

# Surrey Heath Local Plan: Strategic Highway Assessment Report

## Fairoaks Airport Sensitivity Test

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## 1 INTRODUCTION

### 1.1 Purpose of Study

1.1.1 Surrey Heath Borough Council are preparing a new Local Plan. Surrey County Council have been commissioned to assess the impact of the Local Plan allocations, which is documented in the *Surrey Heath Local Plan: Strategic Transport Assessment*. Alongside this, this report presents a **sensitivity test** which adds the development at Fair Oaks Airport to assess its impact should this site be granted planning permission during the Local Plan period.

1.1.2 Surrey's transport model SINTRAM has been used for the assessment as well as a cordoned Local Model of Surrey Heath and its immediate surroundings. A future year of 2038 has been assessed, to tie in with the horizon year of the Local Plan period. Validation of the model and details of the forecasting methodology is detailed in the *Surrey Heath Local Plan: Strategic Highway Assessment Report: Technical Annex*.

### 1.2 Caveats

1.2.1 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.

1.2.2 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 developments to have detailed, local transport assessments carried out which may identify additional specific impacts on the network (e.g., junction congestion) that require mitigation.

1.2.3 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.

### 1.3 Scenarios

1.3.1 The sensitivity test presented in this report is a comparison of the following two model scenarios:

- 2038 Do Something – this includes growth outside the borough, growth from planned and committed developments since 2014 within the borough, **plus** Local Plan development sites and windfalls.
- 2038 Fair Oaks Airport – as above plus development at Fair Oaks Airport. This is also termed the **Sensitivity Test** scenario in this report.

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

- 1.3.3 NOTE: 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.

#### 1.4 Fairoaks Airport Development

- 1.4.1 Fairoaks Airport is located east of Chobham at Surrey Heath's boundary with Runnymede. It lies between the A319 and A320, north of Woking. Development at Fairoaks Airport is larger than any of the Local Plan site allocations, with an assumed gross of 1,000 dwellings and 54,543 m<sup>2</sup> GFA of commercial use. Table 1-1 shows the breakdown of the estimated gross arrivals and departures that Fairoaks is forecast to generate in the model.

*Table 1-1 Estimated gross trip arrivals and departures for Fairoaks*

Land Uses	AM Peak Hour		PM Peak Hour	
	Arrivals (vehs)	Departures (vehs)	Arrivals (vehs)	Departures (vehs)
Residential	110	294	269	126
Retail	240	5	290	66
Industry, Construction & Transport	387	36	39	437
Recreation & Leisure	30	27	102	72
Employment	435	41	44	491

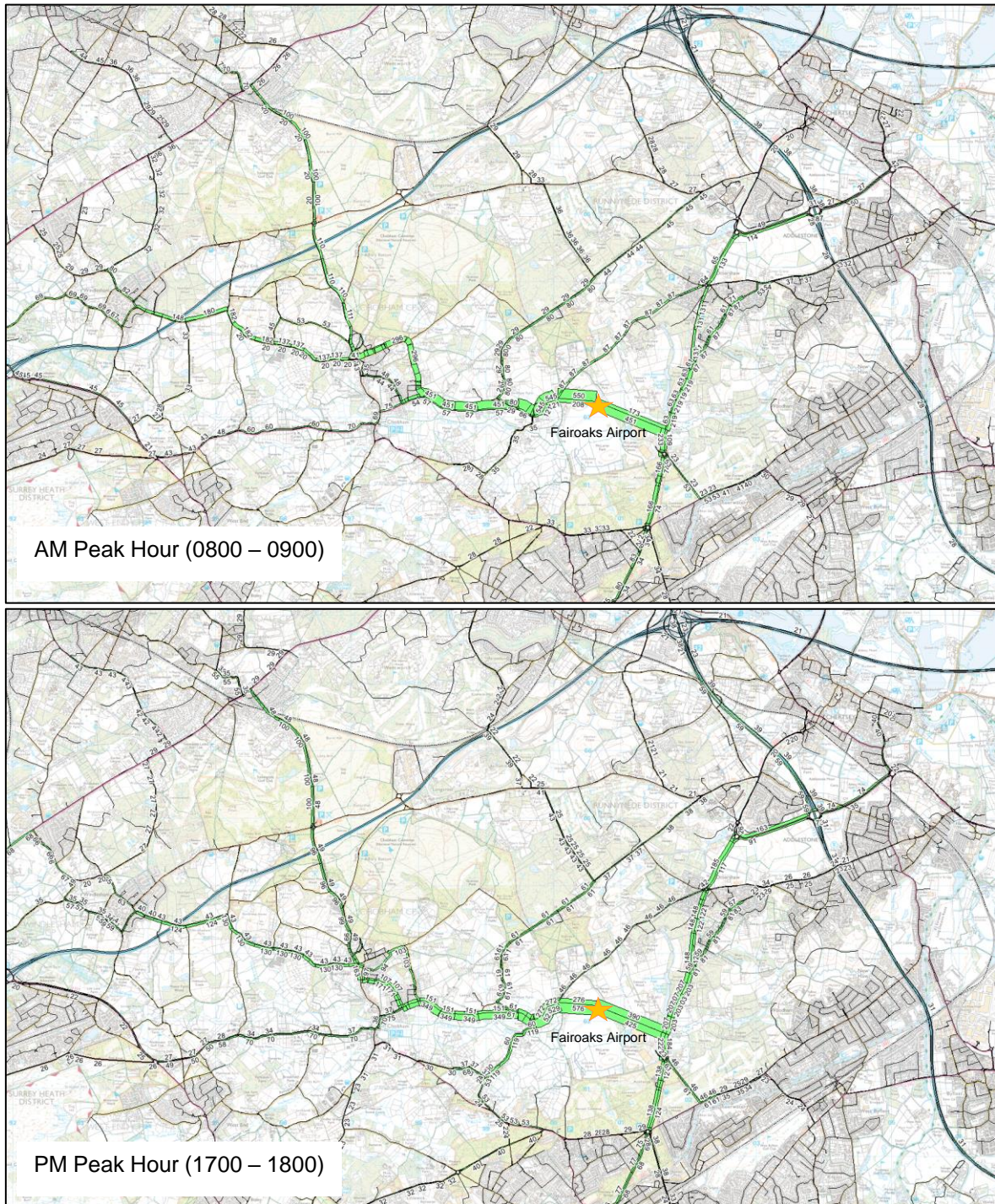
- 1.4.2 For this assessment a new zone was used to represent the development, which connects to both the A319 and A320, as per detailed in the proforma by Surrey Heath Borough Council, but also as shown in the most recent planning application for the site. The junctions where they connect have not been modelled as the detail is not known at this stage, and thus there will be additional delay to both the A320 and A319 which is not captured in this assessment.
- 1.4.3 The trip distribution for the Fairoaks Airport site is based on the surrounding zones with comparable land uses, but a more detailed assessment of both trip generation and distribution should be undertaken as part of the planning process.
- 1.4.4 Given its proximity to the borough boundary, results in this report are not just focused on the borough of Surrey Heath but include its neighbouring authorities, such as Woking and Runnymede, where they are affected by the development.

## 2 SELECT LINK ANALYSIS

- 2.1.1 To help visualise and understand the highway impact of the Fairoaks Airport development, select link analysis has been undertaken on the Sensitivity Test scenario which adds development to the Fairoaks Airport site. The select link plots in Figure 2-1 show the routing of vehicles accessing and egressing the Fairoaks Airport site and therefore allow analysis of its contribution towards the changes in flow on the surrounding network. All values in the select link plot have been labelled, and the geographical context has not been limited to the borough of Surrey Heath. The units are vehicles per hour (vph) and flows less than 20vph are not labelled to avoid cluttering the plots.
- 2.1.2 When interpreting the select link plots it should be noted that the results presented are for highway modes of car, LGV and HGV only and the single AM and PM peak hours. This is to say that a greater number of trips are generated from each development site than presented in Figure 2-1 but the analysis of this report focuses only on impacts relating to car, LGV and HGV users on the highway.

- 2.1.3 Figure 2-1 shows that during the AM peak hour, 550vph arrive from the west of the site and 451vph from the east. For those arriving from the west, around 450vph travel via A319 Chertsey Road from the direction of Chobham, with around 80 PCU travelling along Stonehill Road and merging with the A319 shortly before the site access. For those arriving from the east of the site, around 220vph come along the A320 from the north and 166vph from the direction of the Six Crossroads Roundabout to the south with an additional 53vph merging with this flow from Martyr's Lane, shortly before the access.
- 2.1.4 Considering the motorway junctions during the AM peak hour, trips to Fairoaks Airport via the M25 J11 comprise of an additional 38vph exiting the M25 via the anticlockwise off-slip and 28vph exiting at J11 via the clockwise on-slip. In addition, 50vph travel via the A320 westbound through J11 to access Fairoaks Airport. Trips travelling away from the site towards J11 during the AM peak hour are lower with just 49vph approaching the junction from Fairoaks Airport, 27vph of which continue eastbound along the A320, 19vph join the M25 clockwise and 5vph join the M25 anticlockwise. At M3 J3 during the AM peak hour, 39vph use the eastbound off-slip to travel to Fairoaks Airport with 3vph travelling away from Fairoaks Airport and joining the M3 westbound.
- 2.1.5 For the PM peak hour, Figure 2-1 shows that 425vph arrive from the east of the site and 276vph from the west of the site. For those arriving from the east, 203 travel along the A320 Guildford Road from the north, with an additional 138 travelling from the south along the A320 from the Six Crossroads Roundabout. An additional 61vph along Martyr's Lane. For drivers arriving from the west, 151vph do so via the A319 Chertsey Road, with around 60vph travelling along Stonehill Road and Philpot Lane apiece before joining with the A319 shortly before the site access.
- 2.1.6 During the PM peak hour, trips to Fairoaks Airport via the M25 J11 comprise of an additional 39vph exiting the M25 via the anticlockwise off-slip and 18vph exiting at J11 via the clockwise on-slip. In addition, 35vph travel via the A320 westbound through J11 to access Fairoaks Airport. Trips travelling away from the site towards J11 are higher than during the AM peak with 163vph approaching the junction from Fairoaks Airport, 74vph of which continue eastbound along the A320, 59vph join the M25 clockwise and 31vph join the M25 anticlockwise. At M3 J3 during the PM peak hour, 14vph exit the M3 at J3 to travel to Fairoaks Airport with 17vph travelling away from Fairoaks Airport and joining the M3 westbound.
- 2.1.7 The trips generated by the development, particularly the number of arrivals in the AM peak and departures in the PM peak is predominantly driven by the commercial land uses, as seen in Table 1-1. However, the trip distribution within the modelling indicates that the strategic road network (SRN) is not impacted to the same degree as other parts of the network with most trips coming from areas close-by. If employee related trips were to come from further afield then a greater proportion of traffic might use the SRN but that would very much depend on the nature of the employment and congestion on the SRN.



*Figure 2-1 Select link plots for the Fair Oaks Airport site*

### 3 LINK ANALYSIS

- 3.1.1 Section 2 shows how the vehicle flows associated with Fair Oaks Airport site would disperse on the road network. In this section, the cumulative impact this causes on the road links in the network has been examined.
- 3.1.2 Flow difference plots have been produced for the Sensitivity Test, which compares the addition of development at Fair Oaks Airport with the Local Plan Do Something scenario. These are presented in Figure 3-1 to Figure 3-2. 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. Units are

passenger car units (PCU) and are shown on the plots where there is an increase greater than 50 PCU. One car or LGV is considered as a standard unit whilst HGVs are considered equivalent to 2 cars or 2 PCU.

- 3.1.3 During the AM peak hour, the largest increase in flow would occur along the A319 Chertsey Road eastbound approach to Fairoaks Garden Village which would see an additional 423 PCU past the junction with Mincing Lane up to an additional 491 PCU at the junction with Philpot Lane. The direction of this flow sees large impacts on roads in the vicinity of Chobham and Burrowhill, with an additional 266 PCU along Mincing Lane and 305 PCU along Red Lion Road. However, in the case of Mincing Lane, this route is likely to be less desirable in reality, as the model does not reflect delay caused by parked cars along certain sections of the road. In addition, sections of the road have no footway which would require mitigation measures. Therefore, these two factors together would impact on traffic using this route and as a result the wider network should the development be progressed.
- 3.1.4 Further afield, changes in traffic flow along links that the modelling suggests development traffic would take include increases of up to 135 PCU eastbound from Windlesham via Woodlands Road and Windlesham Road in the eastbound direction. An increase in flow southbound via B383 Windsor Road of up to 159 PCU is predicted in the modelling though only an increase of around half that travel southwards towards Burrowhill.
- 3.1.5 Traffic flows east of the development would also see significant change, especially along the A320. The modelling shows that traffic levels immediately north of the site access (up to junction with Brox Road) decrease northbound by 144 PCU but increase southbound by 217 PCU. Brox Road itself sees a very large increase of northbound flow up to 354 PCU heading towards the Ottershaw Roundabout, with a sharp decrease along the adjacent A320 Guildford Road of 499 PCU towards the junction. The modelling also predicts an increase on the Murray Road approach of up to 121 PCU. The origin of this appears to be traffic re-routing via Row Town and Hare Hill from Woking and West Byfleet. A 110 PCU increase occurs along the A320 southbound carriageway fed it seems mainly by a 104 PCU increase westbound along St. Peter's Way from J11 of the M25.
- 3.1.6 South of the site along the A320, quite significant changes occur at the Six Crossroads Roundabout. Traffic flow entering via A245 Shores Road would decrease by 297 PCU on approach with an increase in 187 PCU on the A320 Chertsey Road northbound approach. In addition, the model indicates that shortly before reaching the roundabout itself, around 600 PCU re-route from Shores Road to A320 Chertsey Road via Carlton Road and continue towards the roundabout. This is seen in Figure 3-1 where a total increase of 793 PCU is presented. However, such a movement in reality is not possible as Carlton Road is private access only with no through route between the two arms. As a result, this huge increase should be ignored and instead it should be assumed that the lower changes (stated in the second line of this paragraph) are more representative of the true level of increases for both arms.
- 3.1.7 When comparing Figure 3-1 to Figure 2-1 in Section 2, a significant level of re-routing by non-development traffic flow occurs in the AM peak hour. Philpott Lane sees a significant drop of over 300 PCU northbound to the junction with the A319 Chertsey Road, suggesting vehicles choose to take quicker alternative routes through the network. Steep Hill sees an increase of 214 vehicles though only around a quarter of those are predicted to be development traffic flow. Other examples of traffic re-routing include a decrease by 127 PCU along Highams Lane but an increase of 201 PCU along Valley End Road which lies adjacent to it. Staple Hill nearby sees an increase northbound of 104 PCU. These three roads do not carry development flow



yet sizeable changes caused by traffic reacting to changes in delay in the network are predicted.

- 3.1.8 The examples of re-routeing quoted in Paragraph 3.1.5 and 3.1.7, as a combination of both development related and non-development trips, indicate that unless the quantum of trip generation can be reduced significantly, then extensive consideration will need to be given to traffic management measures over a wide area, including traffic calming and junction alterations to address potential impacts and improved road safety. The effect of the increase in trips as depicted by the model may have negative impacts on local communities, especially in centres such as Chobham and Ottershaw, as well as on efforts to encourage active travel in general (by increasing trip numbers through local communities).
- 3.1.9 In the PM peak hour, the largest increase in flows would be 741 PCU two-way along the A319 Chertsey Road between the northern site access and Philpott Lane. Of that total, an increase of 517 PCU would be westbound and 224 PCU eastbound. An increase of 179 PCU is predicted to travel southbound along Philpott Lane while an increase of up to 263 PCU travelling along the A319 Chertsey Road to Chobham is predicted with a rise of up to 147 PCU in the opposite direction.
- 3.1.10 The modelling suggests that both Chobham and Burrowshill will see significant increases in traffic on parts of their network. The B383 Windsor Road northbound approach to the junction with Windlesham Road and Red Lion Road would see an increase of 219 PCU with an additional 83 PCU coming via Little Heath Road just off the junction. In the opposite direction, an increase of 148 PCU occurs on the southbound approach whilst traffic on the east-west giveway approaches both decrease by smaller amounts.
- 3.1.11 In addition, the modelling suggest that two-way flow would increase along Delta Road, to and from the A319 Chertsey Road by over 250 PCU and Mincing Lane would experience an increase of over 100 PCU northbound, with virtually no change southbound. Meanwhile, traffic entering Windlesham from Woodlands Lane would increase by 143 PCU northbound with smaller decreases along the B386 Updown Hill and Thorndown Lane. Church Road would also see increases of up to 121 PCU westbound.
- 3.1.12 The A322 south of J3 of the M3 would see increases of up to 72 PCU on the westbound carriageway and 66 PCU on the eastbound carriageway close to Lightwater. The grade-separated roundabout itself with see increase of up to 89 PCU on the circulatory lanes.
- 3.1.13 To the east of the site, traffic flow is predicted to increase along the A320. To the north of the Paragon Roundabout, flow northbound would increase by up to 190 PCU to the junction with Brox Road with a smaller increase in the opposite direction up to 115 PCU. The increase in flows then diverge along Brox Road with an increase of 118 PCU and the A320 northbound approach to the Ottershaw Roundabout with a smaller increase of 66 PCU. Modelling also shows that an increase of 84 PCU would occur on the immediate B3121 Murray Road approach to the roundabout. Beyond the roundabout, an increase of 143 PCU would head north on the A320 northbound exit, with an increase of 128 PCU then seen heading eastbound along St. Peter's Way towards the grade separated roundabout with J11 of the M25. Flows in the opposite direction up to the Ottershaw Roundabout would see a much lower increase of up to 36 PCU.
- 3.1.14 South of the Paragon Roundabout, the impact would see less change. On the A320 Chertsey Road northbound approach to the roundabout, (from Six Crossroads) an increase of 138 PCU is predicted with an increase of 53 PCU in the opposite

direction. Beyond Six Crossroads Roundabout, changes are relatively minor to and from Woking. Traffic flow on the A320 would increase up to 50 PCU northbound and 38 southbound.

Figure 3-1 Link flow difference plots for the modelled network, Sensitivity Test compared with the Local Plan scenario, AM peak hour

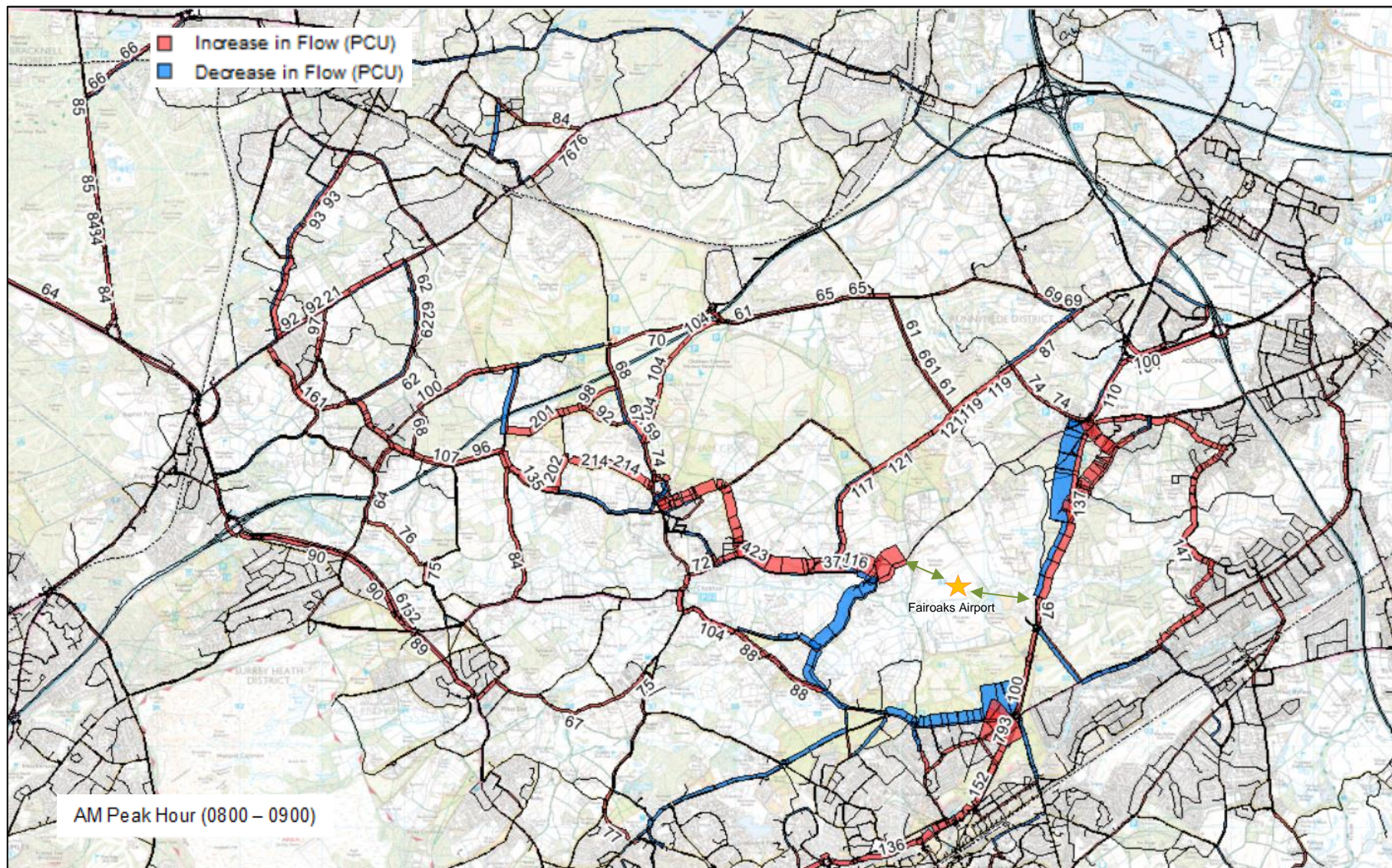




Figure 3-2 Link flow difference plots for the modelled network, Sensitivity Test compared with the Local Plan scenario, PM peak hour

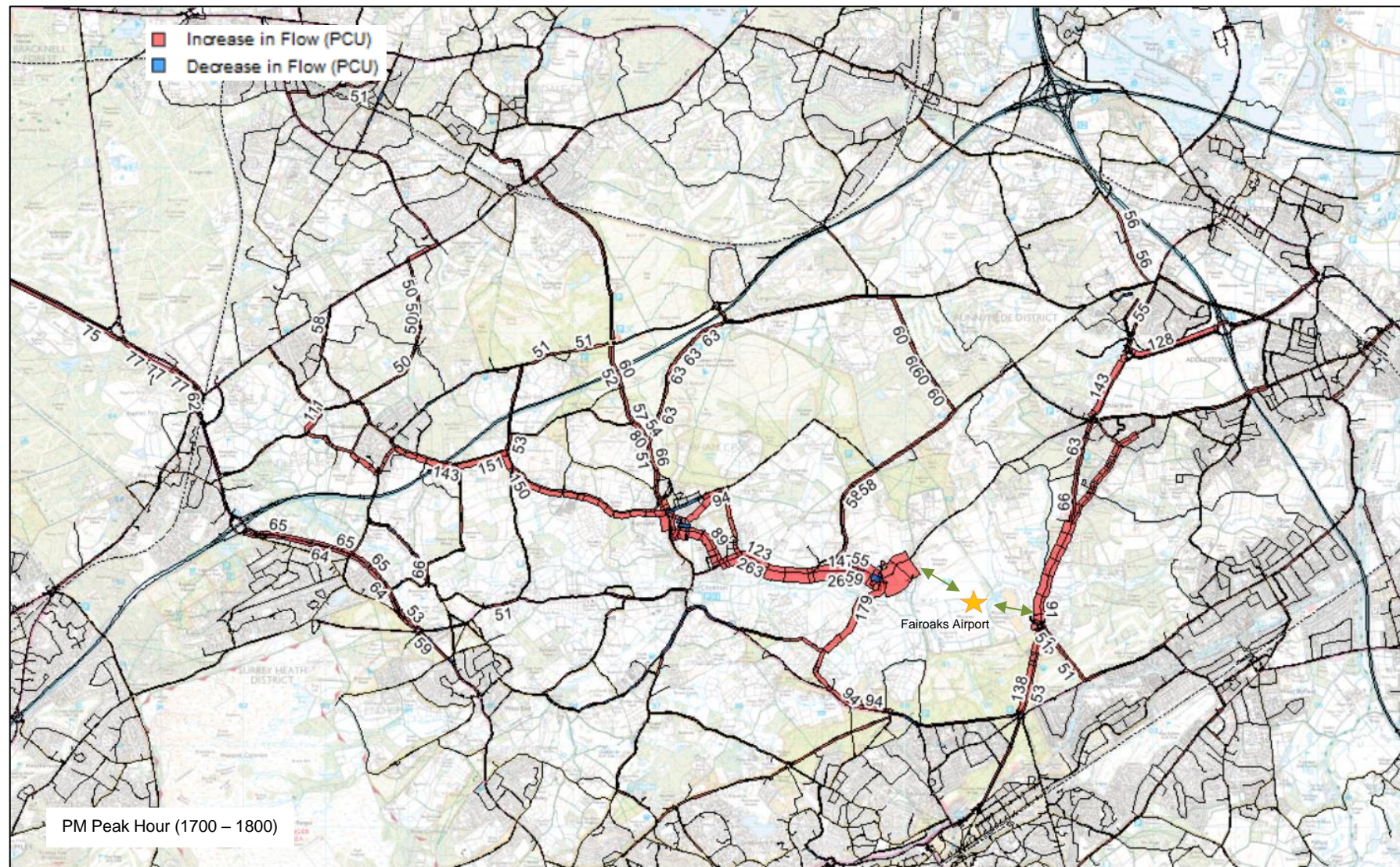




Figure 3-3 Link flow difference plots in the Chobham and Windlesham areas, Sensitivity Test compared with the Local Plan scenario, AM peak hour

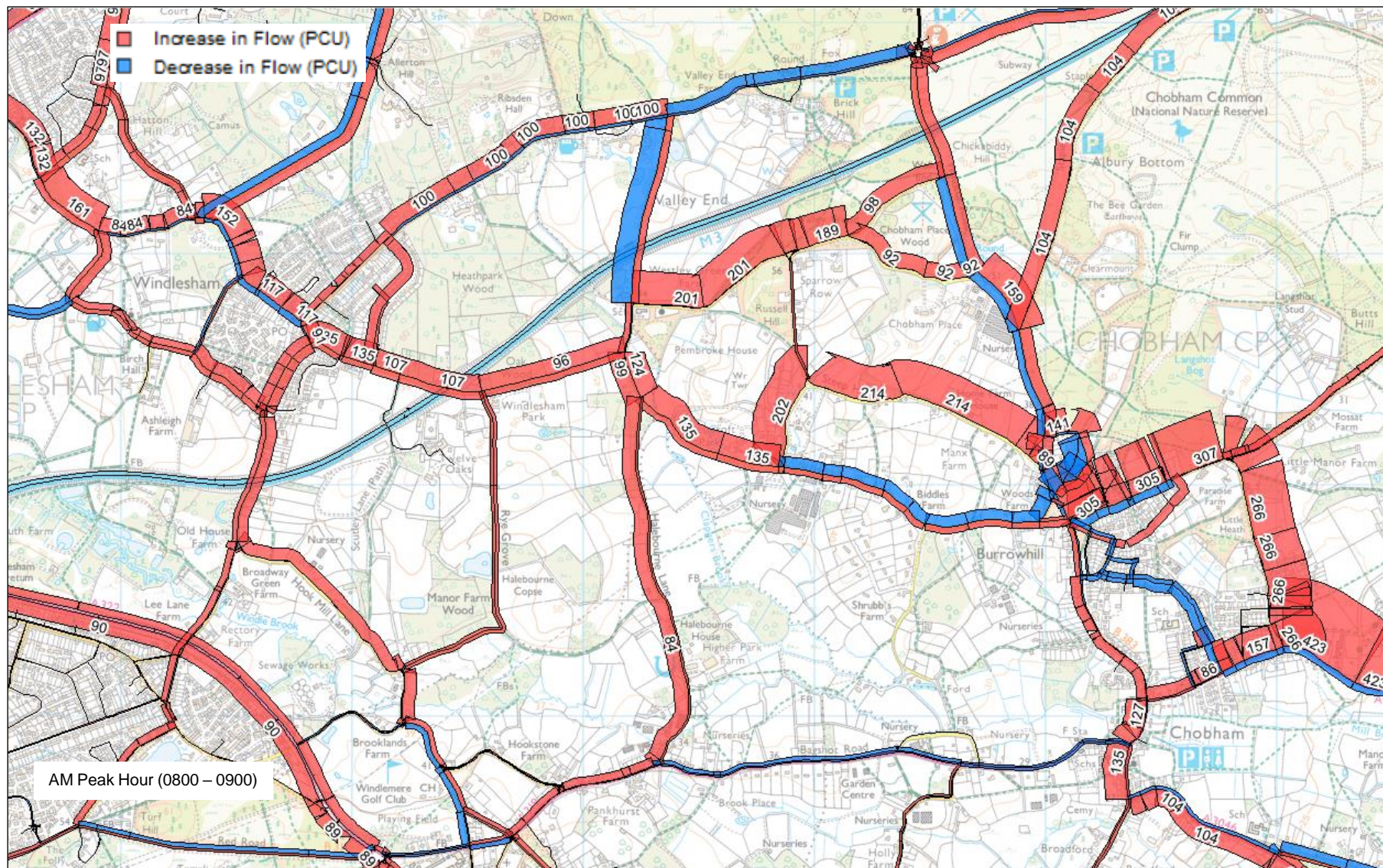
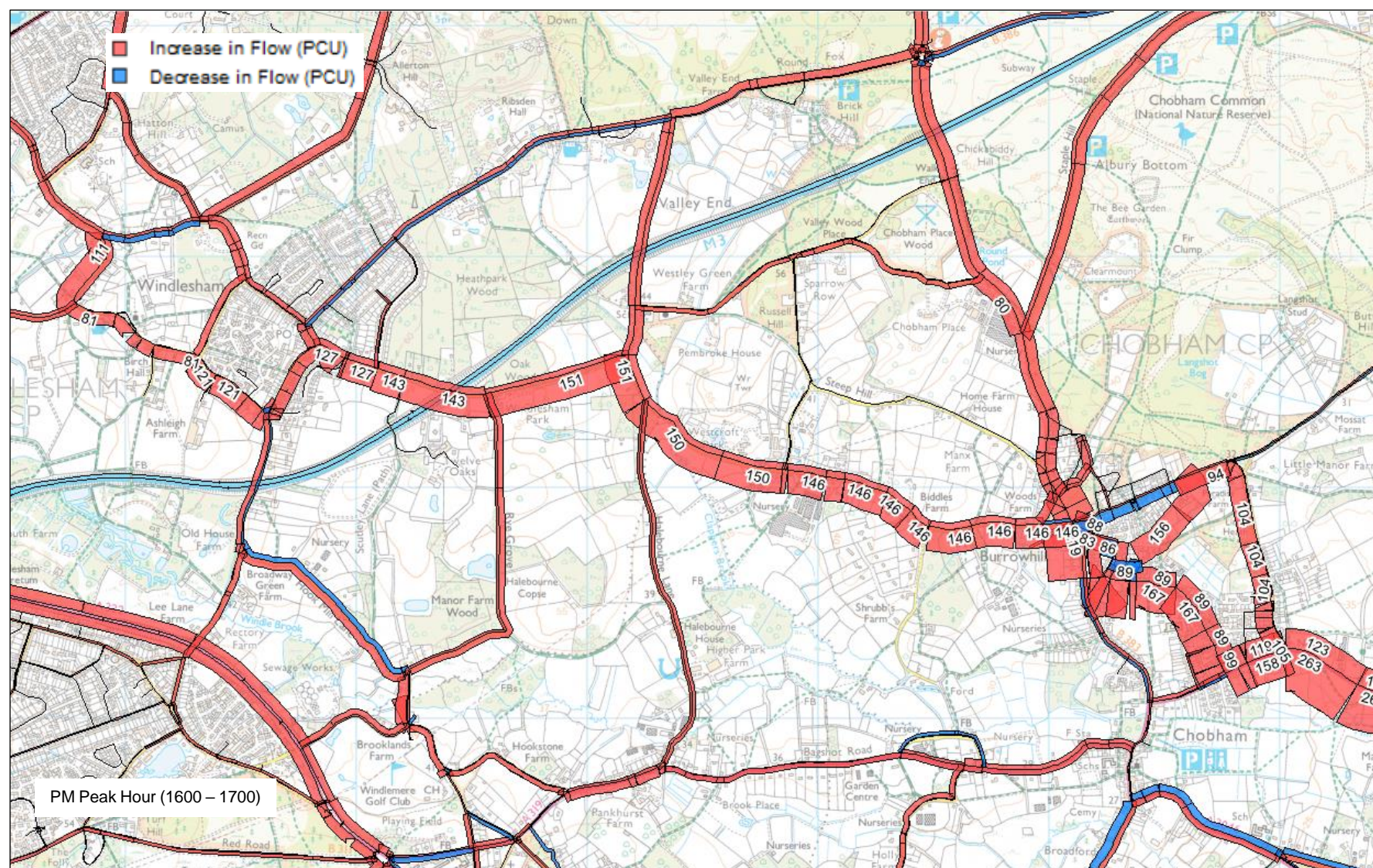




Figure 3-4 Link flow difference plots in the Chobham and Windlesham areas, Sensitivity Test compared with the Local Plan scenario, PM peak hour



## 4 JUNCTION ANALYSIS

4.1.1 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<sup>1</sup> outlined in Table 4-1. Note that there are more LOS bands for junctions than links with levels going from A, free flow to F, forced or breakdown flow.

*Table 4-1 Level of Service categorisation for junctions as outline by the HCM*

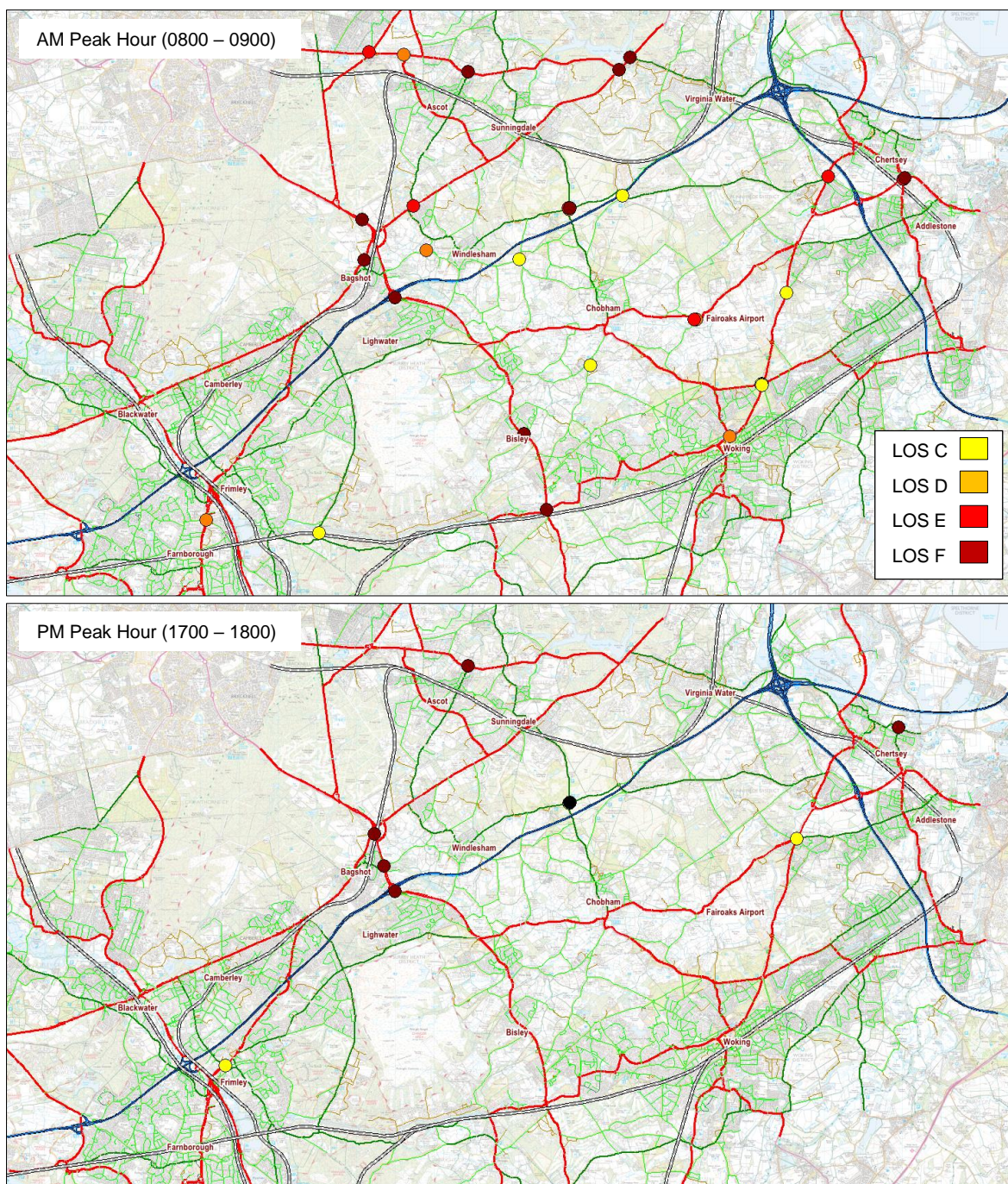
LOS	Definitions	Signalised Junction	Unsignalised Junction
A	Free flow	≤10 sec	≤10 sec
B	Reasonably free flow	10-20 sec	10-15 sec
C	Stable flow, at or near free flow	20-35 sec	15-25 sec
D	Approaching unstable flow	35-55 sec	25-35 sec
E	Unstable flow, operating at capacity	55-80 sec	35-50 sec
F	Forced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

4.1.2 Figure 4-1 shows the junctions where the Level of Service (LOS) deteriorates due to an increase in delay from the addition of the Fair Oaks Airport development, and those junctions with a Level of Service of E or F which have an increase in delay of more than 3 seconds per vehicle. At a Level of Service of E or F the junction is considered to be operating at or above capacity.

<sup>1</sup> Highway Capacity Manual, Transportation Research Board, 2010



*Figure 4-1 Junctions where the Level of Service (LOS) deteriorates or an increase in delay of 3 seconds per vehicle for LOS E and F with the addition of development at Fair Oaks Airport*



4.1.3 There are a considerable number of junctions negatively impacted by the addition of Fair Oaks Airport in the AM peak hour, which are spread across a relatively wide geographic area. Listed below are 21 junctions with a Level of Service (LOS) which deteriorate due to the addition of Fair Oaks Airport development in the AM peak hour.

- Guildford Road priority junction with Grove Road, Chobham (LOS **deteriorates** from B to C)
- Highmans Lane priority junction with Windlesham Road and Woodlands Lane, Windlesham (LOS **deteriorates** from A to C)



- B386 Longcross Road priority junction with Staple Hill Road, Longcross (LOS **deteriorates** from A to C)
  - B3015 Bridge Road signals for narrowing over the rail line, Deepcut (LOS **deteriorates** from B to C)
  - Woodham Road arm of the roundabout junction with A320 Chertsey Road and A245 Shores Road, Woking (LOS **deteriorates** from A to C)
  - A320 Chertsey Road south arm of the roundabout junction with A245 Shores Road and Woodham Road, Woking (LOS **deteriorates** from A to C)
  - A320 Guildford Road priority junction with Brox Road, Ottershaw (LOS **deteriorates** from A to C)
  - A325 Farnborough Road signalised junction with Prospect Avenue, Farnborough (LOS **deteriorates** from C to D)
  - New Road priority junction with Church Road, Windlesham (LOS **deteriorates** from C to D)
  - B383 Windsor Road arm of the roundabout junction with B386 Chertsey Road, Chobham (LOS **deteriorates** from A to D)
  - A329 High Street priority junction with A330 Station Hill, Ascot (LOS **deteriorates** from C to D)
  - A320 Victoria Way signalised junction with A3046 Chobham Road, Woking (LOS **deteriorates** from C to D)
  - A320 Chertsey Road north arm of the roundabout junction with A245 Shores Road and Woodham Road, Woking (LOS **deteriorates** from B to D)
  - A319 Chertsey Road priority junction with Philpot Lane, Chobham (LOS **deteriorates** from A to E)
  - B3020 Sunninghill Road signalised junction with A30 London Road, Windlesham (LOS **deteriorates** from D to E)
  - B386 Chertsey Road west arm of the roundabout junction with B383 Windsor and Chobham Roads, Chobham (LOS **deteriorates** from D to E)
  - A320 Guildford Road priority junction with Green Lane, Addlestone (LOS **deteriorates** from D to E)
  - A318 Chertsey Road arm of the roundabout junction with A317 Woburn Hill, Chertsey (LOS **deteriorates** from D to E)
  - B383 Chobham Road arm of the roundabout junction with B386 Chertsey Road, Chobham (LOS **deteriorates** from E to F)
  - A322 Bagshot Road signalised junction with A324 Connaught Road, Brookwood (LOS **deteriorates** from E to F)
- 4.1.4 There are a further 9 junctions below, which have a LOS of E or F (implying the junction is operating at or above its capacity) and an increase in delay of more than 3 seconds per vehicle with the addition of Fair Oaks Airport in the AM peak hour:
- A30 London Road signalised junction with Bridge Road, Bagshot (LOS F maintained but increase in delay of 5 seconds per vehicle)
  - A322 Lightwater By-Pass arm of the grade separated roundabout junction with M3 J3, Lightwater (LOS F maintained but increase in delay of 11 seconds per vehicle)
  - A322 Bracknell Road priority junction with Dukes Covert, Bagshot (LOS F maintained but increase in delay of 18 seconds per vehicle)

- A329 London Road arm of the roundabout junction with A322 Kings Ride, Ascot (LOS E maintained but increase in delay of 11 seconds per vehicle)
  - A30 London Road signalised junction with A329 Blacknest Road, Virginia Water (LOS F maintained but increase in delay of 16 seconds per vehicle)
  - A30 London Road signalised junction with B389 Christchurch Road, Virginia Water (LOS F maintained but increase in delay of 24 seconds per vehicle)
  - A329 London Road arm of the roundabout junction with B3020 Sunningdale Road, Ascot (LOS F maintained but increase in delay of 5 seconds per vehicle)
  - A322 Guildford Road signalised junction with Clew's Lane and Queen's Road, Bisley (LOS F maintained but increase in delay of 15 seconds per vehicle)
  - A317 Woburn Hill arm of the roundabout junction with A318 Chertsey Road, Chertsey (LOS F maintained but increase in delay of 26 seconds per vehicle)
- 4.1.5 The impact of the Fairoaks development on additional junction delay affects less junctions during the PM peak hour. Listed below are 5 junctions with a Level of Service (LOS) which deteriorate due to the addition of Fairoaks Airport development in the PM peak hour:
- A325 Portsmouth Road arm of the roundabout junction with B3411 Frimley Road, Frimley (LOS **deteriorates** from B to C)
  - B383 Windsor Road arm of the roundabout junction with B386 Chertsey Road, Chobham (LOS **deteriorates** from A to C)
  - B121 Murray Road signalised arm of the roundabout junction with A320 Guildford Road, Ottershaw (LOS **deteriorates** from B to C)
  - B386 Chertsey Road east arm of the roundabout junction with B383 Windsor and Chobham Roads, Chobham (LOS **deteriorates** from D to E)
  - A329 London Road arm of the roundabout junction with B3020 Sunningdale Road, Ascot (LOS **deteriorates** from E to F)
- 4.1.6 There are a further 4 junctions below, which have a LOS of E or F (implying the junction is operating at or above its capacity) and an increase in delay of more than 3 seconds per vehicle with the addition of Fairoaks Airport in the PM peak hour:
- A322 Lightwater By-Pass arm of the grade separated roundabout junction with M3 J3, Lightwater (LOS F maintained but increase in delay of 7 seconds per vehicle)
  - A322 Bracknell Road signalised junction with B3029 Guildford Road, Bagshot (LOS F maintained but increase in delay of 11 seconds per vehicle)
  - A30 London Road southbound off-slip priority junction to northbound A322 Bracknell Road (LOS F maintained but increase in delay of 4 seconds per vehicle)
  - B375 Bridge Road signalised junction with B387 Weir Road (LOS F maintained but increase in delay of 26 seconds per vehicle)
- 4.1.7 The relatively large number of junctions reported as deteriorating over a wide area highlights the congestion on the network already being experienced which cannot cope with the additional trips that would be generated by Fairoaks Airport.



## **5 MOTORWAYS**

### **5.1 Flow Difference on Motorways**

- 5.1.1 The closest motorway junction to Fair Oaks Airport is M25 Junction 11 within the neighbouring borough of Runnymede. This together with Junctions 3 and 4 of the M3, located within Surrey Heath, have been analysed below to show the impact of adding development at Fair Oaks Airport to the Local Plan Do Something scenario.

- 5.1.2 Table 5-1 presents the change in flow at these junctions for the AM peak hour, and Table 5-2 for the PM peak hour. The flow differences between the Local Plan Do Something (DS) and Sensitivity Test (ST) scenarios are also shown graphically in Figure 5-1 through to Figure 5-6.
- 5.1.3 Out of the junctions analysed, Junctions 3 and 4 of the M3 are situated the furthest away from Fairoaks Airport, and the differences between the Local Plan Do Something and Sensitivity Test flows at these motorway junctions are mostly minimal. In the AM peak hour, the largest absolute increase is 51 PCU (0.6%) on the eastbound mainline between Junctions 3 and 2, with the next largest being an increase of 30 PCU (0.4%) between Junctions 4 and 3 also on the eastbound carriageway. In both these cases, the increase is caused by traffic re-routing rather than development generated trips. The remaining values are either reductions in flow or relatively small increases, with the westbound carriageway experiencing the least change with the development at Fairoaks Airport.
- 5.1.4 Figure 5-1 also shows that traffic decreases on the off-slip and on-slip compared with the Do-Something scenario. This seems to be due to a decrease in the phenomenon of cars within the model exiting than immediately re-joining the eastbound carriageway as first identified in Paragraph 5.1.4 of the Surrey Heath Local Plan: Strategic Highway Assessment Report.
- 5.1.5 There is a greater impact at Junction 11 of the M25, which is situated closer to Fairoaks Airport. In the anticlockwise direction during the AM peak hour, there is an increase of 61 PCU on the Junction 11 to 12 mainline, which mostly leaves the M25 at the Junction 11 off-slip. Similarly, in the clockwise direction there is increased flow of 30 PCU between Junctions 10 and 11 which exits at Junction 11. The increases of flow at these off-slips cause a 4% and 7.2% rise respectively, but their Level of Service (LOS) remains as category A (free-flow). For link-based Level of Service categorisations, please see the Strategic Highway Assessment Report (Table 3-1 in section 3.1.12).
- 5.1.6 The largest absolute increase of 61 PCU reported above on the anticlockwise mainline between Junctions 12 and 11 gives an increase of 0.8% and is sufficient to change the Level of Service from C to D in the model. This is a 0.8% flow increase, yet it is enough to change the LOS from C (unstable and operating at capacity) to D (overcapacity, forced or breakdown of flow).

*Table 5-1 AM Peak hour motorway flow summary table in PCU for the Local Plan Do Something (DS) and Sensitivity Test (ST) scenarios*

Road	Flow		Diff	% Diff	LOS		LOS Diff
	DS	ST			DS	ST	
M3 Eastbound							
M3 J4a - J4 Mainline	6,899	6,910	11	0.2%	C	C	No
M3 J4 Off-Slip	1,593	1,588	-5	-0.3%	A	A	No
M3 J4 On-Slip	2,378	2,392	14	0.6%	B	B	No
M3 J4 - J3 Mainline	7,684	7,713	30	0.4%	D	D	No
M3 J3 Off-Slip	1,602	1,568	-34	-2.2%	A	A	No
M3 J3 On-Slip	2,095	2,082	-13	-0.6%	B	A	Yes
M3 J3 - J2 Mainline	8,177	8,227	51	0.6%	D	D	No
M3 Westbound							
M3 J4a - J4 Mainline	5,346	5,342	-4	-0.1%	B	B	No
M3 J4 On-Slip	1,014	1,015	1	0.1%	A	A	No
M3 J4 Off-Slip	1,905	1,898	-6	-0.3%	A	A	No
M3 J4 - J3 Mainline	6,237	6,226	-11	-0.2%	B	B	No
M3 J3 On-Slip	484	471	-12	-2.6%	A	A	No
M3 J3 Off-Slip	1,487	1,495	7	0.5%	A	A	No
M3 J3 - J2 Mainline	7,240	7,249	9	0.1%	C	C	No
M25 Clockwise							
M25 J10-11 Mainline	7,208	7,238	30	0.4%	C	C	No
M25 J11 Off-Slip	824	883	59	7.2%	A	A	No
M25 J11 On-Slip	2,160	2,184	24	1.1%	B	B	No
M25 J11-12 Mainline	8,545	8,539	-5	-0.1%	D	D	No
M25 Anticlockwise							
M25 J10-11 Mainline	7,095	7,100	5	0.1%	C	C	No
M25 J11 Off-Slip	1,329	1,382	54	4.0%	A	A	No
M25 J11 On-Slip	847	845	-2	-0.3%	A	A	No
M25 J11-12 Mainline	7,576	7,637	61	0.8%	C	D	Yes

- 5.1.7 During the PM peak hour, the largest absolute increase of flow at the M3 junctions with the development at Fairoaks Airport is a 40 PCU increase on the M3 Junction 3 eastbound on-slip. This is a 3.0% increase, which is also the largest percentage increase on all reported motorway flows on the M3 in the PM peak hour. Similar to the AM peak hour, this increase is as a result of existing traffic re-routing rather than new trips generated by the Fairoaks development.
- 5.1.8 On the M3 mainline the largest increase on the eastbound carriageway is 27 PCU, and 26 PCU on the westbound carriageway, both between Junctions 2 and 3. There is no change to the Level of Service (LOS) on the reported sections of M3, but the westbound carriageway between Junctions 2 and 3 is category D (overcapacity, forced or breakdown of flow) in both scenarios.
- 5.1.9 At the M25 Junction 11 in the PM peak hour, anticlockwise flow before the junction is 37 PCU greater in the Sensitivity Test (ST) scenario than in the Local Plan Do Something (DS) scenario. 58 PCU use the off-slip, however approximately the same number of vehicles re-join the M25 in the same direction. The clockwise direction in the PM peak period is similar to the opposite direction. There is a surplus of 21 PCU before the junction, and an increased number of vehicles use the off-slip. However,

88 PCU are modelled to re-join the M25 (clockwise), resulting in a surplus on the mainline downstream of the junction of approximately 63 PCU. As with the M3 junctions there is no change to Level of Service (LOS), but all mainline sections reported, apart from anticlockwise carriageway between Junctions 11 and 10, are categorised as D (overcapacity, forced or breakdown of flow) and thus unable to tolerate the increase in flow without exacerbating conditions.

*Table 5-2 PM Peak hour motorway flow summary table in PCU for the Local Plan Do Something (DS) and Sensitivity Test (ST) scenarios*

Road	Flow		Diff	% Diff	LOS		LOS Diff
	DS	ST			DS	ST	
M3 Eastbound							
M3 J4a - J4 Mainline	6,085	6,091	6	0.1%	B	B	No
M3 J4 Off-Slip	1,335	1,335	0	0.0%	A	A	No
M3 J4 On-Slip	2,194	2,196	2	0.1%	B	B	No
M3 J4 - J3 Mainline	6,944	6,952	8	0.1%	C	C	No
M3 J3 Off-Slip	786	807	22	2.8%	A	A	No
M3 J3 On-Slip	1,318	1,358	40	3.0%	A	A	No
M3 J3 - J2 Mainline	7,476	7,503	27	0.4%	C	C	No
M3 Westbound							
M3 J4a - J4 Mainline	6,326	6,337	11	0.2%	B	B	No
M3 J4 On-Slip	1,441	1,437	-5	-0.3%	A	A	No
M3 J4 Off-Slip	2,208	2,203	-5	-0.2%	B	B	No
M3 J4 - J3 Mainline	7,092	7,103	11	0.1%	C	C	No
M3 J3 On-Slip	1,100	1,067	-33	-3.0%	B	B	No
M3 J3 Off-Slip	1,931	1,914	-18	-0.9%	A	A	No
M3 J3 - J2 Mainline	7,924	7,949	26	0.3%	D	D	No
M25 Clockwise							
M25 J10-11 Mainline	8,166	8,187	21	0.3%	D	D	No
M25 J11 Off-Slip	1,581	1,627	46	2.9%	A	A	No
M25 J11 On-Slip	1,965	2,053	88	4.5%	A	A	No
M25 J11-12 Mainline	8,551	8,613	63	0.7%	D	D	No
M25 Anticlockwise							
M25 J10-11 Mainline	7,487	7,520	32	0.4%	C	C	No
M25 J11 Off-Slip	1,741	1,799	58	3.3%	A	A	No
M25 J11 On-Slip	1,083	1,136	53	4.9%	A	A	No
M25 J11-12 Mainline	8,145	8,183	37	0.5%	D	D	No



Figure 5-1 Motorway flow difference between the Local Plan scenario and Sensitivity Test for the AM peak hour, focussing on M3 junction 3

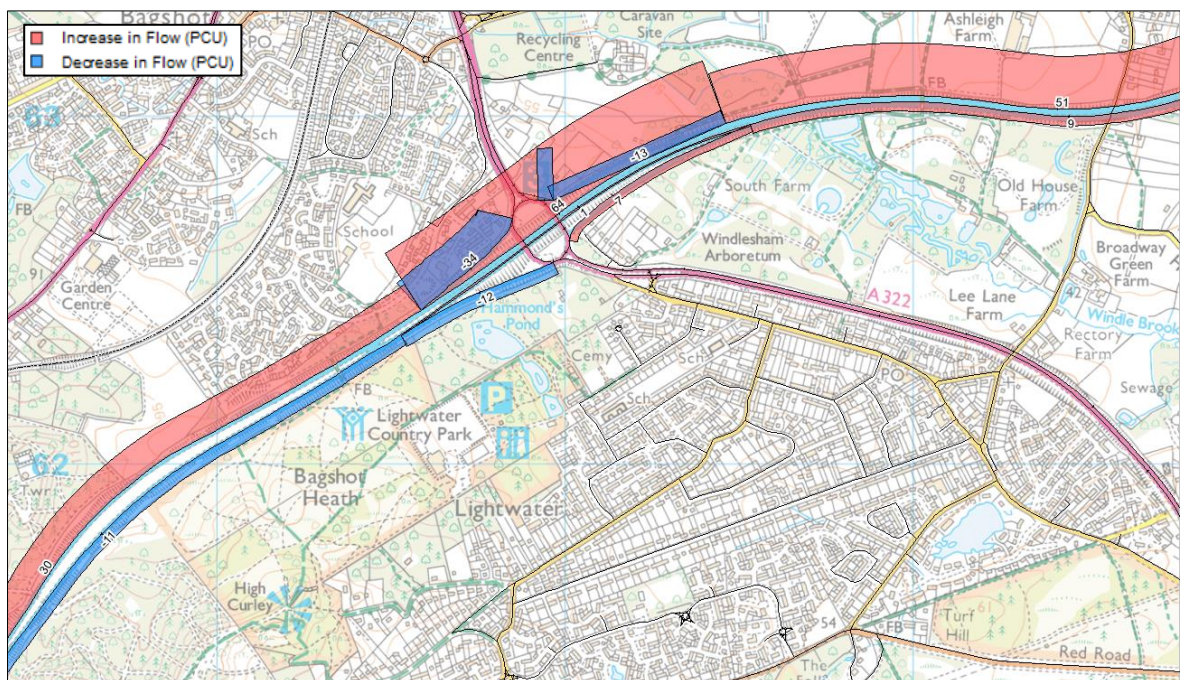


Figure 5-2 Motorway flow difference between the Local Plan scenario and Sensitivity Test for the AM peak hour, focussing on M3 junction 4

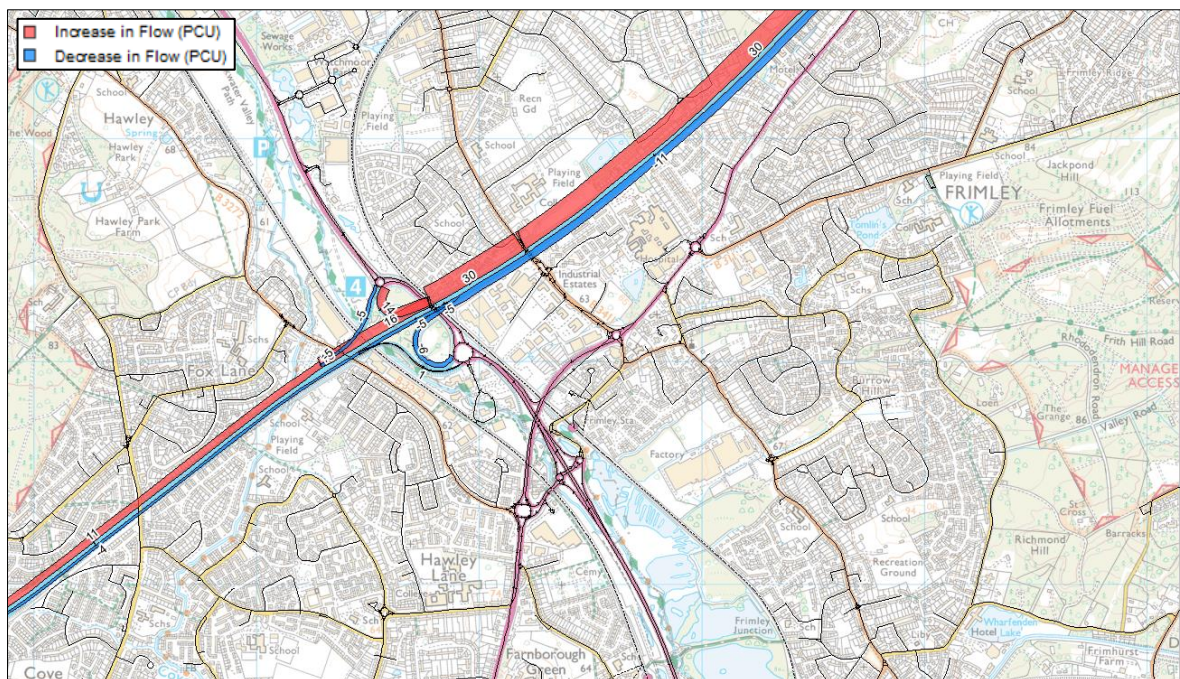




Figure 5-3 Motorway flow difference between the Local Plan scenario and Sensitivity Test for the AM peak hour, showing junction 11 of the M25

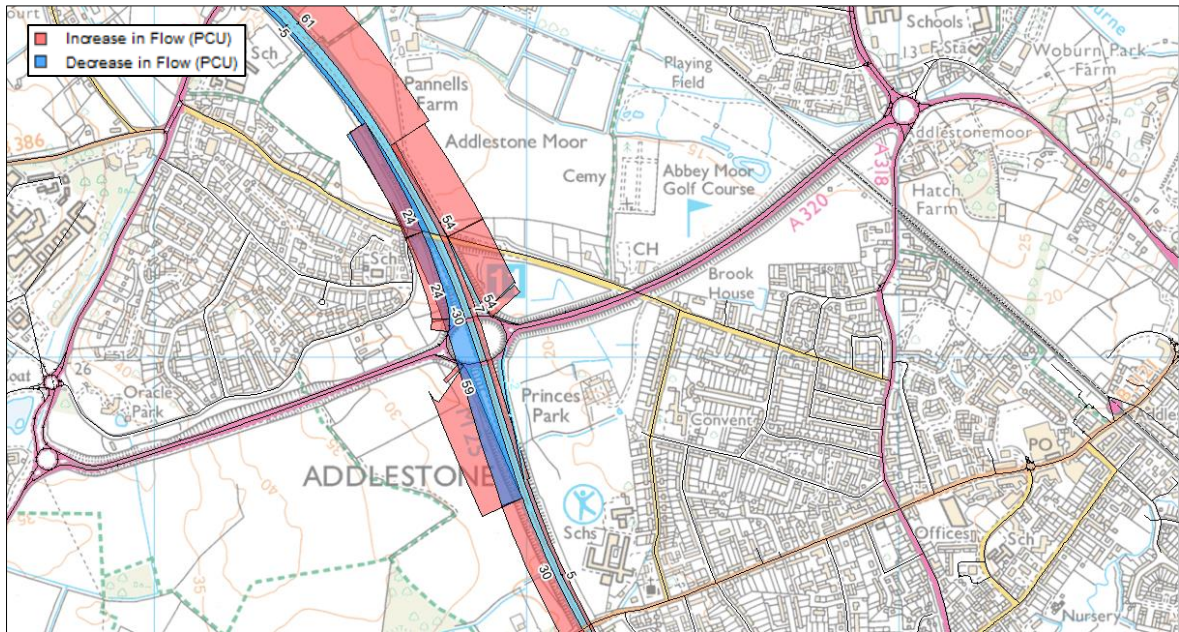


Figure 5-4 Motorway flow difference between the Local Plan scenario and Sensitivity Test for the PM peak hour, focussing on M3 junction 3

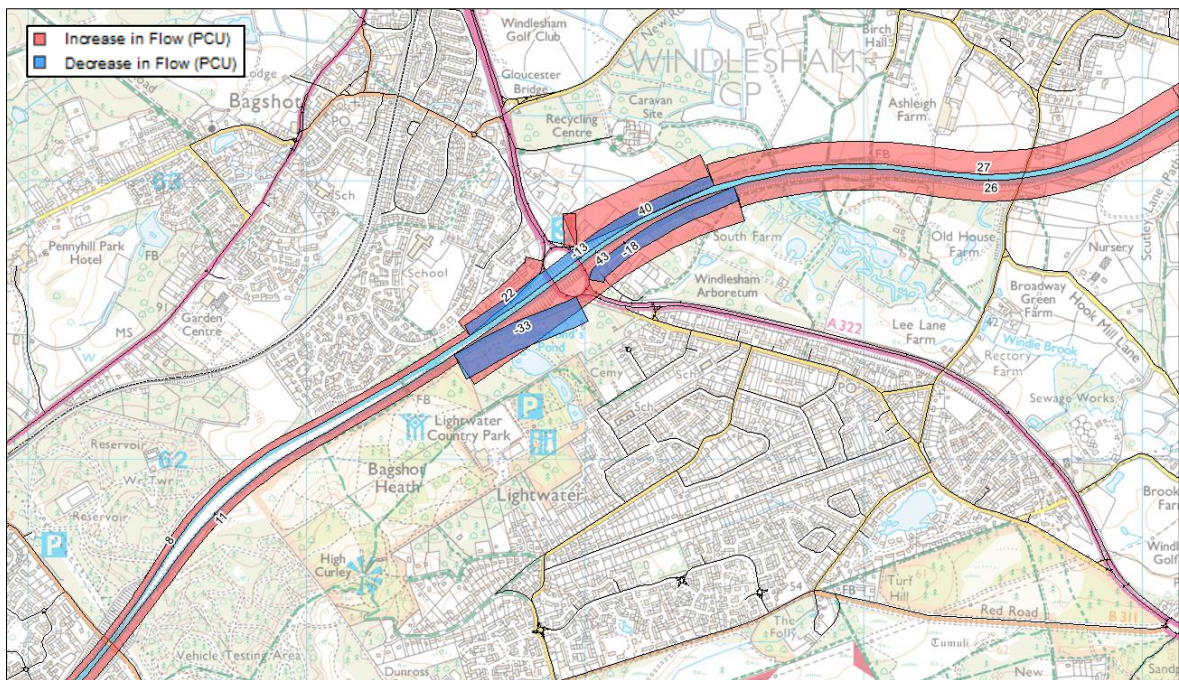




Figure 5-5 Motorway flow difference between the Local Plan scenario and Sensitivity Test for the PM peak hour, focussing on M3 junction 4

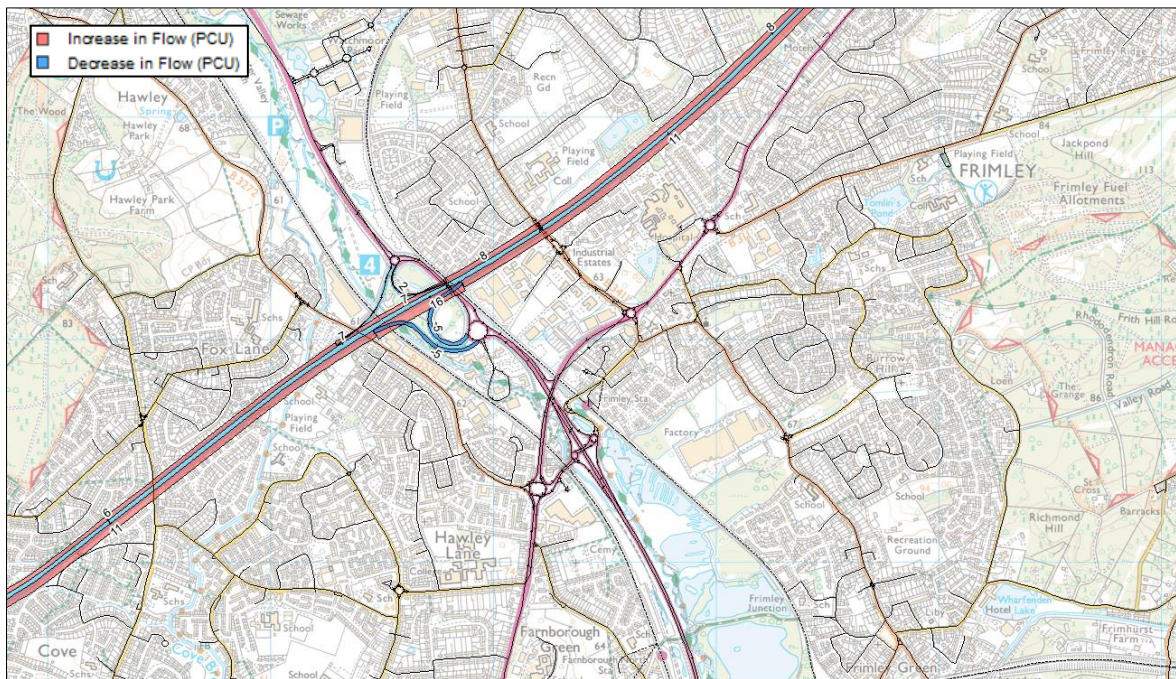
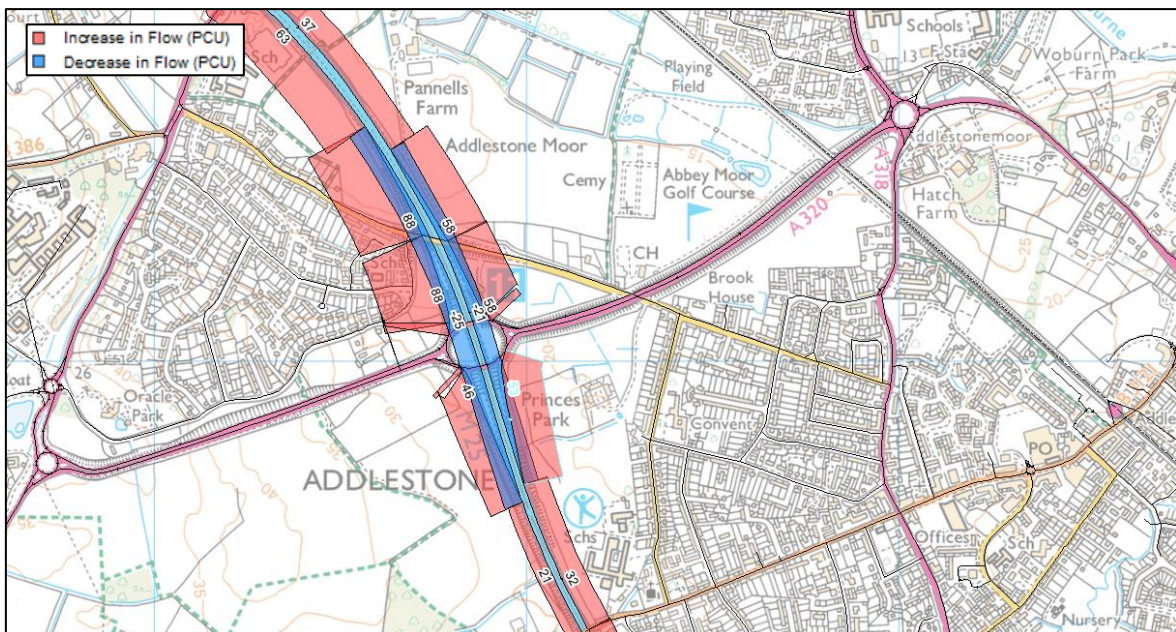


Figure 5-6 Motorway flow difference between the Local Plan scenario and Sensitivity Test for the PM peak hour, showing junction 11 of the M25



## 5.2 Merge Delay

- 5.2.1 The delay at merges has been calculated in the model using the formula specified in Appendix D.9 Merge Modelling on High Speed Road of the Department for Transport's [TAG Unit M3.1 Highway Assignment Modelling](#). The result of which is added to the calculated link generalised cost used in assignment<sup>2</sup>.

<sup>2</sup> More detail regarding this method is provided in *TN5: SINTRAM Model Technical Report*

5.2.2 Table 5-3 presents the calculated merge delay for the on-slips at M3 Junctions 3 and 4, and M25 Junction 11 for the weekday AM and PM peak hours. The additional merge delay only applies if the ratio of flow to capacity (RFC) of the downstream mainline is greater than 0.75, otherwise a value of 0 is presented.

5.2.3 As shown in Table 5-3, the largest absolute change is a 1.8 seconds per vehicle increase to merge delay, which occurs on the eastbound on-slips at both junctions 3 and 4 of the M3 in the AM peak hour, and at the M3 Junction 3 eastbound on-slip in the PM peak hour. There is also increase of 0.6 seconds per vehicle at the M3 Junction 4 westbound and M25 Junction 11 anticlockwise merges, and 1.2 seconds on the clockwise carriageway at M25 Junction 11. There are no other increases in merge delay, and the westbound M3 Junction 3 on-slip reduces by 0.6 seconds per vehicle.

*Table 5-3 Additional merge delay (seconds per vehicle) for the AM and PM peak hours*

Road	Extra Delay in Seconds		Diff	% Diff
	DM	DS		
AM Peak Hour				
Junction 4 Eastbound On-Slip	117.0	118.8	1.8	2%
Junction 4 Westbound On-Slip	0.0	0.0	0.0	0%
Junction 3 Eastbound On-Slip	58.8	60.6	1.8	3%
Junction 3 Westbound On-Slip	5.4	4.8	-0.6	-11%
M25 Junction 11 Clockwise On-Slip	61.8	61.8	0.0	0%
M25 Junction 11 Anticlockwise On-Slip	20.4	20.4	0.0	0%
PM Peak Hour				
Junction 4 Eastbound On-Slip	86.4	86.4	0.0	0%
Junction 4 Westbound On-Slip	10.8	11.4	0.6	6%
Junction 3 Eastbound On-Slip	36.6	38.4	1.8	5%
Junction 3 Westbound On-Slip	31.8	31.8	0.0	0%
M25 Junction 11 Clockwise On-Slip	58.2	59.4	1.2	2%
M25 Junction 11 Anticlockwise On-Slip	29.4	30.0	0.6	2%

## 6 SUMMARY

6.1.1 This report presents a sensitivity test which adds the development at Fair Oaks Airport to assess its impact should this site be granted planning permission during the Local Plan period. The sensitivity test compares the Local Plan Do Something scenario with the addition of development at Fair Oaks Airport for the forecast year 2038.

6.1.2 The additional vehicle trips arising from an assumed gross of 1,000 dwellings and 57,543 m<sup>2</sup> GFA of commercial use for the Fair Oaks Airport site, does present a notable impact on the highway network. Where the site connects to the network at the A320 and A319 there is between 600 and 800 vehicles at each location both departing and accessing Fair Oaks Airport site during the weekday AM and PM peak hours.

6.1.3 The link analysis suggests that this impacts both A320 and A319 routes and surrounding areas which provide access to the Fair Oaks site. Development traffic using the A319 predominantly travel to and from feed in from Chobham, Burrowhill, Windlesham and Sunningdale. This sees large increases on such key roads as the



B386 Kennel Lane, B383 Windsor Road, Woodslane Lane and Windlesham Road. The impact on the A320 meanwhile sees increases in flow towards and from Ottershaw. Increases are mainly predicted northbound beyond the Ottershaw Roundabout and onto St Peter's Way towards Chertsey, in addition Brox Road also sees increases though these tend to decrease somewhat quicker. However, there would still be an increase in two-way flow along the B3121 Spinney Hill towards Addlestone.

- 6.1.4 The impact to junction delay from the addition of development at Fair Oaks Airport is considerable, affecting a relatively large number of junctions across a wide geographical area. The model indicates 30 junctions in the AM peak hour and 9 in the PM peak hour experiencing a deterioration in Level of Service (LOS) or an increase in delay of more than 3 seconds per vehicle for those junctions with a Level of Service categorised as E or F, which denotes junctions operating at or above capacity.
- 6.1.5 In comparison to the impacts above, development traffic is much more dispersed by the time it reaches the M3 and M25 motorway junctions. However, the development still leads to increases in flow on the motorway on sections which are operating at or overcapacity with a Level of Service category of C or D in the forecast scenarios.
- 6.1.6 Overall, the model suggests the impact of the addition of development at Fair Oaks Airport is notable and across a wide area, with the potential to generate up to an extra 1,600 vehicle trips per weekday peak hour. Furthermore, the impact to the junctions and links reported cannot be resolved by capacity improvements alone.
- 6.1.7 As per the policies set out in Surrey County Council's newly adopted [Local Transport Plan \(LTP4\)](#), this both highlights the need to ensure that, should the site be developed, it has sufficient and suitable amenities within walking distance to greatly reduce the need to travel by car for everyday purposes such as going to school, shopping, leisure and work, thereby creating 'liveable neighbourhoods', as well as providing suitable walk, cycle and public transport connectivity to surrounding towns and villages.