The impact of each development scenario will only be felt in certain corridors, the corridors affected by each scenario are summarised in Table 72. It is notable that the A34 is affected by all modelled scenarios, as such the A34 is forecast to experience increased delays in relation to all development scenarios. It should also be noted that forecast increases in delay along the A4185 may appear significant when considered in isolation, in percentage terms, but these increases are relatively small and from a low base (Table 77 and Table 78).

The modelling of an additional 1,600 dwellings at South Abingdon is forecast to increase delay on the A34 under Scenario 4. But with addition of South Abingdon By-pass mitigation in Scenario 5, this is forecast to reduce delay on A34 compared to Scenario 4, but not compared to Scenario 1, 2 and 3 with lower levels of development. The modelling of the South Abingdon By-pass is forecast to reduce delays on the A415.

Table 72. Corridors influenced in each scenario

Scenario Number	Corridor
1	A34, A4185, A420
2	A34, A415, A4130, A4185, A420
3	A34, A4130,A4185, A420
4	A34, A415, A417, A4185, A420
5	A34, A417, A4185, A420

11.2. Scenario 1

11.2.1. Network Performance

The modelled highway network performance within the VOWH district for the Do-Minimum and the Scenario 1 are shown in the Table 73 and Table 74. These statistics give a high-level summary of how the model has responded to the changes in land use assumptions.

The trips generated by the 3,600 additional dwellings are forecast to increase delays, travel times and travel distances within the District during the morning and evening peak hours and has the effect of reducing average speed.

Table 73. Vale of White Horse District modelled network performance - morning peak hour 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 1 (C1)	% Difference (C1-DM)
Delay (pcu hr)	2147	2269	6%
Total Time (pcu hr)	11020	11282	2%
Total Distance (pcu km)	536607	543294	1%
Average Speed (km/h)	48.7	48.2	-1%

Table 74. Vale of White Horse District modelled network performance - evening peak 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 1 (C1)	% Difference (C1-DM)
Delay (pcu hr)	3131	3282	5%
Total Time (pcu hr)	12510	12824	3%
Total Distance (pcu km)	563210	570625	1%
Average Speed (km/h)	45.0	44.5	-1%

11.2.2. Flow Impacts

The forecast actual flow difference between Scenario 1 and Do-Minimum modelled across the District is shown in Figure 42 and Figure 43. For the purposes of the report, we focus on changes along the A34, A420 and A4185 corridors, but where relevant will provide commentary on forecast impacts on other links.

In the morning peak hour, the demand flow is forecast to increase in both directions along the A34 between the Milton interchange and Chilton and along the A4185 which is likely to be related to the 1,000 additional dwellings at Harwell Campus. The demand is also forecast to increase on the A34 northbound between Hinksey Hill and Botley and modelled to decrease Southbound towards Botley Interchange. The demand flow in the southbound direction is forecast to reduce by 100pcu between the Pear Tree Interchange and the Botley Interchange. This traffic is forecast to re-route along Godstow Road joining A34 again at Botley Interchange. The reduction in Southbound direction is in the range of 30 PCUs between Botley and Lodge Hill and 3 PCUs between Lodge Hill and Hinksey Hill which is very small in absolute numbers in terms of Strategic Modelling.

In the evening peak hour, the demand is forecast to increase along the A4185 in both directions in relation to the additional dwellings modelled at Harwell Campus. The demand is also forecast to increase between the Botley Interchange and Chilton Interchange along the A34 Southbound.

In both the morning and evening peak hours, there is forecast to be some small change in the demand flow along the A420 corridor in the vicinity of the proposed developments. The number of dwellings proposed in the vicinity of the A420 is 600, with trips per dwelling as 3.65, the trips generated by these dwellings during peak hour is around 165. In the morning peak these trips are forecast to load onto A420 with 110 trips eastbound and 50 trips westbound, when compared to the do-minimum scenario.

Figure 42 A34, A4185 corridor demand flow difference (PCU/hr) – 2031 AM peak hour

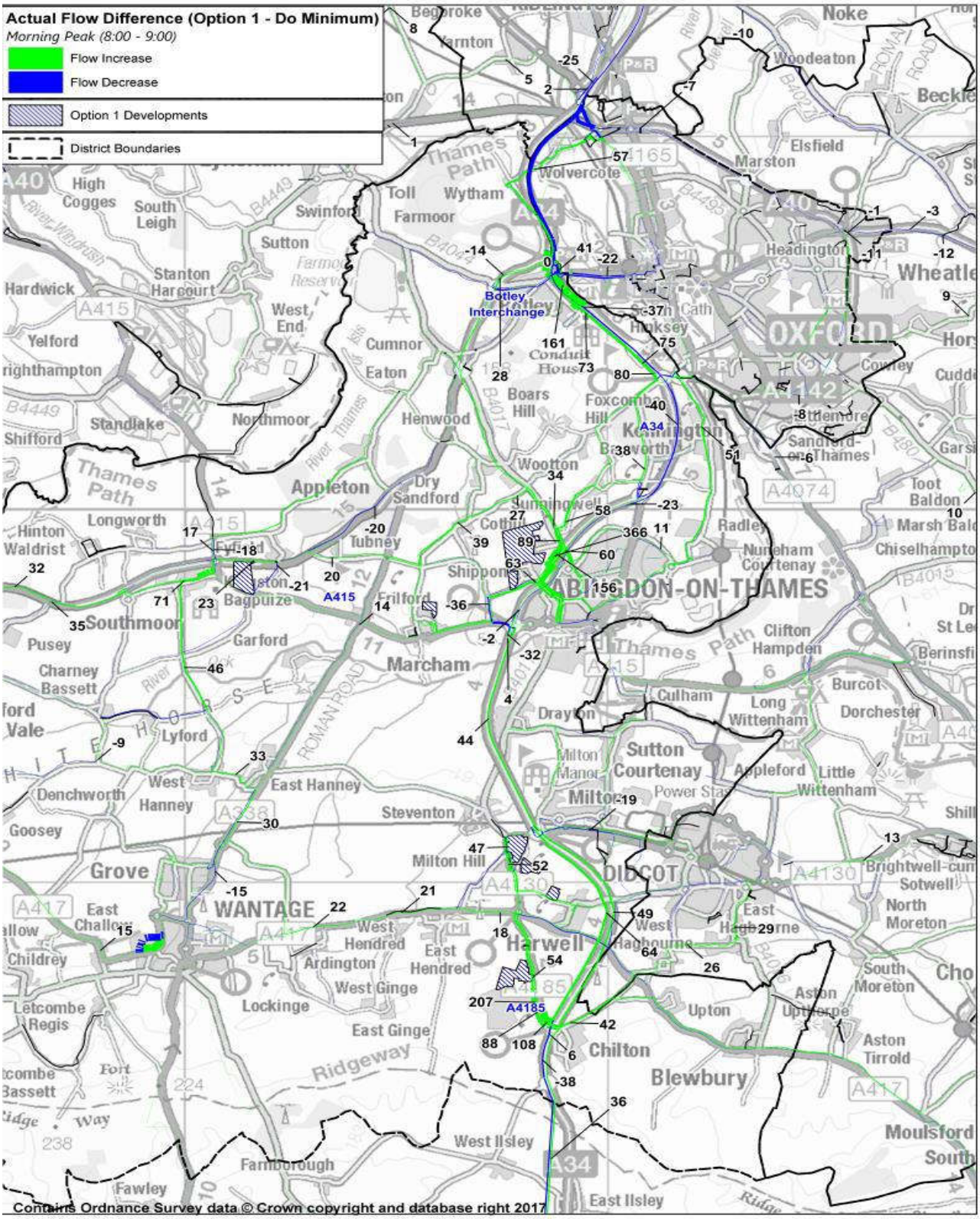
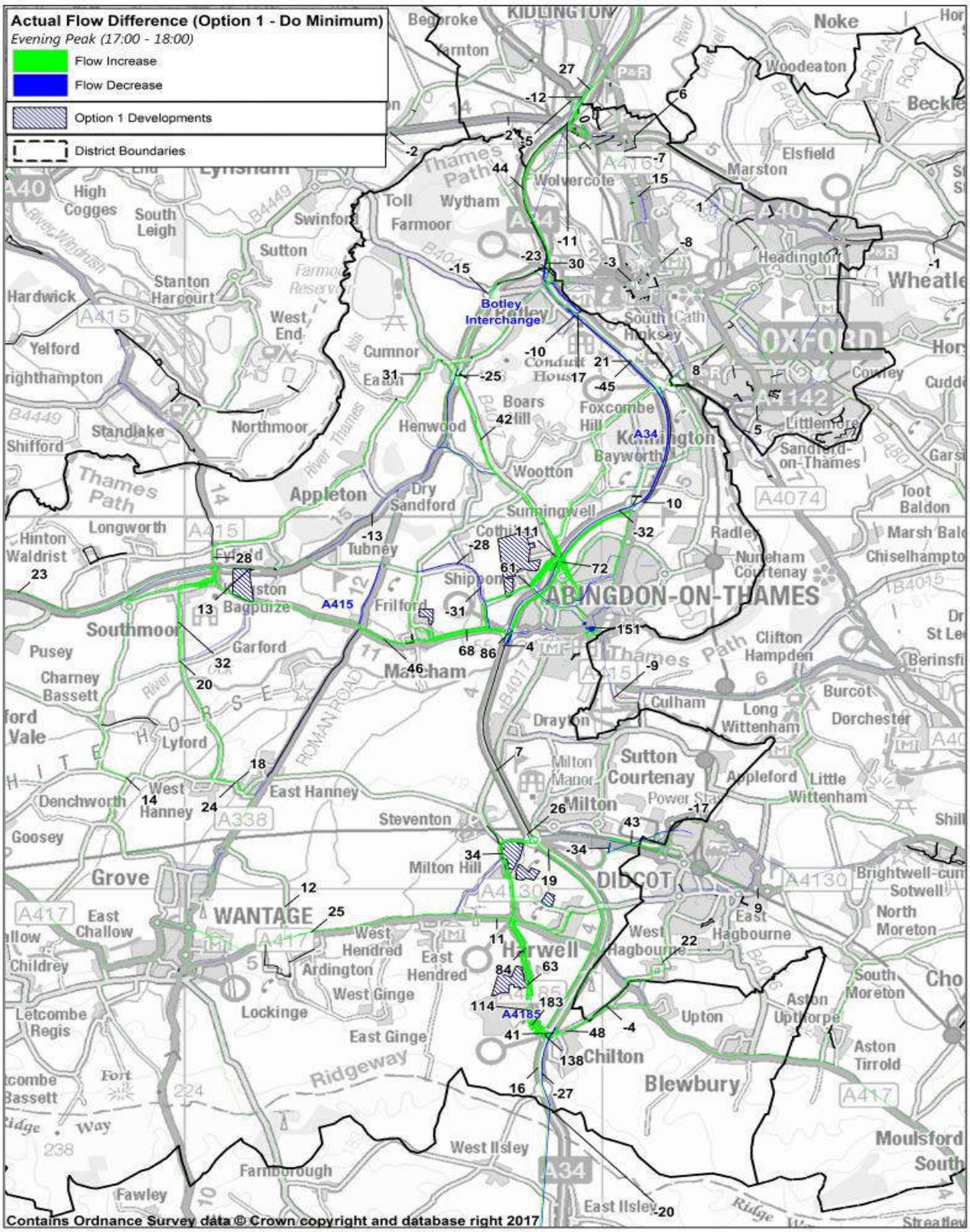


Figure 43 A34, A4185 corridor demand flow difference (PCU/hr) – 2031 PM peak hour



11.2.3. Capacity impacts

The forecast volume to capacity plots for Scenario 1 across the District are shown in Figure 44 and Figure 45.

In Scenario 1, the A34 is forecast to exceed capacity at the following approaches:

- In the morning peak hour, Botley Interchange, Hinksey Hill Interchange, A34 northbound between Hinksey Hill and Botley Interchange, both directions between Lodge Hill and Hinksey Hill, north and southbound between Marcham Road and B4017 and at the A4130 / A34 Interchange.
- In the evening peak hour, Botley Interchange, Hinksey Hill, the southbound between Botley Interchange and Milton Interchange, both directions between Marcham Road and B4017 and at the A4130 / A34 Interchange.

The A420 is modelled to exceed capacity at the following approaches:

- In the morning peak hour, the A420 northbound direction near Cumnor and the northbound direction at Fyfield.
- In the evening peak hour, the northbound and southbound directions at Fyfield and the southbound direction near Southmoor.

The A4185 is forecast to remain below capacity in both morning and evening peak hours. Additionally, the A338 northbound is modelled to experience delays between East Hanney and Frilford in both the morning and evening peak hours. In the evening peak the modelling suggests delays southbound on the A338 approaching Wantage.

Figure 44 A34, A4185 and A420 corridor V/C for links and junctions– 2031 Scenario 1 AM peak hour

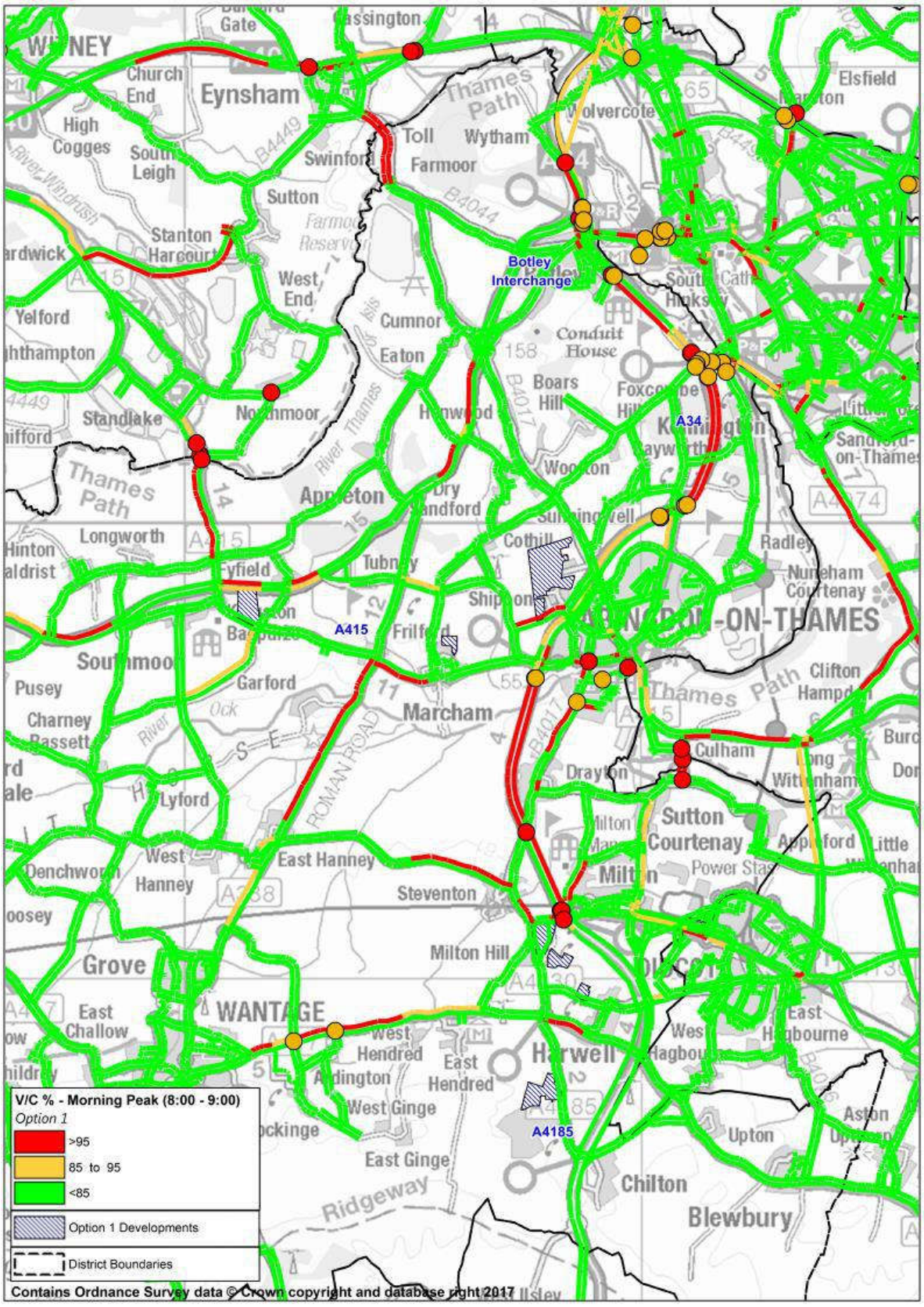
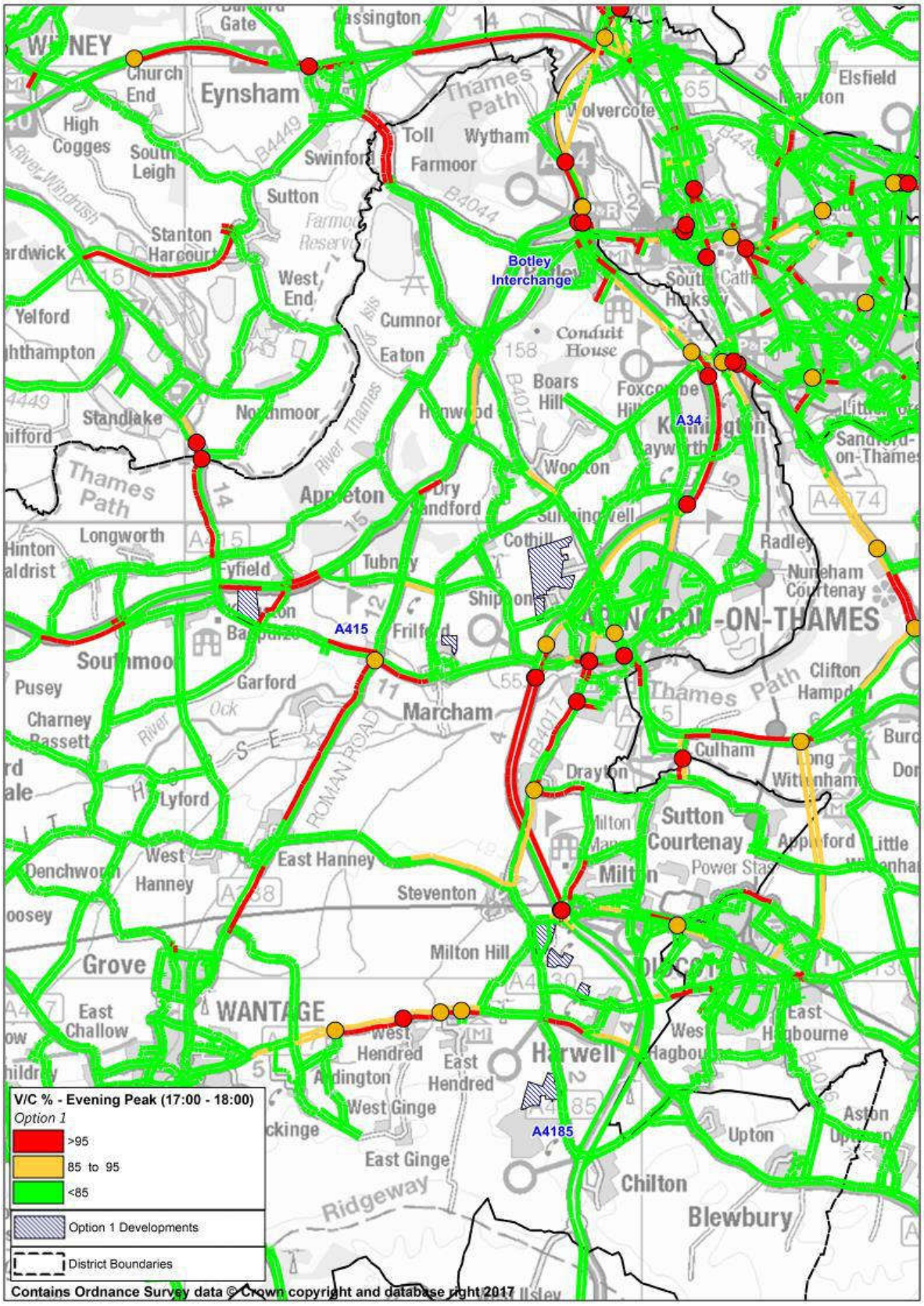


Figure 45 A34, A4185 and A420 corridor V/C for links and junctions– 2031 Scenario 1 PM peak hour


Eynsham
Botley Interchange
A34
A415
A4185
Marcham
Sutton Courtenay
Milton
Harwell
WANTAGE
Grove
Steventon
Milton Hill
East Hanney
West Hanney
Garford
Longworth
Appleton
Cumnor
Wytham
Farmoor
Swinford
Sutton
Stanton Harcourt
Standlake
Northmoor
Yelford
Eaton
Boars Hill
Wootton
Radley
Abingdon-on-Thames
Culham
Drayton
Clifton Hampden
Pusey
Charney Bassett
Denchworth
East Challow
West Hendred
East Hendred
West Ginge
East Ginge
Chilton
Upton
Blewbury
Ridgeway
Thames Path
River Thames
River Ock
ROMAN ROAD
V/C % - Evening Peak (17:00 - 18:00)
Option 1
>95
85 to 95
<85
Option 1 Developments
District Boundaries
Contains Ordnance Survey data © Crown copyright and database right 2017

11.2.4. Corridor Performance

Focusing the analysis on the corridors where delays are forecast to increase by more than 5%, the following corridors shall be discussed for Scenario 1 – A34, A4185 and A420.

11.2.4.1. A34 Corridor

The network performance for Scenario 1 along the A34 corridor is shown in Table 24 and Table 25 for the morning and evening peak hours respectively.

In both the morning and the evening peak hours the delay, total time and total distance are forecast to increase while the average speed is forecast to decrease. The new developments along this corridor are forecast to increase traffic flow on the A34 leading to a forecast increase in delay along the corridor.

Table 75. A34 Chilton – Botley Interchange corridor performance in the morning peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 1 (S1)	Difference (S1 - DM)
Delay (pcu hr)	641	689	8%
Total Time (pcu hr)	3011	3083	2%
Total Distance (pcu km)	191514	193146	1%
Average Speed (km/h)	64	63	-1%

Table 76. A34 Chilton – Botley Interchange corridor performance in the evening peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 1 (S1)	Difference (S1 - DM)
Delay (pcu hr)	809	891	10%
Total Time (pcu hr)	3165	3266	3%
Total Distance (pcu km)	192834	194279	1%
Average Speed (km/h)	61	60	-2%

11.2.4.2. A4185 Corridor

The modelled network performance for Scenario 1 along the A4185 corridor is shown in Table 77 and Table 78 for the morning and evening peak hours respectively.

In both morning and evening peaks, the increased level of demand generated by the new sites is forecast to result in increased delays, travel distance and total travel times while the average speed is forecast to decrease. The difference percentages presented look relatively high for delays and total time but the change in the actual numbers is small, as such the A4185 remains to be forecast as operating within capacity.

Table 77. A4185 corridor performance in the morning peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 1 (S1)	Difference (S1 - DM)
Delay (pcu hr)	8	9	12%
Total Time (pcu hr)	65	75	15%
Total Distance (pcu km)	3698	4093	11%
Average Speed (km/h)	57	55	-4%

Table 78. A4185 corridor performance in the evening peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 1 (S1)	Difference (S1 - DM)
Delay (pcu hr)	8	9	13%
Total Time (pcu hr)	60	71	18%
Total Distance (pcu km)	3560	4082	15%
Average Speed (km/h)	60	58	-3%

11.2.4.3. A420 Corridor

The network performance for Scenario 1 along the A420 corridor is shown in Table 79 and Table 80 for the morning and evening peak hours respectively.

In the morning peak hour, the performance of the A420 corridor is almost the same for both the Do Minimum scenario and Scenario 1 with no significant impact caused by the new sites.

In the evening peak hour, the additional dwellings result in an increase in delay, total travel time and total distance and a decrease in average speed.

Table 79. A420 corridor performance in the morning peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 1 (S1)	Difference (S1 - DM)
Delay (pcu hr)	210	210	0.0%
Total Time (pcu hr)	1461	1467	0.4%
Total Distance (pcu km)	83509	83843	0.4%
Average Speed (km/h)	57	57	0.0%

Table 80. A420 corridor performance in the evening peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 1 (S1)	Difference (S1 - DM)
Delay (pcu hr)	287	323	12.4%
Total Time (pcu hr)	1601	1648	2.9%
Total Distance (pcu km)	87705	88404	0.8%
Average Speed (km/h)	55	54	-2.0%

11.3. Scenario 2

11.3.1. Network Performance

The modelled highway network performance within the VOWH district for the Do-Minimum and the Scenario 2 are shown in the Table 81 and Table 82. These statistics give a high-level summary of how the model has responded to the changes in land use assumptions.

The trips generated by the 3,600 additional dwellings are forecast to increase delays, travel times and travel distances within the District during the morning and evening peak hours and this is forecast to have the effect of reducing average speed.

Table 81. Vale of White Horse District modelled network performance - morning peak hour 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 2 (S2)	% Difference (S2-DM)
Delay (pcu hr)	2147	2257	5%
Total Time (pcu hr)	11020	11266	2%
Total Distance (pcu km)	536607	542979	1%
Average Speed (km/h)	48.7	48.2	-1%

Table 82. Vale of White Horse District modelled network performance - evening peak 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 2 (S2)	% Difference (S2-DM)
Delay (pcu hr)	3131	3308	6%
Total Time (pcu hr)	12510	12843	3%
Total Distance (pcu km)	563210	570225	1%
Average Speed (km/h)	45.0	44.4	-1%

11.3.2. Flow Impacts

The forecast actual flow difference between Scenario 2 and Do-Minimum modelled across the District is shown in Figure 46 and

Figure 47. For the purposes of the report, we focus on changes along the A34, A415, A4130, A4185, A420 corridors, but where relevant will provide commentary on forecast impacts on other links.

In the morning peak hour, the demand is forecast to increase on the A34 northbound between Hinksey Hill and Botley and on the A415 Witney Road northbound.

In the evening peak hour, the demand is forecast to increase on the A4130 eastbound and on the A415 Witney Road southbound.

Figure 46 A34, A415, A4130, A4185 and A420 corridors demand flow difference (PCU/hr) – 2031 AM peak hour

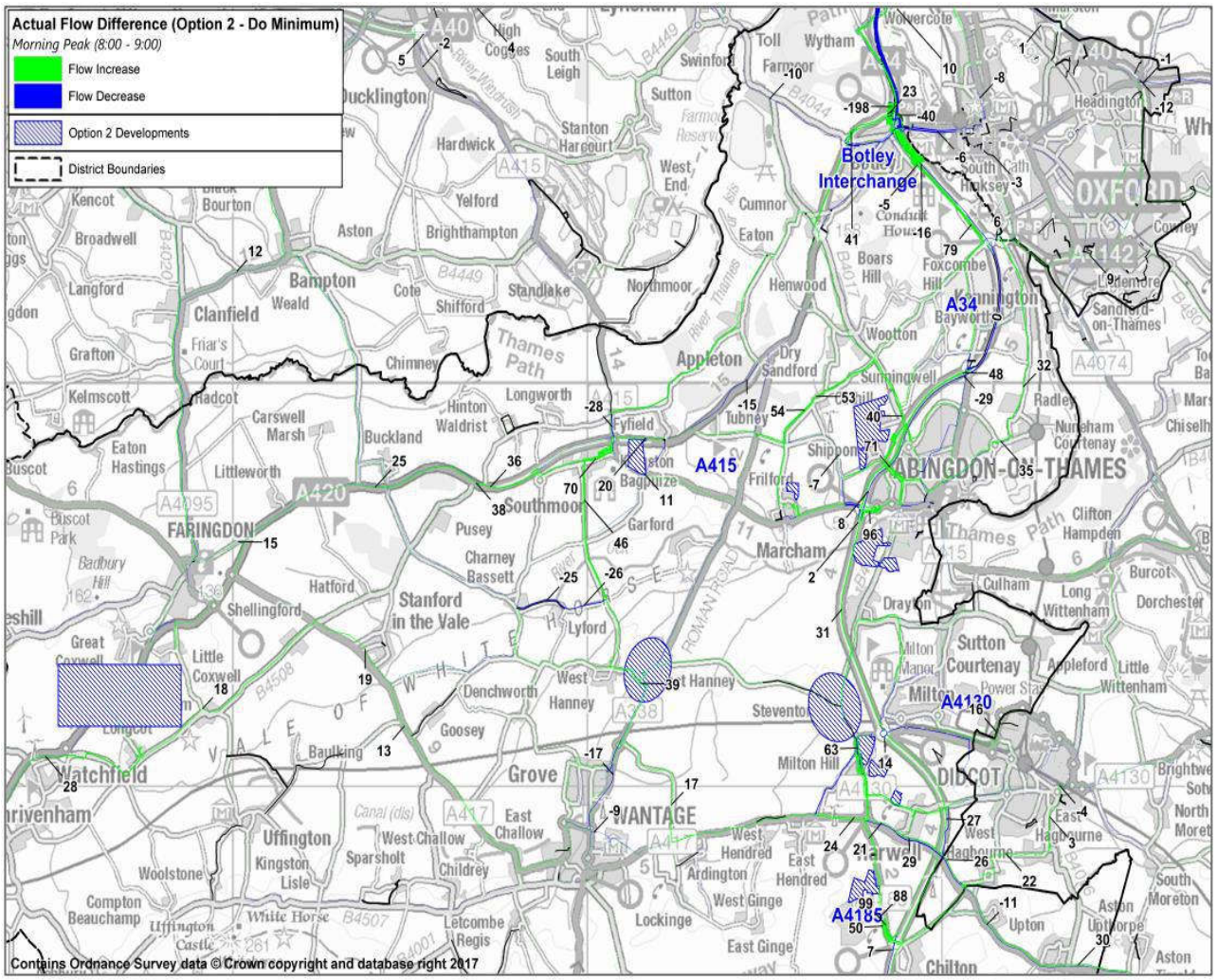
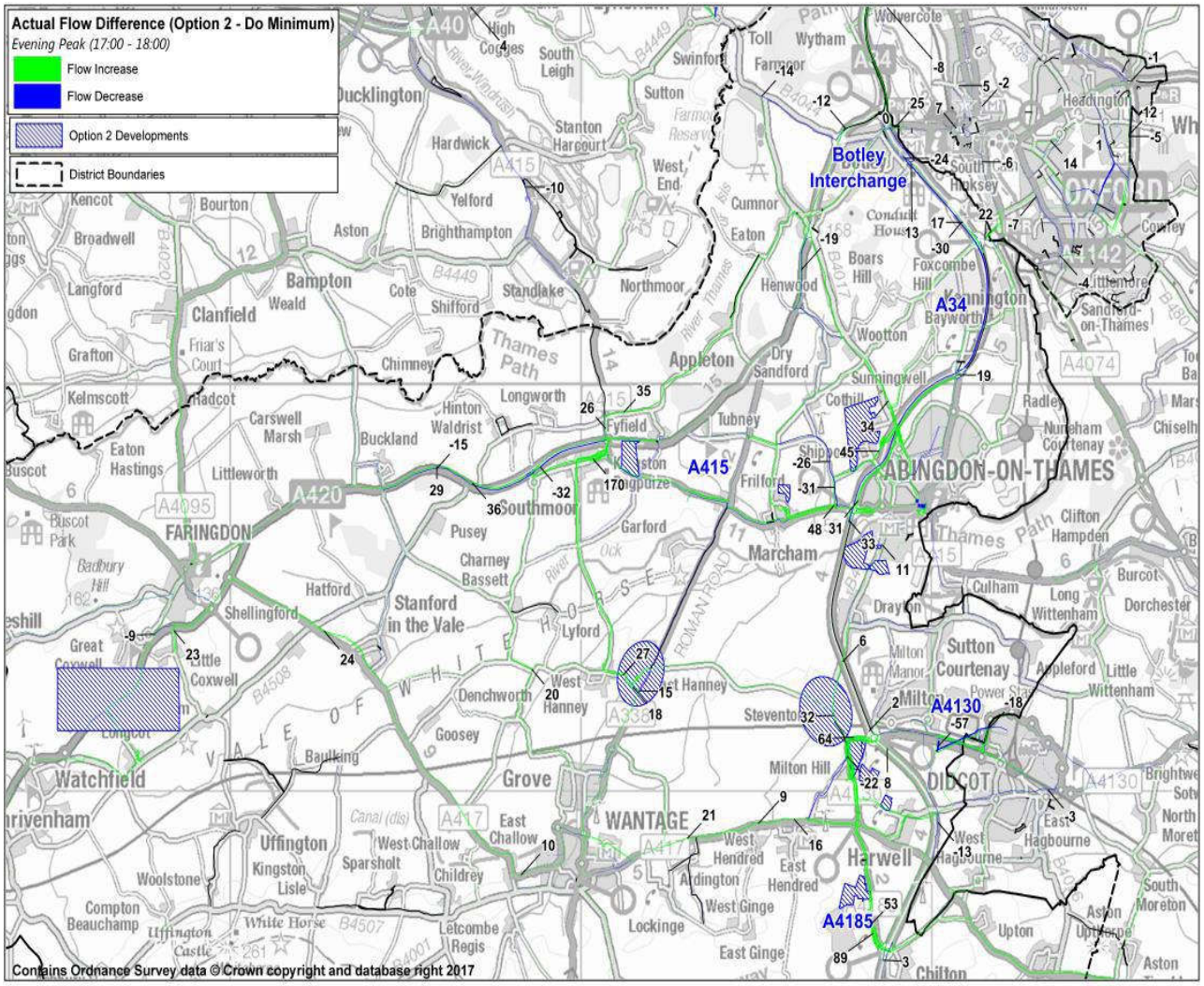


Figure 47 A34, A415, A4130, A4185 and A420 corridors demand flow difference (PCU/hr) – 2031 PM peak hour



11.3.3. Capacity impacts

The forecast volume to capacity plots for Scenario 2 across the District are shown in Figure 48 and Figure 49.

The A34 is forecast to exceed capacity at the following approaches:

- In the morning peak hour, at the Botley Interchange, the A34 northbound towards Botley, between Hinksey Hill and Lodge Hill north and southbound, Hinksey Hill junction north merge and diverge nodes, both directions between Marcham Interchange and Milton Interchange and at the Milton Interchange junction.
- In the evening peak hour, Botley Interchange, Hinksey Hill Interchange, southbound towards Lodge Hill and Hinksey Hill, Marcham Road junction, north and southbound between Marcham Road and Milton Interchange and Milton Interchange.

The A415 is also forecast to exceed capacity at the following approaches:

- In the morning peak hour, A415 / A338 junction, Frilford Road westbound at the A338 approach, the A415 northbound near Appleton Road, Marcham Road / Spring Road junction, B4017 / Ock Street

junction and Ock Street/ West St Helen Street junction. The Marcham Road/Spring Road junction is also forecast to exceed capacity in the do-minimum scenario.

- In the evening peak hour, Kingston Road approaching the A338, Frilford Road westbound approaching the A338, Marcham Road / Spring Road junction, B4017 / Ock Street junction and Ock Street /West St Helen Street junction.

The A4185 and the A4130 are modelled to remain below capacity in both morning and evening peak hours.

The A420 is forecast to exceed capacity at the following approaches,

- In the morning peak hour, A420 northbound direction near Cumnor and the northbound direction at Fyfield, the southbound direction near Southmoor.
- In the evening peak hour, the northbound and southbound directions at Fyfield, the northbound direction near Southmoor.

In addition, the A338 northbound is modelled to experience delays between East Hanney and Frilford in both the morning and evening peak hours. In the evening peak the modelling suggests delays southbound on the A338 approaching Wantage. This is likely to be associated with the prospective development at East Hanney.

Figure 48 A34, A415, A4130, A4185 and A420 corridors V/C for links and junctions– 2031 Scenario 2 AM peak hour

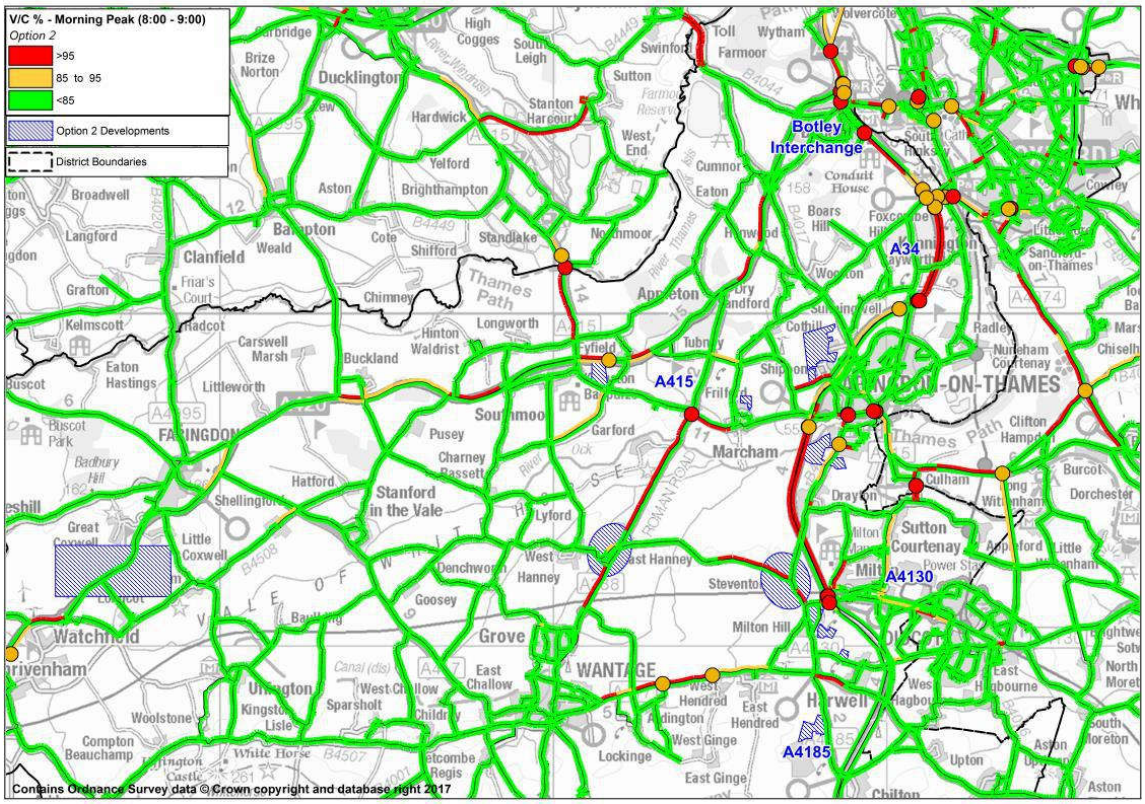
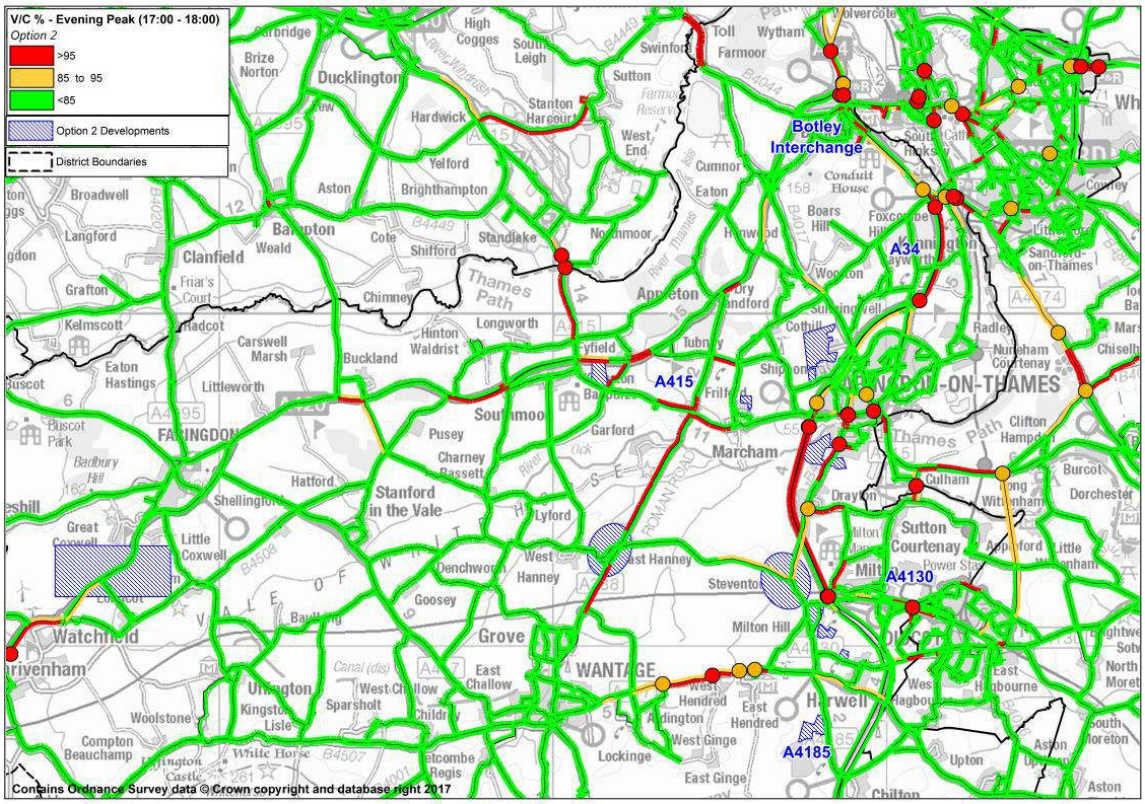


Figure 49 A34, A415, A4130, A4185 and A420 corridors V/C for links and junctions– 2031 Scenario 2 PM peak hour



11.3.4. Corridor Performance

Focusing the analysis on the corridors where delays are forecast to increase by more than 5%, the following corridors shall be discussed for Scenario 2 – A34, A415, A4130, A4185 and A420

11.3.4.1. A34 Corridor

The network performance for Scenario 2 along the A34 corridor is shown in Table 83 and Table 84 for the morning and evening peak hours respectively.

In both the morning and evening peaks, the increased level of demand generated by the new sites is forecast to result in increased delays, travel distance and total travel times while the average speed is decreasing. Delay is forecast to increase by 9-12% due to either 'large' modelled increases in flow in the corridor or 'smaller' increases in flow at the higher end of the link's capacity and thus generating disproportionate delay to the increase in flow

Table 83. A34 Chilton – Botley Interchange corridor performance in the morning peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	641	701	9%
Total Time (pcu hr)	3011	3091	3%
Total Distance (pcu km)	191514	192764	1%
Average Speed (km/h)	64	62	-3%

Table 84. A34 Chilton – Botley Interchange corridor performance in the evening peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	809	905	12%
Total Time (pcu hr)	3165	3274	3%
Total Distance (pcu km)	192834	193850	1%
Average Speed (km/h)	61	59	-3%

11.3.4.2. A415 Corridor

The network performance for Scenario 2 along the A415 corridor is shown in Table 85 and Table 86 for the morning and evening peak hours respectively.

The new developments along the A415 are modelled to have a slight impact on the corridor performance, increasing the delays, total travel time and total distance for the morning peak hour and to a lesser extent the evening peak hour. The average speed along the corridor is not affected by the demand generated by the additional dwellings.

Table 85. A415 corridor performance in the morning peak hour in 2031

	A415		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	257	272	6%
Total Time (pcu hr)	580	597	3%
Total Distance (pcu km)	15849	15984	1%
Average Speed (km/h)	27	27	0%

Table 86. A415 corridor performance in the evening peak hour in 2031

	A415		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	383	388	1%
Total Time (pcu hr)	681	695	2%
Total Distance (pcu km)	15609	16092	3%
Average Speed (km/h)	23	23	0%

11.3.4.3. A4130 Corridor

The network performance for Scenario 2 along the A4130 corridor is shown in Table 87 and Table 88 for the morning and evening peak hours respectively.

In the morning peak hour, the increased level of demand generated by Scenario 2 sites is forecast to increase delays, total travel time and total distance with no impact on the average speed.

In the evening peak hour, delays, total travel time and total distance are modelled to increase and the average speed is decreasing.

Table 87. A4130 corridor performance in the morning peak hour in 2031

	A4130		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	194	211	9%
Total Time (pcu hr)	571	593	4%
Total Distance (pcu km)	20771	21020	1%
Average Speed (km/h)	36	36	0%

Table 88. A4130 corridor performance in the evening peak hour in 2031

	A4130		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	210	225	7%
Total Time (pcu hr)	594	623	5%
Total Distance (pcu km)	21525	22064	3%
Average Speed (km/h)	36	35	-3%

11.3.4.4. A4185 Corridor

The network performance for Scenario 2 along the A4185 corridor is shown in Table 89 and Table 90 for the morning and evening peak hours respectively.

In the morning peak hour, the delay remains the same, total time and total distance are increasing and the average speed is decreasing.

In the evening peak hour, the delay is increasing, the percentage difference associated with this delay and presented in Table 90 look relatively high but the change in the actual numbers is not significant given the low values of delay. The total travel time and the total distance are also increasing while the average speed is decreasing.

Table 89. A4185 corridor performance in the morning peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	8	8	0%
Total Time (pcu hr)	65	70	8%
Total Distance (pcu km)	3698	3899	5%
Average Speed (km/h)	57	56	-2%

Table 90. A4185 corridor performance in the evening peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	8	9	13%
Total Time (pcu hr)	60	65	8%
Total Distance (pcu km)	3560	3817	7%
Average Speed (km/h)	60	59	-2%

11.3.4.5. A420 Corridor

The network performance for Scenario 2 along the A420 corridor is shown in Table 91 and Table 92 for the morning and evening peak hours respectively.

In the morning peak hour, the forecast demand generated by the new developments have a very slight impact on the A420 corridor performance, increasing the delay, total time and total distance.

In the evening peak hour, the modelled impact on the performance is more significant, with an increase in delays, total time and total distance and a decrease in average speed as can be seen in Table 92.

Table 91. A420 corridor performance in the morning peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	210	212	1%
Total Time (pcu hr)	1461	1471	1%
Total Distance (pcu km)	83509	84021	1%
Average Speed (km/h)	57	57	0%

Table 92. A420 corridor performance in the evening peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 2 (S2)	Difference (S2 - DM)
Delay (pcu hr)	287	319	11%
Total Time (pcu hr)	1601	1645	3%
Total Distance (pcu km)	87705	88451	1%
Average Speed (km/h)	55	54	-2%

11.4. Scenario 3

11.4.1. Network Performance

The modelled highway network performance within the VOWH district for the Do-Minimum and the Scenario 3 are shown in the Table 93 and Table 94. The trips generated by the 3,600 additional dwellings are forecast to increase delays, travel times and travel distances within the District during the morning and evening peak hours and has the effect of reducing average speed.

Table 93. Vale of White Horse District modelled network performance - morning peak hour 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 3 (S3)	% Difference (S3-DM)
Delay (pcu hr)	2147	2254	5%
Total Time (pcu hr)	11020	11267	2%
Total Distance (pcu km)	536607	543052	1%
Average Speed (km/h)	48.7	48.2	-1%

Table 94. Vale of White Horse District modelled network performance - evening peak 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 3 (S3)	% Difference (S3-DM)
Delay (pcu hr)	3131	3295	5%
Total Time (pcu hr)	12510	12840	3%
Total Distance (pcu km)	563210	570656	1%
Average Speed (km/h)	45.0	44.4	-1%

11.4.2. Flow Impacts

The forecast demand flow difference between Scenario 3 and the Do-Minimum modelled the District is shown in Figure 50 and Figure 51. For the purposes of the report, we focus on changes along the A34, A4130, A4185, A420 corridors, but where relevant will provide commentary on forecast impacts on other links.

In the morning peak hour, the demand is forecast to increase on the A34 northbound between Hinksey Hill and Botley, on the A4185 southbound near Chilton Interchange and on the A4130 northbound and southbound west of Milton Interchange. The absolute value of flow difference on the A420 is smaller than 50 pcu.

In the evening peak hour, the modelled flow increases on the A4130 northbound and southbound west of Milton Interchange and northbound on the A4185 near Chilton Interchange. The proposed site adjacent to the A420 is forecast to generate 262 trips, of these 182 are modelled to travel eastbound, with around 80 trips subsequently using the A420.

Figure 50 A34, A4130, A4185 and A420 corridors demand flow difference (PCU/hr) – 2031 AM peak hour

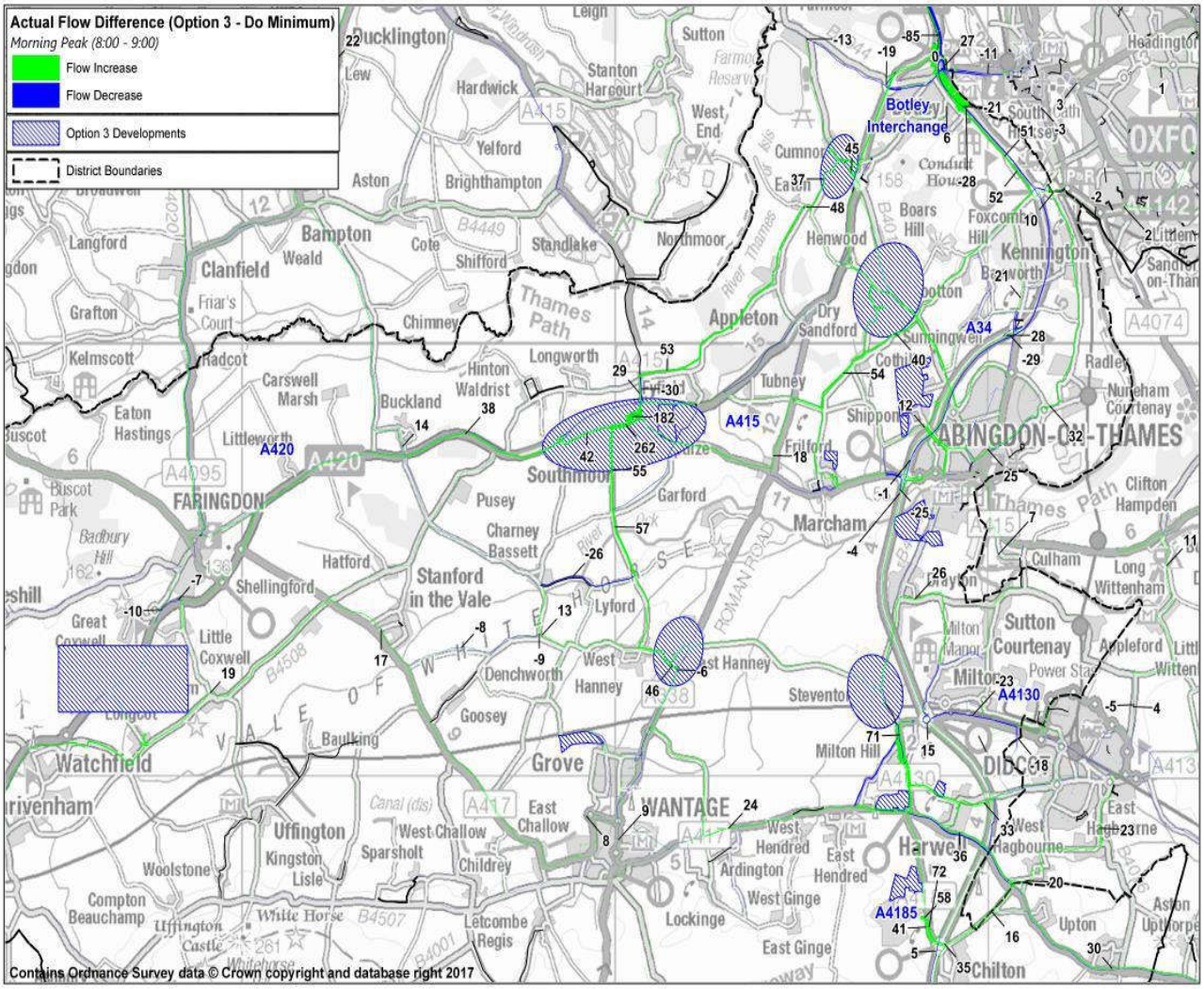
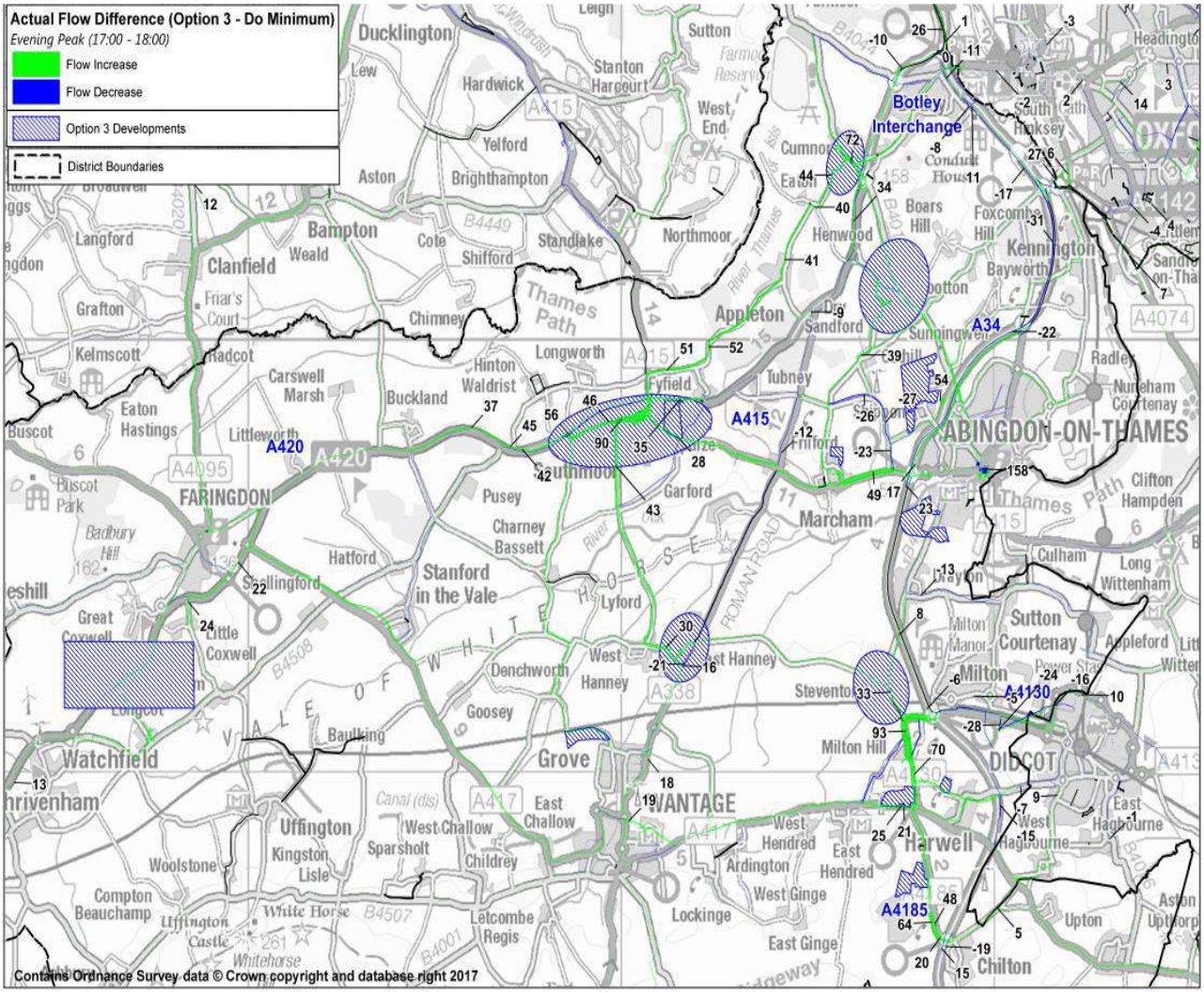


Figure 51 A34, A4130, A4185 and A420 corridors demand flow difference (PCU/hr) – 2031 PM peak hour



11.4.3. Capacity impacts

The forecast volume to capacity plots for Scenario 3 across the District are shown in Figure 52 and Figure 53.

The A34 is forecast to exceed capacity at the following approaches:

- In the morning peak hour, the Botley interchange, northbound between Hinksey Hill and Botley interchange, northbound and southbound between Hinksey Hill and Oxford Road, Oxford Road junction, both directions between Marcham Road and Milton interchange and at Milton interchange junction.
- In the evening peak hour, the Botley interchange, Hinksey Hill, the southbound between Hinksey hill and Oxford Road, Oxford Road junction, Marcham Road junction, both directions between Marcham Road and Milton interchange.

The A4130 and A4185 are forecast to have minor capacity issues.

The A420 is modelled to exceed capacity at the following approaches:

- In the morning peak hour, northbound at Cumnor, near Fyfield and near Southmoor.
- In the evening peak hour, northbound and southbound near Fyfield and southbound near Southmoor.

Figure 52 A34, A4130, A4185 and A420 corridors V/C for links and junctions– 2031 Scenario 3 AM peak hour

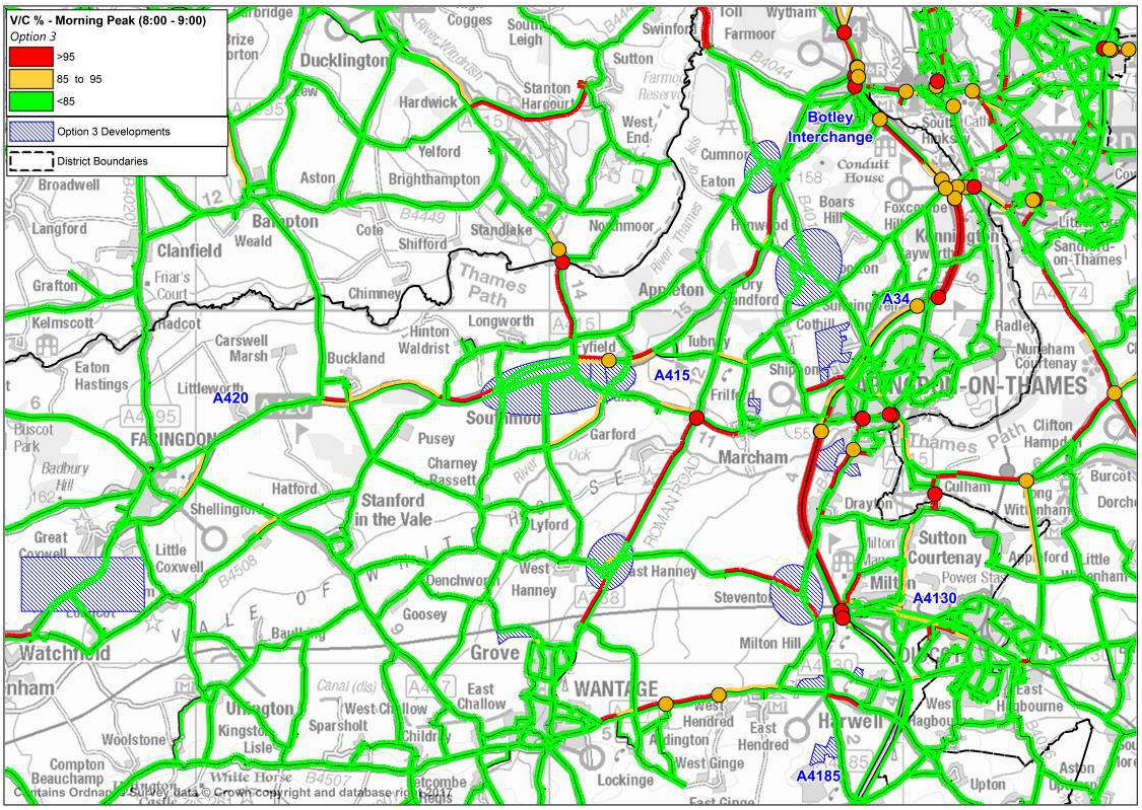
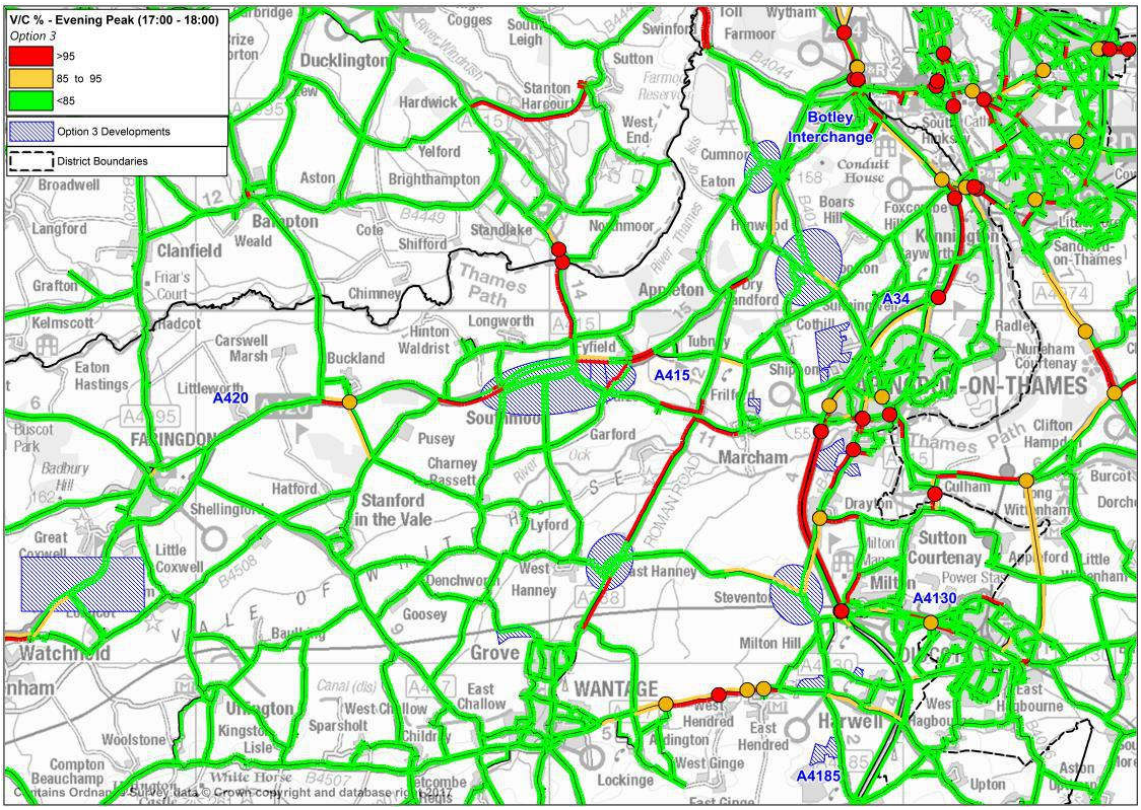


Figure 53 A34, A4130, A4185 and A420 corridors V/C for links and junctions– 2031 Scenario 3 PM peak hour



11.4.4. Corridor Performance

Focusing the analysis on only the corridors where delays are forecast to increase by more than 5%, the following corridors shall be discussed for Scenario 3 – A34, A4130, A4185 and A420.

11.4.4.1. A34 Corridor

The network performance for Scenario 3 along the A34 corridor is shown in Table 95 and Table 96 for the morning and evening peak hours respectively.

In both morning and evening peak hours the modelled increased level of demand generated by the new sites results in increased delays and total travel times while the average speed is forecast to decrease while the total distance is slightly increasing.

Table 95. A34 Chilton – Botley Interchange corridor performance in the morning peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 3 (S3)	Difference (S3 - DM)
Delay (pcu hr)	641	687	7%
Total Time (pcu hr)	3011	3068	2%
Total Distance (pcu km)	191514	192282	0%
Average Speed (km/h)	63.6	62.7	-1%

Table 96. A34 Chilton – Botley Interchange corridor performance in the evening peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 3 (S3)	Difference (S3 - DM)
Delay (pcu hr)	809	902	11%
Total Time (pcu hr)	3165	3269	3%
Total Distance (pcu km)	192834	193746	0%
Average Speed (km/h)	60.9	59.3	-3%

11.4.4.2. A4130 Corridor

The network performance for Scenario 3 along the A4130 corridor is shown in Table 97 and Table 98 for the morning and evening peak hours respectively.

In both morning and evening peak hours, the forecast delay, total time and total distance are increasing and the average speed is decreasing. Forecast corridor performance along the A4130 is comparable with performance under Plan Scenario 2, where modelled growth levels and locations are similar.

Table 97. A4130 corridor performance in the morning peak hour in 2031

	A4130		
	Do-Minimum (DM)	Scenario 3 (S3)	Difference (S3 - DM)
Delay (pcu hr)	194	217	12%
Total Time (pcu hr)	571	599	5%
Total Distance (pcu km)	20771	21036	1%
Average Speed (km/h)	36.4	35.1	-4%

Table 98. A4185 corridor performance in the evening peak hour in 2031

	A4130		
	Do-Minimum (DM)	Scenario 3 (S3)	Difference (S3 - DM)
Delay (pcu hr)	210	224	7%
Total Time (pcu hr)	594	622	5%
Total Distance (pcu km)	21525	22042	2%
Average Speed (km/h)	36.2	35.4	-2%

11.4.4.3. A4185 Corridor

The network performance for Scenario 3 along the A4185 corridor is shown in Table 99 and Table 100 for the morning and evening peak hours respectively.

In the morning peak hour and the evening peak hour the delay, total time and total distance are increasing and the average speed is decreasing.

Table 99. A4185 corridor performance in the morning peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 3 (S3)	Difference (S3 - DM)
Delay (pcu hr)	7.8	8.2	5%
Total Time (pcu hr)	65	69	6%
Total Distance (pcu km)	3698	3845	4%
Average Speed (km/h)	57	56	-2%

Table 100. A4185 corridor performance in the evening peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 3 (S3)	Difference (S3 - DM)
Delay (pcu hr)	7.8	8.4	8%
Total Time (pcu hr)	60	64	7%
Total Distance (pcu km)	3560	3750	5%
Average Speed (km/h)	60	60	-2%

11.4.4.4. A420 Corridor

The network performance for Scenario 3 along the A420 corridor is shown in Table 101 and Table 102 for the morning and evening peak hours respectively.

In the morning peak hour, the forecast level of demand generated by the new sites increases the delay, total time and total distance along the A420 while the average speed is modelled to decrease.

In the evening peak hour, the modelling suggest that there is likely to be a comparatively higher impact on the A420 with patterns similar to those of the morning peak hour.

Table 101. A420 corridor performance in the morning peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 3 (S3)	Difference (S3 - DM)
Delay (pcu hr)	210	221	5%
Total Time (pcu hr)	1461	1484	2%
Total Distance (pcu km)	83509	84177	1%
Average Speed (km/h)	57.2	56.7	-1%

Table 102. A420 corridor performance in the evening peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 3 (S3)	Difference (S3 - DM)
Delay (pcu hr)	287	326	13%
Total Time (pcu hr)	1601	1655	3%
Total Distance (pcu km)	87705	88632	1%
Average Speed (km/h)	55	54	-2%

11.5. Scenario 4

11.5.1. Network Performance

The modelled highway network performance within the VOWH district for the Do-Minimum and Scenario 4 are shown in the Table 103 and Table 104.

The trips generated by the additional 3,600 dwellings, plus an additional 1,800 dwellings at the South Abingdon site, without the South Abingdon by-pass, are forecast to increase delays, travel times and travel distances within the District during the morning and evening peak hours and has the effect of reducing average speed. In comparison with Scenario 1, the additional housing is forecast to have a greater impact on network performance.

Table 103. Vale of White Horse District modelled network performance - morning peak hour 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 4 (S4)	% Difference (S4-DM)
Delay (pcu hr)	2147	2326	8%
Total Time (pcu hr)	11020	11386	3%
Total Distance (pcu km)	536607	545655	2%
Average Speed (km/h)	48.7	47.9	-2%

Table 104. Vale of White Horse District modelled network performance - evening peak 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 4 (S4)	% Difference (S4-DM)
Delay (pcu hr)	3131	3361	7%
Total Time (pcu hr)	12510	12964	4%
Total Distance (pcu km)	563210	573072	2%
Average Speed (km/h)	45.0	44.2	-2%

11.5.2. Flow Impacts

The forecast demand flow difference between Scenario 4 and Do-Minimum modelling across the District is shown in Figure 54 and Figure 55.

In the morning peak hour, the demand is forecast to increase on the A34 northbound by 100pcu and decrease southbound by 50pcu between Hinksey Hill and Botley Interchange. There is also a modelled decrease in demand on the A34 between Hinksey Hill and Oxford Road southbound by 50pcu, a forecast increase in demand by 100pcu between Marcham Road and Oxford Road northbound, Marcham Road and Milton Interchange southbound and Milton Interchange and Chilton Interchange southbound. On the A4185, there is a modelled increase of 50pcu northbound which becomes 100pcu closer to the Chilton Interchange, southbound near Chilton the modelled flow increases by 200pcu. The demand is forecast to decrease on the A415 eastbound and westbound near the Marcham roundabout. The absolute value of flow difference on the A417 and on the A420 is forecast to be smaller than 50 pcu.

In the evening peak hour, the demand is modelled to decrease on the A34 between Oxford Road and Hinksey Hill by 100pcu northbound and by 60pcu between Marcham Road and Oxford Road northbound.

The demand is forecast to increase on the A34 southbound by 140pcu between Marcham Road and Oxford Road.

Near the Mill Road / North Street junction on the A415 the demand is modelled to decrease by 60pcu westbound and increase by approximately same value eastbound. The absolute value of flow difference on the A417 and on the A420 is predicted to be smaller than 50 pcu.

Figure 54 A34, A415, A417, A4185 and A420 corridors demand flow difference (PCU/hr) – 2031 AM peak hour

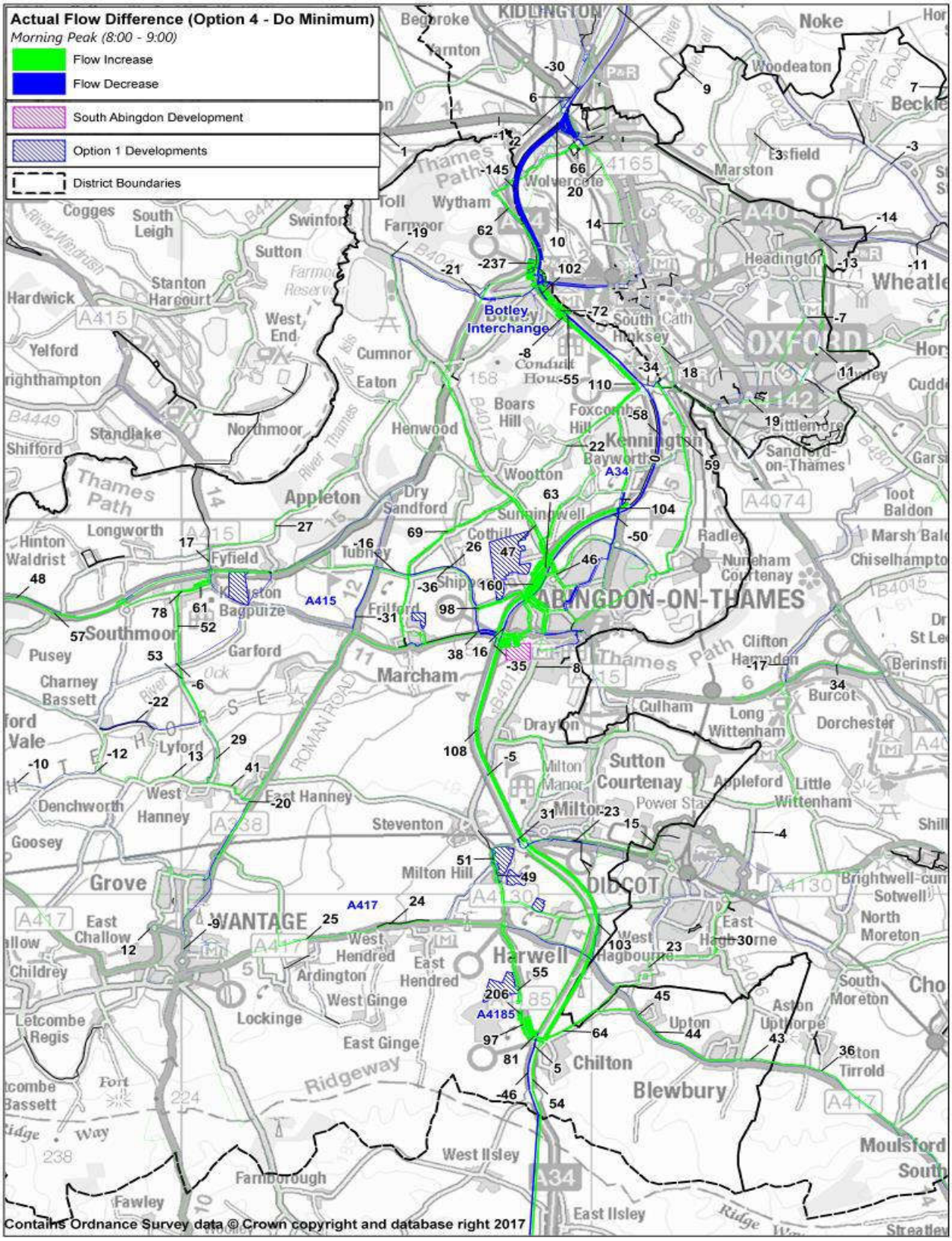
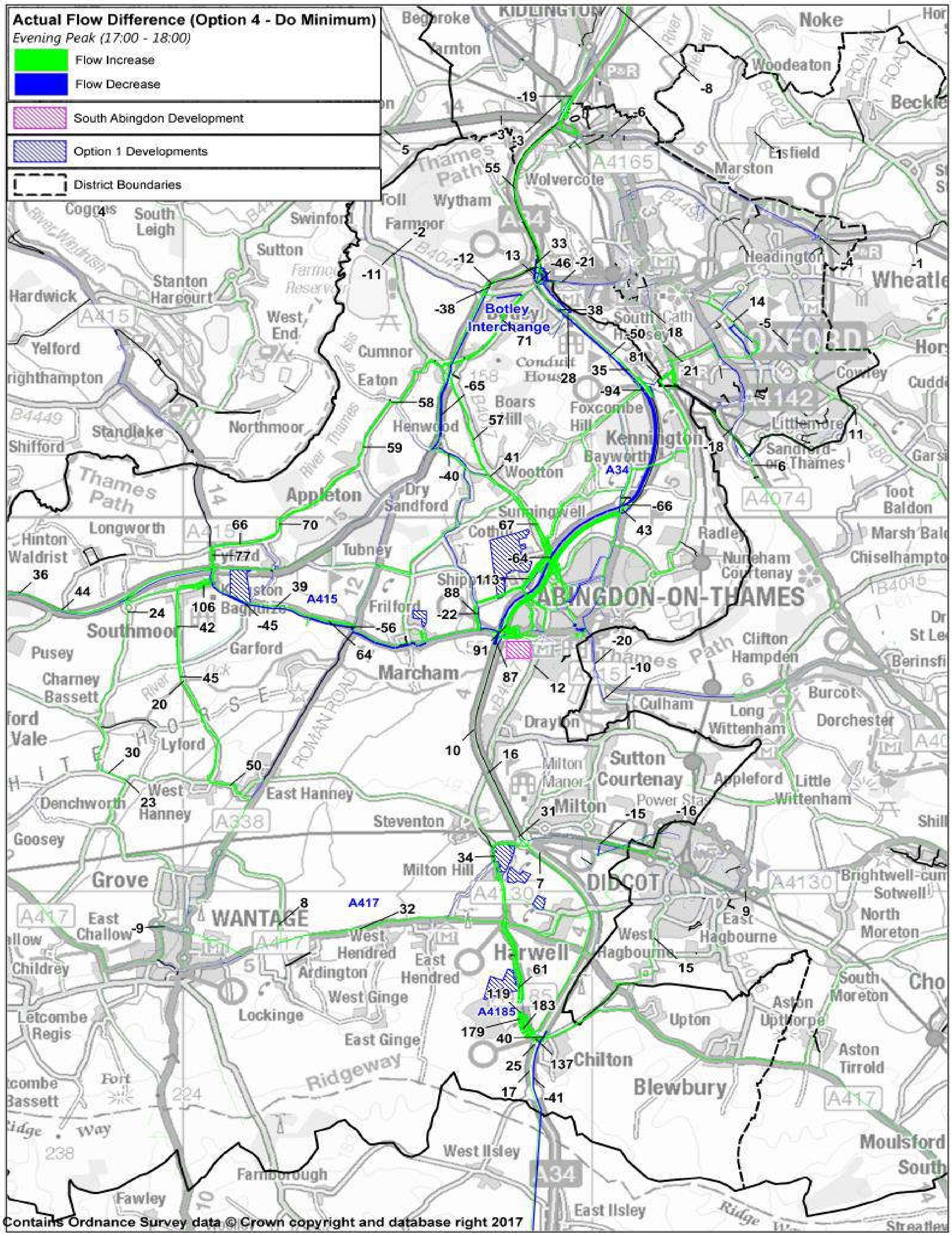


Figure 55 A34, A415, A417, A4185 and A420 corridors demand flow difference (PCU/hr) – 2031 PM peak hour



11.5.3. Capacity impacts

The forecast volume to capacity plots for Scenario 4 for the District are shown in Figure 56 and Figure 57.

In Scenario 4, the performance of A34, A417, A4185, A420 and A415 is forecast to be as follows:

The A34 is forecast to exceed capacity at the following sections:

- In the morning peak hour, northbound approach between Milton Interchange and Botley, southbound approaches between Hinksey Hill and Lodge Hill, Marcham Road junction and Milton Interchange.
- In the evening peak hour, northbound approach between Milton Interchange and Marcham Road junction and Hinksey Hill and Botley Interchange, southbound approach between Milton Interchange and Botley are exceeding capacity.

The A417 is modelled to exceed capacity along the following sections:

- In the morning peak hour, eastbound approach between Wantage and Featherbed Lane, and westbound approach at the Rowstock roundabout.
- In the evening peak hour, eastbound and westbound approaches between Wantage and Featherbed Lane, and westbound approach at the Rowstock roundabout.

The A4185 corridor is forecast to have minor capacity issues in both morning and evening peak hours.

The A420 is modelled to exceed capacity on the following sections:

- In the morning peak hour, eastbound approach between Buckland and Longworth, Southmoor and Fyfield, Besselsleigh and Cumnor and the approach to Botley Interchange, westbound approach between Southmoor and Fyfield are exceeding capacity.
- In the evening peak hour, eastbound and westbound approaches between Southmoor and Fyfield, westbound approach between Cumnor and Besselsleigh are exceeding capacity.

The A415 is forecast to exceed capacity at the following approaches:

- In the morning peak hour, the A415 / A338 junction, Frilford Road westbound at the A338 approach, the A415 northbound near Appleton Road, Marcham Road / Spring Road junction, the B4017 / Ock Street junction and Ock Street / West St Helen Street junction.

Figure 56 A34, A415, A417, A4185 and A420 corridors V/C for links and junctions– 2031 Scenario 4 AM peak hour

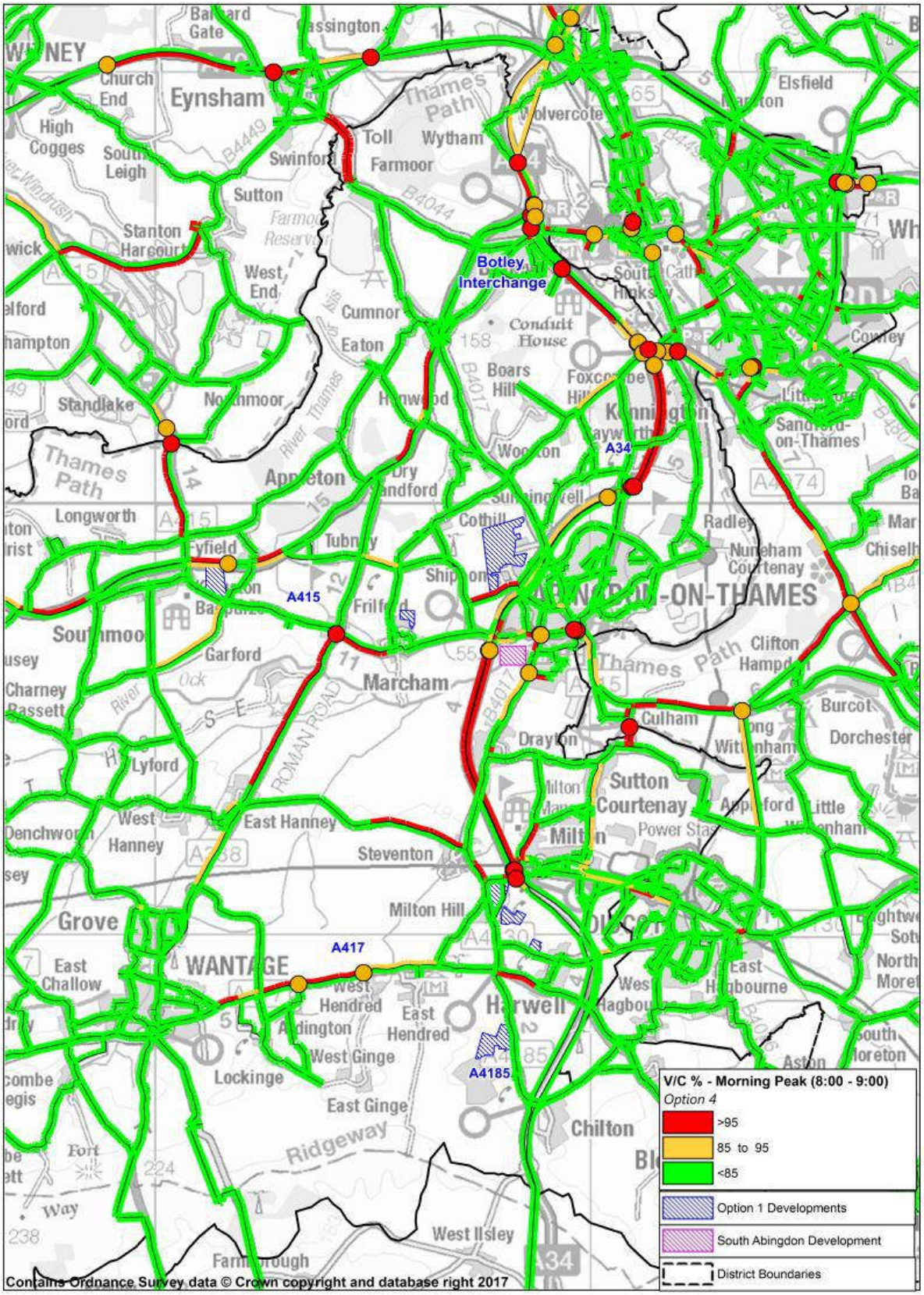
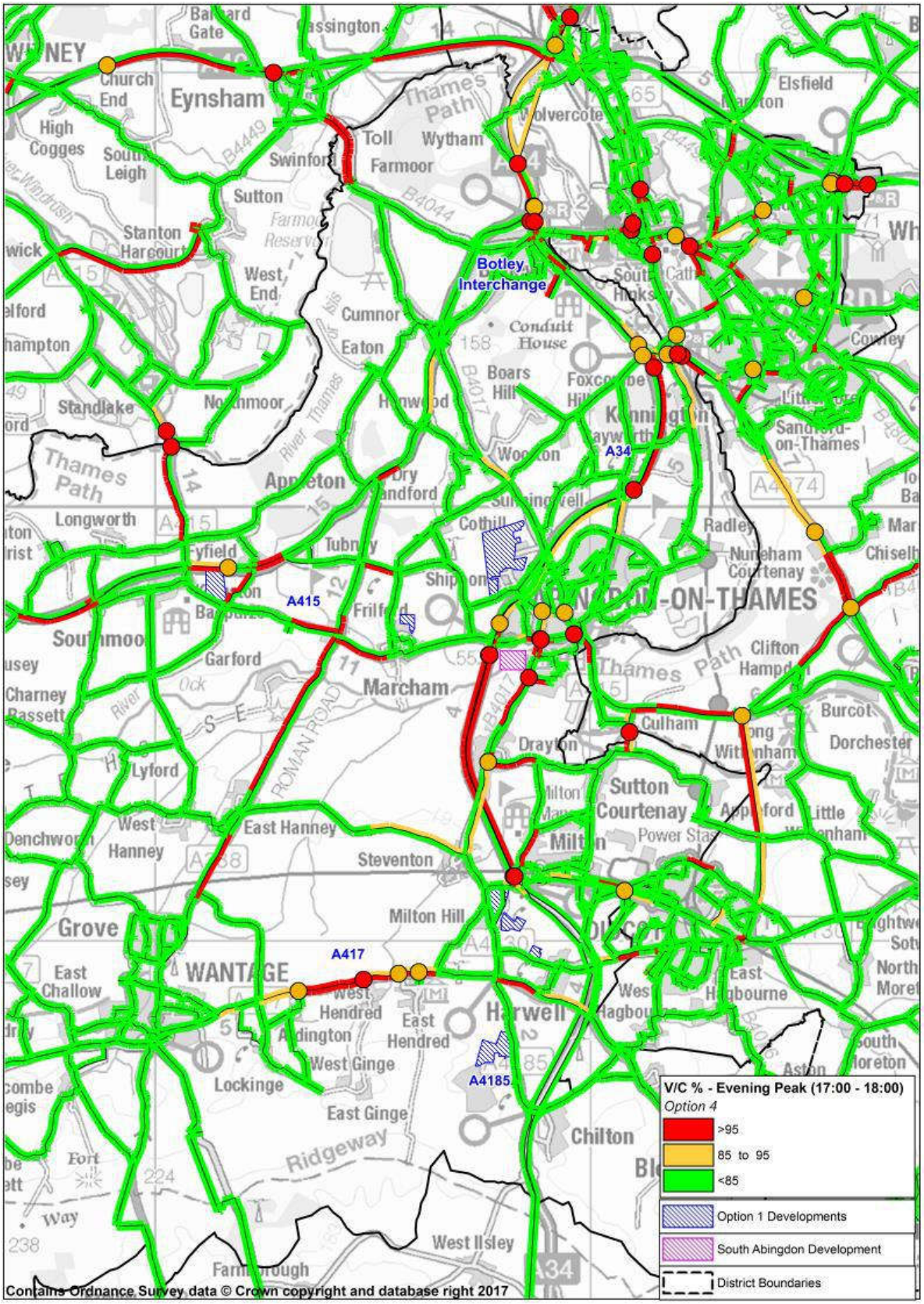


Figure 57 A34, A415, A417, A4185 and A420 corridors V/C for links and junctions– 2031 Scenario 4 PM peak hour



11.5.4. Corridor Performance

Focusing the analysis on only the corridors where delays are forecast to increase by more than 5%, the following corridors shall be discussed for Scenario 4 – A34, A415, A417, A4185 and A420.

11.5.4.1. A34 Corridor

The forecast network performance for Scenario 4 along the A34 corridor is shown in Table 105 and Table 106 for the morning and evening peak hours respectively.

In the morning and evening peak hours, the increased level of demand generated by the Scenario 4 sites results in a forecast increase in delay, total travel time and total distance while the average speed decreases, both in comparison with the do minimum scenario and when compared to Scenario 1.

Table 105. A34 Chilton – Botley Interchange corridor performance in the morning peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	641	722	13%
Total Time (pcu hr)	3011	3129	4%
Total Distance (pcu km)	191514	193910	1%
Average Speed (km/h)	63.6	62.0	-3%

Table 106. A34 Chilton – Botley Interchange corridor performance in the evening peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	809	951	18%
Total Time (pcu hr)	3165	3330	5%
Total Distance (pcu km)	192834	194673	1%
Average Speed (km/h)	60.9	58.5	-4%

11.5.4.2. A415 Corridor

The network performance for Scenario 4 along the A415 corridor is shown in Table 107 and Table 108 for the morning and evening peak hours respectively. The A415 corridor was not forecast to experience a 5% increase in delay in Scenario 1, which again suggests reduced network performance when additional dwellings at South Abingdon are modelled in this scenario.

In the morning peak hour, the increased level of demand generated by the new sites is forecast to increase delays, total travel time and total distance while the average speed decreases.

In the evening peak hour, the increased level of demand is modelled to have a lesser impact on the A415 performance with slight increases in delay, total time and total distance forecast. The average speed is modelled to remain unaffected.

Table 107. A415 corridor performance in the morning peak hour in 2031

	A415		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	257	290	13%
Total Time (pcu hr)	580	617	7%
Total Distance (pcu km)	15849	16120	2%
Average Speed (km/h)	27.3	26.1	-4%

Table 108. A415 corridor performance in the evening peak hour in 2031

	A415		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	383	390	2%
Total Time (pcu hr)	681	694	2%
Total Distance (pcu km)	15609	15916	2%
Average Speed (km/h)	22.9	22.9	0%

11.5.4.3. A417 Corridor

The modelled network performance for Scenario 4 along the A417 corridor is shown in Table 109 and Table 110 for the morning and evening peak hours respectively. The A417 corridor was not forecast to experience a 5% increase in delay in Scenario 1, which again suggests reduced network performance when additional dwellings at South Abingdon are modelled.

In the morning and evening peak hours, the forecast increased level of demand generated by the Scenario 4 sites results in modelled increases to delays, total travel time and total distance, while the average speed decreases.

Table 109. A417 corridor performance in the morning peak hour in 2031

	A417		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	114	121	6%
Total Time (pcu hr)	517	530	2%
Total Distance (pcu km)	21680	21881	1%
Average Speed (km/h)	41.9	41.4	-1%

Table 110. A417 corridor performance in the evening peak hour in 2031

	A417		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	136	146	8%
Total Time (pcu hr)	594	618	4%
Total Distance (pcu km)	23292	23645	2%
Average Speed (km/h)	39.2	38.3	-2%

11.5.4.4. A4185 Corridor

The network performance for Scenario 4 along the A4185 corridor is shown in Table 111 and Table 112 for the morning and evening peak hours respectively.

In both morning and evening peaks, the increased level of demand generated by the new sites is forecast to increase delays, travel distance and total travel times while the average speed is modelled to decrease, both in comparison with the do minimum scenario and when compared back to Scenario 1.The difference in percentages presented look relatively high for delays and total time but the change in the actual numbers is not significant given the small numbers.

Table 111. A4185 corridor performance in the morning peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	8	9	12%
Total Time (pcu hr)	65	75	16%
Total Distance (pcu km)	3698	4097	11%
Average Speed (km/h)	57.1	54.5	-5%

Table 112. A4185 corridor performance in the evening peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	8	9	17%
Total Time (pcu hr)	60	71	18%
Total Distance (pcu km)	3560	4070	14%
Average Speed (km/h)	59.8	57.7	-4%

11.5.4.5. A420 Corridor

The network performance for Scenario 4 along the A420 corridor is shown in Table 113 and 114 for the morning and evening peak hours respectively.

In the morning peak hour, the delay modelled is slightly decreasing along the A420 corridor with minor changes for the total time, total distance and average speed.

In the evening peak hour, the delay, total time and total distance are increasing and the average speed is decreasing due to the additional level of demand generated by the new sites.

Table 113. A420 corridor performance in the morning peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	210	206	-2%
Total Time (pcu hr)	1461	1467	0%
Total Distance (pcu km)	83509	84090	1%
Average Speed (km/h)	57.2	57.3	0%

Table 114. A420 corridor performance in the evening peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 4 (S4)	Difference (S4 - DM)
Delay (pcu hr)	287	326	14%
Total Time (pcu hr)	1601	1657	3%
Total Distance (pcu km)	87705	88631	1%
Average Speed (km/h)	54.8	53.5	-2%

11.6. Scenario 5

11.6.1. Network Performance

The modelled highway network performance within the VOWH district for the Do-Minimum and the Scenario 5 are shown in the Table 115 and Table 116.

The trips generated by the additional 3,600 dwellings, plus an additional 1,800 dwellings at the South Abingdon site, with the South Abingdon by-pass are forecast to increase delays, travel times and travel distances within the District during the morning and evening peak hours and are predicted to have the effect of reducing average speed.

Table 115. Vale of White Horse District modelled network performance - morning peak hour 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 5 (S5)	% Difference (S5-DM)
Delay (pcu hr)	2147	2256	5%
Total Time (pcu hr)	11020	11309	3%
Total Distance (pcu km)	536607	545662	2%
Average Speed (km/h)	48.7	48.2	-1%

Table 116. Vale of White Horse District modelled network performance - evening peak 2031

	Vale of White Horse		
	Do-Minimum (DM)	Scenario 5 (S5)	% Difference (S5-DM)
Delay (pcu hr)	3131	3285	5%
Total Time (pcu hr)	12510	12875	3%
Total Distance (pcu km)	563210	573191	2%
Average Speed (km/h)	45.0	44.5	-1%

11.6.2. Flow Impacts

The forecast demand flow difference between Scenario 5 and Do-Minimum modelled across the District is shown in Figure 58 and Figure 59.

In the morning peak hour, the demand flow along A34 is forecast to increase although there is a small reduction in the northbound direction between Milton and Marcham Road junction and southbound between Botley Interchange and Lodge Hill in the range of +/- 50pcu. The change in demand flow along A420 is in the range of +/-50pcu in eastbound and westbound directions. The demand flow along A417 and A4185 is forecast to increase in both directions.

In the evening peak hour, the demand flow along A34 is forecast to increase although there is a small reduction in the northbound direction between Milton and Marcham Road junction. There is a slight increase in demand flow along A420 in the eastbound and westbound directions except at Cumnor eastbound where there is a reduction of 50pcu. The demand flow along A417 and A4185 is forecast to increase in both directions.

Figure 58 A34, A417, A4185 and A420 corridors demand flow difference (PCU/hr) – 2031 AM peak hour

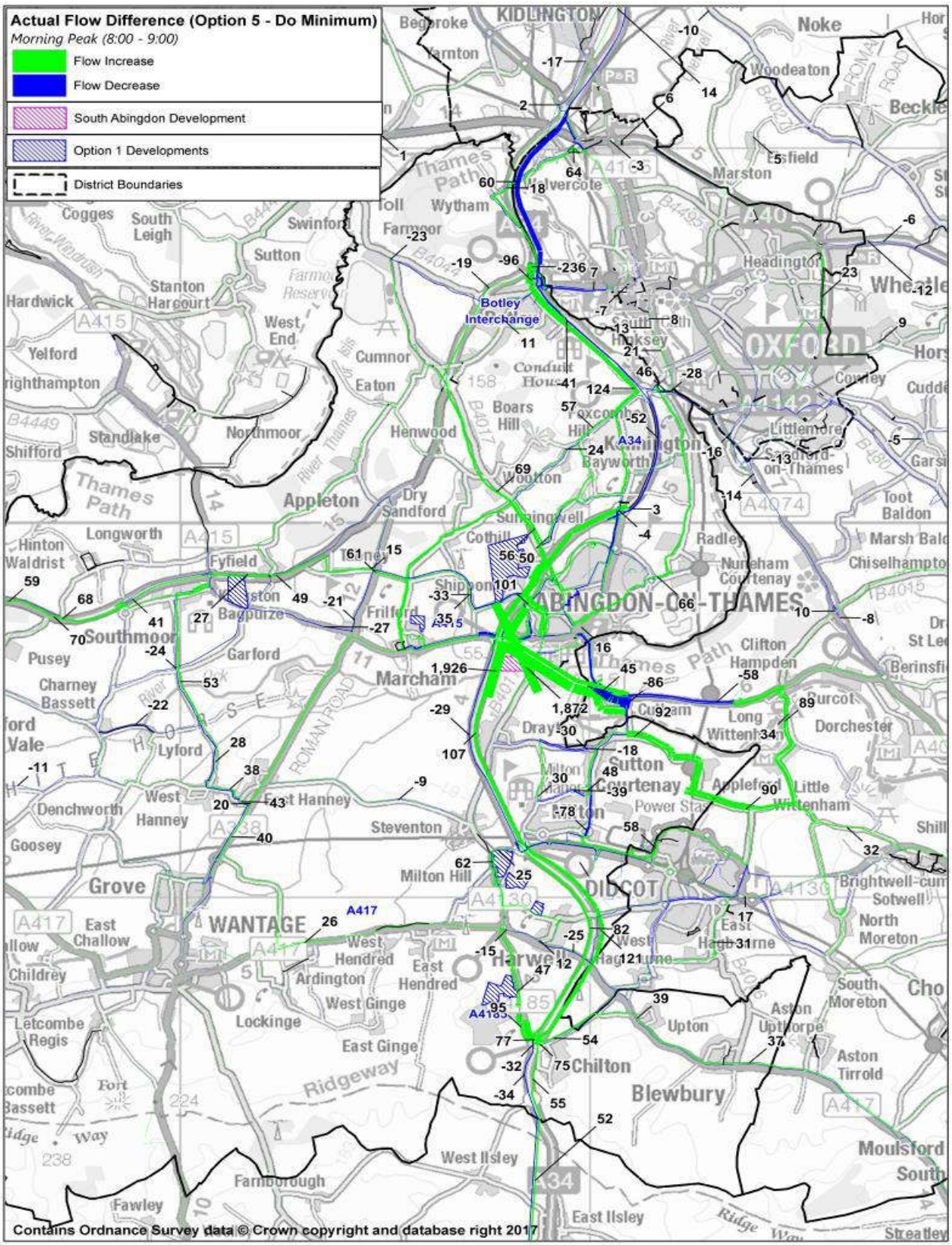
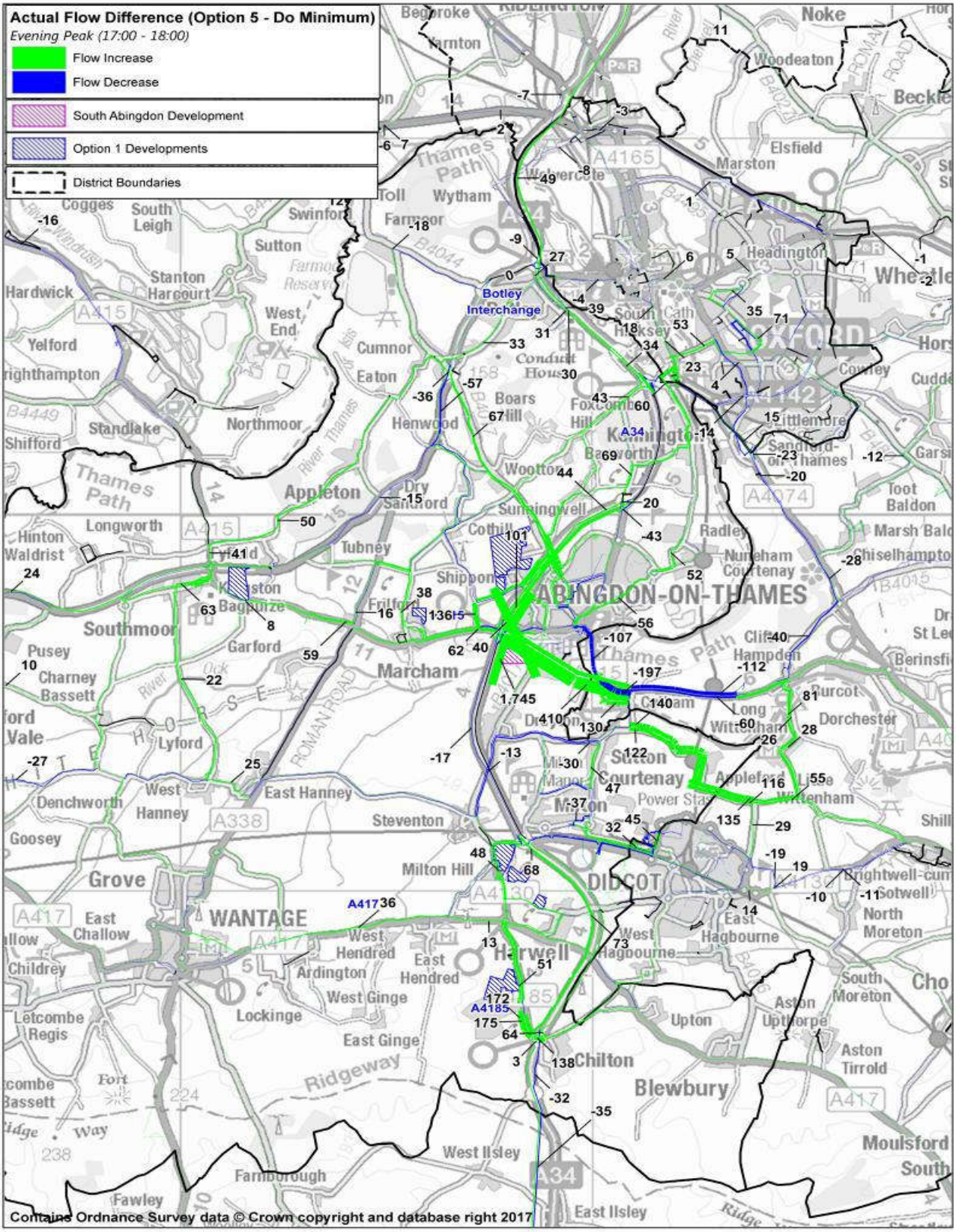


Figure 59 A34, A417, A4185 and A420 corridors demand flow difference (PCU/hr) – 2031 PM peak hour



11.6.3. Capacity impacts

The forecast volume to capacity plots for Scenario 5 across the District are shown in Figure 60 and Figure 61.

In Scenario 5, the performance of A34, A417, A4185 and A420 is as follows:

The A34 is forecast to exceed capacity at the following sections:

- In the morning peak hour, northbound approach between Milton Interchange and Botley, southbound approaches between Hinksey Hill and Lodge Hill, Marcham Road junction and Milton Interchange.
- In the evening peak hour, northbound approach between Milton Interchange and Marcham Road junction and Hinksey Hill and Botley Interchange, southbound approach between Milton Interchange and Botley are exceeding capacity.

A417 is modelled to exceed capacity at the following sections:

- In the morning peak hour, eastbound approach between Wantage and Featherbed Lane, and westbound approach at the Rowstock roundabout.
- In the evening peak hour, eastbound and westbound approaches between Wantage and Featherbed Lane, and westbound approach at the Rowstock roundabout.

The A4185 corridor is forecast to have minor capacity issues in both morning and evening peak hours.

The A420 is modelled to exceed capacity at the following sections:

- In the morning peak hour, eastbound approach between Buckland and Longworth, Southmoor and Fyfield, Besselsleigh and Cumnor and the approach to Botley Interchange, westbound approach between Southmoor and Fyfield are exceeding capacity.
- In the evening peak hour, eastbound and westbound approaches between Southmoor and Fyfield, westbound approach between Cumnor and Besselsleigh are exceeding capacity.

Along the A415 towards South Oxfordshire, the modelling forecasts negligible impacts compared to the Do-minimum and Scenario 1, with the A415/A338 junction at Frilford and the river crossing remaining over capacity.

Figure 60 A34, A417, A4185 and A420 corridors V/C for links and junctions– 2031 Scenario 5 AM peak hour

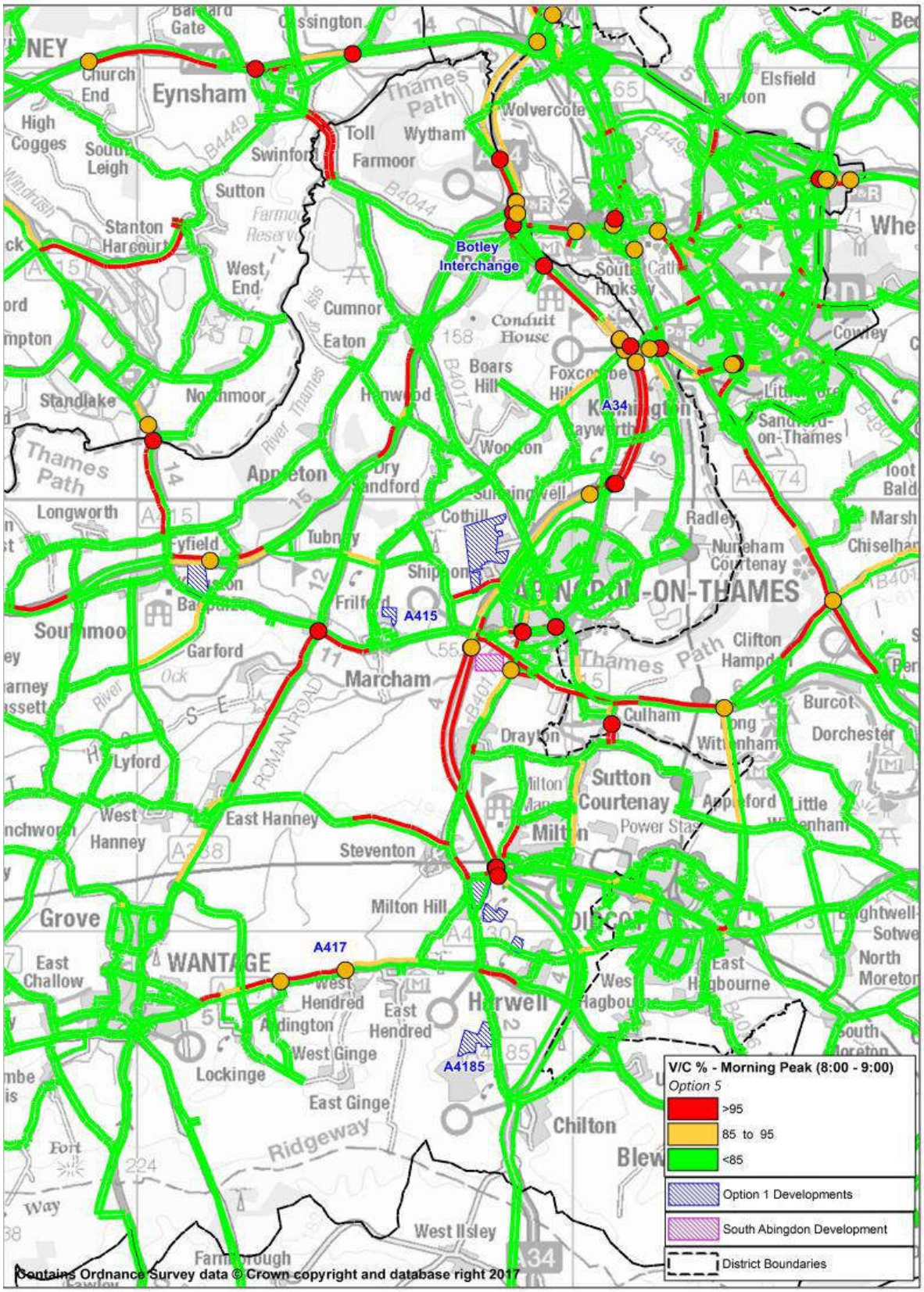
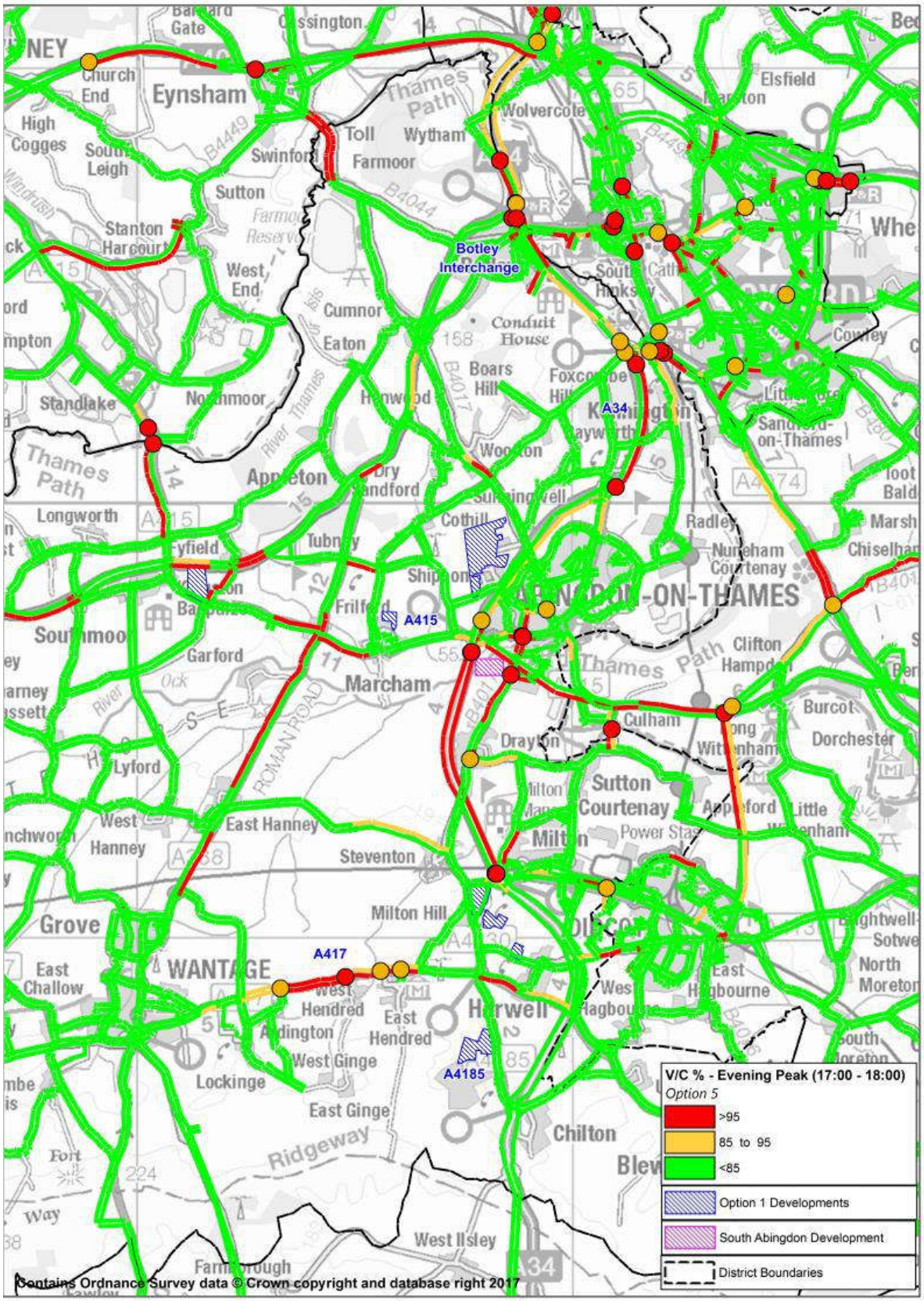


Figure 61 A34, A417, A4185 and A420 corridors V/C for links and junctions– 2031 Scenario 5 PM peak hour



11.6.4. Corridor Performance

Focusing the analysis on only the corridors where delays are forecast to increase by more than 5%, the following corridors shall be discussed for Scenario 5 – A34, A417, A4185 and A420.

11.6.4.1. A34 Corridor

The network performance for Scenario 5 along the A34 corridor is shown in Table 117 and Table 118 for the morning and evening peak hours respectively.

In the morning and evening peak hours, the increased level of demand generated by the Scenario 5 sites is forecast to result in increased delays, total travel time and total distance while the average speed decrease. The additional dwellings mean that A34 corridor performance is likely to be slightly worse when compared to Scenario 1.

Table 117. A34 Chilton – Botley Interchange corridor performance in the morning peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 5 (S5)	Difference (S5 - DM)
Delay (pcu hr)	641	703	10%
Total Time (pcu hr)	3011	3113	3%
Total Distance (pcu km)	191514	194081	1%
Average Speed (km/h)	63.6	62.4	-2%

Table 118. A34 Chilton – Botley Interchange corridor performance in the evening peak hour in 2031

	Chilton – Botley		
	Do-Minimum (DM)	Scenario 5 (S5)	Difference (S5 - DM)
Delay (pcu hr)	809	934	15%
Total Time (pcu hr)	3165	3323	5%
Total Distance (pcu km)	192834	195306	1%
Average Speed (km/h)	60.9	58.8	-3%

11.6.4.2. A417 Corridor

The network performance for Scenario 5 along the A417 corridor is shown in Table 119 and Table 120 for the morning and evening peak hours respectively.

In the morning and evening peak hours, the increased level of demand generated by the Scenario 5 sites is forecast to result in increased delays, total travel time and total distance while the average speed decrease.

Table 119. A417 corridor performance in the morning peak hour in 2031

	A417		
	Do-Minimum (DM)	Scenario 5 (S5)	Difference (S5 - DM)
Delay (pcu hr)	114	124	9%
Total Time (pcu hr)	517	531	3%
Total Distance (pcu km)	21680	21879	1%
Average Speed (km/h)	41.9	41.2	-2%

Table 120. A417 corridor performance in the evening peak hour in 2031

	A417		
	Do-Minimum (DM)	Scenario 5 (S5)	Difference (S5 - DM)
Delay (pcu hr)	136	149	10%
Total Time (pcu hr)	594	620	4%
Total Distance (pcu km)	23292	23635	1%
Average Speed (km/h)	39.2	38.1	-3%

11.6.4.3. A4185 Corridor

The network performance for Scenario 5 along the A4185 corridor is shown in Table 121 and Table 122 for the morning and evening peak hours respectively.

In the morning and evening peak hours, the increased level of demand generated by the Scenario 5 sites is modelled to result in increased delays, total travel time and total distance while the average speed decrease.

Table 121. A4185 corridor performance in the morning peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 5 (S5)	Difference (S5 - DM)
Delay (pcu hr)	8	9	13%
Total Time (pcu hr)	65	75	15%
Total Distance (pcu km)	3698	4074	10%
Average Speed (km/h)	57.1	54.5	-5%

Table 122. A4185 corridor performance in the evening peak hour in 2031

	A4185		
	Do-Minimum (DM)	Scenario 5 (S5)	Difference (S5 - DM)
Delay (pcu hr)	8	9	13%
Total Time (pcu hr)	60	70	17%
Total Distance (pcu km)	3560	4051	14%
Average Speed (km/h)	59.8	57.7	-4%

11.6.4.4. A420 Corridor

The network performance for Scenario 5 along the A420 corridor is shown in Table 123 and Table 124 for the morning and evening peak hours respectively.

In the morning peak hour, the increased level of demand generated by the Scenario 5 sites is predicted to have a very slight impact.

In the evening peak hour, the increased level of demand generated by the Scenario 5 sites is forecast to result in increased delays, total travel time and total distance while the average speed decrease.

Table 123. A420 corridor performance in the morning peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 5 (S5)	Difference (S5 - DM)
Delay (pcu hr)	210	207	-1%
Total Time (pcu hr)	1461	1471	1%
Total Distance (pcu km)	83509	84235	1%
Average Speed (km/h)	57.2	57.3	0%

Table 124. A420 corridor performance in the evening peak hour in 2031

	Shrivenham – Botley		
	Do-Minimum (DM)	Scenario 5 (S5)	Difference (S5 - DM)
Delay (pcu hr)	287	326	14%
Total Time (pcu hr)	1601	1647	3%
Total Distance (pcu km)	87705	88198	1%
Average Speed (km/h)	54.8	53.5	-2%

12. LPP2 Stage 1: Development Scenarios: Analysis Summary

The scenarios considered as part of the second stage of the ETI include a mixture of different levels of housing growth spread across a range of sites. There are positive and negative aspects to each scenario and we have presented analysis of modelled forecasts.

In addition to the Do-minimum assumptions, alternative Development Scenarios for the Vale of White Horse District were considered as follows:

- Scenario 1: 3,600 dwellings focused on Harwell and Dalton Barracks and four smaller sites
- Scenario 2: 3,600 dwellings spread over eleven sites
- Scenario 3: 3,600 dwellings spread over thirteen sites
- Scenario 4: 5,400 dwellings, adding 1,800 dwellings at South Abingdon to Scenario 1 without mitigation
- Scenario 5: 5,400 dwellings, adding 1,800 dwellings at South Abingdon to Scenario 1 with mitigation

In terms of transport supply assumptions (highway, park and ride and public transport), no differences were considered between the Do Minimum and the modelled scenario tests, except that scenario 5 includes the South-Abingdon By-pass.

Congestion is forecast to increase as follows:

- **Scenario 1** is forecast to affect network performance along the A34, particularly at the Botley, Hinksey Hill and Lodge Hill junctions. Additionally, Scenario 1 is forecast to affect network performance on the A420 Near Cumnor, Fyfield and Southmoor;
- **Scenario 2** is modelled to impact upon network performance along the A34, particularly at the Botley Hinksey Hill and Lodge Hill junctions. Furthermore, the A415 at Frilford Road westbound at the A338 approach, near Appleton Road, Marcham Road / Spring Road junction, B4017 / Ock Street junction and Ock Street/ West St Helen Street junction and A420 at Fyfield and Southmoor are forecast to exceed capacity;
- The modelling forecasts an impact on network performance along the A34 under **Scenario 3**, particularly at the Botley, Hinksey Hill and Lodge Hill junctions. The A420 is modelled to exceed capacity at Cumnor, Fyfield and Southmoor.
- Under **Scenario 4**, in addition to network capacity issues identified under Scenario 1, the modelling forecasts capacity impacts along the A417 between Wantage and Featherbed Lane and Westbound approach at Rowstock Roundabout and along A415 at Frilford Road westbound at the A338 approach, near Appleton Road, Marcham Road / Spring Road junction, the B4017 / Ock Street junction and Ock Street / West St Helen Street junction.
- The modelling of the South Abingdon by-pass in **Scenario 5** is forecast to have comparable network performance to Scenario 1.

A summary of highway capacity impacts is provided in Table 125. Scenarios 1 and 3 are modelled to offer good network performance, with a lower forecast impact on the strategic road network, particularly in the morning peak. Generally, the evening peak is forecast to experience network stress in all modelled scenarios. Comparatively, Scenario 3 is forecast to provide the lowest impact on network performance in the evening peak period against the other scenarios. Scenario 4 has a higher level of growth and as a result has a reduced level of network performance. Addition of the South Abingdon by-pass provides an improved level of network performance, but further mitigation measures may be required.

Table 125. Summary of highway capacity impacts - Stage 2

Cluster	Time	Road						
		A420	A34	A415	A4130	A417	A4185	A338
Do Min	Morning peak	The A420 eastbound is forecast to be above operational capacity at Faringdon, eastbound section between Buckland and Longworth, eastbound and westbound directions at Fyfield and eastbound direction at Cumnor.	A34 is forecast to be operating at or above operational capacity in the northbound and southbound directions between Botley and Lodge Hill and between Marcham and Lodge Hill in the northbound direction and in the northbound and southbound directions between Marcham and Milton Interchange.	The A415 is forecast to be operating below operational capacity in the westbound direction except at Frilford junction and Abingdon. In the eastbound direction the A415 is forecast to be operating at or above operational capacity at the approach to Marcham junction and in Abingdon.	The A4130 is forecast to exceeding the operating at capacity at eastbound approach to Milton Interchange and the westbound approach at A4130/B4493 junction.	A417 is operating at or above operational capacity in the eastbound direction between Wantage and Featherbed Lane.	A4185 is performing within capacity.	The A338 is forecast to be above operational capacity in the northbound direction between East Hanney and Frilford.
	Evening peak	The A420 is forecast to be operating above operational capacity at Buckland in both directions, Fyfield in both directions and Cumnor in the westbound direction.	The northbound section between Milton and Marcham is above operational capacity. In the southbound direction the A34 is operating at or above operational capacity between Botley and Lodge Hill, Lodge Hill and Marcham and Marcham and Milton Interchange.	The eastbound and westbound directions at Frilford, eastbound approach at Marcham junction and eastbound and westbound directions in Abingdon are forecast to perform above operational capacity.	The A4130 is forecast to exceeding the operating at capacity at eastbound approach to Milton Interchange and the westbound approach at A4130/B4493 junction.	The eastbound and westbound directions between Wantage and Featherbed Lane and the westbound direction at Rowstock are operating at or above operational capacity.	A4185 is performing within capacity.	The A338 is forecast to be operating above operational capacity in the northbound and southbound directions at Frilford junction and in the southbound direction between East Hanney and Wantage.
Scenario 1	Morning peak	Northbound direction near Cumnor and the northbound direction at Fyfield are forecast to exceed capacity.	A34 is forecast to be operating at or above operational capacity at Botley Interchange, Hinksey Hill Interchange, A34 northbound between Hinksey Hill and Botley Interchange, both directions between Lodge Hill and Hinksey Hill, north and southbound between Marcham Road and				The A4185 is forecast to remain below capacity in both morning and evening peak hours	The A338 northbound is modelled to experience delays between East Hanney and Frilford in both the morning and evening peak hours.

Cluster	Time	Road						
		A420	A34	A415	A4130	A417	A4185	A338
			B4017 and at the A4130 / A34 Interchange.					
	Evening peak	The northbound and southbound directions at Fyfield and the southbound direction near Southmoor are forecast to exceed capacity.	Botley Interchange, Hinksey Hill, the southbound between Botley Interchange and Milton Interchange, both directions between Marcham Road and B4017 and at the A4130 / A34 Interchange are forecast to operate at or above operational capacity.					
Scenario 2	Morning peak	A420 northbound direction near Cumnor and the northbound direction at Fyfield, the southbound direction near Southmoor are forecast to be operating at or above capacity.	Botley Interchange, the A34 northbound towards Botley, between Hinksey Hill and Oxford Road north and southbound, Hinksey Hill junction , both directions between Marcham Road and Milton Interchange and the Milton Interchange junction are forecast to operate at or above capacity.	Sections of A415 / A338 junction, Frilford Road westbound at the A338 approach, the A415 northbound near Appleton Road, Marcham Road / Spring Road junction , B4017 / Ock Street junction and Ock Street/ West St Helen Street junction are forecast to operate at or above capacity.	The A4130 is forecast to remain below capacity in both morning and evening peak hours		The A4185 is forecast to remain below capacity in both morning and evening peak hours	

Cluster	Time	Road						
		A420	A34	A415	A4130	A417	A4185	A338
	Evening peak	The northbound and southbound directions at Fyfield, the northbound direction near Southmoor are forecast to be operating at or above capacity.	The A34 is forecast to be operating at or above operational capacity at Botley Interchange, Hinksey Hill Interchange, southbound towards Lodge Hill and Hinksey Hill, Marcham Road junction, north and southbound between Marcham Road and Milton Interchange and Milton Interchange.	Kingston Road approaching the A338, Frilford Road westbound approaching the A338, Marcham Road / Spring Road junction, B4017 / Ock Street junction and Ock Street / West St Helen Street junction are forecast to operate at or above capacity.				
Scenario 3	Morning peak	Northbound approach at Cumnor, near Fyfield and near Southmoor are forecast to operate at or above capacity.	A34 is forecast to be operating at or above operational capacity at the Botley interchange, northbound between Hinksey Hill and Botley interchange, northbound and southbound between Hinksey Hill and Oxford Road, Oxford Road junction, both directions between Marcham Road and Milton interchange and at Milton interchange junction.		The A4130 is forecast to have minor capacity issues.		The A4185 is forecast to have minor capacity issues.	
	Evening peak	Northbound and southbound near Fyfield and southbound near Southmoor are forecast to operate at or above capacity.	The Botley interchange, Hinksey Hill, the southbound between Hinksey hill and Oxford Road, Oxford Road junction, Marcham Road junction, both directions between Marcham Road and Milton interchange are forecast to operate at or above capacity.					

Cluster	Time	Road						
		A420	A34	A415	A4130	A417	A4185	A338
Scenario 4	Morning peak	Eastbound approach between Buckland and Longworth, Southmoor and Fyfield, Besselsleigh and Cumnor and the approach to Botley Interchange, westbound approach between Southmoor and Fyfield are exceeding capacity.	Northbound approach between Milton Interchange and Botley, southbound approaches between Hinksey Hill and Lodge Hill, Marcham Road junction and Milton Interchange are forecast to be operating at or above capacity.	The A415 / A338 junction, Frilford Road westbound at the A338 approach, the A415 northbound near Appleton Road, Marcham Road / Spring Road junction, the B4017 / Ock Street junction and Ock Street / West St Helen Street junction are forecast to be operating at or above capacity.		Eastbound approach between Wantage and Featherbed Lane, and westbound approach at the Rowstock roundabout are forecast to be operating at or above capacity.	The A4185 corridor is forecast to have minor capacity issues in both morning and evening peak hours.	
	Evening peak	Eastbound and westbound approaches between Southmoor and Fyfield, westbound approach between Cumnor and Besselsleigh are exceeding capacity.	Northbound approach between Milton Interchange and Marcham Road junction and Hinksey Hill and Botley Interchange, southbound approach between Milton Interchange and Botley are exceeding capacity.	Frilford Road eastbound and westbound at the A338 junction, Marcham Road / Spring Road junction, the B4017 / Ock Street junction are forecast to be operating at or above capacity.		Eastbound and westbound approaches between Wantage and Featherbed Lane, and westbound approach at the Rowstock roundabout are forecast to be operating at or above capacity.		
Scenario 5	Morning peak	Eastbound approach between Buckland and Longworth, Southmoor and Fyfield, Besselsleigh and Cumnor and the approach to Botley Interchange, westbound approach between Southmoor and Fyfield are exceeding capacity.	Northbound approach between Milton Interchange and Botley, southbound approaches between Hinksey Hill and Lodge Hill, Marcham Road junction and Milton Interchange are forecast to be operating at or above capacity.			Eastbound approach between Wantage and Featherbed Lane, and westbound approach at the Rowstock roundabout are forecast to be operating at or above capacity.	The A4185 corridor is forecast to have minor capacity issues in both morning and evening peak hours.	

Cluster	Time	Road						
		A420	A34	A415	A4130	A417	A4185	A338
	Evening peak	Eastbound and westbound approaches between Southmoor and Fyfield, westbound approach between Cumnor and Besselsleigh are exceeding capacity.	Northbound approach between Milton Interchange and Marcham Road junction and Hinksey Hill and Botley Interchange, southbound approach between Milton Interchange and Botley are exceeding capacity.			Eastbound and westbound approaches between Wantage and Featherbed Lane, and westbound approach at the Rowstock roundabout are forecast to be operating at or above capacity.		

13. Next Steps

A comprehensive assessment of forecast development growth and associated transport impacts has been undertaken. The LPP2 ETI modelling work summarised in this report - Stage 1 Clusters and Stage 1 Development Scenarios have helped to inform proposed site selection, recognising that transport evidence is only part of the consideration in proposing new sites.

The analysis summarised in this report will be used to inform decision making and to determine a preferred development scenario. The analysis should also be applied to determine potential locations where highway infrastructure and sustainable transport mitigation may be required to support future development and growth.

Appendices

Appendix A. Demand Model Results

A.1. Summary of Demand Model results for the entire model

A.1.1. Cluster 1

Morning peak period (07:00-10:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 1 (C1)	C1-DM
Reg car (veh.)	239,449	333,799	94,350	338,436	4,637
P&R (veh.)	2,221	3,124	903	3,193	69
Bus only (pax)	27,925	34,600	6,675	35,093	493
Rail (pax)	9,302	16,128	6,826	16,636	508
TOTAL (persons)	338,981	471,415	132,434	478,287	6,872

Inter Peak period (10:00 – 16:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 1 (C1)	C1-DM
Reg car (veh.)	418,193	622,502	204,309	630,713	8,211
P&R (veh.)	2,235	2,416	181	2,407	-9
Bus only (pax)	46,839	68,256	21,417	68,639	383
Rail (pax)	9,824	22,724	12,900	22,906	182
TOTAL (persons)	581,864	871,765	289,901	882,584	10,819

Evening peak period (16:00 - 19:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 1 (C1)	C1-DM
Reg car (veh.)	316,831	418,807	101,976	423,771	4,964
P&R (veh.)	2,021	2,610	589	2,708	98
Bus only (pax)	27,885	34,229	6,344	34,628	399
Rail (pax)	11,112	17,987	6,875	18,361	374
TOTAL (persons)	437,259	578,595	141,336	585,681	7,086

A.1.2. Cluster 2

Morning peak period (07:00-10:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 2 (C2)	C2-DM
Reg car (veh.)	239,449	333,799	94,350	336,622	2,823
P&R (veh.)	2,221	3,124	903	3,140	16
Bus only (pax)	27,925	34,600	6,676	34,858	258
Rail (pax)	9,302	16,128	6,827	16,391	262
TOTAL (persons)	338,981	471,415	132,433	475,481	4,066

Inter Peak period (10:00 – 16:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 2 (C2)	C2-DM
Reg car (veh.)	418,193	622,502	204,308	627,005	4,504
P&R (veh.)	2,235	2,416	181	2,435	19
Bus only (pax)	46,839	68,256	21,417	68,447	191
Rail (pax)	9,824	22,724	12,899	22,838	114
TOTAL (persons)	581,864	871,765	289,900	877,721	5,956

Evening peak period (16:00 - 19:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 2 (C2)	C2-DM
Reg car (veh.)	316,831	418,807	101,975	421,769	2,962
P&R (veh.)	2,021	2,610	589	2,619	9
Bus only (pax)	27,885	34,229	6,344	34,445	216
Rail (pax)	11,112	17,987	6,875	18,171	184
TOTAL (persons)	437,259	578,595	141,336	582,709	4,113

A.1.3. Cluster 3

Morning peak period (07:00-10:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 3 (C3)	C3-DM
Reg car (veh.)	239,449	333,799	94,350	336,791	2,992
P&R (veh.)	2,221	3,124	903	3,192	68
Bus only (pax)	27,925	34,600	6,676	34,909	309
Rail (pax)	9,302	16,128	6,827	16,502	374
TOTAL (persons)	338,981	471,415	132,433	475,911	4,496

Inter Peak period (10:00 – 16:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 3 (C3)	C3-DM
Reg car (veh.)	418,193	622,502	204,308	628,113	5,611
P&R (veh.)	2,235	2,416	181	2,418	2
Bus only (pax)	46,839	68,256	21,417	68,458	202
Rail (pax)	9,824	22,724	12,899	22,867	143
TOTAL (persons)	581,864	871,765	289,900	879,126	7,361

Evening peak period (16:00 - 19:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 3 (C3)	C3-DM
Reg car (veh.)	316,831	418,807	101,975	422,160	3,353
P&R (veh.)	2,021	2,610	589	2,648	38
Bus only (pax)	27,885	34,229	6,344	34,484	255
Rail (pax)	11,112	17,987	6,875	18,234	247
TOTAL (persons)	437,259	578,595	141,336	583,330	4,735

A.1.4. Cluster 4

Morning peak period (07:00-10:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 4 (C4)	C4-DM
Reg car (veh.)	239,449	333,799	94,350	335,265	1,466
P&R (veh.)	2,221	3,124	903	3,129	5
Bus only (pax)	27,925	34,600	6,676	34,794	194
Rail (pax)	9,302	16,128	6,827	16,281	153
TOTAL (persons)	338,981	471,415	132,433	473,598	2,183

Inter Peak period (10:00 – 16:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 4 (C4)	C4-DM
Reg car (veh.)	418,193	622,502	204,308	625,104	2,602
P&R (veh.)	2,235	2,416	181	2,417	1
Bus only (pax)	46,839	68,256	21,417	68,337	81
Rail (pax)	9,824	22,724	12,899	22,802	78
TOTAL (persons)	581,864	871,765	289,900	875,177	3,412

Evening peak period (16:00 - 19:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 4 (C4)	C4-DM
Reg car (veh.)	316,831	418,807	101,975	420,519	1,712
P&R (veh.)	2,021	2,610	589	2,613	3
Bus only (pax)	27,885	34,229	6,344	34,391	162
Rail (pax)	11,112	17,987	6,875	18,093	106
TOTAL (persons)	437,259	578,595	141,336	581,006	2,411

A.1.5. Cluster 5

Morning peak period (07:00-10:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 5 (C5)	C5-DM
Reg car (veh.)	239,449	333,799	94,350	336,887	3,088
P&R (veh.)	2,221	3,124	903	3,135	11
Bus only (pax)	27,925	34,600	6,676	34,869	269
Rail (pax)	9,302	16,128	6,827	16,591	463
TOTAL (persons)	338,981	471,415	132,433	476,017	4,602

Inter Peak period (10:00 – 16:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 5 (C5)	C5-DM
Reg car (veh.)	418,193	622,502	204,308	627,836	5,334
P&R (veh.)	2,235	2,416	181	2,434	18
Bus only (pax)	46,839	68,256	21,417	68,441	185
Rail (pax)	9,824	22,724	12,899	22,936	212
TOTAL (persons)	581,864	871,765	289,900	878,849	7,084

Evening peak period (16:00 - 19:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 5 (C5)	C5-DM
Reg car (veh.)	316,831	418,807	101,975	422,369	3,562
P&R (veh.)	2,021	2,610	589	2,682	72
Bus only (pax)	27,885	34,229	6,344	34,440	211
Rail (pax)	11,112	17,987	6,875	18,350	363
TOTAL (persons)	437,259	578,595	141,336	583,701	5,106

A.1.6. Cluster 6

Morning peak period (07:00-10:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 6 (C6)	C6-DM
Reg car (veh.)	239,449	333,799	94,350	336,712	2,913
P&R (veh.)	2,221	3,124	903	3,131	7
Bus only (pax)	27,925	34,600	6,676	34,876	276
Rail (pax)	9,302	16,128	6,827	16,461	333
TOTAL (persons)	338,981	471,415	132,433	475,671	4,256

Inter Peak period (10:00 – 16:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 6 (C6)	C6-DM
Reg car (veh.)	418,193	622,502	204,308	627,805	5,303
P&R (veh.)	2,235	2,416	181	2,417	1
Bus only (pax)	46,839	68,256	21,417	68,424	168
Rail (pax)	9,824	22,724	12,899	22,831	107
TOTAL (persons)	581,864	871,765	289,900	878,671	6,906

Evening peak period (16:00 - 19:00)

Entire model	Base Year (BY)	Do Minimum (DM)	DM-BY	Cluster 6 (C6)	C6-DM
Reg car (veh.)	316,831	418,807	101,975	422,127	3,320
P&R (veh.)	2,021	2,610	589	2,610	0
Bus only (pax)	27,885	34,229	6,344	34,453	224
Rail (pax)	11,112	17,987	6,875	18,212	225
TOTAL (persons)	437,259	578,595	141,336	583,195	4,600