IS04

Epsom and Ewell Local Plan Strategic Transport Model Assessment Report

Results and Analysis

October 2024

Transport Studies

SURREY COUNTY COUNCIL

Amendment List

Issue/ Revision	Date	Officers	Reviewed by	Comment
1	23/10/24	SP, JL, PM, AH, GJ	GJ, AH, WB	First issue
2	14/11/24	GJ, AH	PM	Amended the text in the Section named Link Analysis: Level of Service (LoS) Metric and Network Hotspots Table 12 (links and junctions)

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Introduction

Regulation 19 Appraisal

Epsom and Ewell Borough Council is in the process of developing their 2040 Local Plan to ensure future growth can be accommodated within the borough. Surrey County Council (SCC) has been commissioned to assess the potential impact of the development site options using the County's strategic transport model SINTRAM.

The overall aim is to help inform the decision making surrounding the suitability of potential development sites, and to highlight where mitigation should be focussed. This will aid the borough by providing the transport evidence base to inform the Regulation 19 consultation.

Organisation of this Report

This report will detail the results and analysis of the forecasts, together with an overview of the key findings from the modelling.

The Results and Analysis section of this report considers the following aspects:

- Caveats
- Scenarios
- Site Allocations
- Scenario Overview
- Mode Share and Vehicle Routeing of the Largest Sites
- Link Analysis
- Level of Service (LoS) Metric
- Junction Analysis
- The Motorway and Trunk Road Network
- Cross Boundary Impacts
- Network Hotspots and Mitigation

This report concludes by summarising the Strategic Transport Model Assessment and highlighting the main points which have arisen.

The figures and tables in this report are designed for viewing in print and at standard scales, but they have a resolution that enables them to be viewed on-screen with a reasonable level of zoom to facilitate reading and discerning details. All figures are orientated to grid north.

Results and Analysis

Caveats

It is important to recognise that all models have limitations, including strategic models such as SINTRAM and its associated Local Models. Strategic models cannot represent accurately every individual journey made by every mode and route. They are also not precise in the way they

replicate specific individual behaviour and the interaction between vehicles. There are many factors that impact people's travel behaviour and the day-to-day variation in congestion which are random and impossible to predict.

The model is strategic in nature and has good validation at this level, but caution must be exercised, and potentially further data collection required if the model outputs are to be used in detailed junction assessments. The strategic nature of this model and its findings do not in any way reduce the need for individual development sites to have detailed, local transport assessments carried out which may identify additional specific impacts on the network (e.g., junction congestion) that require mitigation.

The strategic transport model has not been adjusted for Covid-19. In the context of this assessment, the analysis is based on a comparison between scenarios with and without Local Plan focussing on differences rather than absolute flows and delays. The impacts can be considered worst case as a result of the underlying vehicle demand being higher than is likely to be the case in 2040.

Understanding the limitations of a model is key to making the best use of it and taking advantage of its strengths. The reasonable expectation from this model is that it is able to estimate the likely route choice of transport users, and the resulting average levels of congestion. The results from this model are only one element of a much wider evidence base needed to be considered in the development of further policy documents.

Scenarios

The presented results represent modelled forecast traffic impacts on highways for the forecast year 2040 taken from the Local Model unless explicitly stated, for the two scenarios:

- 2040 Do-Minimum. This includes completions and commitments within the borough since 2019, significant recent completions and commitments outside of the borough, and natural traffic growth
- 2040 Do-Something. This is a copy of the 2040 Do-Minimum scenario **plus** Local Plan development sites and windfalls.

To understand the impacts of the Local Plan sites, the Do-Something scenario is compared with the Do-Minimum

The accompanying *Technical Annex* describes the forecasting of growth within and outside the borough in more detail.

Unless stated, the results are for Epsom and Ewell Borough. Specific analysis with regards to impacts on the motorway and trunk road network, which is situated outside of the borough, is presented later in the report in the relevant sections.

Results within this report are for the average weekday AM peak hour 0800 – 0900 and PM peak hour 1700 – 1800.

Site Allocations

For reference, Local Plan site allocations for the Do-Something scenario are displayed on maps shown in Figure 1 and Figure 2 in terms of net increases in residents and jobs respectively. Note that where there are net reductions in jobs or dwellings these are not shown. Table 1 lists all the proposed sites with net increase in dwellings and jobs.

At this stage, site access arrangements are indicative and do not represent final locations or junction configurations, as these would be determined later in the planning process for the individual sites when this level of detail is known.

Figure 1 Location of Epsom and Ewell Local Plan Residential Sites with Values showing the Net Increase in Dwellings

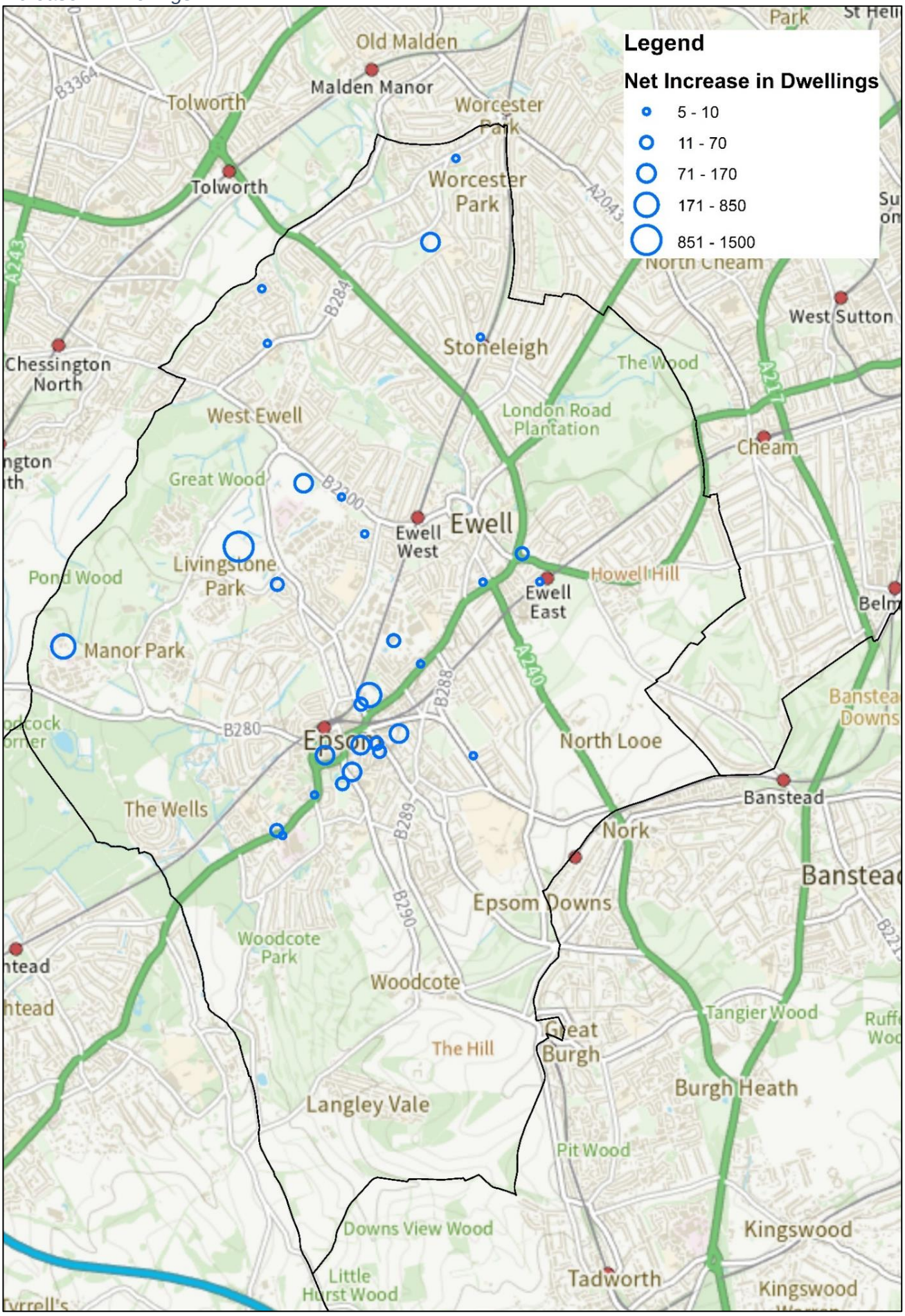


Figure 2 Location of Epsom and Ewell Local Plan Commercial Sites with Values showing the Net Increase in Jobs

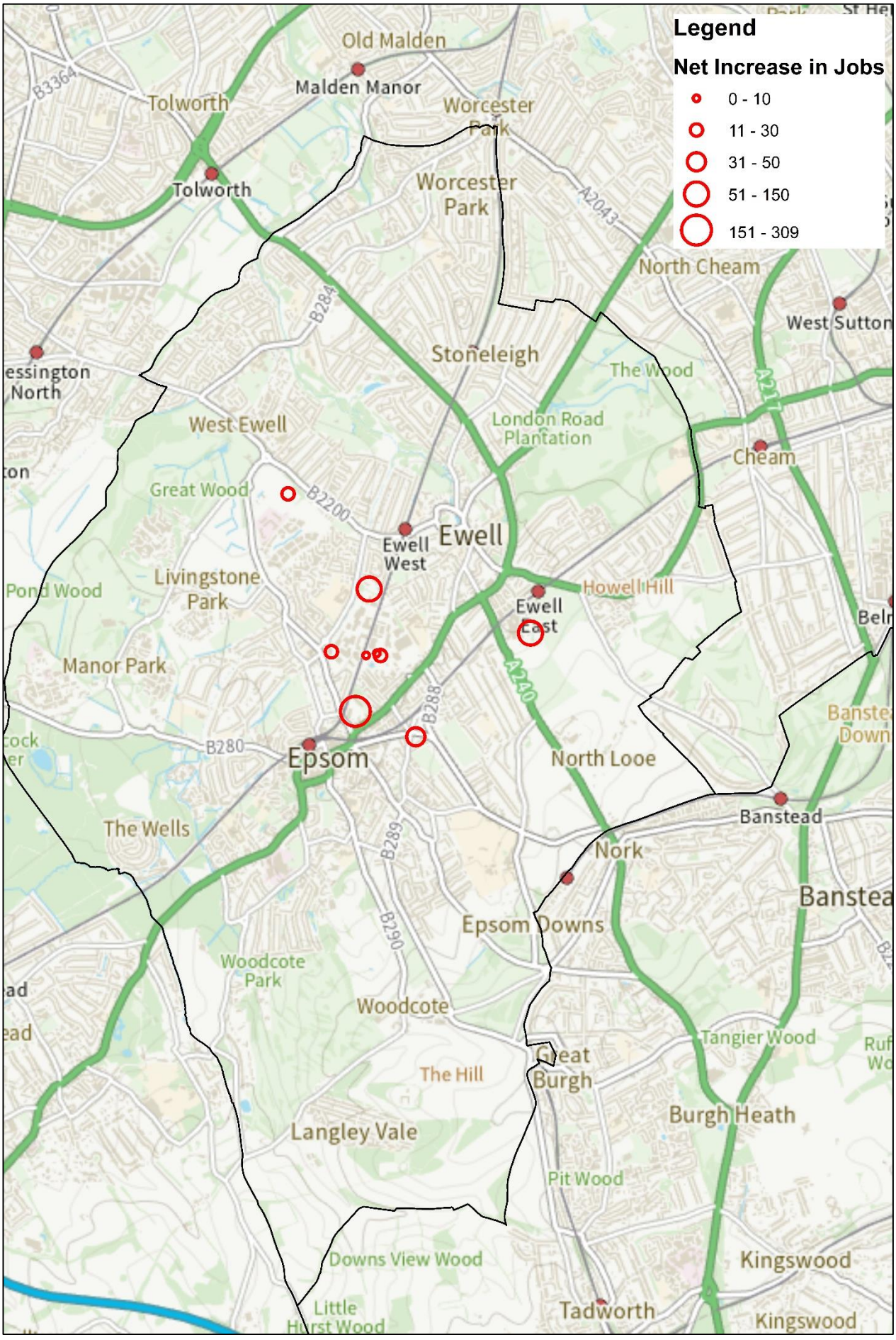


Table 1 Local Plan Site Allocations and Windfalls

Site	Net Increase in Dwellings	Net Increase in Jobs
Hook Road Car Park and SGN Site	800	309
Town Hall	75	-171
Hope Lodge	25	0
Depot Road & Upper High Street Car Parks	100	0
The Ashley Centre and Global House	100	0
Land at West Park Hospital plus community hospital	200	0
Horton Farm	1,500	0
Land at Chantilly Way	30	0
Hook Road Arena	100	30
Swail House	100	0
Finachem House, 2-4 Ashley Road	21	0
Land at Kiln Lane (Site 3) (corner of Kiln Lane & Conifer Park)	40	23
Hatch Furlong Nursery	30	-3
Land rear of Rowe Hall, Salisbury Road	93	0
20 Hook Road, Solis House	25	0
Gibraltar Crescent	0	128
Blenheim House, 1 Blenheim Road	0	11
Wilsons - Longmead / Kiln Lane (Site 1) (square site-Conifer Park)	0	2
Wilsons - Longmead / Kiln Lane (Site 2) (triangular site-Conifer Park)	0	10
Former Dairy Crest Site, 4 Alexandra Road	0	50
Nescot, Reigate Road	0	150
7 Station Approach, Stoneleigh	10	-7
35 Alexandra Road	8	0
Epsom Lodge, 1 Burgh Heath Road	-2	0
Garages at Somerset Close & Westmorland Close	6	0
46 The Avenue, Worcester Park	7	0
26 Reigate Road	5	0
Etwelle House, Station Road	10	-9
Crane Court/Rowden Rd (Garage)	6	0
140-142 Ruxley Lane West Ewell Surrey	7	0
Corner of Kiln Lane & East Street [101B East Street]	5	-2
Richards Field Car Park	7	0
64 South Street, Epsom	6	-8
22-24 Dorking Road	18	0
63 Dorking Road	8	-21
Epsom Clinic, Church Street	15	-32
SITE ALLOCATION TOTAL	3,355	460
Windfalls	922	0
ALLOCATIONS PLUS WINDFALLS TOTAL	4,277	460

The total amount of housing included in the Local Plan housing trajectory, which was tested in this Strategic Transport Model Assessment is 5,693 units between 2020 and 2040. In addition to the site allocations listed above, this figure includes (a) committed development either completed since 2019 or sites with extant planning permission, expected to be delivered within the Local Plan period (included in the Do-Minimum scenario) and (b) a small sites (windfall) allowance totalling 922 dwellings included in the Do-Something option only.

Scenario Overview

The matrix totals for all vehicles (car, LGV and HGV) are presented in Table 2. These totals relate to the entire local model. As expected, the Do-Minimum scenario has the least total trips and Do-Something the most. The total number of vehicle trips in the Do-Something scenario increases by 1.5% in the AM peak hour, and 0.9% in the PM peak hour, compared to Do-Minimum.

Table 2 Vehicle Trip Matrix Totals by Scenario, Whole Model

Scenario	AM Peak Hour (0800 – 0900)			PM Peak Hour (1700 – 1800)		
	Vehicles per Hour	Difference from Do-Min	% Change	Vehicles per Hour	Difference from Do-Min	% Change
Do-Minimum	87,892			85,256		
Do-Something	89,260	1,277	1.5%	85,994	738	0.9%

The number of person trips by mode travelling to and from the borough are presented in Table 3. Note vehicles refer to the number of people travelling by car, LGV or HGV and are estimated based on vehicle occupancy values from the Department for Transport's (DfT) TAG data book - GOV.UK (www.gov.uk).

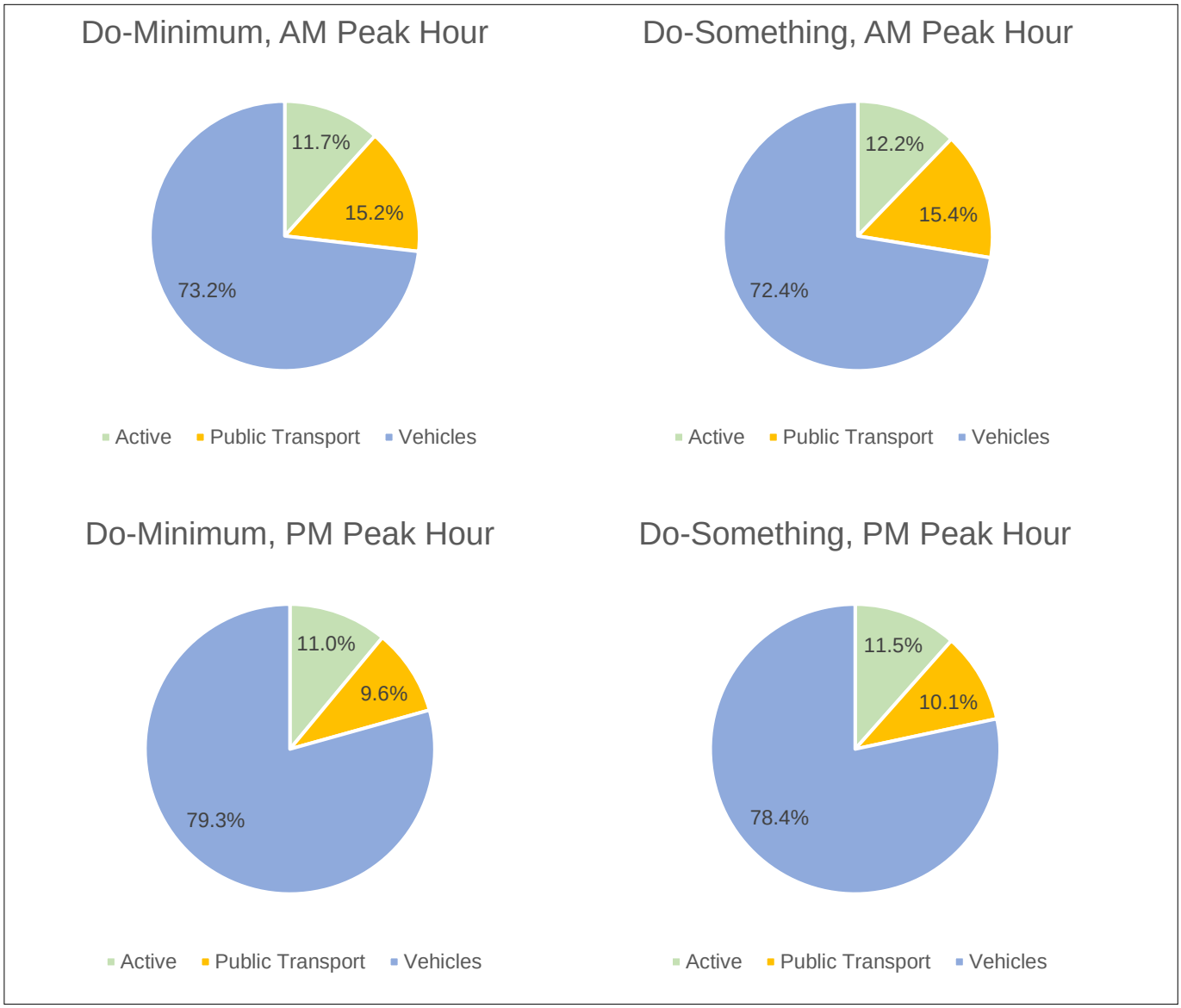
Compared with the Do-Minimum scenario, the Do-Something scenario gives an increase in active mode trips, which are walk and cycle estimates, of 18% in the AM peak and 16% in the PM peak. The estimate of active travel is calculated from the choice model within the larger SINTRAM model. Public Transport similarly increases by 14% in the AM peak, and by 16% in the PM peak. This is an increase in patronage of around 770 people in the AM peak and 490 people in the PM peak. The number of people using vehicles has a lower increase of 11% in the AM peak and 9% in the PM peak.

As also shown in Figure 3 the vehicle mode share reduces in the Do-Something compared with the Do-Minimum. For example, in the AM peak the active mode share is 0.5% higher and the public transport mode share is 0.2% higher than the Do-Minimum, with a corresponding fall in vehicle mode share of -0.7%. This change in mode share is impacted by increased road congestion, but also the location of sites in relation to proximity to amenities such as schools and shops within walking and cycle distance, as well as public transport connectivity. This is discussed further in the next section.

Table 3 Trip End Totals by Scenario for Epsom and Ewell only in Units of Person Trips, where Vehicles Refer to the Number of People travelling by Car, LGV and HGV

Mode	Do-Minimum		Do-Something	
	AM Peak Hour (0800 – 0900)	PM Peak Hour (1700 – 1800)	AM Peak Hour (0800 – 0900)	PM Peak Hour (1700 – 1800)
Active	4,244	3,514	4,994	4,079
Public Transport	5,514	3,077	6,285	3,565
Vehicles	26,603	25,302	29,608	27,678
Absolute Change				
Active			750	565
Public Transport			771	488
Vehicles			3,005	2,375
Percentage Change				
Active			18%	16%
Public Transport			14%	16%
Vehicles			11%	9%

Figure 3 Mode Share Comparison for all Trips Travelling to and from Epsom and Ewell



The total vehicle distance for the AM and PM peak hours is presented in Figure 4. Similarly, total vehicle travel time is presented in Figure 5 and average speed in Figure 6.

Total vehicle distance and travel time are greater in the AM than the PM peak hour in both the Do-Minimum (DM) and Do-Something (DS) scenarios, indicating that the AM peak hour is more congested. This is typical as peak commuting and education escort trips coincide, with speeds during the AM peak being slower than the PM as a result.

It can also be seen that due to the additional trips generated by Local Plan sites in the Do-Something scenario, total vehicle distance increases by 2.5% in the AM peak and 2% in the PM peak, with an associated increase in total travel time of 3.4% in the AM and 2.6% in the PM. This reflects both increased numbers of trips overall as well as increased delays on the network.

Compared with the Do-Minimum, speeds in the Do-Something scenario reduce by 0.1kph in the AM peak and increase by 0.3kph in the PM peak. An increase in speeds in the PM peak may seem counterintuitive, but is the result of the additional trips in the Do-Something scenario causing complex and interrelated changes in travel patterns such as re-routeing both of existing and new trips as well as modal shift. This is discussed in more detail in the Link Analysis section.

Figure 4 Peak Hour Total Vehicle-Kilometres per Scenario for Epsom and Ewell Borough

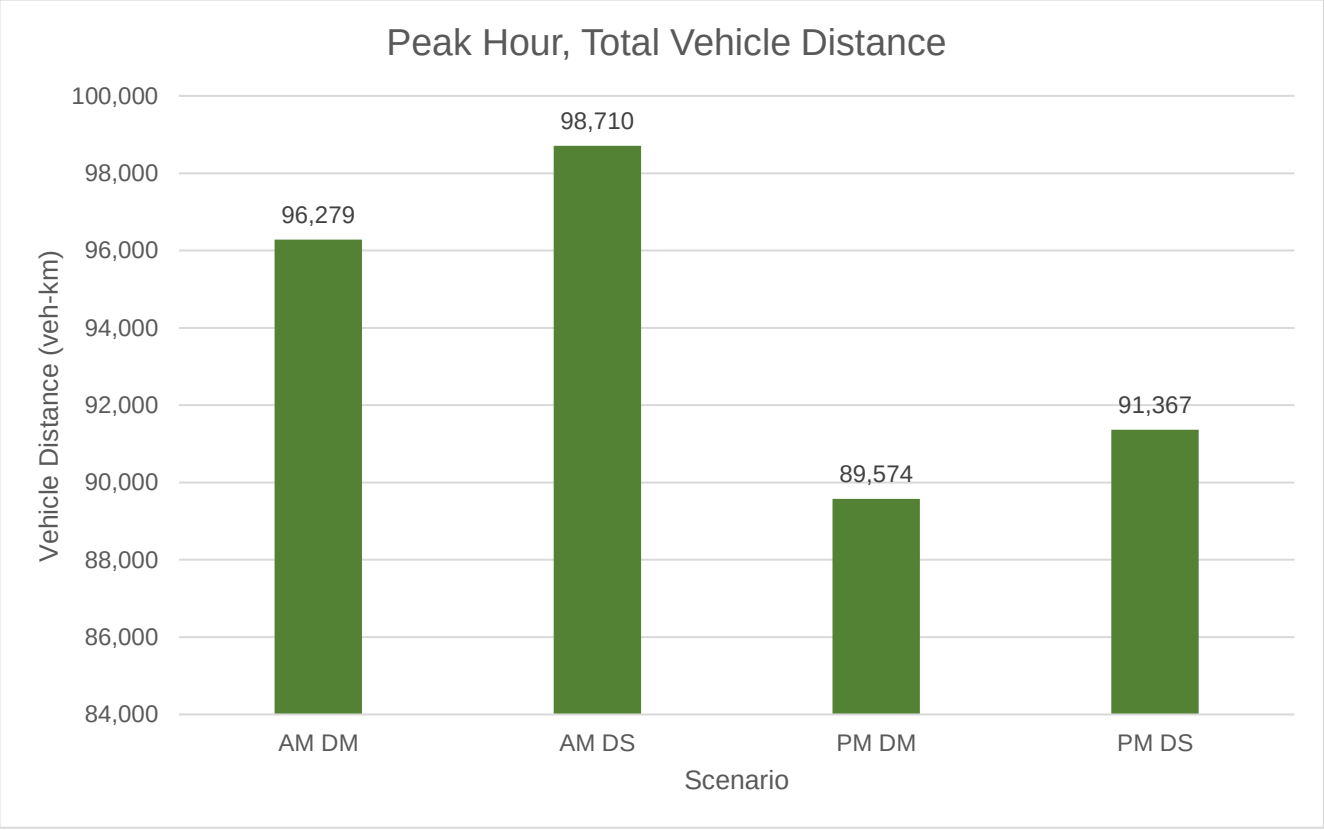


Figure 5 Peak Hour Total Vehicle-Hours per Scenario for Epsom and Ewell Borough

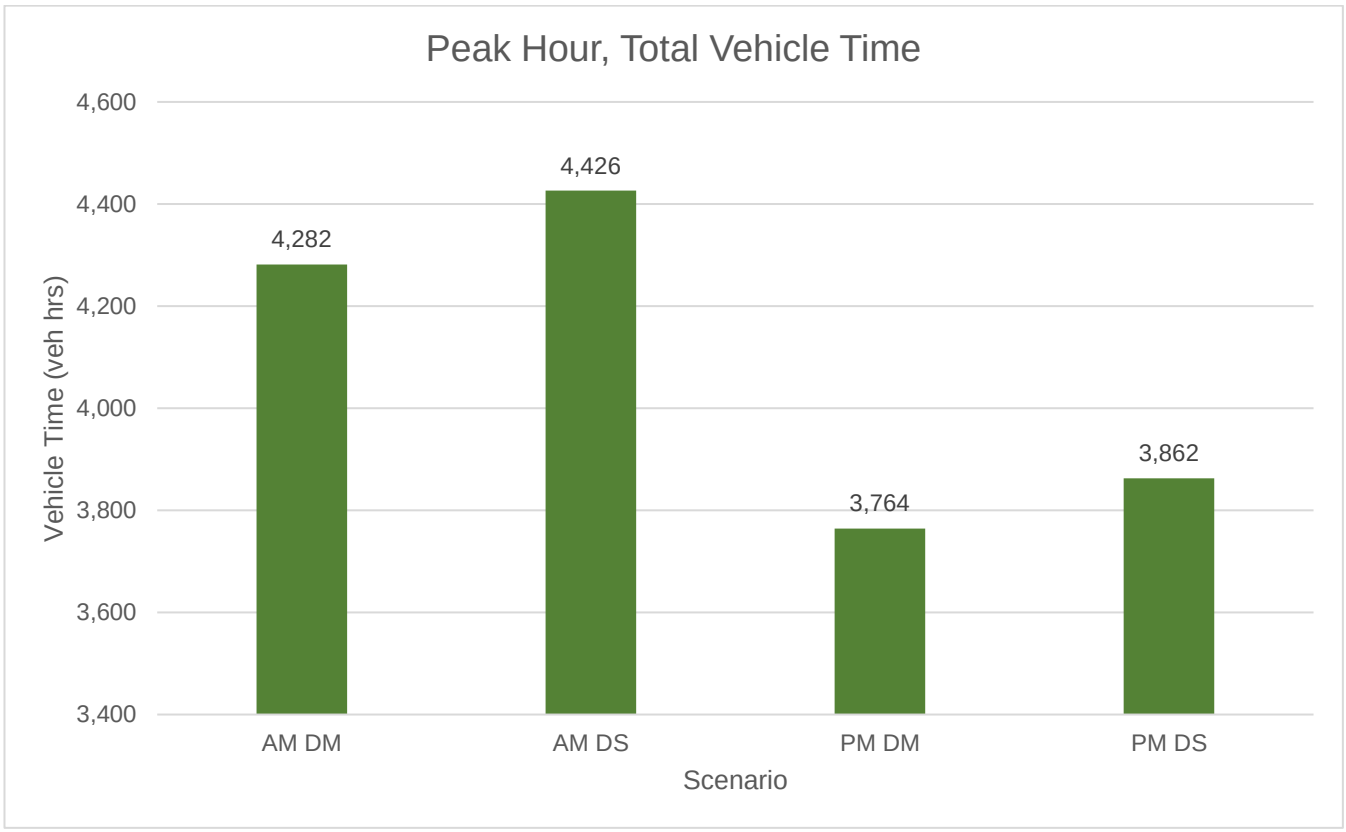
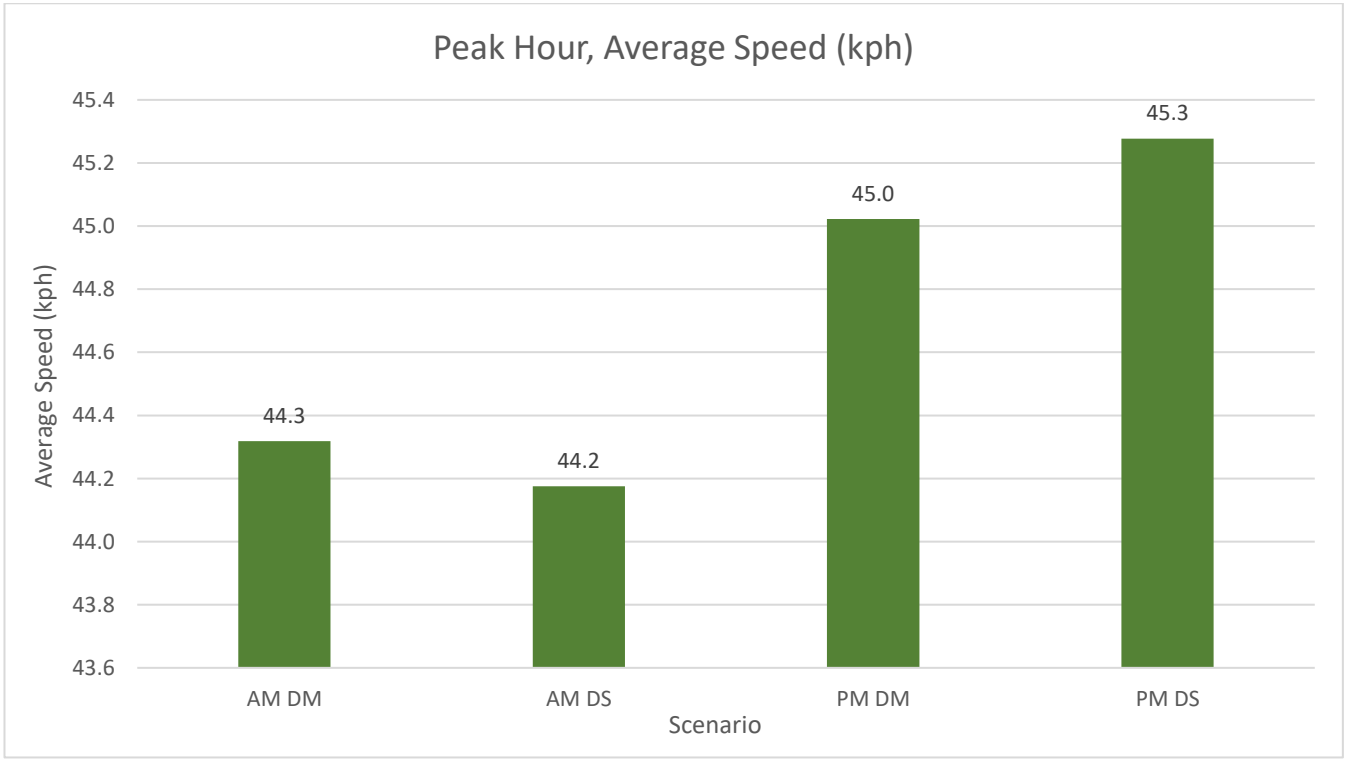


Figure 6 Peak Hour Average Link Speed for Epsom and Ewell Borough



Mode Share and Vehicle Routeing of the Largest Sites

In this section, the mode share and vehicle routeing associated with the largest sites is presented for the Local Plan Do-Something scenario, to help visualise and understand the highway impact and reliance on the car. The sites evaluated have a net increase in dwellings and/or jobs equal to or greater than 100 and are listed below. Excluding windfalls, they make up 86% of the net increase in residential dwellings in the Do-Something scenario with the remaining 14% coming from smaller sites mostly situated in the vicinity of Epsom Town centre and Worcester Park.

- Horton Farm (1,500 net dwellings)
- Hook Road Car Park and SGN (800 net dwellings and 309 net jobs)
- NESCOT (150 net jobs)
- Land at West Park Hospital (200 net dwellings)
- Hook Road Arena (100 net dwellings and 30 net jobs)
- Gibraltar Crescent (128 net jobs)
- Depot Road and Upper High Street Car Parks (100 net dwellings)
- The Ashley Centre and Global House (100 net dwellings)
- Swail House (100 net dwellings)

The select link plots presented below show the potential routeing of all vehicles (car, LGV and HGV) accessing and egressing the allocation sites and therefore allow analysis of the contribution of each individual site towards the changes in flow on the surrounding network. In the listed figures, all values have been labelled, and the geographical context has not been limited to Epsom and Ewell. Where it aids clarity, only values greater than 20 vehicles per hour have been shown.

The mode share values for each site present the estimated number of person trips travelling by active modes (walk and cycle), public transport (rail and bus), and cars. LGVs and HGVs have been excluded as they make up a very small percentage and measures to influence these are much more limited as they predominantly relate to deliveries or trade at residential sites and job type for commercial sites. Furthermore, switching from goods vehicle modes to active or public transport is not practical in most circumstances.

The estimate of active travel share is the same in both time periods as this is only calculated from the choice model within the larger SINTRAM model which provides an all-day average value which has been weighted by the total trips per time period.

Estimations of car users have been obtained from vehicle trip matrices and vehicle occupancy values from the Department for Transport's (DfT) TAG data book - GOV.UK (www.gov.uk).

Note these values should not be relied on as part of any subsequent planning applications as the underlying values and/or assumptions may have changed. Furthermore, the mode share estimations do not consider the quality of the walk, cycle, public transport or vehicle routes, just simply time and distance of competing modes and routes. Planning applications should closely assess route quality to major attractors, for example in terms of safety, surfacing, width and

perception, to assist in the delivery of successful development sites which offer good travel by a variety of modes and for residents and visitors not to be solely reliant on the car.

Horton Farm

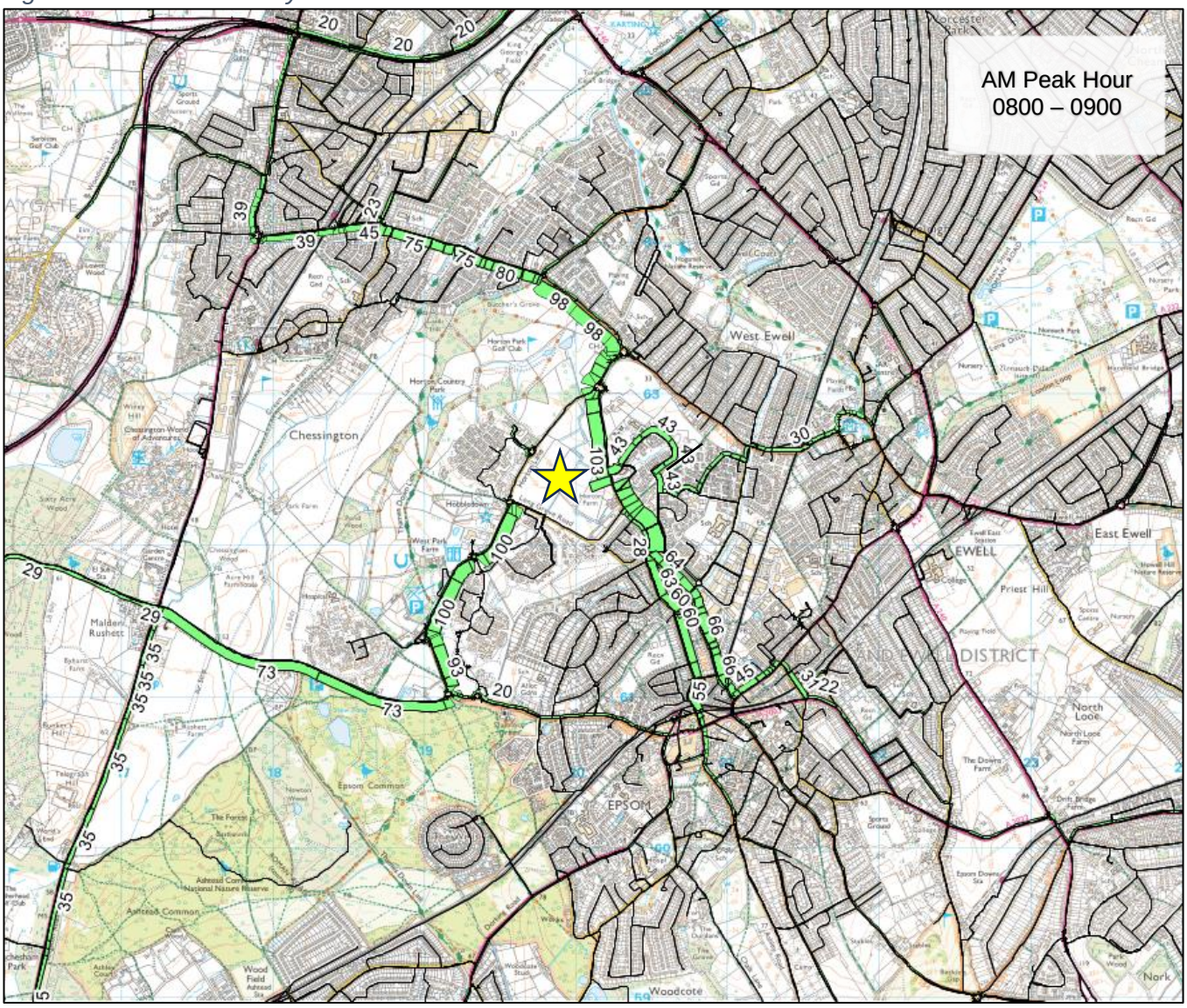
Horton Farm is the largest residential only site with a net increase of 1,500 dwellings, and with the exception of the commercial sites, Horton Farm has one of the highest shares of car use with a mode share of 65% in the AM peak and 69% in the PM peak. The public transport share is 24% and 21% for the AM and PM peaks respectively, and active modes 10% in both time periods.

The mode share for Horton Farm is similar to the other two residential sites at Hook Road Arena and Land at West Park Hospital which are similarly located in the north and west suburbs of Epsom with direct access to a limited number of bus services, but still just within walking and cycling distance of Epsom town centre itself. Although it has one of the highest car user shares of the residential sites, it is still relatively well located in terms of connecting with local amenities. The Horton Farm area is served by the E5 bus from Langley Vale to Watersedge via Epsom, operating approximately once per hour at irregular times Monday to Friday from the bus stop on B284 Hook Road. The E9 anticlockwise route operates at approximately 30 minute intervals Monday to Friday, providing 30 services per day, accessed via the bus stop on Chantilly Way.

Figure 7 presents the routeing of all vehicles to and from Horton Farm during the AM peak hour. Vehicles typically route away from Horton Farm in the morning to travel to work and school because it is a residential site, and they do this primarily along three routes.

Approximately 100 vehicles head southwest along Horton Lane to the roundabout junction with B280 Christ Church Road. From there the majority travel further afield via Malden Rushett, while the remainder travel east on the B280 towards Epsom town centre.

Figure 7 Select Link Analysis Plot for the Horton Farm Site in the AM Peak Hour



Around 100 vehicles travel north on the B284, with most going to Chessington and Hook. A handful of these join the A3 at Hook junction and travel northbound. Finally, approximately 130 vehicles move south and southeast along the B284 towards Epsom. However, many of these vehicles turn onto the primarily residential Temple Road to avoid the more congested B284 Hook Road on the way into Epsom town centre.

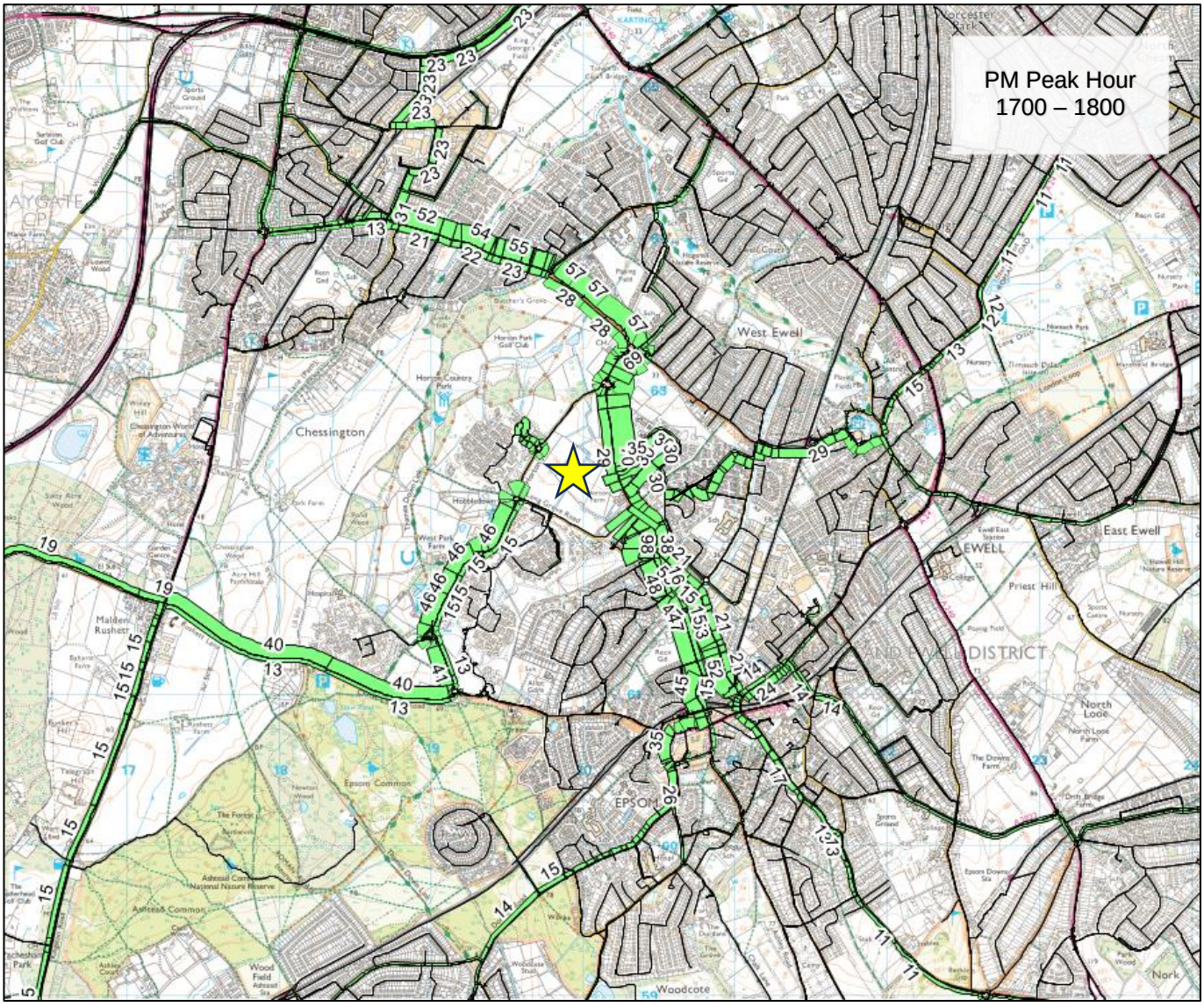
It must also be noted that around 30 vehicles move east towards Stoneleigh and West Ewell, and these cut residential roads such as Parkview Way before joining the B2200. On street a section of this route between Harvester Road and Parkview Way is restricted to buses and access only, however this is only enforced through signage and a narrow section rather than a physical barrier and as such in reality could be used by any vehicle. The modelling shows that the Horton Farm site would likely increase the number of vehicles which may choose to route this way to avoid congestion on main roads and as such the enforcement of this restriction may need to be reviewed.

As shown in Figure 8, in the PM peak hour trips to and from the Horton Farm site are generally the reverse of those in the AM peak hour, however overall trip numbers are lower. Approximately 45 vehicles head towards the site from the southwest along Horton Lane. Roughly 100 vehicles approach Horton Farm from the southeast, coming from Epsom, along the B284, with around half of these come from Temple Road, joining the B284 at the junction

with Lower Court Road. 70 vehicles approach from the north, coming from Chessington and Hook, with a handful of these coming from southbound on the A3. Finally, 30 vehicles approach from Parkview Way, originating near Ewell and Stoneleigh, again routeing via the restricted section described above.

Being the largest residential site of 1,500 dwellings and purely residential, residents of the potential Horton Farm site would need to travel to access work and education as well as shopping and leisure amenities. Although there are leisure facilities, nursery, a primary school and local shops within walking distance in the Long Grove Park area to the west of the site, if additional amenities were on site, the need for vehicle travel would be further reduced, and in travel terms the site would be more sustainable as these shorter distance trips would be more likely to be made using active modes. At the very least, high quality, safe walk and cycle connections across Chantilly Way would be necessary to help reduce car use and to enable residents to make use of these local amenities, from both the existing and proposed development sites.

Figure 8 Select Link Analysis Plot for the Horton Farm Site in the PM Peak Hour



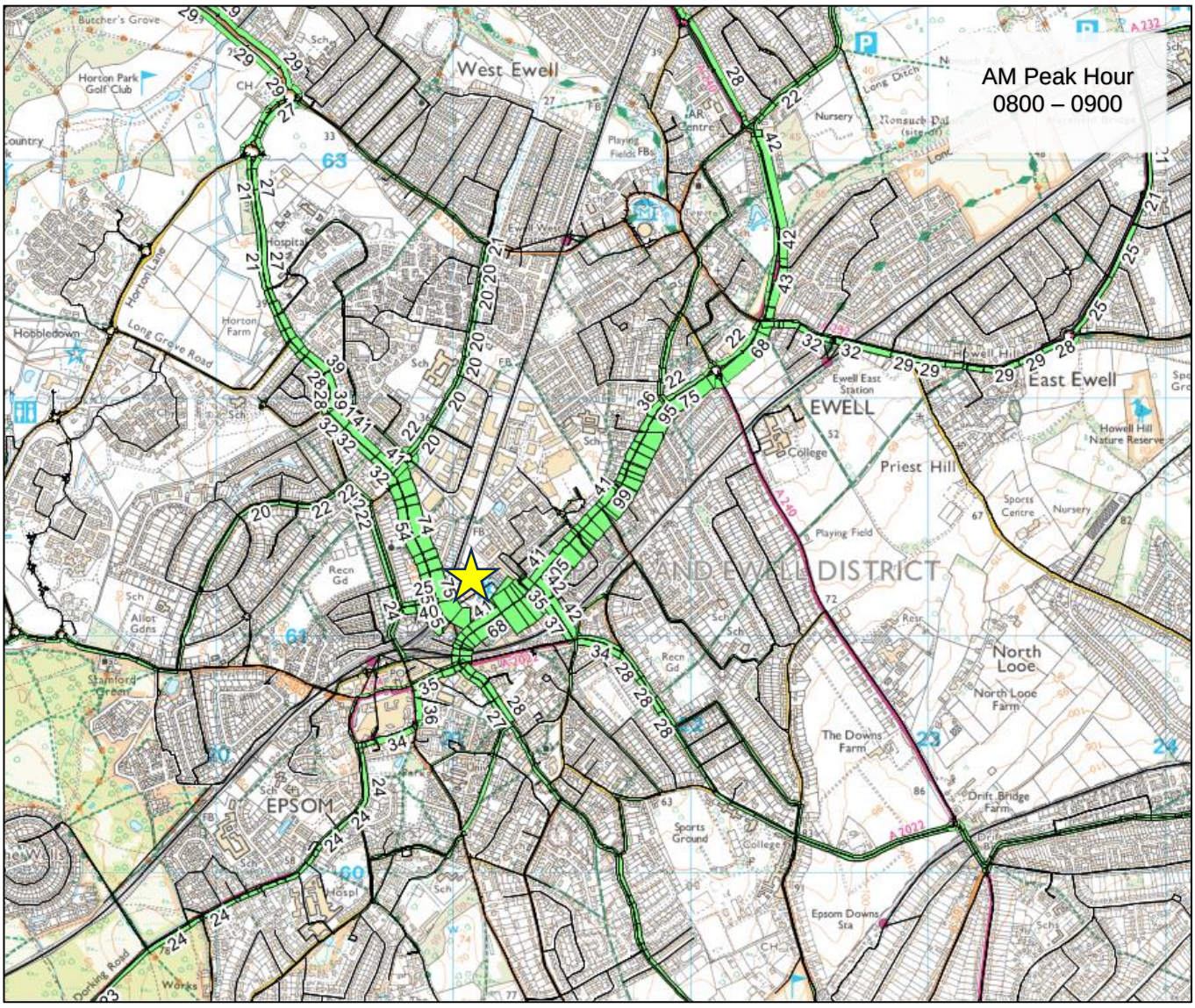
Hook Road Car Park and SGN

Hook Road Car Park and SGN is a mixed-use site comprising 800 net dwellings, 309 net adult education jobs, and public parking. The site has a relatively high car share for its location of 65% in the AM peak and 64% in the PM peak, predominantly due the commercial entity and public parking. Public transport makes up 22% and 24% for the AM and PM peak respectively, and active modes the remaining 13%.

Figure 9 presents the routeing for vehicles entering or exiting the proposed Hook Road Car Park and SGN site. Due to the proposed site having a relatively large projected increase in jobs (309), a big proportion of vehicles are heading towards the site during the AM peak. Primarily, these trips originate to the north, with over 100 vehicles approaching southbound on the A24, mostly from Ewell and Stoneleigh. 75 vehicles approach from the B284, originating in West Ewell, Chessington and Hook. A handful originate on the A3. 78 vehicles approach from the south, from the A24 Epsom one-way system, the A2022, and Church Street.

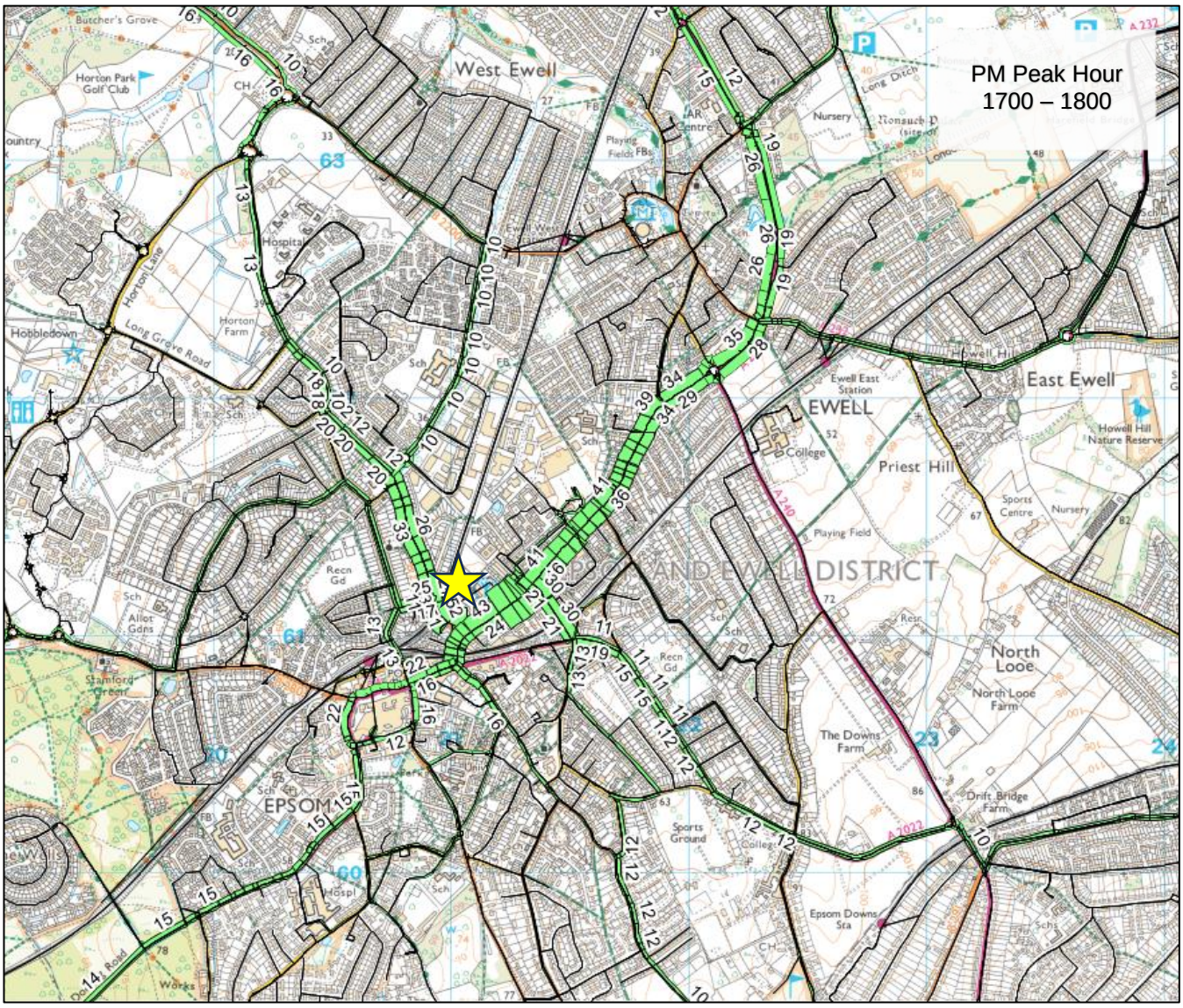
As the site also has a residential element, a number of vehicles leave the site in the AM peak hour. Approximately 83 vehicles head east on the A24 from Hook Road Car Park. Around half of these continue on towards Stoneleigh and Cheam, while the other half head southeast on the A2022. 55 vehicles travel north on the B284, towards West Ewell and Chessington, while approximately 45 vehicles travel south through Epsom, most of these westbound on the A24 towards Ashtead.

Figure 9 Select Link Analysis Plot for the Hook Road Car Park Site in the AM Peak Hour



In the PM peak hour, as shown in Figure 10, 41 vehicles travel northeast along the A24 from the Hook Road Car Park and SGN site, primarily destined for Stoneleigh, but also a handful for East Ewell. 33 vehicles go northbound on the B284 out of Epsom, most heading for Chessington, but also some for West Ewell. A small number of vehicles head south, using various roads such as the A24 westbound and the A2022. Conversely, 26 vehicles approach Hook Road Car Park from Chessington and West Ewell along the B284. 46 vehicles approach from the east on the A24, originating from Ewell, East Ewell and Stoneleigh. 22 vehicles approach from the Ewell one-way system to the west, while approximately 20 vehicles approach from the A2022 and Church Street. A low number of vehicles approach from Christ Church Road, but these route via Manor Green Road and Temple Road to avoid congestion on the one-way system.

Figure 10 Select Link Analysis Plot for the Hook Road Car Park Site in the PM Peak Hour



Nescot

Nescot is solely a commercial site with a net increase of 150 higher education jobs. The estimated mode share is the lowest for active being just 2%. The mode share for public transport is low too at 13% in the AM peak and 7% in the PM peak. This also makes it one of the highest shares of car users out of the analysed sites, with 85% and 91% in the AM and PM peaks respectively. However, the mode share for car is expected to be lower than modelled, and public transport higher, as these additional jobs only connect to the transport network to the south on A240 Reigate Road, unlike the rest of Nescot which also connects to footpaths which access Ewell East Station and the S2 bus service on A232 Cheam Road.

Although Nescot is not centrally located, with an approximately 30 minute walk from Epsom town centre, and a 20 minute walk from Ewell Village, it does have some good public transport connections. This includes the 406 and 409 bus services which run every 20 minutes between Epsom and Kingston upon Thames, and train services at Ewell East which can be accessed along the footpath at the rear of Nescot and connect to London, Epsom and Horsham, and conurbations in between.

Figure 11 presents the select link analysis for the additional development at Nescot in the AM peak hour. There is a low number of trips leaving this site in this time period, as would be expected for an educational site like this as most people arrive rather than leave in the AM peak, with the reverse being true in the PM peak. Almost all of the trips leaving in the AM peak route northbound on Reigate Road. The majority of these turn right and head northbound on the A24, towards Stoneleigh. A handful travel south on Reigate Road towards Nork. Most trips generated in the AM peak hour travel towards the site. Most of these approach from the A24 to the north of Nescot (46), primarily originating from Stoneleigh and the surrounding area, but some also from Cheam. 22 vehicles approach from Reigate Road to the north of the site, mainly originating in the West Ewell area.

Figure 11 Select Link Analysis Plot for the Nescot Site in the AM Peak Hour

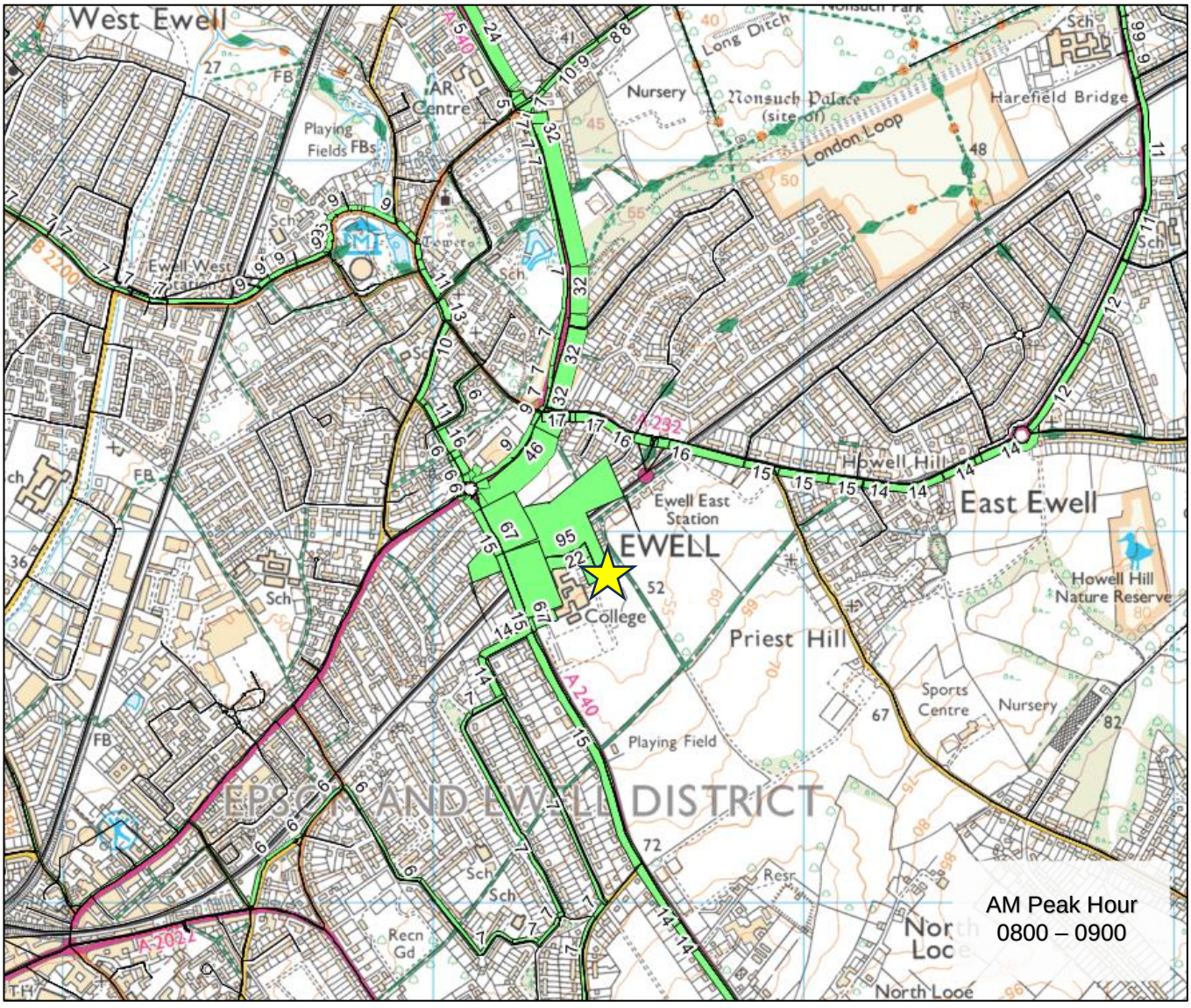
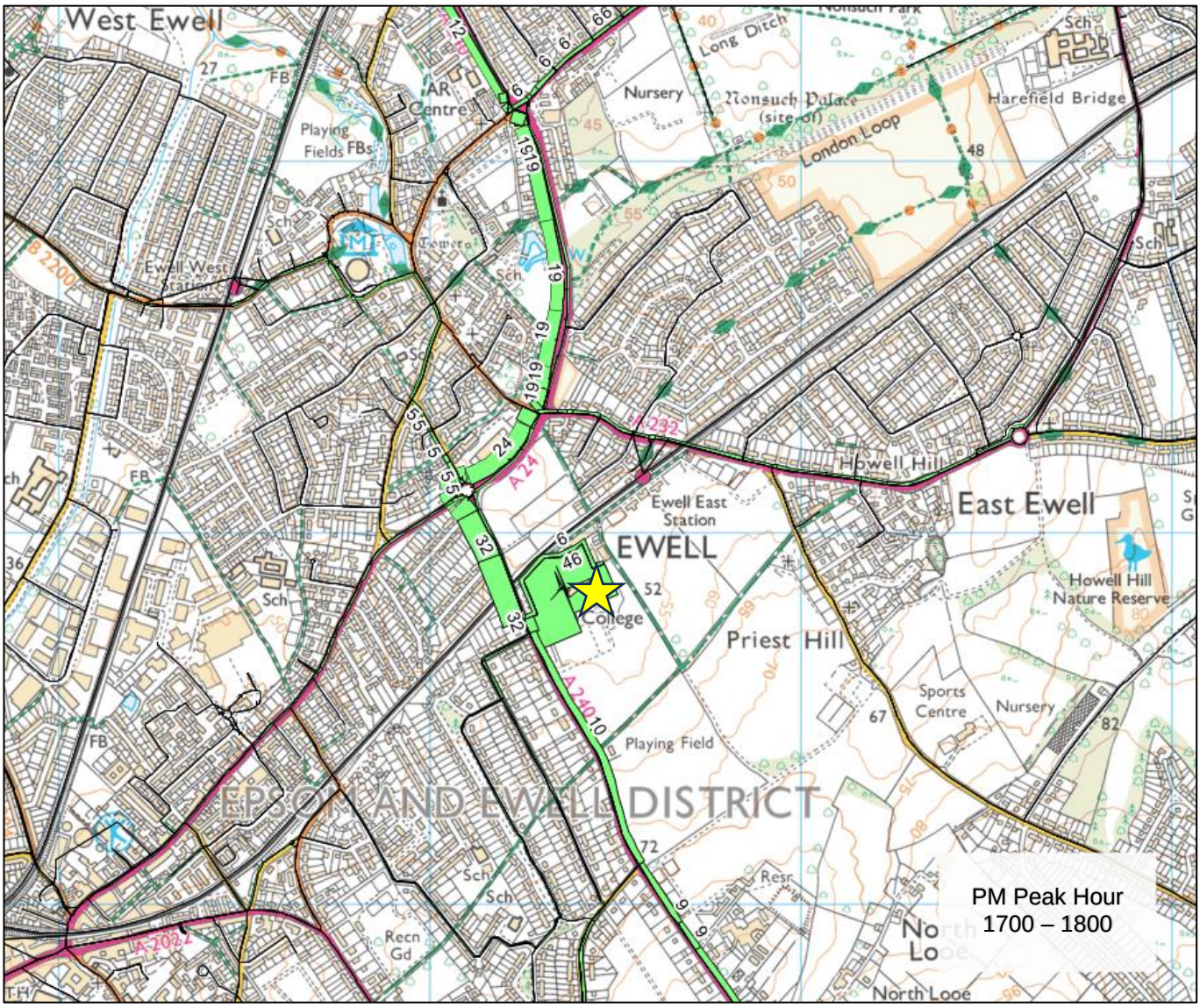


Figure 12 shows the select link analysis in the PM peak hour, most generated trips are leaving the site. They primarily route away from the site north on Reigate Road, then east on the A24 towards Stoneleigh. 10 vehicles travel south on Reigate Road, primarily travelling towards Nork, while some go northwest on Reigate Road towards Ewell West Train Station.

Figure 12 Select Link Analysis Plot for the Nescot Site in the PM Peak Hour



Land at West Park Hospital

The Land at West Park Hospital site has a net increase of 200 dwellings. The mode share for the site is 66% for car, 24% for public transport, and 11% for active modes during the AM peak hour, and 71% for car, 19% for public transport and 10% for active modes during the PM peak hour. The area is served by route E10 only, with a half hourly frequency between Noble Park and Epsom Town Centre operating 33 services per day. With more residential dwellings here, and at Horton Farm, there may be sufficient patronage to support increased bus services and increase the public transport mode share.

Figure 13 presents flows for the land at West Park Hospital in the AM peak hour. It is clear that vehicles primarily head south along Horton Lane towards the roundabout with Christ Church Road when leaving the site. Approximately 50% then turn right and go westbound towards Malden Rushett, and the other half turn left and travel towards Epsom. 11 vehicles head north on Horton Lane, most of which then turn towards Chessington.

Figure 13 Select Link Analysis Plot for the Land at West Park Hospital Site in the AM peak hour

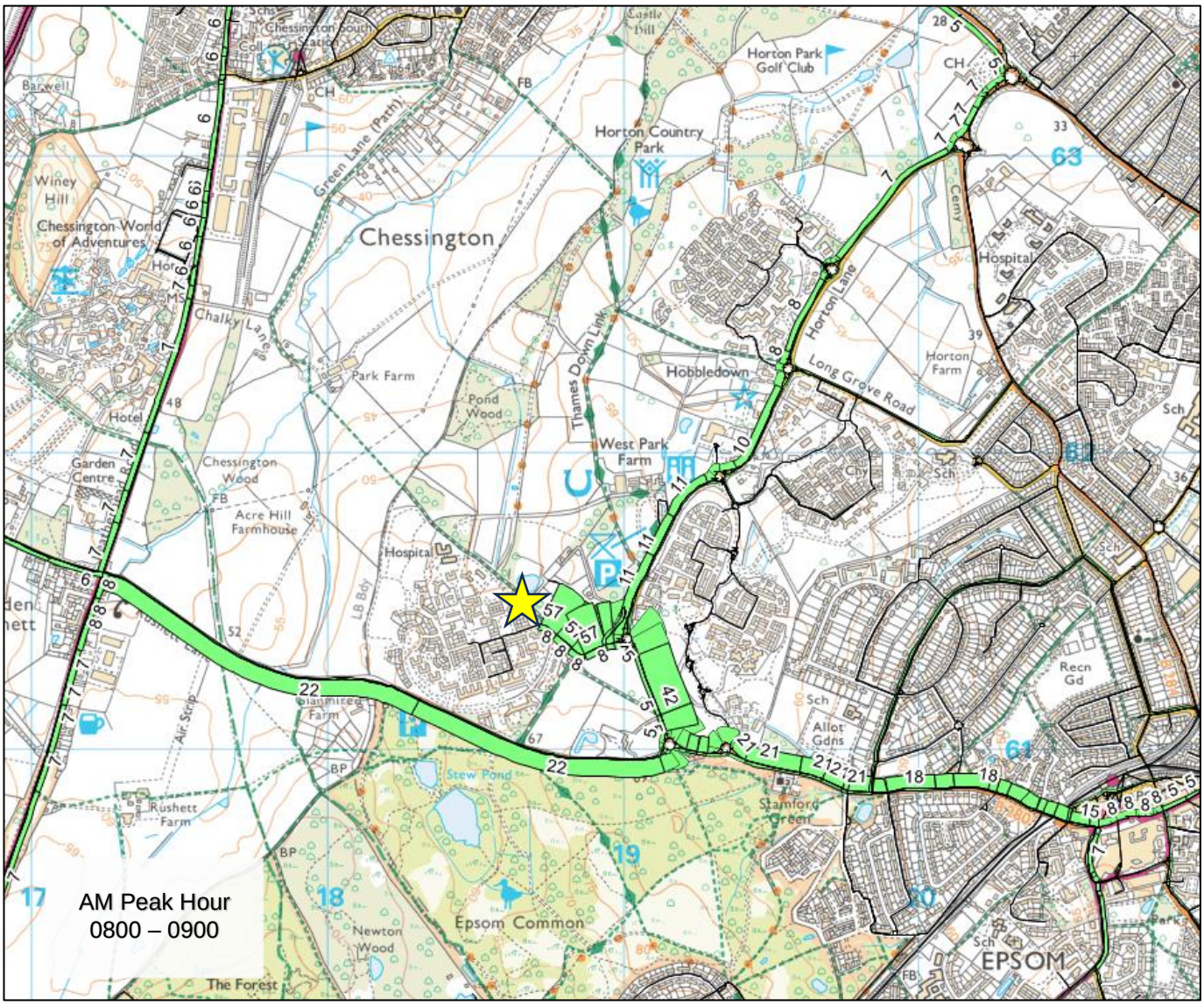
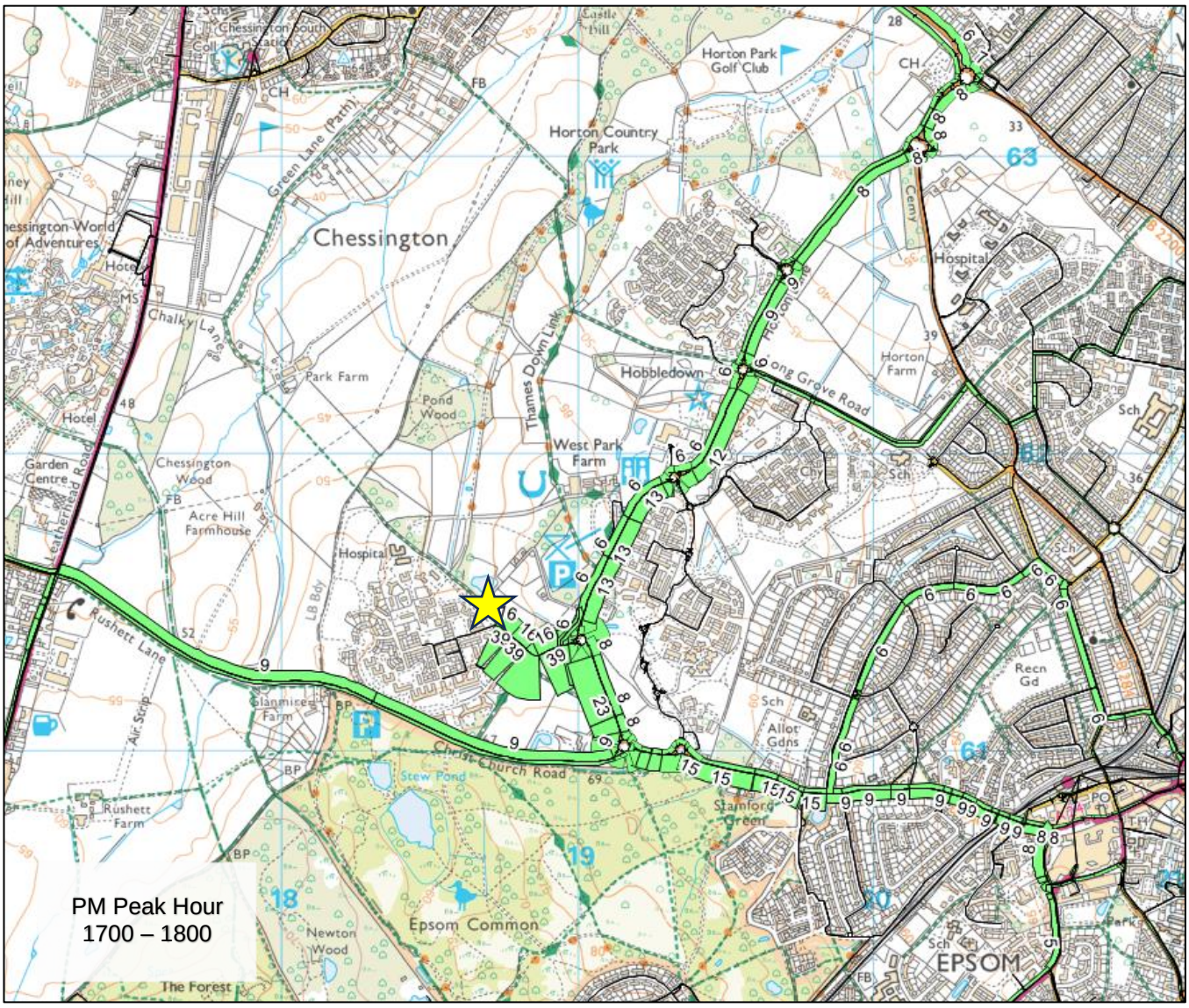


Figure 14 presents the select link analysis plots for the land at West Park Hospital site in the PM peak hour. In this time period, the majority of vehicles are travelling towards the site. Most come from the south, either coming from Malden Rushett, and turning left onto Horton Lane, or from Epsom. Most vehicles approaching from the north originate in or near Chessington. A small number of vehicles originate east of Epsom's one-way system, but route via Temple Road and Manor Green Road to avoid congestion. A handful of trips originate near West Ewell and use Long Grove Road to join Horton Lane to the northeast of West Park Hospital.

Figure 14 Select Link Analysis Plot for the Land at West Park Hospital Site in the PM peak hour



Hook Road Arena

Hook Road Arena comprises 100 net dwellings and 30 net sport and recreation jobs. It has similar patronage to the other suburban residential sites, but slightly higher car use due to the commercial element. In the AM peak the mode share is 70% car, 18% public transport and 12% active travel. In the PM peak the mode share is 76% car, 12% public transport and 12% active travel. Hook Road Arena is just over a 30 minute walk to both Epsom town centre and Ewell Village, but has relatively good accessibility by bus. The 418, 467, 668 and 868 bus services pass just north of the site along the B2200 Chessington Road connecting with Ewell, Epsom, Kington upon Thames, Hook, Worcester Park and North Cheam.

Figure 15 presents flows for the Hook Road Arena site in the AM peak hour. As a mostly residential site, most vehicles leave the site in the AM peak hour. 12 vehicles turn right out of the site, travelling north. Most of these then turn left and travel towards Hook. Several vehicles turn right and travel past Ewell West Station. 9 vehicles turn left out of the site and travel southbound on the B284, almost exclusively travelling into Epsom. A small number of vehicles travel south-west towards Malden Rushett along Horton Lane and Christ Church Road. There are relatively few vehicles which travel towards Hook Road Arena in the AM peak hour, but those that do mostly approach from Epsom, Hook and West Ewell.

Figure 15 Select Link Analysis Plot for the Hook Road Arena site in the AM Peak Hour

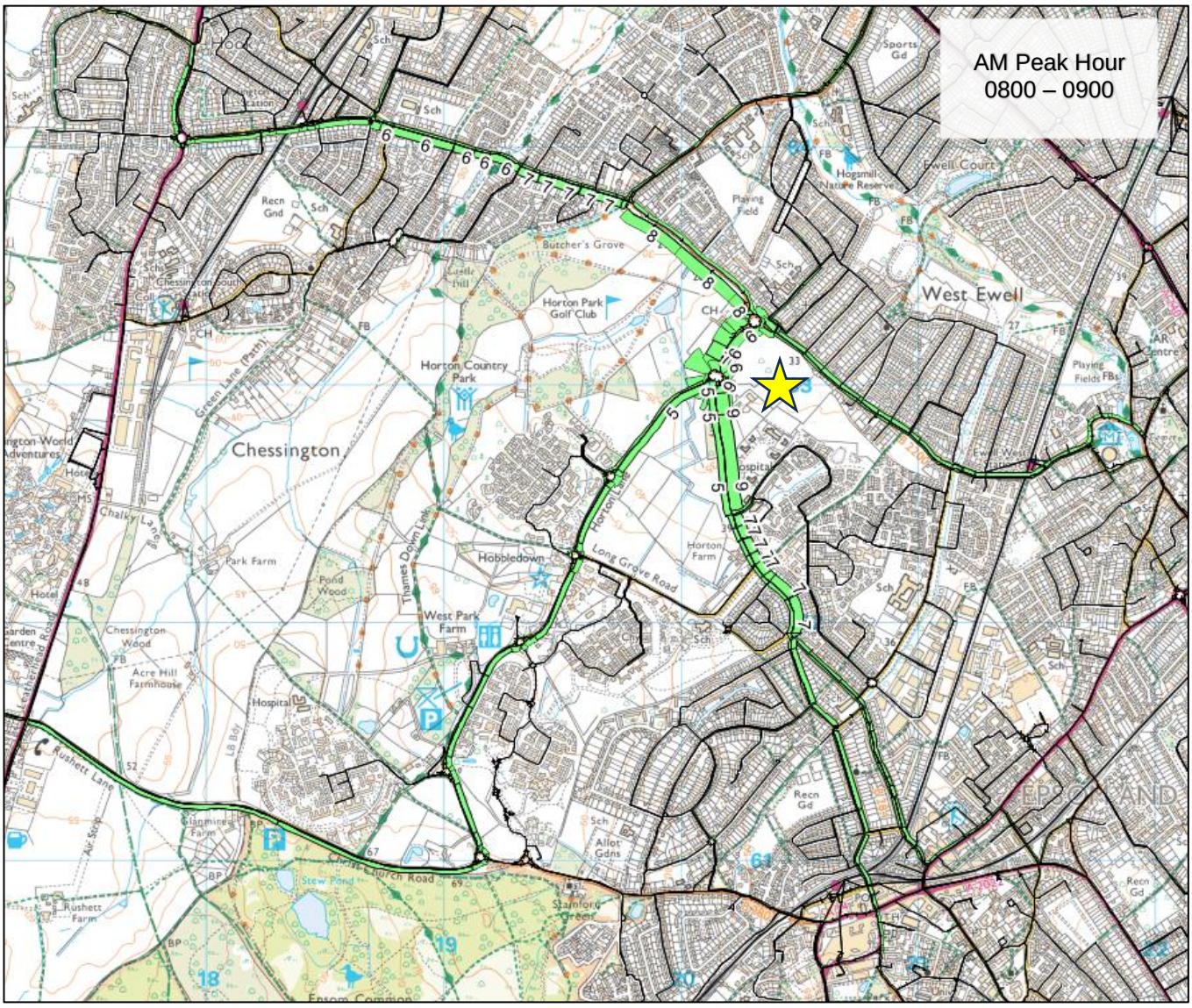
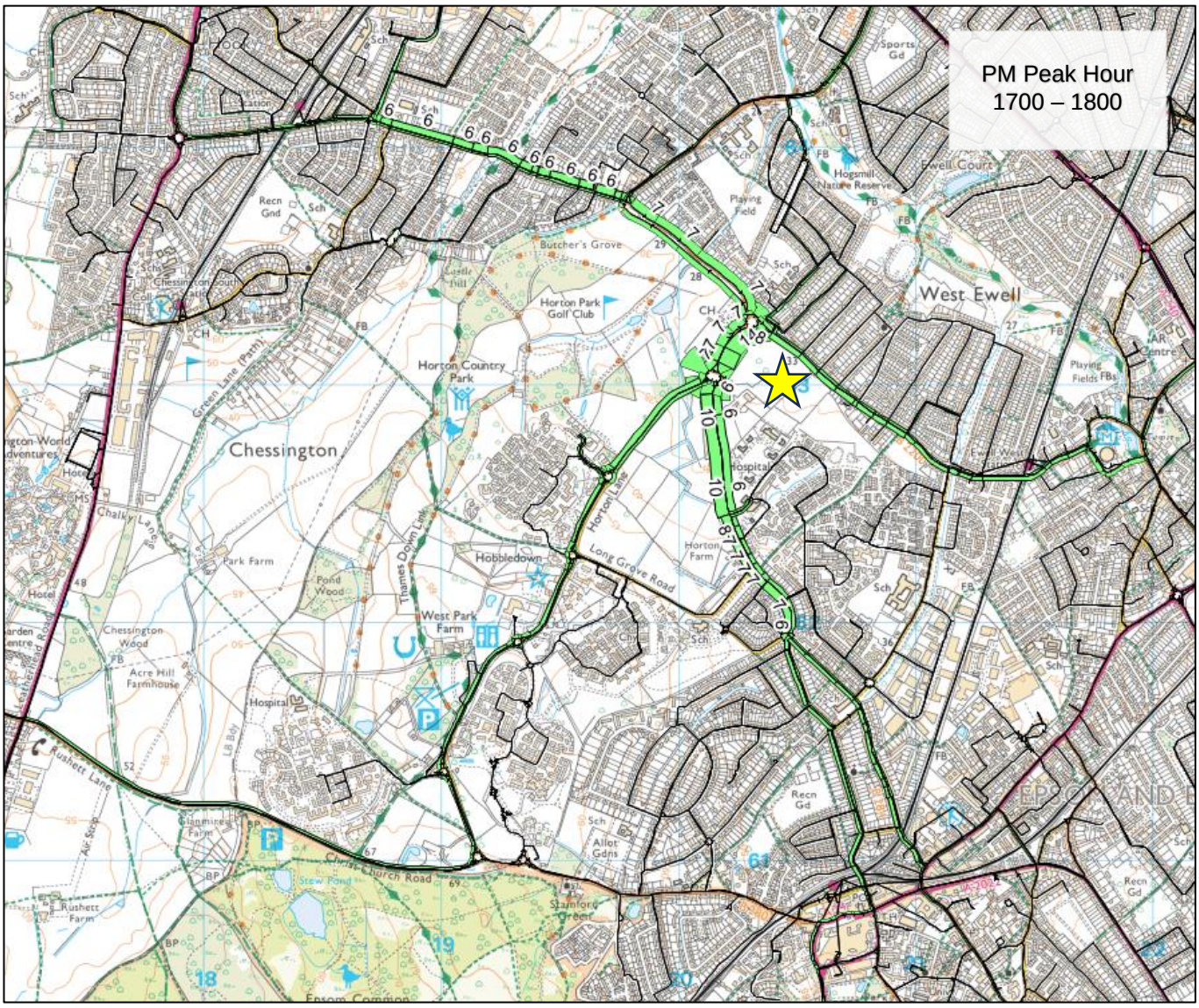


Figure 16 presents flows for the Hook Road Arena site in the PM peak hour. More vehicles travel towards the site than travel away due to the site being primarily residential. 14 of these vehicles approach from the roundabout between the B284 and the B2200 to the north. Approximately half of these vehicles approach from Hook (with a small number coming from the A3), with the other half approaching from West Ewell. 10 vehicles approach from the south, mostly from Epsom. 5 vehicles approach from Horton Lane, some of which originate from Malden Rushett.

Figure 16 Select Link Analysis Plot for the Hook Road Arena Site in the PM Peak Hour



Gibraltar Crescent

Gibraltar Crescent is a proposed general industrial use site with an estimated 128 net jobs. The car mode share is the highest out of all assessed sites at 90% in the AM peak and 92% in the peak hour. This leaves active travel at 5% during both time periods, and a public transport share of also 5% in the AM peak and 7% in the PM peak. The high car share is due to its commercial use.

Figure 17 presents flows for the Gibraltar Crescent site in the AM peak hour. 14 vehicles approach from the junction between Chessington Road (B2200) and Longmead Road. Approximately half of these vehicles come from the northwest, while the other half approach from the east, such as from West and East Ewell. 10 vehicles approach the site from the south, mostly originating from Epsom.

Figure 17 Select Link Analysis Plot for the Gibraltar Crescent Site in the AM Peak Hour

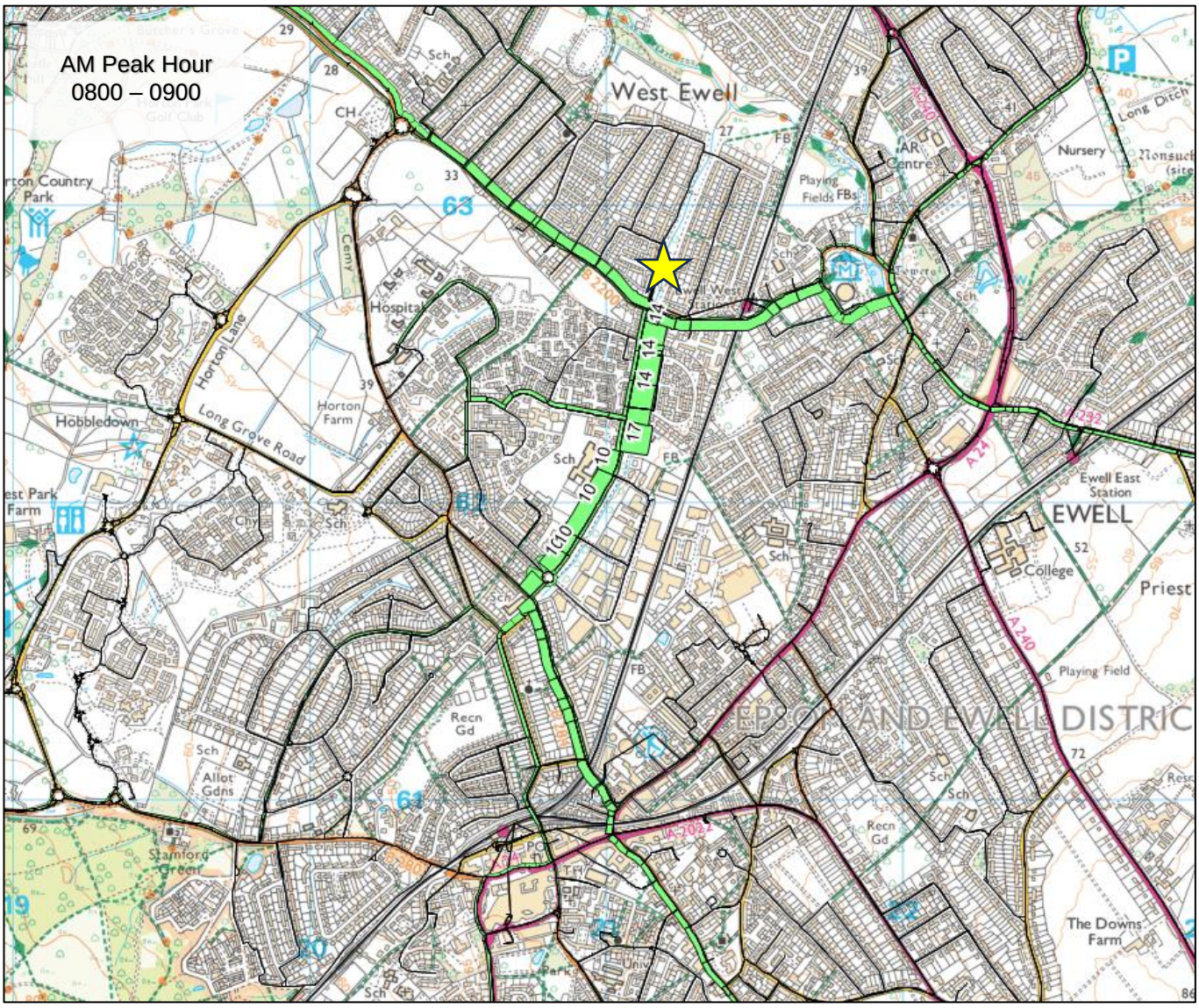
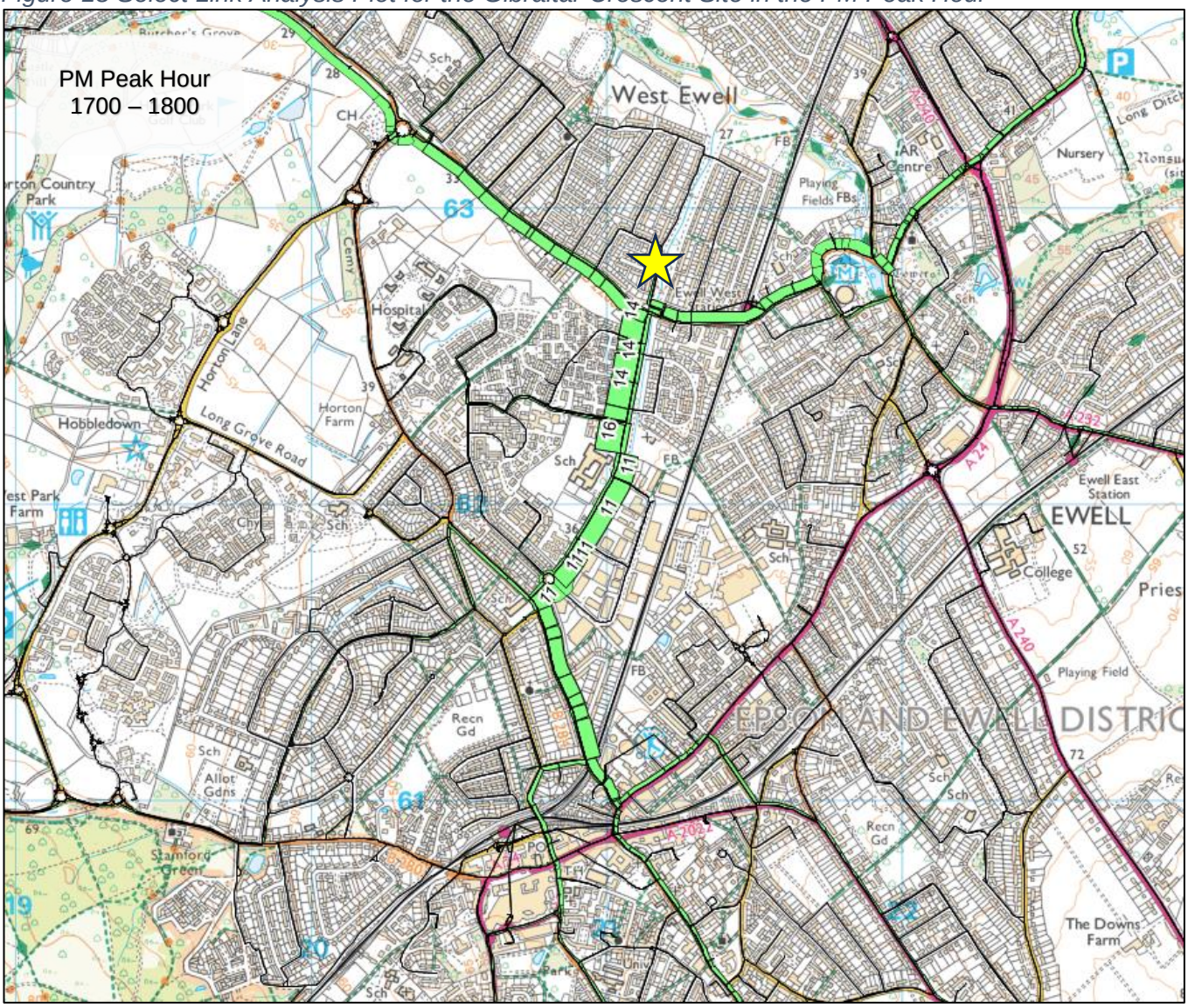


Figure 18 presents flows for the Gibraltar Crescent site in the PM peak hour. The majority of vehicles travel away from the site in this period. 14 vehicles travel north along Longmead Road to the junction with Chessington Road (B2200). Approximately half turn left and travel towards Hook, the other half turning right, travelling towards Stoneleigh. 11 vehicles travel southwest, joining the B284, then dispersing into Epsom.

Figure 18 Select Link Analysis Plot for the Gibraltar Crescent Site in the PM Peak Hour



Depot Road and Upper High Street Car Parks

The Depot Road and Upper High Street car parks site comprises 100 net dwellings and is situated in the eastern part of Epsom town centre. With its central location, close to amenities and workplaces, as well as bus stops and Epsom rail station with frequent services, the mode share is more equally split between car and non-car modes with a car mode share value of 58% in the AM hour and 63% in the PM peak. In the AM peak, the public transport share is higher at 29% compared to 25% in the PM peak. Active travel is 12% during both time periods.

Figure 19 presents flows for the Depot Road and Upper High Street Car Parks site in the AM peak hour. The majority of vehicles travel away from the site in the AM peak hour as it is a residential site. 7 vehicles travel eastbound on the A2022, dispersing into Ewell and travelling towards Banstead. 4 vehicles travel northbound on the B284, most of which continue on towards Hook. 4 vehicles travel southwest on Worple Road, before joining the A24. It should be noted that approximately half of these vehicles route south of Epsom Hospital, along Woodcote Green Road, before joining the A24 on the outskirts of Epsom. 2 vehicles travel southbound on Burgh Heath Road, towards Great Burgh and Nork.

Figure 19 Select Link Analysis Plot for the Depot Road and Upper High Street Car Parks Site in the AM Peak Hour

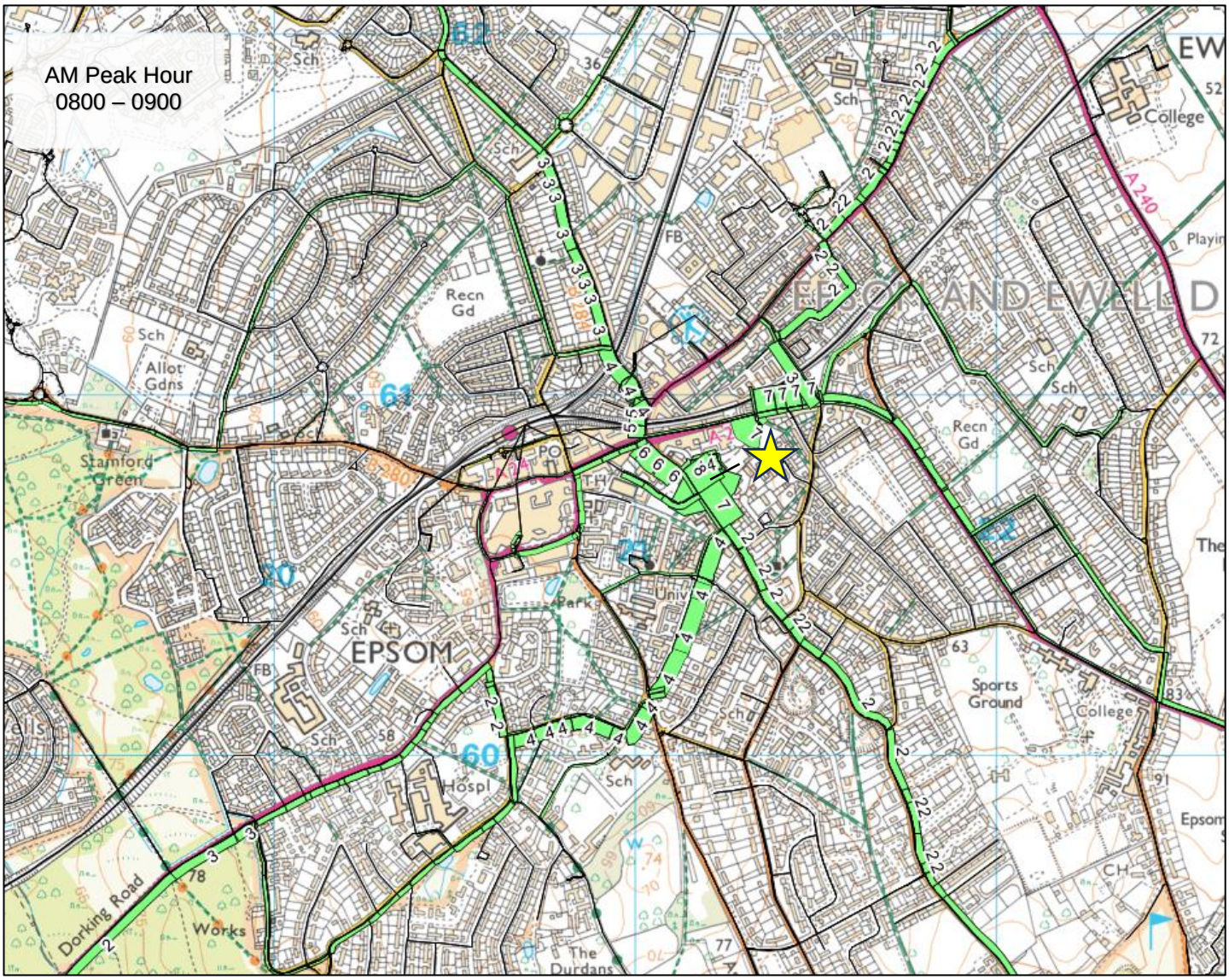
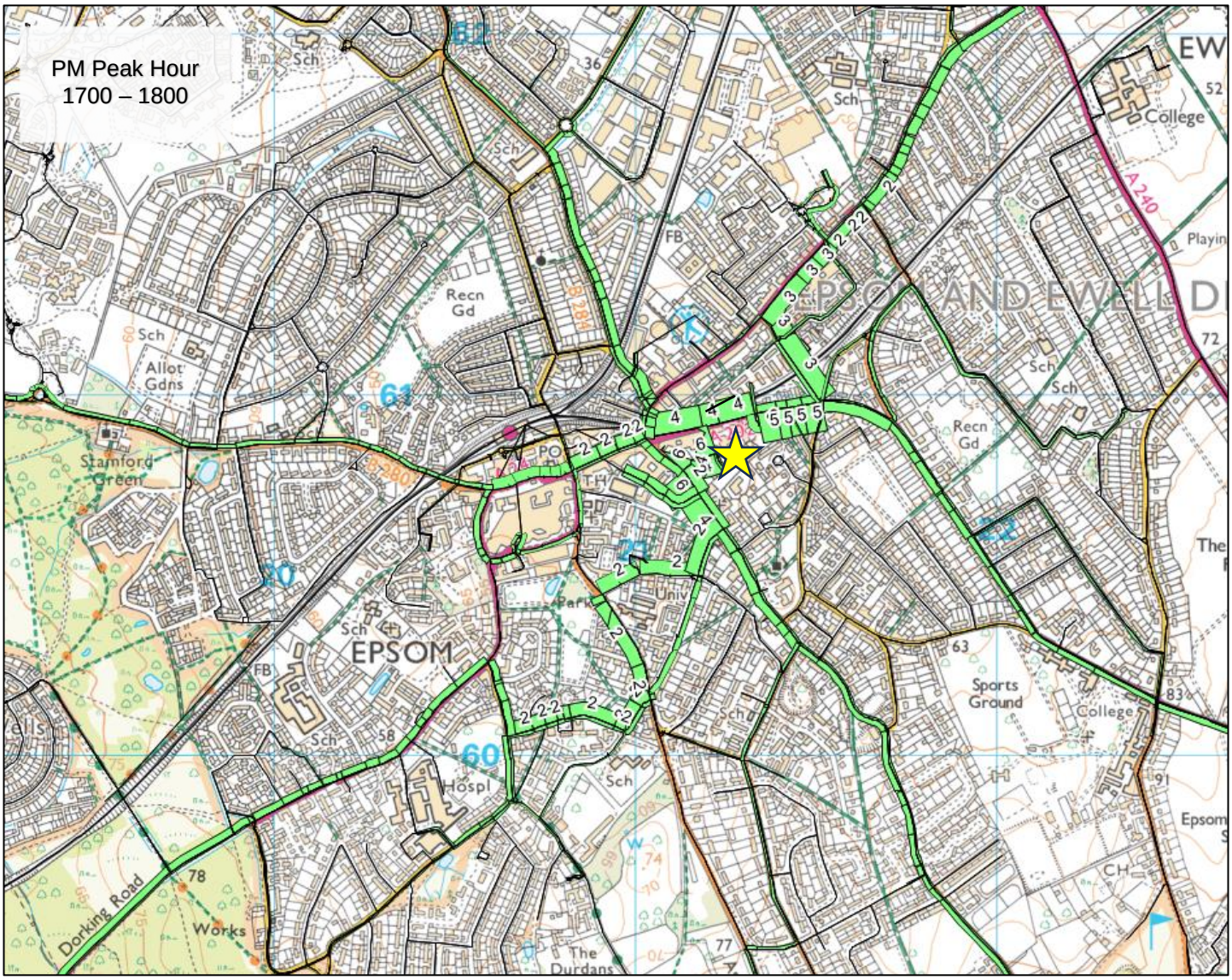


Figure 20 presents the flow for the Depot Road and Upper High Street Car Parks site in the PM peak hour. 5 vehicles approach from the A2022, 3 of which join from the A24 east of Epsom, originating from West Ewell. 2 vehicles approach from the A24 to the west, in the Epsom one-way system, while 2 vehicles approach from the southwest, using Heathcote and Worple Road.

Figure 20 Select Link Analysis Plot for the Depot Road and Upper High Street Car Parks Site in the PM Peak Hour



The Ashley Centre and Global House

The Ashley Centre and Global House site comprises 100 net dwellings and is situated in the heart of Epsom town centre, in very close proximity to shops, employers and frequent public transport services. This is reflected in the mode shares, with more than half of the site's trips taken by public transport, which also makes it the lowest car share out of all the assessed large sites. In the AM peak hour, the car mode share is 39%, 53% for public transport and 8% active travel. In the PM peak hour, the car mode share is just 34%, 58% for public transport and 8% active travel.

The comparatively low car use is reflected in the figures below. Figure 21 presents the flows for the site on the A24 to the south, approximately half from southeast Epsom, and half from southwest of Epsom, such as Leatherhead and Ashtead. 10 vehicles move north on the A24 out of the site. 3 of these vehicles travel west along the B280, 4 turn north onto Waterloo Road, while 3 continue east on the A24. Very few vehicles travel to the site in this time period.

Figure 21 Select Link Analysis Plot for The Ashley Centre and Global House Site in the AM Peak Hour

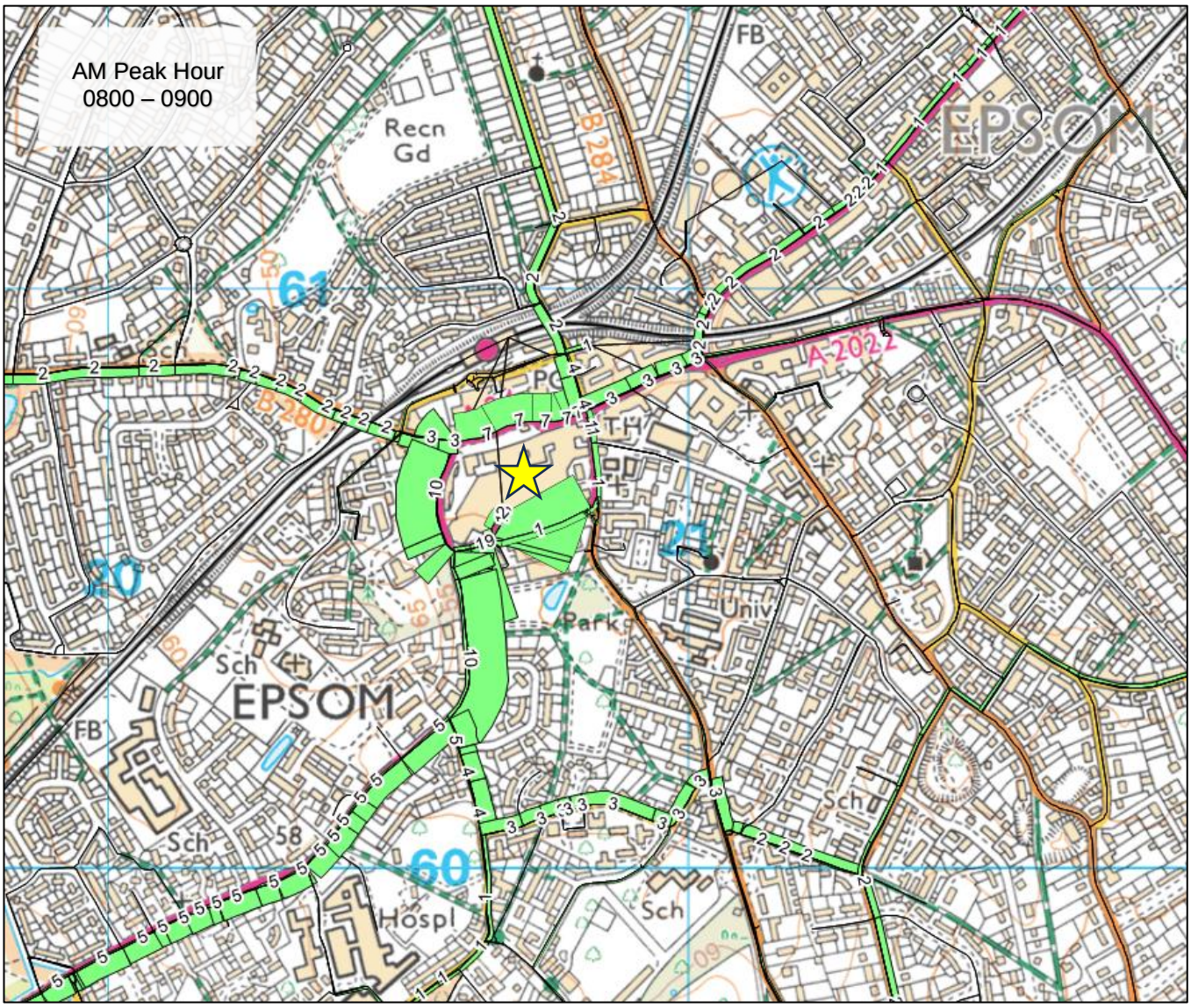
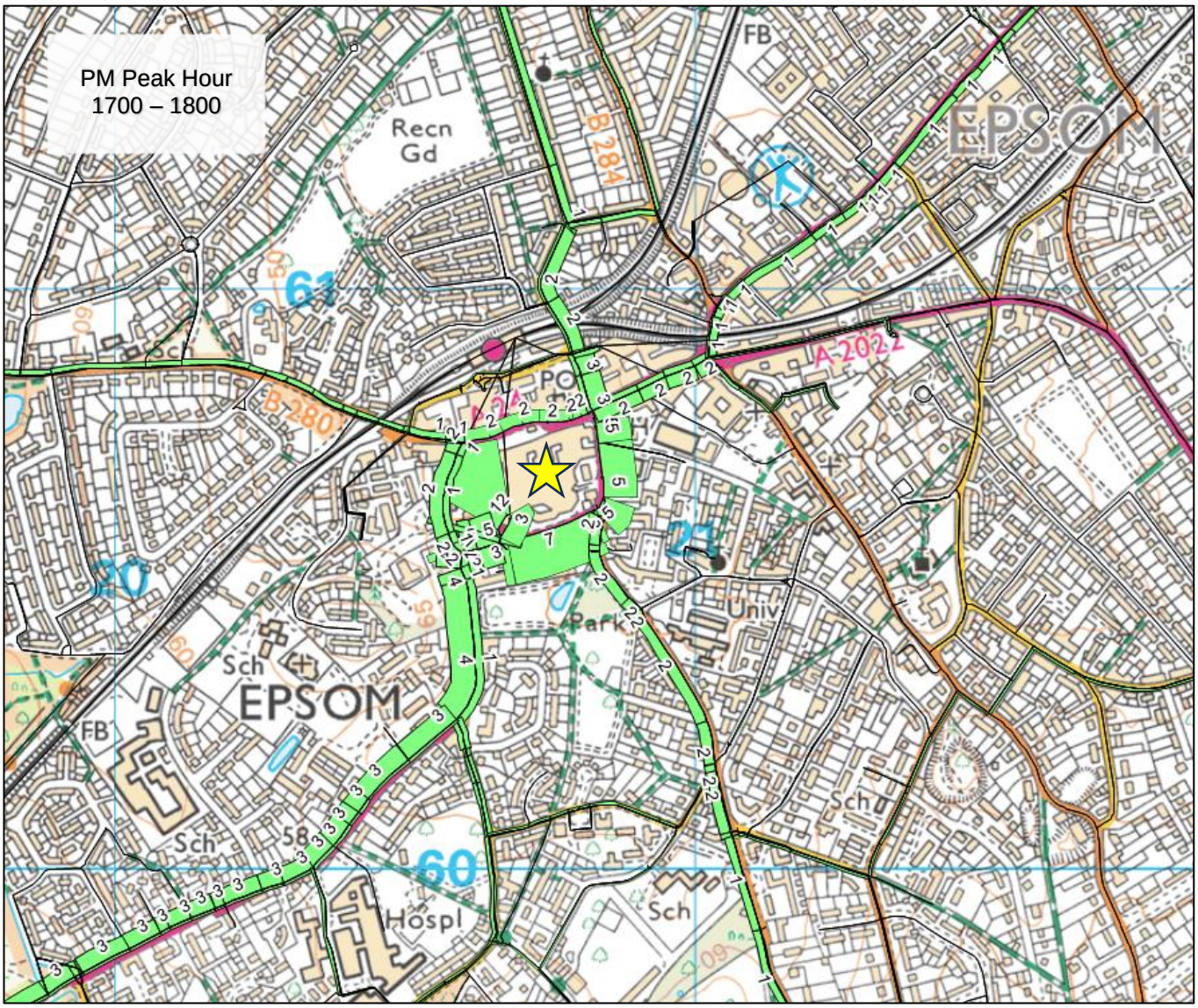


Figure 22 presents the flows for the Ashley Centre and Global House site in the PM peak hour. In this time period, there are few vehicles travelling away from the site. 4 vehicles approach from the southwest, moving north-east on the A24, primarily from Ashtead. 3 vehicles move south along Waterloo Road and combine with 2 travelling west on the A24 to travel around the one-way system. 2 vehicles travel north along Ashley Road before joining the one-way system on the approach to the site.

Figure 22 Select Link Analysis Plot for The Ashley Centre and Global House Site in the PM Peak Hour



Swail House

The proposal at Swail House is for a net increase of 100 dwellings, in part to replace the existing specialist accommodation.

Although not as centrally located as The Ashley Centre and Global House site, like the Depot Road and Upper High Street Car Parks site, Swail House, being just south of Epsom town centre, is comparatively well located in terms of access to amenities and public transport services. This is reflected in lower car mode share compared to sites situated in suburban areas. The AM peak hour mode share is 57% for car users, 31% for public transport and 12% for active travel. In the PM peak the mode share is 59% car users, 29% for public transport and 12% for active travel.

Figure 23 presents the flows for the Swail House site in the AM peak hour. In this time period, there are very few vehicles travelling towards the residential site. 6 vehicles travel north on Church Street up to the A24, before turning onto the B284 and travelling north. 7 vehicles travel southwest along Worple Road, before joining the A24 and heading towards Ashtead. It should be noted that approximately half of these vehicles route south of Epsom Hospital, along Woodcote Green Road, before joining the A24 on the outskirts of Epsom. 3 cut through

residential roads, such as Grove Road, before heading northeast, while some travel southeast along roads such as the A2022 and Burgh Heath Road. Very few vehicles interact with Epsom's one-way system.

Figure 23 Select Link Analysis Plot for the Swail House Site in the AM Peak Hour

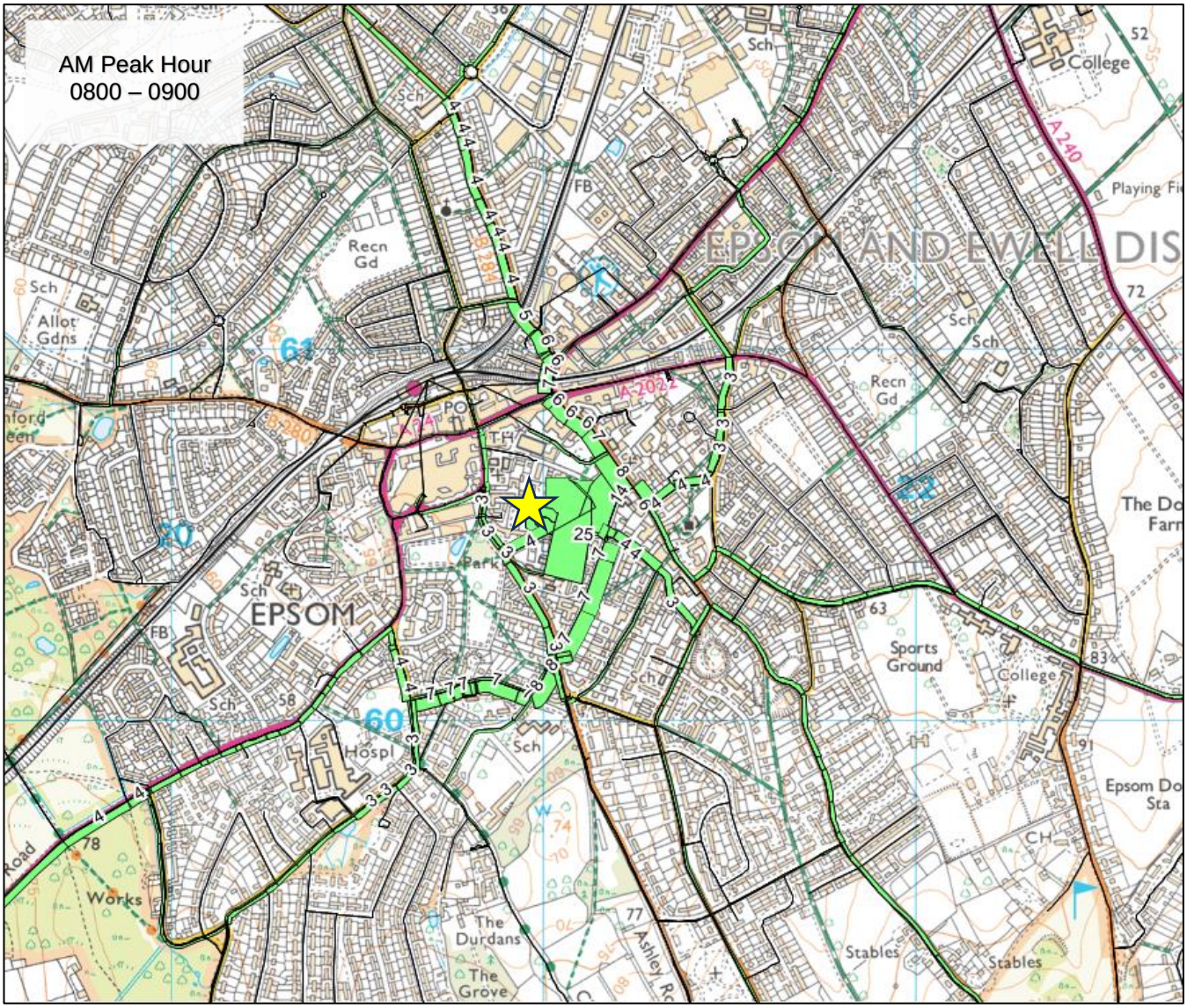
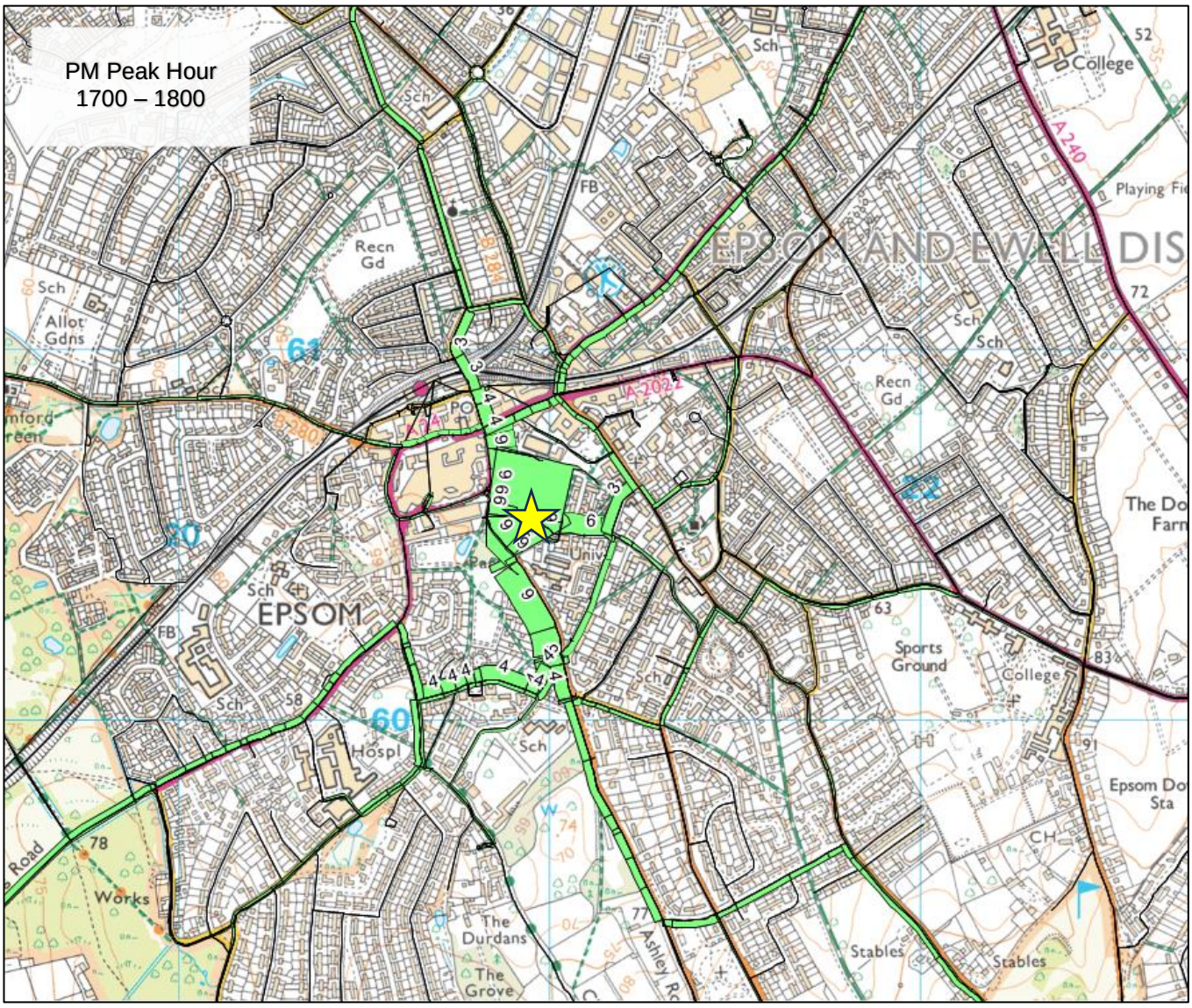


Figure 24 presents the flows for the Swail House site in the PM peak hour. Vehicles primarily travel towards the site in this time period. 9 vehicles approach from the south on Ashley Road, approximately half of these come from the A24 heading eastbound, and half from southeast of Epsom. 9 vehicles approach on Ashley Road from the north, heading southbound, made up primarily of vehicles travelling westbound on the A24, and vehicles travelling southbound on the B284 and Temple Road.

Figure 24 Select Link Analysis Plot for the Swail House Site in the PM Peak Hour



Link Analysis

The select link plots in the previous section show how the vehicle flows associated with the largest development sites would disperse on the road network. In this section, the cumulative impact this causes on the road links in the network has been examined.

Flow difference plots for Epsom and Ewell Borough have been considered comparing the Do-Something and Do-Minimum Scenarios for the AM and PM peak hours. These are presented in Figure 25. Bandwidths coloured red show an increase in flow, whereas those coloured blue represent a decrease in flow, with their size being proportional to the increase or decrease. Values are only shown for increases of more than 30 vehicles.

As expected, the greatest increases in link flows are found around the proposed new development sites and on the main roads throughout the borough.

The blue bandwidths show a decrease in flow when comparing scenarios. This can sometimes be due to residential development replacing commercial land uses which generally have more vehicle trips during the analysed time periods. However, re-routeing is also an effect of local congestion. Epsom and Ewell borough is congested, even more so in the forecast year 2040,

whereby even small changes in local congestion cause trips to change their routes to avoid the delay. With an increase in dwellings and jobs in the area from the Local Plan sites, there is an increase in local trips. In turn, the model is showing a displacement of longer distance trips away from affected areas, as alternative competing routes become more attractive.

Many of the Local Plan sites are situated in Epsom town centre. Although they experience the lowest car use of all the sites, some vehicle use will remain. Conversely, in both time periods there is a small reduction in vehicles travelling on the A24 through Epsom town centre in parts, despite the location of many of the Local Plan sites. With more vehicles originating and departing from the town centre and its vicinity, the trip pattern changes, and it appears to make the A24 through the centre less attractive that competing alternatives. With this, there is a displacement of vehicle trips to the southern local alternative routes such as Worple Road and Woodcote Road, and further afield on Headley and Langley Vale Roads to join or leave the A24 in Ashtead. However, this displacement is considered minimal with most increases being less than 20 vehicles per hour on these alternative routes, and with a maximum increase of 40 vehicles on Langley Vale Road in the southbound direction during the AM peak, and 51 vehicles on Headley Road in the northbound direction during the PM peak.

In the AM peak, there is a displacement of around 80 vehicles from A240 Kingston Road between B284 Worcester Park Road and Beggar's Hill roundabout at the junction with Kingston Road, to the Worcester Park and Cheam areas, as well as the competing A217 corridor. This displacement also appears in the PM peak, but to a lesser extent. As discussed in the next section, there are junctions along this A240 section which experience the highest levels of delay, even without the addition of the Local Plan sites. The increase in local trips has made this route less attractive for the longer distance trips, which have diverted accordingly.

For similar reasons there is a displacement of trips on the B232 Cheam Road to both A240 Reigate Road south of this and the A217 in the PM peak. In part this can be attributed to a large increase in delay at the A232 Cheam Road signalised junction with St Normans Way and Nonsuch Court Avenue, discussed in the next section, making this route less attractive. The increase in delay is caused by 75 vehicles which divert from A232 via Nonsuch Court Avenue in order to reach the A24 southbound. However, due to the nature of parked cars reducing the capacity and, therefore, the preference for drivers to use Nonsuch Court Avenue, the route is unlikely to be used by vehicles travelling southbound on the A24 from A232. As such, it would be expected that these vehicles would continue to use the A232 rather than rerouting with associated increases in delay along this stretch of road, limiting the displacement of vehicles to alternative routes.

The largest residential sites create an increase in vehicle flows in their vicinity. As shown in the Mode Share and Vehicle Routeing of the Largest Sites above, the greatest increases are from the Horton Farm and Hook Road Car Park and SGN. Travel to and from these sites contributes to the largest increases in flow in the borough and includes the B280 Christ Church Road, Horton Lane, B284 Hook Road, Temple Road, Longmead Road and B2200 Chessington Road. The largest increase is on Horton Lane of 157 vehicles in a westbound direction during the AM peak, and 84 vehicles in a northbound direction during the PM peak.

It is noted that in Stoneleigh and Worcester Park, the model predicts that between the Do-Minimum scenario and the Do-Something scenario, there is an increase of trips in the PM peak of 54 vehicles on Chadacre Road, corresponding with a fall in vehicle trips on the A24. Likewise, in the PM peak there are increased numbers of vehicles using Stoneleigh Park Road between Stoneleigh and Worcester Park, as well as Cuddington Avenue, as opposed to vehicles using the A24 or B284 Worcester Park Road. This indicates there is a potential increase in the level of rat-running in the area due to increased congestion and limited spare

capacity, particularly at junctions, on the main roads. Some of the increases in Worcester Park area are also a result of a net increase of 93 dwellings at the Land at Rowe Hall site on Salisbury Road and much smaller contribution of 7 dwellings at 46 The Avenue.

Figure 25 Link Flow Difference Plots, Do-Something compared with Do-Minimum

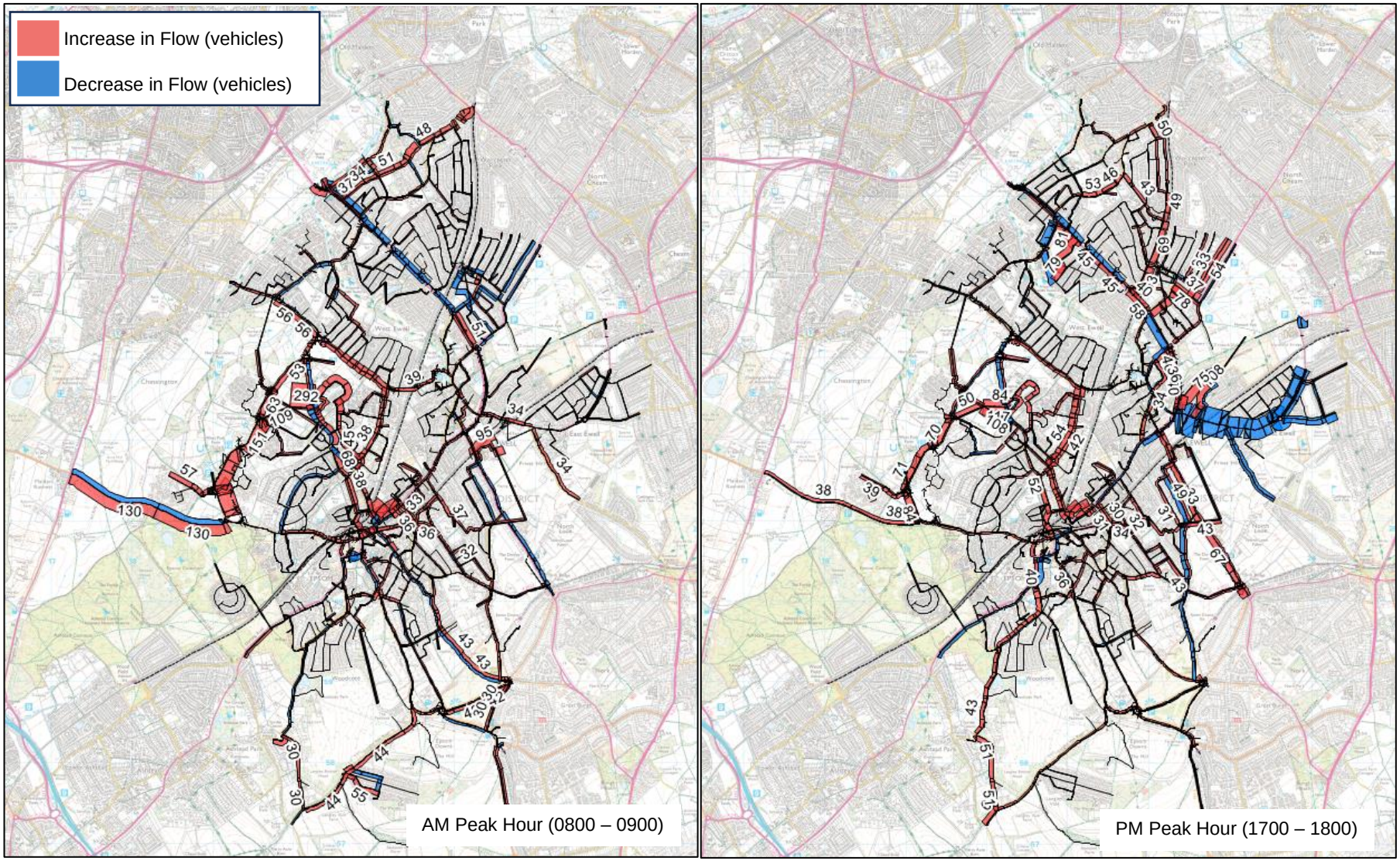
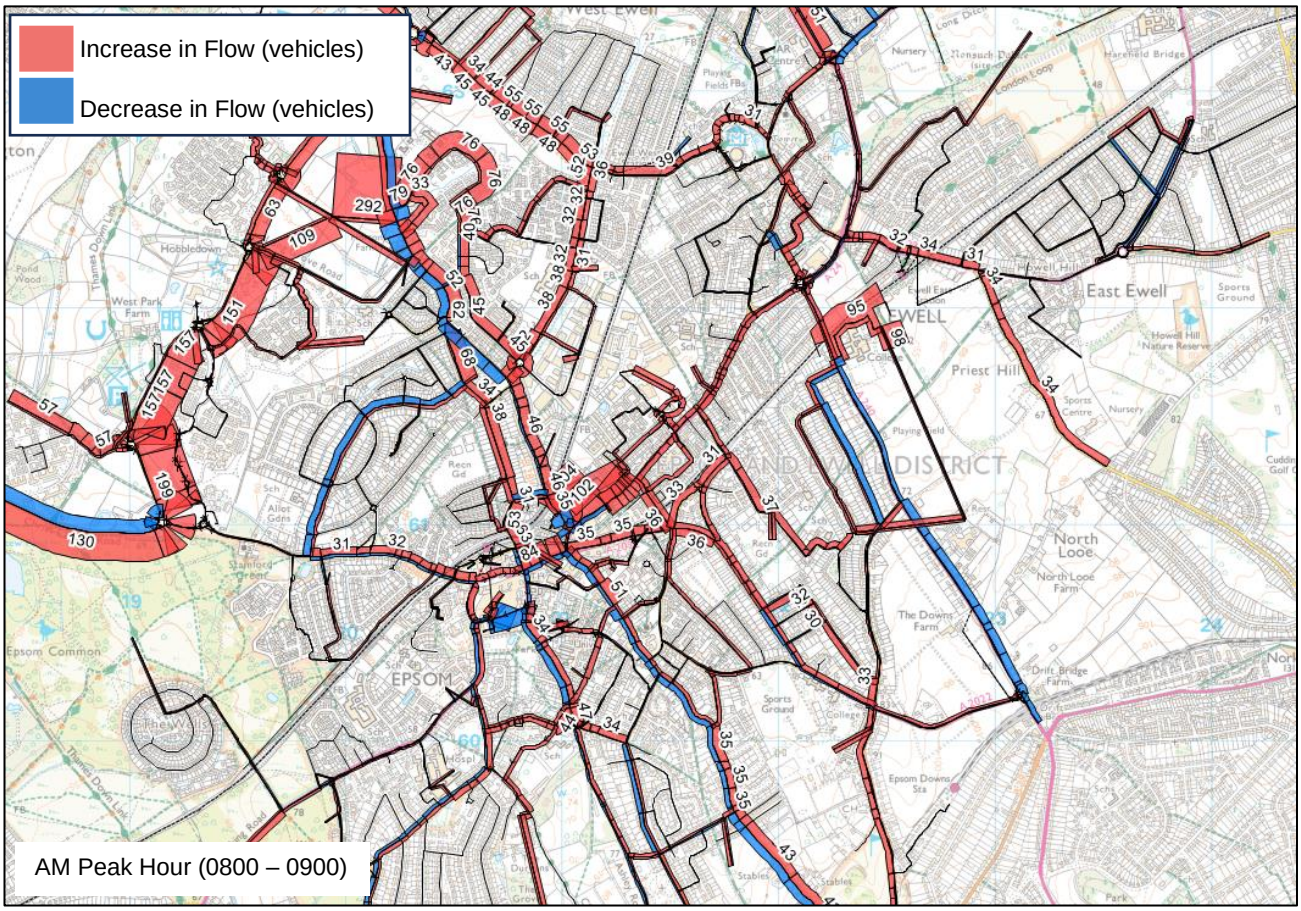


Figure 26 Link Flow Difference Plots, Do-Something compared with Do-Minimum for Epsom Town Centre and Ewell Village



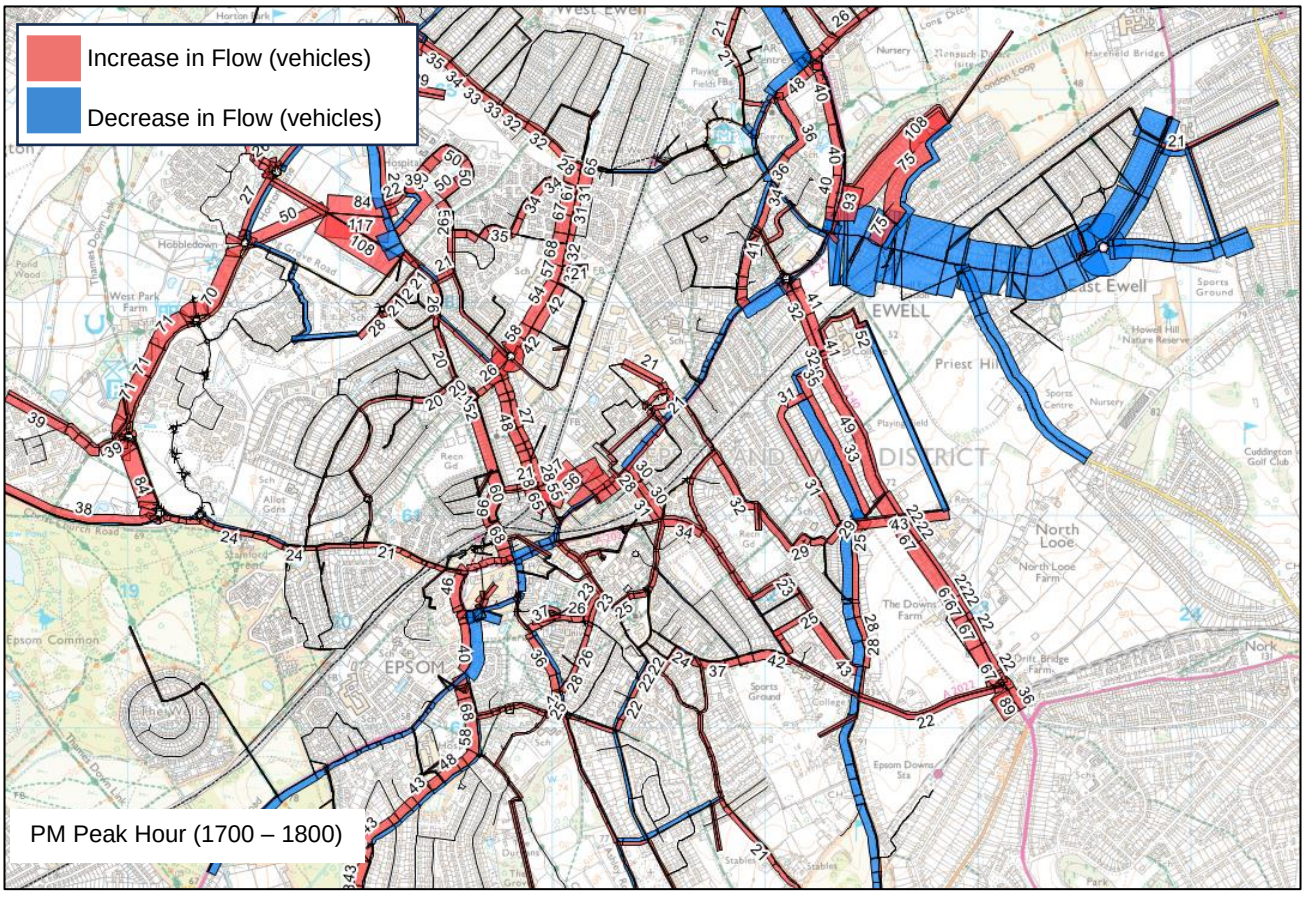


Figure 26 above presents the Link Flow Difference Plots comparing the Do-Minimum and Do-Something scenarios in the AM and PM peak hour specifically for Epsom Town Centre. There is increased flow on key routes that is more pronounced in the AM peak than the PM peak hour. B284 Hook Road and its junction with the A24 East Street in Epsom sees increases of around 102 vehicles in the AM peak hour and 55 vehicles in the PM peak hour, reflecting the increased demand for vehicles from the larger development sites, particularly Horton Farm, as well as the Hook Road car park development, and smaller contributions such as from Solis House at 20 Hook Road and Land at Chantilly Way.

As expected, there are increased flows on roads such as B2200 Chessington Road between Ewell and Chessington in both the AM and PM peak hour, in both directions, as well as on key routes to the A24 including A240 Reigate Road and A2022 College Road/Alexandra Road. The model indicates that there are 76 vehicles in the AM peak diverting from Hook Road and onto Parkview Way via a bus gate. In theory, anyone may choose to divert via this road, but in practice it is unlikely that this will be the preferred route for drivers, which would lead to increased flows on Hook Road. Finally, the model indicates that in the Do-Something scenario that some vehicles may choose to use Lower Court Road, and Temple Road in order to bypass B284 Hook Road to access the Epsom Town Centre gyratory.

Level of Services (LoS) Metric

The Level of Service (LoS) metric, which is an adaptation of the US Highway Capacity Manual LoS metric, is determined by the level of traffic flows relative to network link and junction capacities, expressed in terms of the ratio of flow to capacity (RFC). The interpretation of RFC values in terms of experienced levels of congestion are described in Table 4.

A level of service categorised as A represents the best operating conditions with an RFC value of less than 0.5. On the other hand, category D is the worst level of service with an RFC value greater than 1. An RFC value greater than 1 means that the stretch of road or turning movement has a higher level of traffic flow than its theoretical capacity, suggesting flow breakdown and extensive queues.

Table 4 Interpretation of Level of Service Categories

Category		Description	RFC
A	Free flow	Traffic flows at or above the posted speed limit and motorists have complete mobility between lanes. Motorists have a high level of physical and psychological comfort.	0 to 0.5
B	Stable flow	Ability to manoeuvre through lanes is noticeably restricted and lane changes require more driver awareness. Speeds slightly decrease as traffic volume slightly increase. Freedom to manoeuvre within the traffic stream is much more limited and driver comfort levels decrease. Roads remain safely below but efficiently close to capacity.	0.5 to 0.85
C	Unstable flow, operating at capacity	Flow becomes irregular and speed varies rapidly because there are virtually no usable gaps to manoeuvre in the traffic stream and speeds rarely reach the posted limit. Any disruption to traffic flow, such as merging ramp traffic or lane changes, will create a shock wave affecting traffic upstream. Drivers' level of comfort become poor.	0.85 to 1
D	Forced or breakdown of flow	Every vehicle moves in lockstep with the vehicle in front of it, with frequent slowing required. Travel time cannot be predicted, with generally more demand than capacity.	>1

The methodology for calculating the LoS has been applied to the analysis of both link flow and junction delay to aid the interpretation of the model results. The calculated LoS has been colour coded using the traffic light colours: green; amber; and red, as shown in Table 4 above.

Figure 27 and Figure 28 present the level of service (LoS) of all roads within the borough for the AM and PM peak hours respectively. Bandwidths are coloured as in Table 4: green for free flow and stable flow (LoS A and B); orange for unstable flow, operating at capacity (LoS C); and red for forced or breakdown of flow (LoS D).

It can be seen that for the majority of the borough, the capacity of the roads is adequate for the volume of carried traffic, with a LoS of either A or B coloured green. This may be surprising, given the level of congestion which already exists within the area, but it is junctions, which often, inhibit traffic flow. Within a strategic model the two elements do not interact and are therefore reported separately.

The roads which are shown to have maintained a category of D (forced or breakdown of flow) between the Do-Minimum and Do-Something scenarios, are as follows:

- A24 Dorking Road, Epsom
- A24 London Road, Ewell
- A232 Cheam Road, Ewell
- A240 Reigate Road, Ewell
- B284 Chessington Road, West Ewell
- B284 Old Malden Lane, Worcester Park
- B284 Ruxley Lane, West Ewell
- B290 Tattenham Corner Road, Epsom Downs
- B2200 Chessington Road, Ewell
- B2200 High Street, Ewell
- B2200 London Road, Ewell (AM peak hour only)
- B2200 Spring Street, Ewell
- Longdown Lane North, Epsom Downs (AM peak hour only)
- Pams Way, West Ewell
- Salisbury Road, Stoneleigh (AM peak hour only)
- The Parade, Epsom (AM peak hour only)
- Timbercroft, Stoneleigh
- Epsom Hospital access, Epsom (PM peak hour only)
- Exit from Ashley Centre onto A24 Ashley Avenue, Epsom (PM peak hour only)
- Exit from Ebbisham Centre Car Park, Epsom (PM peak hour only)

The roads which are shown to have declined in LoS from a category of B to C (stable to unstable flow, operating at capacity) or C to D (unstable flow, operating at capacity to forced or breakdown of flow) between the Do-Minimum and Do-Something scenarios, are as follows:

- A24 Epsom Road, Epsom (AM peak hour only, C to D)
- A240 Reigate Road, Ewell (PM peak hour only, C to D)

- B284 Chessington Road, West Ewell (PM peak hour only, C to D)
- B284 Hook Road, Epsom (C to D)
- Longmead Road, West Ewell (C to D)
- Pound Lane, Epsom (PM peak hour only, B to C)
- Salisbury Road, Stoneleigh (PM peak hour only, C to D)
- Temple Road, Epsom (PM peak hour only, B to C)
- The Avenue, Stoneleigh (B to C)

These roads will be operating just within or above capacity. The majority of these deteriorations in LoS, for the Do-Something scenario, are situated on routes which provide access to and from the largest of the evaluated development sites. Other roads which have seen a decline in their LoS for the Do-Something scenario are residential rat runs, such as Temple Road which is mostly associated with the larger developments in the northern suburbs of Epsom and the Hook Road Car Park and SGN site and traffic avoiding the more congested B284 Hook Road.

Residential roads that are subject to a decline in LoS between the scenarios may not be suitable for increases in traffic and potentially require mitigation measures to reduce impact.

Figure 27 Changes to AM Peak Hour (0800 – 0900) Link Level of Service between Scenarios (Changed from C to D and Maintained at D)

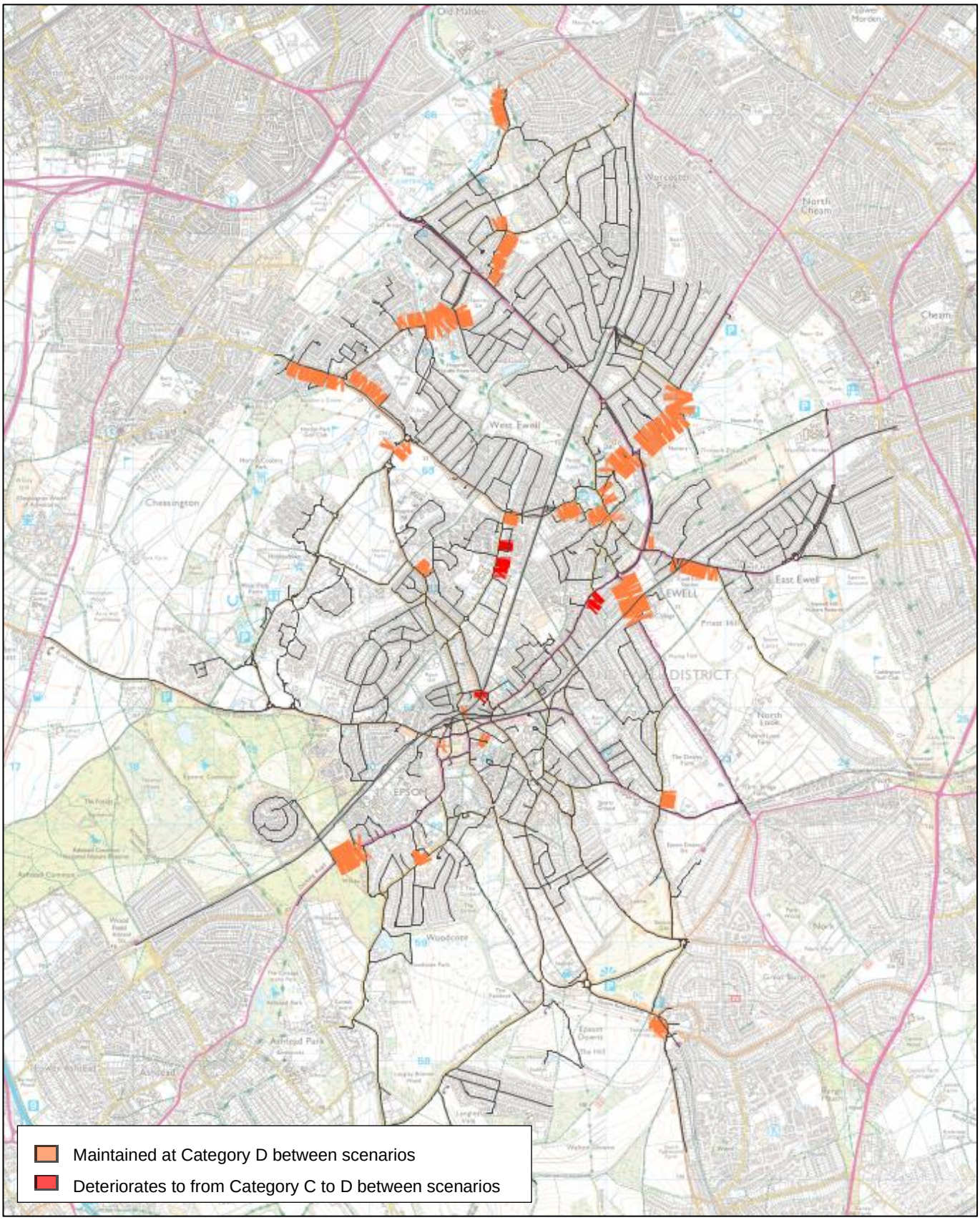
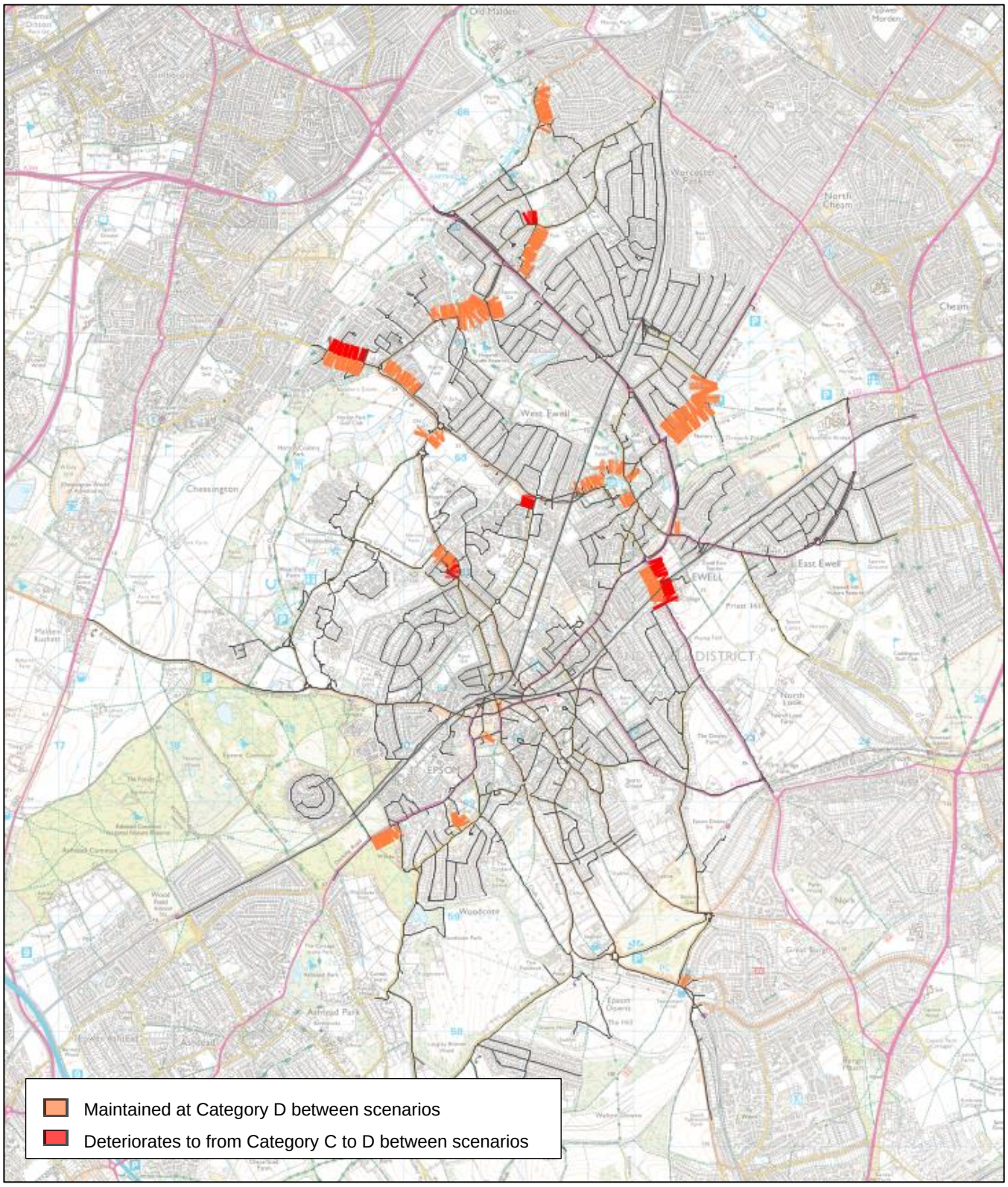


Figure 28 Changes to PM Peak Hour (1700 – 1800) Link Level of Service between Scenarios (Changed from C to D and Maintained at D)



Junction Analysis

Junctions were assessed based on average delay per vehicle. This was then converted to a Level of Service (LoS) band according to the Highway Capacity Manual (HCM)[1] outlined in Table 5.

Table 5: Level of Service categorisation for junctions as outlined by the HCM

LoS	Definitions	Signalised Junction	Unsignalised Junction
A	Free flow	≤10 sec	≤10 sec
B	Reasonably free flow	10-20 sec	10-15 sec
C	Stable flow, at or near free flow	20-35 sec	15-25 sec
D	Approaching unstable flow	35-55 sec	25-35 sec
E	Unstable flow, operating at capacity	55-80 sec	35-50 sec
F	Forced or breakdown flow	≥80 sec	≥50 sec

The majority of junctions in the Do-Minimum scenario have available capacity during both time periods. Figure 29 shows all junctions with a LoS of C (stable flow, at or near free flow) or worse in the Do-Minimum scenario. and shows junctions situated on major routes, including the A24, A240, A2022, B284, B290 and B2200, are under pressure with seventeen junctions in the AM peak hour and fifteen junctions in the PM peak hour with junction delay at a level which is either approaching unstable flow, or already experiencing unstable or breakdown flow:

- A24 Dorking Road signalised junction with Woodcote Road, Epsom
- A24 East Street signalised junction with Kiln Lane and Dirdene Gardens, Epsom
- A24 Ewell By-Pass signalised junction with B2200 Cheam Road and A232 Cheam Road, Ewell
- A24 Ewell By-Pass signalised junction with B2200 London Road, Ewell
- A24 High Street signalised junction with A24 Ashley Road and Waterloo Road, Epsom
- A24 High Street signalised junction with Church Street and Upper High Street, Epsom
- A240 Ewell By-Pass southern approach to the roundabout with Kingston Road and Park Avenue, Ewell
- A240 Ewell By-Pass northern approach to the roundabout with Kingston Road and Park Avenue, Ewell
- A240 Kingston Road signalised junction with B284 Ruxley Lane, Ewell
- A240 Kingston Road signalised junction with Stoneleigh Park Road, Stoneleigh
- A240 Kingston Road signalised junction with Thorndon Gardens, Stoneleigh
- A2022 College Road signalised junction with Longdown Lane, Epsom
- B284 Chessington Road signalised junction with Ruxley Lane, West Ewell
- B284 Hook Road signalised junction with Chantilly Way, Epsom

[1] Highway Capacity Manual, Transportation Research Board, 2010

- B290 Ashley Road signalised junction with Langley Vale Road, Langley Vale
- Briarwood Road junction with Glenwood Road, Stoneleigh
- Park Avenue approach to the roundabout with A240 Ewell By-Pass and Kingston Road, Ewell

Figure 29 Do-Minimum Level of Service (LoS) for junctions classified ≥ C

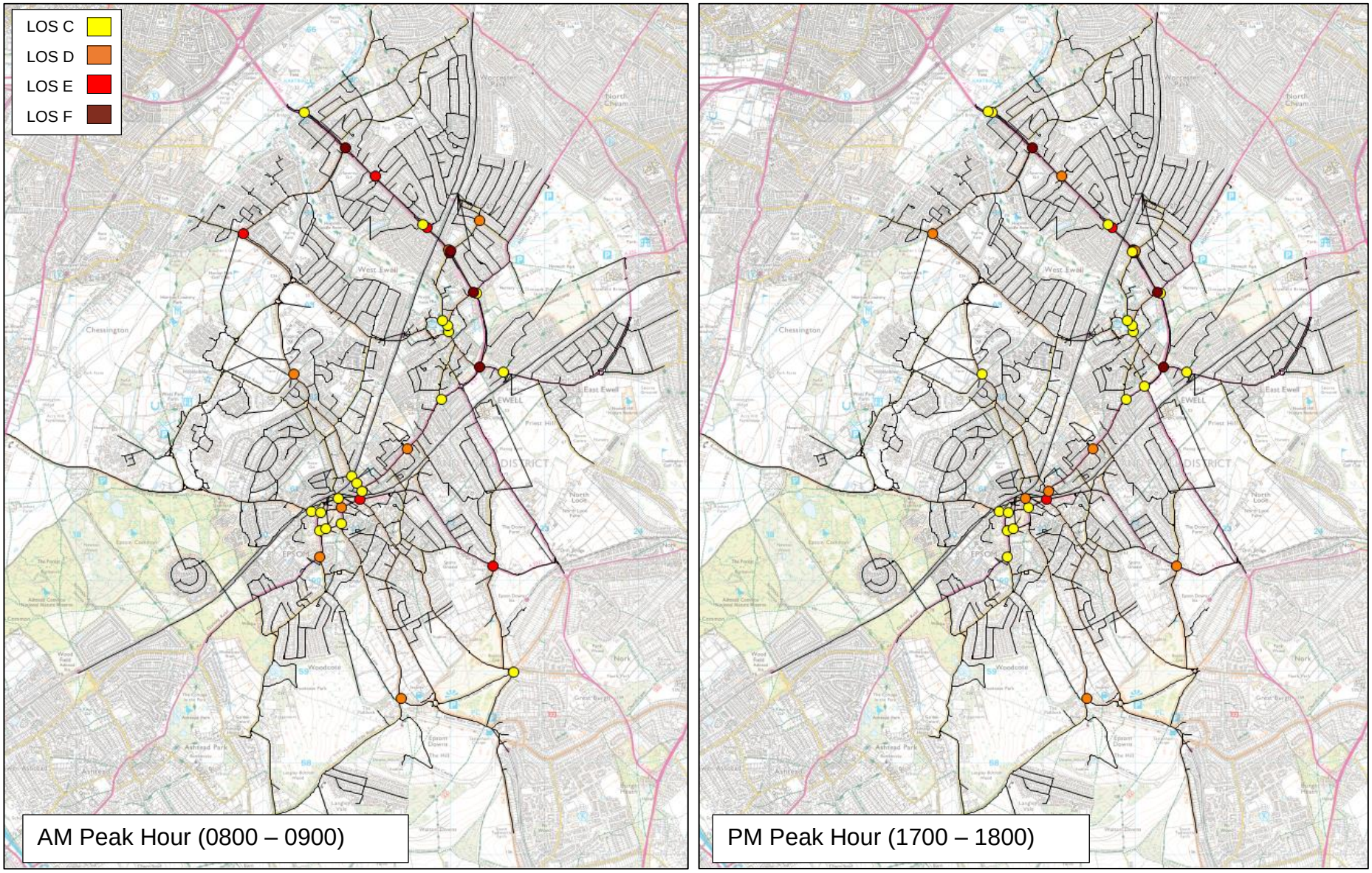


Figure 30 shows the junctions which have experienced a worsening of LoS category in the Do-Something scenario compared with the Do-Minimum scenario as a result of the addition of Local Plan development traffic. It also shows junctions which remain over capacity, categorised as LoS D.

During the AM peak hour there is no deterioration in LoS at any of the junctions. A LoS of D or greater is maintained at the following junctions:

- A24 Dorking Road signalised junction with Woodcote Road, Epsom (D)
- A24 East Street signalised junction with Kiln Lane and Dirdene Gardens, Epsom (D)
- A24 Ewell By-Pass signalised junction with B2200 Cheam Road and A232 Cheam Road, Ewell (F)
- A24 Ewell By-Pass signalised junction with B2200 London Road, Ewell (F)
- A24 High Street signalised junction with A24 Ashley Road and Waterloo Road, Epsom (D)
- A24 High Street signalised junction with Church Street and Upper High Street, Epsom (E)
- A240 Ewell By-Pass northern approach to the roundabout with Kingston Road and Park Avenue, Ewell (D)
- A240 Ewell By-Pass southern approach to the roundabout with Kingston Road and Park Avenue, Ewell (F)
- A240 Kingston Road signalised junction with B284 Ruxley Lane, Ewell (F)
- A240 Kingston Road signalised junction with Stoneleigh Park Road, Stoneleigh (E)
- A240 Kingston Road signalised junction with Thorndon Gardens, Stoneleigh (E)
- A2022 College Road signalised junction with Longdown Lane, Epsom (E)
- B284 Chessington Road signalised junction with Ruxley Lane, West Ewell (E)
- B290 Ashley Road signalised junction with Langley Vale Road, Langley Vale (D)
- Park Avenue approach to the roundabout with A240 Ewell By-Pass and Kingston Road, Ewell (F)

For the most part the delay at these junctions increases by only a few seconds, further highlighting how junctions are already facing capacity issues in the Do-Minimum scenario. The largest increase in delay amongst these junctions is fifteen seconds on the A24 Ewell By-Pass signalised junction with B2200 London Road, Ewell.

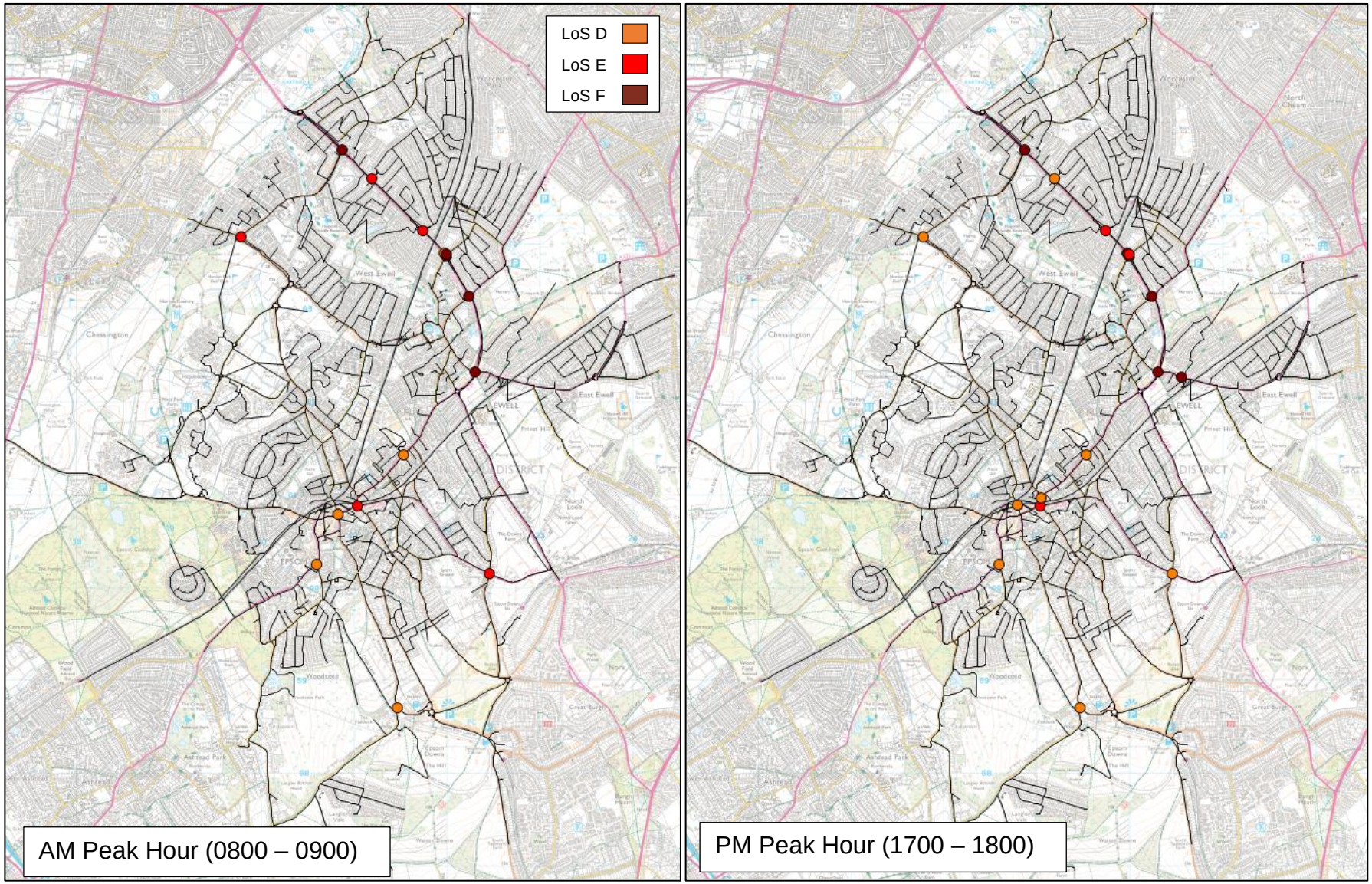
During the PM peak hour, the LoS deteriorates at three junctions in comparison to the Do-Minimum scenario:

- A24 Dorking Road signalised junction with Woodcote Road, Epsom (C to D)
- A232 Cheam Road signalised junction with St Normans Way and Nonsuch Court Avenue, Ewell (C to F)
- Park Avenue approach to the roundabout with A240 Ewell By-Pass and Kingston Road, Ewell (D to E)

The largest deterioration in LoS is at the A232 Cheam Road signalised junction with St Normans Way and Nonsuch Court Avenue, where delay increases by 95 seconds in comparison to the Do-Minimum scenario. This increased delay appears to be associated with an additional 75 right turners from the A232 Cheam Road into Nonsuch Court Avenue. As noted in the link analysis section, the increase in vehicles routeing via Nonsuch Court Avenue to

approach the A24 Ewell By-Pass junction with A232 Cheam Road from the north rather than from the south is not likely to happen in reality. As such these vehicles would continue along the A232 to the A24 junction which in the Do-Minimum scenario is already operating extremely close to capacity and therefore small increases in traffic have the potential to exacerbate delays disproportionately.

Figure 30 Do-Something junctions where the LoS either deteriorates, or is maintained at D, E, or F



The Motorway and Trunk Road Network

Epsom and Ewell Borough does not contain any motorway or trunk roads. Due to its locality, however, a proportion of the population which reside or work in the borough use the M25 and A3 Trunk, which are the responsibility of National Highways (NH).

Table 6 and Table 7 present the traffic flow for National Highways' network contained within the subarea model, for the weekday AM and PM peak hours respectively. A3 north of Hook has also been included, as although not trunk, it remains a high-speed road of importance, which is maintained and operated by Transport for London (TfL). This section of A3 is asterisked in the tables.

Compared with the Do-Minimum Scenario, the most notable increases in mainline vehicle flow occur in the AM peak clockwise on the M25 between Junction 10 and 11, with an increase of 70 vehicles (0.9%). Except for junction 10-11 in the clockwise direction in the AM peak, the Level of Service (LoS) is maintained between the Do-Something and Do-Minimum scenario, meaning that this section of carriageway is still operating just within capacity. Notably, there is a fall between Junctions 10 and 9 of 90 vehicles anti-clockwise in the AM peak and 91 vehicles clockwise in the PM peak.

With the exception of the M25 Junction 10 on-slip in the anti-clockwise direction, seeing an increase of 3% in vehicles during the AM peak, equivalent to 87 vehicles, the assessed M25 slips experience minor increases or decreases in vehicle flow in both time periods for the Do-Something Scenario compared with the Do-Minimum.

Conversely, the A3 sees general increases in use southbound in the AM peak and northbound in the PM peak compared with the M25 which does not see as much variation between scenarios.

In the southbound direction of travel on the A3 there is an increase of more than 108 vehicles (2.9%) between Esher Common and Painshill compared with the Do-Minimum scenario during the AM peak hour. This rise corresponds with an increase seen between Painshill and Esher Common in the PM peak of 109 vehicles (3.2%) over the Do-Minimum scenario.

An increase during the AM peak also occurs in the southbound direction between Painshill and the M25 of 102 vehicles (2.1%). This corresponds with an increase of 99 vehicles in the PM peak between the M25 and Painshill.

The largest increase in flow on any of the A3 slips in the Do-Something scenario compared to the Do-Minimum is 65 vehicles on the A3 northbound off slip at Esher Common during the PM peak. Note that Elmbridge Local Plan modelling indicated that mitigation may be required at the Esher Common roundabout in the form of part signalisation however after subsequent detailed modelling and discussions between Elmbridge Borough Council, Surrey County Council and National Highways as set out in Elmbridge's Infrastructure Delivery Plan it was agreed that this may not be needed within the Elmbridge plan period and that "queuing on the two off-slips from the A3 to the junction of the A3 and the A244 (Esher Common Roundabout) will be monitored by NH and SCC and if necessary, the potential for signalisation of the off-slips will be discussed further between SCC and NH should a need be identified to prevent queuing back onto the A3."

Only one of the flow changes results in a change in the LoS, M25 clockwise between J10 and J11, which changes from C to D. The increase in number of vehicles for this flow is 70 between the Do-Minimum and Do-Something scenario, representing a percentage increase of 0.9%. As

this is a very low percentage increase, it would suggest that this section of the M25 was close to a tipping point between categories in the Do-Minimum scenario.

The model has been interrogated to determine the impact of the largest sites on the strategic road network. During the AM peak the Horton Farm site generates 18 vehicles which access the A3 southbound at Esher Common with fewer than 10 joining the M25 at Junction 10. During the PM peak the Horton Farm site adds fewer than 10 vehicles on any of the M25 links. The remainder of the large sites add very minimal trips to any National Highways roads, indicating that any changes in flow on the strategic road network in the Do-Something model are largely a result of rerouting and displacement of existing trips rather than trips generated by the Local Plan sites themselves.

Table 6 Traffic Flow Summary in Vehicles for the M25 and A3 for the AM Peak Hour (0800 – 0900)

Road and Segment	Flow		Difference	Difference (%)	Level of Service (A-D)		LoS Difference from Do-Minimum
	Do-Minimum	Do-Something			Do-Minimum	Do-Something	
M25 Clockwise	*44,387*	*44,506*	*120*	*0.3%*			
M25 J7 - 8	9,988	9,966	-22	-0.2%	D	D	
M25 J8 off-slip	2,320	2,314	-6	-0.3%	B	B	
M25 J8 on-slip	841	847	6	0.7%	A	A	
M25 J8 - 9	8,509	8,499	-10	-0.1%	D	D	
M25 J9 off-slip	924	923	-1	-0.1%	A	A	
M25 J9 on-slip	608	607	-1	-0.1%	A	A	
M25 J9 - 10	8,194	8,183	-11	-0.1%	C	C	
M25 J10 off-slip	1,976	1,983	8	0.4%	A	A	
M25 J10 on-slip	2,878	2,965	87	3.0%	B	B	
M25 J10 - 11	8,148	8,218	70	0.9%	C	D	C to D
M25 Anticlockwise	*33,605*	*33,404*	*-202*	*-0.6%*			
M25 J11 - 10	6,188	6,155	-33	-0.5%	B	B	
M25 J10 off-slip	2,924	2,930	7	0.2%	B	B	
M25 J10 on-slip	2,219	2,169	-49	-2.2%	A	A	
M25 J10 - 9	6,431	6,341	-90	-1.4%	B	B	
M25 J9 off-slip	1,760	1,670	-90	-5.1%	A	A	
M25 J9 on-slip	608	627	19	3.2%	A	A	
M25 J9 - J8	5,280	5,298	18	0.3%	B	B	
M25 J8 off-slip	1,201	1,191	-10	-0.8%	A	A	
M25 J8 on-slip	1,458	1,457	-1	0.0%	A	A	
M25 J8 - 7	5,536	5,564	28	0.5%	B	B	
A3 Northbound	*33,633*	*33,650*	*18*	*0.1%*			
A3 M25 off-slip	2,219	2,169	-49	-2.2%	A	A	
A3 M25 on-slip	2,060	2,065	5	0.2%	A	A	
A3 M25 - Painshill	4,817	4,846	29	0.6%	B	B	
A3 Painshill off-slip	1,724	1,715	-10	-0.6%	A	A	
A3 Painshill on-slip	305	312	7	2.4%	A	A	
A3 Painshill - Esher Common	3,398	3,444	46	1.4%	B	B	
A3 Esher Common off-slip	1,032	1,019	-13	-1.3%	A	A	
A3 Esher Common on-slip	746	703	-43	-5.7%	A	A	
A3 Esher Common - Hook	3,111	3,128	17	0.5%	A	A	
*A3 A309 on-slip	572	557	-15	-2.6%	A	A	
*A3 Hook on-slip	1,680	1,683	3	0.2%	C	C	
*A3 Hook - Tolworth	4,753	4,758	6	0.1%	C	C	
*A3 Tolworth off-slip	792	781	-11	-1.4%	A	A	
*A3 Tolworth on-slip	315	326	11	3.5%	A	A	
*A3 Tolworth - Malden Junction	4,937	4,943	6	0.1%	C	C	
*A3 Malden Junction off-slip	585	609	24	4.1%	A	A	
*A3 Malden Junction on-slip	586	591	5	0.9%	B	B	
A3 Southbound	*36,633*	*36,778*	*145*	*0.4%*			
*A3 Malden Junction off-slip	266	250	-16	-5.9%	A	A	
*A3 Malden Junction on-slip	530	544	15	2.8%	B	B	
*A3 Malden Junction - Tolworth	4,350	4,366	17	0.4%	C	C	
*A3 Tolworth off-slip	1,582	1,534	-48	-3.0%	C	C	
*A3 Tolworth on-slip	1,358	1,311	-47	-3.4%	B	B	
*A3 Tolworth to Hook	4,898	4,895	-3	-0.1%	3	3	
*A3 Hook off-slip	1,674	1,670	-4	-0.2%	D	D	
*A3 A309 off-slip	572	557	-15	-2.6%	A	A	
A3 Hook - Esher Common	3,419	3,464	44	1.3%	B	B	
A3 Esher Common off-slip	572	554	-18	-3.2%	A	A	
A3 Esher Common on-slip	908	954	45	5.0%	A	A	
A3 Esher Common - Painshill	3,756	3,864	108	2.9%	B	B	
A3 Painshill off-slip	669	670	1	0.1%	A	A	
A3 Painshill on-slip	1,677	1,673	-5	-0.3%	A	A	
A3 Painshill - M25	4,764	4,866	102	2.1%	B	B	
A3 M25 off-slip	2,946	2,952	6	0.2%	B	B	
A3 M25 on-slip	2,691	2,653	-38	-1.4%	B	B	

Table 7 Traffic Flow Summary in Vehicles for the M25 and A3 for the PM Peak Hour (1700 – 1800)

Road and Segment	Flow		Difference	Difference (%)	Level of Service (A to D)		LoS difference from Do-Minimum
	Do-Minimum	Do-Something			Do-Minimum	Do-Something	
M25 Clockwise	*37,449*	*37,404*	*-44*	*-0.1%*			
M25 J7 - 8	6,631	6,665	34	0.5%	B	B	
M25 J8 off-slip	1,627	1,637	10	0.6%	A	A	
M25 J8 on-slip	1,020	1,000	-20	-2.0%	A	A	
M25 J8 - 9	6,025	6,028	3	0.1%	B	B	
M25 J9 off-slip	938	939	2	0.2%	A	A	
M25 J9 on-slip	1,382	1,342	-39	-2.9%	B	B	
M25 J9 - 10	6,469	6,431	-38	-0.6%	B	B	
M25 J10 off-slip	2,559	2,595	36	1.4%	B	B	
M25 J10 on-slip	2,982	2,990	9	0.3%	B	B	
M25 J10 - 11	7,817	7,776	-41	-0.5%	C	C	
M25 Anticlockwise	*40,852*	*40,590*	*-262*	*-0.6%*			
M25 J11 - 10	7,860	7,886	25	0.3%	C	C	
M25 J10 off-slip	1,634	1,646	12	0.7%	A	A	
M25 J10 on-slip	2,725	2,644	-80	-2.9%	B	B	
M25 J10 - 9	8,026	7,935	-91	-1.1%	C	C	
M25 J9 off-slip	1,406	1,373	-33	-2.4%	A	A	
M25 J9 on-slip	1,063	1,060	-4	-0.3%	A	A	
M25 J9 - J8	7,682	7,621	-61	-0.8%	C	C	
M25 J8 off-slip	1,905	1,859	-46	-2.4%	A	A	
M25 J8 on-slip	1,387	1,402	15	1.1%	A	A	
M25 J8 - 7	7,164	7,164	1	0.0%	C	C	
A3 Northbound	*33,158*	*33,273*	*115*	*0.3%*			
A3 M25 off-slip	2,725	2,644	-80	-2.9%	B	B	
A3 M25 on-slip	1,959	2,009	51	2.6%	A	A	
A3 M25 - Painshill	4,511	4,610	99	2.2%	B	B	
A3 Painshill off-slip	1,599	1,586	-13	-0.8%	A	A	
A3 Painshill on-slip	491	488	-4	-0.7%	A	A	
A3 Painshill - Esher Common	3,402	3,511	109	3.2%	B	B	
A3 Esher Common off-slip	885	950	65	7.3%	A	A	
A3 Esher Common on-slip	597	595	-2	-0.4%	A	A	
A3 Esher Common - Hook	3,115	3,156	41	1.3%	A	A	
*A3 A309 on-slip	634	618	-16	-2.5%	A	A	
*A3 Hook on-slip	1,610	1,605	-4	-0.3%	C	C	
*A3 Hook - Tolworth	4,802	4,799	-3	-0.1%	C	C	
*A3 Tolworth off-slip	871	855	-16	-1.8%	A	A	
*A3 Tolworth on-slip	111	108	-3	-2.5%	A	A	
*A3 Tolworth - Malden Junction	4,727	4,703	-25	-0.5%	C	C	
*A3 Malden Junction off-slip	526	457	-69	-13.2%	A	A	
*A3 Malden Junction on-slip	593	579	-14	-2.3%	B	B	
A3 Southbound	*39,753*	*39,765*	*12*	*0.0%*			
*A3 Malden Junction off-slip	344	342	-2	-0.5%	A	A	
*A3 Malden Junction on-slip	571	644	73	12.7%	B	B	
*A3 Malden Junction - Tolworth	4,735	4,754	19	0.4%	C	C	
*A3 Tolworth off-slip	1,344	1,308	-36	-2.7%	B	B	
*A3 Tolworth on-slip	1,560	1,510	-50	-3.2%	C	C	
*A3 Tolworth to Hook	5,171	5,197	27	0.5%	D	D	
*A3 Hook off-slip	1,568	1,565	-3	-0.2%	C	C	
*A3 A309 off-slip	634	618	-16	-2.5%	A	A	
A3 Hook - Esher Common	3,888	3,936	48	1.2%	B	B	
A3 Esher Common off-slip	525	487	-39	-7.4%	A	A	
A3 Esher Common on-slip	1,157	1,134	-24	-2.0%	A	A	
A3 Esher Common - Painshill	4,520	4,583	63	1.4%	B	B	
A3 Painshill off-slip	337	363	26	7.9%	A	A	
A3 Painshill on-slip	2,013	1,971	-42	-2.1%	B	B	
A3 Painshill - M25	6,196	6,190	-5	-0.1%	B	B	
A3 M25 off-slip	2,406	2,404	-2	-0.1%	B	B	
A3 M25 on-slip	2,784	2,758	-26	-0.9%	B	B	

The delay at merges has been calculated in the model using the formula specified in Appendix E.9 of TAG unit M3-1 highway assignment modelling - GOV.UK (www.gov.uk). The result of which is added to the calculated link generalised cost used in assignment.

Table 8 and Table 9 present the calculated merge delay for all on-slips on the M25 and A3 for the weekday AM and PM peak hours respectively. The additional merge delay only applies if the RFC of the downstream mainline is greater than 0.75, otherwise a value of '-' is presented.

As shown in Table 8 the greatest increase in additional merge delay is at the M25 Junction 10, for traffic joining the road in the anti-clockwise direction during the AM Peak of 1.86 seconds per vehicle.

In the PM peak hour, as shown in Table 9, differences with the Do-Minimum Scenario are comparatively small with reductions across most junctions. Notable increases are only seen at Malden in both directions on the A3, and at Tolworth in the Southbound direction. While this is not associated with major changes to flows on the slips in these locations, it reflects the nature that the A3 has increased mainline flow through these sections, contributing to slightly increased delay.

This concludes that the Do-Something scenario particularly is not notably worse for users of the M25 and A3, with minor improvements being seen to merge delay in some locations. The changes are small enough that they are likely to not be noticeable to users and are within daily variation.

Table 8 Additional Merge Delay (seconds per vehicle) for the AM Peak Hour (0800 – 0900)

Merge	Additional Delay (s/veh)		Difference from Do-Minimum
	Do-Minimum	Do-Something	
M25 Clockwise			
Junction 10	9.12	6.72	-2.40
Junction 9	56.70	56.40	-0.30
Junction 8	66.36	66.12	-0.24
Cobham Services	56.70	56.40	-0.30
M25 Anticlockwise			
Junction 10	55.20	57.06	1.86
Junction 9	-	-	-
Junction 8	-	-	-
Cobham Services	9.12	6.72	-2.40
A3 Northbound			
M25 Junction 10	-	-	-
Painshill	-	-	-
Hook	57.00	57.30	0.30
Tolworth	-	-	-
Malden	33.00	32.22	-0.78
A3 Southbound			
Malden	28.86	28.44	-0.42
Tolworth	49.86	49.80	-0.06
Hook	-	-	-
Esher	-	-	-
Painshill	-	-	-
M25 Junction 10	3.18	3.54	0.36

Table 9 Additional Merge Delay (seconds per vehicle) for the PM Peak Hour (1700 – 1800)

Merge	Additional Delay (s/veh)		Difference from Do-Minimum
	Do-Minimum	Do-Something	
M25 Clockwise			
Junction 10	48.84	46.38	-2.46
Junction 9	6.90	5.94	-0.96
Junction 8	-	-	-
Cobham Services	6.90	5.94	-0.96
M25 Anticlockwise			
Junction 10	43.44	42.36	-1.08
Junction 9	39.72	38.10	-1.62
Junction 8	26.46	26.52	0.06
Cobham Services	48.84	46.38	-2.46
A3 Northbound			
M25 Junction 10	-	-	-
Painshill	-	-	-
Hook	54.24	53.76	-0.48
Tolworth	-	-	-
Malden	38.16	39.36	1.20
A3 Southbound			
Malden	67.68	68.82	1.14
Tolworth	60.06	61.20	1.14
Hook	-	-	-
Esher	-	-	-
Painshill	3.90	3.72	-0.18
M25 Junction 10	-	-	-

Cross Boundary Impacts

Traffic flows on A principal and B roads which cross into neighbouring authorities have also been analysed and compared. Table 10 present the flows entering and exiting the borough for the weekday AM peak hour, and Table 11 for the PM peak hour. The roads have been listed in a clockwise direction, starting with the London Borough of Sutton. Although not an A or B Road, Chessington Road (asterisked in the tables) has been included, because it provides direct access between the A243 and B284 and is considered a key access point of travel to and from the borough.

It can be seen that any change in flow at the borough's boundary is relatively small for the majority of roads listed during both time periods. The exceptions to this are listed below, with increases in excess of 50 vehicles, when compared with the Do-Minimum Scenario:

- Entering the borough via B280 Rushett Lane for the AM peak hour (decrease of 64vph)
- Exiting the borough via B280 Rushett Lane for the AM peak hour (increase of 130vph)
- Exiting the borough via A240 Kingston Road for the AM peak hour (increase of 70vph)
- Entering the borough via A240 Reigate Road for the PM peak hour (increase of 89vph)
- Entering and exiting the borough via B284 Yew Tree Bottom Road for the PM peak hour (increase of 60vph and 58vph respectively)
- Exiting the borough via A232 Cheam Road for the PM peak hour (decrease of 141vph)

With the exception of B280 Rushett Lane which is in close proximity to and directly impacted by vehicle trips accessing the Land at West Park Hospital and Horton Farm sites, the other routes listed above are as a result of the displacement and rerouting of trips to alternative, competing routes.

Comparing the Do-Something with the Do-Minimum Scenario, level of service has only been impeded to category D on Chessington Road entering Epsom and Ewell in the PM peak hour. The change in flow is minimal from 1,205 vehicles to 1,219 vehicles representing an increase of 1%.

Table 10 AM Peak Hour Traffic Flow Summary for A Principal and B Roads which Cross the Epsom and Ewell Boundary into Neighbouring Authorities

Link ID	Road	Crosses Boundary with	Flow (Veh)		Difference from Do-Minimum	% Change from Do-Minimum
			Do-Minimum	Do-Something		
Vehicles Entering Epsom and Ewell Borough						
330521_1	A24 London Road	Sutton	759	753	-5	-1%
92824_2	A232 Cheam Road	Sutton	557	562	4	1%
116125_2	A240 Reigate Road	Reigate and Banstead	1,233	1,231	-3	0%
203849_1	B291 Fir Tree Road	Reigate and Banstead	567	582	15	3%
203848_2	B284 Yew Tree Bottom Road	Reigate and Banstead	708	696	-12	-2%
115603_2	B2221 Tattenham Crescent (south)	Reigate and Banstead	195	178	-16	-8%
115604_1	B2221 Tattenham Crescent (north)	Reigate and Banstead	92	93	1	1%
71613_2	B290 Epsom Lane North	Reigate and Banstead	718	741	23	3%
331409_1	A24 Dorking Road	Mole Valley	733	744	10	1%
331903_1	B280 Rushett Lane	Kingston upon Thames	488	424	-64	-13%
403761_1	Chessington Road*	Kingston upon Thames	1,205	1,200	-5	0%
402584_2	A240 Kingston Road	Kingston upon Thames	1,950	1,942	-9	0%
331367_2	B284 Old Malden Lane	Kingston upon Thames	714	698	-15	-2%
Vehicles Exiting Epsom and Ewell Borough						
330521_2	A24 London Road	Sutton	663	644	-20	-3%
92824_1	A232 Cheam Road	Sutton	543	521	-23	-4%
116125_1	A240 Reigate Road	Reigate and Banstead	1,147	1,124	-23	-2%
163048_2	B291 Fir Tree Road	Reigate and Banstead	252	286	35	14%
203846_2	B284 Yew Tree Bottom Road	Reigate and Banstead	651	663	12	2%
115603_1	B2221 Tattenham Crescent (south)	Reigate and Banstead	191	163	-29	-15%
115604_2	B2221 Tattenham Crescent (north)	Reigate and Banstead	106	117	11	11%
71613_1	B290 Epsom Lane North	Reigate and Banstead	481	509	28	6%
331409_2	A24 Dorking Road	Mole Valley	806	833	26	3%
331903_2	B280 Rushett Lane	Kingston upon Thames	900	1,031	130	14%
403761_2	Chessington Road*	Kingston upon Thames	1,325	1,349	23	2%
92609_1	A240 Kingston Road	Kingston upon Thames	1,900	1,970	70	4%
331367_1	B284 Old Malden Lane	Kingston upon Thames	829	832	3	0%

Table 11 PM Peak Hour Traffic Flow Summary for A Principal and B Roads which Cross the Epsom and Ewell Boundary into Neighbouring Authorities

Link ID	Road	Crosses Boundary with	Flow (Veh)		Difference from Do-Minimum	% Change from Do-Minimum
			Do-Minimum	Do-Something		
Vehicles Entering Epsom and Ewell Borough						
330521_1	A24 London Road	Sutton	791	795	4	1%
92824_2	A232 Cheam Road	Sutton	392	353	-39	-10%
116125_2	A240 Reigate Road	Reigate and Banstead	876	965	89	10%
203849_1	B291 Fir Tree Road	Reigate and Banstead	393	364	-29	-7%
203848_2	B284 Yew Tree Bottom Road	Reigate and Banstead	381	441	60	16%
115603_2	B2221 Tattenham Crescent (south)	Reigate and Banstead	172	174	3	2%
115604_1	B2221 Tattenham Crescent (north)	Reigate and Banstead	78	74	-4	-6%
71613_2	B290 Epsom Lane North	Reigate and Banstead	465	477	13	3%
331409_1	A24 Dorking Road	Mole Valley	731	724	-7	-1%
331903_1	B280 Rushett Lane	Kingston upon Thames	704	742	38	5%
403761_1	Chessington Road*	Kingston upon Thames	1,205	1,219	14	1%
402584_2	A240 Kingston Road	Kingston upon Thames	2,093	2,080	-13	-1%
331367_2	B284 Old Malden Lane	Kingston upon Thames	829	831	3	0%
Vehicles Exiting Epsom and Ewell Borough						
330521_2	A24 London Road	Sutton	747	733	-14	-2%
92824_1	A232 Cheam Road	Sutton	599	458	-141	-23%
116125_1	A240 Reigate Road	Reigate and Banstead	982	1,018	36	4%
163048_2	B291 Fir Tree Road	Reigate and Banstead	319	340	21	6%
203846_2	B284 Yew Tree Bottom Road	Reigate and Banstead	708	767	58	8%
115603_1	B2221 Tattenham Crescent (south)	Reigate and Banstead	97	94	-3	-3%
115604_2	B2221 Tattenham Crescent (north)	Reigate and Banstead	300	312	12	4%
71613_1	B290 Epsom Lane North	Reigate and Banstead	461	475	14	3%
331409_2	A24 Dorking Road	Mole Valley	772	735	-37	-5%
331903_2	B280 Rushett Lane	Kingston upon Thames	376	369	-7	-2%
403761_2	Chessington Road*	Kingston upon Thames	1,263	1,255	-8	-1%
92609_1	A240 Kingston Road	Kingston upon Thames	1,463	1,473	11	1%
331367_1	B284 Old Malden Lane	Kingston upon Thames	790	782	-8	-1%

Network Hotspots and Mitigation

To summarise the traffic impacts identified in this study, Table 12 lists the junctions and sections of road which experience large vehicle delay, termed ‘hotspots’. The hotspots are shown geographically in Figure 31.They are essentially all links and junctions which have been identified within this report as having a Level of Service (LoS) category of D, forced or breakdown of flow and operating above capacity. Only junctions with an average delay value greater than 25 seconds have been included within this category. The hotspots, therefore, include links and junctions which are already categorised in the Do-Minimum as operating above their theoretical capacity with a LoS category D. This accounts for the majority of the hotspots listed. Those marked with an asterisk are those where the LoS deteriorates to category D in the Do-Something scenario.

Hotspots are areas of stress where drivers are subject to considerable delay and are likely to require mitigation to facilitate any development in the local area. This could be ‘hard’ or ‘soft’ measures, or most likely a combination of both. Hard engineering measures could involve junction reconfiguration or introducing a cycle lane, for example, whilst soft measures could be the implementation of a travel plan to encourage travel by sustainable modes.

The hotspots provide a preparatory list of where potential mitigation should be focused, to inform the borough’s Infrastructure Delivery Plan (IDP) and subsequent Community Infrastructure Levy (CIL).

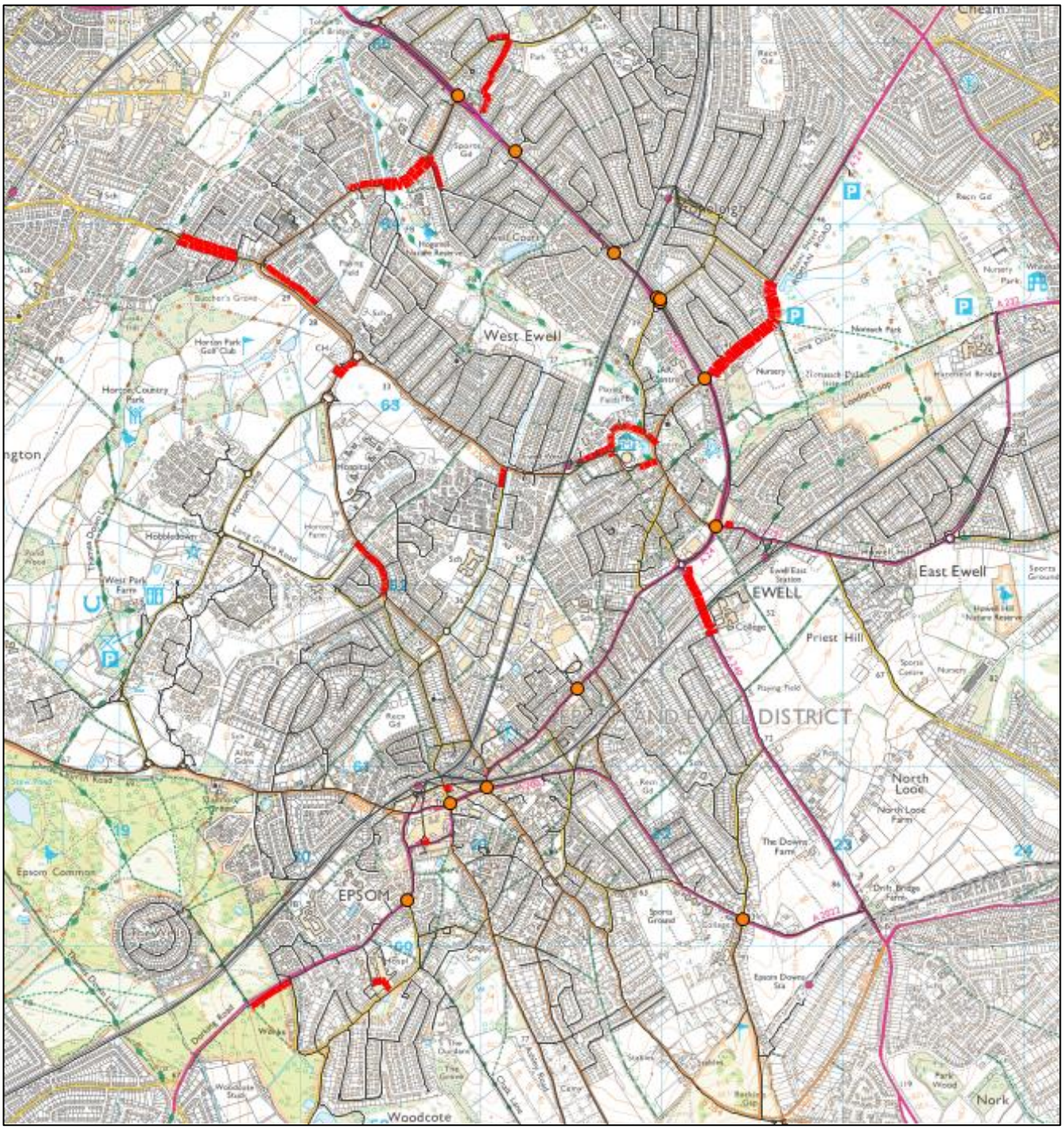
Given the land and severance constraints of the existing highway network within Epsom and Ewell, together with the fact that the majority of the Local Plan sites are within areas of good accessibility to key services, mitigation should predominantly focus on reducing the reliance on the private car. This should be assisted by good spatial planning of any Local Plan site. For example, the supply of and/or connectivity to local amenities which can be reached on foot or by bike. It is also recommended that mitigation is not limited to just the occupiers of the Local Plan sites, as well as to existing users of the highway network in Epsom and Ewell.

NOTE: in accordance with the National Planning Policy Framework all individual development sites that generate significant amounts of movement should be supported by a specific Transport Statement or Transport Assessment. These are submitted as part of the planning application process.

Table 12 Network Hotspots

Area	Location
Links	
Epsom	A24 Dorking Road
	*B284 Hook Road
	The Parade
	Epsom Hospital Access
	Exit from the Ashley Centre
	Exit from Ebbisham Centre Car Park
Epsom Downs	B290 Tattenham Corner Road
	Longdown Lane North
Ewell	*A24 Epsom Road
	A24 London Road
	A232 Cheam Road
	*A240 Reigate Road
	B2200 Chessington Road
	B2200 High Street
	B2200 London Road
	B2200 Spring Street
West Ewell	*B284 Chessington Road
	B284 Ruxley Lane
	*Longmead Road
	Pams Way
Worcester Park/ Stoneleigh	B284 Old Malden Lane
	*Salisbury Road
	Timbercroft
Junctions	
Epsom	*A24 Dorking Road signalised junction with Woodcote Road
	A24 High Street signalised junction with A24 Ashley Road and Waterloo Road
	A24 High Street signalised junction with Church Street and Upper High Street
	A24 East Street signalised junction with Kiln Lane and Dirdene Gardens
	A2022 College Road signalised junction with Longdown Lane
	B284 Hook Road signalised junction with Chantilly Way
Ewell	A24 Ewell By-Pass signalised junction with B2200 London Road
	A24 Ewell By-Pass signalised junction with B2200 Cheam Road and A232 Cheam Road
	*A232 Cheam Road signalised junction with St Normans Way and Nonsuch Ct Avenue
	A240 Ewell By-Pass southern approach to the roundabout with Kingston Road and Park Avenue
	A240 Ewell By-Pass northern approach to the roundabout with Kingston Road and Park Avenue
	A240 Kingston Road signalised junction with B284 Ruxley Lane
	*Park Avenue approach to the roundabout with A240 Ewell By-Pass and Kingston Road
West Ewell	B284 Chessington Road signalised junction with Ruxley Lane
Langley Vale	B290 Ashley Road signalised junction with Langley Vale Road
Stoneleigh	A240 Kingston Road signalised junction with Stoneleigh Park Road
	A240 Kingston Road signalised junction with Thorndon Gardens
	Briarwood Road junction with Glenwood Road

Figure 31 Network Hotspots in Epsom and Ewell Borough



Overview of Findings

The potential highway impacts of Epsom and Ewell Borough Council's Regulation 19 Local Plan have been assessed for the forecast year 2040 using a combination of Surrey County Council's strategic transport model, SINTRAM, and a local model derived from it.

Two scenarios have been created:

- 2040 Do-Minimum. This includes completions and commitments within the borough since 2019, significant recent completions and commitments outside of the borough, and natural traffic growth

- 2040 Do-Something. This is a copy of the 2040 Do-Minimum scenario **plus** Local Plan development sites and windfalls.

The potential highway impacts of the Regulation 19 Local Plan have therefore been identified by comparing the Do-Minimum scenario with the Do-Something scenario.

Links and junctions within the borough which have been forecasted to be under stress, where drivers will be subject to considerable delay, have been defined as 'hotspots'. These hotspots, set out in the previous section, are likely to require mitigation to reduce the impact of any development sites in the local area, and provide a preparatory list to inform the borough's Infrastructure Delivery Plan (IDP) and subsequent Community Infrastructure Levy (CIL). This mitigation is likely to focus on measures to encourage the use of alternatives to the private car rather than simply increasing highway capacity. It should be noted that the majority of these locations already experience congestion issues which are exacerbated by the additional trips arising from the potential development sites.

Key Points

The primary impacts of Epsom and Ewell Borough Council's Regulation 19 Local Plan from the strategic transport model can be summarised as follows:

- There is a greater increase in walk, cycle and public transport trips than vehicle trips. In part this is due to increased road congestion, but also the location of the Local Plan sites in relation to their proximity to amenities such as schools and shops within walk and cycle distance, as well as public transport connectivity.
- Evaluation of mode share of the largest Local Plan sites showed car usage was lowest for the sites located in and close to Epsom town centre, where amenities are reachable on foot and there is very good public transport accessibility. Conversely, car usage was higher in the suburban sites, where amenities and public transport services are more limited. Nevertheless none of the proposed sites are without existing public transport services or without some amenities within walking distance (assessed in the Regulation 18 assessment[2]), and with the increase in dwellings to the north and west of Epsom, there may be sufficient patronage to improve bus service frequency, further reducing the car share where it is worst performing.
- Car usage at Horton Farm site could also be reduced if amenities could be provided on site. Currently the assessment considers the site to be entirely residential with residents of the potential Horton Farm development site needing to travel to access work and education as well as shopping and leisure amenities. Although there are leisure facilities, nursery, a primary school and local shops within walking distance in the Long Grove Park area to the west of the site, if additional amenities were on site, the need for vehicle travel would be further reduced, and in travel terms the site would be more sustainable as these shorter distance trips would be more likely to be made using active modes. At the very least, high quality, safe walk and cycle connections across Chantilly Way would be necessary to help reduce car use and to enable residents to make use of these local amenities.
- The main roads and junctions in Epsom and Ewell Borough are notably congested during peak times. The Local Plan sites, which bring increased dwellings and jobs to the area, increase the number of local trips. In turn, the model is showing a displacement of longer distance trips away from the affected areas, as alternative competing routes become more attractive. This includes:
    - Fewer vehicles travelling on the A24 through Epsom town centre with displacement on the southern local routes such as Worple Road and Woodcote Road, and further

[2] Epsom and Ewell Local Plan, Regulation 18 Transport Assessment

afield on the Headley and Langley Vale Roads to join or leave the A24 in Ashtead. However, this displacement is considered minimal.

  - A displacement of vehicles from A240 Kingston Road between B284 Worcester Park Road and Beggar's Hill roundabout at the junction with Kingston Road, to the Worcester Park and Cheam areas, and the A217.
  - In the PM peak a displacement of trips on the B232 Cheam Road to both A240 Reigate Road south of this, and the A217.

- The larger sites create an increase in flows in their vicinity. Most notable are trips travelling to and from the largest sites of Horton Farm and Hook Road Car Park and SGN due to their size, with larger increases in vehicles on B284 Hook Road, Temple Road, Horton Lane, Longmead Road and B2200 Chessington Road.
- Evaluation of the motorway and trunk road network closest to Epsom and Ewell Borough shows that variation in flow along the M25 between junctions 7 and 11 is limited, with a maximum increase of 87 vehicles on the Junction 10 clockwise on-slip in the AM peak and 36 vehicles on the clockwise Junction 10 off-slip in the PM peak hour.
- On the A3, flow changes are minimal, apart from between A3 Esher Common and the M25 in the AM peak which experiences a southbound increase of about 100 vehicles in the AM peak, with 45 vehicles joining at Esher Common. The direction is reversed in the PM peak with around 100 additional vehicles travelling northbound between the M25 and Esher Common junction, with 61% of those exiting at Esher Common and 39% at Hook.
- The routeing analysis of the largest sites indicates trips are sufficiently dispersed by the time they reach the M25 and A3 that the increases are not solely sourced from the proposed development sites, but mostly an indirect impact of displaced trips from the local network.
- Analysis of A principal and B roads which cross into neighbouring authorities shows that for the majority of these links the changes in flow are relatively minor, although there are some more significant increases on B280 Rushett Lane exiting the borough during the AM peak, A240 Kingston Road exiting the borough during the AM peak, A240 Reigate Road entering the borough during the PM peak, and B284 Yew Tree Bottom Road entering and exiting the borough during the PM peak. None of these increases results in a change in level of service on these routes. Out of these only B280 Rushett Lane is a direct impact from Local Plan sites, whilst the others are due to longer distance trips displacing onto alternative routes as a response to increased local trips.

To conclude:

- Overall, the Local Plan sites are mostly reasonably small and/or well located in relation to existing transport connections and amenities. As a result, the highway impacts tend to be local to the development sites themselves and the cumulative impact is in general tolerable.
- It is not considered that any impacts would be considered severe in terms of the National Planning Policy Framework (NPPF).
- There is a need for localised mitigation tied in with specified development sites as well as schemes to address cumulative impacts. In particular, high quality pedestrian and cycle links linking the development sites with where people want to travel is required, in order to limit travel by private vehicles, and this includes connections to their local bus and rail services.

Lastly, the assessment should be considered in the context of the caveats introduced at the beginning of this report on page 4. In particular, the strategic transport model has not been adjusted for Covid-19, and thus the underlying demand is likely to be overestimated. In this

context, some of the displacement of longer distance trips may not materialise in practice, and thus should be considered as worst case.

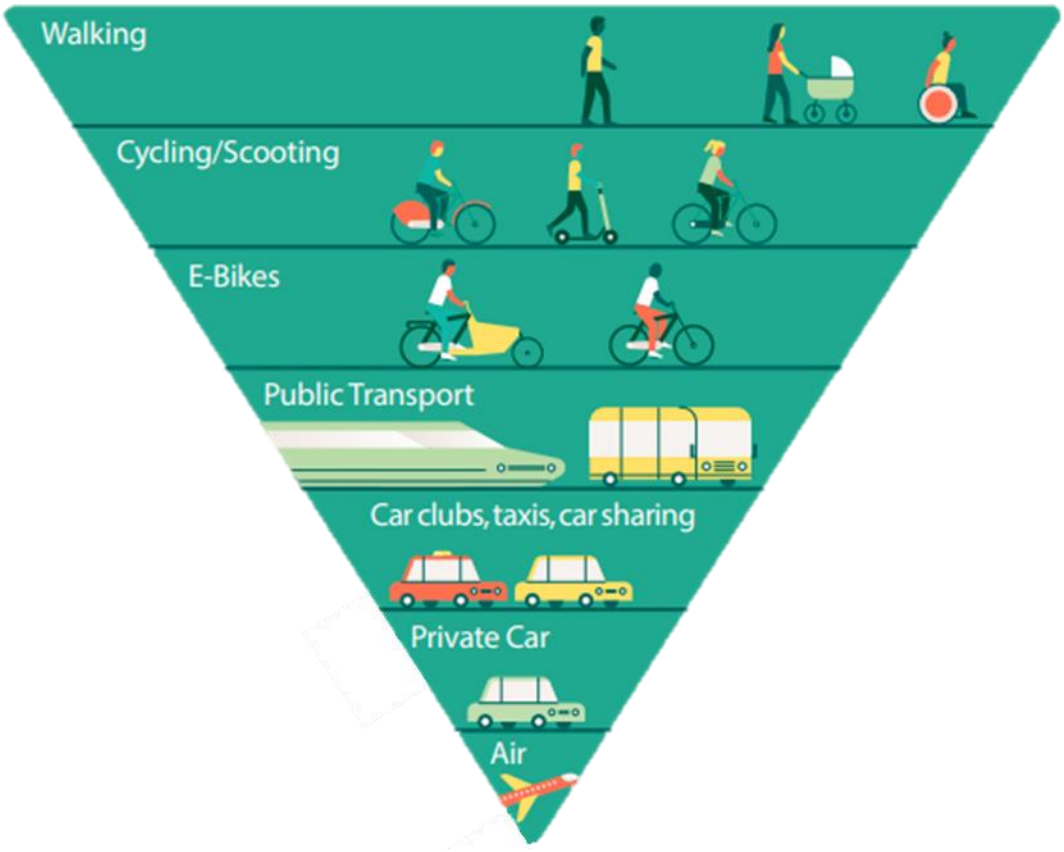
Mitigation and Policy Context

Mitigation should be sought that reduces the impact of the Local Plan. Within the constraints of Epsom and Ewell Borough, this is most likely to focus on reducing the reliance on the private car, but it is recommended that this is not limited to the occupiers of the Local Plan sites and should consider all transport users in the borough.

Local Transport Plan 4 (LTP4)

Local Transport Plan (LTP4) - Surrey County Council (surreycc.gov.uk), adopted by Surrey County Council in 2022, sets out the ambition to transform Surrey's transport network up to 2032, aiming to reduce carbon emissions from transport in order to work towards the UK Government's national legal commitment to meet net zero emissions by 2050. The objectives of the Transport Plan are to achieve net zero carbon emissions, to achieve sustainable gross, build well-connected communities and to attain clean air and an excellent quality of life for residents. Actions of the Local Transport Plan include seeking to improve health and wellbeing through cleaner air, providing charging points and parking for electric vehicles, developing and implementing safer walking and cycling routes, improving bus services across the county and providing support for those with accessibility needs. This will support residents to have more options to travel, reducing dependency on private vehicles. Within LTP4, there is a demonstrated need to better align spatial planning with transport planning in order to develop a more joined-up approach to development across the County. Finally, the Sustainable Transport Hierarchy (Figure 32) prioritises modes such as walking, wheeling, cycling and public transport over less sustainable modes of transport such as single-occupant vehicles. This is particularly relevant in a borough such as Epsom and Ewell, a largely urbanised borough on the periphery of Greater London with a more integrated transport system, where encouraging the use of active and public transport modes is a realistic alternative to car-dependency for the majority of people.

Figure 32 Sustainable Travel Hierarchy



Epsom and Ewell Local Cycling and Walking Infrastructure Plan (LCWIP)

Epsom and Ewell Local Cycling and Walking Infrastructure Plan (LCWIP) has been developed in collaboration with the general public and officers from Surrey County Council and Epsom and Ewell Borough Council. It sets out a long-term vision and plan to increase the number of people able to undertake walking, wheeling and cycling trips, and the output of this report provides a network for key walking and cycling corridors in order to focus investment on in the future. Further information can be found online: Local Cycling and Walking Infrastructure Plan | Epsom and Ewell Borough Council (epsom-ewell.gov.uk).

At the time of writing, it has been endorsed by Epsom and Ewell Borough Council at the Licensing and Planning Policy meeting on 24 September 2024 and will be imminently adopted by Surrey County Council. The Plan will then move to the feasibility stage.

The LCWIP contains measures that will assist in reducing the reliance of the car both for Local Plan sites, but also for existing residents and visitors to the borough.