

## 5 MODELLING RESULTS

### 5.1 Summary Network Statistics

5.1.1 Tables 5.1 and 5.2 present the network based summary statistics for all modelled vehicles and links within Surrey. The summary statistics compare the key outputs from the modelling of the 2011 base, 2026 Do-Nothing and the 2026 Do-Something. The network statistics are disaggregated into road types.

5.1.2 Table 5.1 shows the amount and proportional breakdown of links modelled within the Surrey.

| Road Type        | No. of Links | Road Length (Kms) | % of Road Length (Kms) |
|------------------|--------------|-------------------|------------------------|
| Motorway         | 223          | 284               | 7.4%                   |
| Trunk A road     | 184          | 144               | 3.7%                   |
| Principal A road | 1,892        | 1,217             | 31.6%                  |
| B road           | 989          | 823               | 21.4%                  |
| Other road       | 1,520        | 1,384             | 35.9%                  |
| <b>Total</b>     | <b>4,808</b> | <b>3,851</b>      | <b>100%</b>            |

Table 5.1: Modelled links in Surrey

| Statistic                    | Road Type        | Surrey Network Totals |                  |                   | Absolute Difference       |  | Percentage Difference     |  |
|------------------------------|------------------|-----------------------|------------------|-------------------|---------------------------|--|---------------------------|--|
|                              |                  | 2011                  | 2026 Do-Nothing  | 2026 Do-Something | 2026 Do-Nothing less 2011 | 2026 Do-Something less 2026 Do-Nothing | 2026 Do-Nothing less 2011 | 2026 Do-Something less 2026 Do-Nothing |
| Vehicle Kilometres (veh kms) | Motorway         | 1,192,870             | 1,200,803        | 1,215,903         | 7,933                     | 15,100                                 | 0.7%                      | 1.3%                                   |
|                              | Trunk A road     | 332,312               | 334,230          | 337,107           | 1,918                     | 2,877                                  | 0.6%                      | 0.9%                                   |
|                              | Principal A road | 971,362               | 976,336          | 1,005,283         | 4,974                     | 28,947                                 | 0.5%                      | 3.0%                                   |
|                              | B road           | 445,914               | 451,490          | 465,251           | 5,576                     | 13,761                                 | 1.3%                      | 3.0%                                   |
|                              | Other road       | 545,419               | 550,692          | 572,904           | 5,273                     | 22,212                                 | 1.0%                      | 4.0%                                   |
|                              | <b>Total</b>     | <b>3,487,877</b>      | <b>3,513,551</b> | <b>3,596,448</b>  | <b>25,674</b>             | <b>82,897</b>                          | <b>0.7%</b>               | <b>2.4%</b>                            |
| Vehicle Hours (veh hrs)      | Motorway         | 18,747                | 19,223           | 19,861            | 476                       | 638                                    | 2.5%                      | 3.3%                                   |
|                              | Trunk A road     | 5,145                 | 5,226            | 5,329             | 81                        | 103                                    | 1.6%                      | 2.0%                                   |
|                              | Principal A road | 21,123                | 21,314           | 22,192            | 191                       | 878                                    | 0.9%                      | 4.1%                                   |
|                              | B road           | 10,721                | 10,847           | 11,380            | 126                       | 533                                    | 1.2%                      | 4.9%                                   |
|                              | Other road       | 11,824                | 11,956           | 12,590            | 132                       | 634                                    | 1.1%                      | 5.3%                                   |
|                              | <b>Total</b>     | <b>67,560</b>         | <b>68,566</b>    | <b>71,352</b>     | <b>1,006</b>              | <b>2,786</b>                           | <b>1.5%</b>               | <b>4.1%</b>                            |
| Average Speed (kph)          | Motorway         | 63.6                  | 62.5             | 61.2              | -1.10                     | -1.30                                  | -1.7%                     | -2.1%                                  |
|                              | Trunk A road     | 64.6                  | 64.0             | 63.3              | -0.60                     | -0.70                                  | -0.9%                     | -1.1%                                  |
|                              | Principal A road | 46.0                  | 45.8             | 45.3              | -0.20                     | -0.50                                  | -0.4%                     | -1.1%                                  |
|                              | B road           | 41.6                  | 41.6             | 40.9              | 0.00                      | -0.70                                  | 0.0%                      | -1.7%                                  |
|                              | Other road       | 46.1                  | 46.1             | 45.5              | 0.00                      | -0.60                                  | 0.0%                      | -1.3%                                  |
|                              | <b>Average</b>   | <b>52.4</b>           | <b>52.0</b>      | <b>51.2</b>       | <b>-0.38</b>              | <b>-0.76</b>                           | <b>-0.7%</b>              | <b>-1.5%</b>                           |

Table 5.2: Surrey summary statistics

- 5.1.3 *In summary Table 5.2* indicates that the County as a whole experiences relatively minor increases in the key transport statistics in all modelled scenarios, when compared to their references (2011 base acts as a reference for the 2026 Do-Nothing and the 2026 Do-Nothing is a reference for the 2026 Do-Something).
- 5.1.4 Secondly all road types experience an increase in vehicle kilometres and vehicle hours between the scenarios and the references. A decrease in average speed is a direct result of increased vehicle kilometres, which is apparent in all modelled variants when compared to their relevant reference case.
- 5.1.5 No additional trips are added to the study area within the 2026 Do-Nothing, so increases in summary statistics in the 2026 Do-Nothing are the impacts felt in Surrey as a result of residual growth in Great Britain in 2026.
- 5.1.6 The vehicle kilometres travelled within Surrey increases by 0.7% in the 2026 Do-Nothing when compared to the 2011 base. In the 2026 Do-Something vehicle kilometres increases by 2.4% when compared to the 2026 Do-Nothing. The amount of vehicle hours is the statistic that has the largest increase (4.1%) in the 2026 Do-Something when compared to the 2026 Do-Nothing. The average speed of all links in Surrey is 52.4 kph (2011 base), 52.0 kph (2026 Do-Nothing) and 51.2 kph (2026 Do-Something), relating to a 0.7% and 1.5% reduction in the 2026 Do-Nothing and Do-Something.
- 5.1.7 The road type that has the largest amount of vehicle kilometres travelled (in the County) for all modelled scenarios is the motorway category. The motorways continue to incur the largest absolute increase in vehicle kilometres in the 2026 Do-Nothing, with an absolute increase of 7,933 veh kms relating to a 0.7% increase (compared to the 2011 base). However, the Principal A road category is also likely to experience the largest increase in vehicle kilometres in the 2026 Do-Something, an increase of 28,947 veh kms relating to a 3% increase (compared to the 2026 Do-Nothing). An explanation for this is that in the 2026 Do-Nothing only trips external to the study area were being growthed to 2026, and as such vehicle kilometres on the motorway links in Surrey incur the largest increase as a result of trips travelling through the County on long distance travel by use of the SRN. In the 2026 Do-Something only additional trips were added to Surrey and local external developments, as a result vehicle kilometres have increased most on principal roads, suggesting increased flow on the LRN around the County to reach a destination internal or external to the County.
- 5.1.8 The Principal A road category also experiences the largest absolute increase in vehicle hours in the 2026 Do-Something (when compared to the 2026 Do-Nothing), with an absolute increase of 878 veh hrs relating to a 4.1% increase. Trunk roads experience the smallest absolute increase in vehicle hours in the 2026 Do-Something when compared to the 2026 Do-Nothing (absolute increase of 103 veh hrs relating to a 2% increase). *Table 5.1* highlights that the road type that covers the smallest amount of distance is the Trunk A road (144 km).
- 5.1.9 In the 2026 Do-Nothing scenario the road type to experience the largest absolute reduction in average speed is the motorway category (absolute decrease of 1.1 kph relating to a 2.1% reduction), thus correlating with the motorways also incurring the largest increase in vehicle kilometres and vehicle hours in the 2026 Do-Nothing (compared to the 2011 Base). This therefore relates to the trip ends external to the study area using the motorways most to travel through the County, relating to long distance travel. In the 2026 Do-Something the motorways, B roads and Other roads experience the largest absolute decreases in average speed, reduction of 2.1%, 1.7% and 1.3% respectively.

## 5.2 Strategic Route Network Journey Times

5.2.1 *Tables 5.3 to 5.6* show the average speeds and journey times estimated to be experienced on all the major sections of the SRN in the County for all modelled vehicles. The sections of the SRN that journey times have been calculated for are:

- M25 junction 5 – 14 (clockwise and anti-clockwise)
- M23 junction 7 – 10 (northbound and southbound)
- M3 junction 1 – 4 (northbound and southbound)
- A3 Hindhead – Tolworth (northbound and southbound)

| Junction       | Junction Length (Km) | Average Speed (Kph) |             |             | Differences Average Speed (Kph) - Absolute Differences |                      | Average Speed (Kph) - Percentage Differences |                      | Journey Time (Mins: Secs) |              |              | Journey Time (Mins: Secs) - Absolute Differences |                      | Journey Time (Mins, Secs) - Percentage Differences |                      |
|----------------|----------------------|---------------------|-------------|-------------|--|----------------------|--|----------------------|---------------------------|--------------|--------------|--|----------------------|--|----------------------|
|                |                      | 2011                | 2026 DN     | 2026 DS     | 2026 DN less 2011                                      | 2026 DS less 2026 DN | 2026 DN less 2011                            | 2026 DS less 2026 DN | 2011                      | 2026 DN      | 2026 DS      | 2026 DN less 2011                                | 2026 DS less 2026 DN | 2026 DN less 2011                                  | 2026 DS less 2026 DN |
| J5 - 6         | 16                   | 48.1                | 45.2        | 46.9        | -3.0   | 1.7                  | -6.2%  | 3.9%                 | 19:22                     | 20:39        | 19:53        | 1:17   | -0:46                | 6.6%   | -3.7%                |
| J6 - 7         | 5                    | 86.3                | 86.1        | 86.1        | -0.3   | 0.0                  | -0.3%  | 0.0%                 | 3:11                      | 3:12         | 3:12         | 0:01   | 0:00                 | 0.4%   | -0.1%                |
| J7 - 8         | 6                    | 76.2                | 78.0        | 74.9        | 1.8  | -3.1                 | 2.3%   | -4.0%                | 5:21                      | 5:17         | 5:25         | -0:04  | 0:08                 | -1.1%  | 2.5%                 |
| J8 - 9         | 11                   | 61.2                | 60.7        | 58.7        | -0.6   | -2.0                 | -0.9%  | -3.3%                | 12:20                     | 12:28        | 13:1         | 0:08   | 0:33                 | 1.2%   | 4.4%                 |
| J9 - 10        | 10                   | 56.0                | 54.2        | 51.4        | -1.8   | -2.8                 | -3.2%  | -5.2%                | 10:39                     | 11:00        | 11:36        | 0:21   | 0:36                 | 3.3%   | 5.4%                 |
| J10 - 11       | 8                    | 65.2                | 62.6        | 59.8        | -2.5   | -2.8                 | -3.9%  | -4.5%                | 7:37                      | 7:57         | 8:21         | 0:20   | 0:24                 | 4.4%   | 5.1%                 |
| J11 - 12       | 4                    | 67.3                | 67.8        | 62.0        | 0.5  | -5.8                 | 0.8%   | -8.6%                | 3:16                      | 3:14         | 3:32         | -0:02  | 0:18                 | -0.9%  | 9.3%                 |
| J12 - 13       | 5                    | 85.0                | 81.9        | 81.0        | -3.1   | -0.9                 | -3.6%  | -1.1%                | 3:40                      | 3:49         | 3:51         | 0:09   | 0:02                 | 4.4%   | 0.8%                 |
| J13 - 14       | 4                    | 71.6                | 71.0        | 70.4        | -0.5   | -0.6                 | -0.8%  | -0.9%                | 4, 12                     | 4:17         | 4:24         | 0:05   | 0:07                 | 2.1%   | 2.5%                 |
| <b>J5 - 14</b> | <b>69</b>            | <b>68.5</b>         | <b>67.5</b> | <b>65.7</b> | <b>-1.1</b>  | <b>-1.8</b>          | <b>-1.5%</b>                                 | <b>-2.7%</b>         | <b>69:37</b>              | <b>71:54</b> | <b>73:15</b> | <b>2:17</b>                                      | <b>1:21</b>          | <b>3.3%</b>  | <b>1.9%</b>          |
| J14 - 13       | 3                    | 102.8               | 102.9       | 103.1       | 0.1  | 0.2                  | 0.1%   | 0.2%                 | 1:56                      | 1:56         | 1:56         | 0:00   | 0:00                 | 0.0%   | -0.2%                |
| J13 - 12       | 5                    | 105.0               | 104.9       | 104.6       | -0.1   | -0.3                 | -0.1%  | -0.3%                | 2:54                      | 2:54         | 2:54         | 0:00   | 0:01                 | 0.1%   | 0.4%                 |
| J12 - 11       | 4                    | 95.9                | 95.7        | 94.5        | -0.3   | -1.2                 | -0.3%  | -1.3%                | 2:26                      | 2:26         | 2:28         | 0:01   | 0:02                 | 0.4%   | 1.5%                 |
| J11 - 10       | 8                    | 86.8                | 86.2        | 85.8        | -0.7   | -0.3                 | -0.8%  | -0.4%                | 5:37                      | 5:40         | 5:41         | 0:03   | 0:01                 | 0.8%   | 0.4%                 |
| J10 - 9        | 10                   | 83.9                | 81.6        | 82.2        | -2.4   | 0.6                  | -2.8%  | 0.7%                 | 7:25                      | 7:39         | 7:35         | 0:14   | -0:04                | 3.1%   | -0.8%                |
| J9 - 8         | 11                   | 84.9                | 83.7        | 83.3        | -1.3   | -0.3                 | -1.5%  | -0.4%                | 8:10                      | 8:08         | 8:10         | 0:07   | 0:02                 | 1.5%   | 0.4%                 |
| J8 - 7         | 6                    | 86.4                | 85.7        | 81.6        | -0.7   | -4.1                 | -0.9%  | -4.8%                | 3:51                      | 3:53         | 4:06         | 0:02   | 0:13                 | 0.9%   | 5.4%                 |
| J7 - 6         | 5                    | 84.7                | 81.1        | 81.5        | -3.7   | 0.4                  | -4.3%  | 0.5%                 | 3:25                      | 3:32         | 3:31         | 0:07   | 0:00                 | 3.3%   | -0.2%                |
| J6 - 5         | 16                   | 67.1                | 63.6        | 62.5        | -3.4   | -1.1                 | -5.1%  | -1.8%                | 17:16                     | 18:47        | 19:19        | 1:31   | 0:32                 | 8.8%   | 2.8%                 |
| <b>J14 - 5</b> | <b>69</b>            | <b>88.6</b>         | <b>87.2</b> | <b>86.6</b> | <b>-1.4</b>  | <b>-0.7</b>          | <b>-1.6%</b>                                 | <b>-0.8%</b>         | <b>52:51</b>              | <b>54:55</b> | <b>55:42</b> | <b>2:04</b>                                      | <b>0:46</b>          | <b>3.9%</b>  | <b>1.4%</b>          |

Table 5.3: Journey times for the M25 junctions 4 – 15 (clockwise and anti-clockwise)

| Junction       | Junction Length (Km) | Average Speed (Kph) |              |              | Differences Average Speed (Kph) - Absolute Differences |                      | Average Speed (Kph) - Percentage Differences |                      | Journey Time (Mins:Secs) |              |              | Journey Time (Mins:Secs) - Absolute Differences |                      | Journey Time (Mins, Secs) - Percentage Differences |                      |
|----------------|----------------------|---------------------|--------------|--------------|--|----------------------|--|----------------------|--------------------------|--------------|--------------|---|----------------------|--|----------------------|
|                |                      | 2011                | 2026 DN      | 2026 DS      | 2026 DN less 2011                                      | 2026 DS less 2026 DN | 2026 DN less 2011                            | 2026 DS less 2026 DN | 2011                     | 2026 DN      | 2026 DS      | 2026 DN less 2011                               | 2026 DS less 2026 DN | 2026 DN less 2011                                  | 2026 DS less 2026 DN |
| J7 - 8         | 3                    | 104.6               | 104.4        | 104.3        | -0.1   | -0.2                 | -0.1%  | -0.2%                | 1:34                     | 1:34         | 1:34         | 0:00  | 0:00                 | 0.1%   | 0.1%                 |
| J8 - 9         | 15                   | 102.7               | 102.6        | 102.4        | -0.0   | -0.2                 | 0.0%   | -0.2%                | 8:49                     | 8:50         | 8:51         | 0:00  | 0:01                 | 0.1%   | 0.2%                 |
| J9 - 10        | 3                    | 104.3               | 104.2        | 104.0        | -0.1   | -0.2                 | -0.1%  | -0.2%                | 1:45                     | 1:45         | 1:45         | 0:00  | 0:00                 | 0.1%   | 0.2%                 |
| <b>J7 - 10</b> | <b>21</b>            | <b>103.9</b>        | <b>103.8</b> | <b>103.6</b> | <b>-0.1</b>  | <b>-0.2</b>          | <b>-0.1%</b>                                 | <b>-0.2%</b>         | <b>12:08</b>             | <b>12:08</b> | <b>12:10</b> | <b>0:01</b>                                     | <b>0:02</b>          | <b>0.1%</b>  | <b>0.2%</b>          |
| J10 - 9        | 3                    | 105.3               | 105.5        | 105.2        | 0.2  | -0.4                 | 0.2%   | -0.3%                | 1:48                     | 1:48         | 1:48         | 0:00  | 0:00                 | -0.2%  | 0.4%                 |
| J9 - 8         | 10                   | 103.9               | 104.3        | 104.0        | 0.4  | -0.3                 | 0.4%   | -0.3%                | 5:59                     | 5:57         | 5:58         | -0:02   | 0:01                 | -0.4%  | 0.3%                 |
| J8 - 7         | 4                    | 103.3               | 103.5        | 103.5        | 0.2  | -0.0                 | 0.2%   | 0.0%                 | 2:18                     | 2:18         | 2:18         | 0:00  | 0:00                 | -0.2%  | 0.0%                 |
| <b>J10 - 7</b> | <b>17</b>            | <b>104.2</b>        | <b>104.4</b> | <b>104.2</b> | <b>0.3</b>   | <b>-0.2</b>          | <b>0.2%</b>                                  | <b>-0.2%</b>         | <b>10:05</b>             | <b>10:03</b> | <b>10:04</b> | <b>-0:02</b>                                    | <b>0:01</b>          | <b>-0.3%</b>                                       | <b>0.2%</b>          |

Table 5.4: Journey times for the M23 junctions 7 – 10 (northbound and southbound)

| Junction      | Junction Length (Km) | Average Speed (Kph) |              |              | Differences Average Speed (Kph) - Absolute Differences |                      | Average Speed (Kph) - Percentage Differences |                      | Journey Time (Mins:Secs) |              |              | Journey Time (Mins:Secs) - Absolute Differences |                      | Journey Time (Mins, Secs) - Percentage Differences |                      |
|---------------|----------------------|---------------------|--------------|--------------|--|----------------------|--|----------------------|--------------------------|--------------|--------------|---|----------------------|--|----------------------|
|               |                      | 2011                | 2026 DN      | 2026 DS      | 2026 DN less 2011                                      | 2026 DS less 2026 DN | 2026 DN less 2011                            | 2026 DS less 2026 DN | 2011                     | 2026 DN      | 2026 DS      | 2026 DN less 2011                               | 2026 DS less 2026 DN | 2026 DN less 2011                                  | 2026 DS less 2026 DN |
| J1 - 2        | 10                   | 103.6               | 103.5        | 103.5        | -0.0   | -0.1                 | 0.0%   | -0.1%                | 5:36                     | 5:37         | 5:37         | 0:00  | 0:00                 | 0.0%   | 0.1%                 |
| J2 - 3        | 12                   | 104.8               | 104.6        | 104.5        | -0.2   | -0.0                 | -0.2%  | 0.0%                 | 6:55                     | 6:55         | 6:55         | 0:01  | 0:00                 | 0.2%   | 0.0%                 |
| J3 - 4        | 8                    | 105.8               | 105.7        | 105.7        | -0.1   | 0.0                  | -0.1%  | 0.0%                 | 4:21                     | 4:22         | 4:21         | 0:00  | 0:00                 | 0.1%   | 0.0%                 |
| <b>J1 - 4</b> | <b>29</b>            | <b>104.7</b>        | <b>104.6</b> | <b>104.6</b> | <b>-0.1</b>  | <b>-0.0</b>          | <b>-0.1%</b>                                 | <b>0.0%</b>          | <b>16:52</b>             | <b>16:53</b> | <b>16:54</b> | <b>0:01</b>                                     | <b>0:00</b>          | <b>0.1%</b>  | <b>0.0%</b>          |
| J4 - 3        | 7                    | 35.4                | 35.5         | 34.1         | 0.1  | -1.4                 | 0.3%   | -4.1%                | 11:38                    | 11:41        | 12:08        | 0:02  | 0:28                 | 0.3%   | 4.0%                 |
| J3 - 2        | 12                   | 38.8                | 39.6         | 38.5         | 0.8  | -1.0                 | 2.0%   | -2.6%                | 23:40                    | 23:8         | 24:09        | -0:32   | 1:01                 | -2.3%  | 4.4%                 |
| J2 - 1        | 11                   | 89.0                | 89.2         | 88.4         | 0.1  | -0.7                 | 0.1%   | -0.8%                | 7:36                     | 7:35         | 7:39         | -0:01   | 0:04                 | -0.2%  | 0.8%                 |
| <b>J4 - 1</b> | <b>30</b>            | <b>54.4</b>         | <b>54.8</b>  | <b>53.7</b>  | <b>0.3</b>   | <b>-1.1</b>          | <b>0.6%</b>                                  | <b>-2.0%</b>         | <b>42:54</b>             | <b>42:23</b> | <b>43:56</b> | <b>-0:31</b>                                    | <b>1:32</b>          | <b>-1.2%</b>                                       | <b>3.6%</b>          |

Table 5.5: Journey times for the M3 junctions 1 – 4 (northbound and southbound)

| Junction   | Junction Length (Km) | Average Speed (Kph) |             |             | Differences Average Speed (Kph) - Absolute Differences |                      | Average Speed (Kph) - Percentage Differences |                      | Journey Time (Mins:Secs) |              |              | Journey Time (Mins:Secs) - Absolute Differences |                      | Journey Time (Mins, Secs) - Percentage Differences |                      |
|--|----------------------|---------------------|-------------|-------------|--|----------------------|--|----------------------|--------------------------|--------------|--------------|---|----------------------|--|----------------------|
|  |                      | 2011                | 2026 DN     | 2026 DS     | 2026 DN less 2011                                      | 2026 DS less 2026 DN | 2026 DN less 2011                            | 2026 DS less 2026 DN | 2011                     | 2026 DN      | 2026 DS      | 2026 DN less 2011                               | 2026 DS less 2026 DN | 2026 DN less 2011                                  | 2026 DS less 2026 DN |
| Hindhead - Guildford (Dennis Roundabout)                 | 21                   | 65.9                | 65.3        | 65.4        | -0.6   | 0.1                  | -1.0%  | 0.2%                 | 20:45                    | 20:59        | 20:58        | 0:13  | 0:00                 | 1.1%   | 0.0%                 |
| Guildford (Dennis Roundabout) - M25 (Wisley Interchange) | 14                   | 78.2                | 77.2        | 76.2        | -1.1   | -0.9                 | -1.4%  | -1.2%                | 10:05                    | 10:16        | 10:25        | 0:10  | 0:10                 | 1.7%   | 1.6%                 |
| M25 (Wisley Interchange) - Tolworth                      | 15                   | 70.5                | 70.4        | 69.0        | -0.1   | -1.4                 | -0.1%  | -2.0%                | 14:04                    | 14:5         | 14:33        | 0:01  | 0:27                 | 0.1%   | 3.2%                 |
| <b>Hindhead - Tolworth</b>                               | <b>50</b>            | <b>71.5</b>         | <b>70.9</b> | <b>70.2</b> | <b>-0.6</b>  | <b>-0.7</b>          | <b>-0.8%</b>                                 | <b>-1.1%</b>         | <b>44:54</b>             | <b>45:19</b> | <b>45:56</b> | <b>0:25</b>                                     | <b>0:36</b>          | <b>0.9%</b>  | <b>1.3%</b>          |
| Tolworth - M25 (Wisley Interchange)                      | 14                   | 76.2                | 76.4        | 76.1        | 0.1  | -0.3                 | 0.2%   | -0.3%                | 11:52                    | 11:50        | 11:54        | -0:02   | 0:05                 | -0.2%  | 0.6%                 |
| M25 (Wisley Interchange) - Guildford (Dennis Roundabout) | 15                   | 93.9                | 94.0        | 93.5        | 0.1  | -0.5                 | 0.1%   | -0.5%                | 9:15                     | 9:15         | 9:17         | -0:01   | 0:03                 | -0.1%  | 0.5%                 |
| Guildford (Dennis Roundabout) - Hindhead                 | 21                   | 75.8                | 75.9        | 75.7        | 0.1  | -0.2                 | 0.1%   | -0.2%                | 16:35                    | 16:32        | 16:38        | -0:03   | 0:06                 | -0.3%  | 0.6%                 |
| <b>Tolworth - Hindhead</b>                               | <b>50</b>            | <b>82.0</b>         | <b>82.1</b> | <b>81.8</b> | <b>0.1</b>   | <b>-0.3</b>          | <b>0.1%</b>                                  | <b>-0.4%</b>         | <b>37:42</b>             | <b>37:37</b> | <b>37:50</b> | <b>-0:05</b>                                    | <b>0:13</b>          | <b>-0.2%</b>                                       | <b>0.6%</b>          |

Table 5.6: Journey times for the A3 Hindhead – Tolworth (northbound and southbound)

- 5.2.2 The flow, average speed and journey time of a link are all related. For example a general trend/correlation occurs between the three elements: when flow increases, average speed decreases and a result of this is increased journey time.
- 5.2.3 *Tables 5.3 to 5.6* indicate that the future development projected to occur in the forecast year of 2026 has a minor affect on the SRN within Surrey. For example, the largest overall absolute increase in journey time estimated to occur in the 2026 Do-Something is on the northbound stretch of the M3 (between junctions 4 and 1), with an increase of 1 minute 32 seconds (3.6% increase) when compared to the 2026 Do-Nothing.
- 5.2.4 *Table 5.3* indicates that the M25 junction 5 to 14 (clockwise) has a longer journey time in all modelled variants than junctions 14 to 5 (anti-clockwise). For example, it is estimated that the journey time between junctions 5 and 14 in the average AM peak hour in 2026 Do-Something is 73 minutes 15 seconds, whereas the journey time between junctions 14 and 5 is estimated to be 55 minutes 42 seconds. Therefore a difference of 17 minutes 33 seconds occurs in the 2026 Do-Something based on direction of travel on the whole section of the M25 in Surrey. *Table 5.3* also suggests that the largest absolute increases in journey time between individual junctions in the 2026 Do-Something (when compared to the 2026 Do-Nothing), is present between junctions 9 and 10 (36 second increase relating to a 5.4% increase) and junctions 8 and 9 (33 second increase relating to 4.4% increase).
- 5.2.5 The additional trips generated from forecast development, in all modelled scenarios, is not likely to affect the M23 between junctions 7 and 10 (in a northbound and southbound direction). *Table 5.4* indicates that the average speeds, and therefore the journey times too, remain virtually constant for this part of the SRN.
- 5.2.6 Average speeds and journey times for the M3 in Surrey (junctions 1 to 4) are presented in *Table 5.5*. The southbound stretch of the M3 between junctions 1 and 4 does not incur any relevant changes in average speed or journey times in the modelled scenarios. However, the northbound stretch, between junction 4 and 1 is subject to an increase in journey time of 1 minute 32 seconds (a 3.6% increase) in the 2026 Do-Something, compared to the 2026 Do-Nothing, as such it also incurs the lowest average speeds. Specifically junctions 3 to 2 are expected to incur the largest absolute increase in journey time in the 2026 Do-Something, 1 minute 1 second (a 4.4% increase), when compared to the 2026 Do-Nothing.
- 5.2.7 *Table 5.6* indicates that the entire Surrey stretch of the A3 has a higher journey time in the 2026 Do-Something in a northbound direction, 45 minutes 56 seconds, when compared to the southbound direction, 37 minutes 50 seconds. A difference of 8 minutes 6 seconds based on the direction of travel in the 2026 Do-Something. When examining journey times for general sections of the A3, the northbound section between the M25 Wisley Interchange and Tolworth junction has the largest individual absolute increase (27 seconds relating to a 3.2% increase) in journey time in the 2026 Do-Something in comparison to the 2026 Do-Nothing.

### 5.3 Cost of Congestion compared to Volume/Capacity Ratio

- 5.3.1 SCC has created a cost of congestion map for the County for 2007/08. The map utilises free flow travel times, congested travel times, modelled flows and the application of a monetary value for different vehicle types. The cost of congestion is plotted on a map of Surrey to highlight the roads in the County that have the highest costs of congestion due to changes in free flow and congested travel times.
- 5.3.2 The values of time for each vehicle type (Car, LGV and HGV) were sourced from WebTAG (*TAG Unit 3.5.6 Table 9*). The modelled flows were sourced from the County model (SINTRAM), and the observed travel times were sourced from the Department for Transport's (DfT) Congestion Journey Time and Acquisition Monitoring System (CJAMS). The formula used to calculate the cost of congestion for each link is shown below in *Figure 5.1*.

$$TCC = \sum_i VOT_i \left( \sum_{jt} V_{ijt} C_{ijt} - \sum_{jt} V_{jt} C_{jt} \right)$$

Where:

TCC = Total Cost of Congestion

$V_{ijt}$  = flow of user class  $i$  on link  $j$  during time of day period  $t$

$C_{ijt}$  = travel time of user class  $i$  on link  $j$  during time of day period  $t$

$C_{j0}$  = free-flow travel time on link  $j$  (generally observed during the off-peak period)

$VOT_i$  = value of time for user class  $i$  (obtained from the DfT's Highway Economic Note)

Figure 5.1: Total Cost of Congestion equation

- 5.3.3 *Figure 5.2* shows the latest cost of congestion map, (2007/08), displaying the two highest cost bands only: between 100 and 200 GBP and over 200 GBP.
- 5.3.4 It is possible to visually compare the 2007/08 cost of congestion map with the modelled flows and volume/capacity ratios (VCR) for the 2011 base and 2026 Do-Something scenarios. This will aid the identification of areas of highest congestion, in terms of cost, in 2007/08 and whether the trends continue into the modelled 2011 base and forecast year of 2026 (with all committed and non-committed planned development in Surrey being modelled).
- 5.3.5 Both the volume of traffic and level of congestion projected to occur in the 2011 base and 2026 Do-Something are represented using a coloured bandwidth plot on the modelled road network. The volume/capacity ratios (VCR) are shown only for links within the study area with a VCR equal to or greater than 1, in *Figures 5.3* and *5.4*.
- 5.3.6 The cost of congestion map shown in *Figure 5.2* indicates roads in the County that have the highest cost of congestion based on 2007/08 modelled flows and observed journey times, by highlighting the roads in red (indicating a cost greater than 200 GBP). The key parts of the SRN with such costs are:
- M3 junctions 4 to 3;



- Majority of the M25 between junctions 13 and 8 as well as junctions 6 and 5 (clockwise and anti-clockwise);
  - A3 approaching the M25 junction 10 Wisley Interchange (from north and south of the M25);
  - A3 surrounding Guildford (specifically near Dennis roundabout).
- 5.3.7 In relation to the LRN, the main areas/corridors shown by the 2007/08 cost of congestion map appear to be:
- A31 between Farnham and Guildford;
  - A245 near the Painshill junction;
  - A320 St Peter's Way (as well as other local roads surrounding the M25 junction 11).
- 5.3.8 *Figures 5.3 and 5.4* display the VCR bandwidths for all links in the study area that have a VCR value equal to or greater than 1, for the 2011 base and 2026 Do-Something forecast. The widths of the bands displayed on the modelled links are proportionate to the projected flow. The colour of the bands relate to the VCR value, for example, links coloured orange have a VCR value ranging from 1 to 1.59. A value of 1 was chosen as it is likely that when a VCR value between 0.85 and 1 is reached it is likely that the flow conditions will decrease thus increasing the likelihood of flow breakdown, congestion and increased journey times. Therefore a VCR value of 1 relates to more certainty of congestion than 0.85.
- 5.3.9 *Figure 5.3* indicates that the links with the highest VCR values (indicated by dark red bands) in the 2011 base are generally located external to Surrey, such as:
- A24 (travelling northbound and into the County) near Horsham;
  - A23 (travelling northbound and into the County) near Crawley;
  - A22 (travelling northbound and into the County) at Haywards Heath.
- 5.3.10 The areas of the SRN that incur largest corridors of congestion in 2011 are:
- M3 junctions 4a to 2 (northbound);
  - M25 junctions 13 to 14 (clockwise);
  - A3 between A31 and Dennis Roundabout (northbound);
  - A3 at the Hook junction (northbound and southbound).
- 5.3.11 With reference to the LRN the main areas of congestion in the 2011 base are:
- A31 approaching Farnham (from the south but travelling northbound);
  - A245 Portsmouth Rd (either side of the Painshill junction).
- 5.3.12 *Figure 5.4* displays VCR bandwidths for the 2026 Do-Something. The VCR bandwidths that have a value equal to or greater than 1 appear to be relatively similar to the 2011 base. This infers that there are not any new, large, areas of congestion projected to occur in 2026 as a result of the committed and non-committed planned future development. However, one area of increased congestion in 2026 (but actually occurs in the 2026 Do-Nothing – compare *Figures 5.5 and 5.6* in *section 5.4*) is apparent on the A3 (travelling northbound) between the Ripley junction and the M25 junction 10 Wisley Interchange.
- 5.3.13 In relation to comparisons between the cost of congestion map for 2007/08 and the VCR bandwidths for the modelled base year of 2011 and 2026 Do-Something, it appears that similar areas of congestion are being represented. *Figures 5.2* (2007/08 cost of congestion map) to *5.4* (2026 Do-Something VCR plot) all highlight the following roads to have high monetary costs and values of congestion:

- M3 junctions 3 to 4 (northbound);
- M25 junctions 13 to 14 (clockwise);
- A245 Portsmouth Rd (west of the A3 Painshill junction);
- A31 Alton Rd (northbound) (approaching and through Farnham)
- A3 Portsmouth Rd (northbound) (between Ripley junction and M25 junction 10 Wisley Interchange)

5.3.14 Roads that are presented in *Figures 5.2 to 5.4* as having high costs of congestion and VCR values over 1, are areas currently thought to be congested (based on observed journey times) and are thought to continue to have high levels of congestion until the forecast year of 2026 (based on modelled flows).

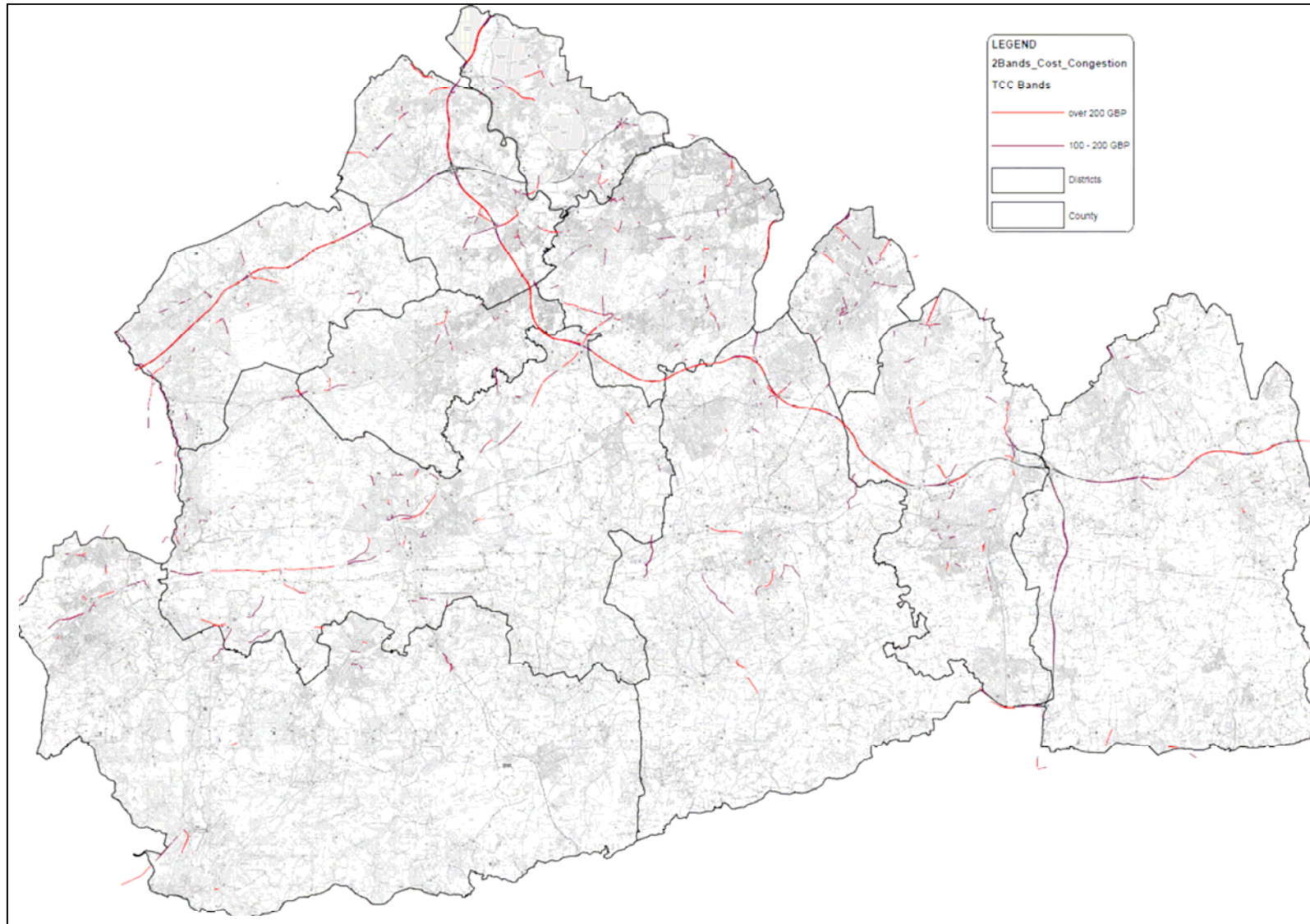


Figure 5.2: 2007/08 Cost of Congestion map for Surrey

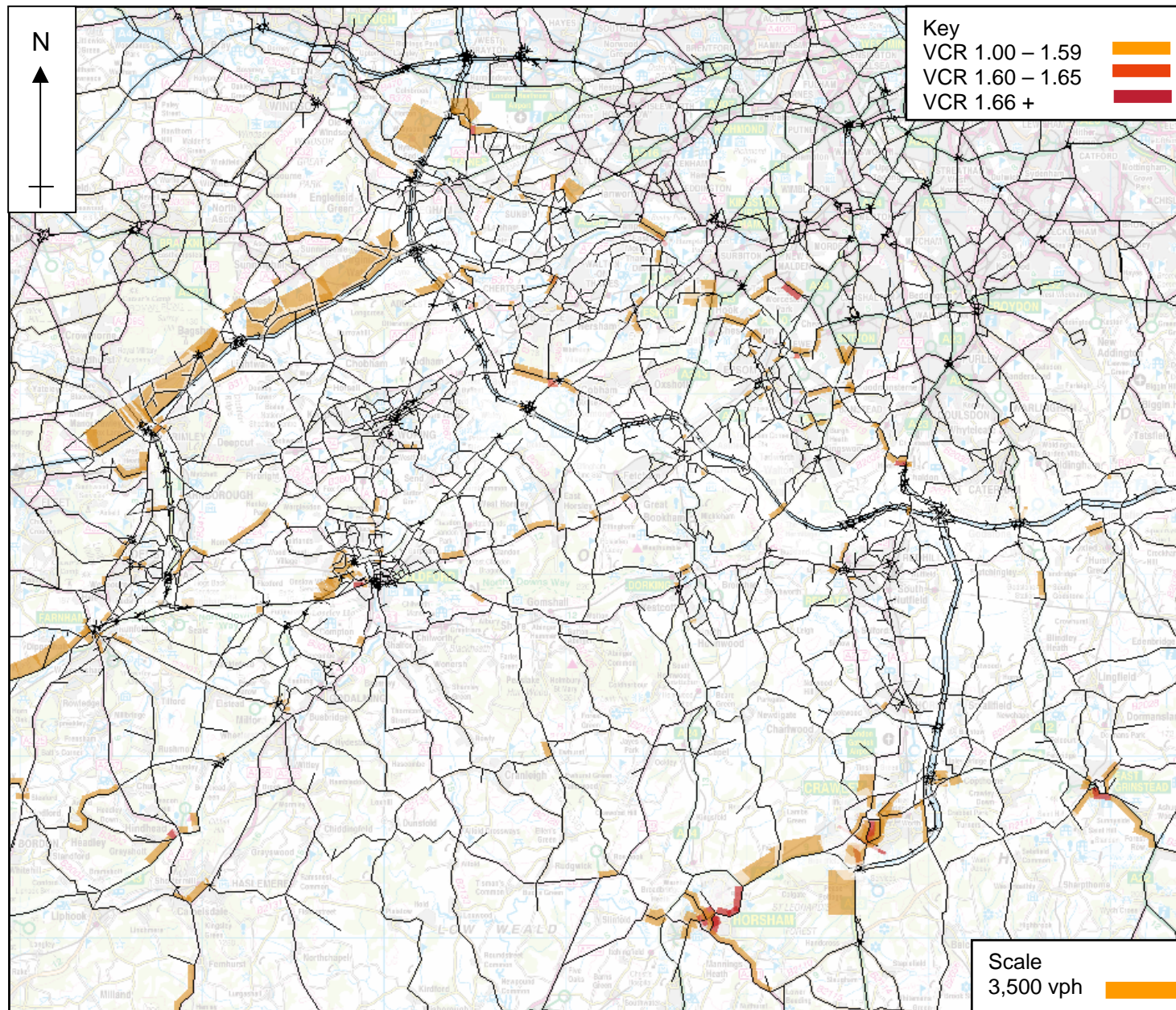


Figure 5.3: 2011 base traffic volumes and VCR (VCR values greater than 1 displayed only).

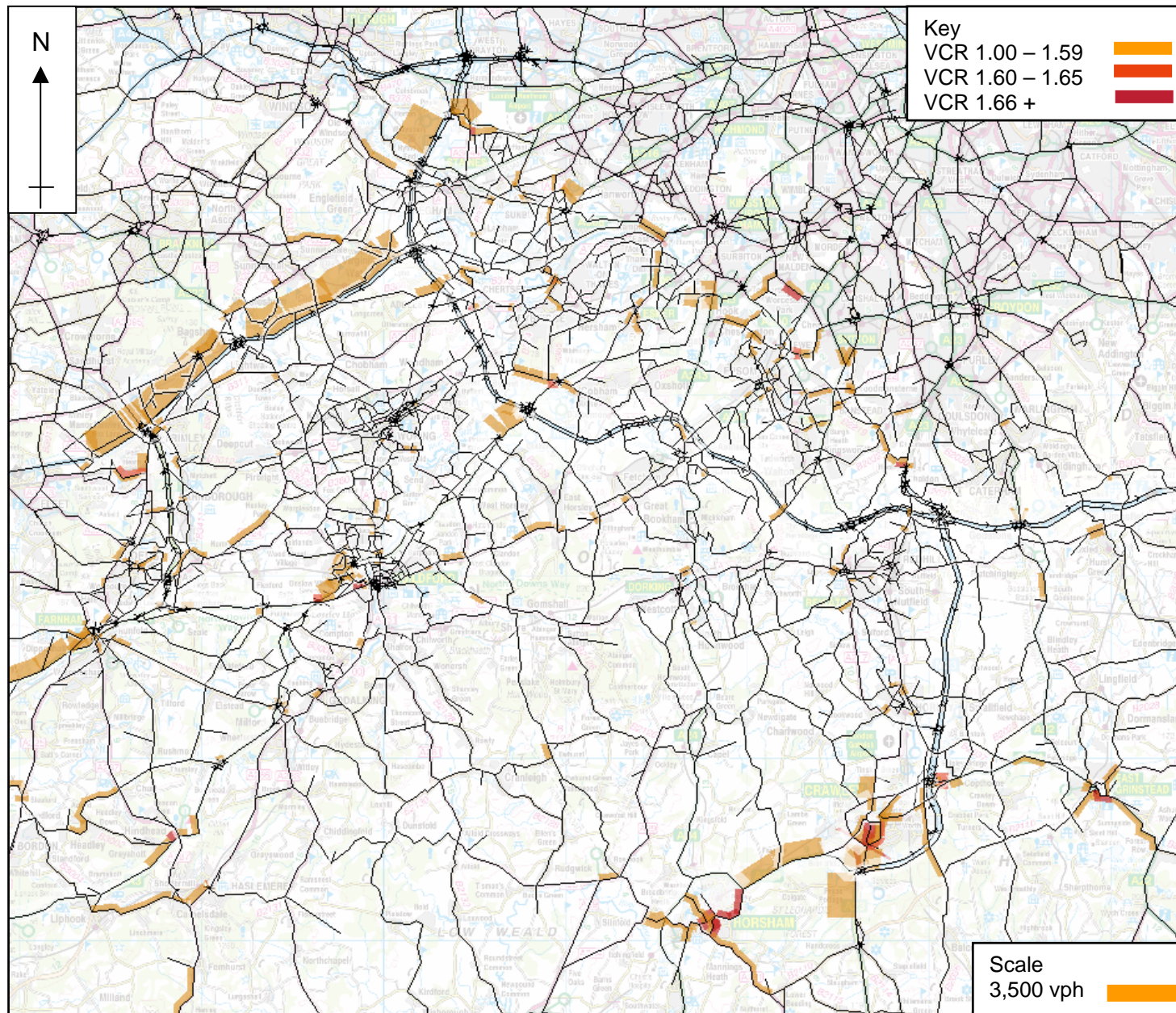


Figure 5.4: 2026 Do-Something traffic volumes and VCR (VCR values greater than 1 displayed only)

## 5.4 Volume/Capacity Ratio

- 5.4.1 *Figures 5.5 to 5.7 display the estimated flows and VCRs for all modelled links in the study area. VCR bandwidths are only displayed for links with a VCR equal to or greater than 0.85.*
- 5.4.2 *Figure 5.5 displays the projected flows and VCR for the 2011 base. A visual interpretation indicates that the main areas of the County projected to incur some of the highest levels of flow and congestion in the 2011 base are:*
- A3 Portsmouth Rd, Hindhead - travelling northbound prior to the Hindhead crossroads;
  - A31 Farnham Rd, Guildford – travelling eastbound prior to the Guildford gyratory;
  - A245 Portsmouth Rd, Painshill – travelling westbound after the A3 Painshill junction;
  - M3 J4a to 2 (M25 J12 Thorpe Interchange) – travelling northbound;
  - A3 Guildford By-pass – travelling northbound between junctions with the A31 and Dennis roundabout;
  - A31 Alton Road, Farnham – travelling eastbound approaching the Coxbridge roundabout;
  - M25 junctions 13 to 14 – travelling clockwise.
- 5.4.3 *Figure 5.5 also indicates that areas outside of the County are estimated to incur relatively significant levels of congestion, specifically Horsham, Crawley and East Grinstead. However, an element of caution should be used when analysing areas external to the County as the level of network coding is not as precise due to these areas being outside of the models main area of purpose.*
- 5.4.4 *Figure 5.6 displays volumes of traffic and congestion in the 2026 Do-Nothing. The 2026 Do-Nothing represents relatively similar bandwidths as the 2011 base for the LRN. This relates to no development occurring in the study area but the rest of the Country growthed to 2026 forecasts. However, small differences can be seen on the SRN when comparing the 2026 Do-Nothing to the 2011 base. For example the VCR values have changed from the ranges of 0.91 - 0.95 to 0.96 –0.99 on the M25 between junctions 5 and 6 (clockwise and anti-clockwise). Areas external to the County that incur an increase in VCR in the 2026 Do-Nothing (when compared to the 2011 base) is the B2026 Balcombe Road travelling northbound (into the County) from the south near Horsham and the A23 London Road travelling northbound (into the County) from the south (Crawley).*
- 5.4.5 *Visual observations of the 2026 Do-Nothing and 2026 Do-Something VCR plots indicate that there are no significant increases in congestion between the two scenarios. However, an area of the SRN projected to experience an increase in flow and therefore congestion, is the M25 between junctions 9 and 8 (anti-clockwise) with an increased VCR value of over 0.85. Increases in congestion are also projected on the LRN in the 2026 Do-Something. The most noticeable being the A31 Hogs Back (eastbound) increasing from a value range between 0.91 and 0.95 to 0.96 and 0.99. The A331 Blackwater Valley Route (BVR) northbound incurs increased congestion as a larger stretch has a VCR value over 0.85 in the 2026 Do-Something. These roads are not part of the SRN but form key routes in an east to west and north to south direction through the County.*

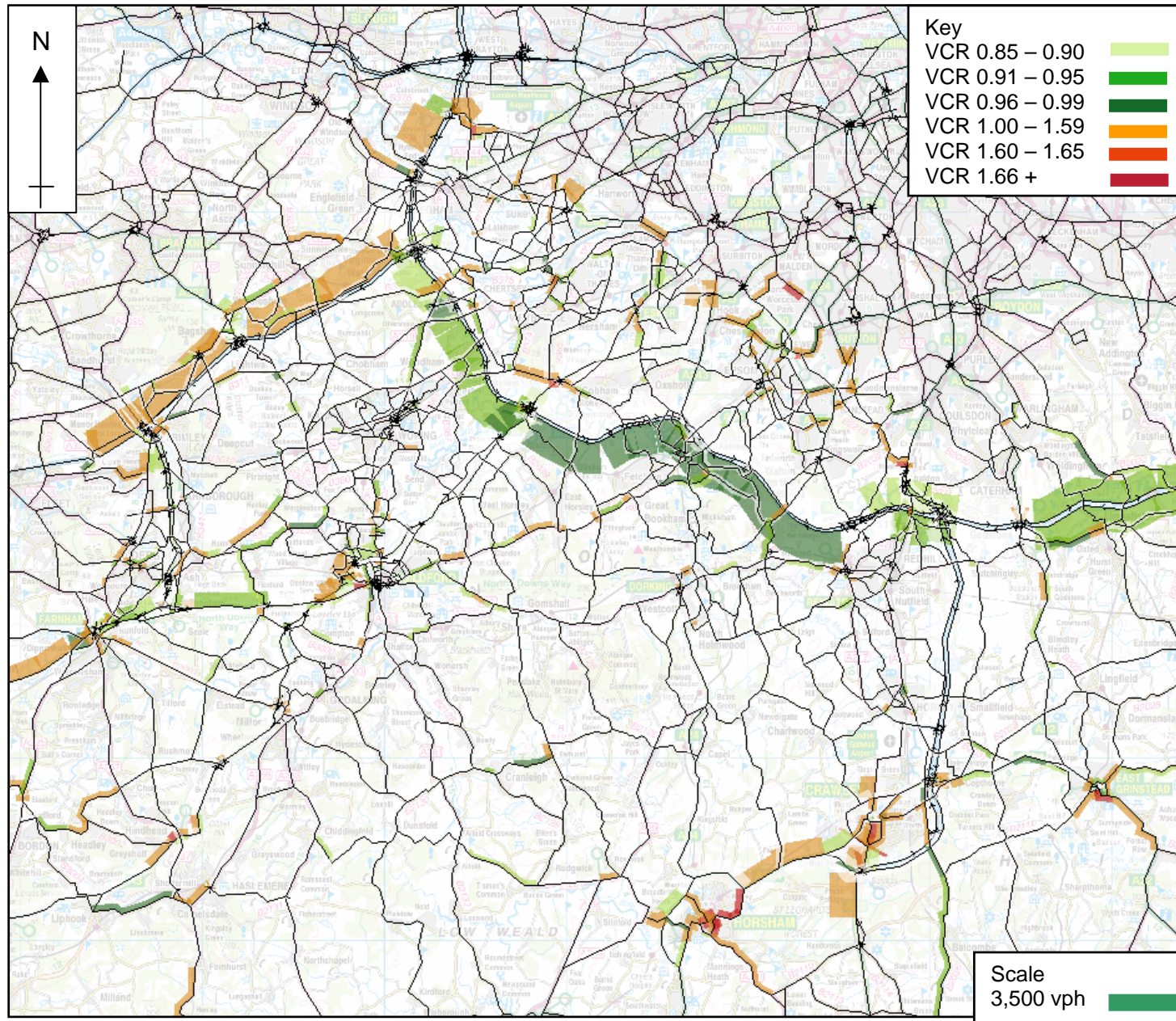


Figure 5.5: 2011 base traffic volumes and VCR

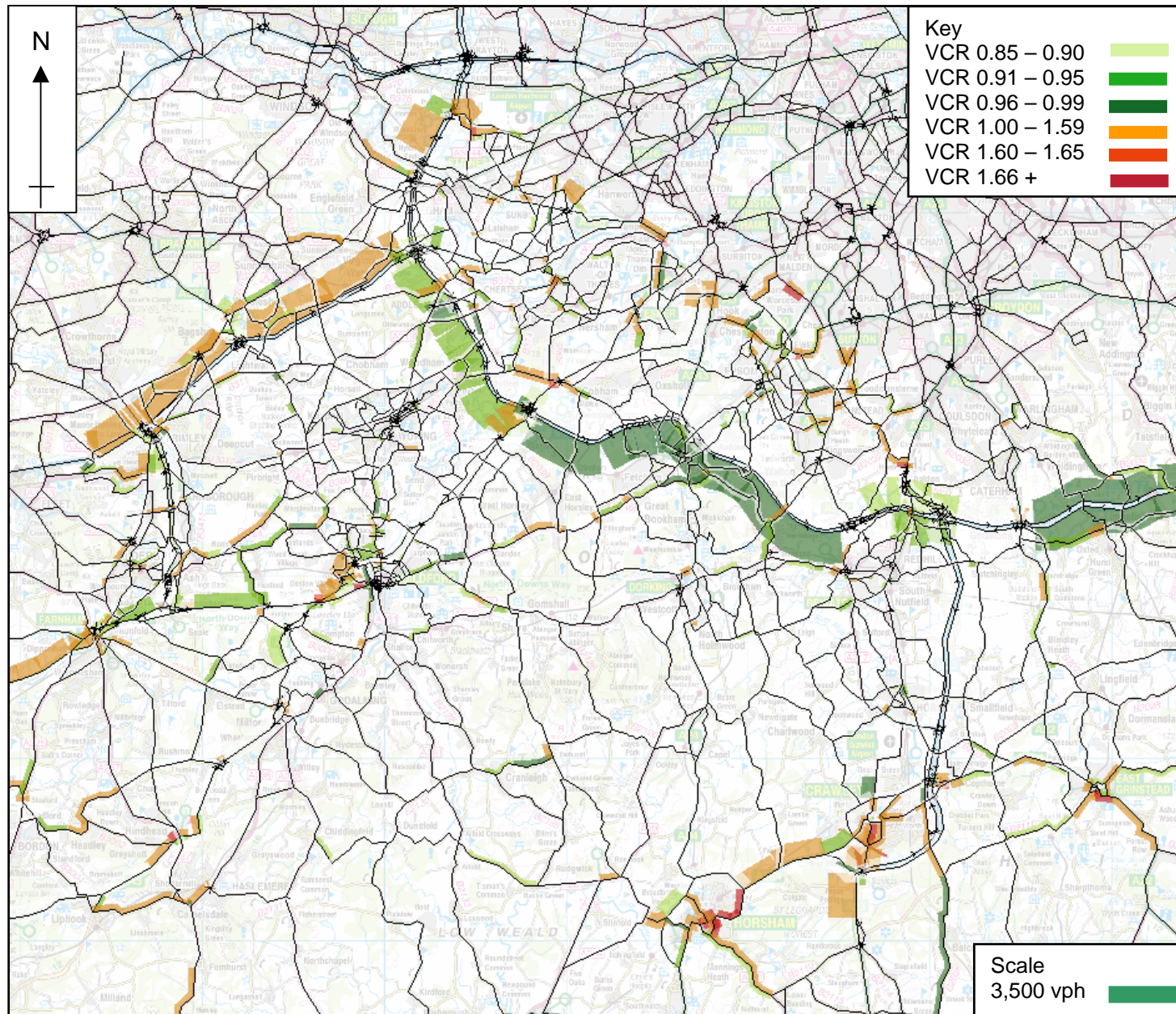


Figure 5.6: 2026 Do-Nothing traffic volumes and VCR



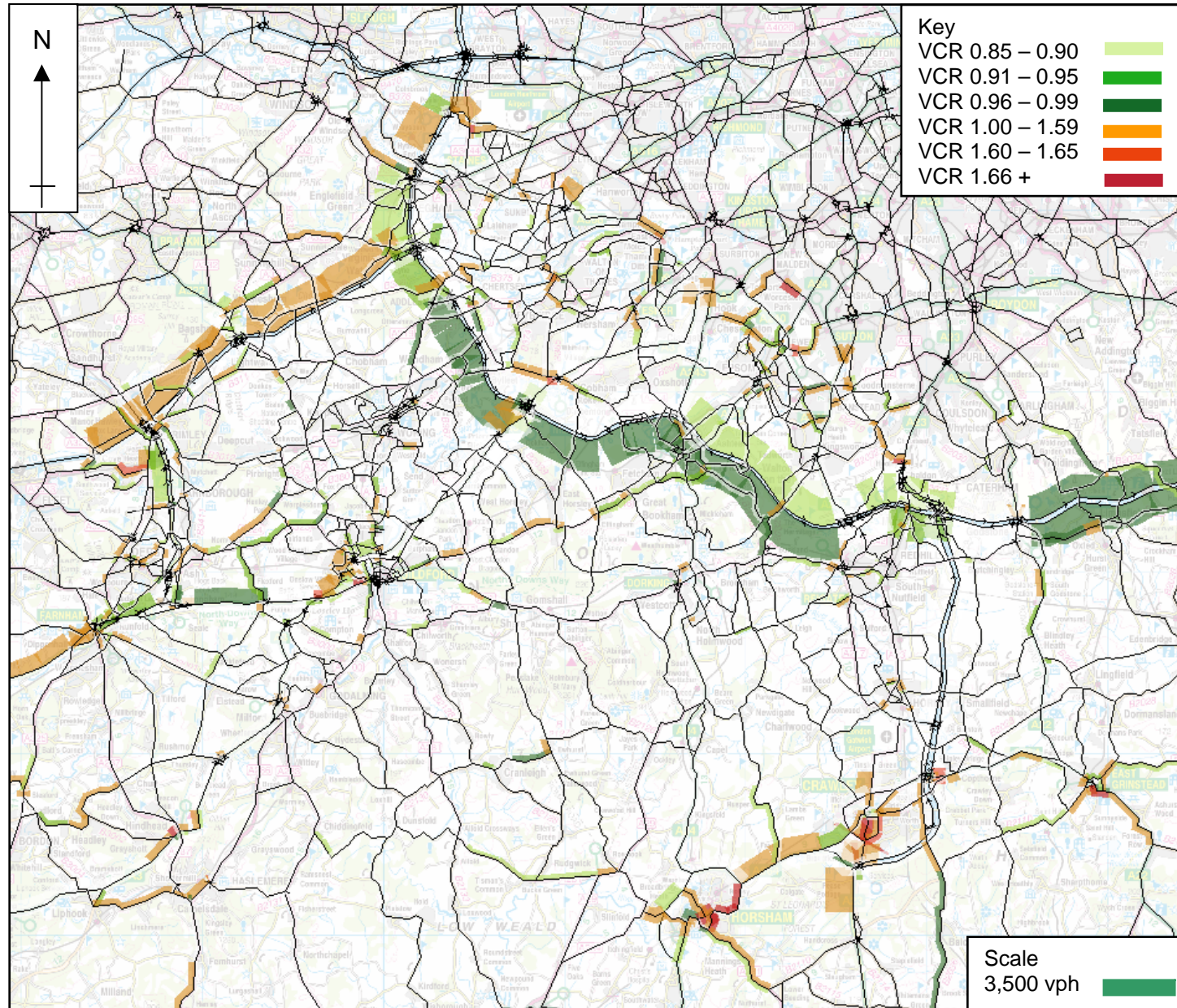


Figure 5.7: 2026 Do-Something traffic volumes and VCR

5.4.6 All modelled links within the County were ranked based on the differences between the 2026 Do-Nothing and 2026 Do-Something based on three criteria: absolute difference in flow; percentage difference in flow and differences in VCR. Each of these three criteria have been ranked separately and then summed to provide an overall un-weighted score which has then been ranked (i.e. the lowest score equals the highest ranked link) to define the links likely to experience the greatest negative impacts in terms of increases in flows and congestion. *Table 5.7* shows a borough/district proportional breakdown of links within the County that are ranked within the top 25%, 10% and top 100 of all links.

|                    | Total no. of links | % of total no. of links | No. of links in top 25 % of total links | % of top 25% of total links | No. of links in top 10% of total links | % of top 10% of total links | No. of links in top 100 links | % of top 100 links |
|--------------------|--------------------|-------------------------|---|-----------------------------|--|-----------------------------|-------------------------------|--------------------|
| Elmbridge          | 347                | 7%                      | 38                                      | 3%                          | 17                                     | 4%                          | 0                             | 0%                 |
| Epsom & Ewell      | 228                | 5%                      | 54                                      | 5%                          | 22                                     | 5%                          | 5                             | 5%                 |
| Guildford          | 884                | <b>19%</b>              | 207                                     | <b>18%</b>                  | 57                                     | 12%                         | 8                             | 8%                 |
| Mole Valley        | 492                | 10%                     | 152                                     | 13%                         | 53                                     | 11%                         | 6                             | 6%                 |
| Reigate & Banstead | 526                | 11%                     | 195                                     | 17%                         | 85                                     | <b>18%</b>                  | 20                            | 20%                |
| Runnymede          | 285                | 6%                      | 80                                      | 7%                          | 55                                     | 12%                         | 21                            | <b>21%</b>         |
| Spelthorne         | 344                | 7%                      | 70                                      | 6%                          | 21                                     | 4%                          | 10                            | 10%                |
| Surrey Heath       | 332                | 7%                      | 88                                      | 7%                          | 46                                     | 10%                         | 11                            | 11%                |
| Tandridge          | 320                | 7%                      | 41                                      | 3%                          | 10                                     | 2%                          | 0                             | 0%                 |
| Waverley           | 507                | 11%                     | 92                                      | 8%                          | 24                                     | 5%                          | 3                             | 3%                 |
| Woking             | 438                | 9%                      | 158                                     | 13%                         | 80                                     | 17%                         | 16                            | 16%                |
| <b>Total</b>       | <b>4703</b>        | <b>100%</b>             | <b>1175</b>                             | <b>100%</b>                 | <b>470</b>                             | <b>100%</b>                 | <b>100</b>                    | <b>100%</b>        |

Table 5.7: Borough/district breakdown of links based on flow and VCR ranking (based on differences between 2026 Do-Nothing and 2026 Do-Something).

5.4.7 *Table 5.7* indicates that the borough of Guildford contains the largest proportion of modelled links within the County, 19% of all modelled links. The borough of Guildford also contains the largest proportion of links ranked in the top 25%, whereas the borough of Reigate & Banstead contains the largest proportion of links in the top 10% and the borough of Runnymede contains the largest proportion of links in the top 100 links, to incur the largest increases in flow and VCR values between the 2026 Do-Nothing and 2026 Do-Something.

5.4.8 *Table 5.8* shows the top twenty links in the County that are forecast to rank highest in terms of increases in flow and VCR. Therefore the links displayed in *Table 5.8* are not the links in the County with the highest VCR values, but are the links that are forecast to incur the largest increases (in flow and VCR values) between the 2026 Do-Nothing and 2026 Do-Something as a result of the future trip generation generated from non-committed development.

5.4.9 *Figures 5.8* and *5.9* display the geographic locations of the links shown in *Table 5.8*.

| Link No. | Link Dir | Road               | District           | Capacity | Flow (All Vehicles) |         |         | VCR  |         |         | Abs Diff in Flow     | % Diff in Flow       | Abs Diff in VCR      | Ranking based on 2026 DS less 2026 DN |                |                  |       |          |
|----------|----------|--------------------|--------------------|----------|---------------------|---------|---------|------|---------|---------|----------------------|----------------------|----------------------|---------------------------------------|----------------|------------------|-------|----------|
|          |          |                    |                    |          | 2011                | 2026 DN | 2026 DS | 2011 | 2026 DN | 2026 DS | 2026 DS less 2026 DN | 2026 DS less 2026 DN | 2026 DS less 2026 DN | Abs Diff in VCR                       | % Diff in Flow | Abs Diff in Flow | Score | Position |
| 10685    | 1 (S)    | A245 Old Woking Rd | Woking             | 1,200    | 689                 | 670     | 1,010   | 0.57 | 0.56    | 0.84    | 340                  | 51%                  | 0.28                 | 2                                     | 23             | 6                | 31    | 1        |
| 15684    | 2 (E)    | Horley Road        | Reigate & Banstead | 800      | 620                 | 633     | 896     | 0.77 | 0.79    | 1.12    | 262                  | 41%                  | 0.33                 | 1                                     | 37             | 16               | 54    | 2        |
| 16870    | 1 (E)    | Trumps Green Rd    | Runnymede          | 1,200    | 761                 | 781     | 1,092   | 0.63 | 0.65    | 0.91    | 311                  | 40%                  | 0.26                 | 5                                     | 45             | 10               | 60    | 3        |
| 10688    | 1 (S)    | A245 Old Woking Rd | Woking             | 1,200    | 661                 | 681     | 957     | 0.55 | 0.57    | 0.80    | 276                  | 41%                  | 0.23                 | 6                                     | 44             | 13               | 63    | 4        |
| 15685    | 2 (W)    | Horley Rd          | Reigate & Banstead | 800      | 531                 | 546     | 757     | 0.66 | 0.68    | 0.95    | 211                  | 39%                  | 0.26                 | 3                                     | 50             | 30               | 83    | 5        |
| 16392    | 1 (N)    | Stroude Rd         | Runnymede          | 1,700    | 268                 | 278     | 502     | 0.16 | 0.16    | 0.30    | 224                  | 81%                  | 0.13                 | 53                                    | 6              | 26               | 85    | 6        |
| 16749    | 2 (E)    | Chobham Ln         | Runnymede          | 1,200    | 697                 | 718     | 979     | 0.58 | 0.60    | 0.82    | 261                  | 36%                  | 0.22                 | 8                                     | 66             | 17               | 91    | 7        |
| 15699    | 2 (N)    | Chertsey Rd        | Woking             | 800      | 247                 | 246     | 397     | 0.31 | 0.31    | 0.50    | 151                  | 61%                  | 0.19                 | 13                                    | 15             | 69               | 97    | 8        |
| 8868     | 2 (W)    | Mill Ln            | Reigate & Banstead | 800      | 323                 | 345     | 504     | 0.40 | 0.43    | 0.63    | 159                  | 46%                  | 0.20                 | 11                                    | 29             | 61               | 101   | 9        |
| 16673    | 1 (S)    | Short Ln           | Spelthorne         | 1,200    | 412                 | 494     | 672     | 0.34 | 0.41    | 0.56    | 178                  | 36%                  | 0.15                 | 29                                    | 71             | 40               | 140   | 10       |
| 15111    | 1 (W)    | B382 Woking Rd     | Woking             | 1,700    | 461                 | 452     | 647     | 0.27 | 0.27    | 0.38    | 195                  | 43%                  | 0.11                 | 76                                    | 36             | 33               | 145   | 11       |
| 8814     | 2 (N)    | A242 Croydon Rd    | Reigate & Banstead | 800      | 396                 | 391     | 535     | 0.49 | 0.49    | 0.67    | 145                  | 37%                  | 0.18                 | 14                                    | 60             | 72               | 146   | 12       |
| 9335     | 1 (S)    | Long Ln            | Spelthorne         | 1,200    | 434                 | 506     | 682     | 0.36 | 0.42    | 0.57    | 176                  | 35%                  | 0.15                 | 31                                    | 75             | 43               | 149   | 13       |
| 16861    | 2 (E)    | B3407 High St      | Runnymede          | 800      | 513                 | 397     | 539     | 0.64 | 0.50    | 0.67    | 142                  | 36%                  | 0.18                 | 16                                    | 72             | 76               | 164   | 14       |
| 15112    | 2 (W)    | B382 Woking Rd     | Woking             | 1,700    | 499                 | 497     | 687     | 0.29 | 0.29    | 0.40    | 190                  | 38%                  | 0.11                 | 85                                    | 52             | 35               | 172   | 15       |
| 8458     | 1 (W)    | B3367 Monkton Ln   | Waverley           | 800      | 228                 | 104     | 217     | 0.29 | 0.13    | 0.27    | 113                  | 109%                 | 0.14                 | 35                                    | 3              | 143              | 181   | 16       |
| 16753    | 2 (E)    | B386 Holloway Hill | Runnymede          | 1,700    | 1,843               | 1,848   | 2,290   | 1.08 | 1.09    | 1.35    | 442                  | 24%                  | 0.26                 | 4                                     | 177            | 1                | 182   | 17       |
| 15914    | 1 (E)    | Green Lane         | Runnymede          | 1,200    | 975                 | 914     | 1,146   | 0.81 | 0.76    | 0.95    | 232                  | 25%                  | 0.19                 | 12                                    | 153            | 24               | 189   | 18       |
| 16769    | 2 (E)    | Norlands Lane      | Spelthorne         | 1,700    | 197                 | 221     | 384     | 0.12 | 0.13    | 0.23    | 163                  | 74%                  | 0.10                 | 130                                   | 9              | 55               | 194   | 19       |
| 16474    | 2 (S)    | Pooley Green Rd    | Runnymede          | 1,200    | 324                 | 233     | 367     | 0.27 | 0.19    | 0.31    | 134                  | 57%                  | 0.11                 | 87                                    | 20             | 93               | 200   | 20       |

Table 5.8: Top 20 links in Surrey likely to incur largest increases in flow and VCR between 2026 Do-Nothing and 2026 Do-Something

Values highlighted in green have a VCR value ranging between 0.85 and 1.  
 Values highlighted in orange have a VCR value ranging between 1 and 1.59.

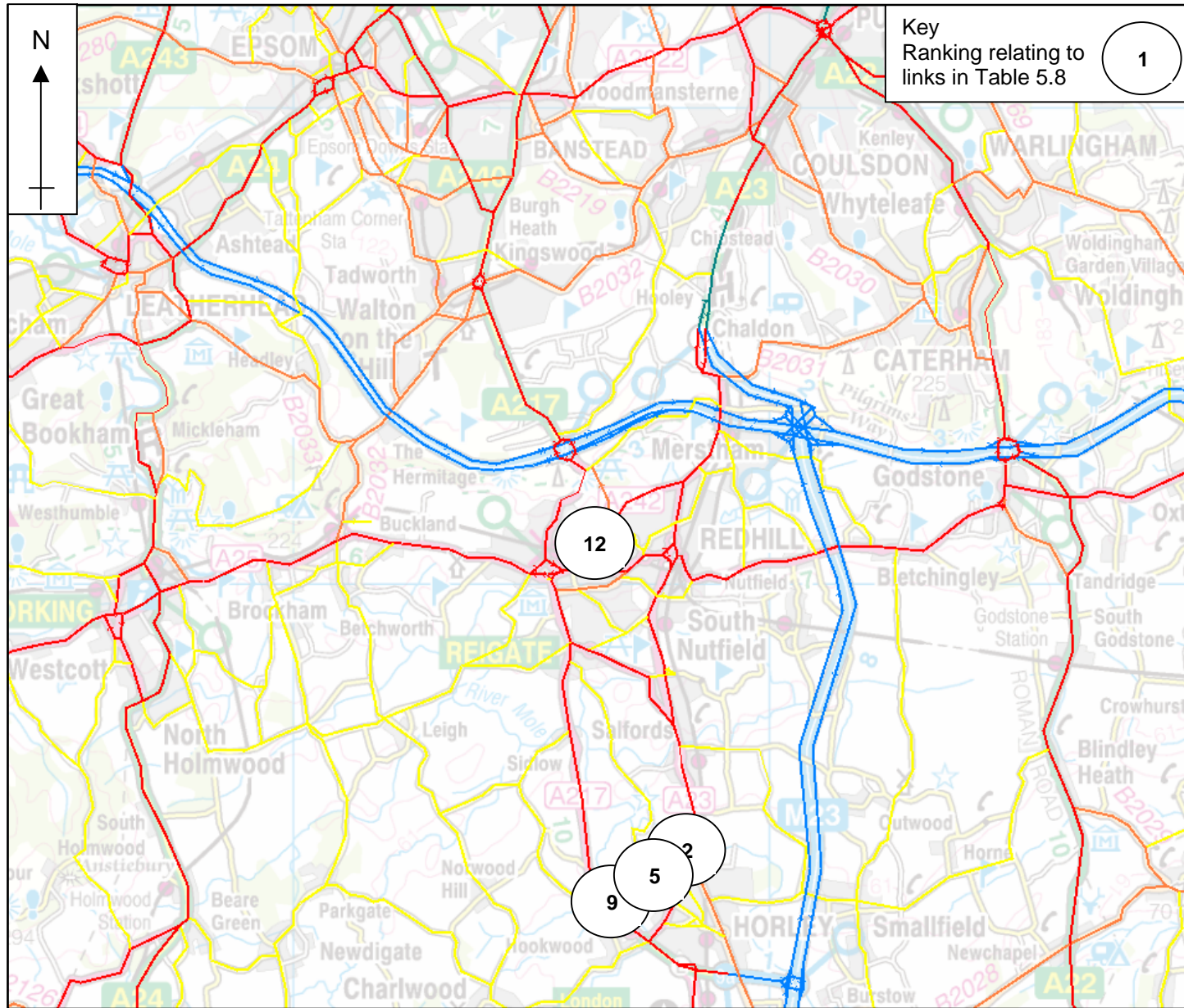


Figure 5.8: Location of links ranked in top 20, to incur largest increases in flow and VCR between 2026 Do-Nothing and 2026 Do-Something, East of the County

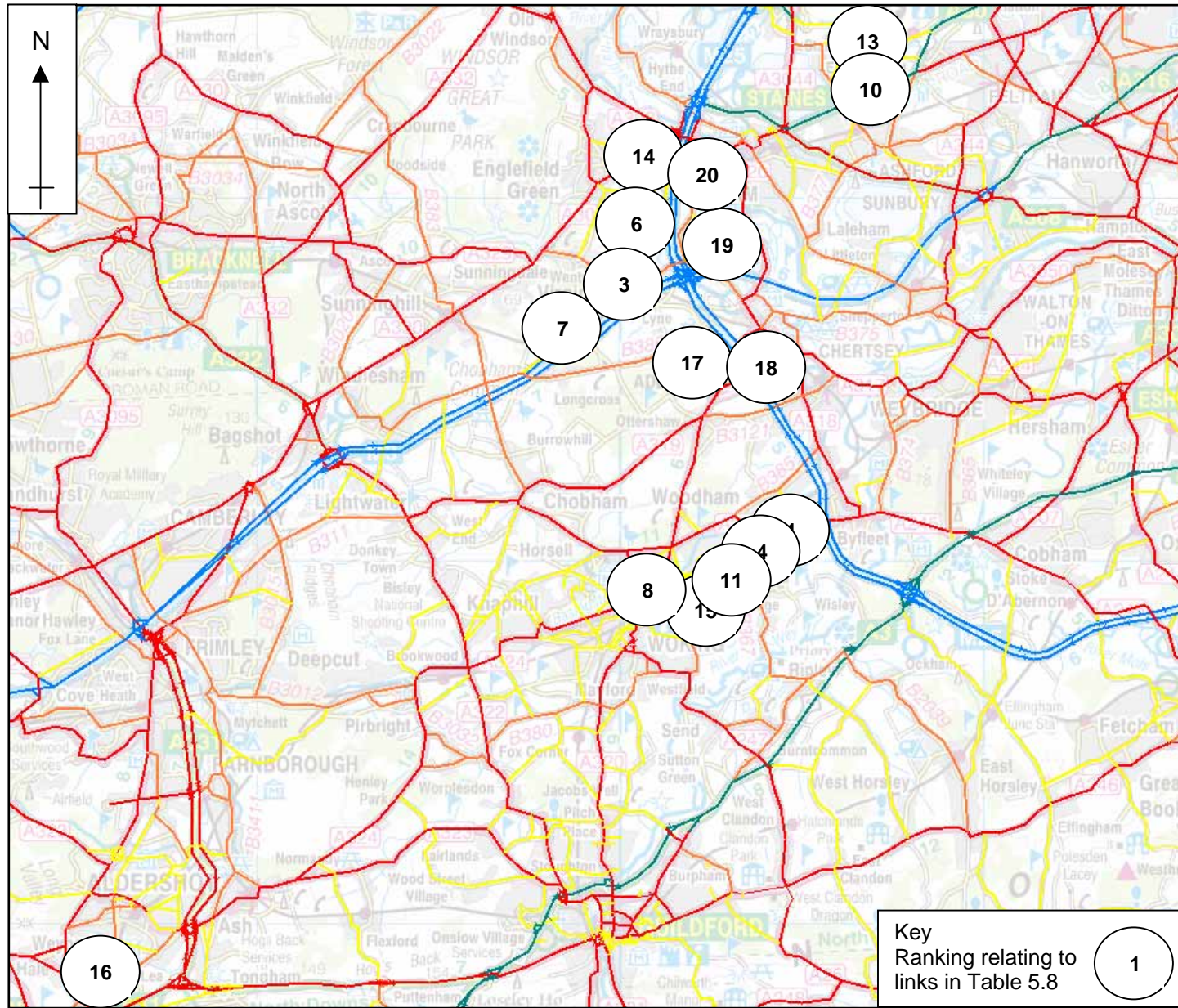


Figure 5.9: Location of links ranked in top 20, to incur largest increases in flow and VCR between 2026 Do-Nothing and 2026 Do-Something, West of the County

- 5.4.10 The majority of links in *Table 5.8* do not have VCR values that exceed 0.85. Out of the twenty links to incur the largest increases in flow and VCR in the 2026 Do-Something, eight of these links are within the borough of Runnymede.
- 5.4.11 Out of the links ranked in *Table 5.8*, Horley Rd (eastbound) and the B386 Holloway Hill (eastbound) have the highest VCR values in the 2026 Do-Something, 1.12 and 1.35 respectively. These links are ranked 2<sup>nd</sup> and 17<sup>th</sup> in *Table 5.8*.
- 5.4.12 The majority of links in *Table 5.8* are in close proximity to/are within the zones that are projected to incur the largest increase in trip ends (specifically origins/departures) between the 2026 Do-Nothing and 2026 Do-Something, (refer to *Tables 4.9* and *4.10*). For example Horley Road is detailed in *Table 5.8* and zone 264 (Horley – Meath Green) is in *Table 4.9*, and as such Horley Rd is located within zone 264. This trend also occurs with zone 379 (Ottershaw) as Chobham Ln, Trumps Green and Stroude Ln are located in close proximity to the centroid of this zone. Zone 274 (West Byfleet Town Centre) features as having some of the largest increases in origin (departure) trip ends between the 2026 Do-Nothing and 2026 Do-Something (see *Table 4.9*) and as such links in close proximity to this zone, A245/B382 Old Woking Rd, are featured in *Table 5.8*.
- 5.4.13 *Figures 5.8* and *5.9* indicate a trend occurring, by many of the twenty links being in close proximity to each other, and thus forming small corridors of increased flow and levels of congestion. Three of these corridors being:
- Horley Rd/Mill Ln, westbound (Reigate & Banstead);
  - Chobham Ln, Trumps Green Rd and Stroude Rd, eastbound/northbound (Runnymede);
  - A245/B382 Old Woking Rd, westbound (Woking).

## 5.5 Difference in Flow

- 5.5.1 Changes in levels of traffic are shown using a bandwidth plot on the road network with comparisons to relevant scenarios. *Figures 5.10* and *5.11* show the differences in traffic between the 2011 base and 2026 Do-Nothing as well as differences between the 2026 Do-Nothing and 2026 Do-Something. Bandwidths are displayed for all links within the County and also areas covering large developments that are external to Surrey. By comparing each scenario with their relevant reference it is possible to visualise the increases/decreases in traffic flows on individual links at a County scale.
- 5.5.2 Where bandwidths are coloured blue, this indicates an increase in flow whereas links coloured red represent a decrease in flow between the two scenarios being compared. The width of the bands displayed for each link is proportional to the increase/decrease in flow.

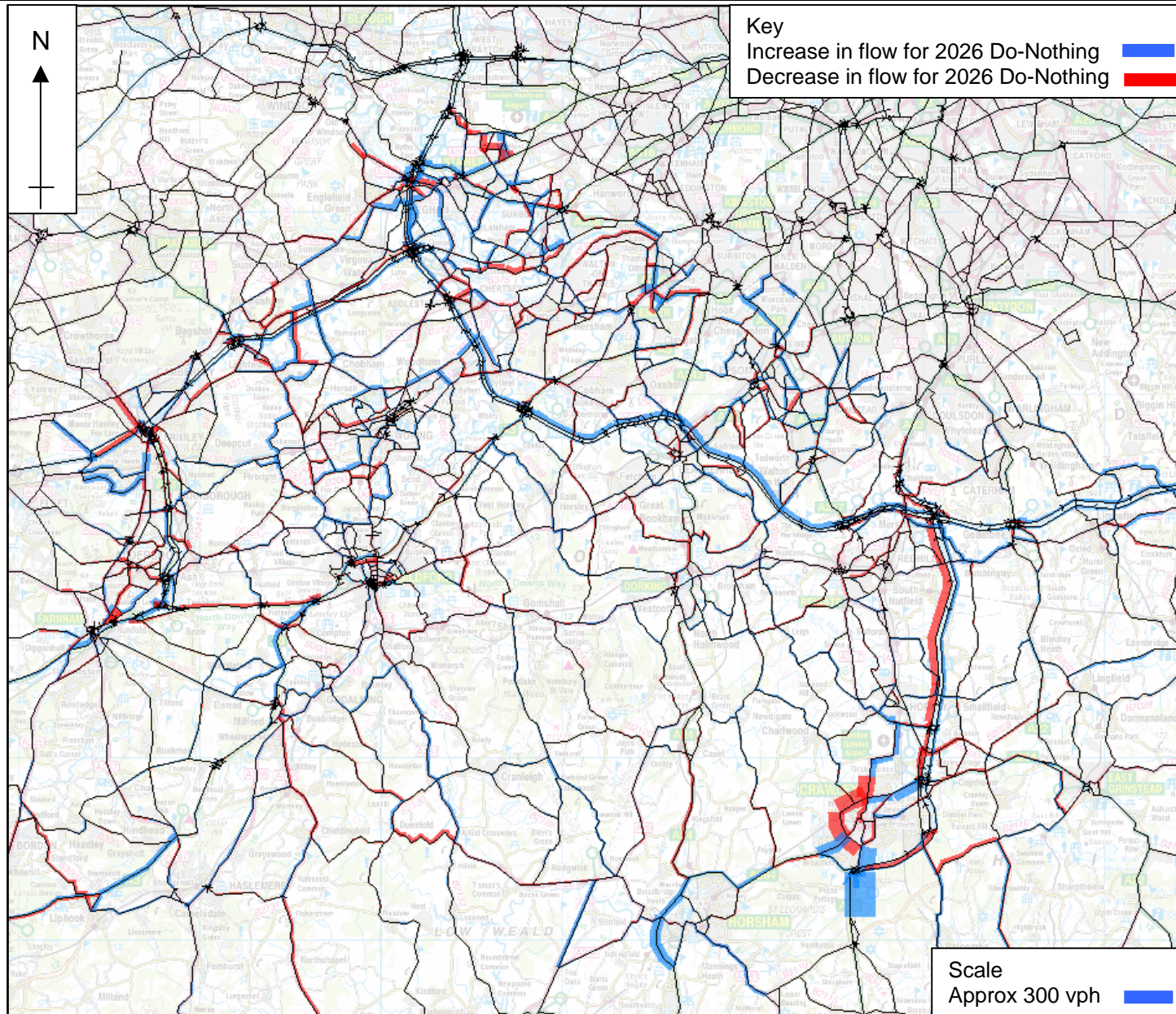


Figure 5.10: 2026 Do-Nothing less the 2011 base flow (results in the increases/decreases in flow between 2011 and 2026 Do-Nothing being displayed)

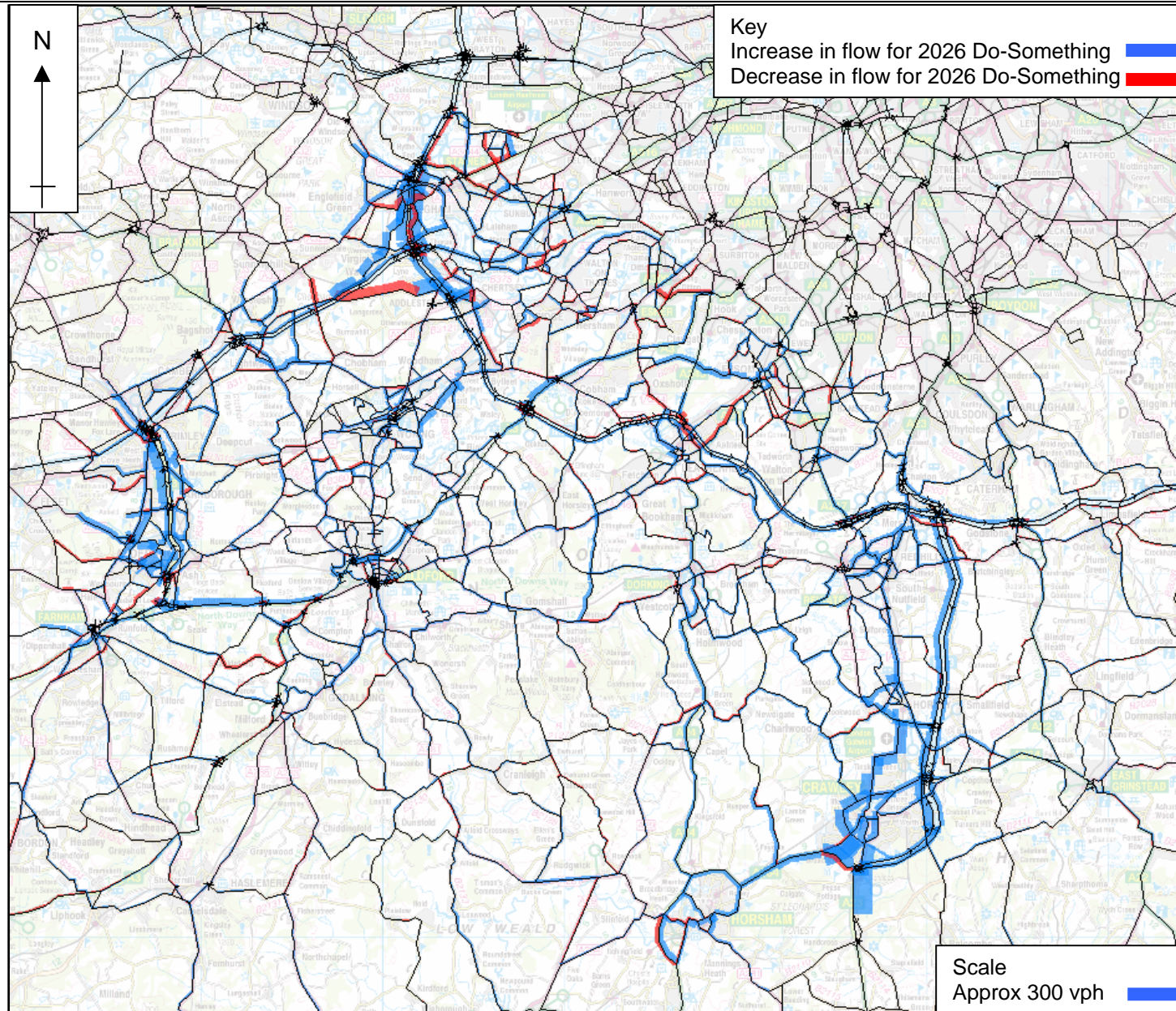


Figure 5.11: 2026 Do-Something less the 2026 Do-Nothing flow (results in the increases/decreases in flow between 2026 Do-Nothing and 2026 Do-Something being displayed)



- 5.5.3 *Figure 5.10* shows a visual display of the increases/decreases in flow between the 2011 base and 2026 Do-Nothing. Therefore this growth only relates to traffic growth outside of the study area of this assessment.
- 5.5.4 *Figure 5.10* indicates that the largest projected increases in flow on the SRN in relation to the study area are:
- M25 junction 10 to 8 (anti-clockwise);
  - M25 junctions 13 to 12 (anti-clockwise);
  - M23 junctions 8 to 10 (southbound).
- 5.5.5 Other areas projected to incur relative increases in flow in the 2026 Do-Nothing are external to the County, such as:
- A23 southbound at Crawley;
  - A24 northbound and southbound at Horsham;
  - A327 northbound and southbound at Fleet.
- 5.5.6 *Figure 5.11* is a bandwidth plot displaying the increases/decreases in flow between the 2026 Do-Nothing and 2026 Do-Something. The majority of links within the study area experience an increase in flow when a comparison is made to the 2026 Do-Nothing. In relation to the SRN the M25 (within Surrey) in general experiences small changes in flow, although the largest increases being in both the clockwise anti-clockwise directions between junctions 11 and 13. All other parts of the SRN in the County also experience an increase in flow, with the largest of these being:
- M23 junction 10 to 8 (northbound);
  - A3 between M25 Wisley Interchange and Painshill (northbound).
- 5.5.7 With relation to the LRN there are several locations that appear to be prominent within *Figure 5.11* (difference in flow between the 2026 Do-Nothing and 2026 Do-Something):
- A331 Blackwater Valley Route (BVR) (northbound);
  - A31 Hogs Back between A331 and Puttenham (eastbound);
  - Chobham Ln, Trumps Green Rd and Stroude Rd (northbound).
- 5.5.8 Areas outside of the County that are projected to experience increases in flow in the 2026 Do-Something are:
- West of the BVR, specifically Aldershot and the A323 (Hampshire);
  - Cluster of links surrounding Gatwick and Crawley, specifically the A23 southbound (West Sussex).
- 5.5.9 Two links within the County that are noticeable in *Figure 5.11*, and displaying large bandwidths of increased flow, are the B386 Holloway Hill and Green Lane travelling northbound. Both of these links are located in close proximity to each other and form a corridor crossing the M25 at junction 11.
- 5.5.10 *Table 5.9* shows a borough/district proportional breakdown of links within the County, that fall within the top 100 and top 20 of all links to incur largest increases in flow between the 2026 Do-Nothing and 2026 Do-Something.
- 5.5.11 *Table 5.9* indicates that when examining increases in flow, in isolation, the borough of Runnymede contains the largest proportion of links within the top 100 and 20 largest increases in flow in the 2026 Do-Something. When ranking links based on largest increases in flow and congestion (VCR), the borough of Runnymede also contains the largest proportion of higher ranked links in the top 100 ranked links (see *Table 5.7*).

|                    | Total No. of Links | % of Total Links | Top 100 links to incur largest increase in flow | % of top 100 links to incur largest increase in flow | Top 20 links to incur largest increase in flow | % of top 20 links to incur largest increase in flow |
|--------------------|--------------------|------------------|---|--|--|---|
| Elmbridge          | 349                | 7%               | 3   | 3%   | 0  | 0%  |
| Epsom & Ewell      | 228                | 5%               | 0   | 0%   | 0  | 0%  |
| Guildford          | 893                | <b>19%</b>       | 13  | 13%  | 0  | 0%  |
| Mole Valley        | 490                | 10%              | 0   | 0%   | 0  | 0%  |
| Reigate & Banstead | 528                | 11%              | 13  | 13%  | 2  | 10%   |
| Runnymede          | 277                | 6%               | 34  | <b>34%</b>   | 12   | <b>60%</b>  |
| Spelthorne         | 339                | 7%               | 11  | 11%  | 2  | 10%   |
| Surrey Heath       | 332                | 7%               | 11  | 11%  | 2  | 10%   |
| Tandridge          | 320                | 7%               | 2   | 2%   | 0  | 0%  |
| Waverley           | 507                | 11%              | 1   | 1%   | 0  | 0%  |
| Woking             | 440                | 9%               | 12  | 12%  | 2  | 10%   |
| <b>Total</b>       | <b>4703</b>        | <b>100%</b>      | <b>100</b>                                      | <b>100%</b>  | <b>20</b>                                      | <b>100%</b>   |

Table 5.9: Borough/district breakdown of largest increases in flow between 2026 Do-Nothing and 2026 Do-Something

5.5.12 *Table 5.10* lists the twenty links in the County that are expected to experience the largest absolute increases in flow between the 2026 Do-Nothing and 2026 Do-Something. The link that is to incur the largest increase in flow in the 2026 Do-Something is the B386 Holloway Hill in Runnymede, with an increase of 442 vehicles (a 24% increase).

5.5.13 Out of the twenty links displayed in *Table 5.10* the A245 Old Woking Road (ranked 5<sup>th</sup> and 10<sup>th</sup>) and Horley Road (ranked 13<sup>th</sup>) are the links that incur the largest proportional increase in flow, 51%, 41% and 41% respectively.

5.5.14 A number of links occurring in the twenty largest increases in flow (*Table 5.10*) also appear in the top twenty ranked links based on increases in flow and VCR (*Table 5.8*). Such links that occur in both top twenty lists of links are:

- A245 Old Woking Rd (Woking);
- Trumps Green Rd (Runnymede);
- Chobham Ln (Runnymede);
- Stroude Rd (Runnymede);
- Horley Rd (Reigate & Banstead);
- B386 Holloway Hill (Runnymede);
- Green Ln (Runnymede).

5.5.15 *Figures 5.12* and *5.13* show the geographic locations of the twenty links in that are displayed in *Table 5.10*.

5.5.16 *Figures 5.12* and *5.13* indicate that the majority of the twenty links in *Table 5.10* are located in boroughs to the northeast of the County. Second to this, the following corridors of increased flow are apparent:

- M25 junctions 12 – 13 (clockwise and anti-clockwise);
- Chobham Ln / Trumps Green Rd / Stroude Rd (northbound);
- B386 Holloway Hill / Green Ln (eastbound);
- A245 Old Woking Rd / B382 Old Woking Rd (westbound);
- A331 BVR between A3011 Lynchford Rd junction and M3 junction 4 (northbound).

| Link No. | Link Dir | Road                                       | District           | Capacity | Flow (All Vehicles) |                   | Absolute difference 2026 DS less 2026 DN | Percentage difference 2026 DS less 2026 DN | Rank |
|----------|----------|--|--------------------|----------|---------------------|-------------------|--|--|------|
|          |          |  |                    |          | 2026 Do-Nothing     | 2026 Do-Something |  |  |      |
| 16753    | 2 (E)    | B386 Holloway Hill                         | Runnymede          | 1,700    | 1,848               | 2,290             | 442                                      | 24%  | 1    |
| 10738    | 2 (S)    | M25 J12 - 11                               | Runnymede          | 5,700    | 2,781               | 3,167             | 386                                      | 14%  | 2    |
| 16684    | 2 (S)    | M25 J13 - 12                               | Runnymede          | 9,500    | 4,259               | 4,604             | 345                                      | 8%   | 3    |
| 10740    | 2 (N)    | M25 J12 Slip On N'bound                    | Runnymede          | 3,800    | 2,597               | 2,938             | 341                                      | 13%  | 4    |
| 10685    | 1 (W)    | A245 Old Woking Rd                         | Woking             | 1,200    | 670                 | 1,010             | 340                                      | 51%  | 5    |
| 16652    | 1 (N)    | M25 J12 - 13                               | Runnymede          | 9,500    | 7,973               | 8,298             | 325                                      | 4%   | 6    |
| 16870    | 1 (E)    | Trumps Green Road                          | Runnymede          | 1,200    | 781                 | 1,092             | 311                                      | 40%  | 7    |
| 12165    | 2 (N)    | A331 BVR                                   | Surrey Heath       | 3,500    | 3,022               | 3,326             | 304                                      | 10%  | 8    |
| 16853    | 1 (E)    | M25 J13 (part of gyratory)                 | Spelthorne         | 9,500    | 3,384               | 3,670             | 285                                      | 8%   | 9    |
| 10688    | 1 (W)    | A245 Old Woking Rd                         | Woking             | 1,200    | 681                 | 957               | 276                                      | 41%  | 10   |
| 1100     | 1 (E)    | A23 Brighton Rd                            | Reigate & Banstead | 3,500    | 1,036               | 1,310             | 274                                      | 26%  | 11   |
| 12164    | 2 (N)    | A331 BVR                                   | Surrey Heath       | 3,500    | 1,347               | 1,612             | 264                                      | 20%  | 12   |
| 15684    | 2 (E)    | Horley Road                                | Reigate & Banstead | 800      | 633                 | 896               | 262                                      | 41%  | 13   |
| 16749    | 2 (E)    | Chobham Lane                               | Runnymede          | 1,200    | 718                 | 979               | 261                                      | 36%  | 14   |
| 16855    | 1 (S)    | M25 J13 (part of gyratory)                 | Spelthorne         | 9,500    | 4,000               | 4,254             | 254                                      | 6%   | 15   |
| 10742    | 2 (N)    | M25 J12 Slip On N'bound                    | Runnymede          | 3,800    | 2,175               | 2,421             | 247                                      | 11%  | 16   |
| 12166    | 2 (N)    | A331 BVR                                   | Surrey Heath       | 3,500    | 2,834               | 3,069             | 235                                      | 8%   | 17   |
| 17179    | 1 (W)    | A331 BVR (part of gyratory south of M3 J4) | Surrey Heath       | 3,500    | 2,577               | 2,811             | 234                                      | 9%   | 18   |
| 15914    | 1 (E)    | Green Ln                                   | Runnymede          | 1,200    | 914                 | 1,146             | 232                                      | 25%  | 19   |
| 16392    | 1 (N)    | Stroude Rd                                 | Runnymede          | 1,700    | 278                 | 502               | 224                                      | 81%  | 20   |

Table 5.10: Twenty links in the County that are forecast to incur the largest increases in flow between the 2026 Do-Nothing and 2026 Do-Something

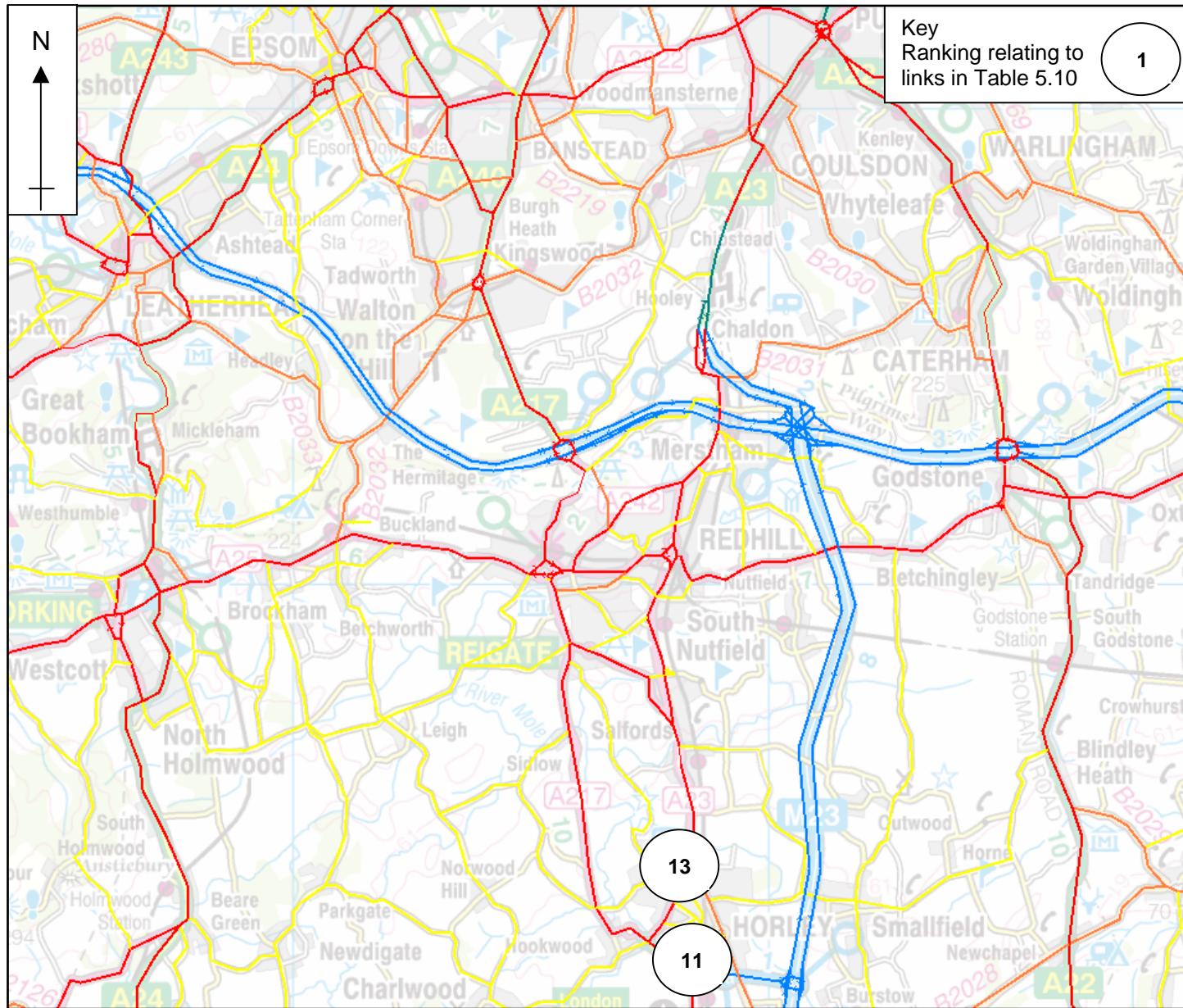


Figure 5.13: Location of links ranked in top 20, to incur largest increases in flow and VCR between 2026 Do-Nothing and 2026 Do-Something, east of the County

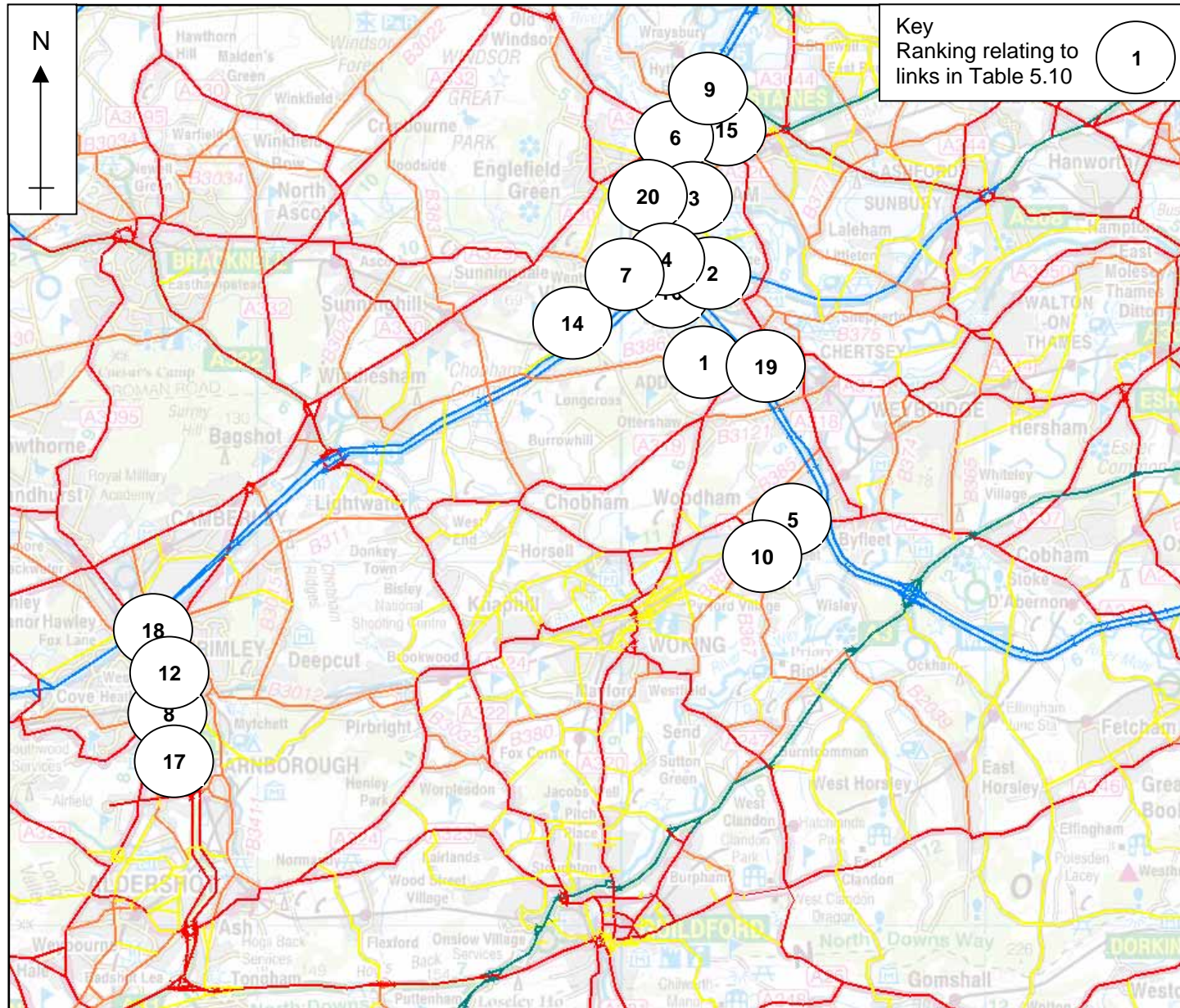


Figure 5.12: Location of links ranked in top 20, to incur largest increases in flow and VCR between 2026 Do-Nothing and 2026 Do-Something, west of the County

## 5.6 Merge and Diverge Assessment of the SRN

- 5.6.1 A form of highway capacity assessment was undertaken on the merge and diverge junctions of the M25 junctions 10 and 11.
- 5.6.2 The assessment utilised the guidelines in the Design Manual for Roads and Bridges (DMRB) using observed flows for 2010 and the modelled flows for the 2011 base, 2026 Do-Nothing and 2026 Do-Something.
- 5.6.3 The DMRB Volume 6 (Road Geometry) Section 2 (Junctions) was used in conjunction with the mainline and merge and diverge flows of the M25 junctions 10 and 11, to determine the junction layout that is required for each scenario.
- 5.6.4 It was thought appropriate to also assess the junction layouts for 2010 using observed flows. Therefore observed flows for 2010 were obtained from the Highways Agency's (HA) Traffic Database System (TRADS) for the average weekday (Monday to Friday) in the month of September (where possible), for the 0800 – 0900 time period. It is important to note that the flows were extracted for the on and off slips of junctions 10 and 11, as well as the initial mainline (junctions 9 to 10 and 12 to 11). Flows for the other sections of the carriageways were calculated using these flows, allowing consistent flows downstream. The 2010 flows that were extracted from TRADS, rounded to nearest fifty vehicles.
- 5.6.5 *Table 5.11* displays the type of merge/diverge junction layouts that have been determined for the M25 junctions 10 and 11, according to the flows and DMRB guidelines. All junction layouts were identified with reference to the merge/diverge graphs and junction diagrams shown in the DMRB (see *Appendix D*). The existing layout was obtained by use of aerial photographs, whilst the 2010 layouts were determined by use of the observed flows from TRADS. 2011, 2026 Do-Nothing and 2026 Do-Something flows were extracted from the SINTRAM model.
- 5.6.6 The key for *Table 5.11* is as follows:
- C1 = Diverge, lane drop at taper diverge;
  - D2 = Diverge, lane drop at parallel diverge;
  - E1 = Merge, lane gain;
  - F1 = Merge, lane gain with ghost island merge (nearside lane of merge is lane gain);
  - F2 = Merge, lane gain with ghost island merge (offside lane of merge is lane gain).

| Road                    | Merge / Diverge | Existing Layout | 2010 Proposed Layout | 2011 Proposed Layout | 2026 DN Proposed Layout | 2026 DS Proposed Layout | Comment           |
|-------------------------|-----------------|-----------------|----------------------|----------------------|-------------------------|-------------------------|-------------------|
| M25 J10 Slip Off Nbound | Diverge         | D,2             | D,2                  | D,2                  | D,2                     | D,2                     | Constant          |
| M25 J10 Slip On Nbound  | Merge           | F,1             | F,2                  | F,2                  | F,2                     | F,2                     | Capacity Required |
| M25 J10 Slip Off Sbound | Diverge         | D,2             | D,2                  | D,2                  | C,1                     | C,1                     | Spare Capacity    |
| M25 J10 Slip On Sbound  | Merge           | F,2             | F,2                  | F,2                  | E,1                     | E,1                     | Spare Capacity    |
| M25 J11 Slip Off Nbound | Diverge         | D,2             | C,1                  | C,1                  | D,2                     | D,2                     | Constant          |
| M25 J11 Slip On Nbound  | Merge           | F,2             | F,2                  | F,2                  | F,2                     | F,2                     | Constant          |
| M25 J11 Slip Off Sbound | Diverge         | D,2             | D,2                  | D,2                  | D,2                     | D,2                     | Constant          |
| M25 J11 Slip On Sbound  | Merge           | F,1             | E,1                  | F,2                  | F,2                     | F,2                     | Capacity Required |

Table 5.11: M25 junctions 10 and 11 assessment of merge/diverge layouts

5.6.7 See *Appendix E* for diagrammatic interpretations of details shown in *Table 5.11*.



- 5.6.8 *Table 5.11* indicates whether the junctions have spare capacity, require additional capacity or the capacity requirements remain constant. These provisional statements are based on the differences between the existing layout and the 2026 Do-Something proposed layout.
- 5.6.9 *Table 5.11* indicates that the majority of the merges/diverges of the M25 junctions 10 and 11 do not require any additional capacity based on the flows and DRMB guidance. However, two merges are suggesting an increase in additional capacity in the 2026 Do-Something (based on the modelled flows of this assessment), specifically junction 10 slip on northbound and junction 11 slip off southbound. However, the merge requirements for both of these on slip junctions remain constant between the modelled 2011 base and 2026 Do-Something, with a suggested merge layout of a lane gain with a ghost island merge, (offside lane of the merge being the lane gain) (category F,2).
- 5.6.10 *Table 5.12* shows the flows for all sections of the M25 between junctions 10 and 11 and these are the flows that were utilised for the junction layout assessment of the merges and diverges. VCR values are also displayed, cells coloured green have a VCR value equal to or greater than 0.85.
- 5.6.11 *Table 5.12* indicates that the variation in flows on the specified sections of the SRN is minimal between the 2011 and 2026 Do-Something, as the largest change in flow is 178 vehicles between junctions 12 and 11 (southbound). The VCR values for all links in *Table 5.12* are below a value of 1, although a number of links encounter a VCR value above 0.85 (suggesting levels of congestion have been reached), specifically in a northbound direction between junctions 10 and 11.
- 5.6.12 In general both *Tables 5.11* and *5.12* indicate that, generally, there is not a need to increase capacity at the merges and diverges of junctions 10 and 11 of the M25, to accommodate traffic generated from the committed and non-committed planned development, and additional Great Britain growth outside Surrey to the forecast year of 2026.

| Road                                     | Flows (Car + LGV +HGV) |               |                  |                  | VCR  |         |         | Absolute Difference in Flow |                   |                      | Absolute Difference in VCR |                      |
|--|------------------------|---------------|------------------|------------------|------|---------|---------|-----------------------------|-------------------|----------------------|----------------------------|----------------------|
|  | 2010 Observed          | 2011 Modelled | 2026 DN Modelled | 2026 DS Modelled | 2011 | 2026 DN | 2026 DS | 2011 less 2010              | 2026 DN less 2011 | 2026 DS less 2026 DN | 2026 DN less 2011          | 2026 DS less 2026 DN |
| M25 J9 - 10 (Nbound)                     | 5,250                  | 7,314         | 7,339            | 7,412            | 0.96 | 0.97    | 0.98    | 2,064                       | 25                | 73                   | 0.01                       | 0.01                 |
| M25 J10 Slip Off Nbound                  | 1,500                  | 2,382         | 2,406            | 2,340            | 0.63 | 0.63    | 0.62    | 882                         | 24                | -66                  | 0.00                       | -0.01                |
| M25 J10 Mainline through junction Nbound | 3,750                  | 4,932         | 4,933            | 5,072            | 0.87 | 0.87    | 0.89    | 1,182                       | 1                 | 139                  | 0.00                       | 0.02                 |
| M25 J10 Slip On Nbound                   | 2,400                  | 2,297         | 2,334            | 2,265            | 0.60 | 0.61    | 0.60    | -103                        | 37                | -69                  | 0.01                       | -0.01                |
| M25 J10 - 11 (Nbound)                    | 6,150                  | 7,229         | 7,268            | 7,337            | 0.95 | 0.96    | 0.97    | 1,079                       | 39                | 69                   | 0.01                       | 0.01                 |
| M25 J11 Slip Off Nbound                  | 1,100                  | 1,687         | 1,753            | 1,777            | 0.44 | 0.46    | 0.47    | 587                         | 66                | 24                   | 0.02                       | 0.01                 |
| M25 J11 Mainline through junction Nbound | 5,050                  | 5,542         | 5,515            | 5,560            | 0.97 | 0.97    | 0.98    | 492                         | -27               | 45                   | 0.00                       | 0.01                 |
| M25 J11 Slip On Nbound                   | 1,700                  | 1,350         | 1,426            | 1,537            | 0.36 | 0.38    | 0.40    | -350                        | 76                | 111                  | 0.02                       | 0.02                 |
| M25 J11 - 12 (Nbound)                    | 6,750                  | 6,892         | 6,940            | 7,097            | 0.91 | 0.91    | 0.93    | 142                         | 48                | 157                  | 0.00                       | 0.02                 |
| M25 J12 - 11 (Sbound)                    | 7,000                  | 5,798         | 5,871            | 6,049            | 0.76 | 0.77    | 0.80    | -1,202                      | 73                | 178                  | 0.01                       | 0.03                 |
| M25 J11 Slip Off Sbound                  | 1,800                  | 1,302         | 1,336            | 1,484            | 0.34 | 0.35    | 0.39    | -498                        | 34                | 148                  | 0.01                       | 0.04                 |
| M25 J11 Mainline through junction Sbound | 5,200                  | 4,495         | 4,535            | 4,566            | 0.79 | 0.80    | 0.80    | -705                        | 40                | 31                   | 0.01                       | 0.00                 |
| M25 J11 Slip On Sbound                   | 900                    | 1,509         | 1,569            | 1,567            | 0.40 | 0.41    | 0.41    | 609                         | 60                | -2                   | 0.01                       | 0.00                 |
| M25 J11 - 10 (Sbound)                    | 6,100                  | 6,005         | 6,104            | 6,132            | 0.79 | 0.80    | 0.81    | -95                         | 99                | 28                   | 0.01                       | 0.01                 |
| M25 J10 Slip Off Sbound                  | 2,200                  | 991           | 990              | 1,059            | 0.26 | 0.26    | 0.28    | -1,209                      | -1                | 69                   | 0.00                       | 0.02                 |
| M25 J11 Mainline though junction Sbound  | 3,900                  | 5,013         | 5,114            | 5,073            | 0.88 | 0.90    | 0.89    | 1,113                       | 101               | -41                  | 0.02                       | -0.01                |
| M25 J11 Slip On Sbound                   | 1,400                  | 1,276         | 1,325            | 1,329            | 0.34 | 0.35    | 0.35    | -124                        | 49                | 4                    | 0.01                       | 0.00                 |
| M25 J10 - 9 (Sbound)                     | 5,300                  | 6,289         | 6,439            | 6,403            | 0.83 | 0.85    | 0.84    | 989                         | 150               | -36                  | 0.02                       | -0.01                |

Table 5.12: Flows and VCR values for the M25 between junctions 10 and 11

## **6 CONCLUSION**

### **6.1 Context**

6.1.1 This 'Cumulative Assessment of Future Development Impacts on the Highway Network' study was undertaken to consider the cumulative impacts of all known future development within Surrey, as well as large developments located externally to the County, with respect to highway capacity, to the likely additional traffic generated by committed and non-committed planned residential and commercial development, as proposed in the emerging Core Strategies of the Local Development Frameworks for the borough and districts in and around Surrey.

6.1.2 The main aims of the cumulative transport assessment were to:

- Evaluate the highway capacity impacts of the cumulative county-wide strategic development within Surrey and large developments external to Surrey;
- Assist in assessing the sensitivity of both the Strategic Route Network (SRN) and Local Road Network (LRN), including classified A and B roads to satisfy the Highways Agency (HA) responsible for the SRN, and Surrey County Council (SCC) the designated highway authority for the LRN, on the ability of the highway network to cope with the predicted future traffic demand;
- Assist in identifying specific locations which may require additional infrastructure provision for transport services;
- And contribute towards the development and adoption of a costed strategic infrastructure schedule at a county-wide level.

6.1.3 The main objectives of the cumulative transport assessment were to:

- Identify the amounts and locations of additional commercial and residential development in Surrey and the large developments external to the County;
- Calculate the distribution of vehicle trips resulting from the additional development;
- Forecast the traffic impacts of individual developments on the SRN and LRN;
- Act as a starting point for identifying locations which may either require additional infrastructure provision for transport services or further study to identify appropriate mitigation measures;
- Report the likely highway capacity impacts on both SRN and LRN.

6.1.4 The main benefit of this approach was to ensure that any strategic infrastructure requirements identified could be used to support the districts and boroughs needs to produce local Infrastructure Delivery Plans (IDP) using a common and consistent strategic evidence base. This evidence base could also be used to support future bids for Central Government funding for transport infrastructure and services.

6.1.5 2026 trip generation forecasts for the boroughs/districts in Surrey and developments external to the County were derived from combining planning data (sourced from the borough/districts where possible) and the TRICS database. TEMPRO forecasts were utilised for borough/districts and external developments where planning data was absent. 2026 trip generation was then used to

generate forecast matrices for the scenarios. An assumption was made in the trip generation process that all trips prior to 2011 are committed by planning permission and all trips post 2011 are non-committed planned estimates.

- 6.1.6 The modelling of the forecast scenarios enabled broad comparisons to be made between the base and forecast years. The main focus of this report has been the estimated impacts between the 2011 base year (consisting of committed development only), the 2026 Do-Nothing (no development growth in the study area but rest of Country grows to 2026) and the 2026 Do-Something (based on 2026 Do-Nothing but 2011 to 2026 non-committed planned development is added to the study area).
- 6.1.7 Analysis of the available planning data suggests that in the 2026 Do-Something scenario the modelled zone in Surrey to incur the largest amount of estimated additional departure trips is zone 379 Ottershaw (Runnymede) with a projected increase of 758 departure trips. Whereas zone 383 Addlestone Moor (Runnymede) is projected to gain the largest amount of estimated additional arrival trips, 282 trips. Explanation as to why zone 379 Ottershaw is estimated to incur the largest amount of departure trips is related to the redevelopment of the former Defence Evaluation and Research Agency (DERA) site, that is located in close proximity to the zone in Runnymede. Modelled zones in the borough of Reigate and Banstead are predicted to incur the largest proportion of additional trips in the 2026 Do-Something, compared to all other Surrey borough/districts.
- 6.1.8 The main outcomes of this cumulative assessment are based on aggregations of modelled outputs from network summary statistics including vehicle kilometrage, travel times and average speeds and the relationships between them. Detailed analysis has been undertaken on the SRN by comparing journey times. Known congestion 'bottlenecks' have been assessed by comparing current cost of congestion data against volume capacity ratio plots. Traffic flow and congestion impacts between scenarios have been ranked for both the SRN and LRN and finally a highway capacity assessment has been undertaken on several motorway merges and diverges.

## **6.2 Traffic Impacts on the SRN in Surrey**

- 6.2.1 In the 2026 Do-Nothing the motorway links experience the largest absolute increase in vehicle kilometres when compared to the 2011 base, (an increase of 7,933 veh kms / 0.7% increase). As a result, the motorway links also experience the largest absolute increase in vehicle hours (an increase of 476 veh hrs / 2.5% increase) and largest decrease in average speed (a decrease of 1.10 kph / 1.7% decrease) in the 2026 Do-Nothing (compared to the 2011 base). It is to be expected that the motorway links incur the largest increases in traffic impacts in the 2026 Do-Nothing (compared to the 2011 base) as the increase in trip ends in the 2026 Do-Nothing occurred external to the study area, so only increase in flow in Surrey relates to long distance trips travelling through the County, which are likely to use the SRN.
- 6.2.2 The motorway and trunk A road links are not forecast to experience the largest increases in vehicle kilometres or vehicle hours in the 2026 Do-Something (compared to the 2026 Do-Nothing), this occurs on principal A roads. This suggests that as additional trips generated from the 2011 to 2026 non-committed planned development make greater use of the LRN in Surrey.

- 6.2.3 The increases in congestion and flow are relatively minor on the SRN in the 2026 Do-Nothing and 2026 Do-Something, as shown by the minimal increases in journey times. The journey times were assessed for the Surrey sections of the M25, M23, M3 and A3 for the 2011 base, 2026 Do-Nothing and 2026 Do-Something. The largest absolute increase in journey time on the Surrey SRN between the 2011 base and 2026 Do-Nothing is forecast to occur on the M25 between junctions 5 and 14 (clockwise), with an increase of 2 minutes 17 seconds (3.3% increase), with 1 minute 17 seconds of this increase occurring between junctions 5 and 6. Whereas the largest absolute increase in SRN journey time from comparisons between the 2026 Do-Nothing and 2026 Do-Something is on the M3 between junctions 4 and 1 (northbound), with an increase of 1 minute 32 seconds (3.6% increase). Of this 1 minute 32 second increase on the northbound section of the M3, 1 minute and 1 second of the increase is experienced between junctions 3 and 2.
- 6.2.4 In relation to largest increases in flow on the SRN, these occur in the 2026 Do-Something specifically on the M25 between junctions 11 and 13 (clockwise and anti-clockwise) and the M23 between junctions 10 and 8 (northbound). In relation to the M25, junction 12 to 11 (anti-clockwise) is ranked as the having the second largest absolute increase in flow between the 2026 Do-Nothing and 2026 Do-Something in the County, with an increase in flow of 386 vehicles (14% increase). Second to this, the M25 junction 13 to 12 (anti-clockwise) is forecast as having the third largest increase in flow (345 vehicles / 8% increase) and junction 12 to 13 (clockwise) is expected to incur the sixth largest increase in flow in the County (325 vehicles / 4% increase). In relation to this, the M25 junction 12 slip on northbound is forecast to incur an increase of flow of 247 vehicles (11% increase and ranked sixteenth largest increase in the County).
- 6.2.5 The sections of the SRN forecast to experience the highest values of congestion (VCR value ranging between 1 and 1.59) in the 2026 Do-Something are the M3 junctions 4 to 1 (northbound), the M25 junction 13 to 14 (clockwise) and the A3 between the Ripley and M25 Wisley Interchange junctions (northbound).
- 6.2.6 Sections of the SRN are forecast to incur traffic impacts related to the forecast additional development, however the impacts in relation to journey times and flows are not thought to be of such a significance to cause major disruption to the SRN network, under normal AM peak hour travelling conditions.

### **6.3 Traffic Impacts on the LRN of Surrey**

- 6.3.1 The category of roads forecast to experience the largest absolute increases in vehicle kilometres and vehicle hours in the 2026 Do-Something is the principal A road category. For example, the principal A roads in Surrey are estimated to experience an increase in vehicle kilometres of 28,947 veh kms (3.0% increase) relating to an increase in vehicle hours of 878 veh hrs (4.1% increase).
- 6.3.2 When observing the ranking of Surrey links based on the largest absolute increases in VCR and flow as well as the percentage increases in flow between the 2026 Do-Nothing and 2026 Do-Something, 18% of the top 10% of total links are in the borough of Reigate and Banstead, and 21% of the top 100 links are in the borough of Runnymede.
- 6.3.3 All links ranked in the top twenty of increased flow and VCR in the 2026 Do-Something, form part of the LRN in Surrey. From these top twenty links small

corridors of increased flow and VCR are apparent in the 2026 Do-Something, three of these being:

- Horley Rd/Mill Ln, westbound (Reigate and Banstead);
- Chobham Ln, Trumps Green Rd and Stroude Rd, eastbound/northbound (Runnymede);
- A245/B382 Old Woking Rd, westbound (Woking).

6.3.4 Many links with high ranking of increased flow and VCR are in the same location or in close proximity to the zones that are to experience the largest amount of additional trips in the 2026 Do-Something. Examples of this are zones 379 (Ottershaw) and zone 264 (Horley – Meath Green) are to experience the largest amount of additional departure trips in the 2026 Do-Something and the Chobham Lane, Stroude Green corridor as well as the Horley Rd/Mill Ln corridors are located near to these zones.

6.3.5 When considering the absolute increases in flow in isolation between the 2026 Do-Nothing and 2026 Do-Something for the LRN, the borough of Runnymede contains 34% links that are in the top 100 links to incur the largest increases in absolute flow, and Runnymede also contains 60% of links in the top 20.

6.3.6 The link forecast to experience the largest increase in absolute flow between the 2026 Do-Nothing and 2026 Do-Something (as a result of additional trips generated from non-committed planned development) is the B386 Holloway Hill eastbound (Runnymede), with an increase of 442 vehicles (a 24% increase).

6.3.7 The main areas/corridors of the LRN in the County to experience largest absolute increases in flow in the 2026 Do-Something are as follows:

- B386 Holloway Hill and Green Ln, eastbound (Runnymede);
- Chobham Rd, Trumps Green Rd and Stroude Ln, northbound (Runnymede);
- A245/B382 Old Woking Rd, southbound (Woking);
- A331 BVR (between A3011 Lynchford Rd and M3 junction 4 junctions), northbound (Surrey Heath).

## 6.4 Summary of Impacts

6.4.1 The main results for both the SRN and LRN are summarised in the table below. The table is based on the greatest changes in flow, density and speed between 2026 Do-Something and 2026 Do Nothing modelled scenarios.

6.4.2 The table highlights sections of both the SRN and LRN within Surrey that are sensitive to reasonably significant increases in traffic flow, exacerbating and prolonging existing levels of congestion, resulting in reduced levels of service and reduced journey time reliability during the am peak hour for local roads in and around urban areas and on the approaches and along the mainline of the SRN.

6.4.3 Corridors of increased flow and congestion have been identified in the 2026 Do-Something and the majority of these are located in the borough of Runnymede, and a reason for the generation of these corridors of increased flow is the proximity to the zones gaining the largest amount of additional trips (departures and arrivals).

6.4.4 As such levels of congestion and flow increase on the majority of LRN links in the County in the 2026 Do-Something, with localised areas experiencing increases in traffic impacts. However, the overall impact of these increases is relatively

insignificant as the proportional increases/decreases in vehicle kilometres, vehicle hours and average speeds are relatively minor. For example the largest proportional increase, at a County level, is a 4.9% increase in vehicle hours on B roads in the 2026 Do-Something, when compared to the 2026 Do-Nothing.

| Criteria                     | SRN   | LRN   |
|------------------------------|---|---|
| <b>Journey Time</b>          | <ul style="list-style-type: none"> <li>M3 Junction 4 to 1 (specifically Junction 3 to 2)</li> </ul>   | <ul style="list-style-type: none"> <li>A23 corridor</li> <li>A320 corridor</li> </ul>   |
| <b>Volume/Capacity Ratio</b> | <ul style="list-style-type: none"> <li>M25 Junctions 13 to 14</li> <li>M3 Junctions 4 to 1</li> <li>A3 from Ripley to M25 Wisley Interchange</li> </ul> | <ul style="list-style-type: none"> <li>Horley Rd/ Mill Ln, westbound (Reigate &amp; Banstead)</li> <li>Chobham Ln, Trumps Green Rd and Stroude Rd, northbound (Runnymede)</li> <li>A245/B382 Old Woking Rd, westbound (Woking)</li> </ul>   |
| <b>Difference in Flow</b>    | <ul style="list-style-type: none"> <li>M25 Junction 11 to 13</li> <li>M25 J13 to 11</li> <li>M23 J10 to 8</li> </ul>                                    | <ul style="list-style-type: none"> <li>B386 Holloway Hill, Green Ln, eastbound (Runnymede)</li> <li>Chobham Rd, Trumps Green Rd and Stroude Rd, northbound (Runnymede)</li> <li>A245/B382 Old Woking Rd, westbound (Woking)</li> <li>A331 Blackwater Valley Route, northbound (Surrey Heath)</li> </ul> |

Table 6.1: Summary of Impacts on the SRN and LRN

## 6.5 Conclusions

6.5.1 The analysis suggests that although major additional highway capacity infrastructure investment such as motorway widening, or local bypasses is not necessary to meet the demands of future development, other types of highway capital schemes in some urban areas, at key junctions and other sensitive locations **will** be required in order to promote and manage the additional demand due to the future development. These schemes will not necessarily create additional capacity but which will assist in managing or improving journey time reliability and levels of service by managing the impacts to ensure congestion - both delay and journey time reliability - does not deteriorate beyond current levels.

6.5.2 Given that providing additional capacity is no longer considered to be the best solution except in certain locations and for particular circumstances, a mix of solutions will be required involving a wide range of tools. This mix of solutions includes demand management, integrated land use & transport planning, network management, traffic management, freight & goods management and behavioural change. Many of these solutions are contained within Surrey's recently adopted Surrey Transport Plan (STP3) which include strategies and associated toolkits to provide adequate mitigation measures and assist in the formulation of robust Infrastructure Delivery Plans.

6.5.3 The results and analysis of this cumulative assessment of future development impacts in Surrey, have been presented and endorsed by the '**Surrey Infrastructure Project Board**' in July 2011.

## **6.6 Limitations of Study**

- 6.6.1 Given the strategic nature of the highway capacity assessment and modelling methodology used there are a number of limitations which need to be considered during the preparation and interpretation of the highway capacity impacts on both the SRN and LRN within this report which are set out below.
- 6.6.2 The results presented in this report are based on local planning estimates from the emerging Core Strategies of the boroughs and districts, which are all at different stages within the LDF process, and are based on estimates available as of February 2010, hence, any future changes to the size and distribution of housing and commercial provision may alter the impacts and interpretation of the analysis of this assessment.
- 6.6.3 The limitations of the planning estimates (such as the varying degrees of available planning data internally and external to Surrey and the uncertainty of the size, distribution and land-use of any future planned developments) the interpretation of the likely impacts on both the SRN and LRN within this assessment should be treated as broad strategic projections, and as such further work would be recommended, (including complementary analysis using appropriate modelling \ assessment tools), to further assist in the identification of additional infrastructure needs and other potential mitigation measures at a more local and detailed level.
- 6.6.4 The cumulative county-wide transport assessment assumes that all the committed and non-committed planned estimates of development would occur simultaneously and that any impacts described in this report do not account for any possible mitigation, demand management or infrastructure provision and effectively present a worse case situation.