M3

Junction 9 Improvement Scheme

PCF Stage 2 – Scheme Assessment Report

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M3 JUNCTION 9 IMPROVEMENT SCHEME

PCF STAGE 2 (OPTION SELECTION)

SCHEME ASSESSMENT REPORT

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INTRODUCTION

The M3 Junction 9 is a key strategic route interchange which connects South Hampshire and the ports of Southampton and Portsmouth with the wider sub region. It also connects the region to London and the north-west via the M3, and the Midlands and the North via the A34.

The northbound and southbound movements between the M3 to the south of the M3 Junction 9 and the A34 to the north, are particularly significant. Queues on the northbound diverge (off-slip) of the M3 regularly back onto the mainline carriageway, resulting in delays and safety concerns for both M3 northbound through traffic and traffic seeking to leave the motorway. Such issues are particularly prevalent during peak periods. There are further potential safety concerns on the A34 southbound due to significant queuing which also results in rat running traffic through the residential suburbs of Winchester.

In March 2015 the DfT[1] published the RIS[2] which sets out a list of improvement schemes to be developed by Highways England over the period 2015-2020.

The 'Road Investment Strategy for the 2015/16 – 2019/20 Road Period' document announced M3 Junction 9 improvements with the intention to provide "upgrade to the junction to allow free movement from the A34 to the M3".

OPTIONS CONSIDERED

At PCF[3] Stage 1, the Investment Decision Committee decided that for the PCF Stage 2 analysis, Option 14 should be progressed as well as the incremental delivery of Option 14 (Option 16B followed by 16C) to meet the requirement for an option that met baseline funding allocation and to investigate whether there are any efficiencies that can be realised by undertaking incremental delivery.

The options in question are:

- Option 14 - this provides free-flow links between A34 and M3 south of the junction, with the A34 southbound link passing under the M3 with a 60mph (100kph) design speed with a three-step relaxation on horizontal geometry. The A34 Northbound Link has a 70mph (120kph) design speed. Junction 9 would be rebuilt with a dumbbell roundabout layout to facilitate the increased number of traffic lanes required beneath the junction roundabout.
- Option 16B – This would be the first stage of an incremental delivery of Option 14 and provides a free-flow for the A34 northbound, which has a 70mph (120kph) design speed. The southbound A34 would still use the existing A34 through the Junction 9 roundabout. This option is considered to facilitate potential scheme capital costs within the original scheme budgets of RIS1.
- Option 16C - This would be the second stage of an incremental delivery of Option 14 and provides a free-flow for the A34 southbound with a 60mph (100kph) design speed with a

[1] DfT – Department for Transport
[2] RIS – Road Investment Strategy
[3] PCF – Project Control Framework

three-step relaxation on horizontal geometry. A new junction 9 dumbbell roundabout is constructed during this stage.

Structural impacts, operational, technology and maintenance assessments were also appraised for each option in their respective chapters of this report.

ENVIRONMENTAL

A non-statutory PCF Stage 2 Environmental Assessment was undertaken, which will be developed with further assessments conducted in PCF Stage 3, along with the development of mitigation measures.

Option 14 is the preferred environmental option because it has similar adverse effects to the other options, but provides WCH benefits sooner. Option 16B has fewer adverse effects due to its smaller scale but does not provide the WCH benefits of Option 14 and 16C. Option 16C has fewer adverse effects than Option 14 and provides WCH benefits, but it would only be constructed after Option 16B had been completed. The combined adverse effects of Options 16B and 16C would be similar to Option 14 and the WCH benefits of Option 16C would be delivered later than Option 14.

ECONOMICS

Cost consultants Benchmark provided a detailed breakdown of costs for each option in 2014 prices. The expected total scheme costs and the corresponding BCRs[4] for all options are shown below.

Option	Expected scheme cost in 2014 prices (£)	Costs Discounted to 2010 in 2010 Prices (£)	Adjusted BCR, with benefits from accident savings applied[5]
Option 14	135.45M	82.4M	1.1
Option 16B	176.40M	98.0m	0.9
Option 16C			

[4] BCR – Benefit to Cost Ratio
[5] Adjusted BCR includes wider impacts benefits

JOURNEY TIME ANALYSIS

The north and southbound movements from M3 Junction 11 to A34 via M3 Junction 9 are expected to gain most from the Option 14 scheme. In the 2036 AM there is a reduction of approximately 90s and 45s in the north and southbound directions respectively. In the PM the northbound reduction is approximately 195s and southbound the reduction is approximately 95s. In Option 16B, the expected 2036 journey time savings (approximately 1 minute in the AM and 3 minutes in the PM) in the northbound direction is in accordance with the focus of this option and small increases are forecast in the southbound direction that is effectively unchanged in arrangement from the DM[6]. The southbound journey time increases stem from increased delays on the A34 southbound approach to Junction 9. The signals have been reoptimised in Option 16B compared to the DM.

PUBLIC CONSULTATION

The non-statutory Public Consultation period commenced on the 9 January 2018 and concluded on the 19 February 2018.

The majority of the public (96%, 817 responses), who responded to the consultation believe improvement of the M3 Junction 9 is required.

The primary concern for the local residents was the access from Junction 9 to the A33. The public perceived the manoeuvre from the A34 northbound merge (on slip), from the Junction 9 link, to the subsequent offside diverge to the A33, to be unsafe. Preliminary options to address these concerns have been produced and included within this report and will be considered further in PCF Stage 3.

PREFERRED ROUTE

Given the engineering considerations, BCR and the overwhelming support from the public and the scheme's stakeholders, subject to the aforementioned consideration of alternative options for the A33 diverge, this report concludes that Option 14 should be the recommended route and should be progressed to PCF Stage 3.

[6] DM – Do Minimum

1 SUMMARY OF EXISTING CONDITIONS

1.1 SCHEME BACKGROUND

1.1.1 The M3 Junction 9 is a key strategic route interchange which connects South Hampshire and the ports of Southampton and Portsmouth with the wider sub region. It also connects the region to London and the north-west via the M3, and the Midlands and the North via the A34. The A34 also provides a connection to the principal east-west corridor of the A303. The junction acts as a bottleneck on the local and strategic highways network and causes significant delay, especially during peak hours.

1.1.2 The northbound and southbound movements between the M3 to the south of the M3 Junction 9 and the A34 to the north, are particularly significant. Queues on the northbound diverge (off-slip) of the M3 regularly back onto the mainline carriageway, resulting in delays and safety concerns for both M3 northbound through traffic and traffic seeking to leave the motorway. Such issues are particularly prevalent during peak periods. There are further potential safety concerns on the A34 southbound due to significant queuing which also results in rat running traffic through the residential suburbs of Winchester.

1.1.3 To overcome queuing on the M3 Junction 9 northbound diverge (off-slip), additional traffic signal green time has been allocated at the Junction 9 signalised roundabout in a recent pinch point project, which has resulted in the development of lengthy queues on the A272 Spitfire Link and Easton Lane during the morning and evening peak periods respectively.

1.1.4 As the primary congestion and safety issues are associated with traffic travelling between the M3 south of Junction 9 and the A34, this scheme does not provide free flowing links between the M3 north of Junction 9 and the A34. This traffic would continue to use Junction 9 for this movement.

1.2 DESCRIPTION OF LOCALITY

1.2.1 The scheme is located in South Hampshire, which is the second mostly densely populated region in the southeast of England, with a population of approximately 1,019,300 recorded during the 2011 census. The junction is also on one of the principal routes serving the ports of Southampton, Portsmouth and Poole, which attract substantial volumes of traffic (including heavy freight movement and holiday traffic) from across the country, with the local area acting as a gateway to mainland Europe, the Channel Islands and the Isle of Wight. In addition Bournemouth and Southampton International Airport, which serve domestic mainland, Channel Islands and European destinations, generate additional vehicle trips, which further constrain the operation of the strategic road network, leading to road congestion and journey-time unreliability.

1.2.2 The location of the junction relative to the surrounding area and local highway networks is illustrated in Figure 1-1.

Figure 1-1: Scheme location relative to the surrounding area and local road network

1.2.3 The M3 Junction 9 is located to the east of the City of Winchester which is the county town of Hampshire. As per the 2011 Census, the Winchester District including Alresford and Bishop's Waltham has a population of 116,800.

1.2.4 M3 Junction 9 is located adjacent to the settlement of Winnall (to the east of Winchester). The surrounding area is urban to the west and northwest of the junction and primarily rural in all other directions with the SDNP[7] located to the east and north of the junction.

1.2.5 The land immediately to the west of the junction is predominantly commercial/industrial with Wykeham Trade Park and a Highways England maintenance depot located to the north-west of the junction. Developments to the south-west include Sun Valley Business Park, Tesco Extra Superstore, Winnall Industrial Estate and Scylla Industrial Estate.

1.2.6 The land to the east is generally greenfield primarily forming part of the SDNP, with the River Itchen and its associated floodplain to the north of the scheme. The River Itchen SAC[8] and SSSI[9] also extend to the north-east and south-west of the existing junction.

1.3 EXISTING HIGHWAY NETWORK

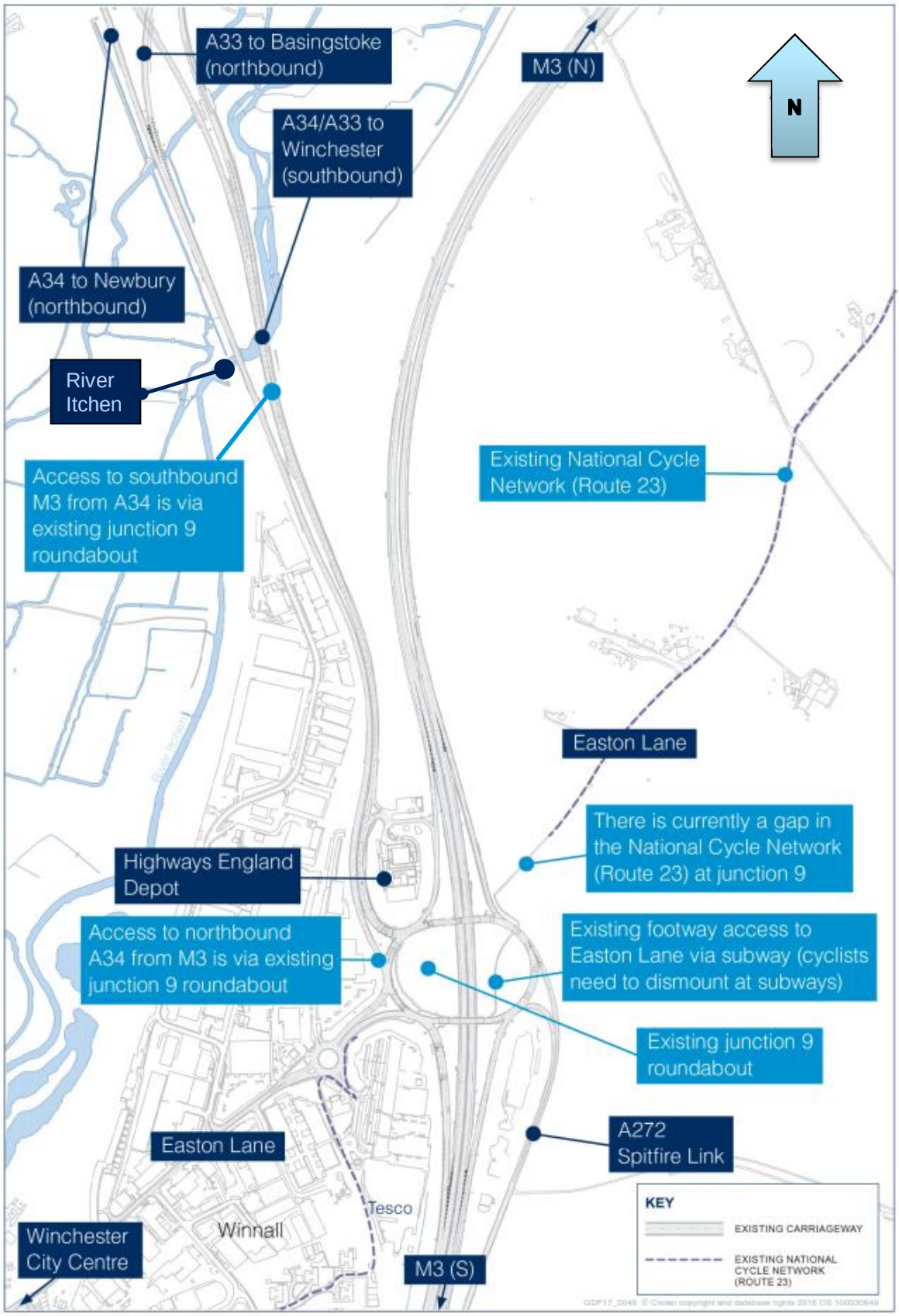
1.3.1 The existing junction forms a grade-separated, partially signal controlled roundabout arrangement between:

- M3 (which forms the principal route between Southampton and London)
- A34 (which forms the principal route between Winchester and Oxford; this also links with the A33 to Basingstoke)
- A272 Spitfire Link (non-signalised link, this forms the principal route between Winchester and Petersfield, this route also links to the A31)
- Easton Lane (which provides the local access route between Winchester and the Strategic Road Network via M3 Junction 9).

1.3.2 The existing junction layout is shown in Figure 1-2.

[7] SDNP –South Downs National Park
[8] SAC – Special Areas of Conservation
[9] SSSI – Sites of Special Scientific Interest

Figure 1-2: Existing junction layout



1.3.3 The northbound carriageway of the M3 approaching Junction 9 from the south is formed of a standard dual 3 lane motorway with hard shoulder. The Junction 9 northbound diverge is a DMRB[10] TD22/06 Layout of Grade Separated Junctions Type 'D' (Option 2) Lane Drop with Parallel diverge. Diverge lanes from the motorway are marked for the A34, with two lanes proceeding northbound through the junction for the M3 as a standard dual 2 lane motorway. A northbound slip road from Junction 9 joins the M3 mainline north of the junction via a TD22/06 Type 'A' Taper merge.

1.3.4 North of the junction the southbound carriageway of the M3 forms part of the standard dual 2 lane motorway. A TD22/06 Type 'A' Taper diverge provides access to the Junction 9 roundabout via the southbound off slip road. The M3 continues through the junction as a standard dual 2 lane motorway with hard shoulder. South of the junction a TD22/06 Type 'F' Lane Gain with Ghost Island Merge (Option 1) is provided after which the junction the M3 becomes a standard dual 3 lane motorway with hard shoulder.

1.3.5 The A34 is a dual 2 lane all-purpose road. Approximately one kilometre north of the M3 Junction 9 the 2 lane northbound carriageway bifurcates. The nearside lane continues north-west as the A34, widening to two lanes just beyond the bifurcation. The offside lane continues to the north to become the A33. The existing A34 / A33 arrangement creates a bottleneck for the A34 traffic by effectively narrowing the A34 from two lanes to one prior to the diverge, before returning to two lanes after the diverge.

1.3.6 In the southbound direction the A33 southbound carriageway merges with the southbound A34 with a TD22/06 Type 'C' ghost island merge. Beyond the merge the A34 is 2 lanes until just before the M3 Junction 9 roundabout where it widens to three lanes on the approach to the Junction 9 traffic signals. On the A34 southbound approach to Junction 9 there is also an access to and egress from the Highways England maintenance depot.

1.4 TRAFFIC

1.4.1 The existing traffic conditions on the approaches to the roundabout at the M3 Junction 9 are summarised in Table 1-1. Traffic counts have been taken from the traffic surveys undertaken in June 2015 by SkyHigh.

Table 1-1: Traffic counts on the approach and exits at the M3 Junction 9

Arm	AM Peak Hour Flow (0800-0900)	% HGV[11]	Inter-Peak Average Hourly Flow (1000-1600)	% HGV	PM Peak Hour Flow (1700-1800)	% HGV	Average Annual Weekday (AADT)	% HGV
M3 Northbound Merge (On-Slip)	229	9.7%	167	6.0%	228	4.0%	2614	5.7%
M3 Southbound Diverge (Off-Slip)	261	5.4%	171	8.9%	500	1.8%	3755	6.8%
A272 Exit	505	8.7%	402	9.4%	1312	2.6%	9248	7.7%
A272 Approach	394	9.1%	347	11.0%	375	6.1%	4723	9.1%
M3 Southbound Merge (On-Slip)	2080	14.8%	1647	17.1%	1963	9.0%	21696	14.8%
M3 Northbound Diverge (Off-Slip)	2370	12.6%	1730	17.5%	2043	10.3%	24891	14.8%
Easton Lane Exit	901	4.3%	606	6.3%	571	2.6%	7096	5.0%

[10] DMRB – Design Manual for Roads and Bridges
[11] HGV – Heavy Goods Vehicle

Arm	AM Peak Hour Flow (0800-0900)	% HGV[11]	Inter-Peak Average Hourly Flow (1000-1600)	% HGV	PM Peak Hour Flow (1700-1800)	% HGV	Average Annual Weekday (AADT)	% HGV
Easton Lane Approach	627	7.5%	727	5.4%	1070	2.2%	8925	5.3%
A34 Northbound	2350	12.9%	2032	16.5%	2562	9.1%	28722	13.8%
A34 Southbound	2593	13.1%	1880	16.3%	2648	7.6%	27081	13.7%

1.4.2 Table 1-1 above shows the busiest arms at the roundabout are the M3 south facing slip roads and the A34 northbound and southbound, with the highest flow of 2,648 vehicles occurring in the PM peak hour on the A34 southbound approach. Flows in the inter-peak are lower than in the peak hours on all of the approaches and exits but still remain high.

1.4.3 The highest proportion of HGV[12] traffic is 17.5% during the inter-peak on the M3 northbound diverge (off-slip); the highest during either the AM or PM is 14.8% on the M3 southbound merge (on-slip). This difference is unlikely to be as a result of increased HGV flow during inter-peak, but rather due to the lower car/LGV[13] flow upon which the HGV proportion depends. There will also be an increase in HGV traffic linked to the timings of the boats departing and arriving from the ports.

1.5 COLLISIONS AND JOURNEY TIME RELIABILITY

1.5.1 Collision data has been obtained from Hampshire Constabulary for a five year period from 1st March 2011 – 29th February 2016. The accident data covers the M3 Junction 9 roundabout including the slip roads, M3 mainline (approximately 800m north and south of the junction), as well as the section of the A34 up to the junction with the A33.

1.5.2 The data is based on personal injury collisions recorded by the police. The number of collisions is summarised in Table 1-2 below, and a plot is included in Appendix A.

Table 1-2: Collisions by Severity

TYPE / YEAR	2011 (Mar – Dec)	2012 (Full Year)	2013 (Full Year)	2014 (Full Year)	2015 (Full Year)	2016 (Jan – Feb)	TOTAL
Fatal	0	0	0	0	0	0	0
Serious	1	1	1	2	1	0	6
Slight	17	8	22	12	16	1	76
Total	18	9	23	14	17	1	82

[12] HGV – Heavy Goods Vehicle
[13] LGV – Large Goods Vehicle

1.5.3 The severity ratio (defined as the number of serious and fatal collisions compared with the total) is 7.3%. 'Reported Road Casualties Great Britain 2014', indicates that the five year national average severity ratio for 50mph (80kph) dual carriageways is 12.3% and for 70mph (120kph) dual carriageways 15.5%. Given that traffic travelling through the M3 Junction 9 roundabout will be slower on average than that observed on 50/70mph (80/120 kph) roads due to the traffic signals, there would likely be a higher proportion of 'slight' shunts resulting in a lower severity ratio in comparison to higher speed roads.

ACCIDENT TRENDS

1.5.4 The collision data from Hampshire Constabulary has been analysed for the five year period above, during which a total of 82 accidents occurred; the data area shows approximately 50% occur on or on the approach to the roundabout. The remaining 50% of the collisions occur on the M3 slip roads or on the main line of the M3 and the A34.

SERIOUS ACCIDENTS

1.5.5 The broad collision characteristics for the serious collisions that have occurred within the study area in the five year period are outlined in Table 1-3 below.

Table 1-3: Serious Collision Characteristics and Location

Possible Attributor			Location of Accidents		
Accident Description	Number of Accidents	%	Accident Location	Number of Accidents	%
Changing Lane	1	17%	Roundabout	4	66%
Loss of Control	1	17%	Not at a junction	1	17%
Rear Shunt	2	33%			
Driver error entering the roundabout	2	33%	Roundabout Approach	1	17%

1.5.6 There are only a few serious accidents that have occurred in the study area over the five year period therefore it is not possible to draw conclusions about trends or prevailing causes but of the 6 accidents, two thirds were as a result of driver error either entering the roundabout incorrectly or driving into the back of the car in front.

SLIGHT ACCIDENTS

1.5.7 Over the five year review period, 76 slight accidents have occurred within the study area. In general these can be grouped into six primary clusters based on location of occurrence:

- à M3 northbound approaching Junction 9.
- à Junction 9 roundabout circulatory carriageway
- à A34 northbound between Junction 9 and A33.
- à A34 southbound approaching Junction 9.
- à A272 Spitfire Link approaching Junction 9.
- à Easton Lane approaching Junction 9.

1.5.8 The remainder of accidents were scattered across the scheme extents and did not follow any trends.

1.5.9 Table 1-4 below summarises the locations, times of occurrence and possible attributors of all 76 slight accidents.

Table 1-4: Summary of the locations, times of occurrence and possible attributors of all slight accidents.

Location	Possible Attributor	AM peak (07.00 – 09.00)		Inter-peak (09.00 – 16.00)		PM peak (16.00 – 18.00)		Off-peak (18.00 – 07.00)	
		Accidents	%	Accidents	%	Accidents	%	Accidents	%
M3 Northbound	Loss of control	0	0.00%	0	0.00%	0	0.00%	1	1.32%
	Changing Lanes	0	0.00%	3	3.95%	1	1.32%	0	0.00%
	Rear Shunt	1	1.32%	3	3.95%	0	0.00%	3	3.95%
	Driver error	0	0.00%	1	1.32%	0	0.00%	0	0.00%
	Total	**1**	**1.32%**	**7**	**9.21%**	**1**	**1.32%**	**4**	**5.26%**
Junction 9	Loss of control	0	0.00%	0	0.00%	0	0.00%	0	0.00%
	Changing Lanes	0	0.00%	1	1.32%	1	1.32%	0	0.00%
	Rear Shunt	0	0.00%	4	5.26%	0	0.00%	2	2.63%
	Driver error	0	0.00%	1	1.32%	0	0.00%	0	0.00%
	Total	**0**	**0.00%**	**6**	**7.89%**	**1**	**1.32%**	**2**	**2.63%**
A34 Northbound	Loss of control	0	0.00%	2	2.63%	0	0.00%	1	1.32%
	Changing Lanes	0	0.00%	1	1.32%	0	0.00%	1	1.32%
	Rear Shunt	0	0.00%	3	3.95%	0	0.00%	1	1.32%
	Driver error	0	0.00%	0	0.00%	0	0.00%	0	0.00%
	Total	**0**	**0.00%**	**6**	**7.89%**	**0**	**0.00%**	**3**	**3.95%**
A34 Southbound	Loss of control	0	0.00%	0	0.00%	1	1.32%	5	6.58%
	Changing Lanes	0	0.00%	2	2.63%	0	0.00%	0	0.00%
	Rear Shunt	1	1.32%	7	9.21%	1	1.32%	4	5.26%

Location	Possible Attributor	AM peak (07.00 – 09.00)		Inter-peak (09.00 – 16.00)		PM peak (16.00 – 18.00)		Off-peak (18.00 – 07.00)	
	Driver error	0	0.00%	0	0.00%	0	0.00%	0	0.00%
	Total	**1**	**1.32%**	**9**	**11.84%**	**2**	**2.63%**	**9**	**11.84%**
A272 approach to roundabout	Loss of control	0	0.00%	0	0.00%	0	0.00%	0	0.00%
	Changing Lanes	0	0.00%	0	0.00%	1	1.32%	0	0.00%
	Rear Shunt	0	0.00%	2	2.63%	0	0.00%	1	1.32%
	Driver error	0	0.00%	1	1.32%	0	0.00%	0	0.00%
	Total	**0**	**0.00%**	**3**	**3.95%**	**1**	**1.32%**	**1**	**1.32%**
Easton Lane approach to roundabout	Loss of control	0	0.00%	0	0.00%	0	0.00%	0	0.00%
	Changing Lanes	0	0.00%	0	0.00%	0	0.00%	0	0.00%
	Rear Shunt	0	0.00%	6	7.89%	1	1.32%	0	0.00%
	Driver error	0	0.00%	1	1.32%	0	0.00%	0	0.00%
	Total	**0**	**0.00%**	**7**	**9.21%**	**1**	**1.32%**	**0**	**0.00%**
Other	Loss of control	0	0.00%	3	3.95%	1	1.32%	1	1.32%
	Changing Lanes	0	0.00%	0	0.00%	0	0.00%	0	0.00%
	Rear Shunt	0	0.00%	5	6.58%	0	0.00%	0	0.00%
	Driver error	0	0.00%	0	0.00%	0	0.00%	1	1.32%
	Total	**0**	**0.00%**	**8**	**10.53%**	**1**	**1.32%**	**2**	**2.63%**

1.5.10 The highest proportion of accidents (27.63%) occurred on the A34 southbound. These were mainly during the inter-peak hours however there was also a significant number of accidents during the off-peak hours in this cluster. Rear shunts due to stationary traffic ahead were the main cause of the accidents as a result of the queues approaching Junction 9.

1.5.11 A significant number of accidents also occurred on the M3 northbound approaching Junction 9 (17.11%) and the A34 northbound between Junction 9 and the A33 (11.84%). These accidents included general loss of control as well as rear shunts and lane changes which reflect the arrangement at both locations where there are diverges to Junction 9 and A33 respectively which result in frequent weaving movements. Anecdotal evidence suggests that these accidents are as a result of some drivers trying to overtake queuing traffic at these locations to jump the queues. These drivers then force their way into the queue at the last minute. This poor driving behaviour can then cause reciprocal behaviours and hence potential conflict.

1.5.12 The approaches to the roundabout from the A272 and Easton Lane also involved accidents caused almost entirely by rear shunts for similar reasons as for the other approaches.

1.5.13 Some accidents also occurred on the Junction 9 circulatory carriageway (11.84%), mostly in the form of rear shunts as a result of the start-stop conditions caused by the traffic signals and lane changes. In addition the A272 is a non-signalised arm of the Junction 9 roundabout and has long queues due to priority at Junction 9 being given to the A34 to M3 traffic. This makes it difficult for A272 traffic to enter the circulatory carriageway, which in turn results in drivers taking risks to enter the roundabout. This has resulted in a cluster of the Junction 9 accidents at the A272 entry.

JOURNEY TIME RELIABILITY

1.5.14 The Highways England journey time database has been examined for the route between the M3 Junction 9 northbound off-slip and the A34, just past the junction with the A33, in order to reveal the variability of journey times on different days of the week. All days within the neutral month of October 2015 have been included in this assessment.

JOURNEY TIME VARIABILITY THROUGH THE DAY

1.5.15 The journey times, reported for an average weekday, are shown for the AM, PM and IP[14] hours in Table 1-5 below for the section between south of the M3 Junction 9 and on the A34, north of the A33 diverge.

[14] IP – Inter-peak

Table 1-5: Peak and Inter-peak Journey Times (Seconds), Average Weekday

SECTION	AM (0800-0900)	IP (1000-1600)	PM (1700-1800)
Northbound	111	121	119
Southbound	134	124	150
Difference compared to IP (%)			
Northbound	-10 (-9%)		-2 (-2%)
Southbound	10 (8%)		26 (21%)

1.5.16 Table 1-5 shows that the northbound route has journey times which are consistent between the AM, IP[15] and PM peak of around two minutes. The percentage change in journey times between the three peaks is 9% equating to a range difference of 10 seconds.

1.5.17 In the southbound direction the PM peak journey time is longer than the AM and the IP journey time. The range difference in journey times in the southbound direction indicates an increase of 10 seconds (8%) in the AM and 26 seconds (21%) in the PM, compared to the IP.

1.5.18 Comparing the journey time variability between peak periods on an average weekday, the difference between travelling at different times of the day is shown to be low. The greatest difference (21%) can be seen on the southbound route between inter-peak and PM peak, which is expected to relate to the increase in traffic flows. The figures in table 1-5 show average journey times across the year, however anecdotally there are considerably longer queues in the summer months which result in significantly longer journey times in the AM and PM peak than shown in the table.

JOURNEY TIME VARIABILITY THROUGH THE WEEK

1.5.19 While the journey time variability between peak periods of an average weekday has been presented, it is useful to also understand the change in journey times through the week. This section utilises the same dataset as in Table 1-5, breaking the data down further by day of the week in order to compare how journey times vary each day.

1.5.20 Network peak hours have been selected for these calculations; the same hours for which the traffic count data has been presented in Section 1-3. The journey time by direction and day of the week is shown in Table 1-6.

Table 1-6: Average Peak Hour Journey Time (Seconds) by Weekday

JOURNEY TIME/ ROUTE SECTION	PEAK PERIOD	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
M3 to A34 (Northbound)	AM	119	104	111	111	111
	IP	123	105	107	109	163
	PM	126	111	116	121	119
A34 to M3 (Southbound)	AM	161	134	131	126	126
	IP	134	131	124	119	117
	PM	157	134	140	153	165

[15] IP – Inter-Peak

1.5.21 It can be seen that there is some variance in journey times when travelling on different days of the week. For northbound travel, the average mid-week journey generally takes less time in most peak periods than on a Monday or Friday. Furthermore, inter-peak journeys on a Friday are significantly longer than on a Monday, 163 seconds compared to 123.

1.5.22 Data for average weekday travel in the southbound direction indicates that journeys on a Monday are longer in all peak periods than mid-week journeys. Slower travel is also observed during the Friday PM peak, with average journeys taking up to 31 seconds longer than on mid-week days.

1.5.23 The average peak hour journey times presented in Table 1-6 provide an indication of usual travel times through the junction, while Table 1-7 summarises the minimum and maximum journey times in each direction/ peak period, for each day of the week observed in the October 2015 dataset. This gives a better indication of how augmented journey times can become, during times of congestion compared to periods of minimal delay through the junction.

Table 1-7: Min/Max Peak Hour Journey Times in October 2015 (Seconds)

JOURNEY TIME/ ROUTE SECTION	PEAK PERIOD	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
M3 to A34 (Northbound)	AM	93 / 238	87 / 128	91 / 131	94 / 142	81 / 182
	IP[16]	93 / 223	84 / 127	99 / 153	88 / 192	100 / 432
	PM	108 / 185	95 / 137	92 / 138	92 / 150	94 / 315
A34 to M3 (Southbound)	AM	117 / 197	99 / 178	100 / 177	105 / 164	99 / 170
	IP	110 / 190	111 / 222	86 / 157	101 / 141	93 / 135
	PM	108 / 194	111 / 186	99 / 201	102 / 194	108 / 201

1.5.24 Based on the lowest recorded northbound journey times, it can be assumed that a journey with minimal delay from traffic signals or congestion takes approximately 81 seconds, while in the southbound direction the lowest recorded journey time is 86 seconds.

1.5.25 The range between minimum and maximum journey times shown in table 1-6 is further summarised in Table 1-8 for each direction and peak period.

Table 1-8: Journey Time Range (Working Weekdays)

JOURNEY TIME/ ROUTE SECTION	PEAK PERIOD	MINIMUM	MAXIMUM	RANGE	RANGE/MIN%
M3 to A34 (Northbound)	AM	81	238	157	194%
	IP	84	432	348	414%
	PM	92	315	223	242%
A34 to M3 (Southbound)	AM	99	197	98	98%
	IP	86	222	136	158%
	PM	99	201	102	103%

[16] IP – Inter Peak

1.5.26 It can be seen from an analysis of minimum and maximum journey times recorded in October 2015 that there is significant variability day to day, with maximum journey times more than double minimum journey times. Most notably, journeys in the northbound direction during the inter-peak varied from 84 to 432 seconds, equating to journey times more than five times longer (414%) than journeys that experienced minimal delay. The measure of journey time variability is important to allow regular road users to make a prediction of their likely journey time. In doing so, road users are able to select a start time to minimise any adverse impact of unexpected delays. The perceived poor level of journey time reliability at this junction has been evidenced above. As a result, regular users will seek alternative routes, avoiding the junction altogether.

1.5.27 Analysis of average journey time variability across the week indicates higher journey times in most peak periods on Mondays/Fridays compared to mid-week. Most regular travellers through this junction are likely to expect this which is as a result of higher traffic flows at these times.

1.6 ENVIRONMENTAL

1.6.1 The surrounding area is primarily urban to the west of the M3 and primarily rural to the east. There are large concentrations of residential receptors close to the A34 (in Headbourne Worthy, Kings Worthy and Abbots Worthy) and close to the M3 to the south (on the eastern fringe of Winchester). A small number of isolated farm holdings or rural dwellings lie to the east of the scheme. There are four schools in proximity to the scheme (the closest of which is St Swithun's School located immediately to the east of the M3 from Alresford Road (B3404)).

1.6.2 The scheme will require land take within the South Downs National Park (SDNP) which extends outside of the scheme area to the north, east, south and some areas to the west. Areas of land take within the SDNP are focused to the eastern and northern boundaries of the scheme. The land to the east is generally green field.

1.6.3 The scheme crosses the River Itchen, its flood plain and several of its tributaries. The river flows in a south-westerly direction. The River Itchen area is subject to European and National designations, namely the River Itchen SAC and SSSI. The River Itchen flows into the Southampton and Solent Water Special Protection Area (SPA) and Ramsar site approximately 22km downstream of the scheme area. It also flows through the SDNP, located both upstream and downstream of the scheme area, through the Winnall Moors Nature Reserve to the west and St Catherine's Hill region to the south.

1.6.4 The River Itchen and a number of its tributaries are classed as 'Main Rivers,' and are therefore managed by the Environment Agency (EA). Water quality is monitored against the Water Framework Directive objectives; the River Itchen and the Nun's Walk Stream are assessed as having 'Good' ecological and chemical status.

1.6.5 The Environment Agency Flood Map for Planning (Rivers and Sea)[17] indicates that the northern section of the scheme is situated within Flood Zone 3 (high risk), which is land assessed as having a 1% or greater Annual Exceedance Probability (AEP) of fluvial flooding. Flood Zone 3 covers a large area between the existing A34 and M3 alignments, and is associated with the River Itchen and its tributaries (draining from the north-east). The northern section of the scheme is also located within Flood Zone 2 (medium risk), which is land assessed as having between a 0.1% and 1% AEP for fluvial flooding. However, it should be noted that only road marking changes are proposed on the highways as they cross over the River Itchen. The remainder of the scheme area is situated within Flood Zone 1 (low risk), which is land assessed as having less than a 0.1% AEP of flooding (see Figure 1-3).

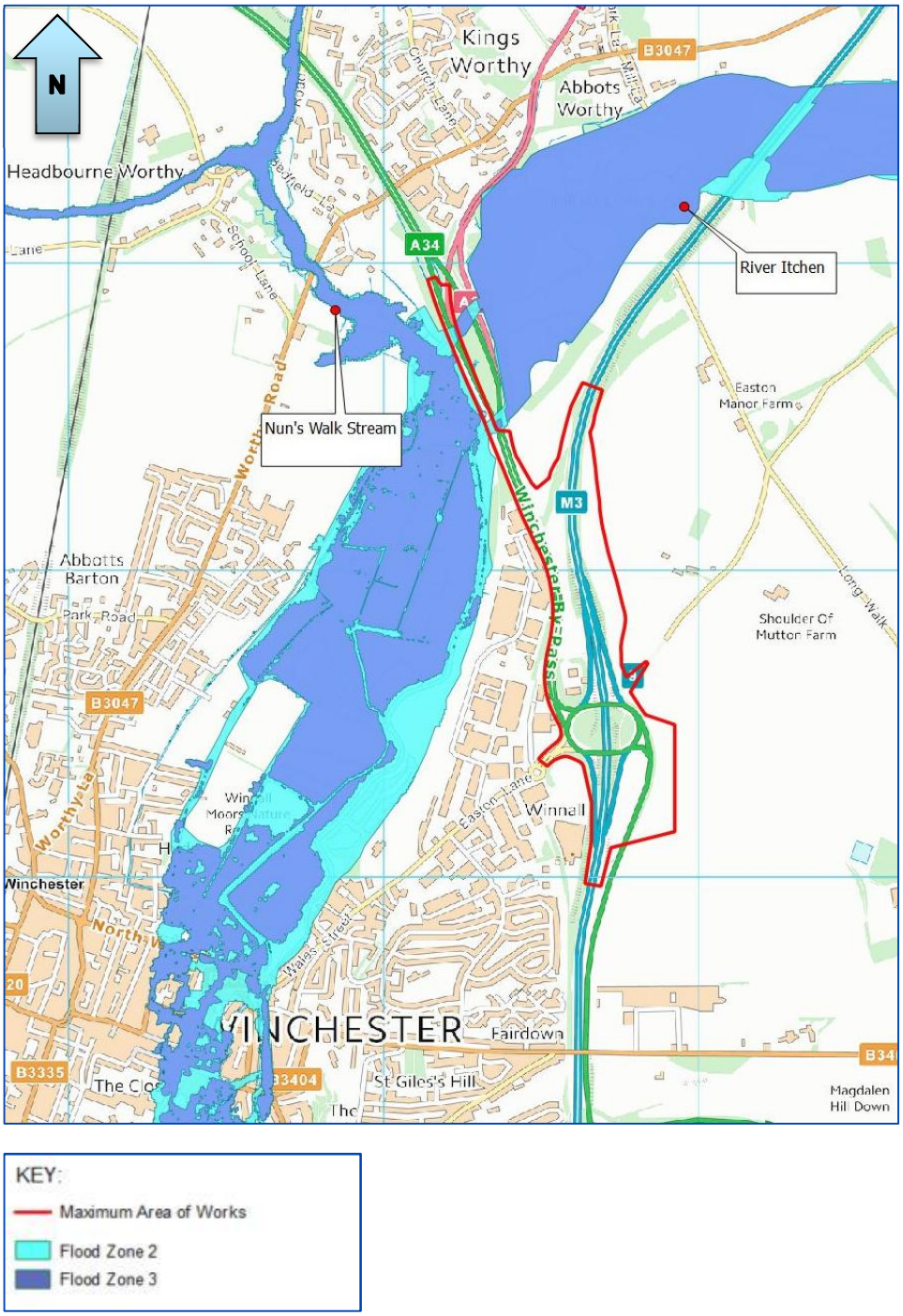
1.6.6 Three Noise Important Areas (NIAs) are located outside the scheme area and are associated with the A34 and M3.

1.6.7 127 heritage assets have been identified within 1km of the scheme including a cluster of designated assets within Worthy Park to the north of the scheme.

1.6.8 A broader list of environmental designations is included in section 2.6 with additional detail provided in the Environmental Assessment Report.

[17] EA (2017) Flood map for planning [online]. Available at: https://flood-map-for-planning.service.gov.uk/summary/449291/130210 [Accessed 12 December 2017].

Figure 1-3: Environment Agency's Flood Map for Planning



1.7 OTHER RELEVANT FACTORS

PUBLIC UTILITIES

1.7.1 Major statutory undertakers were contacted with a NRSWA[18] C2 Enquiry on 3 September 2015 to ascertain whether or not this scheme will impact upon their utilities. The status of responses received from statutory undertakers with equipment potentially affected by the scheme are summarised in Table 1-9.

Table 1-9: Affected Utilities

UTILITY COMPANY	TYPE	COMMENT
GeneSYS - [National Roads Telecommunications Services (NRTS)]	Telecoms	Apparatus has been identified in the M3 in both directions as well as on the Junction 9 roundabout. All are expected to be affected by the proposed works.
GTC	Gas, electric and water	GTC have identified assets in the area. However, it is only one location and it is unlikely to be within scheme area.
Openreach – [British Telecommunications]	Telecoms	BT has identified apparatus to be present in the immediate vicinity of the scheme. Specifically there is apparatus which runs along Easton Lane on either side of Junction 9. These connect through Junction 9 alongside the existing footpath
SGN – (Southern Gas Network)	Gas	SGN highlighted presence of underground services. Specifically there is a low pressure main crossing M3 on the south of side of Junction 9 within the scheme area.
Southern Water	Water	Presence of utilities within the vicinity of the scheme have been highlighted. There are mains running alongside the M3 and would be affected by the proposed works.
SSE - (Southern Electric Power Distribution)	Electricity	SSE has identified apparatus within the vicinity of the proposed works. The impacted apparatus is likely to be a LV and HV cable running along the eastern side of the M3 southbound offslip.
Vodafone	Telecoms	Vodafone confirmed they have apparatus within the vicinity of the proposed works on the north side of A33. however this is likely to be outside the extents of works and therefore would not be impacted

[18] NRSWA - New Roads and Streetworks Act

1.7.2 A NRSWA[19] C3 Enquiry was carried out on 30 January 2017 to ascertain the cost of Statutory Undertaker diversions for each option. The costs of diversions for each option are shown in Chapter 4.

STREET LIGHTING

1.7.3 The M3 and A34 are currently unlit. The only street lighting within the limit of works is Hampshire County Council owned in the central reserve of Easton Lane to the west of Junction 9. Street lighting requirements for the scheme will be considered further in PCF[20] Stage 3.

TECHNOLOGY

1.7.4 The technology assets on the M3 and at Junction 9, include the Motorway Incident Detection and Automated Signalling (MIDAS) system, CCTVs[21], variable message signs, traffic signals and emergency telephones. These will be investigated further during PCF Stage 3.

EXPRESSWAY

1.7.5 A technical note was issued in March 2016 which documented the high level core requirements which shall be present for a route to be designated an “Expressway”. This technical note is due to be formalised as an IAN[22].

1.7.6 This technical note identified the A34 as part of the Highways England Expressway network and would require the addition of VMS’s, emergency telephones and CCTV’s to the A34 with associated emergency laybys, signing and road markings. These will be investigated further during PCF Stage 3.

[19] NRSWA - New Roads and Streetworks Act
[20] PCF – Project Control Framework
[21] CCTV – Closed Circuit Television
[22] IAN – Interim Advice Note

2 PLANNING FACTORS

2.1 INTRODUCTION

2.1.1 This section considers a number planning factors in terms of local, strategic and national plans under contexts summarised by the following:

- à Housing and Employment
- à Transport and Connectivity
- à Transport Technology
- à Programming
- à Environmental
- à Statutory Process
- à Interface with Third Parties

2.2 HOUSING AND EMPLOYMENT

2.2.1 The Winchester Local Plan part 1 covering the period from 2011 to 2031 aims to provide 4,000 dwellings in the City of Winchester as well as employment. This includes a strategic allocation of 2,000 dwellings at a new suburb called Barton's Farm to the north of Winchester adjacent to the A34 just north of the scheme. This is likely to contribute to an increase in traffic flows on the A34 using Junction 9. Any new or planned alterations to local roads will be captured in the final traffic modelling during PCF[23] Stage 3.

2.3 TRANSPORT AND CONNECTIVITY

2.3.1 Highways England is considering other improvement schemes on the Strategic Road Network. Schemes in the region that may directly impact the M3 Junction 9 Improvement include the M3 Junction 9 to Junction 14 Smart Motorway programme, M27 Junction 4 to Junction 11 Smart Motorway Programme and M27 Southampton Junctions Improvement.

2.3.2 Southampton Port is forecasting an increase in handling of container units from 2.7 million units in 2020 to 4.2 million in 2030. It is also forecasting an increase from 1.5 million cruise passengers in 2020 to 1.9 million in 2030[24]. This substantial development of the port will increase HGV[25] and other traffic on the A34 and M3.

[23] PCF – Project Control Framework
[24] Port of Southampton Port Master Plan 2016 – 2035 CONSULTATION DRAFT
[25] HGV – Heavy Goods Vehicle

2.4 TRANSPORT TECHNOLOGY

2.4.1 While it is not a main priority to deliver significant enhancements in transport technology as part of this scheme, the adjacent smart motorway scheme would require upgrades to the transport technology within the limits of the M3 Junction 9 scheme. Consideration will also be made to take account of plans for any other improvements or major upgrades that may arise moving forward.

2.5 PROGRAMMING

2.5.1 The key constraints that will need to be considered as part of the programming of the scheme:

- The construction phasing and resourcing in Highways England's supply chain, as current delivery is expected to be at the same time as a large number of national schemes.
- Highways England resource availability especially in respect to timing of the Development Consent Order, as current delivery is expected to be at the same time as a large number of national schemes.
- Specifically, considerable coordination will be required between this and the M3 Junction 9 to Junction 14 Smart Motorway scheme as well as general maintenance works on the network and any other nearby construction projects.
- The environmental windows required for clearance and translocation of flora and fauna.

2.6 ENVIRONMENTAL

2.6.1 There are a number of environmental constraints and designations located in proximity to the scheme including:

- The River Itchen (SSSI, SAC, Flood Zone 2 and 3), partly located within the scheme area
- Three Noise Important Areas located outside the scheme area including:
  - NIA4006, M3, north of Junction 9
  - NIA4007, A34, north of Junction 9
  - NIA4008, M3, south of Junction 9
- South Downs National Park, partly located within the scheme area
- Groundwater Source Protection Zone 1 (inner zone), located outside the scheme area
- Historic Landfill within the scheme area (under Junction 9)
- Agricultural Land Class Grade 3 within the scheme area
- 127 heritage assets (within 1km of the scheme area) including:
  - Three Scheduled Monuments
  - One Grade I Listed Building
  - Seven Grade II* Listed Buildings
  - 52 Grade II Listed Buildings
  - Three Conservation Areas
  - 11 Locally listed historic parks and gardens
  - 10 Water Meadows of national significance
  - 40 non-designated heritage assets
- National Cycle Network Route 23, to the northeast and south west of the scheme area.

An environmental constraints drawing is shown in Appendix B.

2.7 STATUTORY PROCESS

2.7.1 For programming purposes, it has been assumed that the proposed scheme is a nationally significant infrastructure project as per the thresholds defined in the Planning Act 2008 (as amended) and will require a DCO[26] accompanied by an Environmental Statement.

2.8 INTERFACE WITH THIRD PARTIES - UTILITIES

2.8.1 A key planning factor will be to ensure that the design and the subsequent construction work will be planned such that there would be minimal disruption and minimal need for diversion of utilities equipment. This will contribute to reducing overall construction costs, and reduce disruptions to road users.

2.9 PLANNING POLICY

NATIONAL POLICY

NATIONAL POLICY STATEMENT FOR NATIONAL NETWORKS (NPS NN)

2.9.1 In 2014, the Government adopted the National Policy Statement for National Networks (NPS NN). This sets out the need for and Government's policies to deliver the development of Nationally Significant Infrastructure Projects (NSIP) such as the national road networks in England. It provides planning policy for promoters of NSIPs on the network, and is the primary policy basis for the Examining Authority and the Secretary of State for making decisions on application for development consent for national networks NSIPs. The NPS NN is consistent with the overall strategic aims of the National Planning Policy Framework (NPPF) and seeks to achieve sustainable development.

2.9.2 The NPS NN paragraph 2.2 states the critical need to improve national networks to address road congestion, expeditious and resilient networks that better support social and economic activity; and provide a network that is capable of stimulating and supporting economic growth.

2.9.3 At paragraph 2.8 the NPS NN states the need to improve the integration between the transport modes, including linkages to ports.

NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

2.9.4 The NPPF published in March 2012 sets out the Government's planning policies for England and how these are expected to be implemented. The Ministry of Housing, Communities and Local Government (MHCLG) is currently consulting on a draft revision of the NPPF, with consultation due to end in May 2018.

2.9.5 The NPPF makes clear that it does not contain specific policies for NSIPs where specific considerations can apply. The NPS NN assumes that function and provides transport policy which guides individual development brought forward under it. If the scheme does not qualify as an NSIP and requires planning permission under the Town and Country Planning Act 1990 (as amended), the NPPF is a material consideration in decision making.

[26] DCO – Development Consent Order

REGIONAL POLICY

HAMPSHIRE LOCAL TRANSPORT PLAN 2011-2031

2.9.6 The Hampshire County Council's Hampshire Local Transport Plan (LTP) 2011-2031 sets out a long-term vision for the transport requirements across Hampshire and specific areas, including Winchester. The Plan identifies working with Highways England to find solutions to address congestion at Junction 9 of the M3 as necessary.

LOCAL PLANNING POLICIES

2.9.7 The plans listed below contain a number of policies which will need to be taken into account in the further development of this scheme.

WINCHESTER

2.9.8 For Winchester district, the statutory Development Plan for the district comprises:

- Winchester District Local Plan Part 1 – Joint Core Strategy (2013)
- Winchester District Local Plan Part 2 – Development Management and Site Allocations (2017)
- Hampshire Minerals and Waste Plan (2013).

There is also a Winchester Transport Strategy currently being prepared which would need to be considered in PCF Stage 3.

SOUTH DOWNS NATIONAL PARK

2.9.9 Part of the scheme is located within the South Downs National Park and the scheme will be viewed from the National Park, therefore the effects of it on the Park must be considered. Once adopted, the policies in the emerging South Downs National Park Local Plan will replace all existing planning policies across the National Park.

2.9.10 The South Downs National Park Local Plan currently consists of the Winchester District Local Plan Part 1 – Joint Core Strategy (2013) and saved policies from the Winchester District Local Plan Review 2006.

3 SUMMARY OF DO NOTHING CONSEQUENCES

3.1 DESCRIPTION OF THE DO NOTHING/MINIMUM OPTION

3.1.1 For the assessment of the scheme using the traffic model, the do minimum network has been used as a baseline situation. This is formed from the 2015 base year network with the addition of committed infrastructure depending on delivery dates in line with the forecast years of 2019, 2026, 2031 and 2041.

3.2 ECONOMIC IMPACT

3.2.1 The economic impact of doing nothing for the M3 Junction 9 is a worsening of existing conditions in terms of the congestion and delays at the junction. The opening of the M3 Junction 9 to Junction 14 Smart Motorway Improvement would result in further increase in volume of traffic accessing M3 junction 9, causing congestion and subsequent journey time increases through the junction.

3.2.2 While the smart motorway project would alleviate some of the delay impacts for M3 to A34 routes, in periods of high volume, such as the northbound direction in the PM peak, there is a large increase in delay at the Junction 9 off-slip traffic signals that exceed the smart motorway delay reductions on the motorway. In the southbound direction from the A34 to M3 the existing conditions would be unaffected by the smart motorway and so the signalised Junction 9 roundabout would still control access to the M3, therefore a steady increase in traffic volumes would result in longer queues on the A34 approach to Junction 9.

3.2.3 With additional congestion it is also expected that the number of accidents on this section of the SRN will increase as a result of stop-start traffic and related shunts.

3.3 SUMMARY OF CONSEQUENCES

3.3.1 The consequences of the do-minimum scenario will be a steady worsening of travel conditions from those currently experienced, associated worsening of accident numbers and a wider knock-on effect on local economic growth.

3.4 ENVIRONMENTAL IMPACT

3.4.1 Section 3.2 above suggests that there will be a steady worsening of existing traffic conditions in terms of the congestion and delays at the junction. Table 3-1 outlines the environmental consequences of the ‘Do Nothing’ scenario.

Table 3-1: Environmental consequences of the 'Do Nothing' scenario

TOPIC	DO NOTHING CONSEQUENCES
AIR QUALITY	It is expected that without the scheme lower emissions would occur, based on the assumption that technological improvements to vehicles would take place. Table 5-10 in the EAR presents the results of the air modelling exercise for the do nothing scenario. This modelling exercise included the changes in traffic indicated by the traffic modelling and changes in technology.
CULTURAL HERITAGE	There would be no change from the existing conditions. No investigations in regard to buried archaeology would likely take place and no further knowledge of the site would be achieved.
LANDSCAPE EFFECTS	The landscape and views are not anticipated to change significantly without the scheme.
BIODIVERSITY	The existing habitats and species are not anticipated to change significantly without the scheme.
GEOLOGY AND SOILS	The status of on-site geology and soils are anticipated to remain the same as existing conditions.
MATERIALS	If the scheme is not constructed there would not be a significant change in relation to materials consumption and waste production and disposal for the existing scheme under consideration.
NOISE AND VIBRATION	Negligible noise changes are predicted in the period between 2023 and 2038 should the proposed scheme not proceed.
PEOPLE AND COMMUNITIES	There would be no land loss if the scheme was not built. The benefits resulting from the improvements to the WCH[27] provision as part of the scheme would not be realised
ROAD DRAINAGE AND THE WATER ENVIRONMENT	The existing drainage network would not likely meet current requirements in terms of water treatment and quality. Several Priority Outfalls have been identified as being at risk of polluting the receiving surface watercourses. In a Do Nothing scenario an increase in traffic flows is likely to lead to an increase in pollutant run off and an increased risk of pollution to receiving watercourses. Furthermore, the effects of climate change are likely to lead to an increase in flood risk.
CLIMATE	Without the scheme, the site would remain as it is. There would be no emissions as a result of the scheme's construction. The junction's existing climate resilience would remain.

[27] WCH – Walking, Cycling and Horse Riding

4 SUMMARY OF ALTERNATIVE SCHEMES

4.1 OPTION HISTORY

4.1.1 Hampshire County Council originally commissioned Atkins to prepare an 'M3 Junction 9 Feasibility Study – Initial Options Summary Report' (November 2013) to examine the strategic case and provide an estimation of the anticipated performance of potential improvement schemes. The report proposed and assessed nine options and recommended that Package 3 (Direct free-flow links from M3 to A34 and Junction 9 remodelled) is most likely to ease congestion while minimising land-take.

4.1.2 Area 3's ASC[28] Contractor (Kier) reviewed Package 3 in more detail and further developed this package into three options as below:

- Option 1 – 70 mph (120kph) speed limit (A34 free-flow link below M3, but could also be considered over M3);
- Option 2 – 50 mph (80kph) speed limit (A34 free-flow link below M3, but could also be considered over M3);
- Option 3 – 40 mph (65kph) speed limit (A34 free-flow link below M3, but could also be considered over M3);

4.2 PCF[29] STAGE 0 OPTIONS

4.2.1 In June 2015, WSP were commissioned by Highways England to complete PCF Stage 0, Strategy, Shaping and Prioritisation. The PCF Stage 0 report identified journey time savings through the coarse journey time analysis undertaken. In particular, Option 1 in the report, which proposes free flow links with 70mph (120kph) design speed (A34 free-flow link below or above M3), has the potential to deliver significant journey time benefits, while relieving congestion at the junction itself. Following discussions with Highways England during the PCF Stage 0 process, it was agreed that Option 3 would not be considered further during PCF Stage 0 as both the 70mph (120kph) and 50 mph (80kph) speed limit options are more likely to maintain the current speed profile on existing links.

4.2.2 During PCF Stage 0, WSP initially developed Option 1 into a further alternative, Option 4, which makes more use of existing infrastructure, such as retaining, rather than demolishing, the Highways England Depot, while delivering broadly similar journey time benefits.

4.2.3 Due to the hybridisation of elements of some of the PCF stage 0 options being progressed into PCF Stage 1, it was decided that the options should be renumbered to provide more clarity. As the original PCF Stage 0 options were numbered 1 to 4, it was decided to renumber future options Option 11 up to Option 18.

[28] ASC – Asset Support Contract
[29] PCF – Project Control Framework

4.3 PCF[30] STAGE 0 REJECTED OPTIONS

4.3.1 The following options were considered during PCF Stage 0 but ultimately rejected for further consideration due to land take, visual impact, cost inefficiencies and environmental issues. Drawings of these options are shown in Appendix C:

- Option 12 – This option provided free-flow links between A34 and M3 with the A34 Southbound Link passing under the M3 with a 70mph (120kph) design speed with a two-step relaxation on horizontal geometry. The A34 Northbound Link has a 70mph (120kph) design speed.
- Option 13 – This option provided free-flow links between A34 and M3 with the A34 Southbound Link passing over the M3 with a 70mph (120kph) design speed. The A34 Northbound Link has a 70mph (120kph) design speed.
- Option 15 – This option provided free-flow links between A34 and M3 with the A34 southbound link passing over the M3 with an 85kph design speed with a two-step relaxation on horizontal geometry. The A34 Northbound Link has a 70mph (120kph) design speed.
- Option 17 – This option provided free-flowing links with a 75m loop for the A34 Southbound Link under the M3. The A34 Northbound Link has a 70mph (120kph) design speed.

4.4 PCF STAGE 1 OPTIONS

4.4.1 The M3 Junction 9 Improvement scheme then progressed into PCF Stage 1, Option Identification. During the early part of PCF Stage 1, five options were shortlisted for further consideration. Drawings of these options are shown in Appendix D. These options were:

- Option 11 - A development of Atkins Package 3 and Area 3's ASC[31] Contractor (Kier) Option 1 to include south facing Junction 9 slip roads; retain Highways England depot; and remove sweeping A33 southbound link to retain existing merge. This option provides free-flow links between A34 and M3 with the A34 southbound link passing under the M3 with a 70mph (120kph) design speed. The A34 Northbound Link also has a 70mph (120kph) design speed. Junction 9 would be rebuilt with a dumbbell roundabout layout.
- Option 14 - A variant of WSP Option 4 (as per PCF Stage 0 report), providing free-flow links between A34 and M3 with the A34 southbound link passing under the M3 with a 60mph (100kph) design speed with a three-step relaxation on horizontal geometry. The A34 Northbound Link has a 70mph (120kph) design speed. Junction 9 would be rebuilt with a dumbbell roundabout layout.
- Option 16A - A variant of WSP Option 4 (as per PCF Stage 0 report) providing incremental delivery of Option 14. This provides a free-flow for the A34 southbound with a 60mph (100kph) design speed with a three-step relaxation on horizontal geometry. The northbound A34 would still use the existing A34 through the Junction 9 roundabout. This option is considered to facilitate potential scheme capital costs within the affordable budgets of RIS1[32]. Option 16A was produced as a possible first stage of the incremental delivery of Option 14 which would then theoretically be followed by a second stage which would be a variation to Option 16B in order to complete the construction of a scheme comparable to Option 14.
- Option 16B - A variant of WSP Option 4 (as per PCF Stage 0 report) providing incremental delivery of Option 14. This provides a free-flow for the A34 northbound, which has a 70mph

[30] PCF – Project Control Framework
[31] ASC – Asset Support Contact
[32] RIS – Road Investment Strategy

(120kph) design speed. The southbound A34 would still use the existing A34 through the Junction 9 roundabout. This option is considered to facilitate potential scheme capital costs within the affordable budgets of RIS1. Option 16B was also produced as a possible first stage of the incremental delivery of Option 14 which would then theoretically be followed by a second stage which would be a variation to Option 16A in order to complete the construction of a scheme comparable to Option 14.

- Option 18 - A variant of Atkins Package 7 provides a through-about at M3 Junction 9 (do-minimum design) with a 40mph (70kph) design speed. This option is developed, to consider a reduced cost option of converting the current Junction 9 roundabout to a through-about. This option is considered to facilitate potential scheme capital costs within the affordable budgets of RIS1[33] and has no impact on the SDNP[34].

4.4.2 Assessment of economics for Option 14 and 16A were based on a 60mph (100kph) design speed for the A34 Southbound with a three step relaxation.

4.4.3 The expected total scheme costs and the corresponding BCR[35] for the PCF[36] Stage 1 options are shown in Table 4-1.

Table 4-1: Expected total scheme costs and the corresponding Benefit to Cost Ratio

OPTION	EXPECTED SCHEME COST IN 2014 PRICES (£)	BCR, WITH BENEFITS FROM ACCIDENT SAVINGS APPLIED	VFM CATEGORY
Option 11	186.8M	1.31	Low
Option 14	134.1M	1.88	Medium
Option 16A	59.4M	1.83	Medium
Option 16B	45.2M	2.54	High
Option 18	18.7M	2.00	High

[33] RIS – Road Investment Strategy
[34] SDNP – South Downs National Park
[35] BCR – Benefit to Cost Ratio
[36] PCF – Project Control Framework

4.5 PCF STAGE 1 REJECTED OPTIONS

4.5.1 Options 11 and 18 were not progressed to PCF Stage 2. Option 11 was discounted due to its significant negative environmental effects, high cost and low BCR compared to other options. Option 18 was discounted as it was not compliant with the scheme objectives for provision of free flowing links from the A34 to the M3 as defined within the RIS.

4.6 PCF STAGE 2 OPTIONS

4.6.1 At the PCF Stage 1 IDC[37] it was decided that for the PCF Stage 2 analysis, Option 14 should be progressed as the option which fully meets the scheme objectives with the least amount of environmental impacts. In addition the incremental delivery of Option 14 (Option 16B followed by 16C) was to be progressed in case there are insufficient funds in future to deliver Option 14 and to investigate whether there are any efficiencies that can be realised by undertaking incremental delivery.

4.6.2 For the incremental delivery it was decided that Option 16B would be built first as it had a lower cost and higher BCR, followed by a variation to Option 16A in order to complete the construction of a scheme comparable to Option 14. The variation to Option 16A was named Option 16C to distinguish it from the original Option 16A as it requires additional improvements such as the dumbbell roundabout and the widening of the Option 16B A34 northbound link under Junction 9 from one lane to two lanes and alteration of the diverge from a ghost island diverge for lane drop to a two lane drop.

4.7 INTERFACE WITH OTHER SRN[38] IMPROVEMENTS

4.7.1 Depending upon the design of the Smart Motorways Junction 9 to 14 scheme, the layout to the south of M3 Junction 9 may change to enable the two schemes to tie in with each other. It is considered that the M3 Junction 9 to 14 smart motorway proposals can be accommodated and made wholly compatible within the Junction 9 scheme.

4.8 DEPARTURES FROM STANDARD

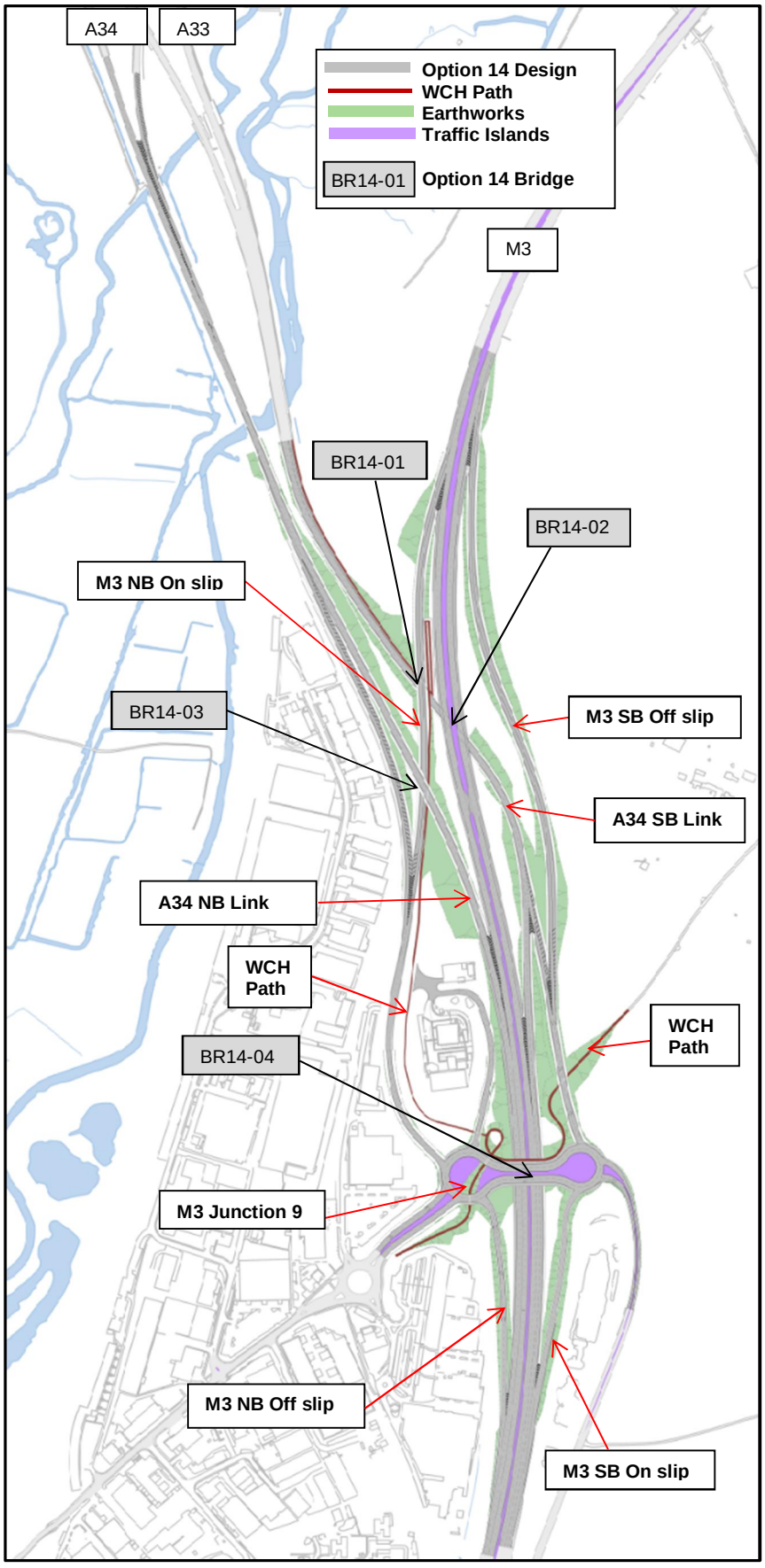
4.8.1 The departures from standard which have been identified for all options during PCF[39] Stage 2 are detailed in the Departures from Standard list shown in Appendix E. These will be further refined during PCF Stage 3.

4.9 OPTION 14

4.9.1 Option 14 is shown on drawing HE551511-WSP-HGN-M3J9PCF2-DR-CH-10001 in Appendix F. The basic layout is shown in figure 4-1.

[37] IDC – Investment Decision Committee
[38] SRN – Strategic Road Network
[39] PCF – Project Control Framework

Figure 4-1: Option 14 Layout



A34 NORTHBOUND LINK

4.9.2 In this option, access to Junction 9 will be provided via a reconstructed northbound off slip with a TD22/06 Type A taper diverge. This slip road is currently proposed to be two lanes, potentially widening to three lanes on the approach to the new roundabout arrangement, subject to detailed traffic modelling.

4.9.3 The two proposed northbound A34 lanes will pass under Junction 9 alongside the two M3 northbound lanes, after which they bifurcate with a TD22/06 Type E – 2 lane drop diverge from the M3 to form the new two lane A34 northbound link with the remaining two offside lanes continuing north as the M3.

4.9.4 After the bifurcation, the A34 continues north, passing over the proposed M3 Northbound on slip before descending to tie into the existing A34 northbound carriageway prior to the existing River Itchen Bridge.

4.9.5 North of the existing River Itchen Bridge the existing A34/A33 diverge will be reconfigured to allow two lanes to run continuously on the A34 with a non-recommended offside type A taper diverge to the A33. TD22 states that an offside diverge is not recommended due to safety reasons, however, this is unavoidable in this case without significant additional construction, significant additional environmental impact to the River Itchen SAC / SSSI, and increased capital cost.

A34 SOUTHBOUND LINK

4.9.6 The A34 southbound link will deviate from the existing A34 alignment immediately south of the existing River Itchen Bridge. Option 14 has been specifically designed to avoid any impact on the River Itchen flood plain thus avoiding the requirement for flood compensation and potential increased environmental mitigation. This has been achieved by reducing the design speed to 60mph (100kph). The A34 will then pass under the M3 in order to reduce the visual impact on the SDNP[40] and the surrounding area.

4.9.7 Beyond the M3 underpass a TD22/06 Type A diverge would lead to a slip road joining the revised Junction 9 roundabout junction. The two traffic lanes of the A34 southbound link road would proceed and join the M3 mainline southbound carriageway to the north of the revised Junction 9 layout via a 2 lane gain.

M3 JUNCTION 9

4.9.8 The Junction 9 circulatory roundabout will be replaced with an offline dumbbell roundabout; all link roads that access the roundabout will require realignment to this new layout.

SLIP ROADS

[40] SDNP – South Downs National Park

4.9.9 The existing M3 northbound on slip will be relocated to accommodate the new free-flowing A34 northbound link. The proposed realigned M3 northbound on slip will pass under the new A34 northbound link and over the new A34 southbound link before merging with the M3 approximately 500m downstream of the existing northbound on slip. The existing northbound A34 carriageway is proposed as a link from the Junction 9 roundabout merging with the A34 northbound with a TD22/06 Type A taper merge just to the south of the River Itchen Bridge. This layout will be reviewed during PCF[41] Stage 3 to take account of comments raised at the Public Consultation as noted in section 9.8.

[41] PCF – Project Control Framework

4.9.10 The existing M3 southbound off slip will be removed and replaced with a new realigned off slip located approximately 0.6km to the north. The proposed southbound M3 off slip will then merge with the proposed connection between the A34 southbound link road and the revised Junction 9 roundabout layout to maintain its access to Junction 9.

BRIDGES

4.9.11 Option 14 has four new bridges as follows:

- BR14-01 – This bridge carries the realigned M3 northbound on-slip over the new A34 southbound link. The structural type would likely to be an integral bridge structure comprising of precast pre-stressed concrete beams with in-situ concrete slab.
- BR14-02 – This bridge carries the M3 mainline over the new A34 southbound link. Construction would likely be undertaken using a staged “top down” methodology which would require lane diversions under traffic management of the M3 carriageways north of the existing M3 Junction 9. The abutments would likely be formed of a contiguous reinforced concrete pile wall, while the deck may be precast beams with an insitu slab. A jacked box structure may be a possible alternative method of construction for consideration within the design development but phasing would need to take into account significant temporary works requirements with jacking and receiving pits. Consideration of advance construction of this structure could facilitate future construction of the scheme including bulk earthworks movements between the west and east sides of the motorway.
- BR14-03 – This bridge carries the new A34 northbound link over the realigned M3 northbound on slip. The structural type would likely to be an integral bridge structure comprising precast pre-stressed concrete beams with in-situ concrete slab.
- BR14-04 – This bridge carries the revised M3 Junction 9 dumbbell roundabout over the M3 mainline carriageway and is likely to be a 2 span precast, pre-stressed concrete beam deck with in-situ concrete slab. The foundation would comprise abutments either side of the M3 and for a 2 span option, a leaf pier in the central reserve. Construction could implement local night time closure of the M3 to allow placing of bridge beams with traffic diverted around the junction via the on and off slip roads in each direction.

WALKING, CYCLING AND HORSE RIDING USERS

4.9.12 Due to the removal of the existing Junction 9 bridges and the associated WCH[42] path, a new WCH path would be re-provided to current cycle standards which would close the gap in the existing NCN[43] Route 23. This path would continue to be available for other WCH users as well and it would be designed to be inclusive for mobility impaired users. On the western side of Junction 9, the path would cross from Easton Lane under the western dumbbell roundabout via subways, before looping up to cross over the M3 alongside the northern side of the Junction 9 carriageway. On the eastern side of the M3 the path descends to pass under the M3 southbound off slip via a subway following which it ties into the existing Easton Lane WCH path on the eastern side of Junction 9. Any closures to the WCH route during construction will be assessed in PCF Stage 3 with the aim of minimising disruption to users.

4.9.13 A new footpath will be provided connecting the A33 at Kingsworthy with Junction 9. Starting at the limit of works on the eastern side of the A34 south of the River Itchen Bridge it runs along the proposed A34 southbound link until it passes under the proposed M3 northbound on-slip bridge (BR14-01). Between this bridge and the M3 bridge (BR14-02) it turns 90 degrees to the north and rises to the level of the on-slip after which it follows, segregated from the carriageway, along the eastern edge of the M3 northbound on-slip until it intersects with the NCN Route 23 at Junction 9.

SITE COMPOUNDS

4.9.14 For the purpose of the PCF[44] stage 2 study, there is currently an allowance made for a construction site compound to be located in land to the east of Junction 9 and the A272 Spitfire Link as well as a secondary compound in the land between the M3 and the A272 Spitfire Link. These locations will be considered further in subsequent PCF stages and will require consultation with stakeholders' such as SDNP[45].

SERVICE DIVERSIONS

4.9.15 Following the NRSWA[46] C3 Enquiry the following approximate utility diversion costs have been provided:

Table 4-2: Approximate utility diversion costs for Option 14

Location	Service	Approximate cost of diversion
GeneSYS (GE)	GeneSYS (GE)	£80,500 (+ £50,00 for replacement equipment)
Hampshire County Council	Street Lighting	£8,000
Openreach (BT)	Telephone	£80,000
Southern Gas Networks (SGN)	Gas	£412,000
Southern Water	Water	£557,950

[42] WCH – Walking, Cycling and Horse Riding
[43] NCN – National Cycle Network
[44] PCF – Project Control Framework
[45] SDNP – South Downs National Park
[46] NRSWA – New Roads and Streetworks Act

Location	Service	Approximate cost of diversion
Southern Electric Power Distribution (SSE)	Electricity	£18,500

POTENTIAL ACCIDENT REDUCTIONS

4.9.16 As detailed in section 1.5, the highest proportion of existing accidents occurred in the form of rear shunts, followed by lane changes.

4.9.17 The majority of these happened on the A34 southbound approach and M3 northbound offslip approach to junction 9, as well as them being a common reason for accidents on the A272 and Easton Lane approaches to Junction 9. The rear shunts occurred as a result of the high traffic volumes combined with the stop start conditions caused by the traffic signals. Once the new free flowing links are opened over 50% of existing traffic using Junction 9 is forecast to move from the roundabout onto the new free flowing A34 link roads. The reduced traffic flow and the resultant reduction in queues on the approaches to Junction 9 is likely to significantly reduce the number of accidents.

4.9.18 The proposed Junction 9 roundabout arrangement does not have traffic signals and has a reduced number of lanes and much lower traffic flows. This should result in reduced stop-start conditions and reduced lane changing manoeuvres and hence a reduced number of accidents on the circulatory carriageway. In addition the lower traffic flows passing the A272 entry arm will mean that drivers accessing the roundabout from the A272 will not need to risk entering the roundabout unsafely which should reduce the occurrence of accidents at this location.

POTENTIAL COST SAVINGS

4.9.19 Some areas where the scheme cost could be reduced or benefits increased include:

- Reducing the land acquisition by increasing the steepness of the cut batters – A conservative assumption has been used for the gradient of the batter slopes during the PCF Stage 2 design. These could potentially be steepened during the PCF[47] Stage 3 design based on the results of the Ground Investigation. This could result in a reduced quantity of excavation and potentially a reduction in land acquisition.
- Refining the link cross-sections - Due to the preliminary nature of the design at PCF Stage 2, refinements to lane arrangements and cross-sections may be possible at PCF Stage 3.

ENVIRONMENTAL EFFECTS, MITIGATION AND ENHANCEMENT MEASURES

4.9.20 The potential environmental effects of Option14 are considered in Chapter 8. Mitigation and enhancement measures will potentially include the following:

- A Construction Environmental Management Plan
- Minimising congestion through design with potential to reduce adverse air quality effects
- Minimising the spatial extent over which impacts are likely to occur within the designated sites
- Design to avoid adverse effects on heritage assets

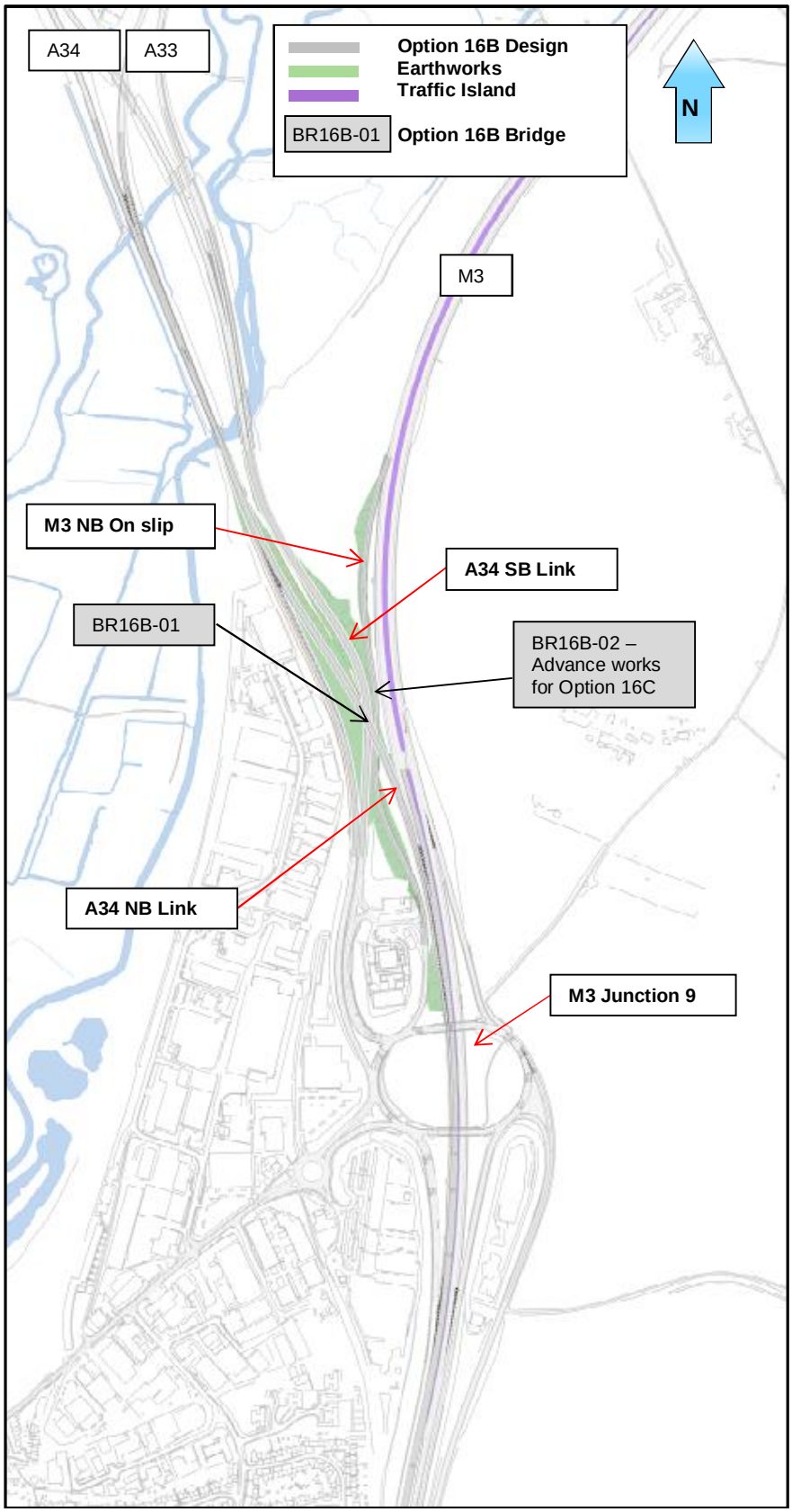
[47] PCF – Project Control Framework

- Advance planting and preservation of existing planting to reduce visual and landscape effects
- Sensitive drainage strategy that minimises effects upon local hydrological processes fundamental to the River Itchen
- Appropriate landscaping and re-planting to benefit species known to be present in the area
- Where possible, ecological enhancements such as the creation of lowland calcareous grassland and lowland mixed deciduous woodland
- Minimising the export and import of fill materials
- Ensuring the route avoids sensitive receptors, keeping the route low where possible to minimise noise effects and where appropriate, using low road noise surfaces and environmental barriers to reduce noise effects
- Avoid closing the existing public rights of way during construction
- Retaining or improving the existing public rights of way
- Minimising the amount of best and versatile agricultural land that will be acquired for the scheme.

4.10 OPTION 16B

4.10.1 Option 16B is shown on drawing HE551511-WSP-HGN-M3J9PCF2-DR-CH-10101 in Appendix F. The basic layout is shown in Figure 4-2.

Figure 4-2: Option 16B Layout



4.10.2 Option 16B proposes the first phase of incremental delivery of the northbound A34 link associated with Option 14. This option has been developed as a potential means of partially meeting the scheme free flow objective at a more affordable cost. Option 16B would then be combined with Option 16C at a later stage to effectively provide option 14 in two phases/schemes.

4.10.3 The eventual construction of the option 14 arrangement over two phases is expected to be more expensive in the long term than building option 14 initially.

A34 SOUTHBOUND LINK TO ROUNDABOUT

4.10.4 The A34 southbound will be realigned under the new A34 northbound link to maintain access to Junction 9 and therefore the M3 southbound.

4.10.5 Traffic using the southbound A34 to the M3 will continue to use the existing arrangement through the Junction 9 traffic signals.

A34 NORTHBOUND LINK

4.10.6 The proposed northbound A34 lane will pass under Junction 9 alongside the two M3 lanes, after which it bifurcates with a TD22/06 Type D – Ghost Island diverge for lane drop from the M3 to form the new two lane A34 northbound link with the remaining two offside lanes continuing north as the M3.

4.10.7 North of the existing River Itchen Bridge the existing A34/A33 diverge will be reconfigured to allow two lanes to run continuously on the A34 with a non-recommended offside type A taper diverge to the A33. TD22 states that an offside diverge is not recommended due to safety reasons, however, this is unavoidable in this case without significant additional construction, significant additional environmental impact to the River Itchen SAC[48] / SSSI[49], and increased capital cost.

M3 JUNCTION 9

4.10.8 The existing M3 Junction 9 roundabout will be retained with a departure from standard for reduced lane widths, required on the M3 under the Junction 9 bridges to enable an additional lane to fit under the existing bridge.

SLIP ROADS

4.10.9 The existing M3 northbound on-slip is to be removed to accommodate the new free-flowing northbound link. It will be replaced by a new on-slip which will pass under the new free-flowing northbound link adjacent to the A34 southbound link to the M3 J9 roundabout and merge with the M3 further north. All other Junction 9 slip roads will be retained in their current form in this option.

BRIDGES

4.10.10 Option 16B has two new bridges as follows:

[48] SAC – Special Area of Conservation
[49] SSSI – Site of Special Scientific Interest

- BR16B-01 – This bridge carries the new A34 northbound link over the realigned M3 northbound on-slip. The structural type is likely to be an integral bridge structure comprising of precast pre-stressed concrete beams with in-situ concrete slab.
- BR16-02 – This bridge will carry the realigned M3 northbound on-slip over the new A34 southbound link required as part of the construction of Option 16C. It is being built during the Option 16B works to minimise the impacts on the M3 Northbound on-slip during the Option 16C construction. Construction is likely be undertaken using a "top down" methodology. The abutments would likely be formed of a contiguous reinforced concrete pile wall, while the deck may be of in-situ reinforced concrete slab. Construction of the bridge deck at ground level will require future excavation under the bridge during Option 16C.

WALKING, CYCLING AND HORSE RIDING USERS

4.10.11 As the existing Junction 9 roundabout is being retained, the existing WCH[50] path would also be retained.

SITE COMPOUNDS

4.10.12 For land cost purposes there is currently an allowance made for a construction site compound similar to Option 14, as detailed in section 4.9.14.

SERVICE DIVERSIONS

4.10.13 Following the NRSWA[51] C3 Enquiry the following approximate utility diversion costs have been provided:

Table 4-3: Approximate utility diversion costs for Option 16B

Location	Service	Approximate cost of diversion
GeneSYS (GE)	GeneSYS (GE)	£80,500 (+ £50,00 for replacement equipment)
Hampshire County Council	Street Lighting	£0
Openreach (BT)	Telephone	£45,000
Southern Gas Networks (SGN)	Gas	£412,000
Southern Water	Water	£352,200
Southern Electric Power Distribution (SSE)	Electricity	£18,500

[50] WCH – Walking, Cycling and Horse Riding
[51] NRSWA – New Roads and Streetworks Act

POTENTIAL ACCIDENT REDUCTIONS

4.10.14 As detailed in section 1.5, the highest proportion of existing accidents occurred in the form of rear shunts, followed by lane changes.

4.10.15 The majority of these happened on the A34 southbound approach and M3 northbound offslip approach to junction 9, as well as them being a common reason for accidents on the A272 and Easton Lane approaches to Junction 9. The rear shunts occurred as a result of the high traffic volumes combined with the stop start conditions caused by the traffic signals. For Option 16B, once the new northbound free flowing link is opened a majority of M3 northbound traffic using Junction 9 is forecast to move from the roundabout onto the new free flowing A34 link road. The reduced traffic flow and the resultant reduction in queues on the M3 northbound offslip approach and Easton Lane approach to Junction 9 is likely to significantly reduce the number of accidents at these locations. As the southbound traffic from the A34 to the M3 will continue to use the existing Junction 9 roundabout there is unlikely to be a significant change to the number of accidents on the A34 southbound approach and the A272 approach.

4.10.16 On the circulatory carriageway of the Junction 9 roundabout it is likely that the accidents would reduce on the roundabout between the M3 northbound offslip and the A34 because of the reduced traffic flow between these locations on the western side of the roundabout. On the eastern side of the roundabout between the A34 and the M3 southbound onslip the traffic flows would be largely unchanged and therefore it is unlikely there would be a significant change to the number of accidents.

POTENTIAL COST SAVINGS

4.10.17 Some areas where the scheme cost could be reduced or benefits increased include:

- à Reducing the land acquisition by increasing the steepness of the cut batters – similar to the further considerations proposed in Option 14 above.
- à Refining the link cross-sections - similar to the further considerations proposed in Option 14 above.

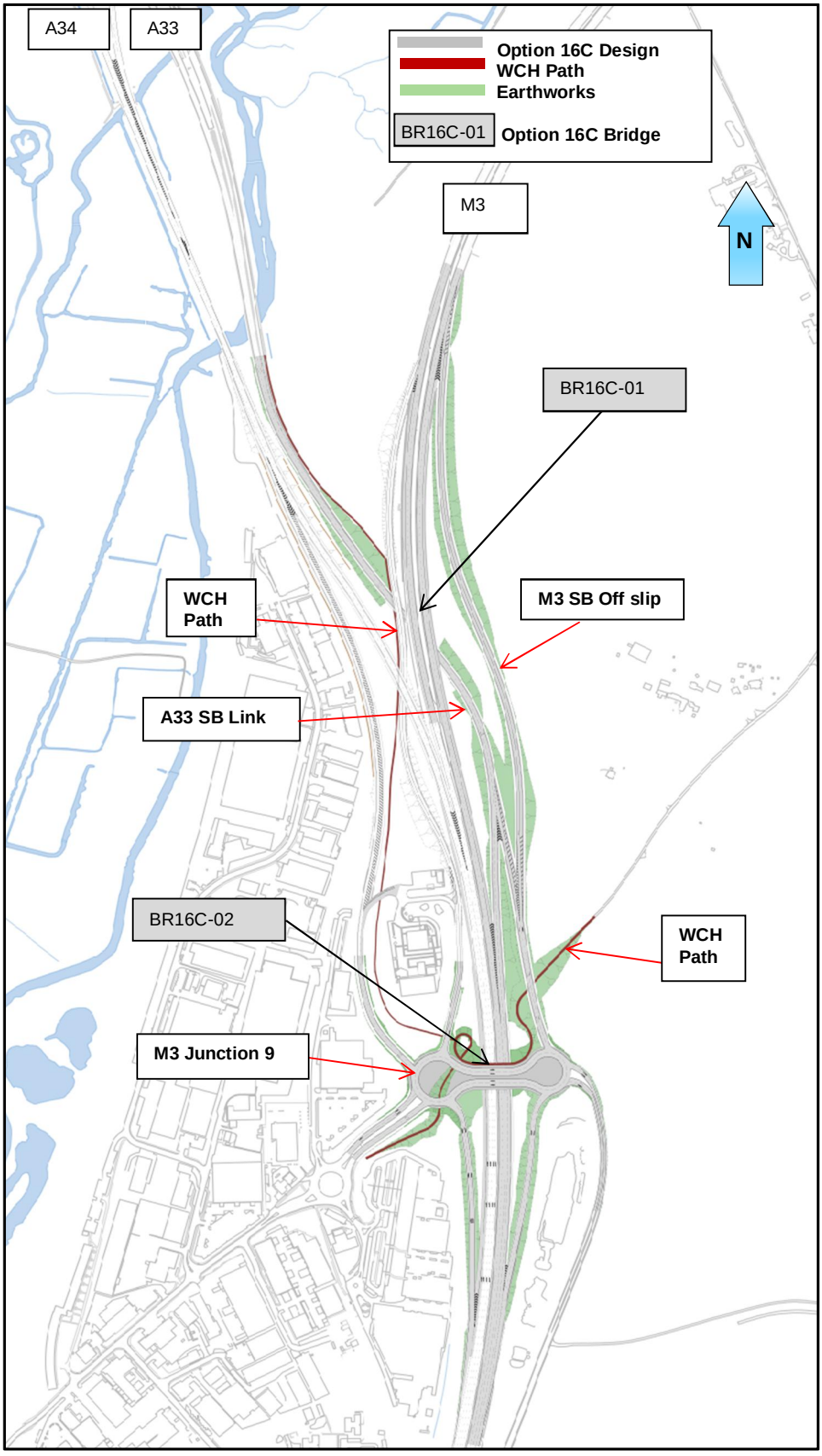
ENVIRONMENTAL EFFECTS, MITIGATION AND ENHANCEMENT MEASURES

4.10.18 The potential environmental effects of this option are considered in Chapter 8. Mitigation and enhancement measures will be similar to those for Option 14.

4.11 OPTION 16C

4.11.1 Option 16C is shown on drawing HE551511-WSP-HGN-M3J9PCF2-DR-CH-10201 in Appendix F. The basic layout is shown in Figure 4-3.

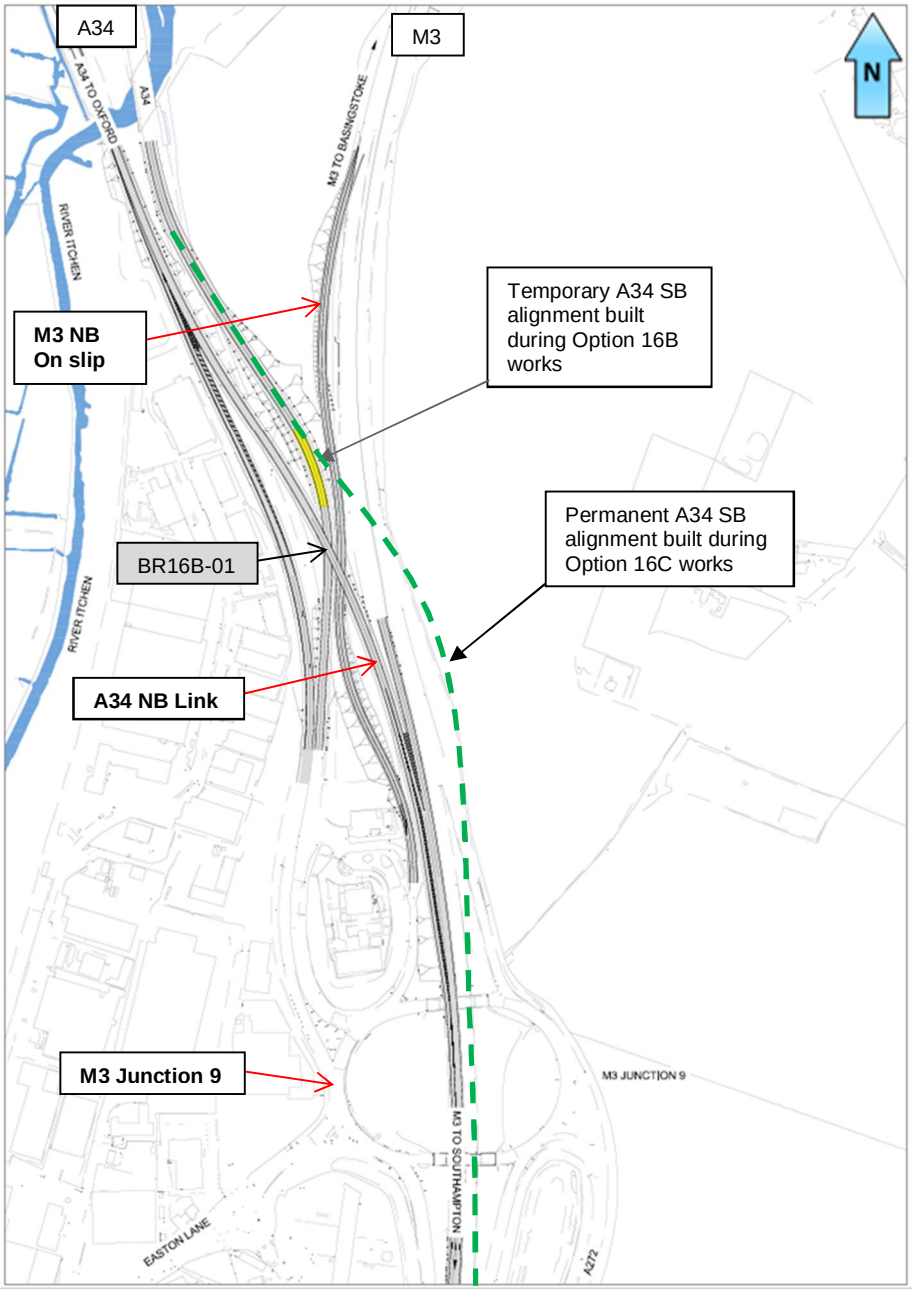
Figure 4-3: Option 16C Layout



4.11.2 Option 16C proposes the second phase of the incremental delivery of the A34 southbound link associated with Option 14. Option 16C would follow a previously built Option 16B to effectively provide Option 14 in two phases/schemes.

4.11.3 The incremental phasing of the construction of Option 16B and 16C will lead to some temporary works that are built as part of Option 16B which will need to be removed when Option 16C is built. The temporary works include the Option 16B connection from the A34 southbound link to Junction 9. This is shown in yellow on figure 4-4.

Figure 4-4: Abortive work built as part of Option 16B which will be removed during construction of Option 16C



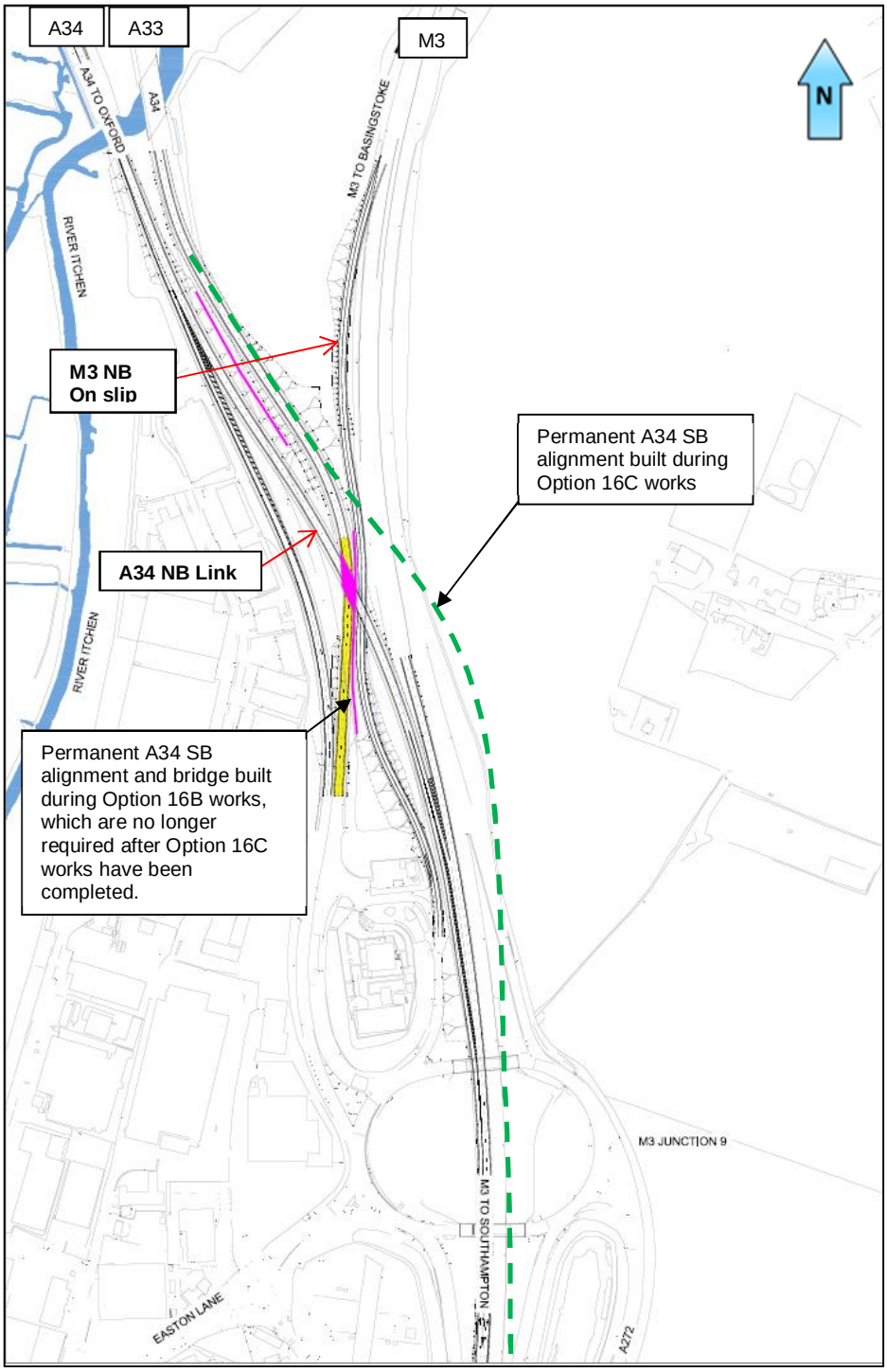
4.11.4 In addition there are some further works that will be required permanently as a result of the incremental delivery which would not be required if only Option 14 were built. These are shown in yellow for the carriageway and magenta for the structures in figure 4-3 and are:

a) The Option 16B design is required to fit under the existing Junction 9 bridges which pushes the A34 northbound link closer to the A34 southbound link than it would for Option 14, this results in a level difference which requires a retaining solution between the two carriageways.

b) A bridge over the temporary A34 Southbound to Junction 9 link where it crosses under the A34 NB Link will become redundant when Option 16C is built. This is as a result of the final permanent alignment being built during Option 16C works.

c) Part of the temporary A34 Southbound to Junction 9 link (this could be used as a maintenance access once it is decommissioned as a link).

Figure 4-5: Permanent work built as part of PCF[52] Stage 2 Option 16B which would not be required if PCF Stage 2 Option 14 were built



[52] PCF – Project Control Framework

4.11.5 As a result of the temporary works and additional works required for the incremental phasing, the eventual construction of the option 14 arrangement over two phases (Option 16 and 16C) is expected to be more expensive in the long term than building option 14 initially.

A34 SOUTHBOUND LINK

4.11.6 As mentioned in 4.11.3 the alignment of the Option 16B A34 southbound link to roundabout will be removed to facilitate the construction of the Option 16C A34 southbound link. The design of the A34 southbound link will be the same as described in Option 14.

A34 NORTHBOUND LINK

4.11.7 Traffic using the northbound A34 from the M3 will continue to use the existing A34 northbound link constructed in Option 16B. The design of the A33/A34 diverge will remain the same as described in Option 16B.

M3 JUNCTION 9

4.11.8 The Junction 9 circulatory roundabout will be replaced with an offline dumbbell roundabout; all link roads that access the roundabout will require realignment to this new layout.

SLIP ROADS

4.11.9 The design of the M3 southbound off slip will be the same as described in Option 14. All other Junction 9 slip roads will be retained in their current form, including the M3 northbound on-slip from Option 16B.

BRIDGES

4.11.10 Option 16C has two new bridges as follows:

- BR16C-01 – This bridge carries the M3 mainline over the new A34 southbound link. Construction would likely be undertaken using a staged “top down” methodology which would require lane diversions under traffic management of the M3 carriageways north of the existing M3 Junction 9. The abutments would likely be formed of a contiguous reinforced concrete pile wall, while the deck may be precast beams with an insitu slab. A jacked box structure may be a possible alternative method of construction for consideration within the design development but phasing would need to take into account significant temporary works requirements with jacking and receiving pits. Consideration of advance construction of this structure could facilitate future construction of the scheme including bulk earthworks movements between the west and east sides of the motorway.
- BR16C-02 – This bridge carries the revised M3 Junction 9 dumbbell roundabout over the M3 mainline carriageway and is likely to be a 2 span precast, pre-stressed concrete beam deck with in-situ concrete slab. The foundation would comprise abutments either side of the M3 and for a 2 span option, a leaf pier in the central reserve. Construction could implement local night time closure of the M3 to allow placing of bridge beams with traffic diverted around the junction via the on and off slip roads in each direction.

WALKING, CYCLING AND HORSE RIDING USERS

4.11.11 The WCH[53] facilities provided at the completion of Option 16C will be similar to those for Option 14.

SITE COMPOUNDS

4.11.12 For land cost purposes there is currently an allowance made for a construction site compound similar to Option 14, as detailed in section 4.9.14.

SERVICE DIVERSIONS

4.11.13 Following the NRSWA[54] C3 Enquiry the following approximate utility diversion costs have been provided:

Table 4-4: Approximate utility diversion costs for Option 16C

Location	Service	Approximate cost of diversion
GeneSYS (GE)	GeneSYS (GE)	£80,500 (+ £50,00 for replacement equipment)
Hampshire County Council	Street Lighting	£8,000
Openreach (BT)	Telephone	£35,000
Southern Gas Networks (SGN)	Gas	£412,000
Southern Water	Water	£433,200
Southern Electric Power Distribution (SSE)	Electricity	£18,500

[53] WCH – Walking, Cycling and Horse Riding
[54] NRSWA – New Roads and Streetworks Act

POTENTIAL ACCIDENT REDUCTIONS

4.11.14 As detailed in section 1.5, the highest proportion of existing accidents occurred in the form of rear shunts, followed by lane changes.

4.11.15 The majority of these happened on the A34 southbound approach and M3 northbound offslip approach to junction 9, as well as them being a common reason for accidents on the A272 and Easton Lane approaches to Junction 9. The rear shunts occurred as a result of the high traffic volumes combined with the stop start conditions caused by the traffic signals. For Option 16C, once the new southbound free flowing link is opened a majority of A34 southbound traffic using Junction 9 is forecast to move from the roundabout onto the new free flowing A34 link road. The reduced traffic flow and the resultant reduction in queues on the A34 southbound approach and A272 approach to Junction 9 is likely to significantly reduce the number of accidents at these locations.

4.11.16 On the circulatory carriageway of the Junction 9 roundabout it is likely that the accidents would reduce on the roundabout between the A34 southbound and the M3 southbound onslip because of the reduced traffic flow between these locations on the eastern side of the roundabout.

POTENTIAL COST SAVINGS

4.11.17 Some areas where the scheme cost could be reduced include:

- à Reducing the land acquisition by increasing the steepness of the cut batters – similar to the further considerations proposed in Option 14 above.
- à Refining the link cross-sections - similar to the further considerations proposed in Option 14 above.

ENVIRONMENTAL EFFECTS, MITIGATION AND ENHANCEMENT MEASURES

4.11.18 The potential environmental effects of this option are considered in Chapter 8. Mitigation and enhancement measures will be similar to those for Option 14.

5 SUMMARY OF TABLES OF TRAFFIC, ECONOMICS AND COST

5.1 MODEL SELECTION

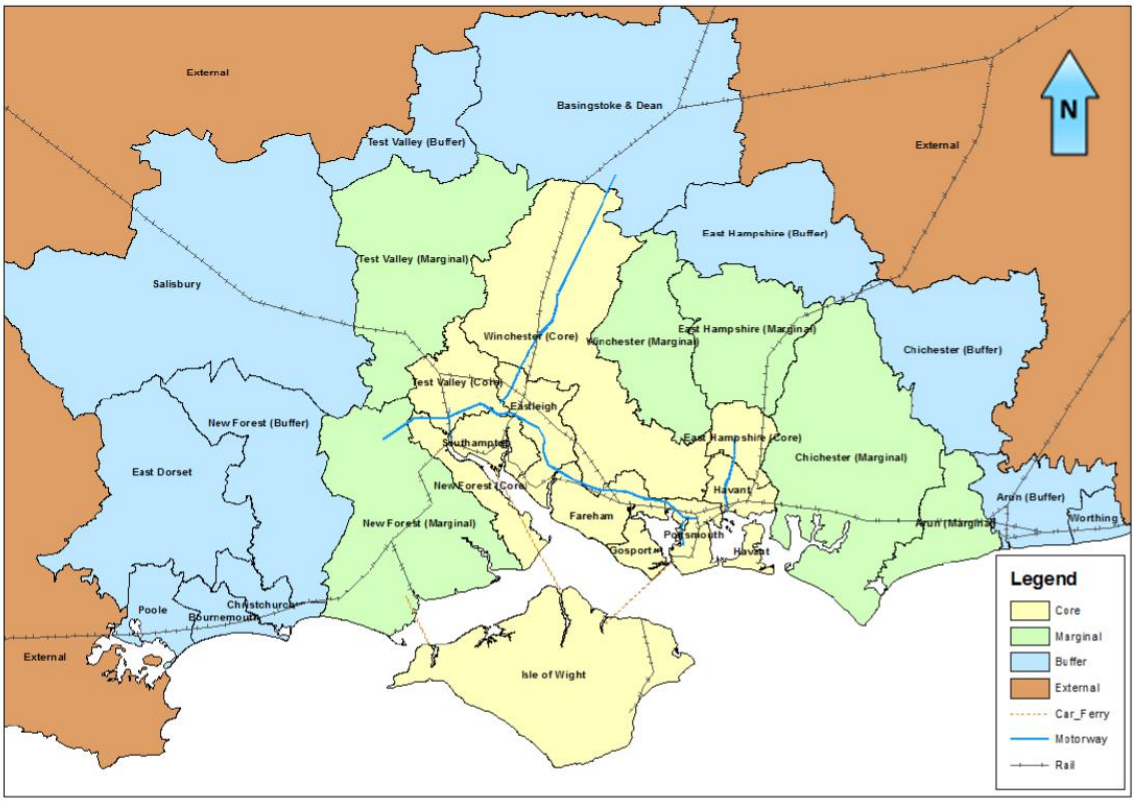
5.1.1 For the purpose of this study, the 2015 Base Year SRTM[55], a land use and transport model for Solent Transport, has been used.

5.1.2 The key points from the 2015 SRTM Model Development and Validation Report are discussed below.

5.2 MODEL COVERAGE

5.2.1 The network coverage of the SRTM model is shown in Figure 5-1 below.

Figure 5-1: SRTM Model Coverage



[55] SRTM – Sub-Regional Transport Model

5.3 SUMMARY OF SRTM[56] 2015 DEVELOPMENT AND VALIDATION REPORT

5.3.1 The conclusions from the Development and Validation Report are presented below and summary results are shown in Table 5-1:

- The SRTM covers a wide geographic area and contains a significant number of strategic motorways, primary routes and complex urban road networks. The model includes two main conurbations, Southampton and Portsmouth, significant district centres such as Fareham and Gosport, a number of peninsulas, and a third geographically distinct centre on the Isle of Wight. Typically traffic models are developed for either single corridors, free-standing cities or conurbations. The strategic validation of the Road Traffic Model needs to be considered in this context, i.e. a model of multiple, often parallel, corridors and multiple centres that generate urban and inter-urban trips combined with strategic road access routes using the motorway and trunk road network.
- The model has been constructed according to WebTAG recommendations. The calibration process did not reveal any significant problems or shortcomings in the base year model. The quality of validation of the model is in general good with the screenline validation performing particularly well. This is critical, as it ensures the demand in the model is correct for assessing multi-modal interventions and future changes.
- The journey time validation and the patterns of junction delay appear consistent and plausible, although the link flow and journey time validation do not meet the WebTAG criteria. However, these recommended criteria mask a good model performance that is close to meeting the acceptability guidelines.
- It is often considered that the WebTAG thresholds of acceptability are more suited to smaller, less complex models, and as such it may be argued that a certain level of flexibility is acceptable given the scale and complexity of the SRTM.
- The calibration and validation suggest that the model is fit for the purpose of representing the highway traffic patterns in the base year, as part of the SRTM.
- The model encompasses a large geographic area at different levels of detail and is expected to be used to consider a range of strategic and specific interventions, e.g. representing the main highway movements, the impact of major highway and public transport interventions on those movements, and providing controlled and consistent inputs to local or more detailed models.
- It is acknowledged that whilst fit for general purpose, depending on the nature and scope of the intervention being tested, additional local validation checks may be beneficial for model application for specific interventions at a local level.

Table 5-1: Link Flow Validation – All Vehicles

Measure	Criteria	Acceptability Guideline	AM Peak	Inter Peak	PM Peak
Matrix Validation	Differences between modelled flows and counts should be less than 5% of the counts.	>85% of cases (WebTAG)	91%	85%	85%
	Differences between modelled flows and counts should be within GEH[57]=4 of the counts		92%	91%	82%
	Differences between modelled flows and counts should be less than 10% of the counts		97%	95%	95%

[56] SRTM – Sub-Regional Transport Model
[57] GEH – Statistic used to compare two sets of traffic volumes, invented by Geoffrey E Havers

Link Flow Validation	Individual flows within 15% of counts for flows from 700 to 2700 veh/h Individual flows within 100 veh/h of counts for flows less than 700 veh/h Individual flows within 400 veh/h of counts for flows more than 2700 veh/h	>85% of cases (WebTAG)	60%	71%	60%
	GEH < 5 for individual flows	>85% of cases (WebTAG)	54%	63%	54%
	GEH < 10 for individual flows	Not a WebTAG criteria	80%	86%	77%
Journey Time Validation	Modelled times along routes should be within **15%** of surveyed times (or 1 minute, if higher)	>85% of cases (WebTAG)	82%	80%	64%

5.4 FORECAST

5.4.1 The modelled forecast years for the options assessment are in line with the SRTM[58] forecast years, i.e. 2019, 2026, 2036 and 2041.

5.4.2 The scenarios, including the DM[59], have been run through the full SRTM model to 2041.

5.4.3 To enable valid economic appraisal of the scheme options, the output land use from the DM is used as the input for all DS[60] models (i.e. there is a fixed land use for DM and DS model runs). All model runs reported below are constrained to NTEM[61] v7.2 growth forecasts.

5.4.4 The full details of the model development and forecasting can be found in the 2015 SRTM Model Development and Validation Report.

5.5 FORECAST RESULT SUMMARY

5.5.1 Table 5-2 shows the convergence of the forecast year models. Convergence is an index for measuring the performance of the model. The analysis shows that most of the models reach the maximum 150 loops set in SRTM, indicating they are not reaching the set convergence criteria. The resulting model noise has been monitored when undertaking the TUBA[62] analysis. A more in-depth assessment around convergence issues can be found with the Economic Assessment Report and Advanced Stage 3 Technical Note 1 (Initial assessment of scheme impact). The latter document is an appendix of the business case and the July 2018 IDC Paper.

5.5.2 Detailed review of the convergence results showed that the 2026 model performs better than the 2036 and 2041 models.

[58] SRTM – Sub-Regional Transport Model
[59] DM – Do Minimum
[60] DS – Do Something
[61] NTEM – National Trip End Model
[62] TUBA – Transport Users Benefit Analysis

Table 5-2: Highway Convergence Statistics

		2019				2026				2036				2041			
	Peak Hour	Iteration	Delta	% Flow	%Gap	Iteration	Delta	% Flow	% Gap	Iteration	Delta	% Flow	% Gap	Iteration	Delta	% Flow	% Gap
Do Min	AM	97	0.0378/ 5	99.5	0.034	142	0.0428/ 6	99.5	0.029	147	0.0778/10	96.8	0.065	147	0.0440/10	98.7	0.142
		98	0.0379/ 5	99.4	0.028	143	0.0245/ 9	99.6	0.034	148	0.0468/ 9	98.7	0.074	148	0.103/10	97.5	0.123
		99	0.0292/ 6	99.5	0.029	144	0.0388/ 7	99.4	0.025	149	0.0811/10	97.9	0.058	149	0.110/10	97.1	0.07
		100	0.0310/ 6	99.5	0.023	145	0.0215/ 9	99.6	0.032	150	0.0446/10	98.7	0.089	150	0.0501/10	98.7	0.066
	IP	22	0.0087/10	98.7	0.0094	34	0.0152/10	98.2	0.018	79	0.0184/10	98.4	0.022	107	0.0220/10	98.4	0.026
		23	0.0074/10	98.5	0.027	35	0.0131/10	98.7	0.033	80	0.0227/10	98.3	0.031	108	0.0208/10	98.1	0.03
		24	0.0073/10	98.4	0.0099	36	0.0151/10	98.4	0.015	81	0.0260/10	98.5	0.019	109	0.0215/10	98.3	0.024
		25	0.0064/10	99.0	0.0075	37	0.0127/10	99.0	0.029	82	0.0189/10	98.7	0.023	110	0.0199/10	98.5	0.03
	PM	100	0.0277/10	98.6	0.03	147	0.0311/10	98.4	0.035	147	0.141/10	96.3	0.103	147	0.0783/10	95.8	0.128
		101	0.0276/10	98.7	0.029	148	0.0324/10	98.4	0.06	148	0.0780/10	97.2	0.079	148	0.0817/10	95.8	0.129
		102	0.0246/10	98.9	0.033	149	0.0411/10	97.9	0.038	149	0.0743/10	97.9	0.07	149	0.0825/10	95.9	0.129
		103	0.0252/10	98.7	0.031	150	0.0280/10	98.6	0.035	150	0.0612/10	98.1	0.122	150	0.0861/10	95.8	0.127
Opt 14	AM	77	0.0400/ 6	99.4	0.034	147	0.0285/10	99.5	0.039	147	0.0896/10	95.4	0.364	147	0.0769/10	97.6	0.071
		78	0.0288/ 8	99.3	0.034	148	0.0388/ 7	99.3	0.032	148	0.234/10	91.2	0.304	148	0.0546/10	98.7	0.12
		79	0.0259/ 7	99.3	0.023	149	0.0330/ 9	99.1	0.033	149	0.108/10	93.7	0.399	149	0.0869/10	97.3	0.102
		80	0.0341/ 8	99.5	0.022	150	0.0281/ 9	99.3	0.034	150	0.230/10	90.9	0.31	150	0.0550/10	98.3	0.071
	IP	19	0.0084/10	98.2	0.011	41	0.0129/10	98.2	0.022	90	0.0189/10	98.1	0.022	147	0.0341/10	96.5	0.053
		20	0.0084/10	98.2	0.0097	42	0.0084/10	98.7	0.012	91	0.0157/10	98.3	0.027	148	0.0392/10	96.5	0.042
		21	0.0077/10	98.7	0.0098	43	0.0088/10	99.2	0.033	92	0.0167/10	98.1	0.019	149	0.0257/10	97.5	0.041
		22	0.0073/10	98.7	0.024	44	0.0105/10	98.3	0.017	93	0.0196/10	98.5	0.022	150	0.0341/10	96.8	0.031
	PM	147	0.0331/10	97.6	0.075	147	0.0371/10	98.6	0.116	147	0.0776/10	96.8	0.089	147	0.0694/10	96.3	0.123
		148	0.0712/10	97.0	0.141	148	0.0878/10	95.3	0.093	148	0.0624/10	97.5	0.073	148	0.0713/10	95.9	0.119
		149	0.110/10	95.5	0.046	149	0.0888/10	96.4	0.045	149	0.0582/10	97.8	0.078	149	0.0627/10	96.0	0.117
		150	0.0343/10	97.9	0.042	150	0.0333/10	98.3	0.033	150	0.0586/10	97.7	0.1	150	0.0891/10	96.4	0.117

		2019				2026				2036				2041			
	Peak Hour	Iteration	Delta	% Flow	%Gap	Iteration	Delta	% Flow	% Gap	Iteration	Delta	% Flow	% Gap	Iteration	Delta	% Flow	% Gap
Opt 16B	AM	63	0.0316/ 7	99.2	0.034	147	0.0371/ 8	99.1	0.035	147	0.0970/10	96.5	0.111	147	0.0584/10	98.7	0.069
		64	0.0326/ 7	99.1	0.03	148	0.0327/10	99.2	0.137	148	0.0656/10	97.6	0.117	148	0.0685/10	98.7	0.105
		65	0.0267/ 8	99.4	0.029	149	0.107/10	96.3	0.036	149	0.0664/10	97.0	0.11	149	0.0929/10	98.1	0.071
		66	0.0404/ 6	99.2	0.031	150	0.0382/10	99.2	0.05	150	0.0731/10	97.3	0.103	150	0.0459/10	98.8	0.061
	IP	20	0.0080/10	98.1	0.023	42	0.0140/10	98.6	0.025	110	0.0246/10	98.1	0.018	147	0.304/10	83.4	0.076
		21	0.0082/10	98.3	0.0094	43	0.0120/10	98.5	0.021	111	0.0203/10	98.5	0.026	148	0.0356/10	95.8	0.048
		22	0.0085/10	98.7	0.015	44	0.0120/10	98.3	0.017	112	0.0169/10	98.2	0.032	149	0.0275/10	97.1	0.038
		23	0.0088/10	98.3	0.0073	45	0.0108/10	99.0	0.032	113	0.0237/10	98.4	0.025	150	0.0298/10	97.4	0.522
	PM	90	0.0292/10	98.6	0.031	147	0.149/10	94.0	0.076	147	0.168/10	93.3	0.403	147	0.0651/10	96.8	0.099
		91	0.0374/10	98.7	0.035	148	0.0477/10	97.0	0.09	148	0.214/10	91.2	0.183	148	0.0978/10	96.8	0.09
		92	0.0376/10	98.6	0.034	149	0.0517/10	96.3	0.07	149	0.124/10	93.9	0.185	149	0.0749/10	97.1	0.09
		93	0.0330/10	98.8	0.029	150	0.0579/10	96.9	0.063	150	0.149/10	94.6	0.131	150	0.0745/10	97.2	0.09
Opt 16C	AM	147	0.0567/10	98.0	0.047	147	0.0336/10	99.4	0.04	147	0.0935/10	94.9	0.173	147	0.0472/10	98.9	0.112
		148	0.0580/10	97.9	0.065	148	0.0375/10	98.6	0.036	148	0.0905/10	94.5	0.195	148	0.0652/10	97.8	0.23
		149	0.0590/10	96.8	0.063	149	0.0350/ 8	99.5	0.038	149	0.119/10	95.0	0.148	149	0.126/10	94.4	0.244
		150	0.0519/10	96.8	0.072	150	0.0336/ 7	99.4	0.029	150	0.0826/10	96.3	0.152	150	0.135/10	94.7	0.167
	IP	17	0.0101/10	98.1	0.015	38	0.0124/10	98.6	0.024	104	0.0161/10	98.3	0.021	109	0.0209/10	98.4	0.034
		18	0.0105/10	98.2	0.013	39	0.0106/10	98.4	0.027	105	0.0174/10	98.3	0.025	110	0.0261/10	98.4	0.026
		19	0.0085/10	98.3	0.0087	40	0.0102/10	98.5	0.021	106	0.0181/10	98.6	0.015	111	0.0201/10	98.5	0.028
		20	0.0066/10	98.8	0.023	41	0.0112/10	98.5	0.018	107	0.0138/10	98.9	0.03	112	0.0210/10	98.3	0.029
	PM	147	0.0390/10	96.5	0.073	147	0.110/10	96.0	0.217	147	0.183/10	90.9	0.214	147	0.0776/10	96.3	0.101
		148	0.0467/10	96.7	0.049	148	0.111/10	91.8	0.13	148	0.146/10	93.2	0.2	148	0.0786/10	96.3	0.104
		149	0.0322/10	97.4	0.059	149	0.0672/10	94.9	0.062	149	0.124/10	94.2	0.156	149	0.0807/10	96.2	0.209
		150	0.0481/10	97.3	0.054	150	0.0480/10	97.0	0.05	150	0.127/10	96.1	0.163	150	0.175/10	94.9	0.103

FLOWS ANALYSIS

5.5.3 Table 5-3 and Table 5-4 show the changes in link flows in passenger PCUs[63] on the key links around the schemes for the DM[64] Scenario, and compare the growth with the Base Year flows.

Table 5-3: Base v Do Min - AM Peak Hr Key Link Flow Difference (PCUs)

Key Link	2026				2036			
	Base 2015	Do Min	Diff	% Diff	Base 2015	Do Min	Diff	% Diff
A33 N/B	680	719	39	6%	680	694	14	2%
A33 S/B	539	591	52	10%	539	636	97	18%
A34 N/B (N of A33)	1,637	1,879	242	15%	1,637	1,957	320	20%
A34 S/B (N of A33)	2,175	2,326	151	7%	2,175	2,601	426	20%
M3 N/B (J9-8)	3,319	3,667	348	10%	3,319	3,819	500	15%
M3 S/B (J8-9)	2,288	2,292	4	0%	2,288	2,552	264	12%
M3 N/B (J10-9)	5,790	6,618	828	14%	5,790	6,738	948	16%
M3 S/B (J9-10)	4,134	4,410	276	7%	4,134	4,617	483	12%
Easton Lane N/B	549	521	-28	-5%	549	498	-51	-9%
Easton Lane S/B	1,414	1,410	-4	0%	1,414	1,431	17	1%
A272 N/B	420	316	-104	-25%	420	372	-48	-11%
A272 S/B	570	574	4	1%	570	877	307	54%
J9 N/B Off-Slip	2,815	3,251	436	15%	2,815	3,213	398	14%
J9 N/B On-Slip	344	301	-43	-13%	344	295	-49	-14%
J9 S/B Off-Slip	373	251	-122	-33%	373	337	-36	-10%
J9 S/B On-Slip	2,219	2,369	150	7%	2,219	2,392	173	8%

[63] PCU – Passenger Car Units
[64] DM – Do Minimum

Table 5-4: Base v Do Min - PM Peak Hr Key Link Flow Difference (PCUs[65])

Key Link	2026				2036			
	Base 2015	Do Min	Diff	% Diff	Base 2015	Do Min	Diff	% Diff
A33 N/B	557	620	63	11%	557	618	61	11%
A33 S/B	804	1,019	215	27%	804	854	50	6%
A34 N/B (N of A33)	1,785	1,898	113	6%	1,785	1,961	176	10%
A34 S/B (N of A33)	1,985	2,249	264	13%	1,985	2,384	399	20%
M3 N/B (J9-8)	2,469	2,580	111	4%	2,469	2,825	356	14%
M3 S/B (J8-9)	2,971	3,318	347	12%	2,971	3,635	664	22%
M3 N/B (J10-9)	4,084	4,463	379	9%	4,084	4,762	678	17%
M3 S/B (J9-10)	5,016	5,605	589	12%	5,016	5,937	921	18%
Easton Lane N/B	945	919	-26	-3%	945	914	-31	-3%
Easton Lane S/B	462	426	-36	-8%	462	445	-17	-4%
A272 N/B	287	184	-103	-36%	287	228	-59	-21%
A272 S/B	930	958	28	3%	930	1,018	88	9%
J9 N/B Off-Slip	2,024	2,238	214	11%	2,024	2,274	250	12%
J9 N/B On-Slip	410	356	-54	-13%	410	336	-74	-18%
J9 S/B Off-Slip	411	330	-81	-20%	411	330	-81	-20%
J9 S/B On-Slip	2,456	2,617	161	7%	2,456	2,632	176	7%

5.5.4 All flows on the key links in the vicinity of Junction 9 increase in the DM[66] v Base comparison except those on Easton Lane, A272 (Spitfire Link) northbound, the M3 northbound on-slip and the M3 southbound off-slip. The signal timings at Junction 9 have been optimised in the DM to account for the forecast flows in that scenario and have further reduced available capacity to non-M3-A34 movements. This results in a disbenefit for movements from Easton Lane and the southbound off-slip (through reduced green), and from Spitfire Link through increased opposing circulating flows and then reduced green at downstream movements. The reduction of flow on these links is a reflection of movements reassigning to avoid the increased delay/ reduced capacity.

5.5.5 Table 5-5 and Table 5-6 show the changes in link flows on the key links around the schemes for the options and compare it with the DM Scenario flows. The values in red italics show the links where the model predicts an increase in flow and bold green shows the locations where there would be a decrease in flow.

Table 5-5: Do Min v Options - AM Peak Hr Key Link Flow Difference (PCUs)

Key Link	2026				2036			
	Do Min	Option 14	Option 16B	Option 16B+16C	Do Min	Option 14	Option 16B	Option 16B+16C
A33 N/B	719	*938*	*856*	-	694	*953*	*847*	*976*
A33 S/B	591	*715*	*594*	-	636	*754*	**625**	*756*
A34 N/B (N of A33)	1879	*2,200*	*2,100*	-	1,957	*2,301*	*2,223*	*2,299*
A34 S/B (N of A33)	2,326	*2,591*	*2,454*	-	2,601	*2,882*	*2,663*	*2,890*
M3 N/B (J9-8)	3,667	*3,766*	*3,704*	-	3,819	*3,910*	*3,852*	*3,916*
M3 S/B (J8-9)	2,292	*2,371*	*2,327*	-	2,552	*2,629*	**2,540**	*2,618*
M3 N/B (J10-9)	6,618	*6,779*	*6,838*	-	6,738	*6,758*	*6,935*	**6,734**
M3 S/B (J9-10)	4,410	*4,691*	**4,294**	-	4,617	*5,088*	**4,555**	*5,093*
Easton Lane N/B	521	*673*	*561*	-	498	*696*	*706*	*731*
Easton Lane S/B	1,410	*1,750*	*1,493*	-	1,431	*1,743*	*1,466*	*1,741*
A272 N/B	316	*693*	*388*	-	372	*844*	*432*	*853*

[65] PCU – Passenger Car Units
[66] DM – Do Minimum

Key Link	2026				2036			
	Do Min	Option 14	Option 16B	Option 16B+16C	Do Min	Option 14	Option 16B	Option 16B+16C
A272 S/B	574	465	714	-	877	568	946	558
J9 N/B Off-Slip	3,251	944	941	-	3,213	824	887	818
J9 N/B On-Slip	301	547	365	-	295	603	375	651
J9 S/B Off-Slip	251	396	282	-	337	481	385	471
J9 S/B On-Slip	2,369	626	2,249	-	2,392	407	2,320	412

Table 5-6: Do Min v Options - PM Peak Hr Key Link Flow Difference (PCUs[67])

Key Link	2026				2036			
	Do Min	Option 14	Option 16B	Option 16B+16C	Do Min	Option 14	Option 16B	Option 16B+16C
A33 N/B	620	647	683	-	618	721	969	723
A33 S/B	1,019	1,213	1,008	-	854	948	842	956
A34 N/B (N of A33)	1,898	2,168	2,150	-	1,961	2,425	2,377	2,428
A34 S/B (N of A33)	2,249	2,449	2,278	-	2,384	2,610	2,411	2,611
M3 N/B (J9-8)	2,580	2,634	2,568	-	2,825	2,893	2,631	2,888
M3 S/B (J8-9)	3,318	3,381	3,326	-	3,635	3,707	3,646	3,695
M3 N/B (J10-9)	4,463	4,590	4,611	-	4,762	5,021	5,020	4,997
M3 S/B (J9-10)	5,605	6,128	5,597	-	5,937	6,470	5,904	6,454
Easton Lane N/B	919	1,166	1,036	-	914	1,167	1,318	1,167
Easton Lane S/B	426	666	474	-	445	686	729	682
A272 N/B	184	471	287	-	228	595	340	619
A272 S/B	958	1,004	975	-	1,018	1,012	984	1,025
J9 N/B Off-Slip	2,238	202	191	-	2,274	206	199	205
J9 N/B On-Slip	356	439	336	-	336	466	175	485
J9 S/B Off-Slip	330	682	329	-	330	768	333	758
J9 S/B On-Slip	2,617	492	2,600	-	2,632	456	2,592	446

5.5.6 The tables show an overall increase in flows on the strategic network, i.e. M3 and A34, for Option 14. The changes to the M3 Junction 9 roundabout alignment are expected to reduce the delay on the A272 and Easton Lane northbound approach to the junction. This is resulting in increases in flows on both these links. As expected, there is a significant reduction in the Junction 9 northbound off-slip and southbound on-slip due to the free-flow link between M3 and A34, relieving these slip roads.

5.5.7 Since Option 16B is only providing northbound free-flow links between M3 and A34, the increases in trips are in the northbound links as well. Easton Lane and A272 are expected to see an increase in flows, due to a decrease in the flows at Junction 9. This increase is however lower than Option 14.

JOURNEY TIME ANALYSIS

5.5.8 Journey time analysis was undertaken for the routes shown in Figure 5-2.

5.5.9 Table 5-7 and Table 5-8 show the changes in journey time on routes around the schemes for the DM[68] Scenario, and compare the change with the Base Year journey times.

[67] PCU – Passenger Car Units
[68] DM – Do Minimum

Figure 5-2: Journey Time Analysis Routes

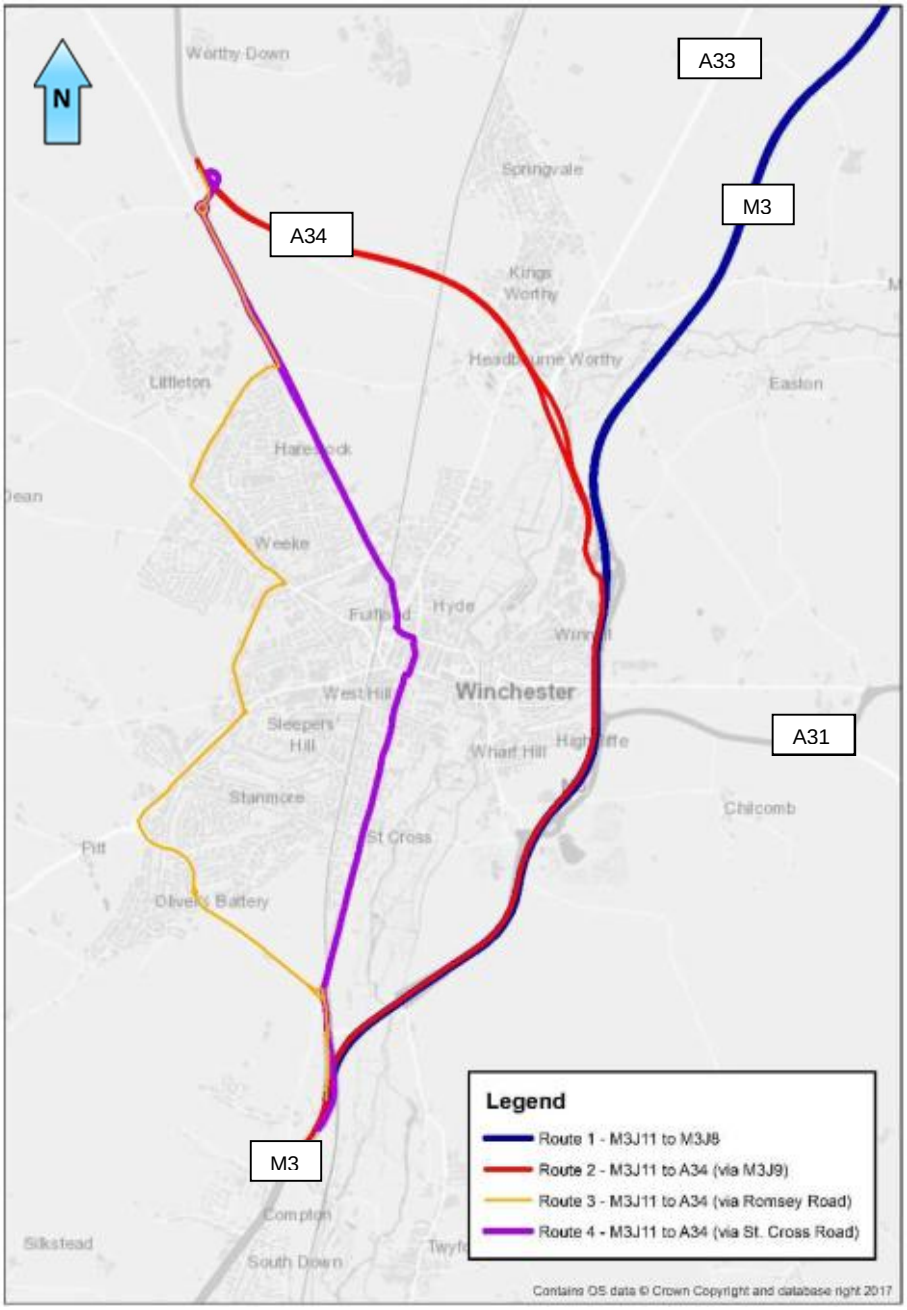


Table 5-7: Base v Do Minimum Peak Hour Journey Time (min: seconds) AM

Route	2026				2036			
	Base 2015	Do Min	Diff	% Diff	Base 2015	Do Min	Diff	% Diff
Route 1 N/B	16:12	16:08	-00:05	0%	16:12	16:41	00:28	3%
Route 1 S/B	13:17	12:57	-00:21	-3%	13:17	13:19	00:02	0%
Route 2 N/B	09:01	08:49	-00:11	-2%	09:01	08:40	-00:20	-4%
Route 2 S/B	08:19	08:10	-00:09	-2%	08:19	08:28	00:09	2%
Route 3 N/B	16:38	16:58	00:20	2%	16:38	16:56	00:18	2%
Route 4 N/B	17:05	17:30	00:25	2%	17:05	17:23	00:18	2%

Table 5-8: Base v Do Minimum Peak Hour Journey Time (min: seconds) PM

Route	2026	2036

	Base 2015	Do Min	Diff	% Diff	Base 2015	Do Min	Diff	% Diff
Route 1 N/B	13:37	13:34	-00:03	0%	13:37	13:52	00:15	2%
Route 1 S/B	15:49	14:18	-1:31	-10%	15:49	15:40	-00:09	-1%
Route 2 N/B	07:38	08:04	00:26	6%	07:38	09:47	02:09	28%
Route 2 S/B	11:09	09:35	-01:34	-14%	11:09	10:19	-00:49	-7%
Route 3 N/B	14:17	14:46	00:30	3%	14:17	15:18	01:01	7%
Route 4 N/B	15:13	15:52	00:39	4%	15:13	16:30	01:17	8%

5.5.10 Route 1 (M3 Junction 11 to Junction 8) includes a section of the M3 upgraded to a Smart Motorway (Junction 9 to 11) and a section that is unchanged (Junction 8 to 9). In both directions, and in both peaks, the sections upgraded to Smart Motorway have forecast delay/journey time decreases and the unchanged section has increases. The net impact to journey times is that in the northbound direction the upgraded sections, though marginally quicker in 2026, do not offset the untreated section in 2036. In the southbound direction the upgraded sections effectively do offset the untreated section except in the 2036 AM peak.

5.5.11 For Route 2 (M3 Junction 11 to A34 via M3 Junction 9) northbound, while there is an increased delay at the M3 Junction 9 northbound off-slip signals, there is an overall improvement in AM journey time as a result of reduction in delay on the widened section of the M3. In the PM peak there is a large increase in delay at the Junction 9 off-slip signals that eclipses the Smart Motorways delay reductions on the motorway. The circulating movement adjacent to Easton Lane, that carries M3 to A34 northbound traffic, is blocking back to the off-slip in the PM which is the cause of the larger increase in PM delay. In the southbound direction in the AM, the journey time for Route 2 is virtually unchanged with the delay savings on the M3 offset by increases on the A34 approach to Junction 9. However the PM sees significant delay reductions at the southbound merges of Junction 10 and Junction 11 as a result of the Smart Motorway (approximately 30s reduction at both merges in 2036) that are the main factors behind the journey time reduction.

5.5.12 Routes 3 and 4 (M3 Junction 11 to A34 via local routes through Winchester) have journey time increases of a similar scale to each other and which are more pronounced in the PM. Without the Smart Motorway, there may have been an even higher increase, with strategic trips going through Winchester to avoid that section of the M3.

5.5.13 Table 5-9 and Table 5-10 show the changes in the journey time routes for the options compared to Do Minimum. The values in red italics show the routes where the model predicts an increase in journey time and bold green shows the routes where there would be a decrease in journey times.

Table 5-9: Do Min v Options - AM Peak Hr Journey Times

Route	2026				2036			
	Do Min	Option 14	Option 16B	Option 16B+16C	Do Min	Option 14	Option 16B	Option 16B+16C
Route 1 N/B	16:08	**16:02**	**16:08**	-	16:41	**16:21**	**16:34**	**16:20**
Route 1 S/B	12:57	*13:07*	*13:06*	-	13:19	*13:24*	**13:18**	*13:23*
Route 2 N/B	08:49	**07:07**	**07:25**	-	08:40	**07:09**	**07:33**	**07:08**
Route 2 S/B	08:10	**07:15**	*08:21*	-	08:28	**07:41**	*08:43*	**07:42**
Route 3 N/B	16:58	**16:21**	**16:30**	-	16:56	**16:27**	**16:29**	**16:34**
Route 4 N/B	17:30	**16:55**	**17:09**	-	17:23	**16:54**	**17:01**	**17:02**

Table 5-10: Do Min v Options - PM Peak Hr Journey Times

Route	2026				2036			
	Do Min	Option 14	Option 16B	Option 16B+16C	Do Min	Option 14	Option 16B	Option 16B+16C
Route 1 N/B	13:34	*13:36*	*13:35*	-	13:52	*13:55*	**13:43**	*13:55*
Route 1 S/B	14:18	*15:07*	*15:52*	-	15:40	*15:59*	**15:40**	*15:57*
Route 2 N/B	08:04	**06:23**	**06:23**	-	09:47	**06:30**	**06:43**	**06:30**
Route 2 S/B	09:35	**08:19**	**08:19**	-	10:19	**08:42**	*10:41*	**08:42**
Route 3 N/B	14:46	**14:36**	**14:36**	-	15:18	**14:50**	**14:55**	**14:39**
Route 4 N/B	15:52	**15:28**	**15:28**	-	16:30	**15:53**	**15:58**	**15:53**

5.5.14 The changes to journey times on Route 1 (M3 Junction 8 to 11) for Option 14 are relatively small in both directions in the AM peak. The northbound shows a small decrease. The PM peak show increases in journey time in both directions, especially southbound. For Option 16B, the journey times are effectively unchanged from Do Minimum conditions on this route, except Route 2, which sees a drop in journey time in most of the cases.

5.5.15 Route 2 encompasses the north and southbound movements expected to gain most from the Option 14 scheme. In the 2036 AM there is a reduction of approximately 90s and 45s in the north and southbound directions respectively. In the PM the northbound reduction is approximately 195s and southbound the reduction is approximately 95s. In Option 16B, the expected 2036 journey time savings (approximately 1 minute in the AM and 3 minutes in the PM) in the northbound direction is in accordance with the focus of this option and small increases are forecast in the southbound direction that is effectively unchanged in arrangement from the DM[69]. The southbound journey time increases stem from increased delays on the A34 southbound approach to Junction 9. The signals have been reoptimised in Option 16B compared to the DM.

5.5.16 In Option 14, Routes 3 and 4 that take routes through Winchester between M3 Junction 11 and A34 have forecast journey time reductions of approximately 30s due to the reduction of traffic on these local routes with traffic attracted to the M3. Option 16B + 16C shows journey time savings of 20-30s in both peaks, which is consistent with traffic being attracted away from the more local routes to the motorway.

5.5.17 Option 16B+16C has similar results as Option 16B for 2026 and Option 14 for 2036.

[69] DM – Do Minimum

5.6 ACCIDENT RESULTS

5.6.1 The following table shows the economic summary of the accident benefits (over 60 years) for Option 14 and Option 16B (opening year 2022). The accident benefits for Option 16C (opening year 2029) have been calculated over a 54 year appraisal period in order to tie in with the final year of the appraisal period for Option 14 and Option 16B, which is year 2082.

5.6.2 'Option 16B + Option 16C' is the sum of the benefits for the first 6 years of Option 16B and total benefits of Option 16C, and hence a different 'without' scheme accident cost.

Table 5-11: Economic accident costs (costs and benefits discounted to 2010) for M3 Junction 9 Improvement Scheme options

Economic Summary			
Option	**'Without' Scheme Accident Costs (£000's)**	**'With' Scheme Accident Costs (£000's)**	**Total Accident Benefits Saved by Scheme (£000's)**
Option 14	£506,662.50	£502,289.60	£4,372.90
Option 16B	£506,662.50	£503,615.60	£3,046.90
Option 16B + 16C	£506,661.40	£503,644.40	£3,017.00

5.6.3 Table 5-11 shows that Option 14 provides the largest benefits compared to the other options. The lowest benefit was estimated for Option 16B + 16C.

5.6.4 The following sections discuss some other key COBALT[70] outputs.

ACCIDENT RESULTS

5.6.5 The COBALT output includes a summary of the number of personal injury accidents estimated to be saved by the scheme. COBALT analysis is based on results from the traffic model. Considering the scale of benefits from the COBALT analysis were small, at this stage it was not felt a revised set of analysis was required, similar to the analysis for TUBA, to address issues identified with the traffic model convergence. Therefore, some caution would be required while considering the quantitative results from this analysis. These discrepancies, along with the estimation of the accident rates are expected to be resolved in Stage 3 modelling using the SERTM model.

5.6.6 The summarised COBALT results are shown in table 5-12 below.

Table 5-12: Personal Injury Accident savings over 60 years for the M3 Junction 9 Improvement Scheme options

Accident Summary			
Option	**Number of 'Without' Scheme Accidents**	**Number of 'With' Scheme Accidents**	**Total Number of Accidents Saved by Scheme**
Option 14	10,457	10,407.6	49.5
Option 16B	10,457	10,414.8	42.2
Option 16B + 16C	10,457	10,424.7	34.7

5.6.7 Table 5-12 shows that the highest number of accident reductions are expected from Option 14.

[70] COBALT – Cost and Benefit to Accidents – Light Touch

CASUALTY RESULTS

5.6.8 The COBALT[71] output provides a summary of the number of casualties estimated to be saved as a result of the scheme, summarised in the tables below.

Table 5-13: Casualty savings over 60 years for Option 14 of the M3 Junction 9 Improvements Scheme

Option 14: Casualty Summary			
Severity	**Total 'Without' Scheme Casualties**	**Total 'With' Scheme Casualties**	**Total Casualties Saved by Scheme**
Fatal	152.9	150.2	2.7
Serious	1,454.5	1,441.5	13.0
Slight	13,059.4	12,985.5	73.9
TOTAL	14,666.8	14,577.2	89.6

Table 5-14: Casualty savings over 60 years for Option 16B of the M3 Junction 9 Improvements Scheme

Option 16B: Casualty Summary			
Severity	**Total 'Without' Scheme Casualties**	**Total 'With' Scheme Casualties**	**Total Casualties Saved by Scheme**
Fatal	152.9	151.0	1.9
Serious	1,454.5	1,448.5	6.0
Slight	13,059.4	12,977.8	81.6
TOTAL	14,666.8	14,577.3	89.5

Table 5-15: Casualty savings over 60 years for Option 16B and 16C of the M3 Junction 9 Improvements Scheme

Option 16B and 16C: Casualty Summary			
Severity	**Total 'Without' Scheme Casualties**	**Total 'With' Scheme Casualties**	**Total Casualties Saved by Scheme**
Fatal	152.9	150.7	2.2
Serious	1,454.5	1,445.2	9.3
Slight	13,059.4	13,007.8	51.6
TOTAL	14,666.8	14,603.7	63.1

5.6.9 The tables show that the proposed options have a minor effect on 'Fatal' accidents. The majority of the benefits are obtained from a reduction in 'Serious' and 'Slight' accidents for each of the options. Option 14 has the greatest effect in reducing 'Fatal' and 'Serious' accidents out of all the options.

5.7 ECONOMICS

5.7.1 The assessment of the impact on transport economics as a result of the scheme has been carried out primarily using the DfT's[72] TUBA[73] software. TUBA has also been used to assess the impact of delays during construction.

[71] COBALT – Cost and Benefit to Accidents – Light Touch
[72] DfT – Department for Transport
[73] TUBA – Transport Users Benefit Analysis

5.7.2 The initial TUBA results were estimated using demand and user costs data using the SRTM forecast models which had convergences issues. Convergence issues in the forecast models have been documented in Section 3.4 of the Traffic Forecasting Report (HE551511-WSP-GEN-M3J9PCF2-RP-TR-00032-P05). It was concluded that the model convergence statistics did not meet the WebTAG criteria. This raised the question of confidence level one can place on the economic assessment and as a result TPG, instructed WSP to undertake further assessment.

5.7.3 The 2026 models showed convergence, whereas the 2036 and 2041 results had serious issues, especially for AM and PM peaks which are expected to have the main benefits. Hence the 2026 model outputs were used to represent other modelled years used in the TUBA assessment.

5.7.4 The TUBA[74] assessment has been combined with the outputs from COBALT[75] (as described above) and the monetisation of the benefits from changes in greenhouse gases, local air quality and noise following WebTAG guidance.

SCHEME COST

5.7.5 The scheme costs were discounted to 2010 and converted to market prices to get the PVC[76] values. They are shown in Table 5-16.

Table 5-16: Present value of costs

Option 14	Option 16B	Option 16B+16C
£82.4m	£49.8m	£98.0m

ECONOMIC PERFORMANCE

5.7.6 summarises the headline economic appraisal outputs for each of the three scheme options, including the impacts of COBALT, as well as impacts from air and noise assessment. Adjusted BCRs[77] are included which incorporate WITA[78] benefits.

[74] TUBA – Transport Users Benefit Analysis
[75] COBALT – Cost and Benefit to Accidents – Light Touch
[76] PVC – Present Value of Costs
[77] BCR – Benefit to Cost Ratio
[78] WITA – Wider Impacts Transport Appraisal

Table 5-17: Summary of Scheme Options' Economic Outputs

	BCR			Adjusted BCR		
	Option 14	Option 16B	Option 16B +16C	Option 14	Option 16B	Option 16B +16C
PVC (£M)	£96.8	£3.9	£53.5	£96.8	£3.9	£53.5
Main Benefits (£M)[2]	-£0.6	-£0.1	-£0.4	-£0.6	-£0.1	-£0.4
Noise (£M)	-£0.6	-£0.3	-£0.5	-£0.6	-£0.3	-£0.5
Local Air Quality (£M)	-£10.1	-£4.7	-£11.1	-£10.1	-£4.7	-£11.1
Greenhouse Gases (£M)	-	-	-	£5.4	£0.8	£2.0
WITA (£M)				£3.4	£1.6	£3.4
PVB[79] (£M)	£85.5	-£1.2	£41.5	£94.3	£1.2	£46.9
BCR	1.0	NA	0.4	1.1	0.0[3]	0.5

Note: Values are in 2010 prices discounted to 2010
[2]Main benefits are made up of TUBA, COBALT and user delays during construction
[3] BCR = 0.02

[79] PVB – Present Value of Benefits

6 SUMMARY OF OPERATIONAL ASSESSMENT

6.1 INTRODUCTION

6.1.1 The operational assessment outlines the road characteristics and option design implications for the;

- à Scheme's operating regime; and
- à Driver Compliance.

6.1.2 The operational assessment for the scheme in PCF[80] Stage 2 was based on Option 14 as presented at the PCF Stage 2 public consultation, as it provides a 'worst case' for the options assessed during PCF Stage 2.

6.2 SCHEME'S OPERATING REGIME

6.2.1 The existing operational regime has been outlined in Section 1.3. The proposed improvements will operate in a slightly different manner to the existing regime as new free flowing links will be added that do not currently exist.

6.2.2 The provision of the additional free flowing links will result in less risk of flow breakdown due to congestion and vehicle stoppages in live lanes. It will also reduce the impact of stoppages as the additional road capacity will usually enable traffic to pass such vehicles.

6.2.3 There is a committed scheme to implement Smart Motorway technology on the M3 between Junctions 9-14 to enhance the strategic road network between Winchester and Southampton by offering features such as:

- à Variable speed limits
- à Speed enforcement
- à Permanent hard shoulder usage as a running lane
- à Emergency refuge areas with emergency telephones
- à Lane specific speed signals at certain locations.

[80] PCF - Project Control Framework

6.2.4 The Highways England Traffic Officer Service does not operate along the A33 or A272 although it does operate along the M3, M3 slip roads, Junction 9 Roundabout and A34. It is not currently envisaged that the scheme proposals will significantly impact on the resource needs of the Traffic Officer Service or the Highways England Regional Control Centre as the services provided will continue as existing, however they have requested a layby is provided on the southbound A34 prior to the merge with the M3, so that any broken-down vehicles on the A34 can be removed prior to entry onto the M3 Smart Motorway. The location of this layby will need to be considered further during PCF Stage 3. Consideration should also be made for a Traffic Officer platform within the scheme limits. Further discussion with the Highways England Traffic Officers will be required during PCF Stage 3.

6.2.5 The provision of additional carriageway will impact on winter maintenance services in that the increased road area will require additional quantities of salt for precautionary treatments.

6.2.6 Methods of snow clearance will also be affected by the provision of the additional carriageway. Snow clearance currently involves moving snow both to the verge and to the central reserve. The provision of the additional traffic lanes may require changes to the method of clearance.

6.3 ROAD CHARACTERISTICS AND OPTION DESIGN IMPLICATIONS

6.3.1 As detailed in section 5, the proposed alignment of the M3 and A34 within the scheme limits for all options is generally in accordance with the DMRB[81] for a Design Speed of 70mph (120kph). The exception to this is the horizontal curvature on the southbound carriageway of the A34 for Option 14 and 16C, which has a design speed of 60mph (100kph). The link road between Junction 9 and the A34 has a 45mph (75kph) design speed.

6.3.2 The existing M3 carriageway will be widened in both directions between the A34 merge/diverge and the tie in to the M3 smart motorway scheme. In this area it would be widened from the existing two lanes and a hard shoulder to four lanes in each direction without a hard shoulder.

[81] DMRB – Design Manual for Roads and Bridges

7 SUMMARY OF TECHNOLOGY AND MAINTENANCE ASSESSMENT

7.1 MAINTENANCE ASSESSMENT

7.1.1 An element of the option development for PCF[82] Stage 2, is the consideration of how maintenance of the proposed scheme will be carried out during its lifetime and the likely effect on network availability and safety issues for road users and operatives.

7.1.2 The requirements of IAN[83] 69/15 - Designing for Maintenance have been considered during the development of the options for the scheme such that all maintenance can be carried out safely and the risks to road workers and users are minimised.

7.1.3 A MRSS[84] has been developed for the scheme. Although not intended as a detailed statement on how maintenance will be undertaken, it will be used to support the operational and maintenance handover of the scheme and contribute to meeting the requirements on the Designer of; Construction (Design and Management) Regulations 2015; IAN 69/15 – Designing for Maintenance; IAN 182/14 – Major Schemes: Enabling Handover into Operation and Maintenance; and CIRIA C686 – Safe access for maintenance and repair. These standards will all be considered in more detail in subsequent PCF Stages.

7.1.4 No specific maintenance activities for assets have been identified although potential maintenance considerations have been recognised. These include:

- **Installation of Temporary Traffic Management:** Although it is anticipated that the current approaches to temporary traffic management will not change, as the current maintenance service provider utilises fixed taper positions, the provision of remotely activated temporary traffic management signs will be considered as detailed in IAN 180/14. In addition, consideration should be given to IAN[85] 150/16, which provides guidance for alternative temporary traffic management techniques for relaxation schemes on dual carriageways.
- **Winter Maintenance Activities:** The realignment of the merge and diverge layouts will necessitate a revision of the treatment routes. Consideration will also have to be given to the ploughing and stacking of snow which will be influenced by the presence of the central reserve rigid concrete barrier.

[82] PCF – Project Control Framework
[83] IAN – Interim Advice Note
[84] MRSS – Maintenance and Repair Strategy Statement
[85] IAN – Interim Advice Note

7.2 TECHNOLOGY ASSESSMENT

7.2.1 The existing technology comprises of MS4's[86] located on the M3 southbound carriageway north of Junction 9 and on the M3 northbound carriageway south of Junction 9.

7.2.2 It is assumed that these MS4's will be relocated as necessary to a suitable location in the verge, however discussions will be required with the adjoining M3 Smart Motorway Scheme during the preliminary design to establish whether they will still be required.

7.2.3 Technology has been identified in the MRSS[87]. Remotely activated temporary traffic management signs will be considered at fixed taper positions to facilitate safe maintenance.

7.2.4 The proximity of the adjoining Smart Motorway Scheme may mean that some sections of the scheme approaching and departing the smart motorway are dependent on the installation of new technology for the safe operation or maintenance of the road.

[86] MS4 – Message Sign Version 4
[87] MRSS – Maintenance and Repair Strategy Statement

8 SUMMARY OF ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL DESIGN

8.1 INTRODUCTION

8.1.1 This section provides the following:

- à A brief statement as to whether the alternatives considered have potential to affect the environment significantly in comparison with the recommended route (Option 14)
- à A brief statement as to whether the alternatives considered have significant potential to achieve the scheme's environmental objectives in comparison with the recommended route.

8.1.2 The objectives of the scheme are outlined in the Client Scheme Requirements (CSR). The environmental objectives are as follows:

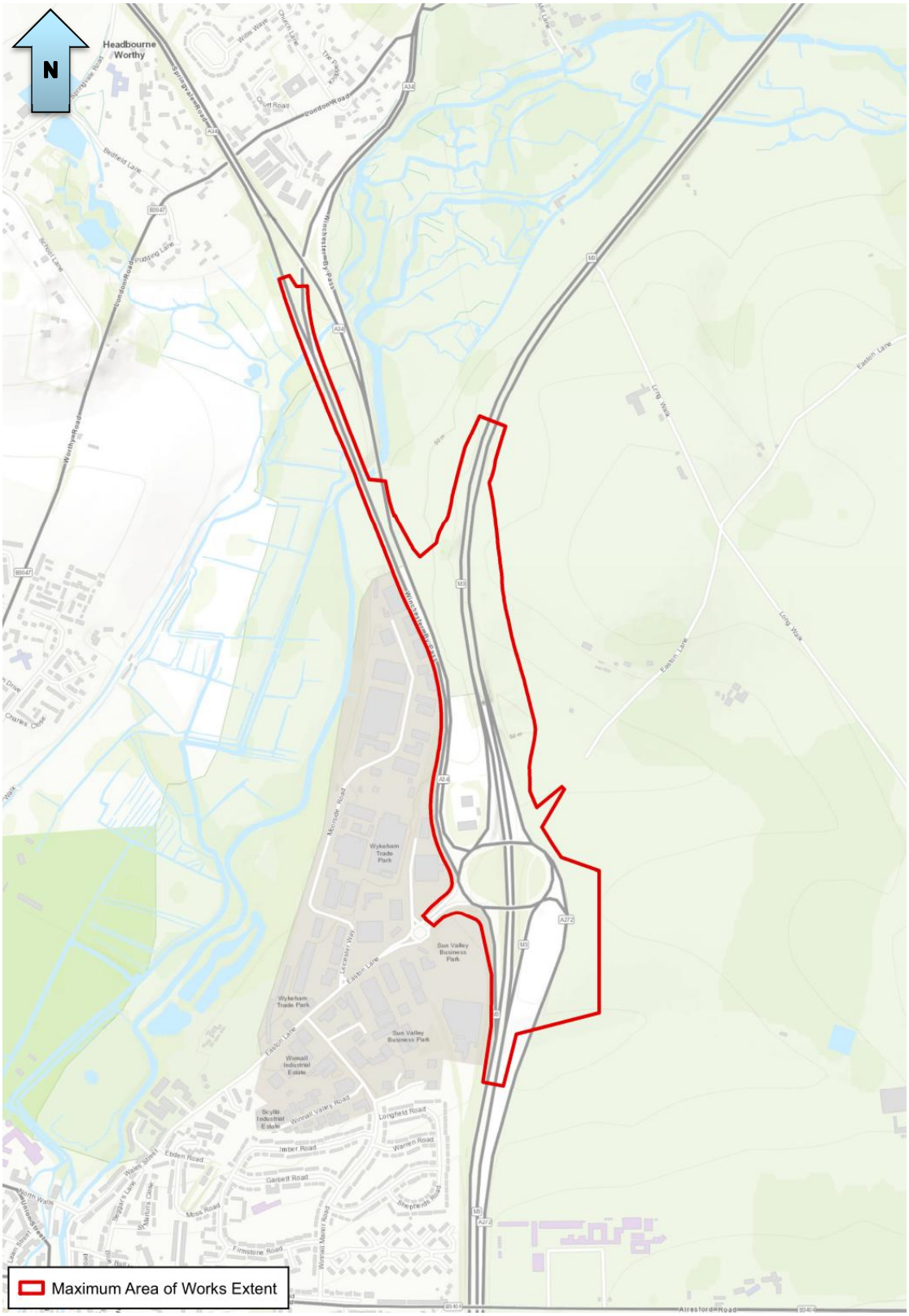
- à An improved environment – Reduced number of people adversely affected by noise; Improve the air quality at sensitive receptors; No net loss in biodiversity by 2020.
- à A more accessible and integrated network – Improvements at Junction 9 would also include improvements for WCH[88]users. The scheme would connect the National Cycle Network Route 23 which is severed by the current junction layout.

8.1.3 The following section represents a summary of the PCF Stage 2 Environmental Assessment Report (EAR). The conclusions for each topic are residual effects that are predicted providing the mitigation measures identified within the EAR are all implemented. A failure to implement these mitigation measures could result in effects of a greater magnitude/significance. Further detail on the assessment methodology, results and mitigation can be found in the EAR.

8.1.4 The anticipated maximum area of works extent (scheme area for Option 14) covers 38 hectares and is illustrated in Figure 8-1. This area includes proposed construction compound areas. If mitigation or compensation land is required this will be identified at PCF Stage 3. Option 16B and 16C would be contained within the same scheme area.

[88] WCH – Walking, Cycling and Horse Riding

Figure 8-1: The maximum area of works extent, including construction compounds



8.2 SUMMARY OF ENVIRONMENTAL ASSESSMENT

AIR QUALITY

8.2.1 The effects of the three options considered for air quality are shown in Table 8-1 (significance level is following mitigation).

Table 8-1: Effects on air quality for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Construction effects	Neutral	Neutral	Neutral
Human Health Impacts	Neutral	Neutral	Neutral
Regional Air Quality (percentage change in 2038 from 2015)	NOx - 1.7% increase PM_{10} – 1.6% increase CO_2 – 1.5% increase	NOx -1.1% increase PM_{10} – 1.5% increase CO_2 – 1.2% increase	NOx -1.5% increase PM_{10} – 1.5% increase CO_2 – 1.4% increase
Effects on designated sites	Neutral	Neutral	Neutral
Compliance Risk	Low risk	Low risk	Low risk
Effects on human receptors	Neutral	Neutral	Neutral

8.2.2 The only element of the air quality assessment that varies between Option 14 and the other two options is in regards to Regional Air Quality, where Option 14 has a marginally higher level of emission increases than the alternatives. However, this is as a result of the larger number of vehicles that can use the scheme. The air quality at sensitive receptors is not predicted to change significantly and so none of the options have significant potential to see an improvement in air quality.

CULTURAL HERITAGE

8.2.3 The effects of the three options considered for cultural heritage are shown in Table 8-2 (significance level is following mitigation).

Table 8-2: Effects on cultural heritage for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Known and hitherto unknown buried archaeological remains	Neutral	Neutral	Neutral
Setting of heritage assets	Slight adverse	Slight adverse	Slight adverse

8.2.4 Neither of the other alternatives are considered to meet the environmental objectives of the scheme better than Option 14 and none of the options are predicted to significantly affect the cultural heritage environment. Preliminary archaeological investigations are proposed to establish the nature, extent and survival of hitherto unknown below-ground archaeological remains at PCF Stage 3 which would reduce uncertainty in relation to unknown archaeological remains.

LANDSCAPE EFFECTS

8.2.5 The effects of the three options considered for landscape are shown in Table 8-3 (significance level is following mitigation).

Table 8-3: Effects on landscape for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Direct and indirect effects on the SDNP	Slight adverse	Neutral	Slight adverse
Landscape	Slight adverse	Neutral	Slight adverse
Visual	Slight adverse	Slight adverse	Slight adverse
Arboriculture	Neutral	Neutral	Neutral

8.2.6 Without mitigation, such as planting, there is potential for moderate to large adverse effects, however a mitigation plan will be developed in PCF Stage 3. With mitigation assumed, significant visual effects would result more from Option 14 and 16C, with more limited effects resulting from Option 16B. Option 16B performs best when considering both landscape and visual effects because it avoids Easton Down and is therefore ranked better. The lower ranking options are those which extend across Easton Down (Option 14 and 16C). The visual impact reduces to neutral or slight adverse fifteen years after the scheme opens due to maturation of planting.

8.2.7 Neither of the alternatives are considered to meet the environmental objectives of the scheme better than Option 14 and none of the options are predicted to significantly affect the landscape environment in the long term.

BIODIVERSITY

8.2.8 The effects of the three options considered for biodiversity are shown in Table 8-4 (significance level is following mitigation).

Table 8-4: Effects on biodiversity for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Area required for compensation for biodiversity (ha)	24.5	15	24.5
European and nationally designated sites	Impact unknown prior to further investigation	Impact unknown prior to further investigation	Impact unknown prior to further investigation
Non-statutory designated sites, habitats (priority and notable, terrestrial, riparian) and species, including: Badgers, Roosting bats, Foraging and commuting bats, Hazel dormouse, Otter, Water vole, Breeding birds, Wintering birds, Reptiles, Amphibians, Freshwater fish, Terrestrial invertebrates, Aquatic invertebrates.	Neutral	Neutral	Neutral

8.2.9 Option 14 and 16C would result in broadly the same outcome in terms of design, so there is unlikely to be any significant difference between the designs in terms of ecological impact. Option 16B would result in lower overall land take and as such the ecological impact would be less. However, this would need to be confirmed by further investigations with regards to groundwater and drainage during the preliminary design work. This further investigation is required in particular in relation to the assessment of European and nationally designated sites where it is considered likely that appropriate mitigation can be developed to ensure neutral residual effects.

8.2.10 None of the options are predicted to significantly affect the biodiversity environment because, following mitigation, all effects across all options have the potential to be neutral. There is potential for all options to achieve the objective of no net loss in biodiversity.

GEOLOGY AND SOILS

8.2.11 The effects of the three options considered for geology and soils are shown in Table 8-5 (significance level is following mitigation).

Table 8-5: Effects on geology and soils for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Effects on geology, geomorphology and mineral resources	Neutral	Neutral	Neutral
Effects on soils and agricultural land	Neutral or slight adverse	Neutral or slight adverse	Neutral or slight adverse
Effects on groundwater	Neutral	Neutral	Neutral
Effect on surface waters	Neutral	Neutral	Neutral
Effect on ecological systems	Neutral	Neutral	Neutral
Effect on the built environment and infrastructure	Neutral	Neutral	Neutral
Effect on construction workers	Neutral	Neutral	Neutral
Effect on existing and proposed future users	Neutral	Neutral	Neutral

8.2.12 None of the alternatives are considered to have a greater potential to meet the environmental objectives of the scheme than Option 14 because, there is no variation in the significance of effects after mitigation and none of the options are predicted to significantly affect the geology and soils environment. A ground investigation is proposed at PCF Stage 3 which may alter the assessment in relation to geology and soils.

MATERIALS

8.2.13 The effects of the three options considered for materials are shown in Table 8-6 (significance level is following mitigation).

Table 8-6: Effects on materials for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Use of materials	Moderate adverse	Slight adverse	Moderate adverse
Site arisings (potential to remove from landfill)	Large or very large beneficial	Large beneficial	Large or very large beneficial
Waste (generated)	Neutral or slight adverse	Neutral	Neutral or slight adverse

8.2.14 None of the alternatives are considered to have a greater potential to meet the environmental objectives of the scheme than Option 14. Although a greater level of materials are used to construct Option 14 in comparison to Option 16B, there are greater benefits in regards to site arisings (with the implementation of recycling/ reuse and the diversion of site arisings from landfill) than Option 16B. Both Options 14 and 16C have the potential to have a moderate adverse effect on materials.

NOISE AND VIBRATION

8.2.15 The effects of the three options considered for noise and vibration are shown in Table 8-7 (significance level is following mitigation).

Table 8-7: Effects on noise and vibration for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Residential receptors within the calculation area	Slight adverse	Slight adverse	Slight adverse
Designated areas within the calculation area	Slight adverse for the River Itchen SSSI and SAC, SDNP and footpaths.	Slight adverse for the River Itchen SSSI and SAC, SDNP and footpaths.	Slight adverse for the River Itchen SSSI and SAC, SDNP and footpaths.

8.2.16 There is the potential for adverse noise and vibration effects during construction, for which it should be possible to manage and mitigate these effects; this will be determined in PCF Stage 3. During operation, although Option 16B will have less adverse effects in the SDNP than Option 14 and 16C, it should be noted that the reason for this is that Option 16B only provides improvements to the area west of the M3 and therefore does not encroach into the SDNP to the east. Neither of the alternatives are considered to be more likely to meet the environmental objectives of the scheme in comparison to Option 14, as there is predicted to be a slight adverse effect in relation to residential receptors. None of the options are predicted to significantly affect the noise environment in the long term.

PEOPLE AND COMMUNITIES

8.2.17 The effects of the three options considered for people and communities are shown in Table 8-8 (significance level is following mitigation).

Table 8-8: Effects on people and communities for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Motorised Travellers during construction	Moderate adverse	Moderate adverse	Moderate adverse
Motorised Travellers during operation	Slight benefit	Slight benefit	Slight benefit
WCH[89] amenity during construction	Slight to large adverse (depending on the length of diversion and if a closure of a WCH route is required)	Slight to large adverse (depending on the length of diversion and if a closure of a WCH route is required)	Slight to large adverse (depending on the length of diversion and if a closure of a WCH route is required)
WCH amenity during operation	Moderate beneficial	Neutral	Moderate beneficial
Communities: Agricultural land	Neutral or slight adverse	Neutral or slight adverse	Neutral or slight adverse
People: Health (through improved accessibility)	Moderate beneficial	Neutral	Moderate beneficial
People: Employment	Minor beneficial	Minor beneficial	Minor beneficial

8.2.18 Option 16B has the potential to have a lesser construction phase effect on WCH amenity because it does not include any improvements to the WCH user provision. Option 16B does not assist in meeting the environmental objective of 'a more accessible and integrated network' as it does not link to National Cycle Route 23. Therefore Options 14 and 16C would meet the scheme objective of improving WCH user provision but Option 16B would not. None of the options are predicted to significantly adversely affect people and communities in the long term.

[89] WCH – Walking, Cycling and Horse Riding

ROAD DRAINAGE AND THE WATER ENVIRONMENT

8.2.19 The effects of the three options considered for road drainage and the water environment are shown in Table 8-9 (significance level is following mitigation).

Table 8-9: Effects on road drainage and the water environment for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Construction phase: pollution risks Construction phase: Surface water flood risk Construction phase: Ground water flood risk Operational phase: pollution risks Operational phase: Ground water flood risk Operational phase: groundwater influenced environments and habitats	Neutral	Neutral	Neutral

8.2.20 Following mitigation, the alternatives are all predicted to have a neutral effect. Neither of the alternatives are considered to be more likely to meet the environmental objectives of the scheme in comparison to Option 14. Further studies in relation to water are required in PCF Stage 3 to determine appropriate mitigation and potential impacts.

CLIMATE

8.2.21 The effects of the three options considered for climate are shown in Table 8-10.

Table 8-10: Effects on climate for options

EFFECT	OPTION 14	OPTION 16B	OPTION 16C
Construction phase Greenhouse gas emissions in thousand tonnes of carbon dioxide equivalent (KtCO2e)	2.7	5.1	3.9
Operation phase Greenhouse gas emissions in KtCO2e	535	420	486

8.2.22 Option 14 has the greatest overall magnitude of GHG[90] emissions and is therefore the least favourable for GHG minimisation. Option 16B has the lowest overall magnitude of GHG emissions and is therefore the most favourable in relation to GHGs minimisation. This is due to Option 16B being a smaller scheme which during operation provides the least traffic capacity. Option 16B has higher GHG emissions during construction as it requires greater earth fill import requirements than the other two options. Neither of the alternatives are considered to be more likely to meet the environmental objectives of the scheme in comparison to Option 14.

8.3 PLANNING CONSENT REGIME

8.3.1 The Planning Act 2008 specifies that all NSIP require a Development Consent Order (DCO). The Applicant must apply to the Secretary of State (SoS) for a DCO under the Planning Act 2008, in order to construct, operate and maintain the proposed scheme. Highway-related development is defined as a NSIP where it involves the construction, improvement or alteration of a highway which is the responsibility of the SoS (i.e. Highways England) and the land required for the construction is over specified thresholds. These thresholds are 15.0 hectares for the construction or alteration of a motorway and 12.5 hectares for the construction or alteration of a highway, other than a motorway, where the speed limit is expected to be 50mph (80kph)or greater. The threshold for the construction or alteration of any other highway is 7.5 hectares.

8.3.2 Using the above criteria and preliminary measurements carried out in PCF Stage 2, the following has been determined:

- à Option 14 would require an area of 38 hectares. It would exceed the 15 hectare threshold if considered to be a motorway scheme. It would therefore be likely to require Development Consent pursuant to the 2008 Act. However, during PCF Stage 3 it needs to be confirmed whether the scheme is classed as a motorway or highway. Nonetheless, if considered to be a

[90] GHG – Green House Gas

highway scheme it would still meet the criteria above to be an NSIP[91] and would require a DCO[92].

- à Option 16B is not considered to be a motorway scheme as it has more works to the A34 than the M3. The sum of land take area is currently estimated to be in the region of 19 hectares. This option would exceed all the area thresholds and would also likely be a road designated as 50mph (80kph) or greater, therefore Option 16B would require a DCO.
- à Option 16C would require an estimated area of 29 hectares. This option would exceed all the area thresholds and would also likely be a road designated as 50 mph (80kph) or greater, therefore Option 16C would also require a DCO.

8.3.3 At this stage it is considered likely that in any case, the scheme will qualify as an NSIP and, therefore, it will require development consent pursuant to the Planning Act 2008. In this case, the scheme will be considered under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

8.3.4 If the scheme does not constitute an NSIP, the consent for the scheme would either require a Transport and Works Act Order (TWAO) under the Transport and Works Act 1992 or a full planning permission under the Town and Country Planning Act 1990 (as amended). In this case, it will be considered under the Environmental Impact Assessment (Miscellaneous Amendments Relating to Harbours, Highways and Transport) Regulations 2017 or the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

8.3.5 The consenting regime for the scheme will be confirmed during PCF Stage 3 once the details of the finalised preferred option are available.

[91] NSIP – Nationally Significant Infrastructure Project
[92] DCO – Development Consent Order

9 SUMMARY OF PUBLIC CONSULTATION

9.1 INTRODUCTION

9.1.1 The Report on the Public Consultation for the M3 Junction 9 Improvement Scheme is a key product required in Stage 2 (option selection) of the PCF[93]. It summarises the options presented to the public and the manner in which the consultation was undertaken. It analyses the views received from the public and stakeholders, summarises the findings and makes recommendations for further actions.

9.1.2 Prior to the Public Consultation, based on economics information it was decided that only Option 14 should be promoted at the Public Consultation, as there was clear evidence that it was more efficient and cost effective to build Option 14 in one phase rather than the two phases of Option 16B followed by 16C. Any subsequent discussions regarding 'the proposal' are therefore in reference to Option 14.

9.1.3 This section provides a summary of the Report on the Public Consultation. The public will be able to request/access the full report from the scheme website (www.highways.gov.uk/m3j9).

9.2 CONSULTATION ARRANGEMENTS

9.2.1 In December 2017, an initial information letter was sent to local MPs, councillors, businesses, WCH[94] user groups and landowners impacted by or adjacent to the works. This was an opportunity to inform letter recipients of the scheme and raise awareness of the forthcoming public consultation and to invite them to the briefing sessions and the public exhibitions.

9.2.2 Members of the public were invited to collect the brochure and questionnaire from deposit points and attend the public exhibitions via a letter sent to 25,141 local residents in December 2017. The brochure and questionnaire were left at the following deposit points:

- Winchester Discovery Centre
- Winchester Tourist Information Centre
- Winchester City Council Customer Service Centre
- Kings Worthy Community Centre
- Winnall Community Centre,
- M3 Services Winchester
- A34 Services at Sutton Scotney
- Tesco Extra in Winnall

[93] PCF – Project Control Framework
[94] WCH – Walking, Cycling and Horse Riding

9.2.3 The Public Consultation period commenced on the 9 January 2018 and concluded on the 19 February 2018.

9.2.4 A press briefing was held between 09:00 and 10:00 on Tuesday 9 January 2018.

9.2.5 The following preview briefing sessions were held prior to the Public Exhibitions:

- Political Briefing – Tuesday 9 January 2018 (10.00 to 12.00)
- WCH[95] user Briefing – Thursday 11 January 2018 (09.00 to 11.00)
- Business Briefing – Thursday 25 January 2018 (08.00 to 11.00)
- Landowner Briefing - Thursday 25 January 2018 (14.00 to 17.00)

9.2.6 Posters were also put up in the surrounding area to advertise the event. The brochure and questionnaire were also posted on the scheme website. Tweets were issued along with a press release as a way to reach out to a wider audience. The press release is available at: https://www.gov.uk/government/news/major-overhaul-for-m3-winchester-junction.

9.2.7 The Public Exhibitions were as shown in Table 9-1:

Table 9-1: Public Exhibitions

Date	Time	Location	Address
Saturday 27 January 2018	10.30am – 4.30pm	Winchester Guildhall	The Broadway, Winchester SO23 9GH
Wednesday 31 January 2018	2.00pm – 8.00pm		
Saturday, 10 February 2018	10.30am – 4.30pm	Winnall Community Centre	Garbett Rd, Winchester SO23 0NY
Friday, 16 February 2018	2.00pm – 8.00pm	Kings Worthy Community Centre	Fraser Rd, Kings Worthy, SO23 7PJ
Saturday, 17 February 2018	10.30am – 4.30pm		

[95] WCH – Walking, Cycling and Horse Riding

9.3 CONSULTATION MATERIAL

9.3.1 The public consultation brochure detailed the location and timing of the exhibition and gave a brief overview of the proposal (Option 14), the benefits of the scheme to the region and the progress to date. It also gave brief information about other options which had previously been discounted.

9.3.2 The brochure also provided contact details for the scheme to enable respondents to communicate by letter, email or phone.

9.3.3 The public consultation questionnaire asked respondents for their views on the proposal, their current use of this section of the M3/A34 and general information about themselves.

9.3.4 The questionnaire could be completed and handed in at the exhibition or could be returned using a Highways England freepost address. The questionnaire could also be completed online at the scheme website.

9.3.5 At the public exhibition, seventeen boards and banners and a 3D visualisation with information regarding the proposal as well as the four rejected options and the Highways England contact information were on display to the public. In addition a hearing loop was available for the hard of hearing as well as large print version of the brochure for attendees with impaired sight.

9.3.6 A sign in sheet was used to capture information about attendee's gender and their postcode. A comments log was used to capture any views or opinions on the day or requests for further information to be sent out.

9.3.7 Copies of all consultation materials can be found within the full Report on the Public Consultation and its appendices.

9.4 EFFECTIVENESS OF THE CONSULTATION

9.4.1 An assessment was undertaken to identify possible venues for the exhibition, looking at their location relative to M3 Junction 9, accessibility and suitability and two venues were initially chosen, one in Kings Worthy and one in Winchester City Centre to maximise attendance and to reach out to those who may be directly affected by the scheme. In addition the local MP suggested an additional exhibition be held in Winnall. The locations, days chosen and opening times of the exhibition were chosen to ensure residents who wished to attend had a reasonable opportunity to do so.

9.4.2 The weather over the two days in Winchester City Centre was overcast but mostly dry with only occasional rain showers, and therefore did not appear to have a detrimental impact on attendance. The weather for the day in Winnall was very wet and may have contributed to the lower attendance than at the other exhibitions. The weather for the two days in Kings Worthy was dry and clear which likely had no detrimental impact on attendance.

9.4.3 21 councillors attended the political briefing session.

9.4.4 830 members of the public attended the Public Exhibitions and 854 questionnaires were returned either via post or online.

9.4.5 The project team were not made aware of any negative feedback regarding the venue, timing of the consultation or answers from the project team at the exhibition. No comments to this affect were left in the questionnaire returns either.

9.5 SUMMARY OF QUESTIONNAIRE RESPONSES

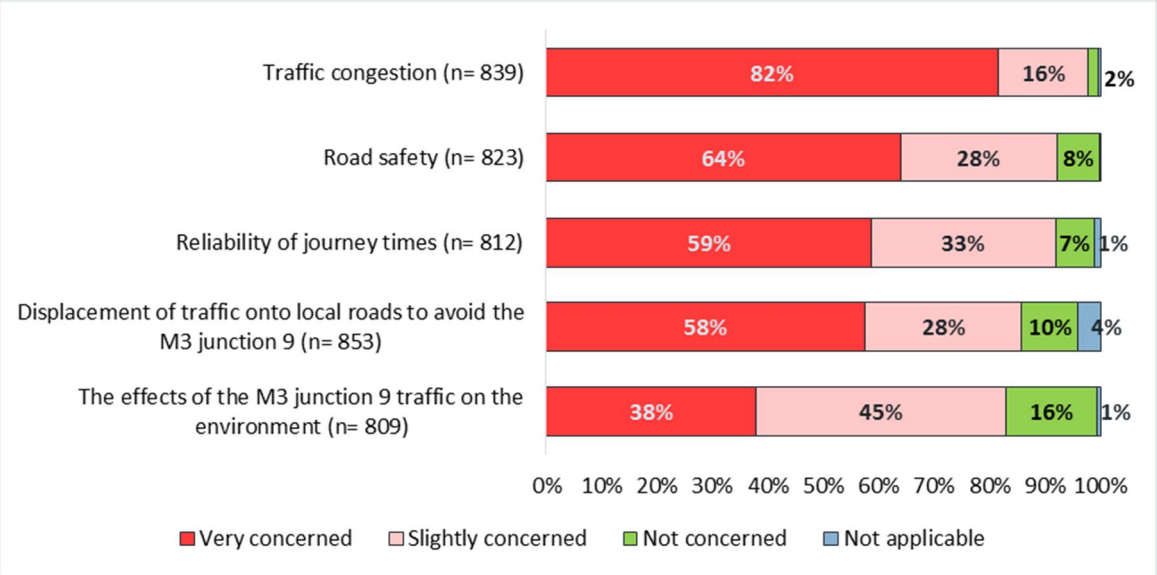
9.5.1 A full analysis of the returned questionnaires can be found in the Report on the Public Consultation.

EXISTING CONCERNS AND ISSUES

9.5.2 Respondents were asked to consider the existing M3 Junction 9 in its current condition and layout.

9.5.3 The results are shown in Figure 9-1, with traffic congestion being the top concern (98% concerned) followed by road safety (92%), reliability of journey time (92%) and 'rat running' onto local road network (86%). In addition 83% are concerned about the environmental impacts of the M3 junction 9 traffic.

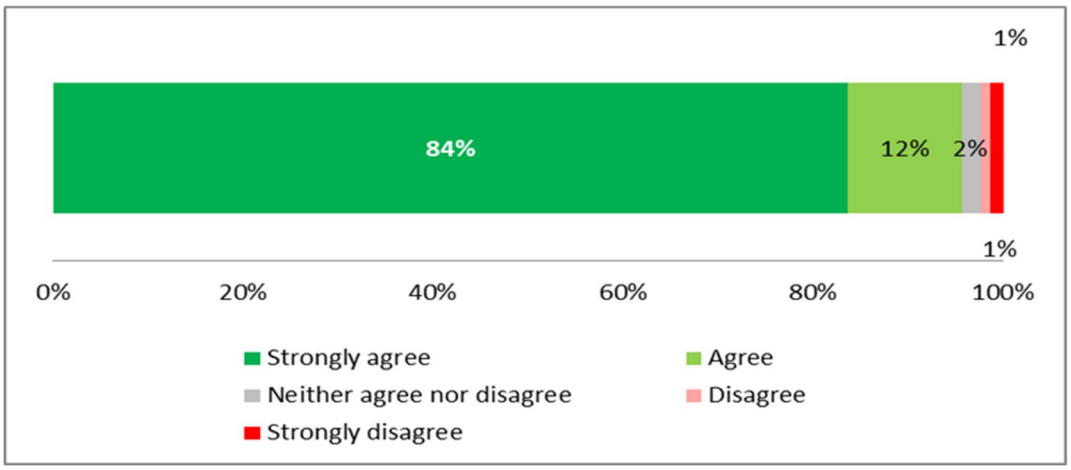
Figure 9-1: Attitudes toward current junction



NEED FOR IMPROVEMENTS TO M3 JUNCTION 9

9.5.4 Figure 9-2 shows that there is substantial support to improve the M3 Junction 9, with 96% (817) of respondents in agreement (84% strongly agree, and 12% agree). Conversely, only 2% (16) do not believe there is a need to improve the junction. The remaining 2% (12) expressed a neutral opinion.

Figure 9-2: Level of support/opposition to improve the M3 junction 9



VIEWS ON PROPOSED SCHEME (OPTION 14)

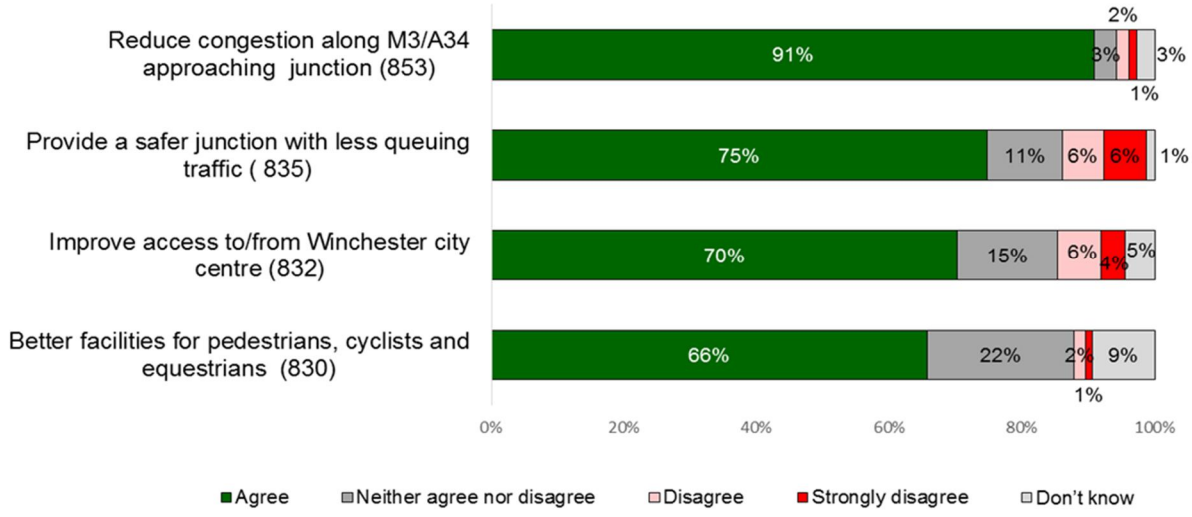
9.5.5 Respondents were subsequently asked to what extent they believe that the proposed Option 14 would meet a set of four scheme objectives. The results are shown in Figure 9-3.

9.5.6 The majority of respondents feel that the proposed Option 14 will meet the scheme objectives, especially reducing congestion along the M3 and A34 approaching the junction (91%). 75% believe the scheme will improve safety for all users of the junction as there will be less queueing traffic, although a minority (12%) do not.

9.5.7 A majority of 70% agree that the scheme will improve access to/from Winchester (e.g. reducing congestion on the A272 and/or Easton Road, although 10% do not.

9.5.8 In addition two thirds (66%) believe that the scheme will provide better facilities for pedestrians, cyclists and equestrians with a new cycle/footpath.

Figure 9-3: Opinion on whether Option 14 will meet the scheme objectives



CONCERNS ABOUT THE PROPOSAL

9.5.9 Respondents were asked to express their level of concern about the proposal (Option 14), across a range of potential issues using a fixed point scale from 'very concerned' through to 'no concern' (Figure 9-4).

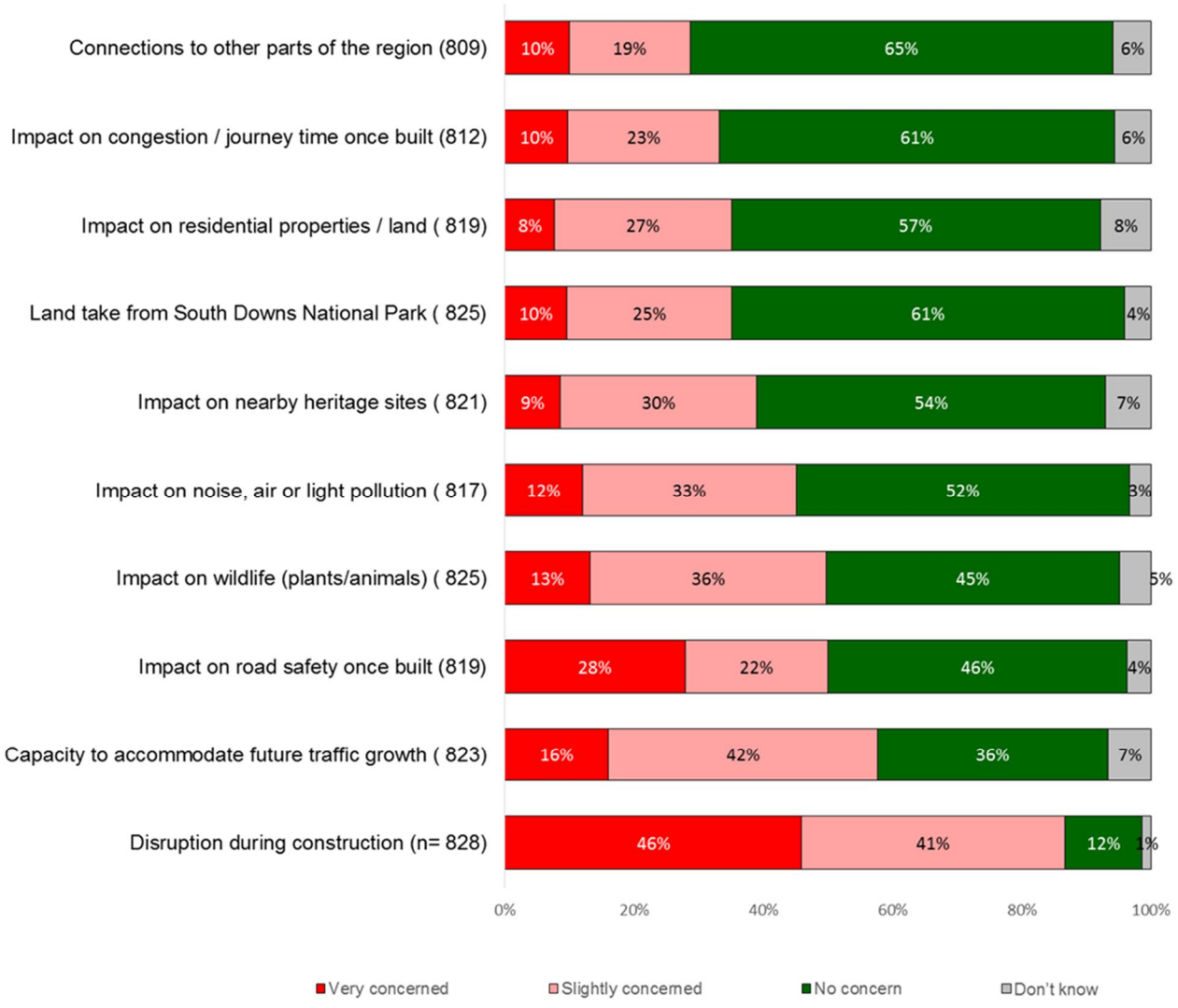
9.5.10 Disruption during construction is the main concern, with 46% being very concerned and 41% slightly concerned. This is echoed within the comments raised by respondents, with twenty one people voicing concern over disruption and wanting details on the routes selected for diversion during the construction phase.

9.5.11 Over half of respondents (58%) question whether the new scheme will provide sufficient capacity to accommodate future growth in traffic, while half are concerned about impacts on road safety, and impacts on wildlife (plants/animals).

9.5.12 Some concern was expressed about the potential impact on nearby heritage sites (39%), and 35% raised concern over the land take from the South Downs National Park.

9.5.13 Around a third of respondents are concerned about the impact of the junction improvements to residential properties (35%) and whether there will be a discernible improvement in easing congestion once built (33%).

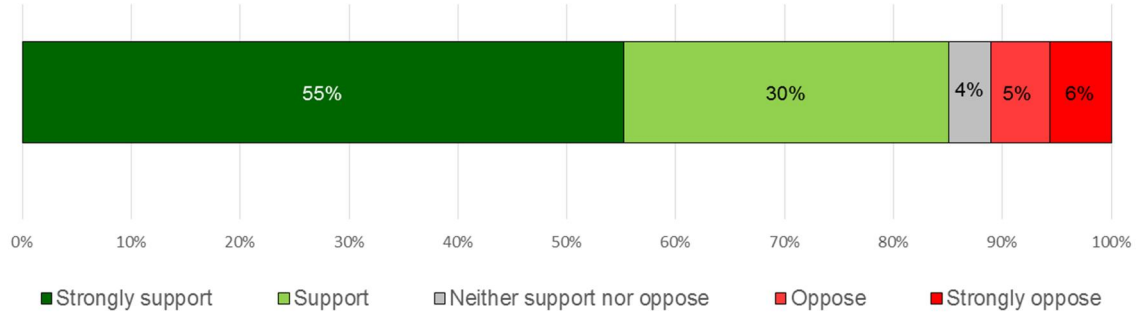
Figure 9-4: Concerns over the implementation of Option 14



OVERALL VIEWS ON THE PROPOSAL

9.5.14 Overall, 85% of respondents are in support of the proposed Option 14 for the M3 Junction 9, with 11% opposing the proposal, as shown in Figure 9-5.

Figure 9-5: Overall levels of support/opposition for Option 14



9.5.15 The main reasons cited for supporting the scheme are shown in table 9-2:

Table 9-2: Main reasons given for supporting Option 14

Reason	Percentage of Respondents	Number of Respondents
Will ease congestion / improve traffic flow/ reduce journey times, delays	21%	175
Long overdue / much needed / should have been done sooner	17%	142
Will improve safety, better driving / reduce incidents or likelihood of incidents/ current layout unsafe& drivers take risks	11%	96
Support proposal / good idea	10%	82
Good as will prevent queuing on M3 mainline	8%	69
Will benefit local traffic / traffic in Winchester/ reduce rat running	8%	68
Good as will prevent queuing on A34 mainline	8%	65

9.5.16 Despite the high level of support for the scheme, 18% (149 respondents) voiced concern over the safety of the design relating to the A34/A33 access from the proposed dumbbell roundabout design, with 8 people recommending the A34 is duelled throughout. The Cart and Horses junction at Kings Worthy was raised as a local concern by 13 respondents. A summary of the main concerns is shown in table 9-3.

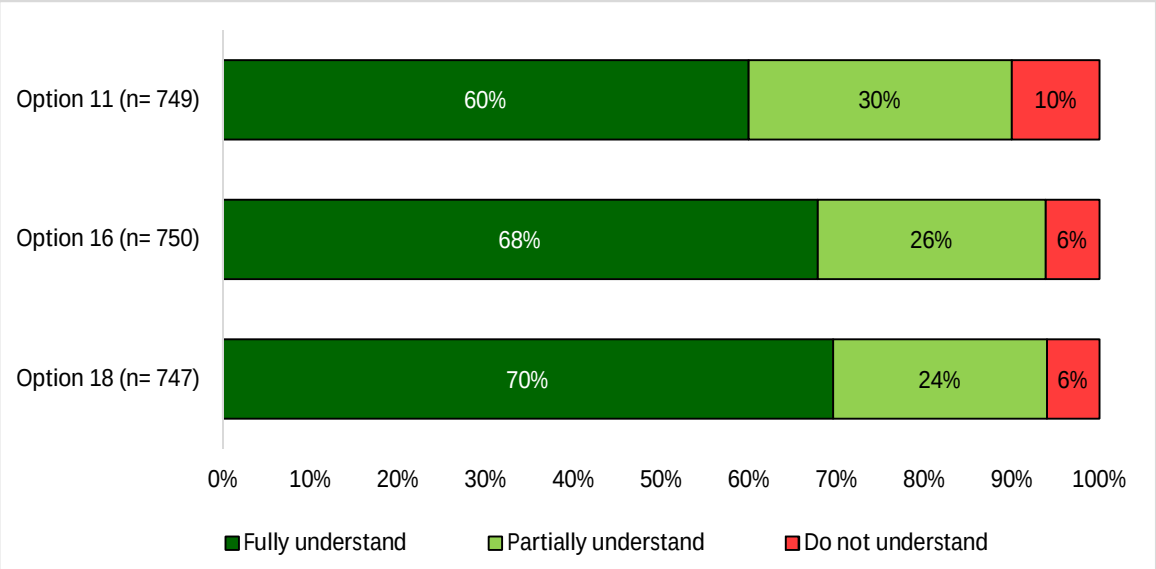
Table 9-3: Issues raised regarding Option 14

Concerns	Percentage of Respondents	Number of Respondents
Concern over safety of A34/A33 access roads	18%	149
Oppose, slip roads are too short / should be longer	4%	31
Issue for traffic from Winnall joining the A34 northbound	3%	27
Concern over safety for local traffic	3%	25
Support proposal, but concerned about construction disruption	2%	20

REJECTED OPTIONS

9.5.17 With Option 14 being put forward as a scheme solution, respondents were asked to what extent they understood the reasons why earlier considered options had been rejected. The results are presented in figure 9-6 below.

Figure 9-6: Understanding of rejected options



9.5.18 The results show that most of the respondents fully understood or partially understood why Options 11, 16 and 18 were rejected, with the reason for the rejection of Option 11 not being understood by 10% of respondents.

OTHER COMMENTS

9.5.19 Respondents were given an opportunity to provide any additional comments in relation to the proposed junction improvements scheme. In total 458 comments were received, with the most common themes mentioned shown in table 9-3.

9.5.20 The issue causing most concern is the perceived safety when using the proposed layout (13%, 101 respondents). The most commonly raised area of concern was accessing the A34 from junction 9 and then changing lanes on the A34 in order to access the A33. This is already cited as a hazard of the existing junction layout and is raised across the various comments in the questionnaire.

9.5.21 While the proposal provides a new cycleway/ footpath, some cyclists feel that this is not a direct route and could be enhanced (3%, 27).

Table 9-4: Further suggestions made by respondents

Suggestion	Percentage of Respondents	Number of Respondents
Proposed layout looks unsafe / will cause accidents	12%	101
Vehicles on A34 will be travelling fast - difficult to merge / different speeds - esp slow vehicles	7%	62
Concern over junction layout / poor design/ don't like design	6%	48
Take steps to minimise impacts of construction on traffic flow	4%	32
Proposed cycle path is not direct/ alternative suggestion for cycleway	3%	27
Slip roads appear short / not long enough	3%	24
Route A33 traffic across A34 via underpass/overpass	3%	23
Long overdue / much needed / should have been done sooner	2%	21
Take steps to minimise environmental impacts of construction	2%	21
Slip road from Winnall roundabout is very short	2%	20
Support, but taking too long to deliver	2%	19
Cyclist safety concerns	2%	19
Reduce speed limit on section of A34	2%	15
Improved / good quality signage / lane markings needed	2%	14
Prefer Option 11	1%	11
Improve junction with Cart and Horses	1%	11
More information needed on traffic management during construction	1%	11
Enforce speed limits/ lane management etc	1%	10

9.5.22 Respondents echoed comments already made regarding the need to minimise disruption during the construction (4%, 32) as well as minimising impact on the environment (2%, 21).

9.6 SUMMARY OF KEY STAKEHOLDER RESPONSES

9.6.1 Highways England invited key stakeholders and local and non-local businesses to attend briefings to make them aware of the consultation and to ask them to provide comments to feed in to the consultation. A full list of stakeholders can be found in the Public Consultation Report.

9.7 SUMMARY OF MAIN FACTORS

9.7.1 The analysis of responses from the public consultation suggests that people are overwhelmingly (85%) in support of Option 14. The views expressed by the public and stakeholders as part of the consultation exercise regarding the design of the scheme were reviewed and will be taken into consideration in the Preliminary Design stage. The key issues raised are as follows:

- A34/A33 merging concerns – The weaving between the access from the A34/A33 northbound from junction 9 and the A34/A33 traffic from the new M3 northbound off-slip is perceived as a major safety concern for road users travelling between junction 9 and the A33. A number of options to modify this section are under review in order to alleviate the

safety concern. This was the most common point raised during the consultation period and will be a priority to resolve within the preliminary design phase.

- The Junction 9 WCH[96] path – A 4m wide path would be preferred to allow for future growth of cyclists. The path should be segregated from the Junction 9 carriageway. The subways should be wide enough to provide sufficient visibility.
- Junction 9 to River Itchen footpath - The footpath, although an improvement on the existing, should be made cycleway compliant and extended to the Cart & Horses Junction on the A33. Where there are sharp turns on the footpath these should have sufficient visibility for cyclists.
- A34 southbound - the weaving between the access from the A34 southbound to Junction 9 and the M3 SB offslip was perceived to be short and should be increased. An auxiliary lane should be added to the A34 southbound link between the A33 and Junction 9 diverge. The M3 underpass should be widened to 3 lanes on the A34 southbound to allow for future growth.
- Easton Lane to the A34/M3 northbound slip road – Several members of the public suggested a dedicated free flow lane from Easton Lane to the A34/M3NB slip road due to the high proportion of HGV's accessing the trading estates on Easton Lane from the M3 and A34.

9.8 ALTERNATIVES PROPOSED

9.8.1 All options considered during PCF[97] Stage 1 and 2 were displayed at the exhibition and detailed in the brochure as rejected options. The public generally understood the reasons for rejecting these options, however the least well understood reason was for Option 11.

9.8.2 As mentioned in section 9.7 the primary concern for the local residents was the access from Junction 9 to the A33. The public perceived the manoeuvre from the A34 merge to the offside diverge to the A33 to be unsafe. After the Public Consultation, some alternative solutions were proposed to improve this arrangement. These will be considered further in PCF Stage 3 and a preferred alternative progressed into preliminary design. These alternatives are shown in Appendix G and are as follows:

- Alternative Link 1 (repositioned merge with auxiliary lane) – This relocates the A34 northbound merge from Junction 9 further south by providing a new link from the Junction 9 roundabout. This increases the available length for vehicles to merge onto the A34, cross one lane and then diverge onto the A33. It also provides an auxiliary lane which maximises the opportunity for vehicles to merge onto the A34.
- Alternative Link 2 (repositioned merge) - This relocates the A34 northbound merge from Junction 9 further south by providing a new link from the Junction 9 roundabout. This increases the available length for vehicles to merge onto the A34, cross one lane and then diverge onto the A33.
- Alternative Link 3 (segregated link from Junction 9 to A33) – This provides a segregated link direct to the A33 from M3 Junction 9 therefore removing the need to merge with the A34 and then diverge onto the A33.

[96] WCH – Walking, Cycling and Horse Riding
[97] PCF – Project Control Framework

10 APPRAISAL SUMMARY TABLE

10.1.1 The most recent Appraisal Summary Tables, updated in PCF[98] Stage 2 are located in Appendix H.

[98] PCF – Project Control Framework

11 CONCLUSION

11.1 INTRODUCTION

11.1.1 This section summarises the main findings of the Scheme Assessment Report comparing the two options and giving a recommended route to be progressed to PCF[99] Stage 3 Preliminary Design.

11.2 TRAFFIC AND ECONOMICS

11.2.1 The tables show an overall increase in flows on the strategic network, i.e. M3 and A34, for Option 14 in both directions and Option 16B in the northbound direction. The changes to the M3 Junction 9 roundabout alignment are expected to reduce the delay on the A272 and Easton Lane northbound approach to the junction. This is resulting in increases in flows on both these links. As expected, there is a significant reduction in traffic flow on the Junction 9 northbound off-slip and southbound on-slip due to the free-flow link between M3 and A34, relieving these slip roads.

11.2.2 For the journeys between the M3 and A34 for Option 14, in the 2036 AM there is a reduction of approximately 90s and 45s in the north and southbound directions respectively. In the PM the northbound reduction is approximately 195s and southbound the reduction is approximately 95s. For Option 16B, the expected 2036 journey time savings (approximately 1 minute in the AM and 3 minutes in the PM) in the northbound direction is in accordance with the focus of this option and small increases are forecast in the southbound direction that is effectively unchanged in arrangement from the DM[100]. The southbound journey time increases stem from increased delays on the A34 southbound approach to Junction 9.

11.2.3 For Option 14, routes through Winchester between M3 Junction 11 and A34 have forecast journey time reductions of approximately 30s due to the reduction of traffic on these local routes with traffic attracted to the M3. Option 16B + 16C shows journey time savings of 20-30s in both peaks, which is consistent with traffic being attracted away from the more local routes to the motorway.

11.2.4 Over a 60 year period it is forecast that 49.5 accidents would be saved if Option 14 were implemented compared to 42.2 if Option 16B only were implemented and 34.7 if Option 16B followed by 16C.

11.2.5 Cost consultants Benchmark provided a detailed breakdown of costs for each option in 2014 prices. The expected total scheme costs and the corresponding BCR[101]'s for all options are shown in table 11-1.

[99] PCF – Project Control Framework
[100] DM – Do Minimum
[101] BCR – Benefit to Cost Ratio

Table 11-1: Expected total scheme costs and corresponding BCR

Option	Expected scheme cost in 2014 prices (£)	Costs Discounted to 2010 in 2010 Prices (£)	Adjusted BCR[102], with benefits from accident savings applied
Option 14	135.45M	82.4M	1.1
Option 16B	176.40M	98.0m	0.5
Option 16C			

11.3 ENVIRONMENT

11.3.1 The following information presents a summary of the key findings from the environmental assessment presented in Chapter 8 of this report.

11.3.2 All options are anticipated to require a DCO regardless of which option is taken forward.

DIFFERENCE BETWEEN THE OPTIONS

11.3.3 Option 14 has the potential to have a marginally higher adverse effect on regional air quality than the other two options but this is as a result of the larger number of vehicles that can use the scheme.

11.3.4 Option 16B would have a lower landscape and visual impact than the other two options due to the avoidance of Easton Down. However, the visual impact for all options reduces to neutral or slight adverse fifteen years after the scheme opens due to maturation of planting.

11.3.5 Option 16B would result in lower overall land take and as such the ecological impact would be less.

11.3.6 Although a greater level of materials are used to construct Option 14 in comparison to Option 16B, there are greater benefits in regards to site arisings (with the implementation of recycling/ reuse) than Option 16B.

11.3.7 The noise modelling determined that Option 16B would have less adverse noise impacts on users of the SDNP than the other two options, however, the majority of adverse effects are removed with mitigation for all options resulting in a residual slight adverse effect.

11.3.8 Option 16B has the potential to have a lesser construction phase effect on WCH[103] amenity because it does not include any improvements to the WCH user provision. This also means it has no benefit during the operation phase, while the other two options would result in improved WCH user provision.

11.3.9 Option 14 also has the greatest magnitude of GHG emissions and is therefore the least favourable for GHG minimisation, followed by Option 16C and 16B.

11.3.10 There is no significant difference between the options for their potential effect on cultural heritage; geology and soils; and road drainage and the water environment.

[102] Values are in 2010 prices discounted to 2010
[103] WCH – Walking, Cycling and Horse Riding

POTENTIAL FOR A SIGNIFICANT EFFECT ON THE ENVIRONMENT AFTER MITIGATION

11.3.11 All options have the potential to have a slight adverse effect on the setting of listed buildings.

11.3.12 There is the potential for a moderate adverse visual effect for all options, which reduces to neutral or slight fifteen years after the scheme opens due to maturation of planting.

11.3.13 During the construction phase, both Options 14 and 16C have the potential to have a moderate adverse effect on materials and Option 16B a slight adverse effect.

11.3.14 There is potential for a slight adverse effects during construction for noise and vibration for which it should be possible to mitigate but will require further consideration in PCF Stage 3.

11.3.15 There is potential for adverse effects during construction for motorised travellers and WCH[104] users and noise and vibration, which will require further consideration in PCF Stage 3. All options have the potential to have a slight adverse effect on agricultural land. There is also potential for a benefit during the operation phase for motorised travellers and employment (all options) and WCH users and people's health (Options 14 and 16C).

11.3.16 After mitigation, none of the options are predicted to cause a significant adverse effect for air quality, biodiversity, geology and soils, road drainage and the water environment, noise and vibration or people and communities in the long term.

POTENTIAL TO ACHIEVE THE SCHEME'S ENVIRONMENTAL OBJECTIVES

11.3.17 Options 14 and 16C would meet the scheme objective of improving WCH user provision but Option 16B would not. For the other environmental objectives, none of the options have more significant potential to achieve the scheme's environmental objectives than the other options, but all options have the potential to meet the objective of no net loss in biodiversity. It is predicted that the air quality effects will be neutral and noise effects will be slight adverse negligible for sensitive receptors and so the objective of improving these aspects may not be met.

OVERALL RECOMMENDATION IN RELATION TO ENVIRONMENT

11.3.18 Option 14 is the preferred environmental option because it has similar adverse effects to the other options, but provides WCH benefits sooner. Option 16B has less adverse effects due to its smaller scale but does not provide the WCH benefits of Option 14 and 16C. Option 16C has less adverse effects than Option 14 and provides WCH benefits, but it would only be constructed after 16B had been completed, so the combined adverse effects of Option 16B and 16C would be similar to Option 14 and the WCH benefits of Option 16C would be delivered later than Option 14.

11.4 PUBLIC CONSULTATION

11.4.1 The overwhelming majority (96%) of the public who responded to the consultation believe the work to the M3 Junction 9 is required.

[104] WCH – Walking, Cycling and Horse Riding

11.4.2 The main concerns expressed by stakeholders during the public consultation were:

- A34/A33 merging concerns – The weaving between the access from the A34/A33 northbound from junction 9 and the A34/A33 traffic from the new M3 northbound off-slip is perceived as a major safety concern for road users travelling between junction 9 and the A33.
- The Junction 9 WCH[105] path – A 4m wide path would be preferred to allow for future growth in the number of cyclists. The path should be segregated from the Junction 9 carriageway. The subways should be wide enough to provide sufficient visibility.
- Junction 9 to River Itchen footpath - The footpath, although an improvement on the existing, should be made cycleway compliant and extended to the Cart & Horses Junction on the A33. Where there are sharp turns on the footpath these should have sufficient visibility for cyclists.
- A34 southbound - the weaving between the access from the A34 southbound to Junction 9 and the M3 SB offslip was perceived to be short and should be increased. The M3 underpass should be widened to 3 lanes on the A34 southbound to allow for future traffic growth.

11.4.3 All comments will be considered further as the scheme design develops and there will be an opportunity for the public to give feedback about the current proposals for the scheme during the statutory consultation process to be held in 2019.

[105] WCH – Walking, Cycling and Horse Riding

12 THE RECOMMENDED ROUTE

12.1.1 There are limited differences between the options in relation to environmental issues. Option 16B has less adverse effects due to its smaller scale but does not provide the WCH benefits of Option 14 and 16C. Option 16C has less adverse effects than Option 14 and provides WCH benefits, but it would only be constructed after 16B had been completed, so the combined adverse effects of Option 16B and 16C would be similar to Option 14 and the WCH benefits of Option 16C would be delivered later than Option 14. Therefore Option 14 is the preferred environmental option because it has similar adverse effects to the other options, but provides WCH benefits sooner.

12.1.2 A comparison of Options 14, 16B and 16C (or where the information is available the combined Options 16B and 16C), for metrics not covered in the conclusion is shown in table 12-1. Within this table the options have been highlighted in terms of which option delivers each metric more effectively, with green being better than amber, and amber being better than red (where combined information is available for Option 16B and 16C only green and red are used).

Table 12-1: Comparison of Options 14, 16B and 16C

<table>
<tr><th></th><th>Option 14</th><th>Option 16B</th><th>Option 16C</th></tr>
<tr><td rowspan="2">Estimated land acquisition (excl. site compound)</td><td rowspan="2">7.7 ha</td><td>2.8 ha</td><td>4.9 ha</td></tr>
<tr><td colspan="2">7.7 ha</td></tr>
<tr><td rowspan="2">Estimated construction duration</td><td rowspan="2">24-26 months</td><td>16-18 months</td><td>20-22 months</td></tr>
<tr><td colspan="2">36-40 months</td></tr>
<tr><td>Expected Opening Year</td><td>2022-23</td><td>2022</td><td>2029</td></tr>
<tr><td>Total Number of Accidents Saved by Scheme (over 60 years)</td><td>49.5</td><td>42.2</td><td>34.7</td></tr>
<tr><td>Expected total scheme costs (2014 prices)</td><td>£135.45M</td><td colspan="2">£176.40M</td></tr>
<tr><td>Adjusted BCR</td><td>1.1</td><td colspan="2">0.5</td></tr>
</table>

12.1.3 Given the engineering, economic and environmental considerations highlighted in the conclusion, and the overwhelming support from the public and the scheme's stakeholders, this report concludes that Option 14 should be the recommended route and should be progressed to PCF Stage 3.

12.1.4 As a result of comments received from stakeholders and the public and assessments carried out during PCF[106] Stage 2, the following items, which are shown on Figure 12-1, should be considered further for the recommended option during PCF Stage 3:

A. Providing improved access from Junction 9 to the A33 – Further investigation of the alternative options detailed in section 9.8.

B. Providing a 4m wide WCH[107] path across Junction 9 to allow for future growth in the number of cyclists. Providing segregation between the WCH path and the carriageway. Make the WCH path bridleway standard.

C. Extending the Junction 9 to Kings Worthy footpath as far as the B3047 'Cart and Horses' junction and making it cycleway standard. The cycleway should be segregated where possible from the A34. Investigate improving visibility at the ninety degree turn at the bottom of the ramp up to the M3 Northbound on-slip.

D. Increasing the weaving length between the access from the A34 southbound to Junction 9 and the M3 SB offslip.

E. Co-ordinating construction works for M3 Junction 9 and M3 Smart Motorway Junction 9 to 14 to minimise impacts on public during construction.

F. Providing alternative locations for construction compounds outside the SDNP[108].

G. Providing a layby for Highways England Traffic Officers to take broken down vehicles from the A34 before entering M3.

H. Further reducing design standards to minimise impacts on SDNP without compromising safety.

[106] PCF – Project Control Framework
[107] WCH – Walking, Cycling and Horse Riding
[108] SDNP – South Downs National Park

Figure 12-1: Elements of Option 14 to be considered further during PCF Stage 3 design