on Farm Hill Road, would remove turning conflicts at the Honey Lane junction and subsequently negate the need to improve its capacity.

Junction 8 – Thornwood Road Signals, Epping

From discussions with EFDC, it is understood that an extension to existing proposals for a western relief road in Epping – providing a cut-through between the B181 and B1393 (illustrated below) - should be given due consideration despite the land-take required through Epping Forest.



With the relief road and extension in place, there is *potential* for the signalised junction along Thornwood Road to operate largely within capacity in 2036 with no alterations to the junction (other than signal optimisation) required. Although the junction is modelled to exceed capacity under the 'Ambitious Growth A' scenario, PM peak period congestion at the junction is shown to be less than that modelled with 2013 traffic flows.

Given the lack of space around the junction in which to expand, removal of peak hour traffic from the junction (via a scheme such as a relief road) would appear to be the best means of mitigating the forecast growth in congestion at the junction.

It should, however, be noted that broad assumptions were made in modelling trip assignment to the relief road, in the absence of origin/destination data.

Using turning count data available at junctions along the B1393, the maximum volume of in-scope background traffic to divert to the relief road was estimated by determining the point at which reassignment left turning movements at junctions along the existing B1393 route

with negative values in the Epping spreadsheet model. Development trips associated with were reassigned to the relief road where the link offered a reasonable alternative to the congested town centre route without significant diversion. The diverted flows were then split between the B1393 and B181 based on existing turning movement proportions at the Thornwood Road signalised junction.

Junction 9 – Station Road / St. John's Road Double-Mini Roundabout, Epping

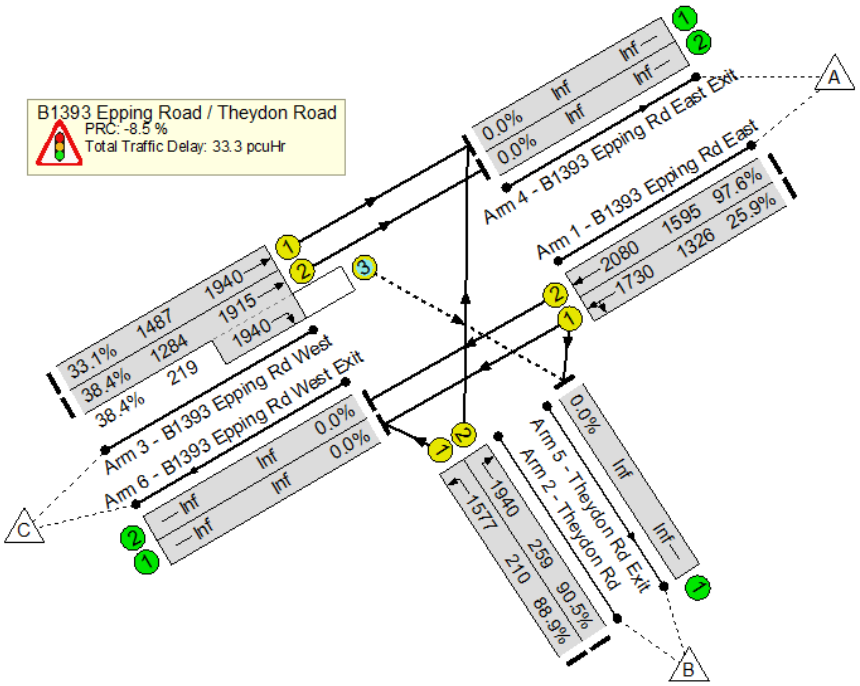
With a relief road in place, effectively bypassing the junction, modelling suggests that there is potential for the double-mini roundabout to accommodate 2036 traffic volumes - without the junction exceeding capacity and without the need for local infrastructure improvements. Model tests using ambitious growth scenarios indicate that all approach arms would operate within capacity.

These model results are however, caveated with an acknowledgement of the methodology and assumptions used in determining usage of the relief road.

Junction 10 – Theydon Road Signals, Epping

Option Test:

- Widened the B1393 eastbound approach arm to three lanes to accommodate two lanes for straight-ahead movements and a dedicated right-turn lane (approximately five vehicles in length) for access to Theydon Road.
- Widened the B1393 westbound approach arm to two lanes to accommodate straight-ahead movements in both.
- Widened the Theydon Road approach to two lanes for dedicated left and right-turn movements.
- Two-lane exits were modelled for both B1393 arms, whilst the length of road widening required along each approach arm was unspecified in the model, but presumed to be in excess of 60 metres.



Evaluation: The capacity enhancements detailed above allow the Theydon Road signalised junction to operate within capacity under the 'Ambitious Growth C' scenario with a high quota of development in and around Epping. Modelling of the other scenarios suggests that with lower volumes of traffic through the junction, the extent of road widening required along the B1393 approaches could be reduced, although the provision of additional lanes would still likely be required.

It is possible that for the junction concept to be realised, the B1393 carriageway could require realignment to make use of land to the south of the junction, given the lack of land available on the northern side.

Junction 11 – Bury Lane Mini-Roundabout, Epping

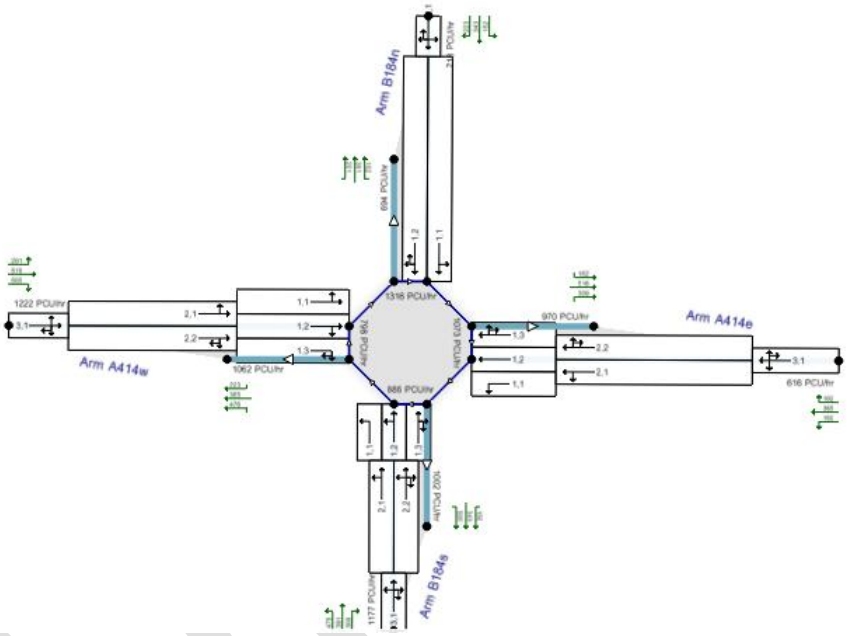
This junction was not considered as part of the mitigation study. Should the Epping Western Relief Road feed into the roundabout as a means of connecting to the B1393, the junction would necessarily require redesigning as part of the overall relief road scheme. Should the relief road connect into the B1393 further to the south, the Bury Lane mini-roundabout would then be bypassed, leaving a significantly reduced flow of traffic passing through. It is also possible that the relief road could connect to the B182 at a point north-west of the junction with the B1393. If this was to occur, the southern section of Bury Lane would effectively become a local access link.

As seen with the Station Road/ St. John's Road double-mini roundabout, under these circumstances, a reduction in flow along the B1393 would likely leave the junction operating within capacity in 2036.

Junction 12 – Four Wantz Roundabout, Ongar

Option Test:

- Widened both A414 approaches to three lanes, with two lanes to accommodate straight-ahead movements.
- Overall carriageway widening extended back approximately 50 metres along both A414 arms.
- Modelled a three lane entry at the roundabout from the B184 southern approach arm and a two lane entry from the B184 northern approach.
- Road widening on these approaches extended back 30 metres and 50 metres respectively.
- Also modelled two-lane exits on all approach arms.



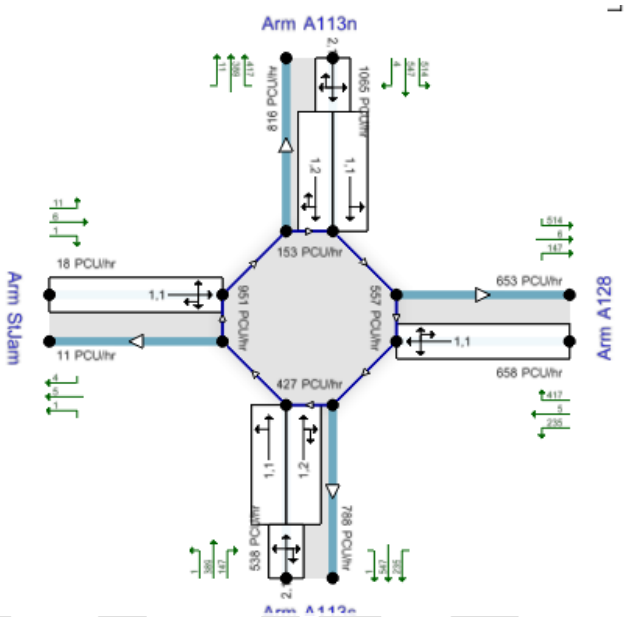
Evaluation: The extent of the carriageway widening described above, takes into consideration the land constraints present at the junction. These include the location of a petrol station, businesses and housing close to the roundabout itself. The concept design also assumes the likely loss or narrowing of footpaths in the vicinity and the relocation of the pedestrian crossing further away from the junction along the A414 western arm.

In light of the capacity constraints, the limited scale of the capacity improvements modelled are shown to leave most junction arms close to, or at capacity in the 2036 assessed scenarios.

Junction 13 – Coopers Hill Roundabout, Ongar

Option Test:

- Modelled the existing mini-roundabout junction as a standard roundabout with a 20 metre diameter.
- Widened both A113 approach arms to two lanes, extending back 20 metres.
- Assumed two-lane exits to both A113 approach arms.



Evaluation: Located in a built-up residential area, there is little land available around the junction within which to expand the junction. Consequently, the proposed length of the approach arm widening, and the size of the proposed roundabout itself, would appear to be sufficient only to keep the junction operating within capacity in 2036 with the low growth scenarios modelled.

Modelling suggests that further road widening along the A113 northern approach arm would likely be required for the junction to fully accommodate peak hour traffic flows associated with the Medium and Ambitious Growth scenarios. This however, would likely require land-take from private residences fronting onto the northern approach arm.

Junction 19 – Piercing Hill / Coppice Road Priority Junction, Theydon Bois

Option Test:

- Widened Piercing Hill and The Green approaches to accommodate two lanes.
- In the event that land constraints might prove prohibitive, there is a possibility to consider a one-way system along The Green approach arm and the link through Theydon Green (although this has not been modelled).

Evaluation: Widening of the Piercing Hill approach was shown in the modelling to accommodate traffic flows in all assessed 2026 development scenarios. However the arm was subsequently shown to exceed capacity in all 2036 scenario tests.

Should the widening proposals be considered as a short-term measure, it is likely that implementation would require a small amount of land-take, removal of surrounding trees and shrubs to improve visibility, and a possible realignment of the minor approach arms.

Alternative Test:

- Converted the priority junction into a small roundabout with a 12 metre long two-lane approach on the B172 to accommodate westbound traffic flows.

Evaluation: The roundabout option was modelled using the same LDP scenarios to appraise its performance alongside that of the road-widening scheme, and was shown to accommodate 2036 traffic flows across all scenarios.

The roundabout scheme would likely prove more costly to implement, and require more land-take than a widened priority junction. The optimum size of the roundabout would need to be determined following more detailed design work, although a small junction of between 15-20 metres diameter was sufficient in the modelling.

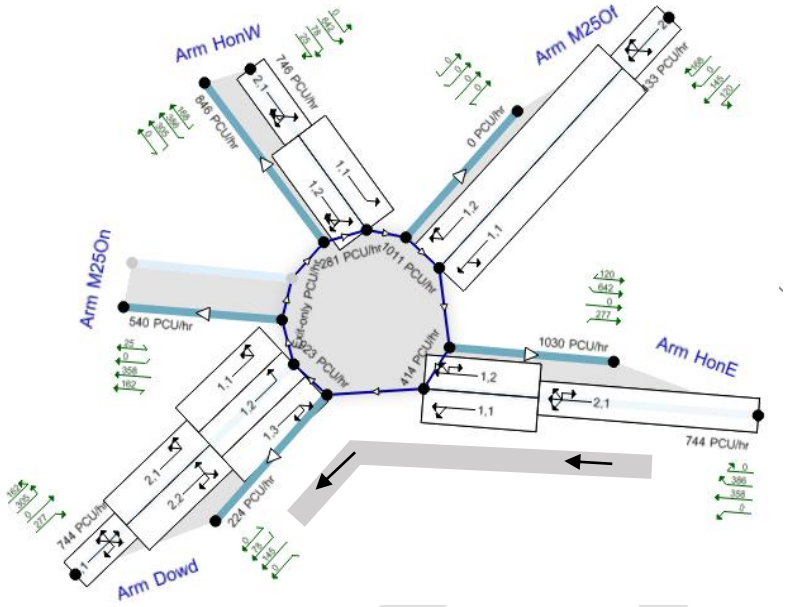
Junction 21 – M25 Junction 26 Northern Roundabout, Waltham Abbey

No mitigation measures are proposed at this junction. A test of the capacity of the junction under the 2036 'Medium Growth B' scenario (which was shown to have the greatest impact on the junction in the 2026 testing), revealed there to be sufficient capacity remaining on all approach arms in the future.

Junction 22 – M25 Junction 26 Southern Roundabout, Waltham Abbey

Option Test:

- Modelled a left-turn slip lane from the A121 Honey Lane to A121 Dowding Way.
- Widened the A121 Dowding Way arm to three lanes at the stop line, with overall carriageway widening extending back 30 metres along the approach.



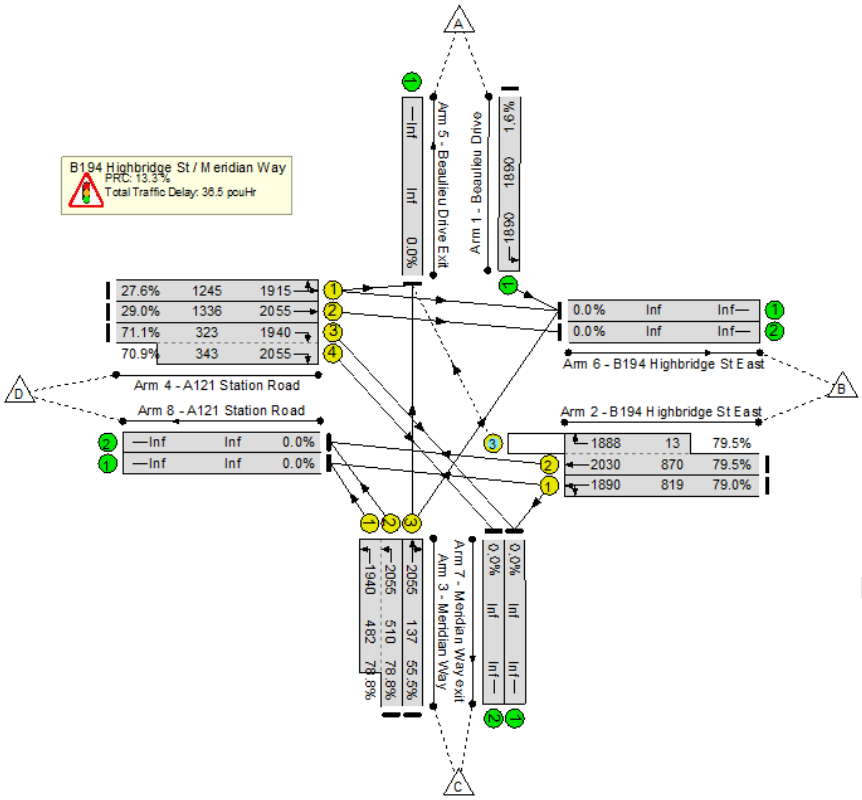
Evaluation: Provision of a filter lane is shown in the modelling to reduce the flow of traffic entering the roundabout from the Honey Lane approach, sufficient to enable the arm to operate within capacity in the 2036 scenarios tested. Channelling more traffic through the junction from the Honey Lane approach, is however, shown to place more constraint on the Dowding Way arm. An additional lane would therefore likely be required to mitigate an increase in congestion on this approach – particularly in the PM peak. Modelling nevertheless shows that with the specific carriageway improvements stated, congestion may still be experienced along Dowding Way in the 'Ambitious Growth C' scenario.

Junction 24 – Meridian Way Signals, Waltham Abbey

Option Test:

- Modelled a three-lane approach along the A121 Meridian Way, with two lanes assigned specifically for left-turn movements and extending back approximately 90 metres along the carriageway.
- Widened the B194 Highbridge Street approach to three lanes, accommodating two lanes for straight-ahead movements and a dedicated right-turn lane.
- A four-lane approach was modelled on the A121 Station Road consisting of two lanes for right-turn movements and two lanes for straight-ahead movements.
- Two-lane exits were assumed on all but the Beaulieu Drive junction arm.
- The length of the three/four lane approach along Station Road matched the length of its existing two lane approach.
- A right-turn lane was modelled along Highbridge Street with stacking capacity for around 9 -10 vehicles.

- Finally, the signal stage for the Beaulieu Drive approach arm was removed and a left-turn only restriction imposed, with access onto the B194 Highbridge Street via a merge after the junction.



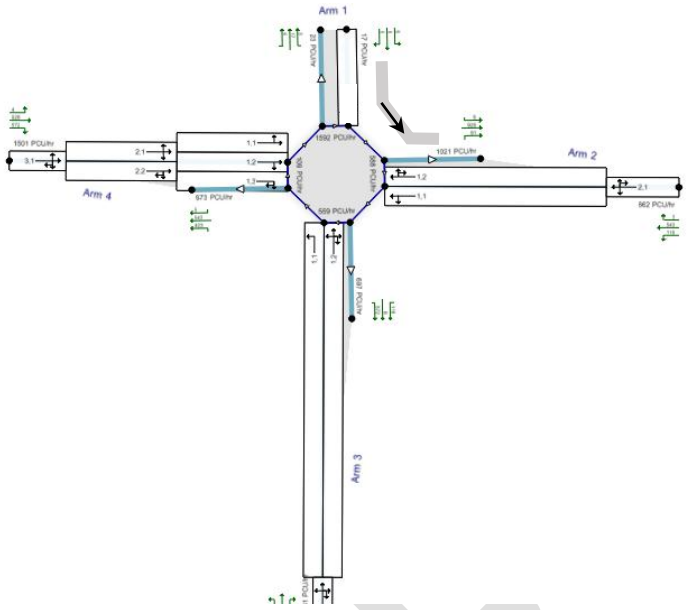
Evaluation: With extensive approach arm widening, access restrictions and possible carriageway realignment, modelling suggests that the signalised junction could operate within capacity under the 2036 scenarios tested.

A comparatively large quantity of land-take would be required to realise this scheme, made more problematic by the close proximity of the McDonalds restaurant and private residences to the junction. Widening of the A121 Station Road could also impact on the existing bridge over the River Lee.

In order to reduce dwell time at the signals for flows on other approach arms (and to subsequently keep the junction operating within capacity), the scheme also restricts access from the housing estate off Beaulieu Drive. Under proposals, local residents leaving the estate would be directed onto the B194 Highbridge Street eastbound, and would be required to route around the Highbridge Street roundabout and back along the A121 for destinations west of Waltham Abbey.

Alternative Test: Converted the signalised junction into a 30 metre diameter roundabout (which may require further enlargement following more detailed design work, in order to accommodate a three-lane section of circulatory carriageway). Widened the A121 westbound approach to three lanes, accommodating five vehicles per lane, and assumed two-lane exits

on all but the Beaulieu Drive access arm. Maintained a left-turn exit-only restriction from Beaulieu Drive with access via a merge with B194 Highbridge Street.



Evaluation: The alternative roundabout scheme concept operates within capacity under the same 2036 LDP scenario tests used for the enlarged signalised arrangement. Although land-take and some carriageway realignment would likely be required to develop the reimagined junction, the extent of road widening required along the junction approaches would appear reduced. This could prove particularly beneficial given potential land constraint on the B194 Highbridge Street and issues around possible bridge engineering on the A121 Station Road.

Access restrictions on the Beaulieu Drive approach arm have been maintained across both options tested. Under a roundabout layout with full access from Beaulieu Drive, modelling suggests that the northern approach arm would exceed capacity – despite a very small approach flow - due to the heavy flow of traffic from the A121 Station Road circulating the roundabout.

Modelling of a left-turn filter merging with the B184 Highbridge Street has been assumed to offer a better means of accessing the wider road network from Beaulieu Drive. However, the feasibility of such access arrangements would require further appraisal at a more detailed design stage. As part of a roundabout redesign, the proposed left-turn filter would benefit only a small quantity of vehicle trips from the nearby housing estate during the peak hours.

Smarter Choices

The promotion and implementation of Smarter Choices initiatives would be expected to have an impact on the number of development trips generated by the LDP. However, for the purposes of this study, any reduction in trip generation brought about through the uptake of alternative modes of travel, has not been represented in the modelling exercise through a given reduction in development trips. Such an approach is open to criticism given the inherent difficulty in establishing an accurate and representative trip reduction factor. There is a recognised spatial variation in the uptake of Smarter Choices, based on the availability of alternative modes of travel, and the quality of infrastructure. The level of Smarter Choices uptake will also vary over time, with an expectation that reductions in private travel achieved from the outset, would be difficult to sustain over a period of time.

With this in mind, the study aims to treat Smarter Choices as a separate, but complementary mitigation measure to work alongside the infrastructure proposals presented in this report.

Potential reductions in trips achievable across the various towns in Epping Forest District are considered below, based on data from case studies in other areas.

The IHT published document; "Making Smarter Travel Choices", states that personal travel planning initiatives reported typical reductions in car use of 7%-15% in urban areas and 2%-6% in rural and smaller urban areas.

Towns in Epping Forest District such as Epping and Waltham Abbey would, along with Harlow, be more likely to achieve reductions in car use of between 7%-15%. These towns are served by both bus and rail networks, providing good, accessible alternatives to private car use. Harlow in particular, has in recent years invested in upgrading bus corridors and cycle networks. To provide a more specific example, personal travel planning undertaken in 2011 in the Great Parndon, Kingsmoor, Stewards and Sumners Farm areas of Harlow recorded a 5.5% reduction in journeys made by car amongst the residents surveyed[1].

Towns such as North Weald and Ongar are more rural in nature, with limited public transport access, and would be more likely to achieve reductions in car use of between 2%-6%.

Given the reduction in car trips achieved in Harlow as a result of personal travel planning, it might be reasonable to expect similar Smarter Choices initiatives in West Essex to achieve car reduction levels closer to the lower estimates stated in the "Making Smarter Travel Choices document.

Under current LDP proposals, The Four Wantz Roundabout (J12) is an example of a junction modelled to be directly impacted by traffic from nearby proposed developments in Ongar. Assuming that the adoption of Smarter Choices travel alternatives could lead to a 2%

[1] "Harlow Personal Travel Planning 3", Mouchel, Dec 2011)

reduction in rural-based development trips, this would equate to a 0.6% reduction in overall traffic flow passing through the junction in 2036 under an ambitious LDP growth scenario. At the Wake Arms Roundabout (J1) a 5% overall reduction in development trips is calculated (using the Epping Spreadsheet Model) to equate to a 1% reduction in total traffic flow through the junction in 2036.

Relocation of LDP developments

The results of the forecast year appraisal and subsequent mitigation testing provide insight into the levels of congestion that could be experienced across the Epping Forest road network under the various LDP scenarios tested. They also provide indicators as to the scale of infrastructure potentially required to mitigate the impact of background growth and development traffic to 2036.

By identifying areas of the road network with spare capacity, and/or areas where junction mitigation may be better implemented (based on presumed cost and land-take), there may be scope to relocate or adjust the scale of LDP housing and employment sites so as to help mitigate the impact of development traffic.

Observations from the modelling are bulleted below:

- Land constraint at the Four Wantz Roundabout (J12) on the A414 and the mini-roundabout on Coopers Hill (J13) would appear to restrict the extent of capacity improvements possible at both junctions to accommodate development traffic in Ongar.
- A relocation of development from sites in Ongar to sites west of the Talbot Roundabout would likely reduce the flow of development traffic along the A414 through the junction, and thus reduce the extent of carriageway widening required along its approach arms.
- In the absence of long-term scheme alternatives aimed at reducing congestion along the B1393 in Epping, a western relief road scheme could arguably be deemed an important consideration to help mitigate the impact of background traffic growth alone. Should such a scheme be built, the revised road network would be better positioned to accommodate the levels of LDP development currently proposed in Epping (and likely required to fund development of the relief road).
- However, focussing development in Epping would be expected to place additional pressure on the capacity of the Wake Arms roundabout (J1), which would likely require extensive capacity upgrades and land-take in a sensitive area to accommodate 2036 traffic flows associated with the current LDP scenario tests.

- Waltham Abbey would appear best placed to accommodate relocated LDP sites to the south, east and (to a lesser extent) the north of the town. Junctions on the periphery are largely modelled to operate within capacity in 2036 under current development proposals, whilst the lack of any obvious land constraint could help reduce the cost of providing any necessary mitigation measures. The proximity of the M25 would also help to distribute traffic away from the local road network, thus reducing the wider impact of development traffic on junctions such as the Wake Arms Roundabout.

Appendices

1) Junction Capacity Descriptions & Application

RFC = Ratio of Flow to Capacity

The ratio of flow to capacity provides a measure of the utilised capacity of a junction approach arm. Arms exceeding a ratio of 0.85 (i.e. 85% capacity utilised) are considered to be approaching capacity and characteristically have light-to-moderate levels of queued traffic flow. Arms exceeding a ratio of 1.00 (i.e. 100% capacity utilised) are considered to be over capacity and are characterised as having heavy volumes of queued traffic.

ARCADY results that exceed RFCs of 1.00 generate queue lengths that are subject to exponential growth. However, the instability of flows through over-capacity approach arms, results in an inherent difficulty in calibrating modelled outputs to observed conditions. For this reason, queue lengths attributed to over capacity approach arms should be seen as indicative rather than representative.

The capacity assessment tables at the end of this technical note use a colour-coding system to assist in appraisal:

- Arms with an RFC of less than 0.85 are coloured green
- Arms with an RFC between 0.85 and 0.99 are coloured amber
- Arms with an RFC of 1.00 or more are coloured red

DOS = Degree of Saturation

The degree of saturation is an output from LINSIG which provides a measure of the utilised capacity of a signalised junction approach lane. It is directly comparable to the RFC outputs obtained from ARCADY assessments (see above).

The colour-coding system used to categorise DOS in the model results tables is as follows:

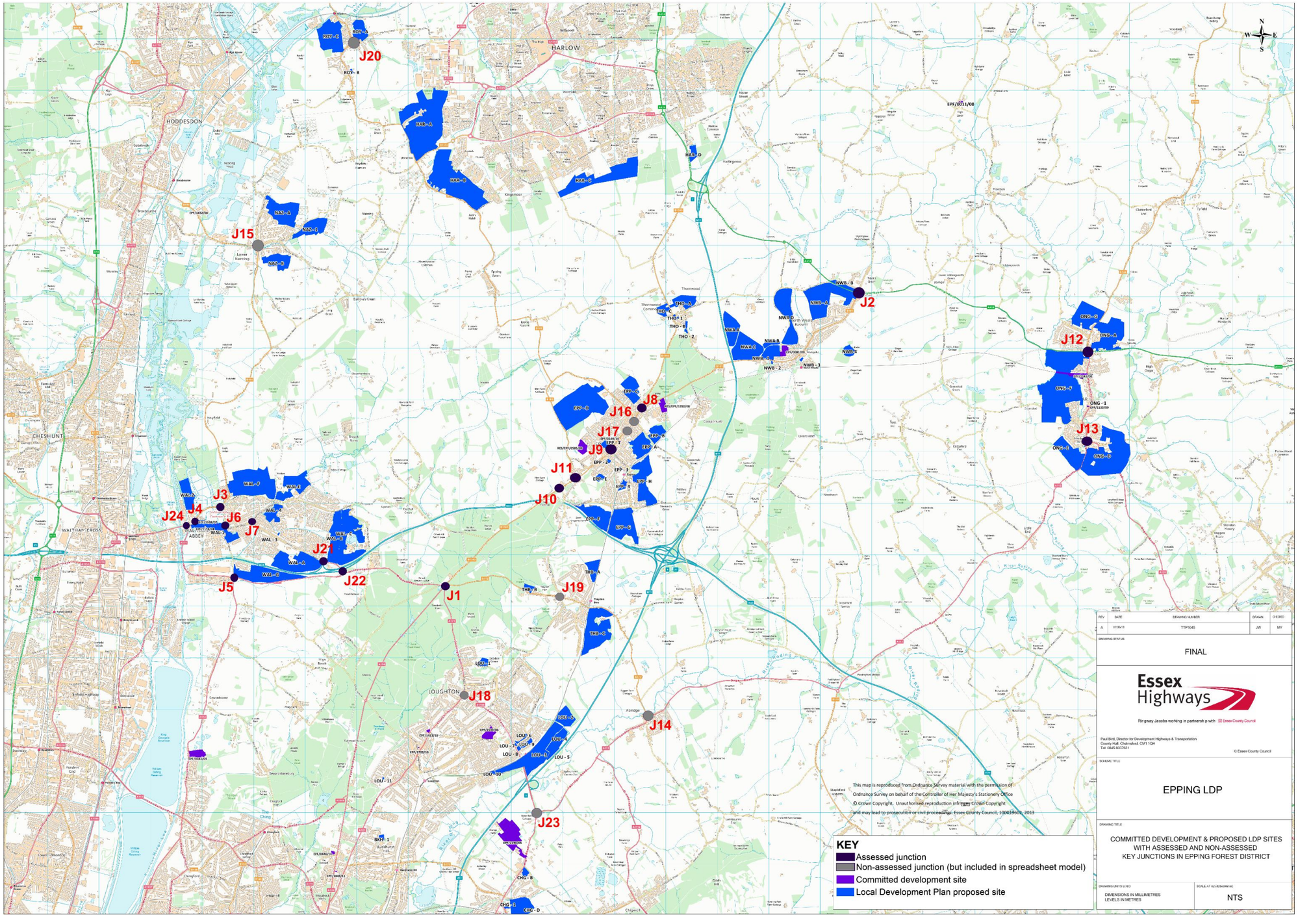
- Lanes with a DOS of less than 85% are coloured green
- Lanes with a DOS between 85% and 99% are coloured amber
- Lanes with a DOS of 100% or more are coloured red

2) Epping Forest Local Plan – reasonable alternatives for housing provision

Epping Forest Local Plan Highway Impact Assessment

Settlement	Study Site Ref.	Low Growth A Site Options	Low Growth A 7,500 to 8,000 dwellings (4850 to 5350)	SA Score:	Study Site Ref.	Low Growth B Site Options	Low Growth B 7,500 to 8,000 dwellings (4850 to 5350)	SA Score	Study Site Ref.	Medium Growth A Site Options	Medium Growth A 8,000 to 10,000 dwellings (5350 to 7350)	SA Score	Study Site Ref.	Medium Growth B Site Options	Medium Growth B 8,000 to 10,000 dwellings (5350 to 7350)	SA Score	Study Site Ref.	Ambitious Growth A Site Options	Ambitious Growth A 11,000 to 13,000 dwellings (8350 to 10350)	SA Score	Study Site Ref.	Ambitious Growth B Site Options	Ambitious Growth B 11,000 to 13,000 dwellings (8350 to 10350)	SA Score	Study Site Ref.	Ambitious Growth C Site Options	Ambitious Growth C 11,000 to 13,000 dwellings (8350 to 10350)	SA Score
Harlow	HAR-C	SR-0006	70	70		~~SR-0006~~	~~70~~	~~70~~	HAR-A	SR-0091	1778	65	HAR-A	SR-0091	1778	65	HAR-C	SR-0006	70	70	HAR-C	SR-0006	70	70	HAR-C	SR-0006	70	70
	HAR-C	SR-0046	2000	50		~~SR-0046~~	~~2000~~	~~50~~									HAR-C	SR-0046	2000	50	HAR-C	SR-0046	2000	50		~~SR-0046~~	~~2000~~	~~50~~
	HAR-C	SR-0074	155	80		~~SR-0074~~	~~155~~	~~80~~									HAR-C	SR-0074	155	80	HAR-C	SR-0074	155	80	HAR-C	SR-0074	155	80
	HAR-C	SR-0092	0	50		~~SR-0092~~	~~0~~	~~50~~									HAR-C	SR-0092	0	50	HAR-C	SR-0092	0	50	HAR-C	SR-0092	0	50
	HAR-C	SR-0139	50	90		~~SR-0139~~	~~50~~	~~90~~									HAR-C	SR-0139	50	90	HAR-C	SR-0139	50	90	HAR-C	SR-0139	50	90
					HAR-A	SR-0091	1778	65									HAR-A	SR-0091	1778	65	HAR-A	SR-0091	1778	65		~~SR-0091~~	~~1778~~	~~65~~
Harlow Subtotal			2275				1778				1778				1778				4053				4053				2053	
Existing Dwellings			35719				35719				35719				35719				35719				35719				35719	
Buckhurst Hill			0		BKH-1	SR-0176	60	130	BKH-1	SR-0176	60	130	BKH-1	SR-0176	60	130	BKH-1	SR-0176	60	130	BKH-1	SR-0176	60	130	BKH-1	SR-0176	60	130
					BKH-2	SR-0230	12	140					BKH-2	SR-0230	12	140	BKH-2	SR-0230	12	140	BKH-2	SR-0230	12	140	BKH-2	SR-0230	12	140
Buckhurst Hill Subtotal			0				72				60				72				72				72				72	
Existing Dwellings			4742				4742				4742				4742								4742				4742	
Chigwell			0		CHG-1	SR-0014	10	110	CHG-1	SR-0014	10	110	CHG-1	SR-0014	10	110	CHG-1	SR-0014	10	110	CHG-1	SR-0014	10	110	CHG-1	SR-0014	10	110
						~~SR-0318~~	~~448~~	~~75~~	CHG-B	SR-0318	448	75		~~SR-0318~~	~~448~~	~~75~~	CHG-B	SR-0318	448	75		~~SR-0318~~	~~448~~	~~75~~		~~SR-0318~~	~~448~~	~~75~~
					CHG-B	SR-0433	75	90					CHG-B	SR-0433	75	90					CHG-B	SR-0433	75	90	CHG-B	SR-0433	75	90
					CHG-D	SR-0478(b)	50	90					CHG-D	SR-0478(b)	50	90					CHG-D	SR-0478(b)	50	85		~~SR-0478(b)~~	~~50~~	~~85~~
																					CHG-D	SR-0478(a)	175	90	CHG-D	SR-0478(a)	175	90
Chigwell Subtotal			0				135				458				135				458				310				260	
Existing Dwellings			2653				2653				2653				2653				2653				2653				2653	
Chipping Ongar	ONG-1	SR-0022	5	130	ONG-1	SR-0022	5	130	ONG-1	SR-0022	5	130	ONG-1	SR-0022	5	130	ONG-1	SR-0022	5	130	ONG-1	SR-0022	5	130	ONG-1	SR-0022	5	130
	ONG-E	SR-0112	765	85	ONG-E	SR-0112	765	85	ONG-E	SR-0112	765	85	ONG-E	SR-0112	765	85	ONG-E	SR-0112	765	85	ONG-E	SR-0112	765	85		~~SR-0112~~	~~765~~	~~85~~
	ONG-E	SR-0268	43	95	ONG-E	SR-0268	43	95	ONG-E	SR-0268	43	95	ONG-E	SR-0268	43	95	ONG-E	SR-0268	43	95	ONG-E	SR-0268	43	95		~~SR-0268~~	~~43~~	~~95~~
		~~SR-0067~~	~~1620~~	~~80~~						~~SR-0067~~	~~1620~~	~~80~~	ONG-D	SR-0053	7	100		~~SR-0067~~	~~1620~~	~~80~~		~~SR-0067~~	~~1620~~	~~80~~		~~SR-0067~~	~~1620~~	~~80~~
	ONG-F	SR-0120	100	95					ONG-F	SR-0120	100	95	ONG-D	SR-0090	114	95	ONG-F	SR-0120	100	95	ONG-F	SR-0120	100	95	ONG-F	SR-0120	~~100~~	~~95~~
	ONG-F	SR-0390	272	105					ONG-F	SR-0390	272	105		~~SR-0267~~	~~1325~~	~~75~~	ONG-F	SR-0390	272	105	ONG-F	SR-0390	272	105	ONG-F	SR-0390	272	105
													ONG-D	SR-0391	172	95	ONG-D	SR-0053	7	100								
																	ONG-D	SR-0090	114	95								
																		~~SR-0267~~	~~1325~~	~~75~~								
																	ONG-D	SR-0391	172	95								
Chipping Ongar Subtotal			1185				813				1185				1106				1478				1185				277	
Existing Dwellings			1686				1686				1686				1686				1686				1686				1686	
Epping	EPP-1	SR-0281	50	135	EPP-1	SR-0281	50	135	EPP-1	SR-0281	50	135	EPP-1	SR-0281	50	135	EPP-1	SR-0281	50	135	EPP-1	SR-0281	50	135	EPP-1	SR-0281	50	135
	EPP-2	SR-0347	35	145	EPP-2	SR-0347	35	145	EPP-2	SR-0347	35	145	EPP-2	SR-0347	35	145	EPP-2	SR-0347	35	145	EPP-2	SR-0347	35	145	EPP-2	SR-0347	35	145
	EPP-3	SR-0005	12	140	EPP-3	SR-0005	12	140	EPP-3	SR-0005	12	140	EPP-3	SR-0005	12	140	EPP-3	SR-0005	12	140	EPP-3	SR-0005	12	140	EPP-3	SR-0005	12	140
	EPP-4	SR-0278	0	135	EPP-4	SR-0278	0	135	EPP-4	SR-0278	0	135	EPP-4	SR-0278	0	135	EPP-4	SR-0278	0	135	EPP-4	SR-0278	0	135	EPP-4	SR-0278	0	135
	EPP-E	SR-0208	0	130	EPP-E	SR-0208	0	130	EPP-E	SR-0208	0	130	EPP-E	SR-0208	0	130	EPP-E	SR-0208	0	130	EPP-E	SR-0208	0	130	EPP-E	SR-0208	0	130
	EPP-F	SR-0466	44	105	EPP-F	SR-0466	44	105	EPP-F	SR-0466	44	105	EPP-F	SR-0466	44	105	EPP-F	SR-0466	44	105	EPP-F	SR-0466	44	105	EPP-F	SR-0466	44	105
	Z-E8	SR-0506	67	100	Z-E8	SR-0506	67	100	Z-E8	SR-0506	67	100	Z-E8	SR-0506	67	100	Z-E8	SR-0506	67	100		~~SR-0506~~	~~67~~	~~100~~		~~SR-0506~~	~~67~~	~~100~~
						~~SR-0113b~~	~~200~~	~~95~~	EPP-G	SR-0113b	200	95	EPP-G	SR-0113b	200	95	EPP-G	SR-0113b	200	95		~~SR-0113b~~	~~200~~	~~95~~		~~SR-0113b~~	~~200~~	~~95~~
														~~SR-0132a~~	~~5000~~	~~105~~		~~SR-0132a~~	~~5000~~	~~105~~		~~SR-0132a~~	~~5000~~	~~105~~	EPP-D	SR-0132a	5000	105
																					EPP-B	SR-0406	604	105	EPP-B	SR-0406	604	105
Epping Subtotal			208				208				408				408				408				745				5745	
Existing Dwellings			5180				5180				5180				5180				5180				5180				5180	
Loughton / Debden	LOU-1	SR-0058	78	100	LOU-1	SR-0058	78	100	LOU-1	SR-0058	78	100	LOU-1	SR-0058	78	100	LOU-1	SR-0058	78	100	LOU-1	SR-0058	78	100	LOU-1	SR-0058	78	100
	LOU-6	SR-0289	41	155	LOU-6	SR-0289	41	155	LOU-6	SR-0289	41	155	LOU-6	SR-0289	41	155	LOU-6	SR-0289	41	155	LOU-6	SR-0289	41	155	LOU-6	SR-0289	41	155
	LOU-9	SR-0286	80	155	LOU-9	SR-0286	80	155	LOU-9	SR-0286	80	155	LOU-9	SR-0286	80	155	LOU-9	SR-0286	80	155	LOU-9	SR-0286	80	155	LOU-9	SR-0286	80	155
	LOU-11	SR-0059	10	140	LOU-11	SR-0059	10	140	LOU-11	SR-0059	10	140	LOU-11	SR-0059	10	140	LOU-11	SR-0059	10	140	LOU-11	SR-0059	10	140	LOU-11	SR-0059	10	140
					LOU-7	SR-0285	19	155					LOU-7	SR-0285	19	155	LOU-7	SR-0285	19	155	LOU-7	SR-0285	19	155	LOU-7	SR-0285	19	155
					LOU-8	SR-0284	41	150					LOU-8	SR-0284	41	150	LOU-8	SR-0284	41	150	LOU-8	SR-0284	41	150	LOU-8	SR-0284	41	150
						~~SR-0446~~	~~80~~	~~90~~					LOU-1	SR-0446	80	90					LOU-1	SR-0446	80	90	LOU-1	SR-0446	80	90
					LOU-1	SR-0436	4	120					LOU-1	SR-0436	4	120					LOU-1	SR-0436	4	120	LOU-1	SR-0436	4	120
Loughton / Debden Subtotal			209				273				209				353				269				353				353	
Existing Dwellings			12961				12961				12961				12961				12961				12961				12961	
Nazeing/ Lower Nazeing			0			~~SR-0434~~	~~150~~	~~70~~	NAZ-B	SR-0507	55	80	NAZ-A	SR-0434	150	70	NAZ-B	SR-0507	55			~~SR-0011~~	~~262~~	~~95~~		~~SR-0011~~	~~262~~	~~95~~
					NAZ-B	SR-0507	55	80					NAZ-B	SR-0507	55	80						~~SR-0101~~	~~7~~	~~65~~		~~SR-0101~~	~~7~~	~~65~~
																						~~SR-0300~~	~~447~~	~~85~~		~~SR-0300~~	~~447~~	~~85~~
																						~~SR-0507~~	~~55~~	~~80~~		~~SR-0507~~	~~55~~	~~80~~
Nazeing/ Lower Nazeing Subtotal			0				55				55				205				55				0				0	
Existing Dwellings			1614				1614				1614				1614				1614				1614				1614	
Lower Sheering			0		LSH-B	SR-0121	14	95	LSH-B	SR-0121	14	95	LSH-B	SR-0121	14	95	LSH-B	SR-0121	14	95	LSH-B	SR-0121	14	95		~~SR-0121~~	~~14~~	~~95~~
Lower Sheering Subtotal			0				14				14				14				14				14				0	
Existing Dwellings			839				839				839				839				839				839				839	
Sheering			0		LSH-B	SR-0472	34	65			0		SHE-A	SR-0073	71	75			0		LSH-B	SR-0472	34	65		~~SR-0472~~	~~34~~	~~65~~
																					SHE-A	SR-0073	71	75		~~SR-0073~~	~~71~~	~~75~~
																					SHE-C	SR-0449	6	60		~~SR-0449~~	~~6~~	~~60~~
																					SHE-C	SR-0450	3	55		~~SR-0450~~	~~3~~	~~55~~
Sheering Subtotal			0				34				0				71				0				114				0	
Existing Dwellings			839				839				839				839				839				839				839	
North Weald Bassett including North Weald Airfield		Low Growth	454			Low Growth	454			Medium Growth	1347			Low Growth	454			High Growth	2397			Medium Growth	1347			Low Growth	454	
North Weald Bassett Subtotal			454				454				1347				454				2397				1347				454	
Existing Dwellings			1865				1865				1865				1865				1865				1865				1865	
Roydon			0		ROY-B	SR-0197	5	55			0		ROY-B	SR-0197	5	55			0		ROY-B	SR-0197	5	55	ROY-B	SR-0197	5	55
					ROY-B	SR-0306	703	45					ROY-B	SR-0306	703	45					ROY-B	SR-0306	703	45		~~SR-0306~~	~~703~~	~~45~~
Roydon Subtotal			0				708				0				708				0				708				5	
Existing Dwellings			914				914				914				914				914				914				914	
Theydon Bois	THB-B	SR-0080	68	95	THB-B	SR-0080	68	95	THB-B	SR-0080	68	95	THB-B	SR-0080	68	95	THB-B	SR-0080	68	95	THB-B	SR-0080	68	95		~~SR-0080~~	~~68~~	~~95~~
		~~SR-0497~~	~~31~~	~~80~~		~~SR-0497~~	~~31~~	~~80~~	THB-A	SR-0497	31	80		~~SR-0497~~	~~31~~	~~80~~	THB-A	SR-0497	31	80		~~SR-0497~~	~~31~~	~~80~~		~~SR-0497~~	~~31~~	~~80~~
					THB-A	SR-0070	0	0						~~SR-0026c~~	~~306~~	~~90~~					THB-A	SR-0070	0	0	THB-A	SR-0070	0	0
					THB-A	SR-0327b	171	105													THB-A	SR-0327b	171	105	THB-A	SR-0327b	171	105
																						~~SR-0026c~~	~~306~~	~~90~~		~~SR-0026c~~	~~306~~	~~90~~
Theydon Bois Subtotal Revised			68				239				99				68				99				239				171	
Existing Dwellings			1693				1693				1693				1693				1693									
Thornwood			0			~~SR-0043~~	~~86~~	~~65~~	THO-1	SR-0271	10	80	THO-1	SR-0271	10	80	THO-1	SR-0271	10	80	THO-1	SR-0271	10	80	THO-1	SR-0271	10	80
					THO-A	SR-0149	175	70					THO-A	SR-0043	86	65						~~SR-0043~~	~~86~~	~~65~~		~~SR-0043~~	~~86~~	~~65~~
													THO-A	SR-0149	175	70					THO-A	SR-0149	175	70		~~SR-0149~~	~~175~~	~~70~~
Thornwood Subtotal			0				175				10				271				10				185				10	
Existing Dwellings			2599				2599				2599				2599				2599				2599				2599	
Waltham Abbey	WAL-1	SR-0283	0	0	WAL-1	SR-0283	0	0	WAL-1	SR-0283	0	0	WAL-1	SR-0283	0	0	WAL-1	SR-0283	0	0	WAL-1	SR-0283	0	0	WAL-1	SR-0283	0	0
	WAL-1	SR-0380	41	110	WAL-1	SR-0380	41	110	WAL-1	SR-0380	41	110	WAL-1	SR-0380	41	110	WAL-1	SR-0380	41	110	WAL-1	SR-0380	41	110		~~SR-0380~~	~~41~~	~~110~~
	WAL-1	SR-0381	15	120	WAL-1	SR-0381	15	120	WAL-1	SR-0381	15	120	WAL-1	SR-0381	15	120	WAL-1	SR-0381	15	120	WAL-1	SR-0381	15	120	WAL-1	SR-0381	15	120
	WAL-1	SR-0382	0	0	WAL-1	SR-0382	0	0	WAL-1	SR-0382	0	0	WAL-1	SR-0382	0	0	WAL-1	SR-0382	0	0	WAL-1	SR-0382	0	0	WAL-1	SR-0382	0	0
	WAL-3	SR-0021	10	140	WAL-3	SR-0021	10	140	WAL-3	SR-0021	10	140	WAL-3	SR-0021	10	140	WAL-3	SR-0021	10	140	WAL-3	SR-0021	10	140	WAL-3	SR-0021	10	140
	WAL-4	SR-0384	199	135	WAL-4	SR-0384	199	135	WAL-4	SR-0384	199	135	WAL-4	SR-0384	199	135	WAL-4	SR-0384	199	135	WAL-4	SR-0384	199	135	WAL-4	SR-0384	199	135
	WAL-F	SR-0089a	341	105	WAL-4	SR-0482	21	120	WAL-F	SR-0089a	341	105	WAL-4	SR-0482	21	120	WAL-F	SR-0089a	341	105	WAL-F	SR-0089a	341	105		~~SR-0089a~~	~~341~~	~~105~~
	WAL-F	SR-0089b	0	100		~~SR-0034~~	~~500~~	~~90~~	WAL-F	SR-0089b	0	100	WAL-B	SR-0034	500	90	WAL-F	SR-0089b	0	100	WAL-F	SR-0089b	0	100	WAL-F	SR-0089b	0	100
	WAL-F	SR-0099	100	110					WAL-F	SR-0099	100	110	WAL-F	SR-0089a	341	105	WAL-F	SR-0099	100	110	WAL-F	SR-0099	100	110		~~SR-0099~~	~~100~~	~~110~~
	WAL-F	SR-0104	150	115					WAL-F	SR-0104	150	115	WAL-F	SR-0089b	0	100	WAL-F	SR-0104	150	115	WAL-F	SR-0104	150	115	WAL-F	SR-0104	150	115
	WAL-F	SR-0376	81	110					WAL-F	SR-0376	81	110	WAL-F	SR-0099	100	110	WAL-F	SR-0376	81	110	WAL-F	SR-0376	81	110		~~SR-0376~~	~~81~~	~~110~~
		~~SR-0034~~	~~500~~	~~90~~					WAL-4	SR-0482	21	120	WAL-F	SR-0104	150	115	WAL-4	SR-0482	21	120		~~SR-0034~~	~~500~~	~~90~~		~~SR-0034~~	~~500~~	~~90~~
									WAL-B	SR-0034	500	90	WAL-F	SR-0376	81	110		~~SR-0034~~	~~500~~	~~90~~	WAL-4	SR-0482	21	120	WAL-4	SR-0482	21	120
Waltham Abbey Subtotal			937				286				1458				1458				958				958				395	
Existing Dwellings			8812				8812				8812				8812				8812				8812				8812	
TOTAL			5336				5244				7081				7101				10271				10283				9795	

3) Location Map of Assessed Junctions, LDP Sites and Committed Developments in Epping Forest District



4) Mitigation Model Output Tables

Junction 1: Wake Arms Roundabout, Epping Forest - No Mitigation (2026)

Junction 1 (Wake Arms PH) - Epping									2026 *Roundabout Maximum RFC Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Road	0.59	0.82	0.85	0.91	0.88	1.01	1.00	1.29	0.73	0.85	0.85	0.87	0.86	0.87	0.88	0.99
B172	0.89	1.15	1.17	1.22	1.20	1.28	1.28	1.33	0.96	1.16	1.17	1.18	1.18	1.20	1.20	1.29
A121 Golding's Hill	1.33	1.68	1.68	1.75	1.73	1.80	1.79	1.91	1.02	1.25	1.27	1.30	1.29	1.34	1.33	1.42
A104 Epping New Road	0.94	1.05	1.03	1.03	1.03	1.01	1.02	1.07	1.14	1.45	1.50	1.55	1.52	1.63	1.63	1.80
A121 Woodridden Hill	0.86	1.08	1.04	1.12	1.12	1.09	1.09	1.12	1.21	1.46	1.48	1.51	1.49	1.53	1.54	1.74

Junction 1 (Wake Arms PH) - Epping									2026 *Roundabout Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Road	1	4	5	8	7	25	21	184	3	5	5	6	6	6	7	21
B172	7	83	94	113	104	142	143	192	14	86	90	96	94	102	103	138
A121 Golding's Hill	160	437	452	506	493	542	535	629	26	125	135	157	150	186	179	234
A104 Epping New Road	11	29	26	25	26	22	22	38	55	234	269	316	293	389	384	529
A121 Woodridden Hill	6	39	27	51	52	41	41	52	79	239	251	277	266	294	300	493

Junction 1: Wake Arms Roundabout, Epping Forest - Mitigation Option Test (2026 and 2036)

Junction 1 (Wake Arms PH) - Epping	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Road		0.58		0.66		0.62		0.72		0.62		0.63		0.65		0.67
B172		0.76		0.76		0.80		0.87		0.73		0.74		0.74		0.77
A121 Golding's Hill		0.79		0.60		0.85		0.90		0.60		0.62		0.65		0.68
A104 Epping New Road		0.54		0.71		0.56		0.63		0.67		0.72		0.75		0.86
A121 Woodridden Hill		0.52		0.74		0.55		0.62		0.71		0.76		0.78		0.95

Junction 1 (Wake Arms PH) - Epping	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Road		1		2		2		4		2		2		2		3
B172		3		3		4		6		3		3		3		3
A121 Golding's Hill		4		2		5		9		2		2		2		2
A104 Epping New Road		1		3		2		2		2		3		4		7
A121 Woodridden Hill		1		4		1		2		3		3		4		18

Junction 1 (Wake Arms PH) - Epping	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Road		0.67		0.72		0.77		1.01		0.71		0.76		0.74		0.79
B172		0.87		0.94		0.98		0.99		0.82		0.84		0.84		0.89
A121 Golding's Hill		0.90		0.97		1.00		0.99		0.69		0.76		0.80		0.89
A104 Epping New Road		0.66		0.68		0.72		0.77		0.84		0.96		1.01		1.01
A121 Woodridden Hill		0.64		0.69		0.67		0.83		0.88		0.98		1.00		1.01

Junction 1 (Wake Arms PH) - Epping	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Road		2		3		5		160		3		3		3		5
B172		6		11		20		61		4		6		6		9
A121 Golding's Hill		9		18		35		107		3		4		5		8
A104 Epping New Road		2		3		3		4		5		17		66		256
A121 Woodridden Hill		2		3		3		4		8		20		37		334

Junction 2: Talbot Roundabout, North Weald - No Mitigation (2026)

Junction 2 (Talbot PH) - North Weald	2026 *Roundabout Maximum RFC Values*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B181 Weald Bridge Road	0.19	0.30	0.29	0.38	0.30	0.51	0.40	0.31
A414 High Road	0.81	1.03	1.01	1.07	1.03	1.15	1.09	1.02
B181 High Road	0.43	0.60	0.59	0.63	0.60	0.66	0.63	0.63
A414	0.45	0.59	0.58	0.59	0.59	0.64	0.63	0.57

	PM PEAK							
Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
0.18	0.28	0.28	0.33	0.28	0.40	0.35	0.28
0.53	0.75	0.74	0.77	0.75	0.83	0.80	0.74
0.47	0.70	0.69	0.78	0.71	0.90	0.81	0.74
0.70	0.93	0.90	0.97	0.92	1.09	1.02	0.90

Junction 2 (Talbot PH) - North Weald	2026 Roundabout Maximum Queue Lengths							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B181 Weald Bridge Road	0	0	0	1	0	1	1	0
A414 High Road	4	43	32	60	41	109	75	34
B181 High Road	1	2	2	2	2	2	2	2
A414	1	2	1	2	2	2	2	1

	PM PEAK							
Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
0	0	0	1	0	1	1	0
1	3	3	3	3	5	4	3
1	2	2	3	2	7	4	3
2	10	8	16	9	55	28	8

Junction 2: Talbot Roundabout, North Weald - Mitigation Option Test (2026 and 2036)

Junction 2 (Talbot PH) - North Weald	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B181 Weald Bridge Road		0.29		0.39	0.30	0.49	0.39	0.31		0.28		0.34	0.29	0.45	0.36	0.28
A414 High Road		0.71		0.73	0.71	0.77	0.73	0.70		0.54		0.56	0.55	0.60	0.59	0.53
B181 High Road		0.42		0.46	0.44	0.48	0.46	0.46		0.49		0.54	0.50	0.61	0.56	0.52
A414		0.42		0.42	0.42	0.45	0.44	0.41		0.64		0.67	0.63	0.74	0.69	0.61

Junction 2 (Talbot PH) - North Weald	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B181 Weald Bridge Road		0		0	0	1	1	0		0		0	0	1	0	0
A414 High Road		2		3	2	3	3	2		1		1	1	2	1	1
B181 High Road		1		1	1	1	1	1		1		1	1	2	1	1
A414		1		1	1	1	1	1		2		2	2	3	2	2

Junction 2 (Talbot PH) - North Weald	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B181 Weald Bridge Road		0.42		0.64	0.44	0.95	0.70	0.46		0.42		0.59	0.46	0.90	0.72	0.45
A414 High Road		0.85		0.88	0.83	0.96	0.91	0.81		0.69		0.71	0.68	0.80	0.76	0.66
B181 High Road		0.55		0.60	0.56	0.67	0.62	0.60		0.64		0.74	0.66	0.89	0.78	0.71
A414		0.51		0.51	0.51	0.60	0.58	0.49		0.79		0.83	0.78	0.98	0.93	0.74

Junction 2 (Talbot PH) - North Weald	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B181 Weald Bridge Road		1		2	1	18	3	1		1		2	1	10	3	1
A414 High Road		5		6	5	16	8	4		2		2	2	4	3	2
B181 High Road		1		2	2	2	2	2		2		3	2	7	4	2
A414		1		1	1	2	1	1		4		5	4	33	11	3

Junction 3: Crooked Mile Roundabout, Waltham Abbey - No Mitigation (2026 and 2036)

Junction 3 (Crooked Mile) - Waltham Abbey	*2026 Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Crooked Mile	0.52	0.61	0.66	0.64	0.67	0.67	0.68	0.59	0.44	0.51	0.53	0.53	0.54	0.54	0.54	0.50
Parklands	0.48	0.59	0.59	0.60	0.62	0.61	0.62	0.56	0.39	0.47	0.48	0.48	0.48	0.48	0.48	0.46
Crooked Mile	0.32	0.37	0.38	0.38	0.39	0.39	0.39	0.37	0.46	0.52	0.53	0.53	0.53	0.53	0.53	0.52
Car park	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
B194 Abbeyview	0.23	0.26	0.27	0.27	0.28	0.28	0.28	0.26	0.53	0.63	0.68	0.67	0.69	0.69	0.71	0.61

Junction 3 (Crooked Mile) - Waltham Abbey	*2026 Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Crooked Mile	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
Parklands	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1
Crooked Mile	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Car park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B194 Abbeyview	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2

Junction 3 (Crooked Mile) - Waltham Abbey	*2036 Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Crooked Mile							0.84								0.64	
Parklands							0.79								0.57	
Crooked Mile							0.46								0.60	
Car park							0.03								0.03	
B194 Abbeyview							0.32								0.89	

Junction 3 (Crooked Mile) - Waltham Abbey	*2036 Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Crooked Mile							5								2	
Parklands							4								1	
Crooked Mile							1								2	
Car park							0								0	
B194 Abbeyview							1								8	

Junction 4: Highbridge Street Roundabout, Waltham Abbey - No Mitigation (2026)

Junction 4 (Highbridge St) - Waltham Abbey									2026 *Roundabout Maximum RFC Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Abbeyview	0.34	0.41	0.44	0.44	0.46	0.46	0.48	0.39	0.27	0.31	0.32	0.32	0.33	0.33	0.33	0.30
Highbridge Street	0.33	0.39	0.40	0.40	0.41	0.41	0.41	0.38	0.25	0.29	0.29	0.29	0.30	0.30	0.30	0.29
B194 Highbridge Street	0.46	0.52	0.53	0.53	0.54	0.54	0.54	0.51	0.85	0.99	1.06	1.04	1.07	1.07	1.09	0.96
Powdermill Lane	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.15	0.18	0.17	0.18	0.17	0.17	0.17	0.18

Junction 4 (Highbridge St) - Waltham Abbey									2026 *Roundabout Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Abbeyview	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0
Highbridge Street	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
B194 Highbridge Street	1	1	1	1	1	1	1	1	6	22	52	39	57	56	69	14
Powdermill Lane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Junction 4: Highbridge Street Roundabout, Waltham Abbey - Mitigation Option Test (2026 and 2036)

Junction 4 (Highbridge St) - Waltham Abbey	2026 *Roundabout Maximum RFC Values*																	
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Abbeyview							0.48								0.33	
Highbridge Street							0.41								0.30	
B194 Highbridge Street							0.35								0.71	
Powdermill Lane							0.05								0.18	

Junction 4 (Highbridge St) - Waltham Abbey	2026 *Roundabout Maximum Queue Lengths*																	
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Abbeyview							1								1	
Highbridge Street							1								0	
B194 Highbridge Street							1								3	
Powdermill Lane							0								0	

Junction 4 (Highbridge St) - Waltham Abbey	2036 *Roundabout Maximum RFC Values*																	
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Abbeyview							0.61								0.39	
Highbridge Street							0.51								0.34	
B194 Highbridge Street							0.40								0.87	
Powdermill Lane							0.06								0.21	

Junction 4 (Highbridge St) - Waltham Abbey	2036 *Roundabout Maximum Queue Lengths*																	
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B194 Abbeyview							2								1	
Highbridge Street							1								1	
B194 Highbridge Street							1								6	
Powdermill Lane							0								0	

Junction 5: Sewardstone Road Roundabout, Waltham Abbey - No Mitigation (2026 and 2036)

Junction 5 (Sewardstone Rd) - Waltham Abbey	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Sewardstone Road	0.36	0.43	0.42	0.43	0.43	0.43	0.43	0.42	0.36	0.44	0.44	0.45	0.45	0.45	0.45	0.45
A121 Dowding Way	0.52	0.63	0.63	0.67	0.66	0.66	0.66	0.69	0.37	0.44	0.44	0.45	0.45	0.44	0.44	0.46
A112 Sewardstone Road	0.42	0.49	0.49	0.50	0.50	0.50	0.50	0.51	0.65	0.76	0.76	0.78	0.78	0.77	0.77	0.76
A121 Meridian Way	0.34	0.39	0.39	0.40	0.40	0.40	0.40	0.41	0.46	0.58	0.58	0.61	0.60	0.62	0.61	0.64

Junction 5 (Sewardstone Rd) - Waltham Abbey	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Sewardstone Road	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
A121 Dowding Way	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
A112 Sewardstone Road	1	1	1	1	1	1	1	1	2	3	3	3	3	3	3	3
A121 Meridian Way	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2

Junction 5 (Sewardstone Rd) - Waltham Abbey	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Sewardstone Road								0.48								0.55
A121 Dowding Way								0.86								0.54
A112 Sewardstone Road								0.60								0.87
A121 Meridian Way								0.48								0.84

Junction 5 (Sewardstone Rd) - Waltham Abbey	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Sewardstone Road								1								1
A121 Dowding Way								6								1
A112 Sewardstone Road								2								7
A121 Meridian Way								1								5

Junction 6: Sewardstone Road / Sun Street Signals, Waltham Abbey - No Mitigation (2026)

Junction 6 (Sun St) - Waltham Abbey	2026 *Signals Maximum DoS Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A121 Crooked Mile	62	74	68	90	69	67	69	69	81	88	81	83	84	87	82	78
Monkswood Avenue	76	76	84	80	72	84	84	87	59	66	70	72	70	69	69	70
Sun Street - *Left/Ahead*	35	37	33	42	35	36	36	37	29	43	40	40	44	42	41	42
Sun Street - *Right*	71	78	70	89	73	75	75	77	88	133	124	127	139	131	126	131
Sewardstone Rd NB - *L/A*	71	76	77	73	83	79	79	78	66	76	70	70	73	72	72	65
Sewardstone Rd NB - *R/A*	54	72	58	29	57	48	48	47	65	63	63	62	62	65	66	59
Sewardstone Rd SB - *L/A*	59	65	66	68	68	70	67	67	82	82	83	82	82	81	82	78
Sewardstone Rd SB - *Ahead*	31	37	33	35	30	30	34	35	42	48	48	47	48	48	47	44
Farm Hill Road	116	142	142	134	155	152	147	144	107	136	130	131	125	127	130	117
Sewardstone Rd NB	69	73	79	91	74	78	79	74	105	114	120	121	121	120	120	130

Junction 6 (Sun St) - Waltham Abbey	2026 *Signals Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A121 Crooked Mile	10	13	10	24	12	12	10	12	10	13	12	12	12	13	14	10
Monkswood Avenue	6	7	7	8	6	8	8	8	4	4	4	5	4	4	4	4
Sun Street - *Left/Ahead*	4	4	4	5	4	4	4	4	3	3	3	3	3	3	3	3
Sun Street - *Right*	9	12	11	14	11	10	12	10	13	71	59	67	82	69	62	70
Sewardstone Rd NB - *L/A*	7	7	7	9	7	7	7	7	7	6	7	7	7	7	7	7
Sewardstone Rd NB - *R/A*	4	5	3	2	2	2	2	2	7	7	7	7	6	5	6	7
Sewardstone Rd SB - *L/A*	7	7	7	8	7	7	7	7	7	7	8	8	7	7	7	7
Sewardstone Rd SB - *Ahead*	3	5	3	7	6	4	4	3	5	6	6	6	6	7	6	7
Farm Hill Road	76	158	160	138	192	185	170	164	45	135	120	124	110	115	119	84
Sewardstone Rd NB	6	7	7	15	7	8	8	7	68	133	165	174	174	170	164	212

Junction 6: Sewardstone Road / Sun Street Signals, Waltham Abbey - Mitigation Option Test (2026 and 2036)

Junction 6 (Sun St) - Waltham Abbey									2026 *Signals Maximum DoS Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A121 Crooked Mile					62								58			
Monkswood Avenue					80								73			
Sun Street - *Left/Ahead*					81								77			
Sun Street - *Right*					62								61			
Sewardstone Rd NB - *L/A*					57								50			
Sewardstone Rd NB - *R/A*					67								67			
Sewardstone Rd SB - *L/A*					31								30			
Sewardstone Rd SB - *Ahead*					34								31			
Farm Hill Road					10								17			
Sewardstone Rd NB					44								67			

Junction 6 (Sun St) - Waltham Abbey									2026 Signals Maximum Queue Lengths							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A121 Crooked Mile					11								8			
Monkswood Avenue					7								4			
Sun Street - *Left/Ahead*					7								7			
Sun Street - *Right*					5								5			
Sewardstone Rd NB - *L/A*					5								5			
Sewardstone Rd NB - *R/A*					7								7			
Sewardstone Rd SB - *L/A*					3								5			
Sewardstone Rd SB - *Ahead*					5								7			
Farm Hill Road					0								1			
Sewardstone Rd NB					5								19			

Junction 6 (Sun St) - Waltham Abbey									2036 *Signals Maximum DoS Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A121 Crooked Mile					75								70			
Monkswood Avenue					94								83			
Sun Street - *Left/Ahead*					89								102			
Sun Street - *Right*					72								94			
Sewardstone Rd NB - *L/A*					54								59			
Sewardstone Rd NB - *R/A*					74								71			
Sewardstone Rd SB - *L/A*					38								34			
Sewardstone Rd SB - *Ahead*					35								35			
Farm Hill Road					9								17			
Sewardstone Rd NB					49								76			

Junction 6 (Sun St) - Waltham Abbey									2036 Signals Maximum Queue Lengths							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A121 Crooked Mile					16								10			
Monkswood Avenue					12								6			
Sun Street - *Left/Ahead*					9								15			
Sun Street - *Right*					5								10			
Sewardstone Rd NB - *L/A*					4								6			
Sewardstone Rd NB - *R/A*					7								8			
Sewardstone Rd SB - *L/A*					5								5			
Sewardstone Rd SB - *Ahead*					7								7			
Farm Hill Road					0								1			
Sewardstone Rd NB					7								30			

Junction 7: Honey Lane Mini-Roundabout, Waltham Abbey - No Mitigation (2026)

Junction 7 (Honey Ln) - Waltham Abbey	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Broomstick Hall Road	0.32	0.48	0.41	0.49	0.49	0.49	0.49	0.43	0.32	0.45	0.45	0.46	0.46	0.45	0.45	0.42
Honey Lane	0.92	1.12	1.07	1.13	1.14	1.13	1.13	1.09	0.85	1.15	1.16	1.18	1.18	1.16	1.16	1.07
Farm Hill Road	0.46	0.54	0.53	0.54	0.55	0.54	0.54	0.53	0.74	0.89	0.89	0.91	0.91	0.90	0.89	0.88

Junction 7 (Honey Ln) - Waltham Abbey	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Broomstick Hall Road	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1
Honey Lane	9	51	34	54	55	54	53	39	5	61	63	70	73	66	65	34
Farm Hill Road	1	1	1	1	1	1	1	1	3	7	7	8	8	7	7	6

Junction 7: Honey Lane Mini-Roundabout, Waltham Abbey - Mitigation Option Test (2026 and 2036)

Junction 7 (Honey Ln) - Waltham Abbey	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Broomstick Hall Road		0.33	0.28		0.34			0.29		0.30	0.30		0.30			0.29
Honey Lane		0.68	0.68		0.69			0.68		0.62	0.61		0.63			0.60
Farm Hill Road		0.42	0.41		0.43			0.41		0.70	0.70		0.71			0.68

Junction 7 (Honey Ln) - Waltham Abbey	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Broomstick Hall Road		0	0		0			0		0	0		0			0
Honey Lane		2	2		2			2		2	2		2			2
Farm Hill Road		0	0		0			0		2	2		2			2

Junction 7 (Honey Ln) - Waltham Abbey	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Broomstick Hall Road		0.44	0.33		0.45			0.36		0.39	0.40		0.41			0.34
Honey Lane		0.74	0.75		0.75			0.74		0.69	0.70		0.73			0.70
Farm Hill Road		0.47	0.47		0.49			0.46		0.82	0.83		0.87			0.79

Junction 7 (Honey Ln) - Waltham Abbey	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Broomstick Hall Road		0	0		0			0		0	0		0			0
Honey Lane		4	3		4			3		4	5		6			3
Farm Hill Road		1	1		1			1		4	5		6			3

Junction 8: Thornwood Road Signals, Epping - No Mitigation (2026)

Junction 8 (Thornwood Road) - Epping	2026 *Signals Maximum DoS Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Thornwood Rd - *L/A*	90	107	108	116	112	128	119	143	110.5	112	111	111	111	111	110	137
B181 The Plain - *L/A*	77	95	95	99	96	103	98	93	101	118	118	119	118	119	115	116
B1393 Palmers Hill - *R/A*	89	102	103	101	103	97	101	111	119.4	161	161	176	165	191	179	194

Junction 8 (Thornwood Road) - Epping	2026 *Signals Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Thornwood Rd - *L/A*	24	143	172	190	183	220	206	290	112.8	135	134	117	136	115	119	270
B181 The Plain - *L/A*	22	42	37	47	37	69	45	39	22	80	80	84	81	89	73	80
B1393 Palmers Hill - *R/A*	20	64	58	47	61	40	52	141	161	413	418	494	437	573	507	614

Junction 8: Thornwood Road Signals, Epping - Mitigation Option Test (2026 and 2036)

Junction 8 (Thornwood Road) - Epping	*2026 Signals Maximum DoS Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Thornwood Rd - *L/A*		65	66	69	66	73	69	67		75	75	78	78	81	79	79
B181 The Plain - *L/A*		51	50	57	52	64	58	56		25	25	27	27	28	28	30
B1393 Palmers Hill - *R/A*		44	43	45	44	46	46	45		84	83	86	86	88	87	85

Junction 8 (Thornwood Road) - Epping	*2026 Signals Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Thornwood Rd - *L/A*		14	14	16	14	17	16	15		9	9	9	9	9	9	10
B181 The Plain - *L/A*		12	11	13	12	16	13	13		4	4	5	5	5	5	5
B1393 Palmers Hill - *R/A*		7	7	7	7	7	7	7		15	15	17	17	19	17	16

Junction 8 (Thornwood Road) - Epping	*2036 Signals Maximum DoS Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Thornwood Rd - *L/A*		74	72	81	73	91	82	80		87	87	94	94	103	99	96
B181 The Plain - *L/A*		63	63	76	65	91	79	75		30	30	32	32	34	35	41
B1393 Palmers Hill - *R/A*		50	50	52	51	54	54	53		93	93	98	98	102	99	97

Junction 8 (Thornwood Road) - Epping	*2026 Signals Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Thornwood Rd - *L/A*		17	17	21	18	28	22	21		11	11	15	15	33	20	17
B181 The Plain - *L/A*		15	15	20	16	30	21	20		6	6	6	6	6	7	8
B1393 Palmers Hill - *R/A*		8	8	8	8	8	8	8		27	26	36	36	57	42	33

Junction 9: Station Road/ St John's Road Double Mini-Roundabout, Epping - No Mitigation (2026)

Junction 9a (Station Rd) - Epping	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 High Street RAB Link	0.80	1.01	1.02	1.08	1.04	1.17	1.14	1.04	0.92	1.10	1.10	1.12	1.12	1.13	1.13	1.16
Station Road	0.77	0.99	0.99	1.04	1.02	1.05	1.02	1.01	0.69	0.85	0.85	0.87	0.87	0.88	0.88	0.86
B1393 High Street	0.92	1.11	1.11	1.13	1.13	1.14	1.14	1.16	0.87	1.12	1.13	1.20	1.15	1.29	1.26	1.15

Junction 9a (Station Rd) - Epping	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 High Street RAB Link	4	26	29	56	36	99	87	35	9	59	63	70	70	76	77	91
Station Road	3	14	14	20	18	22	18	15	2	5	5	6	6	6	6	5
B1393 High Street	9	64	63	73	72	78	80	92	6	72	79	115	89	175	155	87

Junction 9b (St. John's Rd) - Epping	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
St. John's Road	0.37	1.01	1.01	1.03	1.02	1.07	1.06	1.01	0.82	1.20	1.21	1.24	1.23	1.28	1.27	1.30
B1393 High Street	0.69	1.19	1.20	1.29	1.23	1.41	1.38	1.23	0.93	1.22	1.23	1.26	1.25	1.28	1.28	1.30
B1393 High Street RAB Link	0.89	1.05	1.05	1.07	1.07	1.08	1.08	1.10	0.72	0.92	0.93	1.00	0.95	1.07	1.05	0.95

Junction 9b (St. John's Rd) - Epping	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
St. John's Road	1	10	10	11	10	13	13	10	4	31	32	38	35	45	42	50
B1393 High Street	2	82	86	140	99	230	206	100	9	85	90	106	103	119	121	126
B1393 High Street RAB Link	7	43	42	54	53	58	56	67	3	10	11	23	14	54	44	13

Junction 9: Station Road/ St John's Road Double Mini-Roundabout, Epping - Mitigation Option Test (2026 and 2036)

Junction 9a (Station Rd) - Epping	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 High Street RAB Link						0.56	0.52	0.43						0.52	0.52	0.54
Station Road						0.73	0.70	0.66						0.61	0.60	0.60
B1393 High Street						0.43	0.45	0.49						0.50	0.56	0.55

Junction 9a (Station Rd) - Epping	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 High Street RAB Link						1	1	1						1	1	1
Station Road						3	2	2						2	2	2
B1393 High Street						6	1	1						1	1	1

Junction 9b (St. John's Rd) - Epping	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
St. John's Road						0.30	0.30	0.30						0.51	0.52	0.57
B1393 High Street						0.49	0.45	0.36						0.29	0.28	0.26
B1393 High Street RAB Link						0.46	0.47	0.51						0.38	0.44	0.43

Junction 9b (St. John's Rd) - Epping	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
St. John's Road						0	0	0						1	1	1
B1393 High Street						1	1	1						0	0	0
B1393 High Street RAB Link						1	1	1						1	1	1

Junction 9a (Station Rd) - Epping	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 High Street RAB Link						0.86	0.79	0.60						0.69	0.68	0.72
Station Road						0.98	0.90	0.80						0.74	0.73	0.74
B1393 High Street						0.49	0.53	0.61						0.56	0.69	0.68

Junction 9a (Station Rd) - Epping	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 High Street RAB Link						6	4	2						2	2	3
Station Road						14	7	4						3	3	3
B1393 High Street						1	1	2						1	2	2

Junction 9b (St. John's Rd) - Epping	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
St. John's Road						0.34	0.35	0.35						0.64	0.67	0.78
B1393 High Street						0.78	0.71	0.52						0.40	0.40	0.36
B1393 High Street RAB Link						0.54	0.55	0.63						0.44	0.55	0.54

Junction 9b (St. John's Rd) - Epping	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
St. John's Road						1	1	1						2	2	3
B1393 High Street						4	2	1						1	1	1
B1393 High Street RAB Link						1	1	2						1	1	1

Junction 10: Theydon Road Signals, Epping - No Mitigation (2026)

Junction 10 (Theydon Road) - Epping	2026 *Signals Maximum DoS Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Rd (E) *L/A*	82	115	116	120	119	126	105	149	65	74	74	115	113	127	121	126
Theydon Road	92	340	343	347	346	348	163	344	84	120	126	337	335	341	351	551
B1393 Epping Rd (W) *R/A*	87	115	115	120	117	126	203	120	75	98	98	111	111	111	110	112

Junction 10 (Theydon Road) - Epping	2026 *Signals Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Rd (East) *L/A*	28	140	151	174	168	216	95	358	17	21	21	108	97	154	135	162
Theydon Road	15	160	162	165	164	165	96	163	12	48	57	160	158	162	169	302
B1393 Epping Rd (West) *R/A*	17	98	96	115	105	137	290	126	22	47	47	106	105	113	108	117

Junction 10: Theydon Road Signals, Epping - Mitigation Option Test (2026 and 2036)

Junction 10 (Theydon Road) - Epping									2026 *Signals Maximum DoS Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Rd (E) *L/A*		55	56	58	57	61	62	78		45	46	46	46	47	48	61
B1393 Epping Rd (E) *A*		38	39	40	40	43	43	42		27	28	28	28	29	29	39
Theydon Road (L)		61	61	63	63	66	61	67		29	29	31	31	31	28	18
Theydon Road (R)		65	66	65	65	69	67	74		73	74	74	73	75	76	84
B1393 Epping Rd (W) *A*		29	29	29	29	30	30	31		37	38	40	39	43	43	51
B1393 Epping Rd (W) *R/A*		33	33	34	34	34	34	36		43	44	46	45	50	49	58

Junction 10 (Theydon Road) - Epping									2026 *Signals Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Rd (E) *L/A*		12	12	13	12	14	14	23		9	9	9	9	9	10	15
B1393 Epping Rd (E) *A*		8	8	8	8	9	9	8		5	5	5	5	5	6	9
Theydon Road (L)		6	6	6	6	6	6	6		3	3	3	3	3	3	2
Theydon Road (R)		7	8	8	7	8	8	8		10	10	10	10	10	11	19
B1393 Epping Rd (W) *A*		5	5	5	5	5	5	5		7	7	8	7	9	9	12
B1393 Epping Rd (W) *R/A*		5	5	5	5	5	5	5		7	8	8	8	10	9	13

Junction 10 (Theydon Road) - Epping									2036 *Signals Maximum DoS Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Rd (E) *L/A*		64	65	69	67	76	78	86		52	53	53	53	55	59	72
B1393 Epping Rd (E) *A*		45	46	49	48	55	54	78		32	32	33	32	34	36	82
Theydon Road (L)		66	66	71	68	75	70	73		31	31	35	35	35	28	14
Theydon Road (R)		71	73	72	68	76	80	83		77	78	79	77	80	82	97
B1393 Epping Rd (W) *A*		33	32	34	34	34	35	76		45	47	50	48	58	59	93
B1393 Epping Rd (W) *R/A*		38	37	39	39	46	47	57		51	53	57	55	65	65	80

Junction 10 (Theydon Road) - Epping									2036 *Signals Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B1393 Epping Rd (E) *L/A*		15	16	18	17	22	24	28		11	11	11	11	12	14	18
B1393 Epping Rd (E) *A*		9	10	11	11	13	12	26		6	6	6	6	7	7	25
Theydon Road (L)		6	6	7	7	7	7	7		3	3	3	3	3	3	2
Theydon Road (R)		9	9	9	8	9	10	10		11	11	11	11	12	13	36
B1393 Epping Rd (W) *A*		6	6	6	6	6	6	23		9	10	11	10	14	14	33
B1393 Epping Rd (W) *R/A*		6	6	6	6	6	6	1		10	11	12	12	16	16	22

Junction 12: Four Wantz Roundabout, Ongar - No Mitigation (2026)

Junction 12 (Wantz Service Stn) - Ongar	2012 *Roundabout Maximum RFC Values*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B184 Fyfield Road	0.67	0.95	0.93	0.96	0.95	0.99	0.99	0.94
A414 Chelmsford Road	0.86	1.14	1.13	1.15	1.15	1.18	1.17	1.15
B184 High Street	0.71	1.00	0.97	1.00	0.99	1.03	1.01	0.95
A414 Epping Road	0.54	0.91	0.90	0.91	0.91	0.96	0.94	0.89

	PM PEAK							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B184 Fyfield Road	0.57	1.02	0.99	1.02	1.00	1.06	1.05	0.98
A414 Chelmsford Road	0.52	0.69	0.68	0.69	0.69	0.71	0.70	0.68
B184 High Street	0.75	1.08	1.06	1.08	1.07	1.13	1.11	1.03
A414 Epping Road	0.76	1.07	1.04	1.07	1.08	1.12	1.10	1.04

Junction 12 (Wantz Service Stn) - Ongar	2012 *Roundabout Maximum Queue Lengths*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B184 Fyfield Road	2	12	10	13	12	18	17	11
A414 Chelmsford Road	6	81	77	84	85	98	95	86
B184 High Street	3	23	16	23	20	33	26	13
A414 Epping Road	1	9	8	10	10	15	13	8

	PM PEAK							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B184 Fyfield Road	1	22	17	23	19	34	29	15
A414 Chelmsford Road	1	2	2	2	2	2	2	2
B184 High Street	3	57	47	60	56	84	74	35
A414 Epping Road	3	53	41	55	56	85	72	40

Junction 12: Four Wantz Roundabout, Ongar - Mitigation Option Test (2026 and 2036)

Junction 12 (Wantz Service Stn) - Ongar	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B184 Fyfield Road		0.66	0.65			0.69	0.68	0.65		0.70	0.67			0.77	0.78	0.67
A414 Chelmsford Road		0.84	0.85			0.86	0.86	0.85		0.54	0.53			0.55	0.55	0.53
B184 High Street		0.74	0.72			0.76	0.74	0.71		0.83	0.80			0.84	0.85	0.80
A414 Epping Road		0.68	0.67			0.72	0.72	0.69		0.76	0.75			0.80	0.80	0.77

Junction 12 (Wantz Service Stn) - Ongar	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B184 Fyfield Road		2	2			2	2	2		3	3			4	4	3
A414 Chelmsford Road		6	6			7	7	7		1	1			1	1	1
B184 High Street		4	3			4	4	3		5	4			6	5	4
A414 Epping Road		2	2			3	3	2		3	3			4	4	3

Junction 12 (Wantz Service Stn) - Ongar	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B184 Fyfield Road		0.88	0.83			0.94	0.94	0.86		0.97	0.99			1.00	1.00	0.98
A414 Chelmsford Road		1.00	0.97			0.99	1.01	0.99		0.64	0.66			0.70	0.66	0.65
B184 High Street		0.92	0.89			0.96	0.93	0.87		0.97	0.97			0.97	1.00	0.94
A414 Epping Road		0.93	0.89			0.97	0.98	0.95		0.92	0.91			0.98	0.97	0.92

Junction 12 (Wantz Service Stn) - Ongar	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
B184 Fyfield Road		9	6			17	14	7		78	50			139	114	39
A414 Chelmsford Road		51	40			78	76	60		2	2			3	2	2
B184 High Street		17	11			28	21	8		42	31			75	61	19
A414 Epping Road		13	10			31	24	13		12	9			32	24	12

Junction 13: Coopers Hill Roundabout, Ongar - No Mitigation (2026)

Junction 13 (Coopers Hill) - Marden Ash (Ongar)	2026 *Roundabout Maximum RFC Values*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A113 Coopers Hill	0.96	1.40	1.37	1.41	1.39	1.45	1.43	1.34
A128 Brentwood Road	0.66	0.83	0.83	0.83	0.89	0.90	0.84	0.84
A113 Stanford Rivers Road	0.37	0.68	0.68	0.68	0.69	0.71	0.69	0.55
St. James Avenue	0.04	0.10	0.10	0.10	0.10	0.11	0.10	0.08

Arm	**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A113 Coopers Hill	0.73	1.09	1.08	1.10	1.13	1.17	1.11	0.98
A128 Brentwood Road	0.53	0.72	0.73	0.73	0.74	0.75	0.74	0.71
A113 Stanford Rivers Road	0.77	1.14	1.12	1.15	1.16	1.20	1.16	1.03
St. James Avenue	0.09	0.34	0.35	0.35	0.39	0.42	0.38	0.35

Junction 13 (Coopers Hill) - Marden Ash (Ongar)	2026 *Roundabout Maximum Queue Lengths*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A113 Coopers Hill	14	231	203	240	224	269	252	187
A128 Brentwood Road	2	5	5	5	7	8	5	5
A113 Stanford Rivers Road	1	2	2	2	2	2	2	1
St. James Avenue	0	0	0	0	0	0	0	0

Arm	**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A113 Coopers Hill	3	49	44	52	64	78	57	17
A128 Brentwood Road	1	3	3	3	3	3	3	2
A113 Stanford Rivers Road	3	62	54	64	69	83	68	25
St. James Avenue	0	0	0	0	1	1	1	0

Junction 13: Coopers Hill Roundabout, Ongar - Mitigation Option Test (2026 and 2036)

Junction 13 (Coopers Hill) - Marden Ash (Ongar)	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A113 Coopers Hill		0.81	0.80		0.81	0.84	0.82	0.79		0.69	0.68		0.72	0.74	0.71	0.67
A128 Brentwood Road		0.66	0.66		0.71	0.72	0.67	0.66		0.53	0.54		0.55	0.56	0.54	0.51
A113 Stanford Rivers Road		0.45	0.46		0.45	0.48	0.46	0.37		0.73	0.72		0.75	0.75	0.73	0.66
St. James Avenue		0.04	0.04		0.04	0.04	0.04	0.03		0.06	0.07		0.06	0.07	0.06	0.05

Junction 13 (Coopers Hill) - Marden Ash (Ongar)	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A113 Coopers Hill		4	3		4	5	4	3		2	2		2	2	2	1
A128 Brentwood Road		2	2		2	2	2	1		1	1		1	1	1	1
A113 Stanford Rivers Road		1	1		1	1	1	0		3	2		3	3	3	2
St. James Avenue		0	0		0	0	0	0		0	0		0	0	0	0

Junction 13 (Coopers Hill) - Marden Ash (Ongar)	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A113 Coopers Hill		0.99	0.98		1.01	1.01	1.01	0.99		0.87	0.85		0.93	0.96	0.90	0.83
A128 Brentwood Road		0.86	0.84		0.96	0.99	0.88	0.85		0.70	0.71		0.75	0.76	0.74	0.65
A113 Stanford Rivers Road		0.67	0.68		0.70	0.71	0.69	0.50		0.94	0.92		0.97	0.99	0.95	0.81
St. James Avenue		0.06	0.06		0.06	0.06	0.06	0.05		0.10	0.10		0.12	0.12	0.11	0.07

Junction 13 (Coopers Hill) - Marden Ash (Ongar)	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
A113 Coopers Hill		48	30		51	88	72	33		7	5		12	21	9	4
A128 Brentwood Road		7	6		17	23	8	5		2	2		2	3	3	1
A113 Stanford Rivers Road		2	2		2	2	2	1		14	11		23	38	20	4
St. James Avenue		0	0		0	0	0	0		0	0		0	0	0	0

Junction 19: Piercing Hill / Coppice Row Priority Junction, Theydon Bois - No Mitigation (2026)

Junction 19 (Piercing Hill) - Theydon Bois	2026 *Priority Junction Maximum RFC Values*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill	0.89	1.11	1.13	1.12	1.12	1.13	1.15	1.17
B172 Coppice Road (E) R-T	0.32	0.36	0.37	0.37	0.36	0.37	0.37	0.38
The Green	0.76	0.96	0.98	0.97	0.97	0.98	0.99	0.98
B172 Coppice Road (W) R-T	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06

	PM PEAK							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill	0.66	0.82	0.85	0.83	0.82	0.84	0.86	0.87
B172 Coppice Road (E) R-T	0.40	0.47	0.48	0.48	0.47	0.49	0.49	0.51
The Green	0.80	1.00	1.02	1.01	1.00	1.01	1.03	1.02
B172 Coppice Road (W) R-T	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Junction 19 (Piercing Hill) - Theydon Bois	2026 *Priority Junction Maximum Queue Lengths*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill	6	27	30	29	28	30	33	37
B172 Coppice Road (E) R-T	0	1	1	1	1	1	1	1
The Green	3	9	10	10	9	10	11	10
B172 Coppice Road (W) R-T	0	0	0	0	0	0	0	0

	PM PEAK							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill	2	4	5	4	4	5	5	6
B172 Coppice Road (E) R-T	1	1	1	1	1	1	1	1
The Green	4	12	14	13	13	14	14	14
B172 Coppice Road (W) R-T	0	0	0	0	0	0	0	0

Note: Results for Piercing Hill and The Green approach arms were incorrectly entered in the reporting tables contained in Technical Note 4.

Junction 19: Piercing Hill / Coppice Row Priority Junction, Theydon Bois - Mitigation Option Test (2026 and 2036)

Junction 19 (Piercing Hill) - Theydon Bois	2026 *Priority Junction Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill L A		0.81	0.83	0.82			0.84	0.87		0.63	0.65	0.64			0.66	0.67
Piercing Hill R A		0.55	0.55	0.55			0.56	0.56		0.35	0.35	0.35			0.36	0.36
B172 Coppice Road (E) R-T		0.36	0.37	0.37			0.37	0..38		0.47	0.48	0.48			0.49	0.51
The Green L A		0.62	0.63	0.63			0.64	0.63		0.63	0.64	0.64			0.65	0.65
The Green R A		0.45	0.46	0.45			0.46	0.46		0.49	0.49	0.49			0.50	0.50
B172 Coppice Road (W) R-T		0.06	0.06	0.06			0.06	0.06		0.08	0.08	0.08			0.08	0.08

Junction 19 (Piercing Hill) - Theydon Bois	2026 *Priority Junction Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill L A		4	4	4			4	5		2	2	2			2	2
Piercing Hill R A		1	1	1			1	1		1	1	1			1	1
B172 Coppice Road (E) R-T		1	1	1			1	1		1	1	1			1	1
The Green L A		2	2	2			2	2		2	2	2			2	2
The Green R A		1	1	1			1	1		1	1	1			1	1
B172 Coppice Road (W) R-T		0	0	0			0	0		0	0	0			0	0

Junction 19 (Piercing Hill) - Theydon Bois	2036 *Priority Junction Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill L A		1.06	1.12	1.09			1.17	1.21		0.78	0.85	0.81			0.89	0.92
Piercing Hill R A		0.66	0.68	0.67			0.69	0.69		0.44	0.46	0.45			0.49	0.49
B172 Coppice Road (E) R-T		0.40	0.42	0.41			0.43	0.45		0.53	0.56	0.55			0.58	0.62
The Green L A		0.80	0.84	0.82			0.87	0.84		0.79	0.83	0.82			0.86	0.85
The Green R A		0.56	0.59	0.57			0.61	0.59		0.58	0.61	0.6			0.62	0.61
B172 Coppice Road (W) R-T		0.07	0.07	0.07			0.07	0.07		0.08	0.09	0.09			0.09	0.09

Junction 19 (Piercing Hill) - Theydon Bois	2036 *Priority Junction Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill L A		16	22	19			27	34		3	5	4			6	7
Piercing Hill R A		2	2	2			2	2		1	1	1			1	1
B172 Coppice Road (E) R-T		1	1	1			1	1		1	1	1			1	2
The Green L A		3	4	4			5	4		3	4	4			5	4
The Green R A		1	1	1			1	1		1	1	1			2	2
B172 Coppice Road (W) R-T		0	0	0			0	0		0	0	0			0	0

Junction 19: Piercing Hill / Coppice Row Priority Junction, Theydon Bois - Mitigation Alternative Test (2026 and 2036)

Junction 19 (Piercing Hill) - Theydon Bois									2026 Roundabout *Maximum RFC Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill		0.73	0.75	0.74			0.75	0.75		0.51	0.51	0.51			0.52	0.52
B172 Coppice Road (E) R-T		0.51	0.52	0.52			0.53	0.53		0.46	0.47	0.47			0.47	0.47
The Green		0.42	0.42	0.42			0.42	0.42		0.62	0.64	0.63			0.65	0.63
B172 Coppice Road (W) R-T		0.45	0.45	0.45			0.45	0.47		0.40	0.41	0.40			0.42	0.42

Junction 19 (Piercing Hill) - Theydon Bois									2026 Roundabout *Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill		3	3	3			3	3		1	1	1			1	1
B172 Coppice Road (E) R-T		1	1	1			1	1		1	1	1			1	1
The Green		1	1	1			1	1		2	2	2			2	2
B172 Coppice Road (W) R-T		1	1	1			1	1		1	1	1			1	1

Junction 19 (Piercing Hill) - Theydon Bois									2036 Roundabout *Maximum RFC Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill		0.83	0.86	0.84			0.87	0.86		0.57	0.59	0.58			0.60	0.61
B172 Coppice Road (E) R-T		0.63	0.65	0.63			0.67	0.65		0.54	0.55	0.54			0.55	0.56
The Green		0.49	0.50	0.50			0.51	0.50		0.73	0.78	0.76			0.81	0.77
B172 Coppice Road (W) R-T		0.50	0.51	0.50			0.51	0.55		0.46	0.48	0.47			0.49	0.51

Junction 19 (Piercing Hill) - Theydon Bois									2036 *Roundabout Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Piercing Hill		5	6	5			6	6		1	1	1			2	1.55
B172 Coppice Road (E) R-T		2	2	2			2	2		1	1	1			1	1.24
The Green		1	1	1			1	1		3	3	3			4	3.19
B172 Coppice Road (W) R-T		1	1	1			1	1		1	1	1			1	1.03

Junction 21: M25 Junction 26 Northern Roundabout, Waltham Abbey - No Mitigation (2026 and 2036)

Junction 21 (M25 J26 Northern RAB) - Waltham Abbey	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Old Shire Lane	0.17	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.13	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Honey Lane RAB Link	0.38	0.43	0.41	0.44	0.44	0.43	0.43	0.43	0.52	0.62	0.63	0.64	0.64	0.63	0.63	0.61
M25 Off Slip	0.24	0.27	0.27	0.27	0.28	0.27	0.27	0.27	0.40	0.47	0.48	0.49	0.49	0.48	0.48	0.46
Honey Lane	0.33	0.46	0.41	0.47	0.47	0.47	0.46	0.42	0.20	0.28	0.28	0.31	0.31	0.29	0.29	0.26

Junction 21 (M25 J26 Northern RAB) - Waltham Abbey	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Old Shire Lane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Honey Lane RAB Link	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
M25 Off Slip	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Honey Lane	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0

Junction 21 (M25 J26 Northern RAB) - Waltham Abbey	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Old Shire Lane					0.25								0.19			
Honey Lane RAB Link					0.51								0.77			
M25 Off Slip					0.31								0.59			
Honey Lane					0.63								0.43			

Junction 21 (M25 J26 Northern RAB) - Waltham Abbey	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Old Shire Lane					0								0			
Honey Lane RAB Link					1								4			
M25 Off Slip					0								2			
Honey Lane					2								1			

Junction 22: M25 Junction 26 Southern Roundabout, Waltham Abbey - No Mitigation (2026)

Junction 22 (M25 J26 Southern RAB) - Waltham Abbey	*2026 Roundabout Maximum RFC Values*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
M25 Off Slip	0.34	0.42	0.41	0.44	0.44	0.42	0.42	0.42
A121 Honey Lane	0.97	1.24	1.20	1.33	1.32	1.30	1.29	1.37
A121 Dowding Way	0.38	0.46	0.46	0.47	0.47	0.47	0.47	0.47
Honey Lane RAB Link	0.46	0.56	0.53	0.60	0.61	0.57	0.57	0.55

	PM PEAK							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
M25 Off Slip	0.26	0.33	0.33	0.34	0.34	0.34	0.33	0.33
A121 Honey Lane	0.75	0.94	0.94	0.98	0.97	0.96	0.96	1.00
A121 Dowding Way	0.49	0.67	0.68	0.73	0.72	0.72	0.71	0.77
Honey Lane RAB Link	0.48	0.55	0.55	0.57	0.57	0.56	0.56	0.57

Junction 22 (M25 J26 Southern RAB) - Waltham Abbey	*2026 Roundabout Maximum Queue Lengths*							
Arm	**AM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
M25 Off Slip	1	1	1	1	1	1	1	1
A121 Honey Lane	17	151	129	205	195	192	186	268
A121 Dowding Way	1	1	1	1	1	1	1	1
Honey Lane RAB Link	1	1	1	2	2	1	1	1

	PM PEAK							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
M25 Off Slip	0	0	0	1	1	1	1	0
A121 Honey Lane	3	12	12	18	18	15	15	26
A121 Dowding Way	1	2	2	3	3	3	2	3
Honey Lane RAB Link	1	1	1	1	1	1	1	1

Junction 22: M25 Junction 26 Southern Roundabout, Waltham Abbey - Mitigation Option Test (2026 and 2036)

Junction 22 (M25 J26 Southern RAB) - Waltham Abbey	2026 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
M25 Off Slip		0.62	0.61	0.63		0.63		0.62		0.44	0.43	0.45		0.45		0.45
A121 Honey Lane		0.73	0.71	0.77		0.75		0.76		0.70	0.69	0.72		0.70		0.69
A121 Dowding Way		0.47	0.47	0.50		0.49		0.49		0.63	0.62	0.64		0.62		0.66
Honey Lane RAB Link		0.61	0.59	0.66		0.62		0.59		0.59	0.58	0.61		0.59		0.60

Junction 22 (M25 J26 Southern RAB) - Waltham Abbey	2026 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
M25 Off Slip		2	1	2		2		2		1	1	1		1		1
A121 Honey Lane		3	2	3		3		3		2	2	2		2		2
A121 Dowding Way		1	1	2		1		2		2	2	2		3		3
Honey Lane RAB Link		1	1	2		1		1		1	1	1		1		1

Junction 22 (M25 J26 Southern RAB) - Waltham Abbey	2036 *Roundabout Maximum RFC Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
M25 Off Slip		0.73	0.70	0.78		0.74		0.73		0.51	0.51	0.53		0.53		0.54
A121 Honey Lane		0.87	0.79	0.94		0.88		0.90		0.83	0.82	0.89		0.85		0.81
A121 Dowding Way		0.59	0.56	0.63		0.60		0.64		0.77	0.77	0.85		0.84		0.98
Honey Lane RAB Link		0.73	0.64	0.83		0.74		0.69		0.65	0.66	0.70		0.68		0.70

Junction 22 (M25 J26 Southern RAB) - Waltham Abbey	2036 *Roundabout Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
M25 Off Slip		3	2	4		3		3		1	1	1		1		1
A121 Honey Lane		6	4	15		7		10		4	4	7		5		4
A121 Dowding Way		2	2	3		3		4		5	5	10		12		72
Honey Lane RAB Link		2	2	5		3		2		1	2	2		2		2

Junction 24: Meridian Way Signals, Waltham Abbey - No Mitigation (2026)

Junction 24 (Station Road) - Waltham Abbey	*2026 Signals Maximum DoS Values*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive	22	24	24	24	24	24	24	24	34	36	36	36	36	36	36	36
B194 Highbridge St (E)	111	143	150	153	154	157	161	143	89	105	109	113	110	115	111	112
Meridian Way	95	103	104	107	107	108	107	113	61	68	69	68	70	67	70	67
A121 Station Road	98	93	93	91	94	92	91	92	89	103	106	106	107	110	111	113

Junction 24 (Station Road) - Waltham Abbey	*2026 Signals Maximum Queue Lengths*															
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
B194 Highbridge St (E)	73	195	226	230	243	249	264	185	19	49	65	78	70	89	73	71
Meridian Way	24	41	44	54	54	60	54	78	12	16	16	16	16	15	16	16
A121 Station Road	23	20	21	19	21	20	20	20	35	88	108	113	121	144	154	165

Junction 24: Meridian Way Signals, Waltham Abbey - Mitigation Option Test (2026 and 2036)

Junction 24 (Station Road) - Waltham Abbey									*2026 Signals Maximum DoS Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive			2		2		2				1		1		1	
B194 Highbridge St E *(L A)*			65		67		68				57		59		60	
B194 Highbridge St E *(R)*			66		68		69				59		61		62	
Meridian Way *(L)*			60		62		63				35		35		35	
Meridian Way *(R)*			50		50		50				64		64		64	
A121 Station Road *(L A)*			24		24		25				36		37		38	
A121 Station Road *(A)*			26		26		26				38		38		39	
A121 Station Road *(R)*			60		60		60				56		56		58	

Junction 24 (Station Road) - Waltham Abbey									*2026 Signals Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive			0		0		0				0		0		0	
B194 Highbridge St E *(L A)*			15		15		16				10		10		10	
B194 Highbridge St E *(R)*			16		17		17				11		11		11	
Meridian Way *(L)*			9		10		10				5		5		5	
Meridian Way *(R)*			3		3		3				4		4		4	
A121 Station Road *(L A)*			4		4		4				8		8		8	
A121 Station Road *(A)*			5		5		5				9		9		9	
A121 Station Road *(R)*			7		7		7				8		8		8	

Junction 24 (Station Road) - Waltham Abbey									*2036 Signals Maximum DoS Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive			2		2		2				1		1		1	
B194 Highbridge St E *(L A)*			76		78		80				64		65		67	
B194 Highbridge St E *(R)*			77		79		81				66		67		69	
Meridian Way *(L)*			70		76		78				39		41		40	
Meridian Way *(R)*			55		55		56				68		71		73	
A121 Station Road *(L A)*			27		28		28				44		44		46	
A121 Station Road *(A)*			29		29		29				45		46		48	
A121 Station Road *(R)*			69		74		75				65		66		69	

Junction 24 (Station Road) - Waltham Abbey									*2036 Signals Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive			0		0		0				0		0		0	
B194 Highbridge St E *(L A)*			19		20		21				12		12		13	
B194 Highbridge St E *(R)*			20		22		23				13		14		14	
Meridian Way *(L)*			12		13		14				5		6		6	
Meridian Way *(R)*			3		3		3				5		5		5	
A121 Station Road *(L A)*			5		5		5				10		10		11	
A121 Station Road *(A)*			6		6		6				11		11		12	
A121 Station Road *(R)*			9		9		9				10		10		11	

Junction 24: Meridian Way Signals, Waltham Abbey - Mitigation Alternative (2026 and 2036)

Junction 24 (Station Road) - Waltham Abbey									*2026 Roundabout Maximum RFC Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive			-		-		-				-		-		-	
B194 Highbridge St E			0.73		0.76		0.77				0.62		0.64		0.64	
Meridian Way			0.63		0.65		0.70				0.48		0.48		0.48	
A121 Station Road			0.57		0.56		0.57				0.83		0.84		0.84	

Junction 24 (Station Road) - Waltham Abbey									*2026 Roundabout Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive			-		-		-				-		-		-	
B194 Highbridge St E			2		3		3				1		1		1	
Meridian Way			2		2		2				1		1		1	
A121 Station Road			1		1		1				4		5		5	

Junction 24 (Station Road) - Waltham Abbey									*2036 Roundabout Maximum RFC Values*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive			-		-		-				-		-		-	
B194 Highbridge St E			0.87		0.92		0.94				0.73		0.76		0.76	
Meridian Way			0.84		0.92		0.96				0.56		0.58		0.57	
A121 Station Road			0.62		0.63		0.63				0.96		0.97		0.99	

Junction 24 (Station Road) - Waltham Abbey									*2036 Roundabout Maximum Queue Lengths*							
Arm	**AM PEAK**								**PM PEAK**							
	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C	Base	Low A	Low B	Med A	Med B	Amb A	Amb B	Amb C
Beaulieu Drive			-		-		-				-		-		-	
B194 Highbridge St E			7		12		17				2		3		3	
Meridian Way			6		11		19				1		1		1	
A121 Station Road			1		1		1				15		19		38	