3.3 Central Chilterns (CFA9)

Central Chilterns (CFA9) SES3 and AP4 revised scheme changes

3.3.1 The original scheme in this area is as described in section 7.5 of the main TA. This has since been amended by the SES and AP2 scheme described in section 3.3 of the SES and AP2 TA.

3.3.2 Additional traffic surveys have been undertaken at the following junctions and section of highway in the Central Chilterns area to supplement the information reported in the main TA and SES and AP2 TA:

- A40 West Wycombe Road/ A4010 Chapel Lane;
- A40 West Wycombe Road/ A4010 Bradenham Road;
- A413 Missenden bypass/ Weedon Hill;
- A413/ Chalk Lane/ Tatlors Lane;
- A413/ London Road;
- A413/ Leather Lane;
- A4010 New Road/ Cressex Road;
- B485 Frith Hill (Chesham Road)/ Hyde Heath Road;
- B485 Frith Hill (Chesham Road) /Kings Lane;
- B485 Frith Hill (Chesham Road) /Frith Hill;
- A413/ Aylesbury Road; and
- A4010 Wycombe Road, between Princes Risborough and A40 at West Wycombe.

3.3.3 A revision to the workforce trip assignment has been made on Leather Lane and Bowood Lane within this area. This has resulted in a small reduction in all vehicle construction trips. This is not considered to have a material impact upon the main TA and SES and AP2 TA technical assessment.

3.3.4 The following AP4 amendment in this CFA has necessitated a revision to the number and routeing of construction vehicle trips by road within this area:

- extension to the Chiltern tunnel from Mantle's Wood portal to South Heath green tunnel north portal and associated works in CFA9 (AP4-009-001).

3.3.5 These changes lead to a number of changes to the traffic and transport assessment in the Central Chilterns (CFA9) area reported in the main TA and SES and AP2 TA. Noted changes to paragraphs are in relation to the main TA or the SES and AP2 TA.

Assessment methodology

3.3.6 The assessment methodology is as described in Section 7.2 of the main TA.

Existing baseline

3.3.7 Baseline conditions in this area are as described in Section 5.11 of the main TA and the SES and AP2 TA, updated by the additional traffic survey data. Further information on surveys can be found in the supplementary baseline survey report in Annex B(iii).

Future baseline

3.3.8 Future baseline conditions in this area are as described in Section 7.5 of the main TA and the SES and AP2 TA, updated by the additional traffic survey data.

3.3.9 Table 7-37 and Table 7-38 are amended to include the following road, whereby new baseline data is provided from the additional traffic data collected.

Table 7-37: Central Chilterns strategic road network future baseline flows (vehicles) - AM peak

Location	Direction	Baseline flow								All vehicles actual change from 2012			All vehicles % change from 2012		
		2012/2015		2021		2026		2041		2021	2026	2041	2021	2026	2041
		All vehs	HGV	All vehs	HGV	All vehs	HGV	All vehs	HGV						
A4010 Wycombe Road, between Princes Risborough and A40 at West Wycombe	NB	524	8	575	8	617	9	740	11	+51	+93	+216	10%	18%	41%
	SB	567	6	622	6	668	6	801	8	+55	+101	+234	10%	18%	41%

Table 7-38: Central Chilterns strategic road network future baseline flows (vehicles) - PM peak

Location	Direction	Baseline flow								All vehicles actual change from 2012			All vehicles % change from 2012		
		2012/2015		2021		2026		2041		2021	2026	2041	2021	2026	2041
		All vehs	HGV	All vehs	HGV	All vehs	HGV	All vehs	HGV						
A4010 Wycombe Road, between Princes Risborough and A40 at West Wycombe)	NB	760	2	833	2	894	2	1074	3	+73	+134	+314	10%	18%	41%
	SB	552	2	605	2	649	2	780	2	+53	+97	+228	10%	18%	41%

Construction description

Construction activities

3.3.10 Paragraph 7.5.31 of the main TA is amended to remove bullet points 'South Heath green tunnel' and 'South Heath cutting' which are no longer construction elements within this area.

Compounds and construction sites

3.3.11 Table 7-41 is replaced by the table below.

Table 7-41: Central Chilterns assumed workforce at construction sites

Compound type	Location	Assumed daily workforce per site for duration of the construction programme	
		Average	Peak
Satellite	Little Missenden vent shaft	32	62
Satellite	Chesham Road vent shaft	30	60
Satellite	Chiltern tunnel north portal (civil engineering)/ Chiltern tunnel north portal access road satellite compound	40	70
Satellite	Chiltern tunnel north portal (railway systems)	70	110

Construction trip assumptions

Trip generation

3.3.12 Table 7-42 in the main TA is amended as follows, due to the Chiltern Tunnel extension amendment revising the compounds within the area and the trips generated by:

- Little Missenden ventilation shaft satellite compound: The average-peak daily two-way HGV trips generated is 210-220, in relation to 160-200 in the SES and AP2 TA (Cars/LGV trips also amended from 50-90 in the SES and AP2 TA to 20-30);
- Chiltern tunnel north portal (civil engineering)/(railway systems) satellite compound: The average-peak daily two-way HGV trips generated is 70-230, in relation to 30-40 in the main TA and SES and AP2 TA (Cars/LGV trips also amended from 80-110 in the SES and AP2 TA to 150-210). This compound will be located on the northern side of Frith Hill (in the main TA it was on southern side of Hyde Heath Lane);

- The South Heath green tunnel (south) satellite compound (civil engineering)/ Chilterns main compound (rail systems), and the South Heath green tunnel (north) satellite compound (civil engineering)/ South Heath tunnel (north portal) satellite compound (rail systems) are removed from Table 7-42, as these compounds are removed due to the Chiltern tunnel extension. Chesham Road vent shaft satellite compound, associated with the Chiltern tunnel extension, is added to Table 7-42 as below.

Table7-42: Central Chilterns typical vehicle trip generation for construction site compounds – partial replacement

Compound Type	Location	Access to/from compound	Indicative start/set up date	Estimated duration of use (Years)	Estimated duration with busy vehicle movements (Months)	Average daily combined two-way vehicle trips during busy period and within peak month of activity	
						Cars/LGV	HGV
Satellite	Chesham Road vent shaft	A413 and B485 Frith Hill/Chesham Road	2019	Six years and eleven months	Four months	80-90	180-220

Assignment

3.3.13 As a result of the changes in routeing due to the Chiltern Tunnel extension amendment (AP4-009-001), paragraph 3.3.13 of the SES and AP2 TA is deleted and paragraph 7.5.40 of the main TA be amended to state:

"within the study area, movement of excavated material has been assigned to the A413 across the whole of the area and the B485 Frith Hill/ Chesham Road between the A413 and Chesham Road vent shaft satellite compound."

Construction lorry routes

3.3.14 Paragraph 7.5.45 of the main TA is amended to remove bullet points relating to South Heath green tunnel (south) satellite compound (civil engineering)/Chilterns main compound (rail systems) and the South Heath green tunnel (north) satellite compound (civil engineering)/ South Heath tunnel (north portal) satellite compound (rail systems).

3.3.15 Paragraph 7.5.45 of the main TA is amended to include the following bullet point:

- "Chiltern tunnel north portal (civil engineering)/(railway systems) satellite compound will be accessed via a link road from the A413."

3.3.16 Paragraph 7.5.45 of the main TA is amended to include the following bullet point:

- "Chesham Road vent shaft satellite compound will be accessed via the A413 and B485 Frith Hill/ Chesham Road."

Traffic management, road closures and diversions

3.3.17 Paragraphs 7.5.46 to 7.5.48 and Table 7-43 of the main TA are removed. This is due to the Chiltern Tunnel extension (AP4-009-001) removing the need to temporarily close Frith Hill and Hyde Lane. These roads will remain open to general traffic during construction of the revised scheme.

PRoW closures and diversions

3.3.18 Table 7-44 of the main TA is amended to remove the references to closure/diversion of the following PRoW. This is due to the Chiltern Tunnel extension (AP4-009-001) removing the need to temporarily close these PRoW during construction of the revised scheme.

- Frith Hill;
- Hyde Lane;
- Footpath GMI/79/2;
- Footpath GMI/80/1;
- Footpath GMI/79/1;
- Footpath GMI/28/1;
- Footpath GMI/28/2;
- Footpath LMI/17/2; and
- Footpath GMI/23/6.

3.3.19 Table 7-44 is also amended to add the following PRoW, which are subject to diversion under the SES3 and AP4 revised scheme, due to the Chiltern Tunnel extension (AP4-009-001).

Table 7-44: Central Chilterns temporary footpath, cycleway and bridleway closures and diversions

PRoW/ pedestrian route	Location	Location (chainage)	Programme	Diversion length (Approx.) and duration	Reason for diversion and diversion route
Footpath GMI/13/3	South Heath	47+400	September 2017	690m Up to five years	Construction of Chiltern Tunnel extension Temporary diversion to the A413 to join Footpath GMI/12 to cross HS2 corridor then temporarily diverted around the edge of the revised scheme boundary and Jenkins Wood.

PRoW/ pedestrian route	Location	Location (chainage)	Programme	Diversion length (Approx.) and duration	Reason for diversion and diversion route
Footpath GMI/33/4	South Heath	46+100	February 2019	600m Up to 10 months (1st phase) Up to 6 months (2nd phase)	Construction of Chiltern Tunnel extension Temporary diversion west along field boundary to join Footpath GMI33/5 and GMI/33/3.

3.3.20 Paragraph 7.5.53 of the main TA is amended to remove bullet point 'GMI/13/3 (public footpath)', as this PRoW is temporarily diverted under the AP4 revised scheme, due to the Chiltern Tunnel extension (AP4-009-001).

3.3.21 Due to the Chiltern Tunnel extension (AP4-009-001) removing the need to permanently close these PRoW during operation of the revised scheme paragraph 7.5.55 of the main TA is amended to remove the following PRoW:

- King's Lane;
- B485 Chesham Road;
- Footpath GMI/33/4;
- Footpath GMI/33/2;
- Footpath GMI/33/3;
- Footpath GMI/27/1
- Footpath GMI/23/7; and
- Footpath LMI/21/1.

Assessment of construction impacts

Key construction transport issues

3.3.22 Paragraph 7.5.65 of the main TA is amended to remove bullet points ' temporary road closures and associated diversions of motorised users' and 'temporary road closures and associated diversions of bus services', as these are no longer construction impacts due to the Chiltern Tunnel extension (AP4-009-001).

Highway network

3.3.23 Changes to forecast traffic flows as a result of the SES3 and AP4 revised scheme are presented in the following section. There are no changes to other forecast flows presented in the main TA and SES and AP2 TA. .

3.3.24 The SES3 and AP4 revised scheme results in the following key changes within Central Chilterns (CFA9) during construction, compared to the SES and AP2 scheme:

- changes to forecast construction traffic flows, due to a difference in trips generated by compounds within the area related to the Chiltern tunnel extension. This results in an increase in all construction vehicles (by up to 20 two-way trips a day) on the A413 north of B485 Frith Hill/Chesham Road and a decrease in all construction vehicles (by up to 75 two-way trips a day) on the A413 south of the B485 Frith Hill/Chesham Road. There is also a decrease in all construction vehicles (by up to 10 two-way trips a day) on the B485 Frith Hill/ Chesham Road, between the Chesham Road Vent Shaft satellite compound and the A413;

- revised construction routes as a result of the Chiltern Tunnel extension, resulting in the removal of all construction traffic from Hyde Heath Road, Potter Row, King's Lane (between Frith Hill and B485 Frith Hill/ Chesham Road) and Frith Hill. Construction traffic assessing Leather Lane Overbridge satellite compound and Bowood Lane Overbridge satellite compound, which previously used Potter Row and King's Lane, will now use the new A413 link road to Chiltern Tunnel North Portal satellite compound and internal compound haul roads;

- revised construction routes as a result of the new A413 link road to Chiltern Tunnel North Portal satellite compound. This has enabled 50% of trips related to the movement of excavated material from Hunts Green (previously all using Rocky Lane) to be routed via the new A413 link road, the A413 between the link road and B4009 Nash Lee Road, and Nash Lee Road. This revision to construction routes will have the following impact:

  - A413, between Chiltern Tunnel North Portal satellite compound link road and Rocky Lane (in CFA 10) - increase in HGV flows;

  - removal of temporary road closures of Hyde Lane and Frith Hill, resulting in the removal of diverted traffic from the A413 (between Hyde Lane and B485 Frith Hill/ Chesham Road), the B485 Frith Hill/ Chesham Road (between the A413 and Hyde Heath Road) and King's Lane (between the B485 Frith Hill/ Chesham Road and Frith Hill); and

  - changes to temporary and permanent diversions of PRoW.

Strategic road network

3.3.25 Table 7-45 and Table 7-46 in the SES and AP2 TA are replaced.

Table 7-45: Central Chilterns strategic road network construction traffic flows (vehicles) - AM peak

Location	Direction	2012 baseline	2021 baseline	2021 with HS2 construction traffic		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
		All vehicles		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A413, between A404 Whielden Lane (in CFA8) and Hyde Lane (Great Missenden)	EB	1135	1237	1268	51	31	21	2%	72%
Named 'A413 Amersham Road (Little Missenden)' in main TA.	WB	659	718	815	34	97	21	14%	164%
A413, between Hyde Lane (Great Missenden) and B485 Frith Hill/Chesham Road	NB	745	812	897	48	85	20	10%	75%
Named 'A413 Missenden Bypass (South of B485)' in main TA	SB	1293	1409	1438	77	29	20	2%	36%
A413 London Road between B485 Frith Hill/Chesham Road and Rocky Lane (in CFA10)	NB	661	720	805	41	84	21	12%	100%
Named 'A413 Missenden Bypass (North of B485)' in main TA	SB	1105	1204	1245	70	41	21	3%	42%
B485 Frith Hill/Chesham Road, between A413 and King's Lane	EB	521	568	593	27	26	14	5%	105%
Named 'B485 Chesham Road/Frith Hill (west of King's Lane)' in main TA	WB	393	428	473	43	45	14	10%	47%

Table 7-46: Central Chilterns strategic road network construction traffic flows (vehicles) - PM peak

Location	Direction	2012 baseline	2021 baseline	2021 with HS2 construction traffic		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
		All vehicles		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A413, between A404 Whielden Lane (in CFA8) and Hyde Lane (Great Missenden)	EB	591	643	734	26	90	16	14%	162%
Named 'A413 Amersham Road (Little Missenden)' in main TA.	WB	1195	1301	1325	38	24	16	2%	75%
A413, between Hyde Lane (Great Missenden) and B485 Frith Hill/Chesham Road	NB	1002	1091	1115	32	23	16	2%	98%
Named 'A413 Missenden Bypass (South of B485)' in main TA	SB	712	775	854	21	79	16	10%	294%
A413 London Road between B485 Frith Hill/Chesham Road and Rocky Lane (in CFA10)	NB	1039	1131	1166	34	35	16	3%	93%
Named 'A413 Missenden Bypass (North of B485)' in main TA	SB	648	706	784	21	78	16	11%	371%
B485 Frith Hill/Chesham Road, between A413 and King's Lane	EB	367	400	443	18	44	14	11%	316%
Named 'B485 Chesham Road/Frith Hill (west of King's Lane)' in main TA	WB	503	548	572	18	25	14	5%	316%

Local road network

3.3.26 Removal of paragraphs 7.5.69 and 7.5.71 of the main TA, as there are no temporary road closures within this area in the SES3 and AP4 revised scheme.

3.3.27 Table 7-47 and Table 7-48 of the main TA are amended to remove rows for King's Lane (between Frith Hill and B485 Chesham Road), Frith Hill (between Potter Row/King's Lane and B485 Frith Hill), Hyde Heath Road and Potter Row (between Frith Hill and Leather Lane). All construction traffic is removed from these links, due to the Chiltern Tunnel extension (AP4-009-001).

3.3.28 Revised construction assumptions have resulted in an increase in HGV movements on the A413, between the Chiltern Tunnel North Portal satellite compound link road and Rocky Lane (in CFA10). This section of road is a new route for the movement of excavated material, in comparison with the SES and AP2 scheme. There is also the removal of all construction traffic from Hyde Heath Road, Potter Row, King's Lane (between Frith Hill and B485 Frith Hill/ Chesham Road) and Frith Hill. This is due to construction traffic generated by Leather Lane Overbridge satellite compound and Bowood Lane Overbridge satellite compound now using the new A413 link road to Chiltern Tunnel North Portal satellite compound and internal compound haul road.

3.3.29 The SES3 and AP4 revised scheme (specifically the Chiltern Tunnel extension amendment) has resulted in an increase in all construction vehicles (by up to 20 two-way trips a day) on the A413 north of B485 Frith Hill/Chesham Road and a decrease in all construction vehicles (by up to 75 two-way trips a day) on the A413 south of B485 Frith Hill/Chesham Road. There is also a decrease in all construction vehicles (by up to 10 two-way trips a day) on the B485 Frith Hill/ Chesham Road between the Chesham Road Vent Shaft satellite compound and the A413.

3.3.30 The SES3 and AP4 revised scheme has also resulted in the removal of temporary road closures of Frith Hill and Hyde Lane, therefore removing traffic from previous diversion routes of the A413 (between Hyde Lane and B485 Frith Hill/ Chesham Road), the B485 Frith Hill/ Chesham Road (between the A413 and Hyde Heath Road) and King's Lane (between the B485 Frith Hill/ Chesham Road and Frith Hill).

3.3.31 As a result of the change in routeing due to the Chiltern Tunnel extension (AP4-009-001), paragraph 7.5.72 of the SES and AP2 TA is amended to replace "the A413 across the whole of the study area" with "the A413 across the whole of the area and the B485 Frith Hill/ Chesham Road between the A413 and Chesham Road vent shaft satellite compound".

Junction capacity

3.3.32 The supplementary traffic survey data, has been used to update the assessments of the B485 Chesham Road/Frith Hill, B485 Chesham Road/King's Lane and B485 Chesham Road/Hyde Heath Road junctions, using industry standard software. Re-assessment of the A413/Leather Lane junction has also been undertaken, due to the introduction of excavated material movements on this section of road, as a result of the Chiltern Tunnel extension (AP4-009-001). The results are shown in Tables 7-48.1 to 7-48.4.

3.3.33 There is no change to the result of the assessment carried out and reported in the main TA (paragraph 7.5.80) and SES and AP2 TA (paragraph 3.3.22), as the modelling results indicate that the B485 Chesham Road/Frith Hill, B485 Chesham Road/King's Lane and B485 Chesham Road/Hyde Heath Road junctions will operate within capacity during construction.

3.3.34 The modelling results indicate that the A413/Leather Lane junction will operate within capacity during construction, in the PM peak, with the highest percentage of flow to capacity forecast at 18% on the Leather Lane arm. However, the results show the Leather Lane minor arm at over 85% flow to capacity during construction during the AM peak. This indicates that the junction will experience intermittent traffic congestion and delay, which replaces the assessment in paragraph 3.3.19 of the SES and AP2 TA, outlining that the junction was 'unlikely to experience additional intermittent traffic congestion and delay during peak periods'. However, traffic flow on the Leather Lane arm of the junction is low and the SES3 and AP4 revised scheme does not add to this in the AM peak. It is therefore the increase in the A413 through traffic that is impacting upon junction operation at this location.

Table 7-48.1: Central Chilterns comparison forecast baseline and construction scenario performance at B485 Chesham Road/ Frith Hill junction

0800-09:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
B485 Chesham Road West	771	0%	0	815	0%	0
Frith Hill	136	44%	1	136	47%	1
B485 Chesham Road East	398	0%	0	461	0%	0
Total	N/A	44%	N/A	N/A	47%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
B485 Chesham Road West	632	0%	0	693	0%	0
Frith Hill	71	22%	0	71	24%	0
B485 Chesham Road East	530	1%	0	572	1%	0
Total	N/A	22%	N/A	N/A	24%	N/A

Table 7-48.2: Central Chilterns comparison forecast baseline and construction scenario performance at B485 Chesham Road/ King's Lane junction

0800-09:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
B485 Chesham Road West	687	0%	0	730	0%	0
King's Lane	107	17%	0	107	17%	0
B485 Chesham Road East	434	10%	0	497	10%	0
Total	N/A	17%	N/A	N/A	17%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
B485 Chesham Road West	380	0%	0	441	0%	0
King's Lane	43	6%	0	43	6%	0
B485 Chesham Road East	613	14%	0	656	14%	0
Total	N/A	14%	N/A	N/A	14%	N/A

Table 7-48.3: Central Chilterns comparison forecast baseline and construction scenario performance at B485 Chesham Road/ Hyde Heath Road junction

0800-09:00		**2021 baseline**			**2021 with HS2 construction traffic**		
Junction arm	**Approach (from)**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
B485 Chesham Rd /Hyde Heath Rd	B485 Chesham Road East	331	0%	0	372	0%	0
	Hyde Heath Road	104	18%	0	104	19%	0
	B485 Chesham Road West	764	38%	1	766	38%	1
Hyde Heath Rd /B485 Chesham Rd	Hyde Heath Road North	236	0%	0	236	0%	0
	B485 Chesham Road.	45	7%	0	45	7%	0
King's Lane	Hyde Heath Road South	131	4%	0	131	4%	0

0800-09:00		2021 baseline			2021 with HS2 construction traffic		
Junction arm	**Approach (from)**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
B485 Chesham Rd /Hyde Heath Road	B485 Chesham Road East	376	0%	0	417	0%	0
	Hyde Heath Road.	27	7%	0	27	7%	0
	B485 Chesham Road West	528	0%	0	530	0%	0
Total		N/A	38%	N/A	N/A	38%	N/A

17:00-18:00		2021 baseline			2021 with HS2 construction traffic		
Junction arm	**Approach (from)**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
B485 Chesham Rd /Hyde Heath Rd	B485 Chesham Road East	444	0%	0	444	0%	0
	Hyde Heath Road	167	31%	1	167	31%	1
	B485 Chesham Road West	393	17%	0	433	17%	0
Hyde Heath Rd /B485 Chesham Rd King's Lane	Hyde Heath Road North	101	0%	0	101	0%	0
	B485 Chesham Road.	28	4%	0	28	4%	0
	Hyde Heath Road South	182	2%	0	182	2%	0
B485 Chesham Rd /Hyde Heath Road	B485 Chesham Road East	472	0%	0	472	0%	0
	Hyde Heath Road.	14	4%	0	15	3%	0
	B485 Chesham Road West	292	0%	0	332	0%	0
Total		N/A	31%	N/A	N/A	31%	N/A

Table 7-48.4: Central Chilterns comparison forecast baseline and construction scenario performance at A413/ Leather Lane junction

0800-09:00	2021 baseline			2021 with HS2 construction traffic		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
A413 North	1431	0%	0	1505	0%	0
Leather Lane	42	26%	0	42	111%	8
A413 South	882	5%	0	994	8%	0
Total	N/A	26%	N/A	N/A	111%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
A413 North	861	0%	0	954	0%	0
Leather Lane	15	5%	0	29	18%	0
A413 South	1444	7%	0	1500	7%	0
Total	N/A	7%	N/A	N/A	18%	N/A

3.3.35 Using the supplementary survey data, revised assessment has been undertaken of the Missenden bypass/Weedon Hill, A413/Chalk Lane/ Taylors Lane, A413/ London Road, A413/ Aylesbury Road, A4010 New Road/Cressex Road, A40 West Wycombe Road/A4010 Chapel Lane and A40 West Wycombe Road/A4010 Bradenham Road junctions. The results are shown in Table 7-48.5 to Table 7-48.11.

3.3.36 The modelling results indicate that the junctions of Missenden bypass/Weedon Hill, A413/Chalk Lane with Taylors Lane, A413/London Road, A413/ Aylesbury Road and A40 West Wycombe Road/ A4010 Bradenham Road will operate within capacity during construction, with the highest percentage of flow to capacity below 85% and construction traffic resulting in a maximum increase of 11%. This is not expected to result in congestion and, therefore, the revised scheme is not considered to have a material impact on capacity at these junctions.

3.3.37 The modelling results indicate that the junctions of A4010 New Road/Cressex Road will operate over capacity during the AM peak only, with the highest percentage of flow to capacity at 102% on the Cressex Road (west) arm. This indicates that the junction will experience intermittent traffic congestion and delay during construction. However, this arm is forecast to operate at 97% flow to capacity in the 2021 baseline, and construction traffic results in a maximum increase of 5% on any arm, which indicates that the revised scheme traffic is unlikely to result in a substantial change in operation.

3.3.38 The results also show that the A40 West Wycombe Road/A4010 Chapel Lane junction will operate over capacity, during both AM and PM peaks. This indicates that the junction will experience intermittent traffic congestion and delay during construction.

However, this junction is forecast to operate at up to 113% flow to capacity in the 2021 baseline (West Wycombe Road Ahead Left lane in the AM peak), and construction traffic results in a maximum increase of 6% on any arm. This indicates that the revised scheme traffic is unlikely to result in a substantial change in operation.

Table 7-48.5: Central Chilterns comparison forecast baseline and construction scenario performance at Missenden bypass/ Weedon Hill junction

0800-09:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
A413 Missenden Bypass West	1476	0%	0	1529	0%	0
Weedon Hill	254	46%	1	254	47%	1
A413 Missenden Bypass East	833	18%	0	958	19%	0
Total	N/A	46%	N/A	N/A	47%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
A413 Missenden Bypass West	674	0%	0	785	0%	0
Weedon Hill	47	6%	0	47	7%	0
A413 Missenden Bypass East	1680	25%	0	1721	25%	0
Total	N/A	25%	N/A	N/A	25%	N/A

Table 7-48.6: Central Chilterns comparison forecast baseline and construction scenario performance at A413/ Chalk Lane/ Taylors Lane junction

0800-09:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
A413 East	748	2%	0	866	2%	0
Taylors Lane	13	7%	0	13	9%	0
A413 West	1456	0%	0	1513	0%	0
Chalk Lane	15	12%	0	15	23%	0
Total	N/A	12%	N/A	N/A	23%	N/A

17:00-18:00	2021 baseline			2021 with HS2 construction traffic		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
A413 East	1517	1%	0	1561	1%	0
Taylors Lane	6	10%	0	6	18%	0
A413 West	662	0%	0	768	0%	0
Chalk Lane	5	2%	0	5	3%	0
Total	N/A	10%	N/A	N/A	18%	N/A

Table 7-48.7: Central Chilterns comparison forecast baseline and construction scenario performance at A413/ London Road junction

0800-09:00	2021 baseline			2021 with HS2 construction traffic		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
A413 South	795	0%	0	913	0%	0
London Road	40	6%	0	40	7%	0
A413 North	1640	11%	0	1696	12%	0
Total	N/A	11%	N/A	N/A	12%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
A413 South	1381	0%	0	1425	0%	0
London Road	25	6%	0	25	6%	0
A413 North	770	4%	0	876	4%	0
Total	N/A	6%	N/A	N/A	6%	N/A

Table 7-48.8: Central Chilterns comparison forecast baseline and construction scenario performance at A413/ Aylesbury Road junction

0800-09:00		**2021 baseline**			**2021 with HS2 construction traffic**		
Junction arm	**Approach (from)**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
A413 /Aylesbury Road	A413 South	761	0%	0	872	0%	0
	(Un-named link)	36	18%	0	36	24%	0
	A413 North	1285	0%	0	1353	0%	0
A413 /Aylesbury Road	Aylesbury Road North	180	0%	0	180	0%	0
	A413	17	3%	0	17	3%	0
	Aylesbury Road South	178	6%	0	178	6%	0
Aylesbury Road /A413	A413 South	744	0%	0	855	0%	0
	(Un-named link)	142	23%	0	178	73%	3
	A413 North	1465	31%	1	1533	33%	1
Total		N/A	31%	N/A	N/A	73%	N/A
17:00-18:00		**2021 baseline**			**2021 with HS2 construction traffic**		
Junction arm	**Approach (from)**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
A413 /Aylesbury Road	A413 South	12	0%	0	12	0%	0
	(Un-named link)	1643	2%	0	1683	3%	0
	A413 North	799	0%	0	799	0%	0
A413 /Aylesbury Road	Aylesbury Road North	982	0%	0	1042	0%	0
	A413	0	3%	0	0	39%	1
	Aylesbury Road South	0	1%	0	0	18%	0
Aylesbury Road /A413	A413 South	0	0%	0	0	0%	0
	(Un-named link)	0	38%	1	0	41%	1
	A413 North	0	31%	1	0	32%	1
Total		N/A	38%	N/A	N/A	39%	N/A

Table 7-48.9: Central Chilterns comparison forecast baseline and construction scenario performance at A4010 New Road /Cressex Road junction

0800-09:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
Cressex Road East	389	41%	1	389	42%	1
A4010 John Hall Way	546	41%	1	583	43%	1
Cressex Road West	706	97%	17	706	102%	33
A4010 New Road North	938	75%	3	952	76%	3
Total	N/A	97%	N/A	N/A	102%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
Cressex Road East	638	65%	2	638	66%	2
A4010 John Hall Way	562	46%	1	566	47%	1
Cressex Road West	550	79%	4	550	79%	4
A4010 New Road North	939	72%	3	967	74%	3
Total	N/A	79%	N/A	N/A	79%	N/A

Table 7-48.10: Central Chilterns comparison forecast baseline and construction scenario performance at A40 West Wycombe Road /A4010 Chapel Lane junction

0800-09:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
West Wycombe Road Ahead Left	900	113%	64	900	108%	49
West Wycombe Road Ahead Right	1289	107%	47	1303	112%	74
Chapel Road Left	470	70%	1	507	76%	2
Total	N/A	113%	N/A	N/A	112%	N/A

17:00-18:00	2021 baseline			2021 with HS2 construction traffic		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
West Wycombe Road Ahead Left	884	111%	56	884	111%	56
West Wycombe Road Ahead Right	1294	110%	64	1322	114%	87
Chapel Road Left	706	105%	44	711	106%	46
Total	N/A	111%	N/A	N/A	114%	N/A

Table 7-48.11: Central Chilterns comparison forecast baseline and construction scenario performance at A40 West Wycombe Road/ A4010 Bradenham Road junction

0800-09:00	2021 baseline			2021 with HS2 construction traffic		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
A40 West Wycombe Road East	1238	63%	2	1274	65%	2
A40 West Wycombe Road West	723	67%	2	723	68%	2
A4010 Bradenham Road	617	47%	1	631	48%	1
Total	N/A	67%	N/A	N/A	68%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
A40 West Wycombe Road East	1403	74%	3	1407	74%	3
A40 West Wycombe Road West	656	71%	2	656	71%	2
A4010 Bradenham Road	851	61%	2	879	63%	2
Total	N/A	74%	N/A	N/A	74%	N/A

3.3.39 The A413 London Road/A4128 Link Road and A413 London Road/B485 Frith Hill junctions have been re-assessed using industry standard software, based upon SES3 and AP4 revised scheme forecast traffic flows. The new A413 link road to Chiltern Tunnel North Portal satellite compound has been added to the A413 London Road/A4128 Link Road junction, for the construction year of assessment. Table 7-51 and Table 7-52 of the SES and AP2 TA are replaced by the substitute tables below.

3.3.40 Revisions to the A413 London Road/B485 Frith Hill junction base model have been made and therefore the results presented are not wholly comparable with those in the SES and AP2 TA.

3.3.41 The modelling results indicate that the junctions of A413 with B485 Frith Hill and A413 London Road with A4128 Link Road/ new link road are predicted to operate over theoretical capacity during both AM and PM peaks, with the B485 Frith Hill junction operating at 135% and the Link Road junction operating just over 128% flow to capacity. This indicates that the junctions will experience intermittent traffic congestion and delay during construction. However, both junctions are also forecast to operate over capacity in the 2021 baseline, with the increase in flow to capacity ratio due to construction traffic by up to 16% in the AM Peak and 13% in the PM Peak for the A413 with B485 Frith Hill junction, and by up to 16% in the AM Peak and 13% in the PM Peak for the A413 London Road with A4128 Link Road/ new link road junction. This assessment replaces that presented in paragraphs 3.3.19, 3.3.24 and 3.3.26 of the SES and AP2 TA, which stated that the junctions are 'predicted to operate well within capacity during construction'.

Table 7-51: Central Chilterns comparison forecast baseline and construction scenario performance at A413/B485 Frith Hill/Chesham Road junction (priority roundabout)

0800-09:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
B485 Frith Hill	593	119%	48	654	135%	97
A413 (S) London Road	827	98%	15	947	108%	53
A413 (N) London Road	1802	87%	6	1831	89%	7
Total	N/A	119%	N/A	N/A	135%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
B485 Frith Hill	623	96%	10	666	109%	24
A413 (S) London Road	1085	89%	7	1129	93%	11
A413 (N) London Road	1052	77%	3	1153	85%	5
Total	N/A	96%	N/A	N/A	109%	N/A

Table 7-52: Central Chilterns comparison forecast baseline and construction scenario performance at A413/A4128 Link Road junction (priority roundabout)

0800-09:00	2021 baseline			2021 with HS2 construction traffic		
Approach (from)	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (All PCU)**	**Flow/ capacity %**	**Max queue**
A413 (S) Missenden Bypass	1103	54%	1	1229	61%	2
A4128 Link Road	683	112%	44	683	128%	87
A413 (N) Missenden Bypass	1204	113%	69	1268	117%	97
New link road	0	N/A	N/A	47	9%	0
Total	N/A	113%	N/A	N/A	128%	N/A
17:00-18:00	**2021 baseline**			**2021 with HS2 construction traffic**		
Approach (from)	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**	**Flow (all PCU)**	**Flow/ capacity %**	**Max queue**
A413 (S) Missenden Bypass	1487	71%	3	1500	73%	3
A4128 Link Road	540	118%	33	540	126%	46
A413 (N) Missenden Bypass	706	108%	25	805	121%	65
New link road	0	N/A	N/A	95	11%	1
Total	N/A	118%	N/A	N/A	126%	N/A

Pedestrians, cyclists and equestrians

3.3.42 Table 7-53 of the main TA is amended to remove the following PRoW. This is due to the Chiltern Tunnel extension (AP4-009-001) removing the need to temporarily close these PRoW during construction.

- Frith Hill;
- Hyde Lane;
- Footpath GMI/79/2;
- Footpath GMI/80/1;
- Footpath GMI/79/1;
- Footpath GMI/28/1;
- Footpath GMI/28/2;
- Footpath LMI/17/2; and
- Footpath GMI/23/6.

3.3.43 Table 7-53 of the main TA is also amended to add the following PRoW which are subject to diversion under the AP4 revised scheme, due to the Chiltern Tunnel extension (AP4-009-001).

Table 7-53: Central Chilterns summary of PRoW severance (construction)

PRoW	Location	Location (chainage)	Construction Activity	Temporary Diversion Route	Daily Users	Maximum Diversion Length	Maximum Diversion Journey Time (nearest minute)
Footpath GMI/13/3	South Heath	47+400	Construction of Chiltern Tunnel extension	Temporary diversion to the A413 to join Footpath GMI/12 to cross HS2 corridor then temporarily diverted around the edge of the revised scheme boundary and Jenkins Wood.	57	690m	10 mins
Footpath GMI/33/4	South Heath	46+100	Construction of Chiltern Tunnel extension	Temporary diversion west along field boundary to join Footpath GMI33/5 and GMI/33/3.	0	600m	8 mins

Operations description

3.3.44 This is as described in Section 7.7 of the main TA.

Assessment of operation impacts

Pedestrians, cyclists and equestrians

3.3.45 Table 7-54 of the main TA and SES and AP2 TA is amended to remove the following PRoW. This is due to the Chiltern Tunnel extension (AP4-009-001) removing the need to temporarily close these PRoW during operation:

- King's Lane;
- B485 Chesham Road;
- Footpath GMI/33/4;
- Footpath GMI/33/2;
- Footpath GMI/33/3;
- Footpath GMI/27/1;
- Footpath GMI/23/7 ; and
- Footpath LMI/21/1.