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Version 1.0 – First Draft sent to client
Version 1.1 – Updated Draft issued to client 08/09/14
Version 1.2 – Updated Draft issued to client 03/12/14
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1. Introduction

South Oxfordshire District Council is in the process of reviewing their Core Strategy Development Plan. The Core Strategy, adopted in December 2012, is the spatial plan that sets out the amount and locations of new development that will take place within the district up to 2026. The review of the Core Strategy – the Local Plan 2031 – will plan for growth to 2031.

The new local plan will inform the scale and shape of development across South Oxfordshire up to 2031, setting out priorities for the future of the area and identifying where new development should be built. The new local plan will be focused on providing new housing and employment to meet the needs of South Oxfordshire residents.

In order to demonstrate that the impacts of increased growth forecasts since the adoption of the Core Strategy on the strategic and local road network have been taken into account, an Evaluation of Transport Impacts (ETI) is required. The ETI provides a robust and credible evidence base upon which the soundness of the Local Plan 2031 can be assessed.

This draft technical note is the first stage of an iterative process to understand the impacts of development on the transport network. There will continue to be further modelling as other data is collected on a range of subjects – for example from landscape capacity studies – and also consultation responses, and the preferred options for development locations are narrowed down. There will also be work to understand what mitigation might be appropriate for identified issues, but this report is at the stage of understanding impact before any mitigation is considered.

This exercise will be undertaken using the COTM. The model will be used in fixed highway demand mode only and is suitable for identifying highway impacts and consistent with recent work undertaken for Vale of White Horse District Council.

Regarding the model, coverage to the south and east of Wallingford is limited with the B4009 being the south eastern extent of the detailed highway network, meaning the junction related delays to the south east of this road are not modelled. Nettlebed, Sonning Common and Henley on Thames are not modelled in the simulation network and traffic problems at these locations would be under-reported. Consequently, options that have a high level of growth in these locations would contain a level of uncertainty greater than other

options; however, there is still some value as the problems in the modelled area will still be identified, just the full extent of problems outside of the modelled area will be less certain

1.1. Scope

This technical note considers the impacts of six land use options in South Oxfordshire through a series of statistics, tables and plots:

- Section 2 outlines the characteristics of the six development scenarios; and
- Section 3 highlights the impact of the different development scenarios across the highway network.

This study uses the model base as it stood with the Vale Local Plan assessment at ETI Stage 3 which represents the housing figures within the Oxfordshire Strategic Housing Market Assessment (SHMA).

The Stage 3 modelling work was undertaken to help the Vale of White Horse District Council to fully understand the impacts of the new housing target (20,560 homes up to 2031) and the proposed mix of development sites consulted on in February 2014. The distribution of these developments was added to the Vale Stage 1 - Draft Local Plan Consultation (Feb 2013) allocations and is shown in Table 1-1. Strategic sites at Monks Farm, Crab Hill and some 2100 dwellings at Valley Park were also included within the land use assumptions along with other completed and committed sites.

Table 1-1 Vale ETI Stage 3 (Housing Delivery Update Feb 14) Strategic Sites

Strategic Site	Dwellings	Strategic Site	Dwellings
South West Faringdon	200	East Sutton Courtenay	220
South Faringdon	200	South Drayton	200
South Shrivenham	200	South Marcham	200
North Shrivenham	400	North Abingdon-on-Thames	410
West Stanford in the Vale	290	North West Abingdon-on-Thames	200
North West of East Challow	200	South Cumnor	200
East Hanney	200	South Kennington	270
Valley Park (additional)	400	North West Radley	240
East Harwell Campus	1400	North Radley	200
Milton Heights	1400	East Wootton	200
West of Harwell	200		

ETI Stage 1 concluded that the following highway interventions were required to support the South East Draft Local Plan Consultation (Feb 2013) growth and they were also assumed to be present in this scenario test:

- Featherbed Lane;
- Steventon Lights;
- Milton Interchange;
- Chilton north facing slips;
- Hagbourne Hill Improvements;
- Harwell Link Road (B4493 to A417);
- Science Bridge;
- Harwell Oxford entrance and
- Rowstock roundabout

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2. Development Scenarios

Six development scenarios have been presented as part of the South Oxfordshire Local Plan 2031. We have used the top of the SHMA identified range for development as a 'worst case' in order to understand potential impact at this early stage. The detail in terms of housing numbers by settlement for each scenario is included in Appendix A. The scenarios are to be compared against the Core Strategy which is considered to be the 'base' scenario. These are described as:

- Core Strategy – 9,100 houses apportioned with 55% of houses in Didcot and the remainder split 60% to Market Towns and 40% to the larger villages;
- Scenario A – Additional 6,000 homes apportioned as per the Core Strategy distribution;
- Scenario B – Additional 6,000 homes focussed on Science Vale (60%) with remainder across 'sustainable settlements';
- Scenario C – Additional 6,000 homes all in Science Vale;
- Scenario D – Additional 6,000 homes all in a single new settlement (in this case around Milton Common);
- Scenario E – Additional 6,000 homes dispersed evenly across all settlements (in this case 143 in each site);
- Scenario F – Additional 6,000 homes next to neighbouring major urban areas (in this case split 3,000 near Reading and 3,000 near Oxford near Grenoble Road).

3. Impact of Development Scenarios

The impact of the different development scenarios across the South Oxfordshire element of the model has been considered. In large the core statistics presented in Tables 2 & 3 relate to Passenger Car Units (PCUs), which is a vehicle unit used for expressing highway capacity (Car/LGV = 1, HGV = 2.3, Bus = 3). The following outputs compare the difference in each scenario to that in the Core Strategy 'base':

- Delays (PCU hours);
- Total Travel Time (PCU hours);
- Total Distance (PCU KMs); and
- Average Speed (KPH).

This information is also shown graphically for South Oxfordshire, South Oxfordshire and Vale of White Horse and the rest of the core modelled area (most of the county).

In addition to network wide impacts we are interested in the particular impacts across six main corridors in the district. For these, plots showing capacity constraints on the corridors and at junctions are investigated (Figures 2 to 15).

3.1. Scenario Impacts on Network

Tables 2 & 3 document the impacts of the different development scenarios across South Oxfordshire. All development scenarios result in generalised negative impacts throughout the network, whilst the morning peak hour performs worse than the evening peak in every development scenario. On a whole, the difference in impacts between development scenarios is limited during either time period. It should also be noted that the impacts from Scenario F will not be fully represented as only those trips either going to, from or through South Oxfordshire will be included in the model outputs.

Morning Peak Hour

During the morning peak hour Scenario C demonstrates the worse impacts upon the South Oxfordshire network, closely followed by Scenario D. Scenario C is forecast to result in a 33% rise in delay and a 9% reduction in speed during the morning peak, whilst Scenario D is forecast to result in a 30% rise in delay and a 7% reduction in speed. These two options concentrate the developments in only two places (Didcot and Berinsfield) in Scenario C and in only one place (Milton Common) for Scenario D. This would strengthen

the urban areas which could be more readily served by public transport and enable more journeys to be made by public transport, walking and cycling; meaning that the impact of these options are possibly over-estimated.

Scenarios A and B are forecast to result in very similar impacts during the morning peak, namely a 23% rise in delay and a 6% reduction in speed. The forecast results for these sites are similar as the distribution of development is broadly similar. It is worth noting that approximately 10-15% of the developments are located in the southern extent of South Oxfordshire and outside of the core modelled area meaning that the impact of these options are possibly under-estimated.

Scenarios E is similar to Scenarios A and B during the morning peak and is forecast to results in a 25% rise in delay and a 5% reduction in speed. This scenario spreads the developments widely across South Oxfordshire, this providing little potential for journeys to be made sustainably. It is also worth noting that a proportion of the developments are located in the southern extent of South Oxfordshire and outside of the core modelled area meaning that the impact of these options are likely to be under-estimated.

The impacts of Scenario F are the least influential in the morning peak with a 10% rise in forecast delay and a 2% reduction in forecast speed. However, the location of half of the proposed developments are situated on the edge of the modelled network, thus development trips generated to anywhere outside the core network are not represented in the model; meaning that the impact of these options are likely to be a large under-estimate.

Table 1. South Oxfordshire highway network statistics (morning peak hour)

AM	Core Strategy	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E	Scenario F
Delay (PCU/hr)	2136.1	2620.7	2629	2834.4	2774.2	2661.7	2340.3
% Change from Core Strategy	-	23%	23%	33%	30%	25%	10%
Total time (PCU/hr)	7803	8547	8555	8672	8586	8589	8156
% Change from Core Strategy	-	10%	10%	11%	10%	10%	5%
Total distance (PCU/km)	427337	441663	441455	434687	435614	444955	437125
% Change from Core Strategy	-	3%	3%	2%	2%	4%	2%
Average speed (kph)	54.8	51.7	51.6	50.1	50.7	51.8	53.6
% Change from Core Strategy	-	-6%	-6%	-9%	-7%	-5%	-2%

The impact of the developments on other parts of the Oxfordshire network are shown in Figure 1. In addition to data for South Oxfordshire (described above), this also shows the impact on the network in South Oxfordshire and Vale of White Horse (grey) and the rest of the core modelled area (yellow). The notable impact is found in Scenario C, which is forecast to increase delay across the South Oxfordshire by 33% across South Oxfordshire and Vale of White Horse network by 12% (the reduction from 33% to 12% is a result of the delay now being considered over a far greater area of network and suggests that the impact being forecast in the Vale is limited). It should also be said that Scenario C, with development focused at existing urban areas of Didcot and Berinsfield, is more likely to be able to support and enhanced public transport service which would be able to provide a viable alternative to car travel. Some of the other scenarios, with dispersed development proposals are unlikely to find that public transport could mitigate their transport impacts.

Evening Peak Hour

As mentioned above, the forecast impact in the evening peak hour is not as intense as the morning peak hour. This will be based upon conditions at the time COTM was built and could reflect a more widely distributed evening peak period compared to an intense morning peak hour.

During the evening peak hour Scenario C demonstrates the worse impacts upon the South Oxfordshire network with results forecasting in a 16% rise in delay and a 4% reduction in speed during the evening peak.

Scenarios A, B, D and E are forecast to result in very similar impacts during the evening peak, namely an 11-14% rise in delay and a 3% reduction in speed.

The impacts of Scenario F are the least influential in the evening peak with a 5% rise in forecast delay and a 1% reduction in forecast speed. However, the location of half of the proposed developments are situated on the edge of the modelled network, thus development trips generated to anywhere outside the core network are not represented in the model; meaning that the impact of these options are likely to be a large underestimate.

Figure 1. Changes in highway delay in the morning peak hour

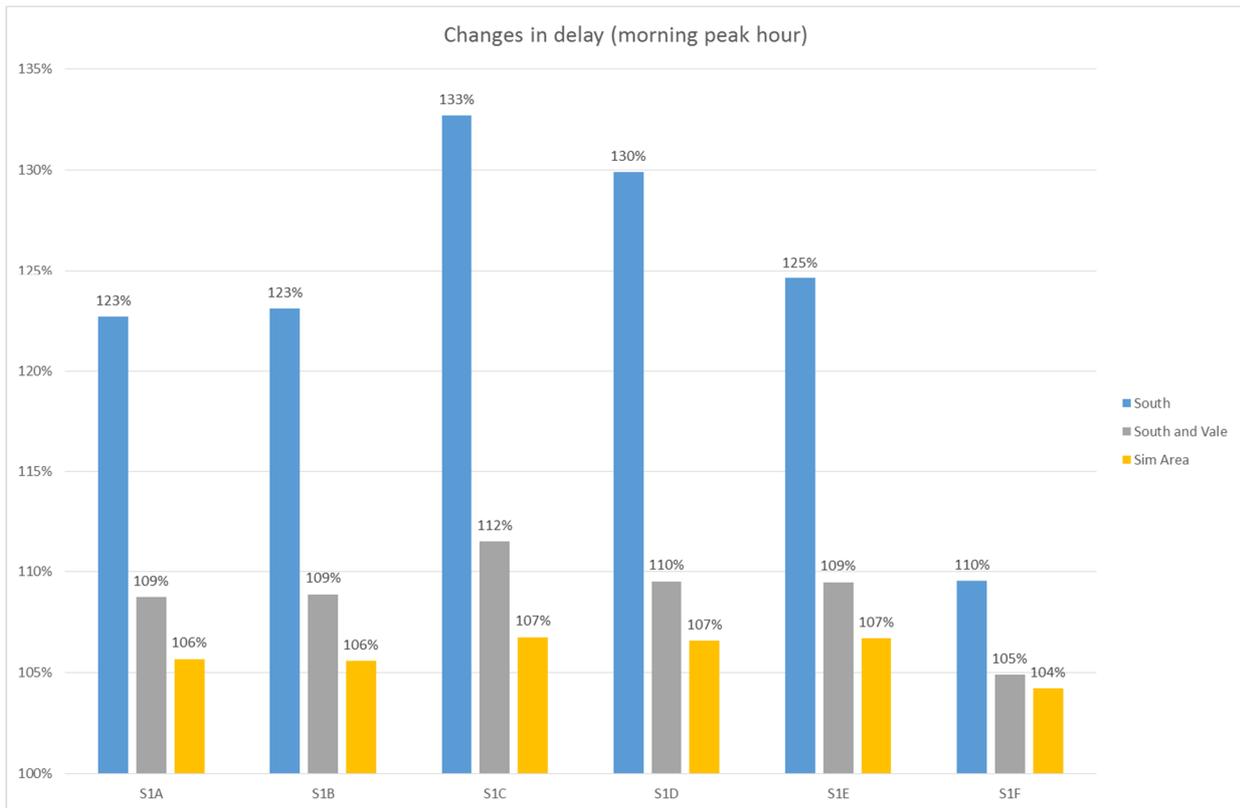


Table 2. South Oxfordshire highway network statistics (evening peak hour)

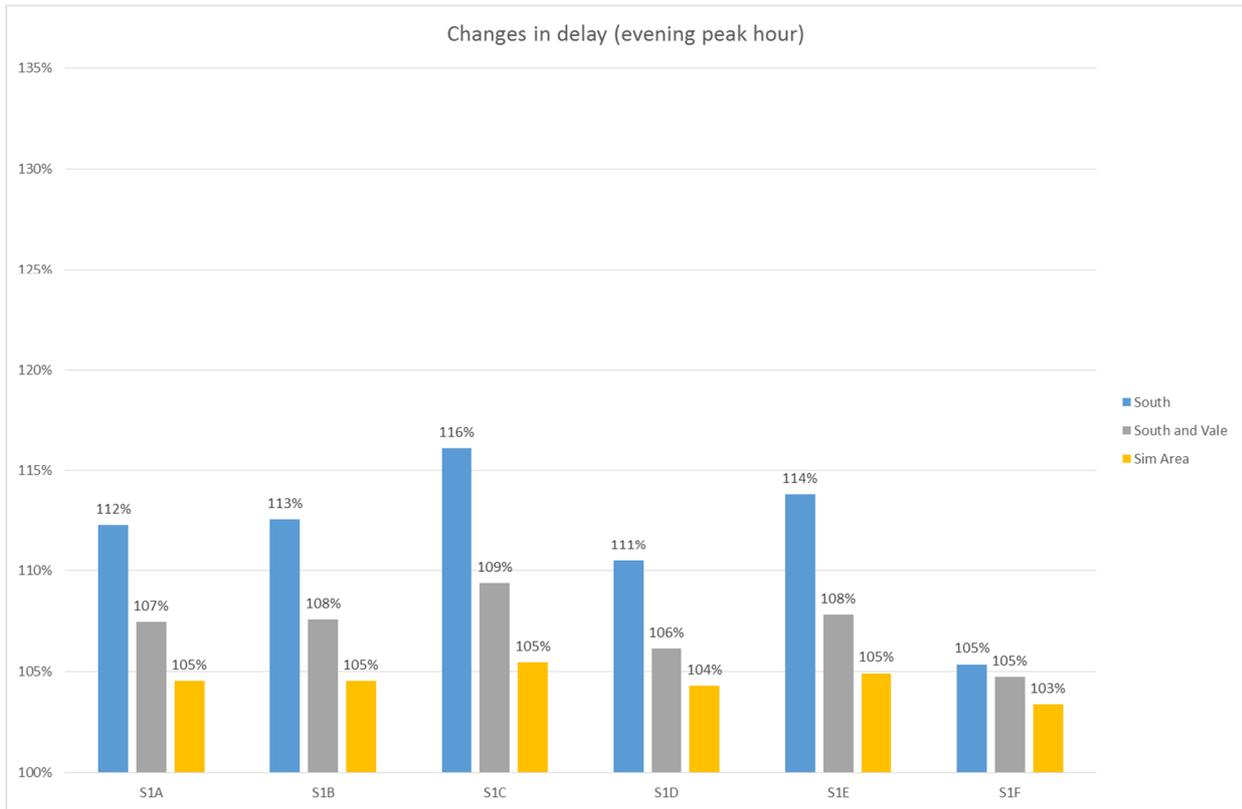
PM	Core Strategy	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E	Scenario F
Delay (PCU/hr)	2293	2575	2582	2663	2534	2610	2416
% Change from Core Strategy	-	12%	13%	16%	11%	14%	5%
Total time (PCU/hr)	8109	8618	8625	8669	8576	8710	8344
% Change from Core Strategy	-	6%	6%	7%	6%	7%	3%
Total distance (PCU/km)	441126	455448	455254	451904	454466	460238	449058

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% Change from Core Strategy	-	3%	3%	2%	3%	4%	2%
Average speed (kph)	54.4	52.8	52.8	52.1	53	52.8	53.8
% Change from Core Strategy	-	-3%	-3%	-4%	-3%	-3%	-1%

The impact of the developments on other parts of the Oxfordshire network are shown in Figure 2. Again, the most notable impact is found in Scenario C, which is forecast to increase delay across the South Oxfordshire and Vale of White Horse network by 9% compared to between 6-8% elsewhere.

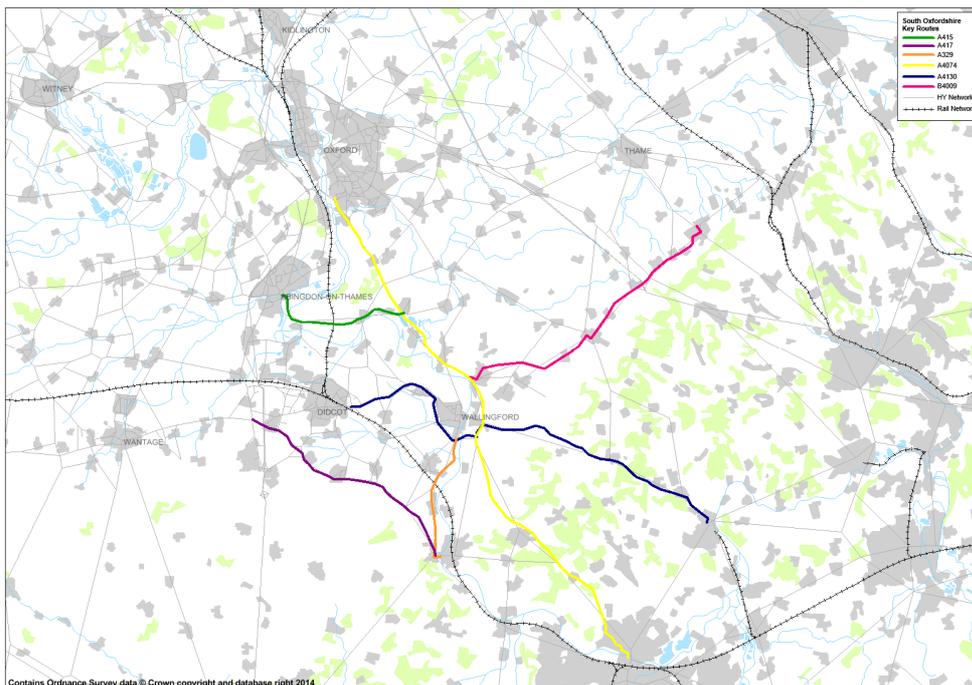
Figure 2. Changes in highway delay in the evening peak hour



3.2. Scenario Impacts on Corridors

There are six key corridors of particular interest in relation to impacts from the Scenarios. These are highlighted in Figure 1 against the highway (HY) network.

Figure 3. Key Corridors of Interest



3.3. Key Route Impacts

The impacts of each development scenario are documented in Appendix C in terms of Volume over Capacity (V/C). The network is said to be operating at operational capacity with a V/C ratio between 75% and 90% and at or above capacity above 90%.

The overriding conclusion is that these plots illustrate limited differences from the reference case and between scenarios in terms of impacts upon the highway network during either time period, although differences are more prominent between scenarios during the AM peak than the PM peak. The small changes apparent on these plots are likely to be as a result of several factors:

- The additional trips on the network are relatively spread out and are not impacting severely on any one area;
- Junctions and links have enough spare capacity that any increase is not enough to tip it into the next category on the plot;
- Junctions are already considered over capacity so any increase is not registering on the plots, and not enough to have significant knock on effects across the rest of the network.

The following section outlines where there are noticeable differences against the reference case, focussing on the key routes identified in Figure 1. A complete list of areas of concern along the specified key routes can be found in Appendix B.

Scenarios A-F: General

The following lists generic differences between the reference case and each development scenario:

- All development scenarios result in greater capacity constraints at the Avon Way junction on the northern edge of Didcot on the A4130 in both directions during both time periods. It is worth noting that the reference case additional infrastructure was included (listed in Section 1) which is adding capacity to the network and hence possibly reducing the number of capacity constraints emerging in that area as a result of additional trips;
- The B4009 Westbound between Benson and the A4074 junction is now operating over capacity during both time periods;
- The A4074/A329 junction at Shillingford is operating at or close to capacity in all development scenarios in both time periods. Every approaching arm is now experiencing severe capacity constraints during both time periods; and
- None of the development scenarios have a negative impact upon the capacity of the A4155 between Reading and Henley-on-Thames in either direction or time period. However the A4155 is located on the edge of the model and not very well represented, so it is difficult to determine the impacts of the development scenarios on the A4155.

Scenario A

- To the north of Didcot, the B4016/Sires Hill junction is now experiencing severe capacity constraints during the PM peak;
- The A4074 to the east of Wallingford is experiencing greater levels of V/C in both directions during the AM peak;
- Further north along the A4074 between Nuneham Courtenay and Oxford is experiencing greater capacity constraints during both time periods; and
- Traffic volume on the A4130 westbound between Henley-on-Thames and the B481 junction has increased to and beyond capacity in the AM peak.

Scenario B

- The developments proposed in Scenario B result in similar impacts on capacity to Scenario A due to the nature of development;
- To the north of Didcot, the B4016/Sires Hill junction is now experiencing severe capacity constraints during the PM peak;
- The A4074 to the east of Wallingford experiences greater levels of V/C in both directions during the AM peak;
- Further north, the A4074 northbound between Nuneham Courtenay and Oxford is experiencing greater capacity constraints during the AM and PM peak; and

- There has been an increase in traffic volume on the A4130 westbound between the B480 junction and the B481 junction during the AM peak.

Scenario C

- As with other scenarios there is an increase in capacity constraints within Didcot, and around the northern edge of the town on the A4130 in both directions during both time periods, although this is not noticeably greater than other scenarios despite the concentration of development within the Didcot area;
- To the east of Wallingford, the A4074 southbound is now operating at capacity during the AM peak;
- The A4074 northbound between Shillingford and Berinsfield is now operating at capacity during both time periods;
- Additionally, the A4074 southbound towards Berinsfield from the B4015 junction is now also severely constrained during both time periods; and
- Further north, the A4074 northbound between Nuneham Courtenay and Oxford is experiencing greater capacity constraints during the AM peak, whilst the capacity issue has switched from northbound to southbound in the PM peak.

Scenario D

- Development at this location is forecast to have its main impact on local roads around the site and the A40 between the M40 and Oxford and on local roads between Great Milton and Oxford. Its impact on links in South Oxfordshire is small. The impact on local roads are forecast as being significant although this highlights the need for a development of this size to be incorporated into the surrounding transport network both sensitively and with due mitigation.

Scenario E

- To the north of Didcot, the B4016/Sires Hill junction is experiencing greater capacity constraints during the AM and PM peak;
- The A329 northbound is now experiencing capacity constraint between Caps Lane at Cholsey and the A4130 junction during the AM peak;
- To the east of Wallingford, the A4074 southbound is now also operating at capacity during the AM peak, and close to capacity in the opposite direction; and
- Further north, the A4074 northbound between Nuneham Courtenay and Oxford is experiencing greater capacity constraints during the AM peak, however there has been an improvement in the level of V/C in the same direction during the PM peak. Again, on further investigation this is because of a minor change but over the border of the two classifications, going from 76% to 74% V/C.

Scenario F

- On the A417 there are higher levels of V/C heading westbound towards Blewbury from Westfield Road during the AM peak period;
- The A329 northbound is now experiencing capacity constraint between Caps Lane at Cholsey and the A4130 junction during the AM peak; and
- The A4074 northbound between Nuneham Courtenay and Oxford is experiencing greater capacity constraints during the AM peak.

3.4. Summary of Impacts

This technical note has investigated the impacts of the proposed development scenarios upon the South Oxfordshire highway network. Possible mitigations have not been considered at this stage.

Across the entire network the AM peak hour performs worse than the PM peak in every development scenario. This is supported by the fact that along key routes small scale capacity improvements are evident in some development scenarios (Scenarios D and E) during the PM peak.

On the whole, there is limited difference between scenarios in terms of resulting impacts on the highway network during either time period, although differences are more prominent between scenarios during the AM peak than the PM peak. Bearing this in mind Scenario C results in the greatest negative impact upon the South Oxfordshire

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network during both time periods. This is closely followed by Scenario D, whilst the impacts of Scenarios A and B could be considered identical and again very similar to Scenario E. Scenario F has the least impact upon the network during both time periods, however the trips generated by the proposed development are not accurately represented in the model due to the location of the development sites being on the periphery of the study area.

Network capacity in terms of V/C has not changed significantly between the reference case and any of the development scenarios. Of all six key routes identified, the A4074 between Wallingford and Oxford is the most negatively affected section of the highway network in all development scenarios.

It should be noted that since this work has started, further work on a transport strategy for Vale of White Horse has been completed and the Oxford Transport Strategy is nearer completion. Both of this would have impact on these results with the Culham Bridge and Clifton Hampden Bypass proposed in the Vale Local Plan likely to have a significant impact.

Appendix A. Development Scenario Details

The Core Strategy distribution is as follows:

Didcot = 6300	Henley = 400	Benson = 125	Goring = 105
	Thame = 775	Berinsfield = 109	Nettlebed = 20
	Wallingford = 555	Chalgrove = 80	Sonning Common = 138
		Chinnor = 159	Watlington = 79
		Cholsey = 128	Wheatley = 50
		Crowmarsh Gifford = 48	Woodcote = 73

See the **additional** numbers for the different options below - all based on an additional **6000** homes. These are assumptions for modelling purposes only based on mathematical proportions and include no planning constraints for the additional numbers or the input of any consultations. This is in order to evaluate the potential high level transport impact of each potential distribution.

As planning constraints and consultation input are analysed these numbers are likely to change but we will test new numbers in more detail at the preferred options stage.

3.4.2. Option A: Continue to use Core Strategy distribution

Didcot:	1620 (2020) split between the Towns as follows:	1080 (actually 1086 due to rounding up) split between the Larger Villages as follows -	
Didcot = 3300 <i>1650 at NE & 1650 at SE</i>	Henley = 648	Benson = 83	Goring = 105
	Thame = 567	Berinsfield = 75	Nettlebed = 24
	Wallingford = 405 <i>western side (A4130 loading)</i>	Chalgrove = 81	Sonning Common = 146
		Chinnor = 163	Watlington = 75
		Cholsey = 98	Wheatley = 127
		Crowmarsh Gifford = 35	Woodcote = 74

3.4.3. Option B: 60% to Science Vale and 40% to sustainable settlements

Science Vale (3600):		Remaining 2400 split between sustainable settlements as follows:	
Didcot = 3300 <i>1650 at NE & 1650 at SE</i>		Thame = 480	Chinnor = 137
Culham = 15	East Hagbourne = 15	Wallingford = 480 <i>western side (A4130 loading)</i>	Cholsey = 137
Clifton Hampden = 15	West Hagbourne = 15	Henley = 480	Crowmarsh Gifford = 137
Burcot = 15	Long Wittenham = 15	Benson = 137	Sonning Common = 137
Berinsfield = 210		Chalgrove = 137	Watlington = 137

3.4.4. Option C: All additional housing in Science Vale

Science Vale (6000):		
Didcot = 3300 <i>1650 at NE & 1650 at SE</i>	Berinsfield = 2400 <i>Load onto A415 & A4074</i>	
Culham = 50	East Hagbourne = 50	Burcot = 50
Clifton Hampden = 50	West Hagbourne = 50	Long Wittenham = 50

3.4.5. Option D: New settlement

Milton Common (Junction 7/8 M40) = 6000 *Load onto M40 & A4130*

3.4.6. Option E: Spread development across all settlements

6000 split evenly between the following 42 settlements, which include the Towns, Larger Villages and several smaller villages (**143 each**)

Didcot	Nettlebed	Dorchester	Rotherfield Peppard
Henley	Sonning Common	East Hagbourne	Shiplake Cross
Thame	Watlington	Ewelme	South Moreton
Wallingford	Wheatley	Garsington	South Stoke
Benson	Woodcote	Great Milton	Stadhampton
Berinsfield	Aston Rowant	Horspath	Stoke Row
Chalgrove	Beckley	Kidmore End	Tetsworth
Chinnor	Brightwell cun Sotwell	Lewknor	Warborough and Shillingford NE of A4074
Cholsey	Checkendon	Little Milton	Whitchurch on Thames
Crowmarsh Gifford	Clifton Hampden	Long Wittenham	
Goring	Culham	Marsh Baldon	

3.4.7. Option F: Urban extensions

Oxford = 3000 – *Grenoble Road loading*

Reading = 3000

Appendix A. Key Route Impacts

B4009

- In all development scenarios sections of the B4009 westbound between Lewknor and Watlington and Benson and the A4074 junction are operating at or above operational capacity in the AM and PM peak period.

A4130

- The reference case indicates the A4130 is operating at operational capacity between the A329 junction and the A4074 junction in both directions during the AM peak, and only eastbound in the PM peak. Westbound between Henley and the B480 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak;
- Scenario A indicates the A4130 is operating at operational capacity between the A329 junction and the A4074 junction in both directions during the AM peak, and only eastbound in the PM peak. Westbound between Henley and the B480 junction is operating at or above capacity during the AM peak, and is operating at operational capacity in both directions during the PM peak. Westbound between the B480 junction and the B481 junction is operating at operational capacity during the AM peak;
- Scenario B indicates the A4130 is operating at operational capacity between the A329 junction and the A4074 junction in both directions during the AM peak, and only eastbound in the PM peak. Westbound between Henley and the B480 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak. Westbound between the B480 junction and the B481 junction is operating at operational capacity during the AM peak;
- Scenario C indicates the A4130 is operating at operational capacity between the A329 junction and the A4074 junction in both directions during the AM peak, and only eastbound in the PM peak. Westbound between Henley and the B480 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak;
- Scenario D indicates the A4130 westbound is operating at operational capacity between the A329 junction and the A4074 junction during the AM peak, and eastbound in the PM peak. Westbound between Henley and the B480 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak;
- Scenario E indicates the A4130 is operating at operational capacity between the A329 junction and the A4074 junction in both directions during the AM peak, and eastbound during PM peak. Westbound between Henley and the B480 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak. Westbound between the B480 junction and the B481 junction is operating at operational capacity during the AM peak;
- Scenario F indicates the A4130 is operating at operational capacity between the A329 junction and the A4074 junction in both directions during the AM peak, and eastbound during PM peak. Westbound between Henley and the B480 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak.

A329

- In the reference case and development scenarios A-D there are no capacity issues to report on the A329;
- Scenario E and F indicate the A329 northbound is operating at operational capacity between Caps Lane at Cholsey and the A4130 junction during the AM peak.

A4074

- The reference case indicates the A4074 northbound is operating at operational capacity between Sandford and Nuneham Courtenay during the PM peak. Northbound between Nuneham Courtenay and the B4015 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak. Northbound between Berinsfield and Shillingford is operating at operational capacity during the AM and PM peak. Southbound between Warborough Road at Shillingford and the A4329 junction is operating at or above capacity during the AM and PM peak. Northbound between the A4329 junction and the B4009 junction is operating at operational capacity during the AM and PM peak. Three out of four arms approaching the A4074/A4329 junction is operating at or over capacity during both time periods. Southbound between the B4009 junction and the A4130 junction is operating at operational

capacity during the AM peak and at or over capacity during the PM peak, whilst northbound flow is operating at operational capacity in the PM peak. Between the A4130 junction and Nosworthy Way junction the A4074 is operating at or over capacity in both directions during both time periods;

- Scenario A indicates the A4074 northbound is operating at operational capacity between Oxford and Nuneham Courtenay during the AM peak, and in both directions during the PM peak. Northbound between Nuneham Courtenay and the B4015 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak. Northbound between Berinsfield and Shillingford is operating at operational capacity during the AM and PM peak. Southbound between Warborough Road at Shillingford and the A4329 junction is operating at or above capacity during the AM and PM peak. Northbound between the A4329 junction and the B4009 junction is operating at or over capacity during the AM and PM peak. Every arm approaching the A4074/A4329 junction is operating at or over capacity during both time periods. Southbound between the B4009 junction and the A4130 junction is operating at capacity during the AM and PM peak, whilst northbound flow is operating at operational capacity during both time periods. Between the A4130 junction and Nosworthy Way junction the A4074 is operating at or over capacity in both directions during both time periods;
- Scenario B indicates the A4074 northbound is operating at operational capacity between Oxford and Nuneham Courtenay during the AM peak, and in both directions during the PM peak. Northbound between Nuneham Courtenay and the B4015 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak. Northbound between Berinsfield and Shillingford is operating at operational capacity during the AM peak and PM peak. Southbound between Warborough Road at Shillingford and the A4329 junction is operating at capacity during the AM and PM peak. Northbound between the A4329 junction and the B4009 junction is operating at or over capacity during the AM and PM peak. Every arm approaching the A4074/A4329 junction is operating at or over capacity during both time periods. Southbound between the B4009 junction and the A4130 junction is operating at capacity during the AM and PM, whilst northbound flow is operating at operational capacity in the AM and PM peak. Between the A4130 junction and Nosworthy Way junction the A4074 is operating at or over capacity in both directions during both time periods;
- Scenario C indicates the A4074 northbound is operating at operational capacity between Oxford and Nuneham Courtenay during the AM peak, and southbound during the PM peak. Northbound between Nuneham Courtenay and the B4015 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak. Southbound between the B4015 junction and Berinsfield is operating at or over capacity during the PM peak. Northbound between Berinsfield and Shillingford is operating at capacity during the AM and PM peak. Southbound between Warborough Road at Shillingford and the A4329 junction is operating at capacity during the AM and PM peak. Northbound between the A4329 junction and the B4009 junction is operating at operational capacity during the AM peak, and at or over capacity during the PM peak. Three out of four arms approaching the A4074/A4329 junction is operating at or over capacity during both time periods. Southbound between the B4009 junction and the A4130 junction is operating at or over capacity during the AM and PM peak, whilst northbound flow is operating at operational capacity in the PM peak. Between the A4130 junction and Nosworthy Way junction the A4074 is operating at or over capacity in both directions during both time periods;
- Scenario D indicates the A4074 northbound is operating at operational capacity Nuneham Courtenay and the B4015 junction is operating at operational capacity during the AM and PM peak. Northbound between Berinsfield and Shillingford is operating at operational capacity during the AM and PM. Southbound between Warborough Road at Shillingford and the A4329 junction is operating at or above capacity during the AM and PM peak. Northbound between the A4329 junction and the B4009 junction is operating at operational capacity during the AM peak, and at capacity during the PM peak. Three out of four arms approaching the A4074/A4329 junction is operating at or over capacity during both time periods. Southbound between the B4009 junction and the A4130 junction is operating at capacity during the AM peak and at operational capacity during the PM peak, whilst northbound flow is also operating at operational capacity in the PM peak. Between the A4130 junction and Nosworthy Way junction the A4074 is operating at or over capacity in both directions during both time periods;
- Scenario E indicates the A4074 northbound is operating at operational capacity between Oxford and Nuneham Courtenay during the AM peak. Northbound between Nuneham Courtenay and the B4015 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak. Northbound between Berinsfield and Shillingford is operating at operational capacity during the AM and PM peak. Southbound between Warborough Road at Shillingford and the A4329 junction is operating at capacity during the AM and PM peak. Northbound between the A4329 junction and the B4009 junction is operating at capacity during the AM and PM peak. Every arm approaching the

A4074/A4329 junction is operating at or over capacity during both time periods. Southbound between the B4009 junction and the A4130 junction is operating at capacity during the AM and PM peak, whilst northbound flow is operating at operational capacity during both time periods. Between the A4130 junction and Nosworthy Way junction the A4074 is operating at or over capacity in both directions during both time periods;

- Scenario F indicates the A4074 northbound is operating at operational capacity between Oxford and Nuneham Courtenay during the AM and PM peak. Northbound between Nuneham Courtenay and the B4015 junction is operating at operational capacity during the AM peak, and in both directions during the PM peak. Northbound between Berinsfield and Shillingford is operating at operational capacity during the AM and PM peak. Southbound between Warborough Road at Shillingford and the A4329 junction is operating at capacity during the AM and PM peak. Northbound between the A4329 junction and the B4009 junction is operating at operational capacity during the AM peak, and at capacity during the PM peak. Three out of four arms approaching the A4074/A4329 junction is operating at or over capacity during both time periods. Southbound between the B4009 junction and the A4130 junction is operating at operational capacity during the AM peak and over capacity during the PM peak, whilst northbound flow is operating at operational capacity during both time periods. Between the A4130 junction and Nosworthy Way junction the A4074 is operating at or over capacity in both directions during both time periods.

A417

- The reference case indicates the A417 westbound is operating at operational capacity between Chalk Hill and Spring Lane at Aston Tirrold during the AM peak. Between the B4493 junction and the A4185 junction the A417 is operating at operational capacity in both directions during the PM peak;
- Scenarios A, B and C indicates the A417 eastbound between Upton and Main Street at West Hagbourne is operating at operational capacity during the AM peak. Westbound between the B4493 junction and the A4185 junction is operating at operational capacity during the AM and PM peak, whilst eastbound flow is operating at operational capacity during the AM peak, and at capacity during the PM peak;
- Scenario D indicates the A417 between the B4493 junction and the A4185 junction is operating at operational capacity in both directions during the AM and PM peak;
- Scenario E indicates the A417 westbound between Upton and Main Street at West Hagbourne is operating at or over capacity during the AM peak. Between the B4493 junction and the A4185 junction the A417 is operating at operational capacity in both directions during the AM and PM peak;
- Scenario F indicates the A417 westbound is operating at operational capacity between Westfield Road and Chalk Hill at Aston Tirrold during the AM peak. Westbound between Upton and Main Street at West Hagbourne is operating at or over capacity during the AM peak. Between the B4493 junction and the A4185 junction the A417 is operating at operational capacity in both directions during the AM and PM peak;

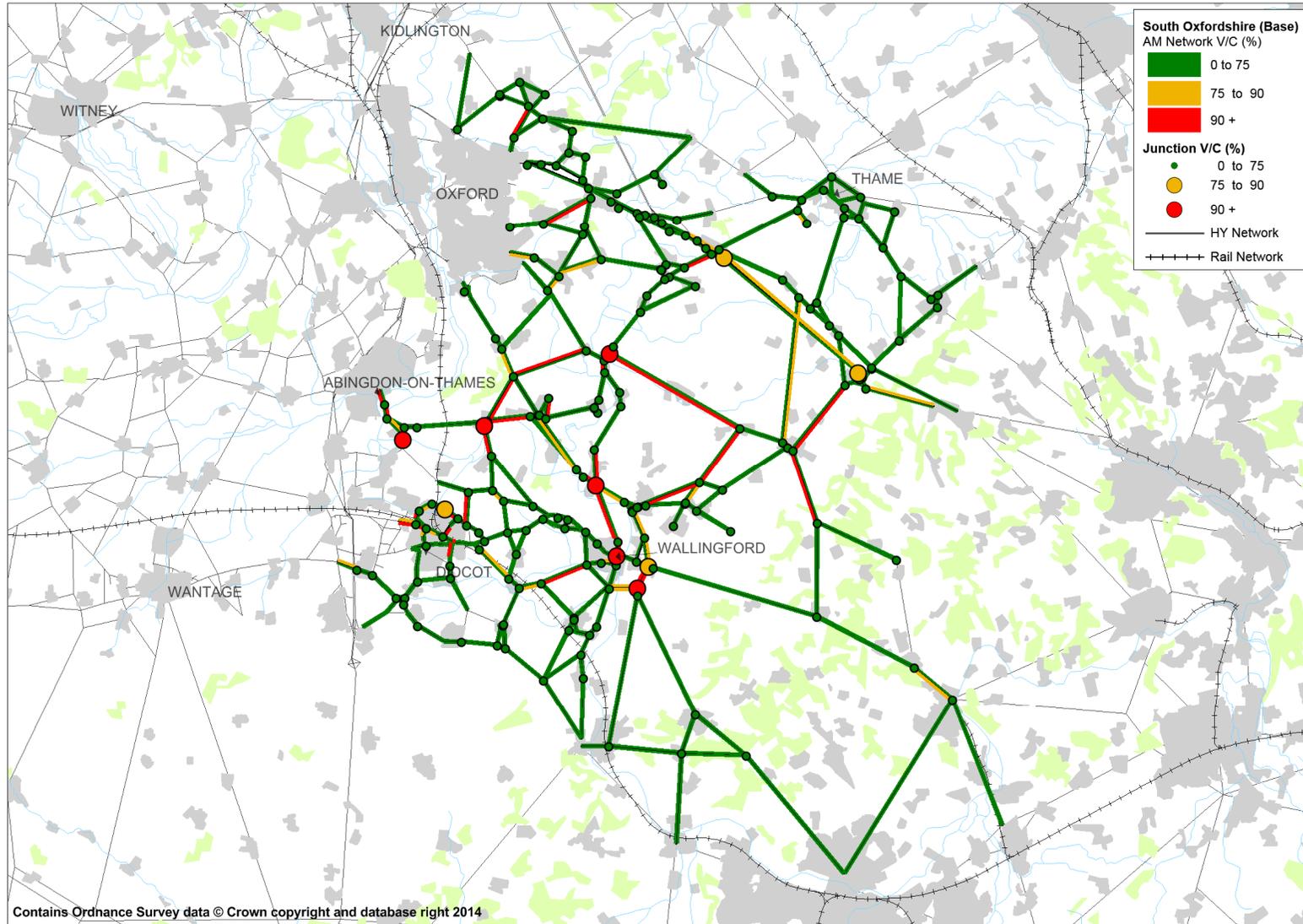
A415

- In the reference case and Scenario A the A415 westbound is operating at or over capacity between Burcot and Clifton Hampden during the AM peak. Eastbound between the Burycroft Road junction and the Tollgate Road junction at Culham is operating at operational capacity during the AM peak. Eastbound between Burycroft Road and the River Thames crossing at Abingdon is operating at capacity during the AM peak. Westbound between the River Thames crossing at Abingdon and Abingdon ring road is operating at or over capacity during the AM and PM peak.
- Scenarios B, C, D, E and F indicate the A415 westbound is operating at or over capacity between Burcot and Clifton Hampden during the AM peak. Eastbound between the Burycroft Road junction and the Tollgate Road junction at Culham is operating at operational capacity during the AM peak. Eastbound between Burycroft Road and the River Thames crossing at Abingdon is operating at or over capacity during the AM peak. Westbound between the River Thames crossing at Abingdon and Abingdon ring road is operating at or over capacity during the AM and PM peak.

Appendix C. Network Capacity

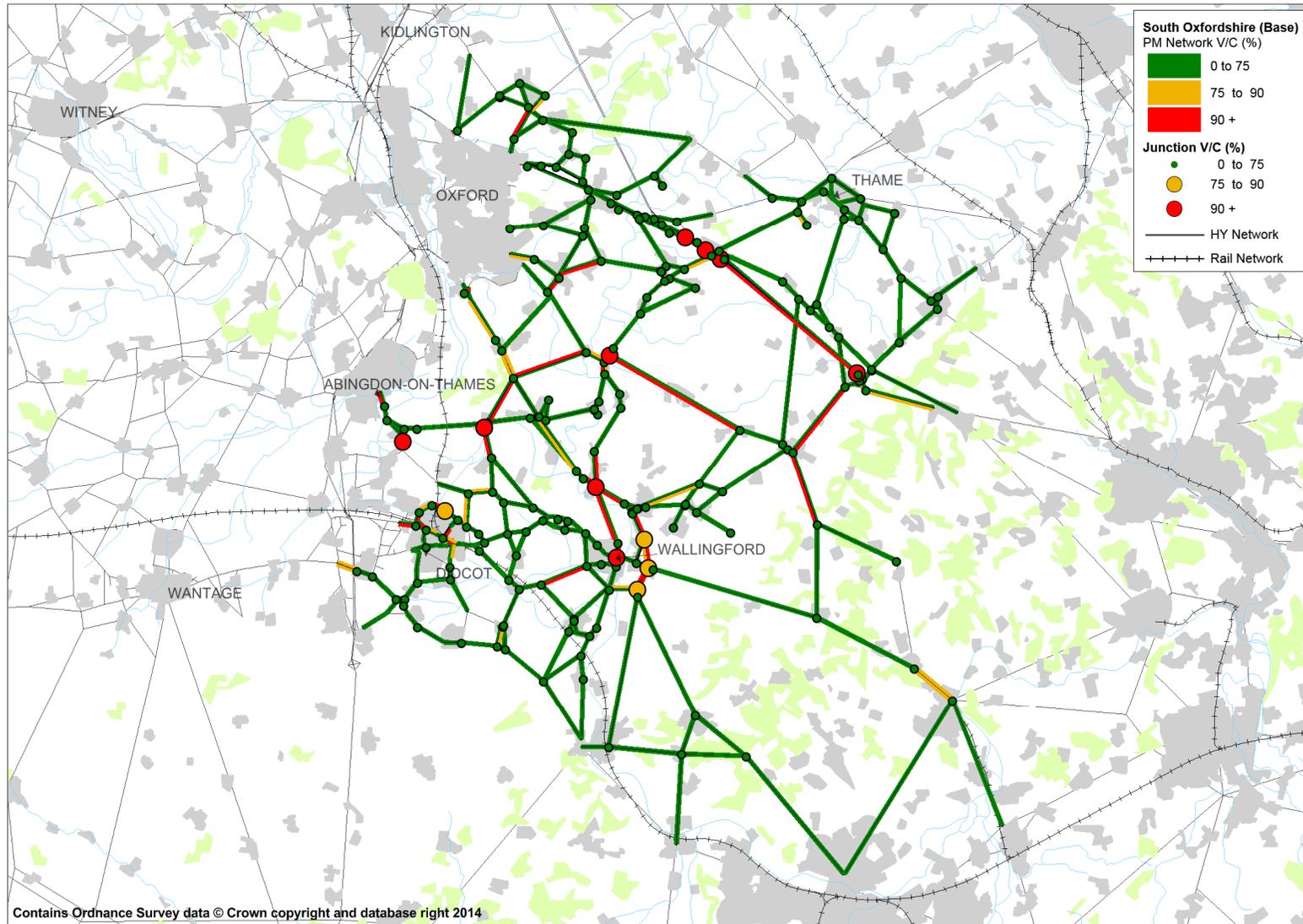
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Figure 1. Impact on the traffic network – Reference Case AM Peak Hour



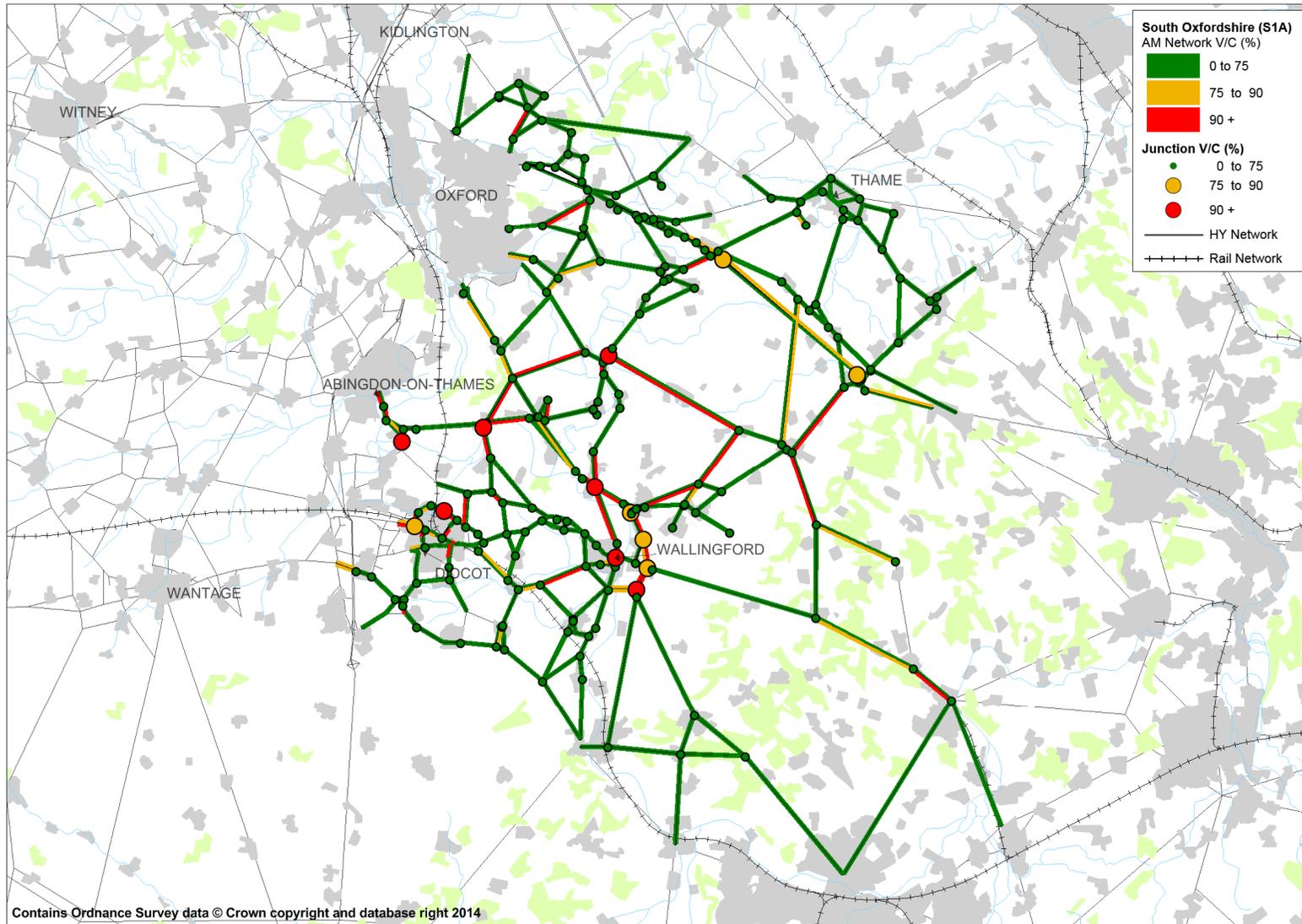
Draft Technical Note

Figure 2. Impact on the traffic network – Reference Case PM Peak Hour



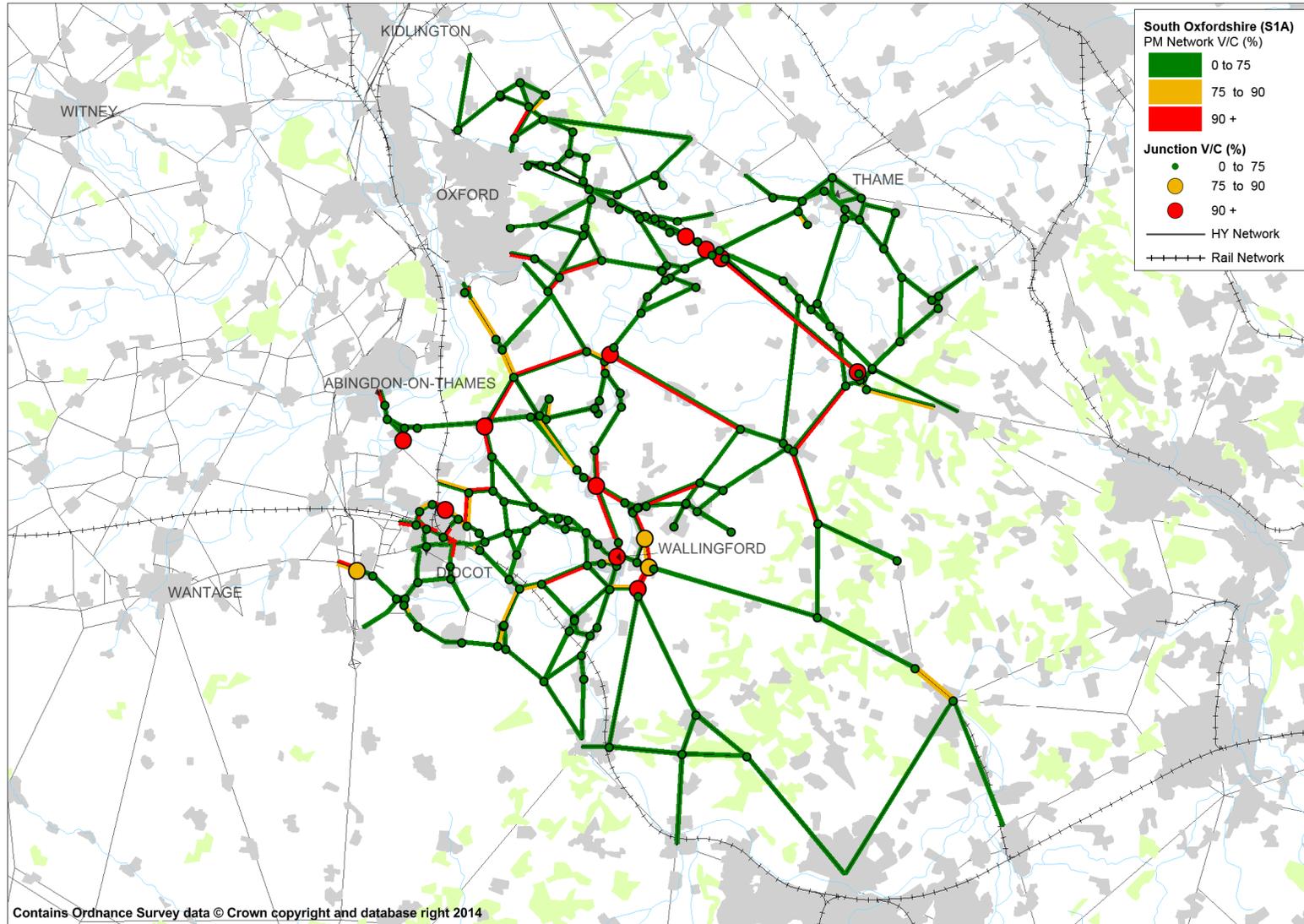
Draft Technical Note

Figure 3. Impact on the traffic network - Scenario A AM Peak Hour



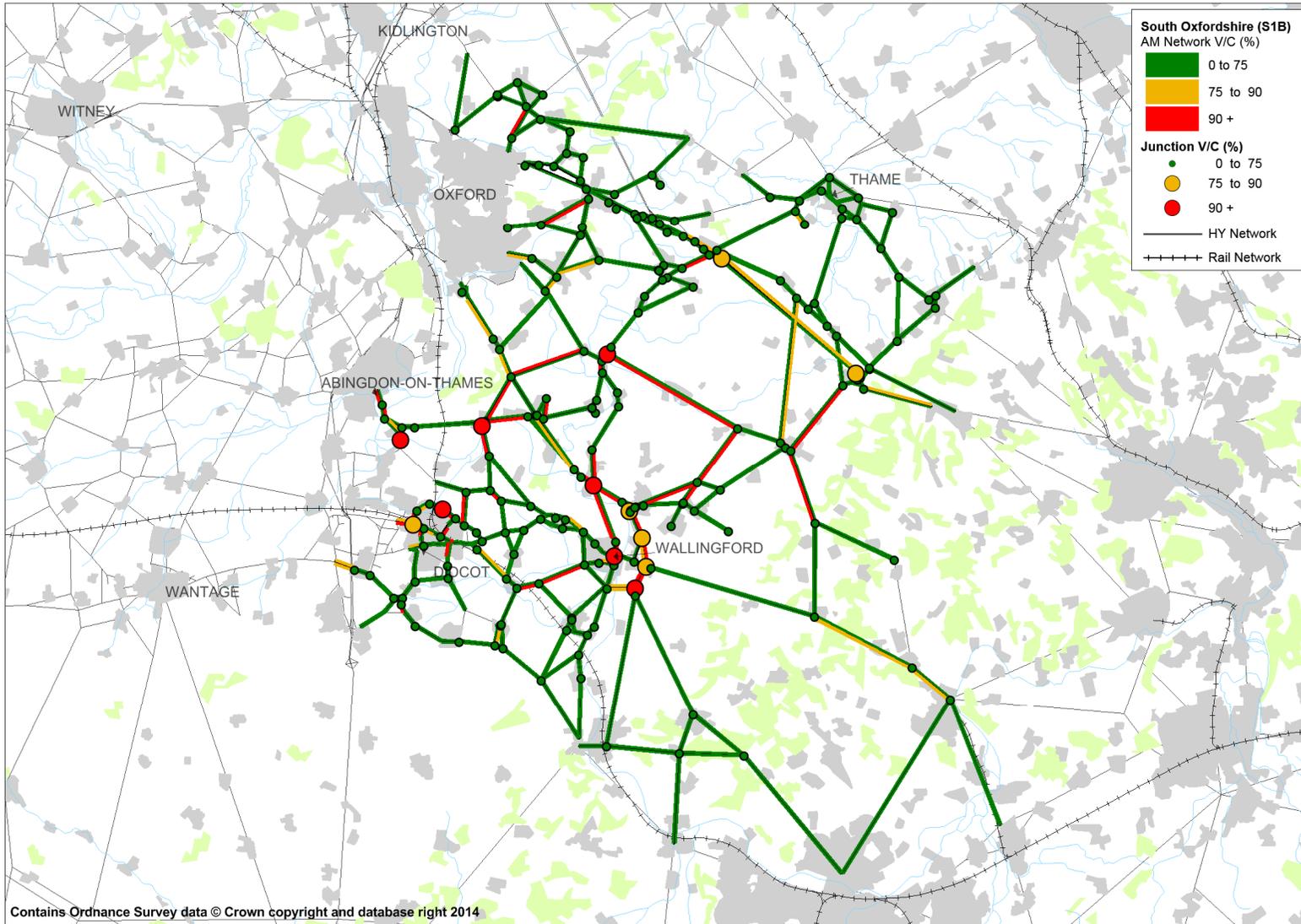
Draft Technical Note

Figure 4. Impact on the traffic network - Scenario A PM Peak Hour



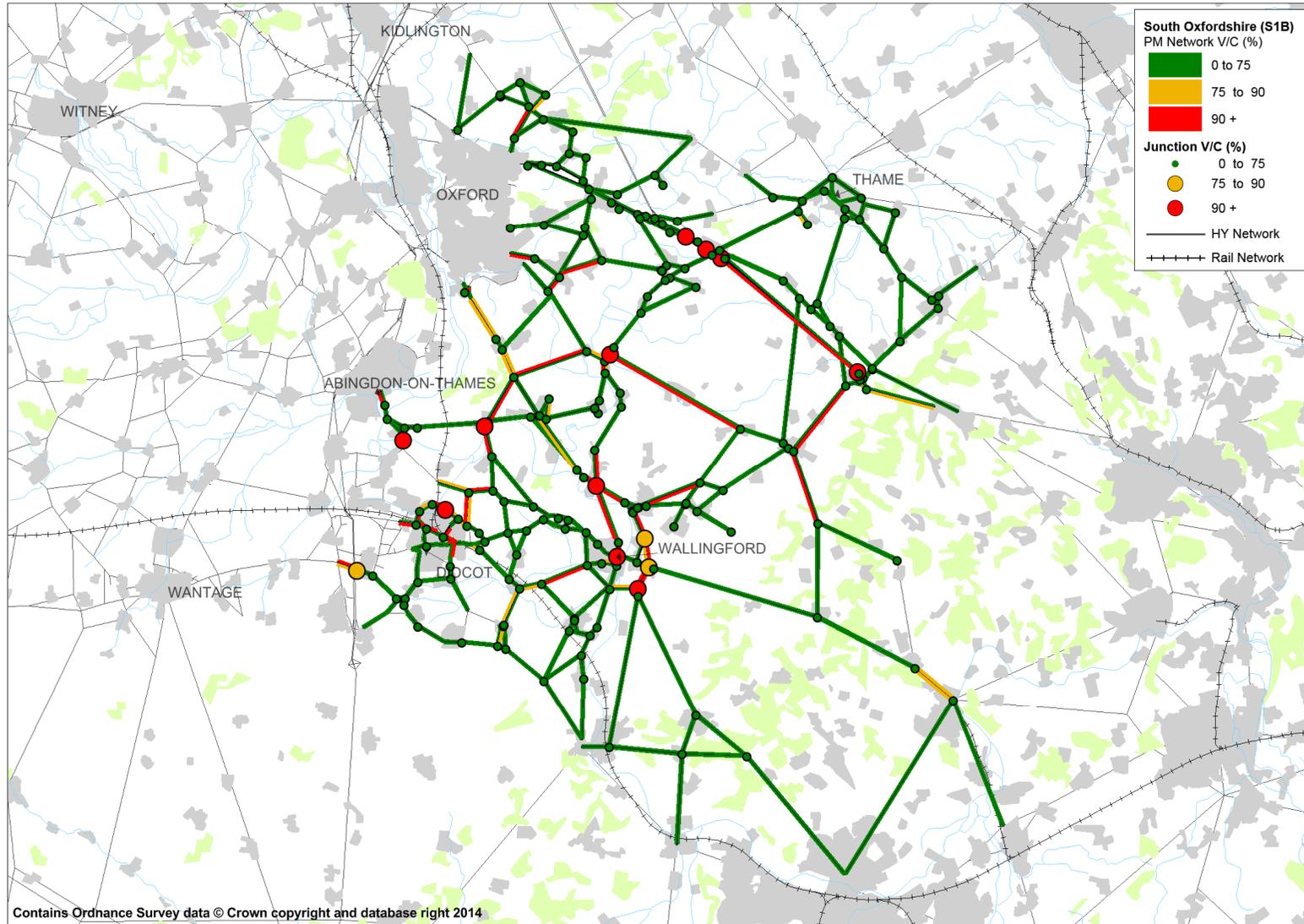
Draft Technical Note

Figure 5. Impact on the traffic network - Scenario B AM Peak Hour



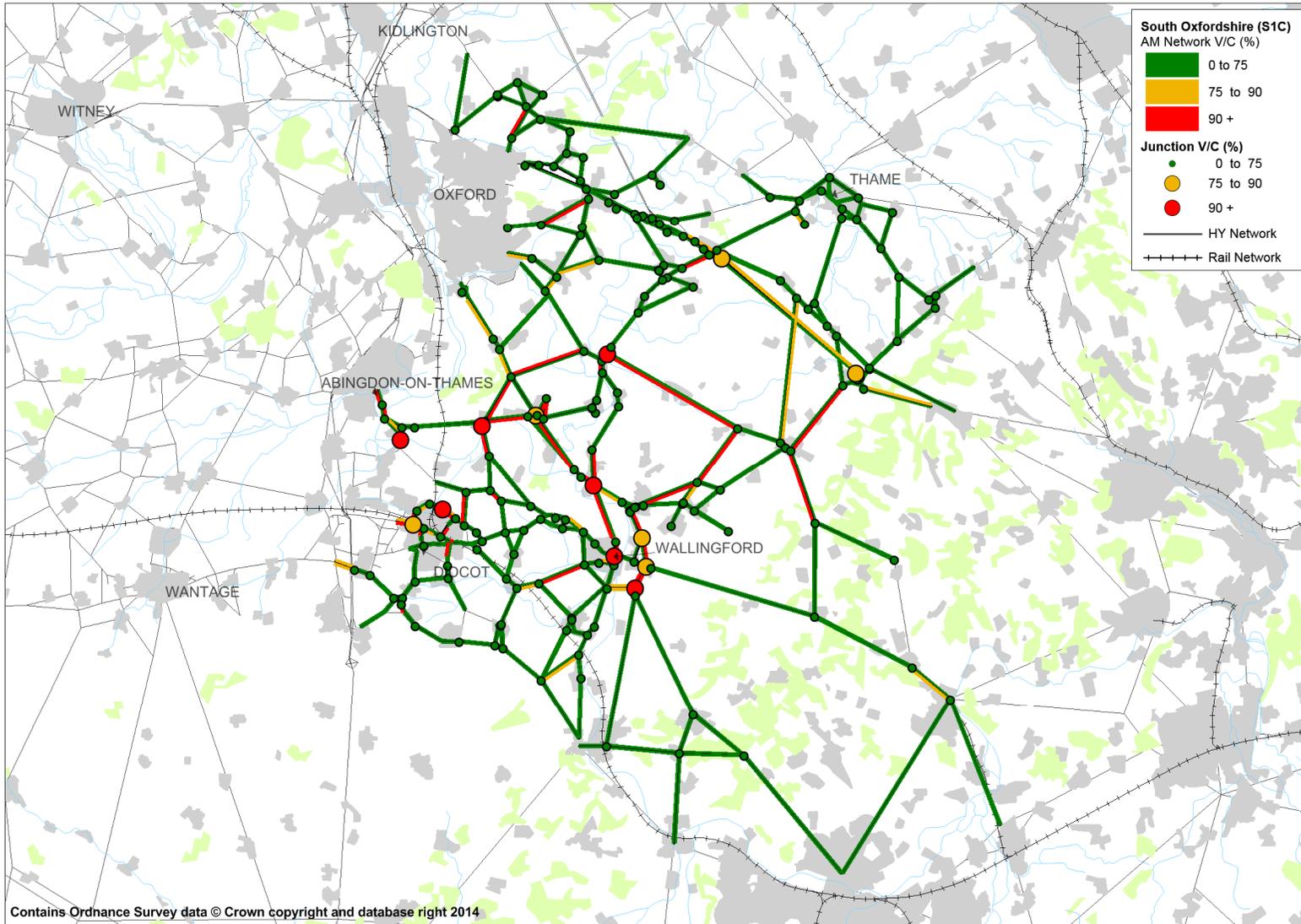
Draft Technical Note

Figure 6. Impact on the traffic network - Scenario B PM Peak Hour



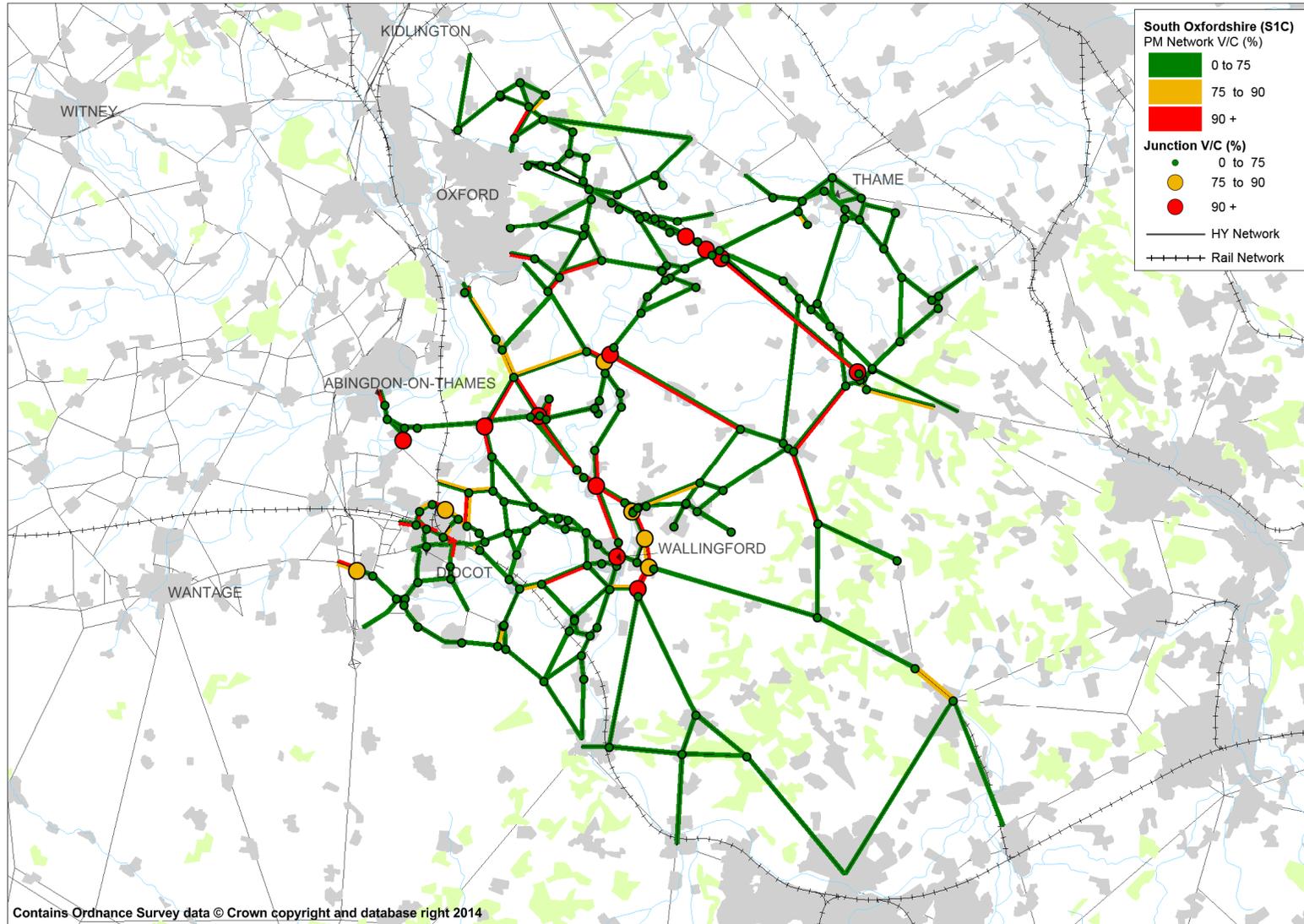
Draft Technical Note

Figure 7. Impact on the traffic network - Scenario C AM Peak Hour



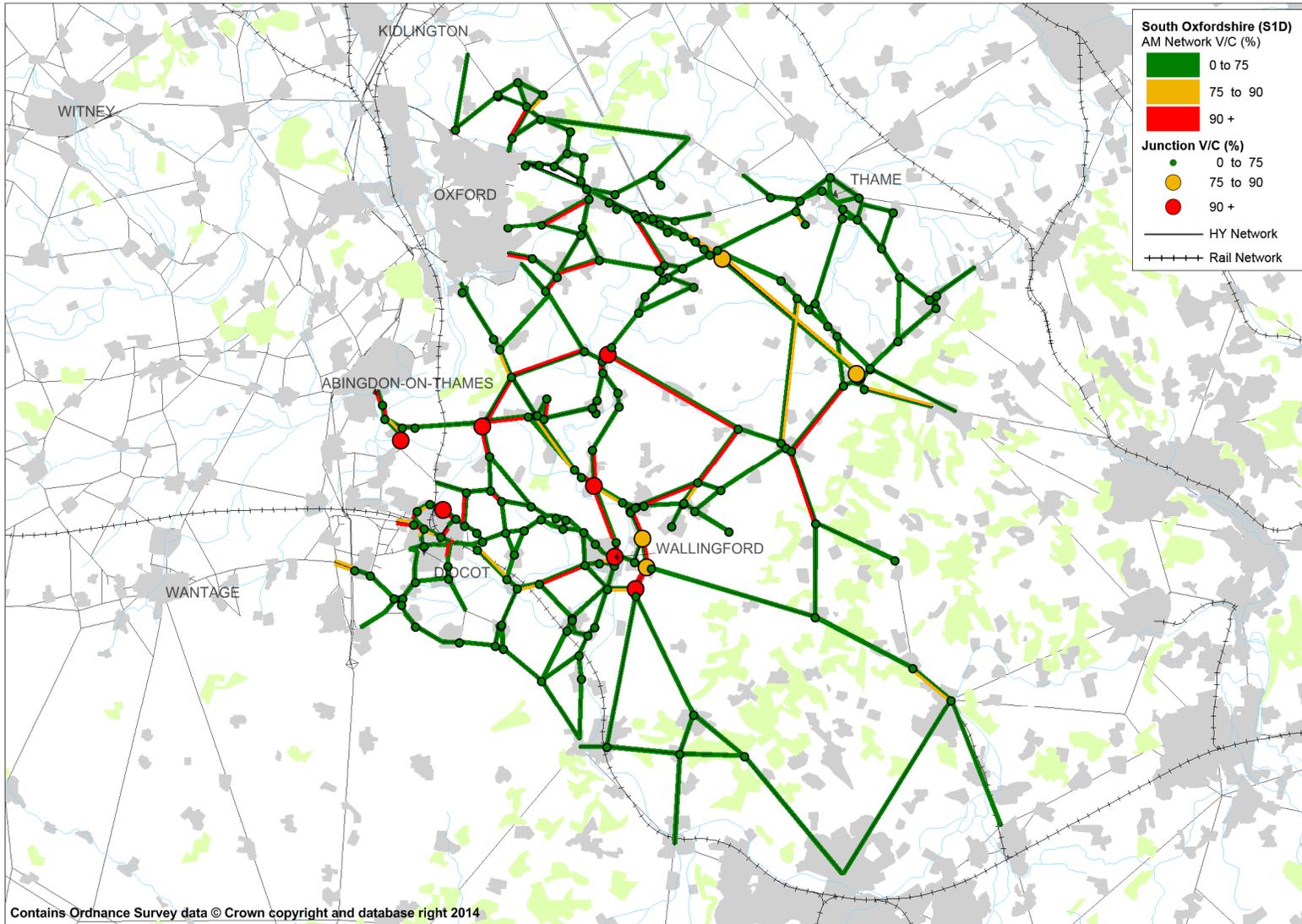
Draft Technical Note

Figure 8. Impact on the traffic network - Scenario C PM Peak Hour



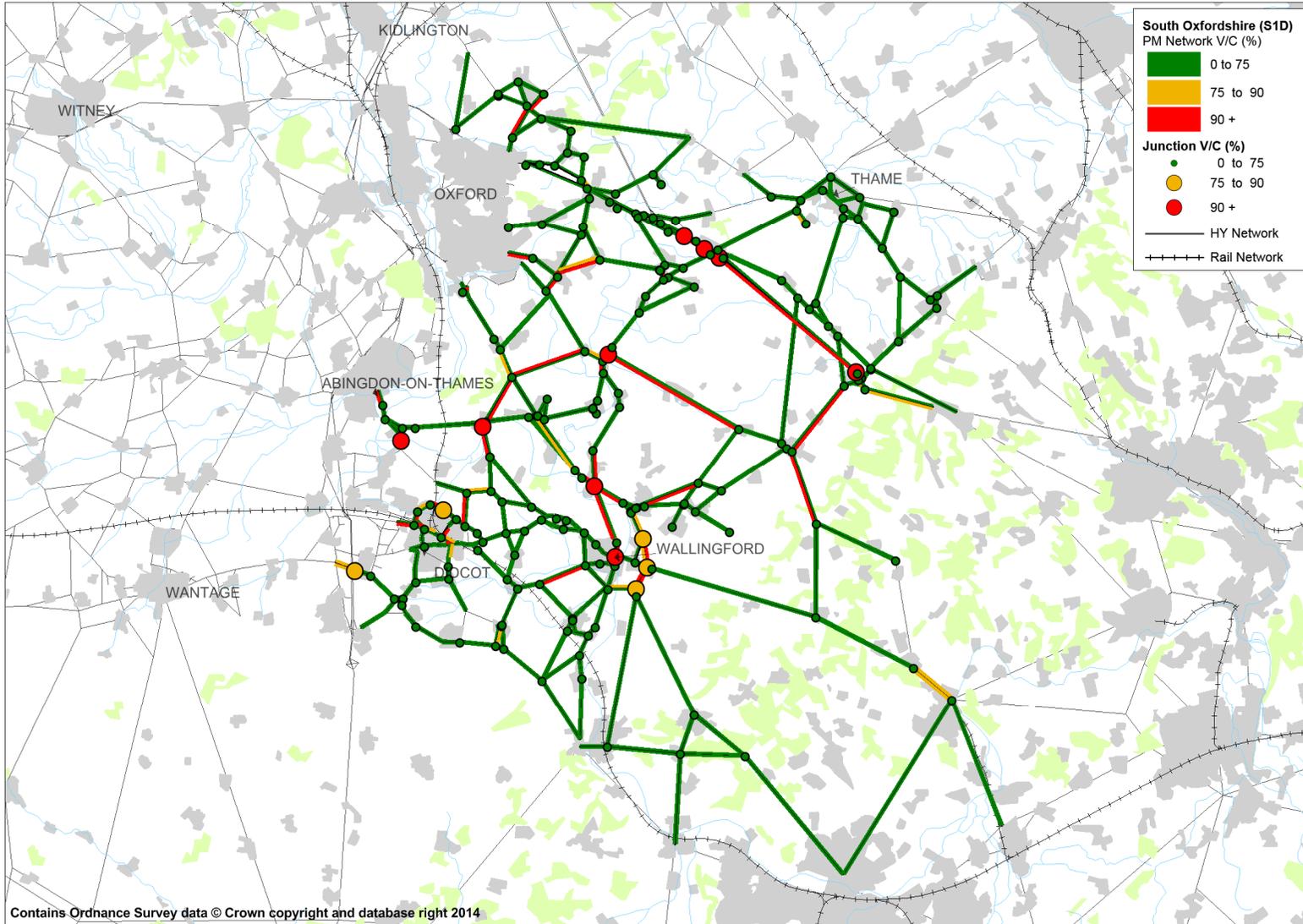
Draft Technical Note

Figure 9. Impact on the traffic network - Scenario D AM Peak Hour



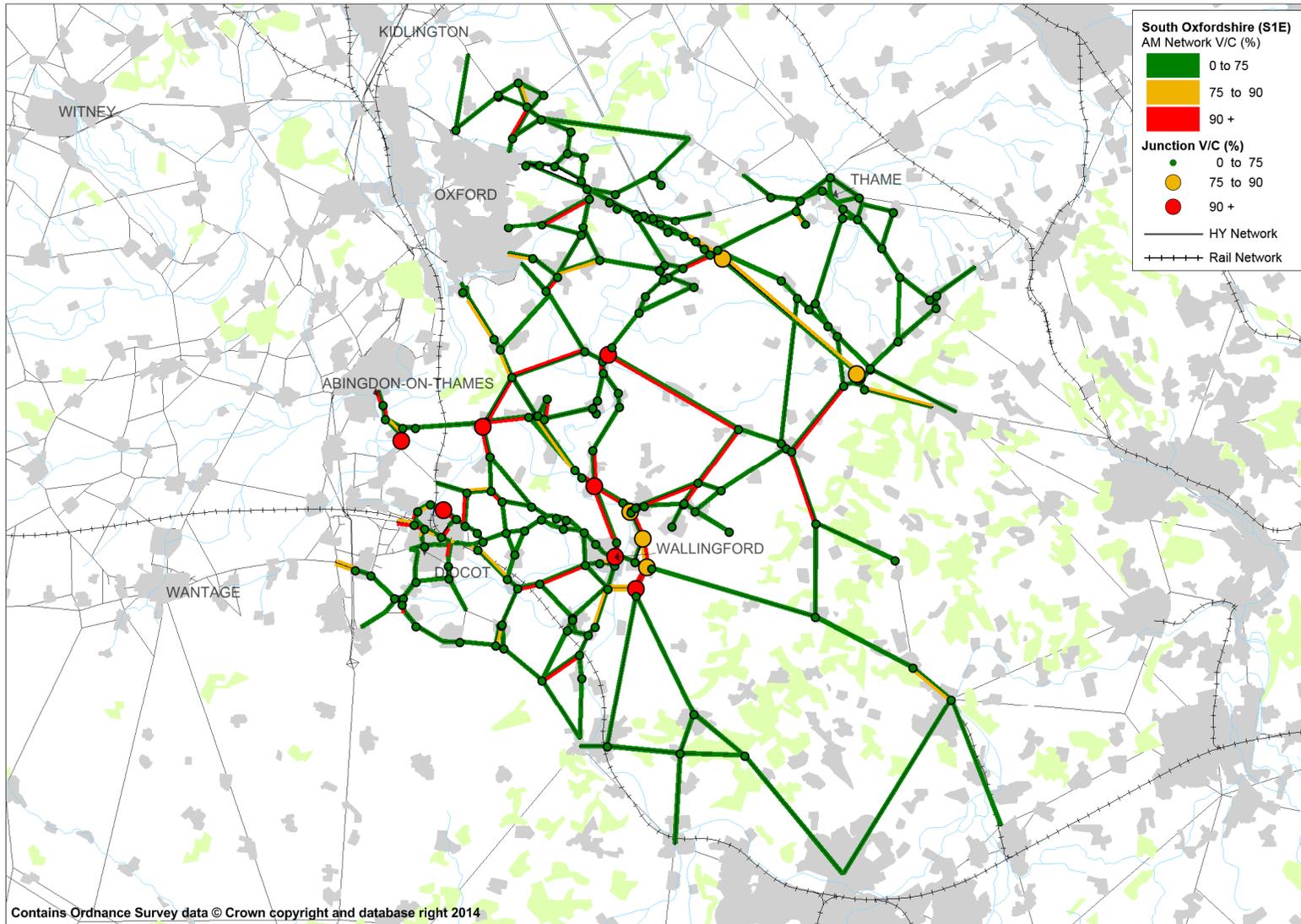
Draft Technical Note

Figure 10. Impact on the traffic network - Scenario D PM Peak Hour



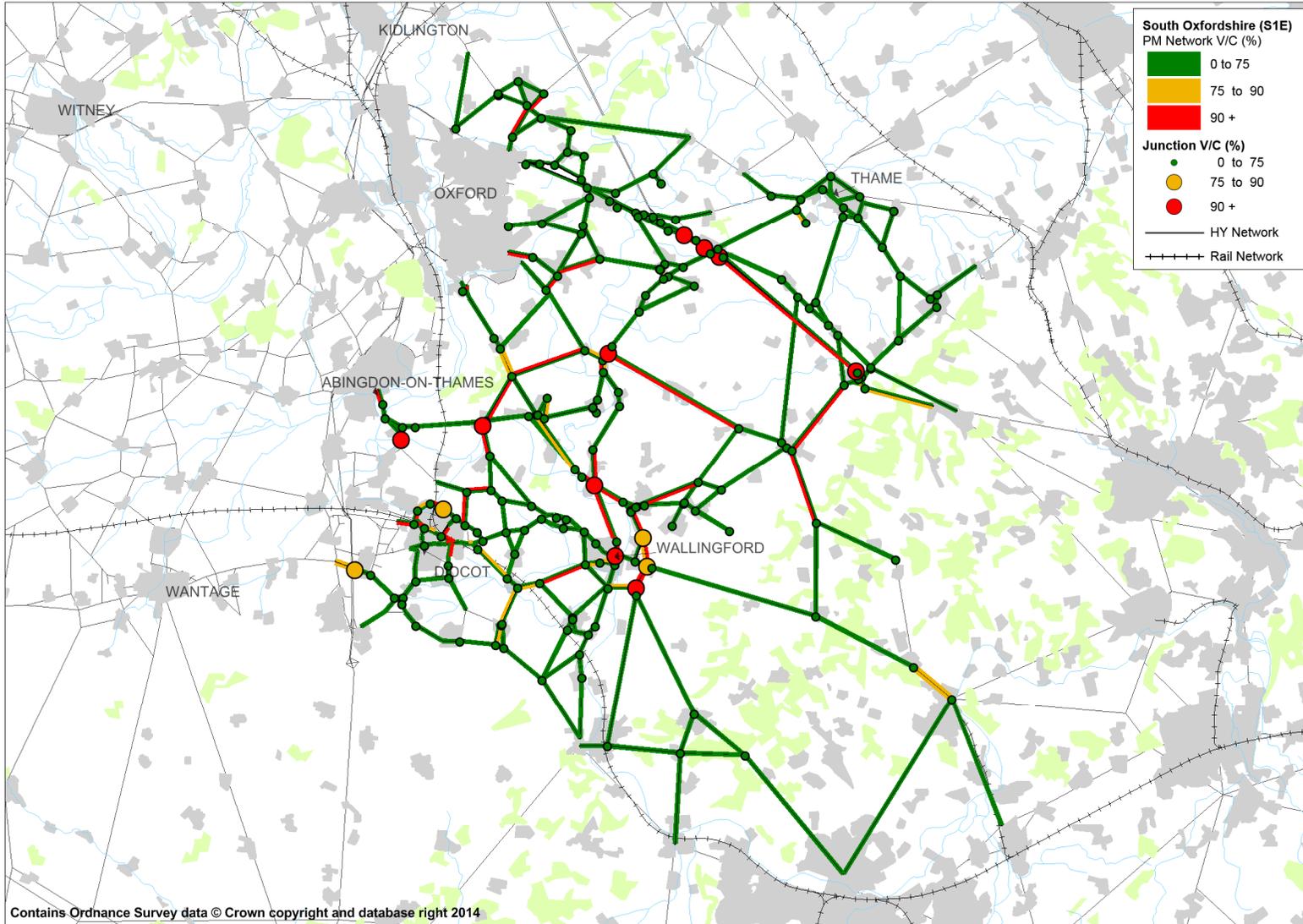
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Figure 11. Impact on the traffic network - Scenario E AM Peak Hour



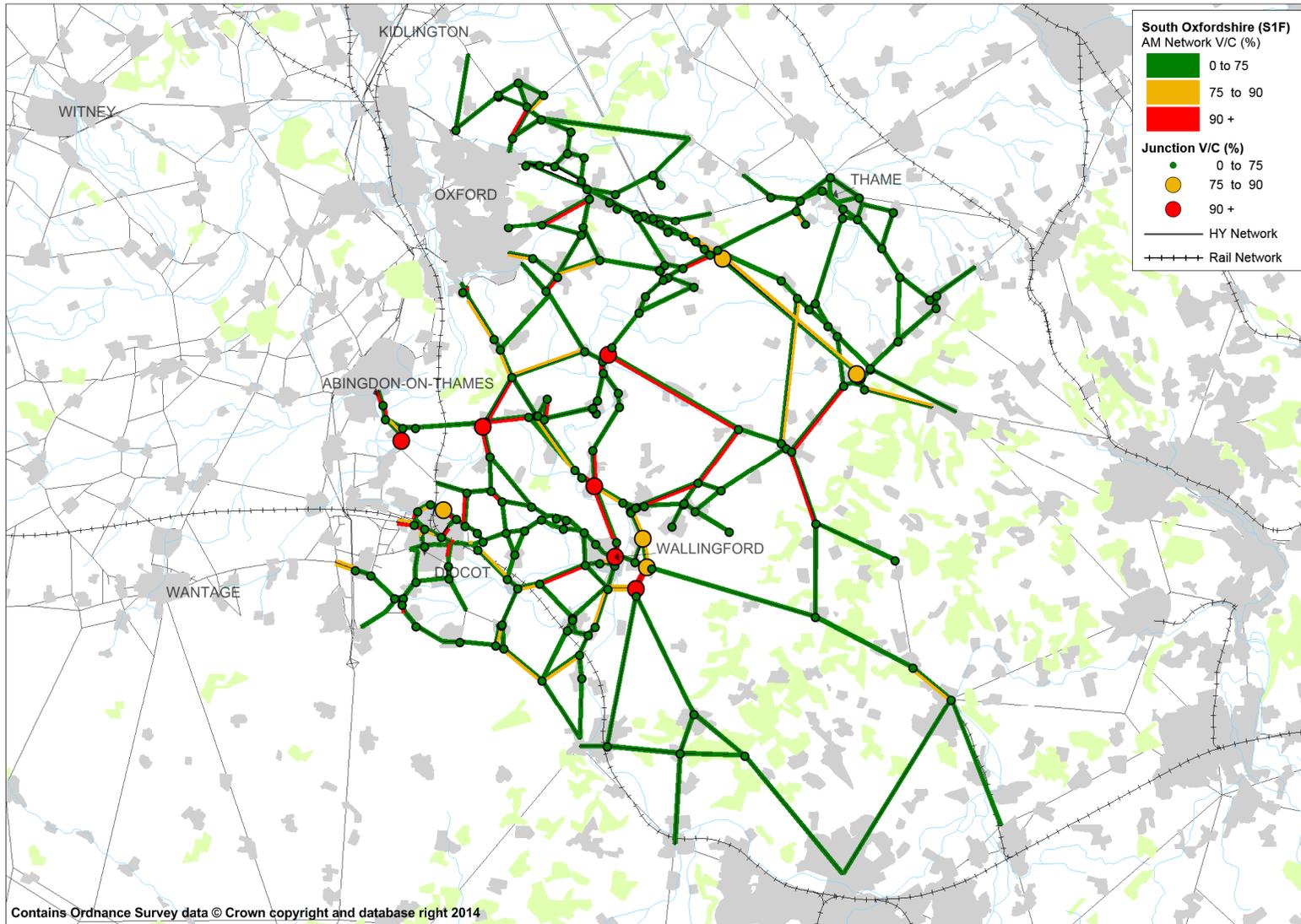
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Figure 12. Impact on the traffic network - Scenario E PM Peak Hour



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Figure 13. Impact on the traffic network - Scenario F AM Peak Hour



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Figure 14. Impact on the traffic network - Scenario F PM Peak Hour

