

M5 Junction 9 and A46 (Ashchurch) Transport Scheme

Option generation and sifting

Gloucestershire County Council

For public engagement (7 October – 2 December 2024)



Contents

Chapter	Page
1. Introduction	4
1.1. Overview	4
1.2. Introduction to the scheme	4
2. Alternative mode options	6
2.1. Alternative mode options generation	6
2.2. Discounting of sustainable travel options	7
3. Generation of offline highway options	8
3.1. Overview	8
3.2. Options that include a relocated M5 Junction 9	8
3.3. Options that include an extended M5 Junction 9	11
3.4. Options that include an additional motorway junction	12
3.5. Other options that retain the existing M5 Junction 9	14
4. Initial sifting of offline highway options	16
4.1. Process	16
4.2. Outcomes / reasons for discounting options	16
4.3. Options shortlisted for Strategic Outline Case submission to DfT (2022)	19
5. Further development and sifting of the SOC options	22
5.1. Process	22
5.2. More detailed assessment and sifting of the SOC options (Part A sift)	23
5.3. A46 eastern connections options	25
5.4. Further option development (routes avoiding Claydon Solar Farm)	27
5.5. Further option development (A46 eastern connection A variants)	29
5.6. Further option development (A46 eastern connection C1 variants)	30
5.7. A38 Western Link options	31
5.8. Detailed assessment and sifting of remaining options (Part B sift)	32
6. Lower cost options	35
6.1. A46 online improvement options	35
6.2. Discounting of online improvements to M5 Junction 9 and the A46	38
7. Potential phasing of scheme delivery	40
7.1. Options for phasing of scheme delivery	40
7.2. Scope for a wider phased approach to infrastructure delivery	41

Tables

Table 2-1 - Description of alternative mode options and types of journeys impacted	6
Table 4-1 - Offline highway options reasons for discounting	17
Table 4-2 - Shortlisted options for 2022 SOC submission to DfT (the 'SOC options')	20
Table 5-1 - Description of A46 eastern connection options (long list)	25
Table 5-2 - Renumbered shortlisted options	34
Table 6-1 - A46 online improvements – interventions including in the Minimum and Maximum options	36

Figures

Figure 3-1 - Options generated – M5 Junction 9 closed (relocated)	9
Figure 3-2 - Options generated – extended M5 Junction 9	11
Figure 3-3 - Options generated – M5 Junction 9 open	13
Figure 4-1 - SOC options (indicative alignments)	20
Figure 5-1 - Part A sift options (indicative alignments)	23
Figure 5-2 - A46 eastern connection options (indicative alignments for Pink Option)	26
Figure 5-3 - Options south of Claydon Solar Farm (indicative alignments)	28
Figure 5-4 - Part B sift options (indicative alignments)	32
Figure 6-1 - A46 online improvement packages	38

1. Introduction

1.1. Overview

This document provides additional background information to support the 7 October – 2 December 2024 public engagement for the M5 Junction 9 and A46 (Ashchurch) Transport Scheme. It forms part of the public engagement materials which can be found on the Have Your Say website: <https://haveyoursaygloucestershire.uk.engagementhq.com/junction-9>.

Other documents in the series cover:

- Scheme context and existing conditions
- Development of scheme objectives
- Summary of shortlisted options
- Analysis of shortlisted options
- Summary of walking, cycling and horse-riding opportunities.

It explains the approach to option generation, assessment and sifting. The range of options considered to date are outlined along with the rationale for options being discounted:

- **Section 2 explains consideration given to alternative mode options** (i.e. options based on walking, cycling or public transport rather than a road scheme)
- **Section 3 describes the full range of offline highway options identified** (i.e. those which include a new A46 link to bypass the existing A46 through Ashchurch)
- **Section 4 outlines the process for sifting the offline highway options**, resulting in the options included in the 2022 Strategic Outline Case (SOC), and summarises the reasons why options were discounted
- **Section 5 describes the work completed since 2022 to further develop and sift the options**, resulting in the shortlisted options presented in this Public Engagement
- **Section 6 explains consideration given to lower cost options** based on online improvements to M5 Junction 9 and A46 and reasons for discounting these
- **Section 7 considers the potential for phasing of scheme delivery** and scope for a wider phased approach to infrastructure delivery alongside the development of the proposed Tewkesbury Garden Communities.

1.2. Introduction to the scheme

The M5 Junction 9 and A46 (Ashchurch) Transport Scheme (referred to throughout as ‘the scheme’) is a proposal to develop a new M5 junction 9a to the south of Tewkesbury and re-route a section of the A46 between the M5 and Teddington Hands roundabout. The scheme aims to help solve long standing traffic issues and provide vital infrastructure to meet existing and future needs, including improving journey times and reliability for journeys between the M5 Junction 9 and Teddington Hands roundabout.

Gloucestershire County Council (GCC) is the promoter for the scheme. However, the A46 and M5 Junction 9 are part of National Highways' Strategic Road Network (SRN). Consequently, it has been agreed to progress the scheme through the National Highways Project Control Framework (PCF) to align the delivery of the project and the production of documentation with National Highways' processes. The scheme is currently at PCF Stage 1 (Option Identification) in the National Highways project lifecycle.

The scheme will rely on securing funding from Government to be delivered. At this early stage, no commitment can therefore be given to funding being secured for the scheme delivery.

The case for improvements to the M5 Junction 9 and A46 through Ashchurch has become more compelling in recent years and would address the following issues:

- Congestion on this section of the A46 and at M5 Junction 9 means that both local and long-distance journeys are unreliable and take longer than they should
- At peak times, queuing from M5 Junction 9 can reach back to the M5 motorway with queuing vehicles on the hard shoulder creating a safety hazard
- Developments which already have planning permission are increasing traffic in this location
- Provision for walking and cycling at M5 Junction 9 and along the A46 is inadequate and does not meet current design standards. Along with the level of traffic on the A46 including Heavy Goods Vehicles (HGVs), this makes the road difficult to cross and discourages travel by bike or foot
- Further significant development in the Ashchurch area cannot be delivered without additional capacity on the road network.

Without intervention, the existing traffic problems at M5 Junction 9 and on the A46 through Ashchurch will continue to get worse. The Cotswold Designer Outlet is due to open in 2025 and over 1,400 new homes have been consented at Fiddington Fields to the east of the M5 and accessed via the A46.

Tewkesbury Borough Council is also advancing its Garden Communities programme. The programme's aim is to ensure that housing and employment opportunities are managed in the best possible way by enabling comprehensively planned, connected communities designed to encourage good growth, helping new and existing residents to enjoy the best possible quality of life.

Diverting long-distance traffic - including HGVs - from the A46 through Ashchurch onto a new road will be key to the successful development of the Tewkesbury Garden Communities. This will provide capacity for additional housing and employment opportunities, and crucially provide benefits to the existing communities, offering a more pleasant environment for residents and greater opportunities for walking, cycling and sustainable travel along the existing road.

2. Alternative mode options

2.1. Alternative mode options generation

A range of transport options were identified for consideration. These are high-level options which aim to solve the issues and meet the scheme objectives, with the aim of identifying the most suitable type of solution. They comprised potential sustainable travel measures which may have an important role in limiting growth in car traffic associated with future developments in the Ashchurch area for local-to-local (shorter distance) and local-to-non-local (longer distance) journeys

The alternative mode options assessed and types of journeys within, to/from or passing through the Ashchurch area which these options can potentially benefit are presented in Table 2-1.

Table 2-1 - Description of alternative mode options and types of journeys impacted

Options	Details	Journeys within local area	Journeys to/from local area	Journeys passing through local area
Active travel	Better facilities between Ashchurch and Tewkesbury for walking and cycling	✓		
Rail service improvements	Increased frequency of services calling at Ashchurch for Tewkesbury station, additional parking at the station, and improved access to the station		✓ (some journeys)	
Bus service improvements	Increased frequency of services between Ashchurch, Tewkesbury, Bishops Cleeve and Cheltenham including new direct bus services and bus priority	✓	✓ (some journeys)	
Travel planning	Workplace, personalised and school travel planning in Ashchurch and Tewkesbury	✓	✓ (some journeys)	
Multi-modal package	Comprising active travel, rail and bus service improvements and travel planning	✓	✓ (some journeys)	

2.2. Discounting of sustainable travel options

The contribution of the options for different modes to the scheme objectives was assessed, and the options were also evaluated for how they perform against strategic, economic, management, financial and commercial criteria using the Department for Transport's Early Assessment and Sifting Tool.

Most traffic on the A46 through Ashchurch is not making local trips, but longer distance journeys (either to/from the Ashchurch area or simply passing through). While sustainable travel options could help deliver some of the scheme objectives, their potential is therefore largely limited to replacing shorter distance journeys within the local area. The A46 and M5 also support a high level of HGVs, which would not be affected by options focussing on active travel and public transport.

This means that while sustainable travel measures would improve travel options for the local community, in isolation they would not address the issues caused by the volume of local and long-distance traffic passing through M5 Junction 9 and the A46.

However, in response to the issues identified with respect to severance and quality of provision for walking and cycling at M5 Junction 9 and along the A46 through Ashchurch, a need has been identified to provide better walking and cycling facilities that are segregated from traffic with a more direct walking route between housing areas along the A46 and Tewkesbury Academy.

The scope of provision for walking, cycling and public transport to be included in the scheme will be developed and consulted on at a later date. It is possible that some improvements at M5 Junction 9 and along the A46 could be delivered separately to and ahead of this scheme in support of further housing development being proposed at Ashchurch.

3. Generation of offline highway options

3.1. Overview

The focus of option development has been on offline highway options which include a new A46 link to divert traffic away from the existing M5 Junction 9 and A46 through Ashchurch. Sections 3 to 5 outline the approach taken to option generation and sifting for these options, leading to the current shortlisted options.

Consideration has also been given to online improvement options (i.e. upgrading the existing M5 Junction 9 and A46) as potential lower cost alternatives to an offline scheme – this is presented separately in Section 6.

37 possible offline highway options were identified considering a range of potential new alignments for the A46 and junction arrangements with the M5. Generally, the options included a new A46 link between the M5 and Teddington Hands roundabout, although there are some that would connect to the existing A46 to the west of Teddington Hands roundabout and others that would extend further towards Beckford.

Options with a new A46 link to the south of Ashchurch could either follow part of the route of the A435 between the B4079 (Seven Bends) junction and Teddington Hands roundabout or follow an entirely offline route before connecting to the A46 in the Teddington Hands area.

The diagrams included in this section aim to present the general concepts of each option. While possible locations of motorway junctions and routes for a new A46 link are shown, they are only illustrative and should not be understood to indicate specific junction locations or road alignments.

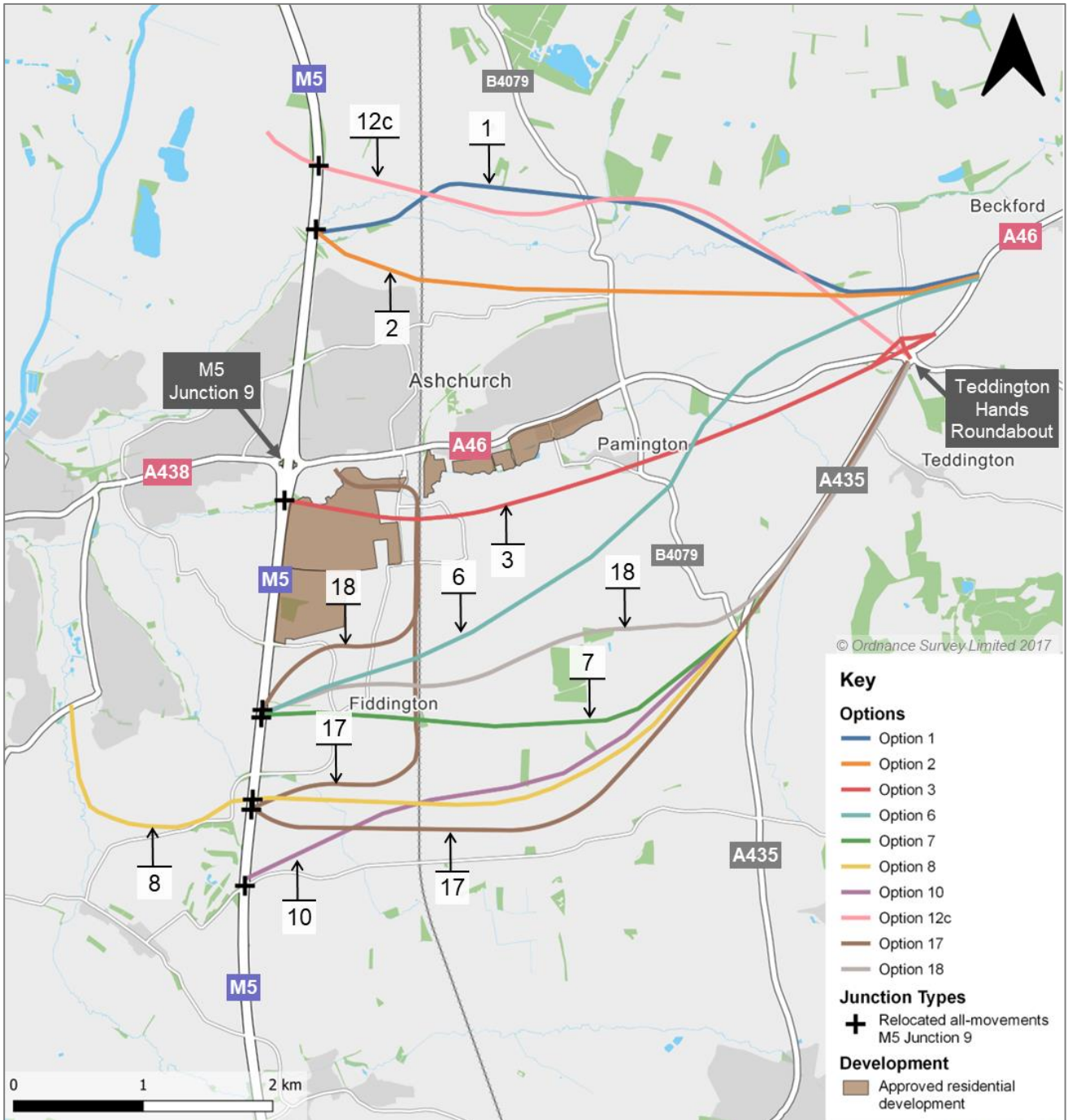
The options can be categorised into four broad groups described in the following sub-sections:

- Options that include a relocated M5 Junction 9
- Options that include an extended M5 Junction 9
- Options that include an additional motorway junction
- Other options that retain the existing M5 Junction 9.

3.2. Options that include a relocated M5 Junction 9

These options (shown below in Figure 3-1) would include a new motorway junction providing connection to a new A46 link either to the north or south of Ashchurch, with the existing M5 Junction 9 closed. Closing the existing junction would mean that new arrangements would be needed for local access between the M5, Tewkesbury and Ashchurch.

Figure 3-1 - Options generated – M5 Junction 9 closed (relocated)



These options can be further sub-divided as follows (starting with new motorway junctions to the north of Ashchurch and then working south):

Options with a relocated M5 Junction 9 and A46 link to the north of Ashchurch:

Options 1 and 2 include moving the M5 Junction 9 north to a location close to Hardwick Bank Road which would provide access to a new A46 link and to Hardwick Bank Road for local traffic. Option 12c would be located slightly further north with local traffic access via a link road to the B4080. These represent the only viable locations for a new motorway junction that avoid the existing built-up area to the south of Hardwick Bank Road and would allow the route of an A46 link to pass south of the village of Kinsham (avoiding environmental constraints to the north of Kinsham).

Options with a relocated M5 Junction 9 and A46 link immediately south of the existing M5 Junction 9:

Option 3 would comprise moving M5 Junction 9 slightly to the south to connect with a new A46 link which would pass to the south of Dobbies Garden Centre (but north of the consented housing at Fiddington) and to the south of the village of Pamington. Access to the M5 from the existing A46 and A438 would need to be provided via either short service roads (either side of the M5) or a link road (one side of the M5) to the new junction. (Note this option was based on options identified in previous studies before the retail and housing developments at Fiddington were approved.)

Options with a relocated M5 Junction 9 and A46 link to the north of Fiddington village:

Options 6, 7 and 18 include moving M5 Junction 9 to a location roughly west of Fiddington village, with a new A46 link passing to the north of the village and to the south of the consented housing at Fiddington. Local road access (to/from the existing A46 and A438) could be provided via link roads between the new motorway junction and A46 on the eastern side of the M5 which would route around the consented housing developments

Options with a relocated M5 Junction 9 and A46 link to the south of Fiddington village:

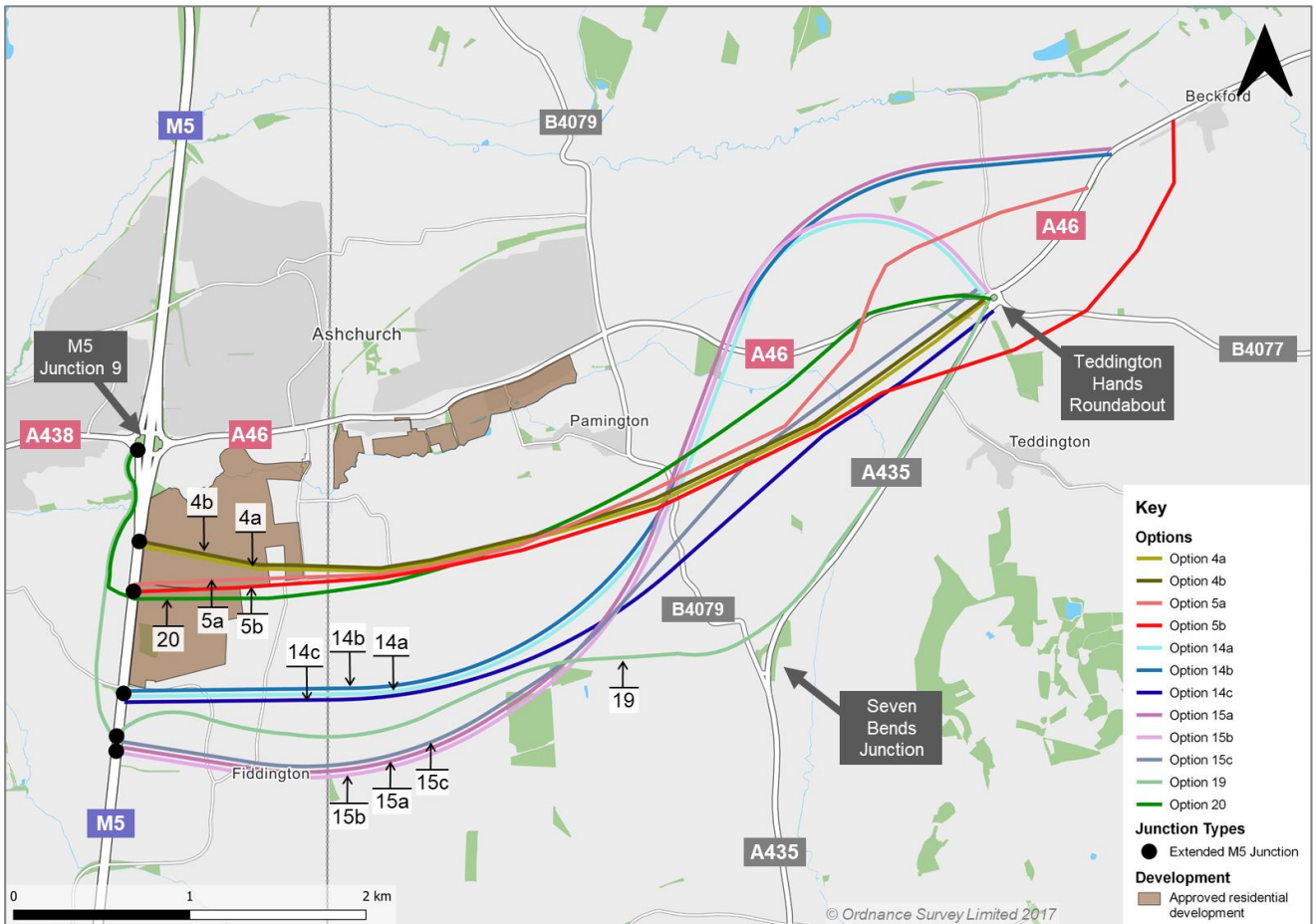
Options 8, 10 and 17 include moving M5 Junction 9 to a location roughly southwest of Fiddington village, with a new A46 link passing to the south of the village. Local road access (to/from the existing A46 and A438) could be provided via link roads between the new motorway junction and A46 on the eastern side of the M5 which would route around Fiddington and/or via a western link road connecting to the A38.

3.3. Options that include an extended M5 Junction 9

These options (shown below in Figure 3-2) comprise modifying M5 Junction 9 to form an extended motorway junction to the south connected by a link road or service roads plus new A46 link to the south of Ashchurch. A new roundabout would be constructed to the south of the existing junction with M5 slip roads to and from the south to connect to the new A46 link. These slip roads (to/from the south) would replace those at the existing M5 Junction 9 which would be closed.

The existing M5 Junction 9 would be retained with M5 slip roads to and from the north plus either service roads or a link road connecting the two parts of the junction (allowing traffic to move in both directions).

Figure 3-2 - Options generated – extended M5 Junction 9



The options can be further sub-divided as follows.

Options with service roads to connect the two parts of the extended M5 Junction 9:

Options 4a/b and 5a/b would include extending M5 Junction 9 slightly to the south with service roads connecting the two parts of the junction as described above. The service roads would run both sides of the M5 (southbound on the eastern side and northbound on the western side). A new A46 link would connect to the southern part of the junction and pass

through the consented housing development at Fiddington and to the south of the village of Pamington.

Options 14a-c and 15a-c have a similar arrangement but with the motorway junction extending further to the south to allow the A46 link to pass to the south of the consented housing development at Fiddington.

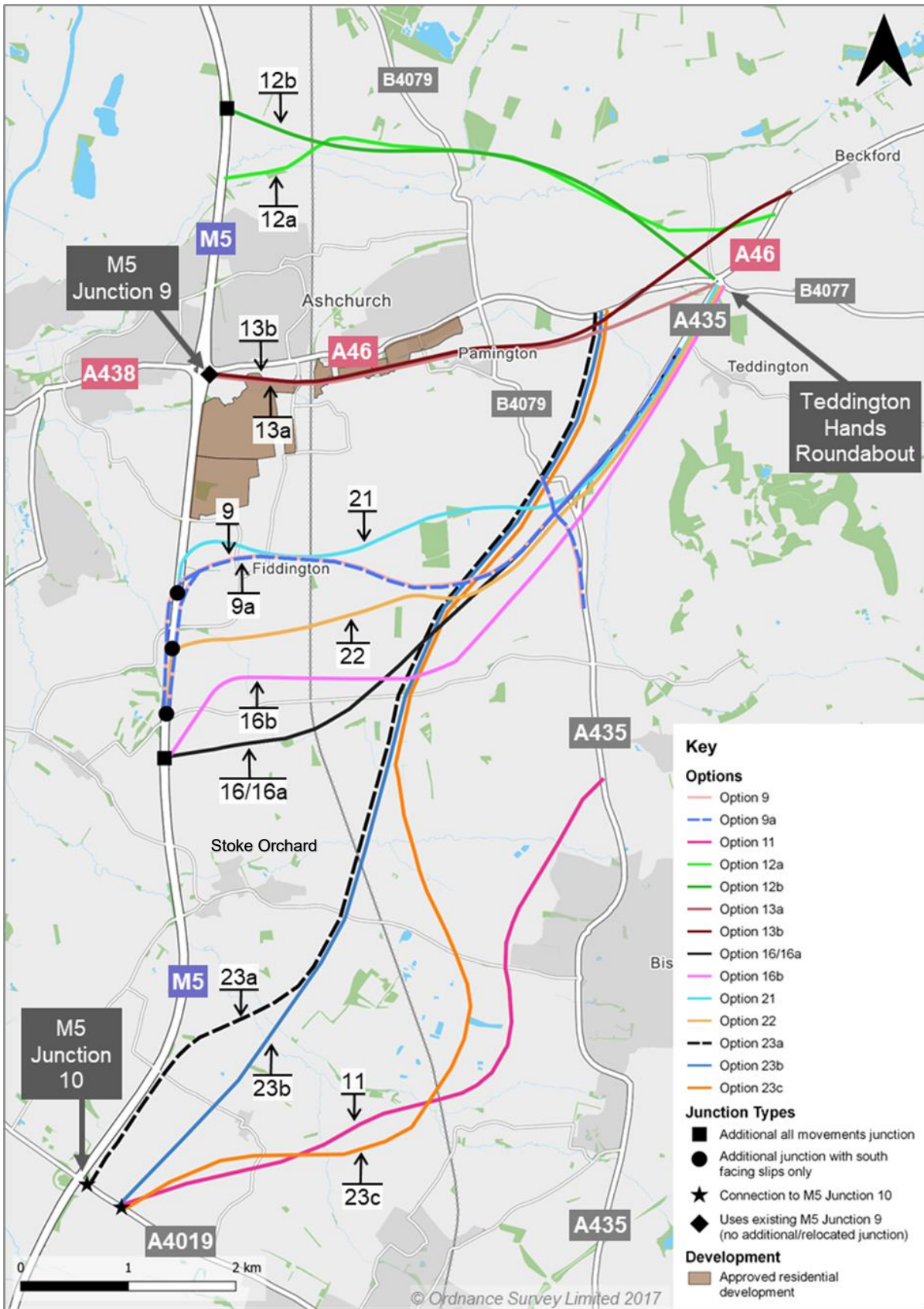
Options with a link road to connect the two parts of the extended M5 Junction 9:

Options 19 and 20 have similar junction arrangements as the above but would be connected by a link road on the western side of the M5 allowing traffic to move in both directions between the two parts of the junction.

3.4. Options that include an additional motorway junction

These options (shown in Figure 3-3) included a new motorway junction providing a connection to a new A46 link either to the north or south of Ashchurch (with the existing M5 Junction 9 remaining open). A key consideration is that for safety reasons, design standards require any new motorway junction which allows traffic movements in all directions to be located at least 2km away from the existing M5 Junction 9 (and Junctions 8 and 10).

Figure 3-3 - Options generated – M5 Junction 9 open



The options can be further sub-divided as follows.

Options with a new unrestricted motorway junction and A46 link to the north of Ashchurch:

Options 12a and 12b include a motorway junction located to the north of Hardwick Bank Road. Possible junction locations to the south of this (but north of the existing M5 Junction 9 remaining open) would not be acceptable for the reason highlighted above. Possible junction locations further north would also not be acceptable due to the distance from M5 Junction 8. Any additional motorway junction would therefore need to be located in the area to the east of Bredon's Hardwick (to the north of Hardwick Bank Road and south of B4080 crossing of the M5).

A new A46 link would also need to pass south of the village of Kinsham due to environmental constraints between Kinsham and Bredon including a scheduled monument. Consequently, options 12a and 12b represent the only feasible options to the north of Ashchurch for an additional motorway junction if M5 Junction 9 is to remain open.

Options with a new restricted motorway junction and A46 link to the south of Ashchurch:

Options 9/9a, 21 and 22 would all include a motorway junction with slip roads that allow travel to or from the M5 south only. Options 9, 9a and 21 would include an A46 link passing to the north of the village of Fiddington (but south of the consented Fiddington housing developments). Option 22 would include an A46 link passing to the south of the village of Fiddington. These are the only feasible options in terms of possible motorway junction locations which avoid constraints to the north (consented housing development) and south (village of Stoke Orchard) while meeting minimum distance requirements from existing motorway junctions.

Options with a new unrestricted motorway junction and A46 link to the south of Ashchurch:

Options 16/16a and 16b would include a motorway junction allowing travel in all directions, roughly mid-way between M5 Junctions 9 and 10. A new A46 link would pass to the south of the village of Fiddington. This is the only feasible location for an unrestricted motorway junction due to distances from the existing motorway junctions.

3.5. Other options that retain the existing M5 Junction 9

These options (also shown in Figure 3-3) assume that a new A46 link would connect to either the existing M5 Junction 9 or to M5 Junction 10, with no need for a new motorway junction.

Options with a new A46 link connecting to the existing M5 Junction 9:

Options 13a and 13b would retain the existing M5 Junction 9 with a new A46 link running generally to the south of the Tirl Brook but north of the village of Pamington. The A46 link would need to connect into the new roads currently being built to serve the Cotswold Designer Outlet and Fiddington housing developments.

Options with a new A46 link which connect to M5 Junction 10 or the A4019:

Option 11 would include a new A46 link between the A4019 just east of M5 Junction 10 and the A435 north of Bishops Cleeve, with the route of the A46 then following the A435 north to Teddington Hands roundabout. Options 23a, 23b and 23c would all provide a new A46 link either from M5 Junction 10 itself or the A4019 to the existing A46 near Teddington Hands roundabout.

4. Initial sifting of offline highway options

4.1. Process

The long list of 37 offline highway options was sifted based on assessment against the following criteria in accordance with DfT (Department for Transport) Transport Analysis Guidance (TAG).¹

The highway option concepts were assessed on the following criteria:

- **Objective fit** – assessing how likely each option is helping to achieve the scheme objectives
- **Local traffic impacts** – assessing whether (beyond meeting the transport objectives) each option would impact on local traffic movements in the Tewkesbury and Ashchurch area
- **Environmental constraints** – looking at the impacts of each option on key environmental features including flood zones, listed buildings and scheduled monuments, priority habitats, Air Quality Management Areas, Noise Important Areas, and archaeological remains and designated sites
- **Engineering constraints** – assessing the options in relation to buildability, compliance with design standards, land take requirements, and impacts on utilities
- **Planning constraints** – identifying potential impacts on Green Belt and approved housing development sites (including consented developments and safeguarded land)
- **Futureproofing** – assessing the scheme based on potential for risks to delivery and compatibility with future development plans.

4.2. Outcomes / reasons for discounting options

Of the 37 options, 33 were discounted, leaving 4 shortlisted options (Options 16b, 19, 21 and 22). Table 4-1 provides a summary of the reasons for each of the options that were discounted.

¹ [Transport analysis guidance - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

Table 4-1 - Offline highway options reasons for discounting

Existing M5 Junction 9	Options	Reason for discounting
Closed / relocated	1, 2 and 12c	<ul style="list-style-type: none"> - Do not align with scheme objectives. Would not sufficiently improve journey time and reliability between M5 Junction 10 and Evesham compared to the existing A46 - Would make access to M5 from Tewkesbury and Ashchurch more challenging - increasing journey times and congestion on Hardwick Bank Road and B4080 through Tewkesbury town centre - Impact on Carrant Brook flood zone - Possible impact on Listed Buildings at Aston-on-Carrant (Option 2) - Impact on potential housing development area to the north of Ashchurch (Option 2)
	3	<ul style="list-style-type: none"> - Does not align with scheme objectives. Severance of potential housing development areas to the south of the A46 - Impact on Tirlle Brook flood zone - Impact on consented development: land occupied by Dobbies Garden Centre, Cotswold Designer Outlet and approved housing site north of Fiddington
	6, 7, 8, 10, 17 and 18	<ul style="list-style-type: none"> - Would make access to M5 from Tewkesbury and Ashchurch more challenging due to relocation of junction even if new link roads provided - Do not align with scheme objectives. Severance of potential housing development areas to the south of the A46 (Option 6) - Passes too close to Fiddington village including Listed Buildings (Option 7)
Extended	4a, 4b, 5a, 5b and 20	<ul style="list-style-type: none"> - Do not align with scheme objectives. Severance of potential housing development areas to the south of the A46 - Impact on consented development: route would pass through approved housing site north of Fiddington
	14a, 14b and 14c	<ul style="list-style-type: none"> - Do not align with scheme objectives. Some impact on potential housing development areas to the south of the A46 (land take and severance)
	15a, 15b and 15c	<ul style="list-style-type: none"> - Would pass too close to Fiddington village including Listed Buildings
Open	9 and 9a	<ul style="list-style-type: none"> - These options have similar alignments and the same junction arrangement on the M5 as Options 21 and 22 (which were progressed instead).

Existing M5 Junction 9	Options	Reason for discounting
	11	<ul style="list-style-type: none"> - Does not align with scheme objectives. Would not sufficiently improve journey time and reliability between M5 Junction 10 and Evesham compared to the existing A46 and as a result provides limited traffic reduction or improvement in journey time and reliability at M5 Junction 9 and the A46 through Ashchurch - Impact on Cheltenham and Gloucester Green Belt - Engineering and environmental challenges: passes through landfill site - Passes through allocated housing sites at North West Cheltenham
	12a and 12b	<ul style="list-style-type: none"> - Do not align with scheme objectives. Would not sufficiently improve journey time and reliability between M5 Junction 10 and Evesham compared to the existing A46 and as a result provides limited traffic reduction or improvement in journey times and reliability at M5 Junction 9 and the A46 through Ashchurch - Impact on Carrant Brook flood zone - Possible impact on a scheduled monument (Enclosures and ring ditches West of Crashmore Lane) (Option 12a)
	13a and 13b	<ul style="list-style-type: none"> - Do not align with scheme objectives. Severance of potential housing development areas to the south of the A46 - Impact on Tirlle Brook flood zone - Impact on consented development: land occupied by Dobbies Garden Centre, Cotswold Designer Outlet and approved housing site north of Fiddington
	16 and 16a	<ul style="list-style-type: none"> - Engineering and environmental challenges: major structure needed to cross the railway (which is already on an embankment in this location)
Open (continued)	23a, 23b and 23c	<ul style="list-style-type: none"> - Would pass through safeguarded development land at North West Cheltenham (and allocated land for housing for Option 23c) - Impact on Cheltenham and Gloucester Green Belt - Cost and funding implications of a much longer A46 link than other options with requirement for substantial modifications to M5 Junction 10 (beyond those proposed in current M5 Junction 10 Improvements Scheme) - Engineering challenges - passes through landfill site (Option 23c) - Impact on Local Wildlife Site and other environmental assets (Option 23c)

4.3. Options shortlisted for Strategic Outline Case submission to DfT (2022)

Following the sifting process described above, four options were shortlisted for the Strategic Outline Case (SOC) submission to DfT in 2022. Each option was given a colour (Pink, Grey, Blue and Orange) alongside its option number. For simplicity, these options are referred to as the 'SOC options' in this and following sections.

The SOC options each included a new A46 link with a new or reconfigured M5 junction and a new junction with the A435 and B4079 in the Seven Bends area, with the new A46 following the route of the A435 between Seven Bends and Teddington Hands roundabout.

At this stage it was not determined whether the new A46 link would need to be:

- Single - a single carriageway road
- Dual - a dual carriageway road
- Hybrid - a combination of the above (for example dual carriageway between the M5 and Seven Bends, reducing to a single carriageway to link back to Teddington Hands).

It was also assumed that all options would make provision for walking, cycling and horse riding. This would include improvements at the existing M5 Junction to infrastructure for walking and cycling to support increased sustainable travel between Tewkesbury and Ashchurch.

The options are described in Table 4-2 and their indicative alignments are shown in Figure 4-1.

Figure 4-1 - SOC options (indicative alignments)

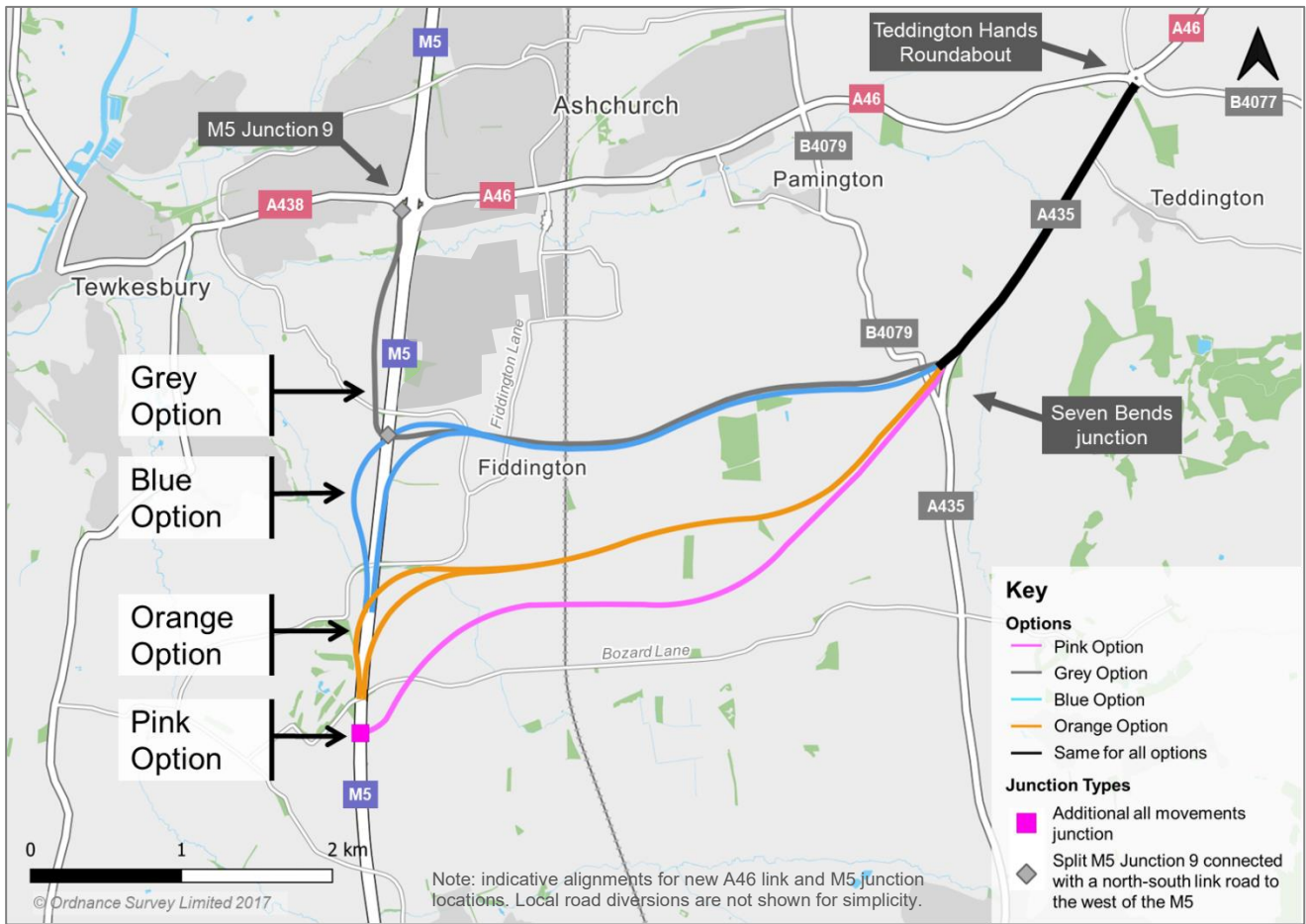


Table 4-2 - Shortlisted options for 2022 SOC submission to DfT (the ‘SOC options’)

Option	Option number	Description summary
Pink	16b	Additional M5 Junction 9a with a roundabout that allows movement in all directions at the mid-point between M5 Junction 9 and M5 junction 10. The existing Junction 9 would remain fully open. A new A46 link road would pass south of Fiddington and connect into the A435 via a new junction at Seven Bends.
Grey	19	Extended M5 Junction 9 connected by a two-way link road between the existing Junction 9 roundabout and a new southern roundabout which would connect to a new A46 link road and allow movement in all directions. The slip roads to and from the north at M5 Junction 9 would not be moved but the slip roads to and from the south would be relocated to the new southern roundabout. The new A46 link road would pass north of Fiddington to the A435 via a new junction at Seven Bends.

Option	Option number	Description summary
Blue	21	Additional M5 Junction 9a that provides slip roads to and from the south only. The existing Junction 9 would remain fully open. A new A46 link road would pass north of Fiddington and connect into the A435 via a new junction at Seven Bends.
Orange	22	Additional M5 Junction 9a that provides slip roads to and from the south only. The existing Junction 9 would remain fully open. A new A46 link road would pass south of Fiddington and connect into the A435 via a new junction at Seven Bends.

5. Further development and sifting of the SOC options

5.1. Process

Following the SOC submission to DfT in September 2022, GCC agreed to continue technical work to develop and assess the SOC options. In particular, it was determined that consideration should be given to:

- Highway capacity likely to be needed on the new A46 link to support future development aspirations and potential options for a phased approach to infrastructure.
- Alternative alignments for all options at their eastern end that would avoid the A435 and connect to the existing A46 either to the west or north of Teddington Hands roundabout. Such options were not considered at the previous stage and could potentially avoid impacts to properties along the A435.
- Variants of the Pink Option that could avoid or reduce the impact on a consented solar farm at Claydon Farm that would be bisected by the Pink Option. Claydon Solar Farm was consented in December 2021, following completion of the options assessment for the SOC. As the alignments were indicative in the SOC submission, it was agreed to consider the impacts of the solar farm plans on the scheme options as part of the post-SOC work.

This further technical work was broken down into the following four elements:

1. **More detailed assessment and sifting of the SOC options (Part A sift)** – considering the four SOC options (Pink, Grey, Blue and Orange) with different levels of highway capacity, plus an additional option taking the same M5 junction arrangement and location as the Pink Option but with an alternative route identified to avoid conflict with Claydon Solar Farm
2. **A46 eastern connection options** – generation and initial sifting of alternative options for alignment of a new A46 between Seven Bends and Teddington Hands / Beckford which could apply to the SOC options (which would avoid following the route of the A435)
3. **Further development and refinement of the remaining SOC options and A46 eastern connection options** – including consideration of additional options to avoid or minimise conflict with Claydon Solar Farm, further details of options to tie into the existing A46 in the Teddington Hands area and options for link road between the M5 and A38 connecting to the proposed new motorway junction
4. **Detailed assessment and sifting of remaining options (Part B sift)** – considering the options shortlisted in Part A alongside additional options and variants resulting from the technical work in 2 and 3 above.

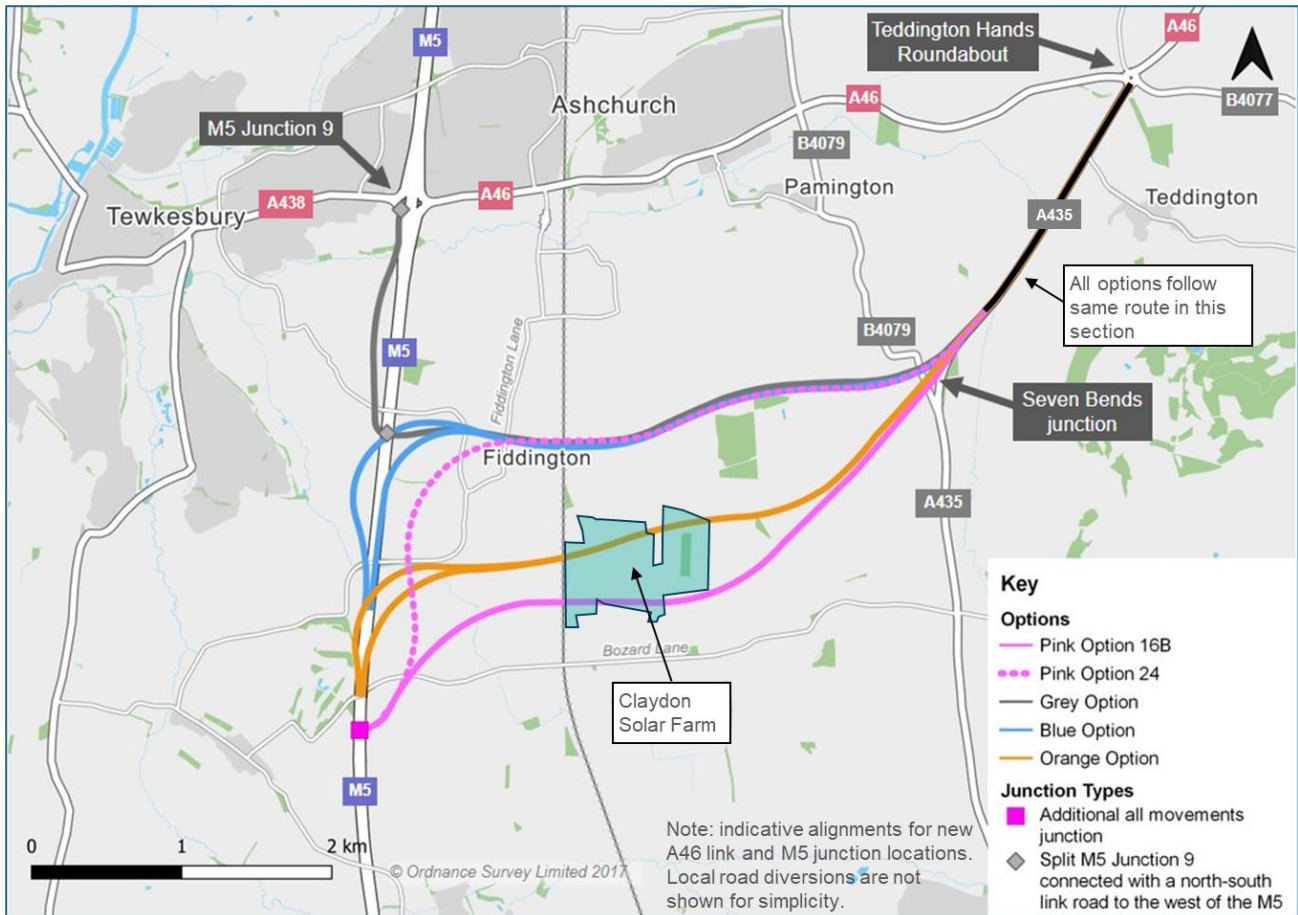
Further details including the outcome from each of these stages is provided in the following sub-sections.

5.2. More detailed assessment and sifting of the SOC options (Part A sift)

5.2.1. Scope of assessment

The options considered in the Part A assessment are illustrated in Figure 5-1 below.

Figure 5-1 - Part A sift options (indicative alignments)



The options comprised:

- The **four SOC options (Pink, Grey, Blue and Orange)** with three intervention levels (based on whether the A46 link would be a single carriageway, dual carriageway or hybrid of the two)
- An **additional option (Option 24)** with the same M5 junction arrangement and location as the Pink Option but with an alternative route to avoid passing through the consented Claydon Solar Farm.

The two Pink Options are referred to as Pink Option 16b and Pink Option 24. The Blue Option already provided an alternative to the Orange Option which avoided the Claydon Solar Farm.

The Part A sift included a more detailed assessment of each option than was possible for the SOC submission against the following topics following National Highways' guidance and methodologies:

- Project objectives
- Environmental impacts
- Stakeholder acceptability and planning impacts
- Buildability
- Economic performance and affordability.

5.2.2. Conclusions

The conclusions of the assessment for the Part A sift were that the Orange and Grey options both received a lower score compared to the Pink and Blue options and were consequently discounted.

- For the **Orange Option**, this was principally due to significant engineering risks in relation to conflict with a national high-pressure gas main for approximately 3km of the route of the new A46, which would likely require a significant diversion including new pipeline under the M5 and diversion around settlement and solar farms in the area.
- For the **Grey Option**, this was due to poorer performance against operational and safety objectives, plus stakeholder and engineering risks due to the requirement for a link road to the west of the M5 which would pass close to schools / playing fields and through the Walton Cardiff Ponds Local Wildlife Site and potentially conflict with overhead high voltage power lines.

In addition, the following conclusions were made regarding whether the new A46 link should be a single carriageway or dual carriageway:

- For the **western section between the M5 and Seven Bends** (A435 junction), a single carriageway A46 would not provide sufficient capacity to accommodate future housing and employment growth in the Ashchurch area – consequently for all options it was recommended this section should be built as a dual carriageway (which would also provide safety benefits given high traffic flows forecast to the west of the A435 junction)
- For the **eastern section between Seven Bends and Teddington Hands roundabout**, a single carriageway A46 would provide sufficient capacity for future growth given lower traffic flow forecast on this section. Dualling this section of the route would provide some traffic and safety benefits but was not recommended due to higher costs, potential impacts on properties and access to Teddington village, and environmental impacts given proximity to the Cotswolds National Landscape boundary.

In summary, the Orange and Grey Options were discounted, while the Pink (Option 16b and 24) and Blue Options were progressed for further development and sifting.

Also, it was recommended that future option development should include a dual carriageway A46 link between the M5 and Seven Bends (A435 junction) reducing to a single carriageway A46 link to the east of the A435 junction.

5.3. A46 eastern connections options

5.3.1. Scope of assessment

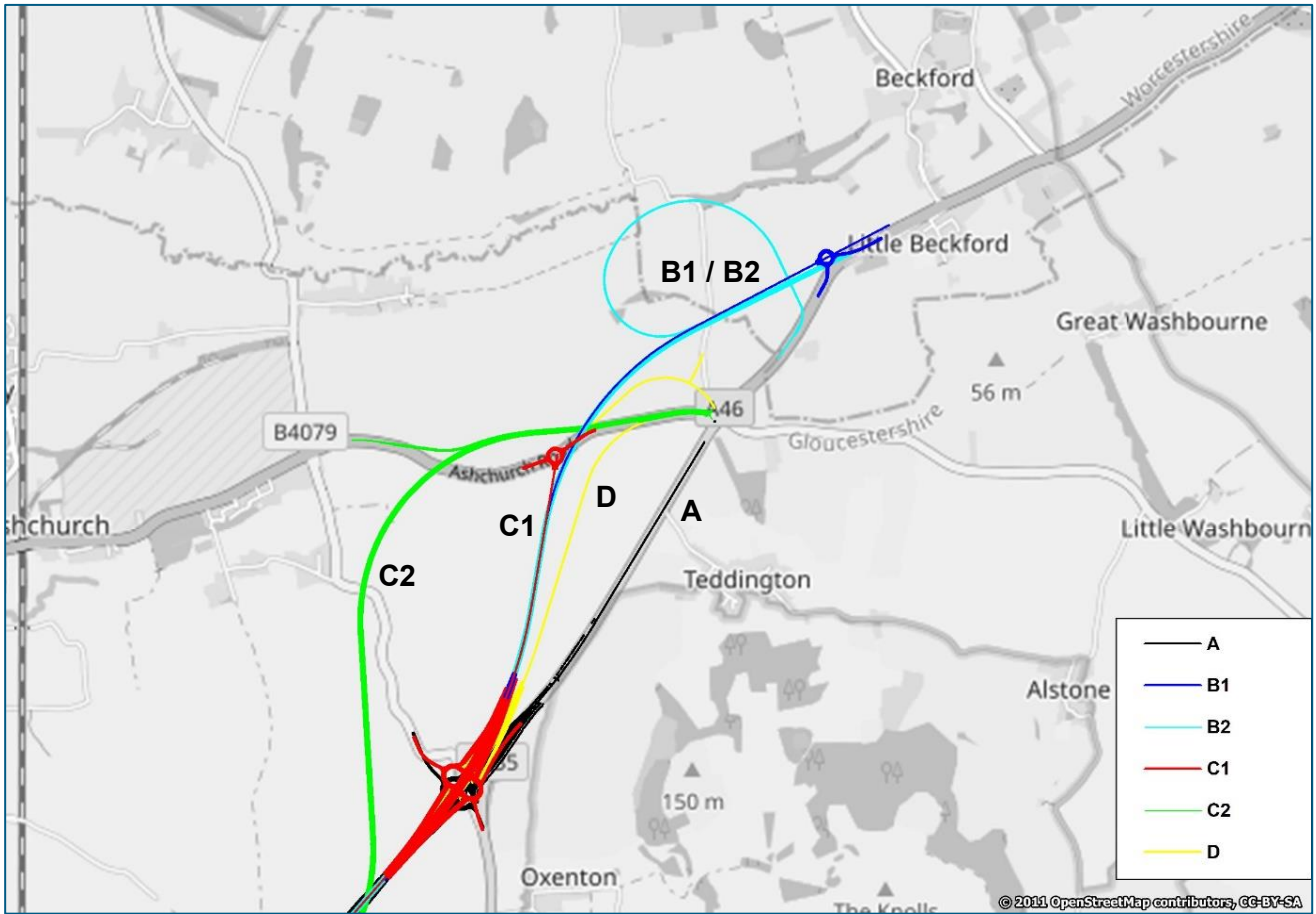
All four SOC options assumed that a new A46 link would follow the route of the A435 between Seven Bends (at a location close to the existing B4079 junction) and Teddington Hands roundabout. Following completion of the SOC, it was agreed that alternative A46 eastern connection options which avoid following the route of the A435 should be explored.

Table 5-1 describes the long list of options considered, which are illustrated in Figure 5-2.

Table 5-1 - Description of A46 eastern connection options (long list)

Option	Description summary
A	As per the SOC options, the new A46 follows the A435 between the B4079 (Seven Bends) junction and Teddington Hands roundabout
B1	The new A46 crosses the existing A46 west of Teddington Hands via an overbridge and connects to the existing A46 west of Little Beckford via an at-grade roundabout junction
B2	The new A46 crosses the existing A46 west of Teddington Hands via an overbridge and connects to the existing A46 west of Little Beckford via a restricted movements grade-separated junction
C1	The new A46 connects to the existing A46 west of Teddington Hands roundabout via an at-grade roundabout junction
C2	The new A46 connects to the existing A46 west of Teddington Hands roundabout via a restricted movements grade-separated junction
D	The new A46 connects directly into an enlarged Teddington Hands roundabout. To the west of the roundabout, the existing A46 route is diverted to accommodate the new A46 and joins Teddington Hands roundabout on the northern side of the junction. Crashmore Lane is also diverted so it joins the existing A46 route via a priority junction.

Figure 5-2 - A46 eastern connection options (indicative alignments for Pink Option)



A46 eastern connection options were generated that routed to the west of the A435, to avoid routing through the Cotswolds National Landscape and impacting the village of Teddington on the eastern side of the A435.

The generation of A46 eastern connection options took place prior to the completion of the technical assessments undertaken for the Part A sift (reported in Section 5.2). Consequently, options were identified that would be suitable for either a dual or single carriageway A46 link. The B2 and C2 options included grade-separated junctions at their eastern end which would be more suited to a dual carriageway A46 link, whereas the A, B1, C1 and D options included at-grade junctions which could be suitable for both single and dual carriageway A46 link options.

5.3.2. Conclusions

The analysis concluded that options extending to Beckford, or which included a grade-separated connection to the existing A46 (the B1, B2 and C2 options) should be discounted. This decision was primarily based on their higher costs with poorer value for money. Transport modelling indicated that these options would not provide significant additional benefits compared to the options connecting to the A46 either at or to the west of Teddington Hands roundabout (A, C1 and D options). Moreover, the C2 option demonstrated a weaker fit with the project objectives and would conflict with future development plans.

The remaining options, namely A, C1 and D, all performed better than B1, B2 and C2. However, each had some issues or risks. The D options involved higher costs due to the complexity and risk associated with the realignment of the A46 north of Teddington Hands roundabout. Consequently, the D options were discounted in favour of the C1 options.

In summary, it was decided to progress the following A46 eastern connection options:

- **A – following the route of the A435**
- **C1 – taking an offline route to connect with the existing A46 west of Teddington Hands roundabout.**

5.4. Further option development (routes avoiding Claydon Solar Farm)

5.4.1. Scope of assessment

Following completion of the Part A sift, further work was undertaken to consider potential options based on the Pink Option (16b) but routing to the south of Claydon Solar Farm to avoid or minimise impacts on the solar farm.

Option 24 was identified and included in the Part A sift as an alternative to the Pink Option (16b) with an alignment that avoided the consented Claydon Solar Farm by routing the new A46 link to the west and north of Fiddington. The **Blue Option** also avoids the solar farm with a similar alignment to Option 24 but with a limited movements M5 junction.

For the Part B sift, three potential options were identified which had an alignment to the south of Option 16b and would either avoid or significantly reduce conflicts with Claydon Solar Farm (Options 25a-c as shown in Figure 5-3). Apart from the solar farm, other significant constraints were identified in this area:

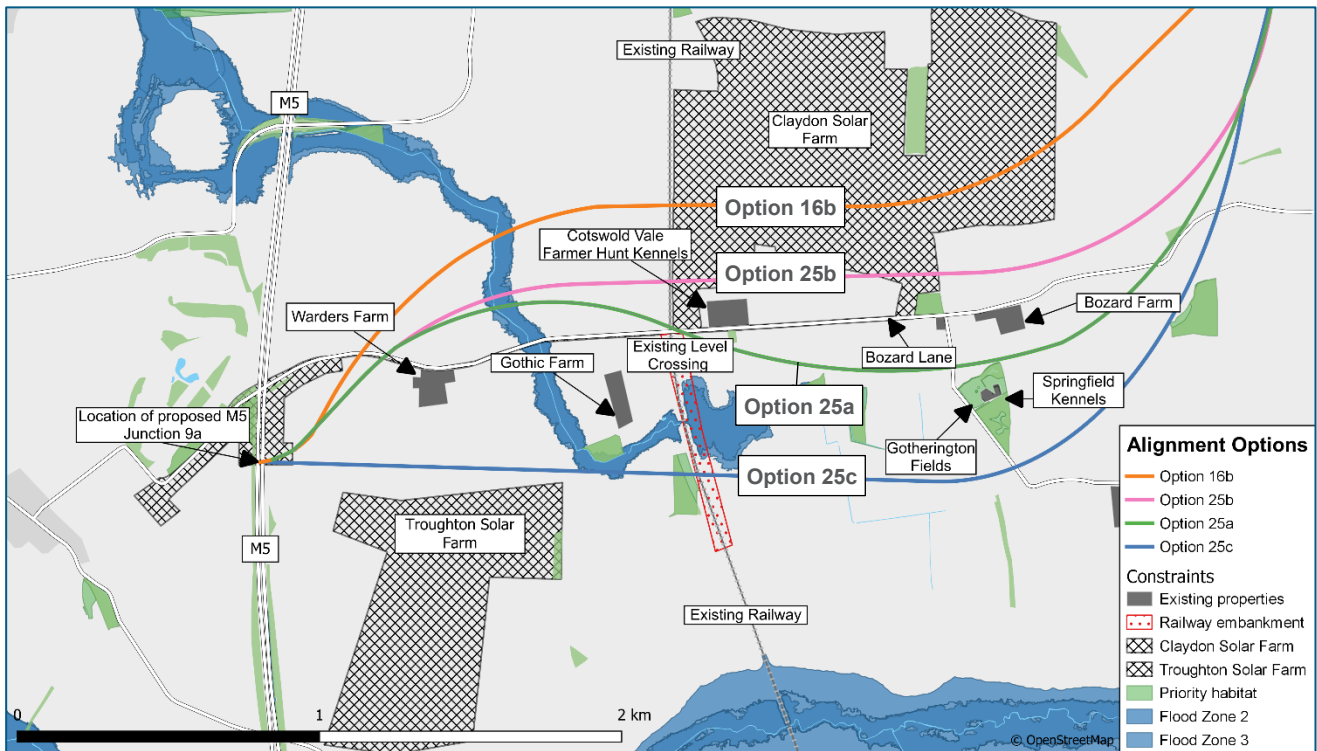
- Properties located along Bozard Lane including three farms (Warders, Gothic and Bozard) and kennels for Cotswold Vale Farmers Hunt, plus properties along Gotherington Fields including Springfield Kennels
- A small valley to the south of Bozard Lane which includes areas of flood zone and Priority Habitat (mostly woodland)
- The Birmingham to Bristol rail line, which crosses Bozard Lane at an Automatic Half Barrier level crossing and then crosses the valley to the south on an embankment roughly 6.5m high
- Troughton Solar Farm (in operation) which occupies land to the south of Gothic Farm.

Option 25a provided a route that would largely avoid Claydon Solar Farm and the rail embankment south of Bozard lane but which as a result would need to cross Bozard Lane at three separate locations and would sever Bozard Lane at the location of the current level crossing (bridging over the level crossing would not be feasible).

Option 25b took a more northerly route, avoiding the multiple crossings of Bozard Lane but which would consequently have a larger impact on Claydon Solar Farm (but significantly reduced compared to Option 16b).

Option 25c took a longer and more southerly route, passing to the south of the watercourse and Springfield Kennels but which would require either a larger road-over-rail bridge or a road-under-rail bridge to due to the size of the rail embankment in this area.

Figure 5-3 - Options south of Claydon Solar Farm (indicative alignments)



5.4.2. Conclusions

The assessment concluded that:

- **Option 25a should be discounted** because it severs Bozard Lane and has a greater impact on properties along Bozard Lane compared with other options
- **Option 25b should be progressed** to the Part B sift because it reduces the impact on Claydon Solar Farm (compared with Option 16b) and Bozard Lane (compared with Option 25a). It is also the shortest alternative to Option 16b
- **Option 25c (with a road-under-rail bridge) should be discounted** because it would require the road to be below ground level adjacent to a flood zone, and a permanent drainage pumping station would probably be needed
- **Option 25c (with a road-over-rail bridge) should be progressed** to the Part B sift because it provides the opportunity to completely avoid Claydon Solar Farm (unlike Options 16b and 25b) and significant impacts on properties along Bozard Lane.

However, it was recognised that Option 25c (road-over-rail bridge) would be the longest and likely to be the most expensive option, with additional challenges (compared to Option 25b) associated with the larger size of structure and embankment needed to cross the rail line and potential impacts on Priority Habitats.

In summary, both Option 25b and 25c were included in the Part B sift (with both A46 eastern connection options).

5.5. Further option development (A46 eastern connection A variants)

5.5.1. Scope of assessment

Following the completion of the initial sifting for A46 eastern connection options (described in Section 5.3), further technical work was undertaken to investigate options for changes to the road network at Teddington Hands that would be required to accommodate the increased traffic flow along the A435 (upgraded to form the new A46 link) as part of the A variants.

To the south of the Teddington Hands roundabout, an existing staggered priority junction provides access to:

- A major Truck Stop and haulage business operated by William Gilder Ltd, Texaco petrol station and Teddington Stores (on west side of road)
- Teddington Hands Inn (on east side of road).

Two listed structures are also present either side of the historic junction – the Tibblestone and Teddington Hands signpost.

A Safety Risk Assessment was carried out on Teddington Hands roundabout and the surrounding junctions. This identified that there is a poor safety record for the existing staggered junction to the south of the roundabout, which had three collisions between January 2017 and December 2021 (1 fatal and 2 serious). Two of these collisions occurred when a vehicle turned right across the path of a northbound motorcyclist, and both took place during the hours of darkness. The assessment recommended that measures to either improve the safety of the right turn into the Truck Stop or the prohibition of the right turn at the access be investigated with perhaps an alternative access provided off the existing A46.

Option refinement for the eastern connection options via A435 (A variants) considered:

- **Online options** requiring widening of the existing A435 and either a roundabout or signalised junction serving the Truck Stop and other businesses
- **An offline option** that would bypass the businesses and existing Teddington Hands roundabout, with a new roundabout formed to the east of the existing junction to connect the new A46 with the B4077 and existing A46 towards Ashchurch.

5.5.2. Conclusions

The assessment of **online options** concluded that neither a roundabout nor a signalised junction that would provide the capacity required to cope with A46 through-traffic volumes is likely to be feasible. Such options would have significant impacts on the businesses due to land take required from the petrol station, Truck Stop and/or Teddington Hands Inn. They would also require the Tibblestone to be relocated.

The **offline option** would avoid the land take impact on businesses at Teddington Hands and would provide greater scope for compliant walking and cycling facilities. However, the assessment noted that it would:

- Potentially result in the closure of the A435 south of the Truck Stop with access to the businesses only from Teddington Hands roundabout (and via new A46 link to/from M5)
- Be a higher cost option in engineering terms (although this may be offset by lower land and business compensation costs)
- Impact the Tewkesbury Borough Special Landscape Area (non-statutory) east of the A435
- Require additional crossings of high-pressure gas mains to the east of Teddington Hands roundabout.

In summary, due to the significant land take required from businesses online options were discounted. As a result, it has been assumed that for all options (A variants) the offline arrangement at Teddington Hands would be required.

Further description of the proposed Teddington Hands layout for the A46 eastern connection A variant including indicative drawings is provided in the '[Summary of shortlisted options](#)' document which can be found on the Have Your Say website:

<https://haveyoursaygloucestershire.uk.engagementhq.com/junction-9>.

5.6. Further option development (A46 eastern connection C1 variants)

5.6.1. Scope of assessment

Following the completion of the initial sifting for A46 eastern connection options (described in Section 5.3), further technical work was undertaken to investigate options changes to the road network at Teddington Hands that would be required to accommodate the C1 variants.

5.6.2. Conclusions

Transport modelling identified that retaining a single carriageway on the A46 between the Teddington Hands roundabout and the proposed new roundabout for the A46 connection to the west of this would not be sufficient to cope with forecast traffic flows. The flows are higher in this section as it would need to accommodate both the A46 demand plus traffic travelling between Ashchurch and the B4077.

A revised arrangement was therefore developed which includes a short section of dual carriageway between the two roundabouts. The new A46 roundabout location was moved further east to reduce the length of dual carriageway required and risk of conflict with North Ashchurch development proposals. A bypass lane was also included at the new roundabout for westbound A46 traffic plus some additional capacity at Teddington Hands roundabout.

As per the previous layout for the C1 variant, this eastern connection option would require flood zone crossing on embankment plus crossings of high-pressure gas mains. Some land

take may be required along the northern boundary of the Truck Stop to accommodate widening and realignment of the A46 to the west of Teddington Hands.

In summary, it has been assumed for all options (C1 variants) that a short section of dual carriageway would be required between the existing Teddington Hands roundabout and new roundabout to the west of this to connect with the new A46 link.

Further description of the proposed Teddington Hands layout for the A46 eastern connection C1 variant including indicative drawings is provided in the 'Summary of shortlisted options' document which can be found on the Have Your Say website:

<https://haveyoursaygloucestershire.uk/engagementhq.com/junction-9>.

5.7. A38 Western Link options

5.7.1. Scope of assessment

Separate to the main option development and sifting process, consideration has also been given to an A38 Western Link. This would provide a direct connection between the new M5 Junction 9a proposed as part of this scheme and the A38 south of Tewkesbury.

5.7.2. Conclusions

An A38 Western Link in combination with the shortlisted scheme options could provide a complete east-west route from the A46 at Teddington Hands roundabout via M5 Junction 9a and the A38 to Tewkesbury, allowing traffic to bypass both Ashchurch and the existing M5 Junction 9 for such journeys. In addition, it would provide an alternative route for journeys between the M5 south and Tewkesbury, although to some extent the proposed M5 Junction 10 Improvements will also provide this (via the A4019 and A38).

Initial optioneering considered the potential for an A38 Western Link in relation to both Blue and Pink Option M5 junction arrangements. Connection to the **Blue Option** M5 Junction 9a (allowing for changing this to a roundabout junction) was discounted due to its more northerly location and the extent of flood zones and housing development between the M5 and A38 at Wheatpieces that would both pose constraints to a new highway alignment.

The proposed M5 Junction 9a for the **Pink Options** (25b and 25c) is located further south to ensure the distance between Junction 9 and 9a would meet requirements for a minimum junction separation of 2km. This provides a more suitable location for an A38 Western Link with fewer constraints between the M5 and A38. However, any alignment here would still need to cross flood zones associated with the River Swilgate and would probably need to pass between Sherdons Golf Centre and the village of Tredington.

An A38 Western Link does not currently form part of the shortlisted options, but further consideration of such options may be required in future given potential to reduce the number of vehicles travelling along the A438 / A46 corridor between Tewkesbury and Ashchurch.

5.8. Detailed assessment and sifting of remaining options (Part B sift)

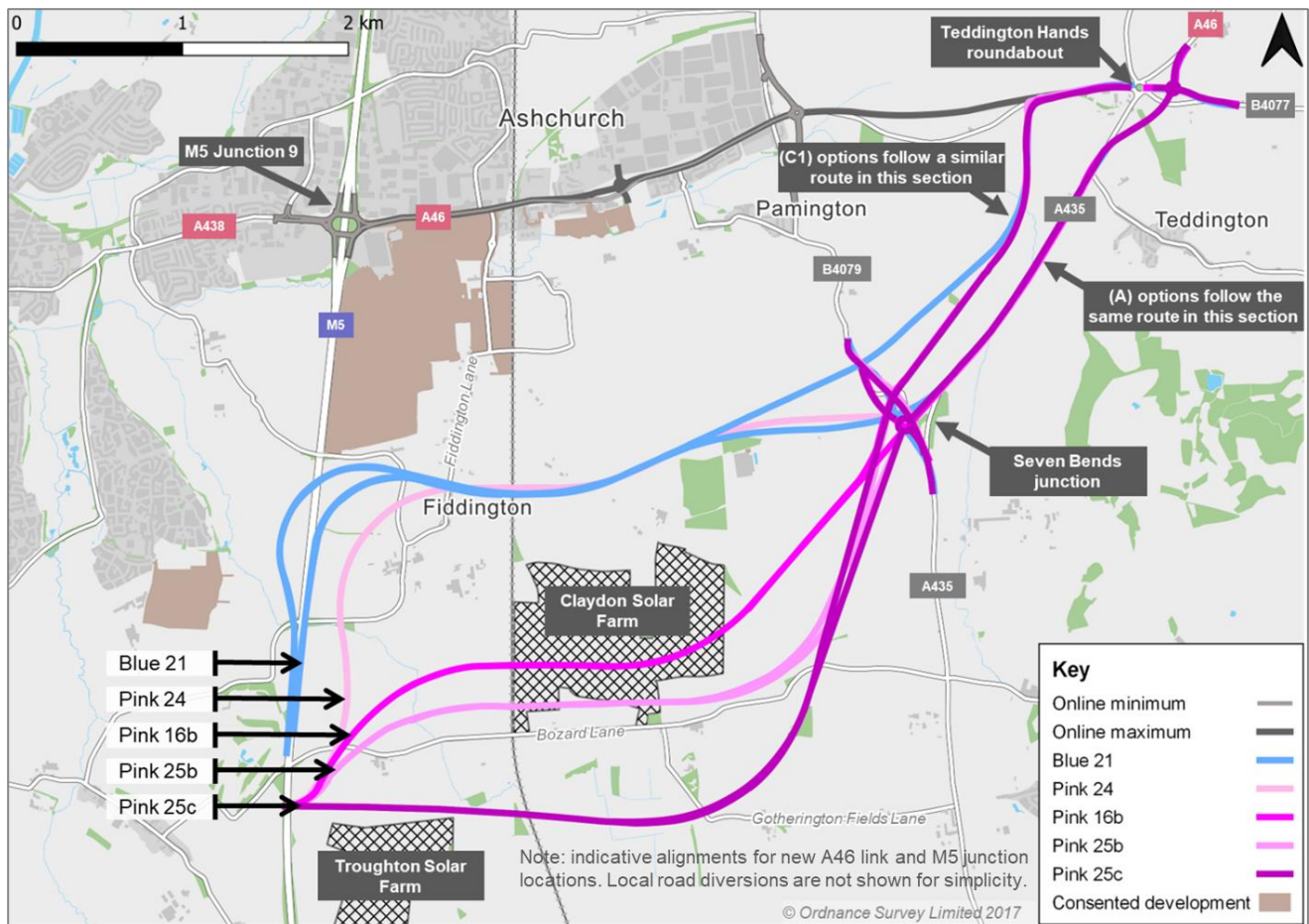
5.8.1. Scope of assessment

The options considered in the Part B sift are shown in Figure 5-4. They comprised:

- The options progressed from the Part A sift (**Pink Options 16b and 24, Blue Option**)
- Additional options with the same M5 junction arrangement as the Pink Option but with alignments to the south of the consented Claydon Solar Farm (**Options 25b and 25c**)
- **Both A and C1 eastern connection options** for all of the above (based on the revised arrangements outlined in Sections 5.5 and 5.6).

Two **A46 online improvement options** were also included in the Part B sift. Information regarding these is provided in Section 6 (Lower cost options).

Figure 5-4 - Part B sift options (indicative alignments)



The Part B sift included a detailed assessment of each option against the following topics:

- Project objectives
- Environmental impacts

- Stakeholder acceptability and planning impacts
- Buildability
- Economic performance and affordability.

5.8.2. Conclusions

Following additional option development, refinement and assessment for the Part B sift, only six options were progressed to the next stage.

The **Pink Options** were the highest scoring options reflecting strong performance against objectives and economic performance. Slight variations in scoring between the Pink Options were mostly due to the differences in costs and lengths of the proposed A46 link between options.

The **Blue Options** did not score as highly as any of the Pink Options due mainly to the reduced benefits provided by a restricted movements M5 Junction 9a including limits to the extent of Garden Community development that could be accommodated. However, they performed well in terms of other objectives and due to their shorter alignments have slightly lower costs.

Noting similar performance between the Pink Options, the outcomes of the Part B sift were that:

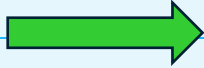

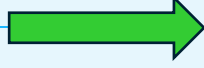
- **Pink 16b was discounted in favour of Pink 25b which was** progressed due to the reduced impact of Option 25b on Claydon Solar Farm
- **Pink 25c was also progressed** as it provides a southern alignment which completely avoids Claydon Solar Farm although with higher costs and some engineering risks associated with the larger rail bridge structure required
- **Pink 24 was discounted in favour of the Blue Option** which follows a similar alignment to the north of Fiddington. Although Option 24 scores more highly overall, it was agreed that it was more important to progress an option which provides a different M5 Junction arrangement and lower costs, as a 'reasonable alternative' to Options 25b and 25c
- **Both A and C1 eastern connection options were progressed** for Pink 25b and 25c and the Blue Option.

In summary, the sifting process has resulted in three options being shortlisted, each with two eastern connection options:

- **Blue Option (A and C1 variants)**
- **Pink 25b Option (A and C1 variants)**
- **Pink 25c Option (A and C1 variants).**

To simplify presentation for public engagement, the shortlisted options have been renumbered as shown in Table 5-2 below. The new numbering system (1A, 1B, etc.) is used in all following sections to refer to the shortlisted options.

Table 5-2 - Renumbered shortlisted options

Shortlisted option (Part B sift)	New option numbering for public engagement
Blue Option 21 (A) 	Option 1A
Blue Option 21 (C1)	Option 1B
Pink Option 25b (A) 	Option 2A
Pink Option 25b (C1)	Option 2B
Pink Option 25c (A) 	Option 3A
Pink Option 25c (C1)	Option 3B

Further description of the shortlisted options including drawings showing indicative alignments and junction layouts is provided in in the 'Summary of shortlisted options' document which can be found on the Have Your Say website:
<https://haveyoursaygloucestershire.uk.engagementhq.com/junction-9>.

6. Lower cost options

6.1. A46 online improvement options

Alongside the development and sifting of offline highway options described in Sections 3 to 5 consideration has also been given to potential lower cost options that might address the scheme objectives (at least in part).

Options to re-route the A46 much closer to the existing road had already been discounted due to conflict with existing and consented development on the southern side of the A46 including the Cotswold Designer Outlet and Fiddington Fields housing development (See Options 3, 4(a/b), 5(a/b), 13(a/b) and 20 described in Section 3). The work on lower cost options has therefore focussed on potential A46 online improvement options that would comprise upgrades to the existing M5 Junction 9 and A46 through Ashchurch.

Two A46 online improvement options were developed that sought to address the key problems and related objectives identified at M5 Junction 9 and along the A46 through Ashchurch:

- **Online Minimum** – which included the minimum necessary to address the most significant problems and provide some headroom capacity for short term development traffic growth
- **Online Maximum** – which included more significant upgrades to the A46 to provide the best possible outcome in terms of improving journey times, reduced congestion, and additional headroom capacity for long term development traffic growth (but limited to upgrades to the existing M5 Junction 9 and A46).

The **Online Minimum** option included an upgraded M5 Junction 9, improvements to the A438 / Shannon Way junction immediately west of M5 Junction 9, some widening of the A46 to dual carriageway between Alexandra Way and Northway Lane and a new Aston Cross roundabout junction with realignment of the B4079 to replace the existing junction. It also included upgraded walking and cycling infrastructure along the A438 and A46 connecting Tewkesbury Academy with communities along the A46, with segregated walking and cycling bridges across the M5 and rail line.

The **Online Maximum** option built on the minimum option by including all of the above plus upgrading the A46 to dual carriageway between Northway Lane / Loverose Way and Teddington Hands roundabout.

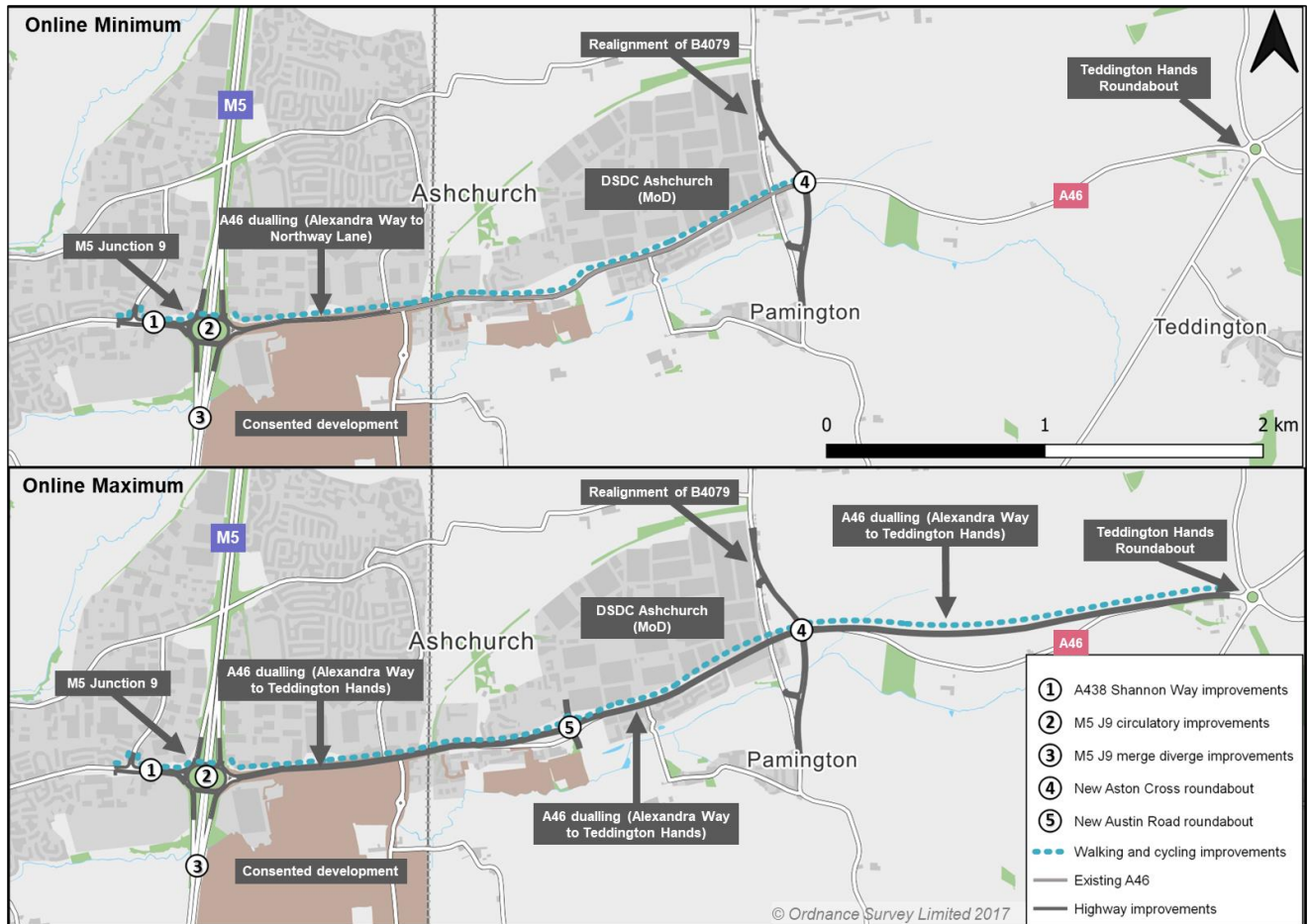
Further details of the Online Minimum and Maximum options are provided in Table 6-1 and Figure 6-1 below.

Table 6-1 - A46 online improvements – interventions including in the Minimum and Maximum options

Problem identified	Proposed solution	Included in Min?	Included in Max?
Insufficient capacity at M5 Junction 9 to accommodate future growth, resulting in traffic delays and queuing on M5 slip roads and mainline	Upgrade M5 Junction 9 to accommodate 3 traffic lanes for the entire circulatory carriageway and on all entries/exits. All arms signalised. Assumed the existing overbridges can accommodate 3 traffic lanes but may require strengthening and separate overbridge required for walking and cycling.	✓	✓
Queuing back from the A438 / Shannon Way junction extends through M5 Junction 9 onto the M5 northbound off slip and M5 mainline. Junction is constrained including close proximity to schools.	Revised junction layout to provide 3 lanes westbound (travelling away from M5 Junction 9) instead of current 2 lanes (1 straight and 2 right hand turn lanes into Shannon Way) – would require removal of dedicated left turn lane in eastbound direction but still leaving 2 lanes eastbound overall.	✓	✓
Traffic delays experienced where A46 reduces to single carriageway with 1 lane in each direction between Alexandra Way and Northway Lane (section also includes new signalised junction for new Moog factory)	Widen the A46 to dual carriageway providing 2 traffic lanes in each direction between Alexandra Way and Northway Lane (plus additional left and right turn lanes at junctions). Moog signalised junction would be retained but access to BP petrol station and Starbucks would be restricted to left-in left-out from the westbound carriageway only.	✓	✓
B4079 Aston Cross junction is a major source of delays on the A46 resulting in long traffic queues in both directions + the junction is constrained by properties on all four sides	Construct a new roundabout junction around 200m to the east with a new B4079 alignment north and south to connect with the new junction. Existing junction would be closed (but crossing for active modes retained) and access to properties provided from the realigned B4079.	✓	✓

Problem identified	Proposed solution	Included in Min?	Included in Max?
<p>Limited capacity along single carriageway section of the A46 between Loverose Way (west of rail bridge) and Teddington Hands roundabout to accommodate growth in strategic and development traffic</p>	<p>Widen the A46 to dual carriageway providing 2 traffic lanes in each direction between Loverose Way and Teddington Hands roundabout (plus additional left and right turn lanes at junctions). A new or expanded rail overbridge would be needed.</p> <p>Access to side roads and properties along this section of the A46 would generally be limited to left-in left-out only. A new roundabout junction would be provided at Austin Road to maintain access from both directions to the MOD site. Along with the new Aston Cross roundabout this would enable u-turns for side road / property access where right turns are removed.</p> <p>Due to the urban nature of the route, it is assumed existing 30 / 40 mph speed limits would be retained west of Aston Cross.</p>	x	✓
<p>Provision for walking and cycling at M5 Junction 9 and along the A46 does not meet current standards with gaps in crossing provision and indirect routing between Ashchurch and Tewkesbury Academy (west of M5 Junction 9)</p>	<p>Upgrade the shared use path between Shannon Way and Aston Cross to meet current design standards. Would include new segregated walking and cycling overbridges to cross the M5 and rail line, upgraded crossings including controlled crossing to serve new housing at Pamington Lane, and more direct routing between housing areas east of the M5 and Tewkesbury Academy.</p>	✓	✓

Figure 6-1 - A46 online improvement packages



6.2. Discounting of online improvements to M5 Junction 9 and the A46

6.2.1. Scope of assessment

The A46 online improvement options were subject to the same assessment methodologies as the offline options in the Part B sift including with respect to traffic modelling, economic appraisal, environmental risk, and buildability assessments.

While the interventions proposed in the Online Minimum and Online Maximum options are technically feasible, it is evident that such changes would have various impacts on local residents, businesses and other stakeholders, including but not limited to:

- Potential loss of property frontages along the A46 and impacts on vehicular access for some residents and businesses
- Increased noise and emissions from vehicles affecting residents along the A46 and others who use it to travel to work or school (especially walkers and cyclists) which would have adverse health and wellbeing impacts

- Widening of the A46 and increased traffic making it more difficult for walkers and cyclists to cross the road even with the provision of additional signal-controlled crossings.

Online improvements could address the most acute problems identified with respect to traffic congestion, delays and safety at M5 Junction 9 and the A46 to a certain extent. However, the A46 through Ashchurch would remain a relatively slow route due to the number of junctions, crossings and retention of urban speed limits.

Also, online improvements would provide relatively limited capacity for future developments. The addition of new development accesses on to the A46 and associated traffic would result in further conflicts between local and long-distance traffic, increasing congestion and journey times at peak times. Retaining the existing A46 as a through route for long-distance traffic with high volume of HGVs may also discourage use of sustainable travel modes in the area resulting in continuing high car dependency.

6.2.2. Conclusions

Both options received negative assessments for contribution to project objectives indicating that they fail to meet objectives overall:

- The **Online Minimum** option would not provide sufficient capacity on the A46 to cater for future traffic flows even with just early phases of Garden Communities development included in the forecast. This option was also assessed as providing negligible contributions to strategic connectivity and safety objectives
- The **Online Maximum** option would resolve capacity issues on the A46 and provide some improvements in long-distance journey times (due to its greater extent of upgrading the A46 to dual carriageway), but would not meet safety and sustainable travel objectives due to increase in traffic on the route and severance
- For **both options** any new Garden Communities development south of the A46 is forecast to result in traffic routing south via the A435 and Stoke Road to join the M5 at Junction 10 rather than Junction 9 – impacting on communities at Bishops Cleeve and Stoke Orchard.

In addition, the Online Maximum received a large negative score for stakeholder acceptability due to the risks of objections from the MOD, other property owners and stakeholders to the proposals to widen the A46 to a dual carriageway between Northway Lane and Aston Cross (extending to Teddington Hands). Such widening would require significant land take from the MOD at the Austin Road entrance to the site requiring changes to entrance and security facilities. It could also result in loss of value to residential properties along the A46 with loss of hedgerows, front gardens, and driveway space. Demolition of at least one property at Aston Cross junction would be required.

Consequently, it was concluded that the A46 online options should be discounted.

7. Potential phasing of scheme delivery

7.1. Options for phasing of scheme delivery

The potential to phase delivery of the scheme (based on the options shortlisted following the Part B sift) has been considered. The options to do this are limited because it is not possible to breakdown the main components of the scheme into smaller sections that could be completed and opened at different points in time:

- Initially completing just the western section of the new A46 link (including junctions with the M5 and B4079 / A435 at Seven Bends) would result in A46 traffic being pushed onto an unimproved A435 which would be unacceptable from a safety and network performance perspective (particularly with respect to the junctions including business accesses at Teddington Hands)
- Initially completing just the eastern section of the new A46 link (including junctions at Teddington Hands and Seven Bends) would not provide any material benefits since A46 traffic would still be routed via the existing M5 Junction 9 and A46 route through Ashchurch.

Another option would be to initially construct the western section of the new A46 link as a single carriageway (along with the eastern section to provide a complete route between the M5 and Teddington Hands roundabout) and then upgrade it to a dual carriageway later. However, this would present some challenges and overall is likely to cost more than constructing a dual carriageway in the first place:

- If this section were to be built initially as a single carriageway road, it is likely that some changes to the alignment would be required to meet design standards which require provision of long, straight sections to provide safe overtaking opportunities and could also affect the curvature on bends
- Given much of the western section of the A46 would be on embankment and includes multiple structures including rail and road overbridges, a decision would be required as to whether the first phase would include all the structures and earthworks required to enable future upgrade to dual carriageway
- Not including the full earthworks and structures would result in cost savings for the first phase of delivery but it would cost significantly more and present additional technical challenges to upgrade them later
- Conversely, including the earthworks and structure required for a dual carriageway (but with only a single carriageway road) would result in limited cost savings since they are some of the largest contributors to overall cost.

Cost estimates were prepared for both single and dual carriageway options (in respect of the western section of the A46) in 2022 as part of SOC submission. The cost savings varied between options, ranging from just 3% to 25% of the overall scheme cost.

As a result, initially constructing the western section of the A46 link as part of a phased approach to deliver the scheme has been ruled out.

7.2. Scope for a wider phased approach to infrastructure delivery

Proposals for development of the Garden Communities and supporting infrastructure that will be required are at an early stage and no detailed phasing plans currently exist. However, given the scale of development envisaged, it is evident that a phased approach would be required. In part this is due to the timescales required to deliver major infrastructure such as this scheme, but also that development of the Garden Communities would be a long-term process extending over 20 to 30 years.

Subject to Government funding, the scheme would potentially be constructed in the early 2030s with the earliest possible opening date currently estimated as late 2034. Development of the Garden Communities (beyond existing planning consents) is unlikely to start before the late 2020s and could extend to some point in the 2050s. Consideration would therefore be required as to what transport infrastructure improvements would be required prior to 2034 to enable early phases of development to proceed, and potentially what might be required in the 2040s and beyond for the later phases of development.

It is beyond the scope of this document to consider all the transport infrastructure that will be needed in relation to the Garden Communities. However, in relation to the options identified for M5 Junction 9 and the A46, it is possible that infrastructure delivery could be phased as follows. Note this is provided simply as an indication of potential phasing options which would need to be developed formally through the plan making and planning processes for the Garden Communities:

- **2025-2030:** Focus on active travel improvements at M5 Junction 9 and along the A46 to provide a continuous high-quality walking and cycling route which along with other sustainable travel improvements could serve initial phases of Garden Communities development as well as existing communities. This phase may also include targeted highway improvements to address specific pinch-points
- **2030-2035:** Focus on delivery of the new motorway junction and A46 link to Teddington Hands which will divert long-distance traffic from the existing A46 and open up access to Garden Communities development areas from the new A46 Seven Bends junction. This phase could also include further active or sustainable travel improvements along the existing A46 following the diversion of long-distance traffic from the route and its downgrading from a trunk road to a local road
- **2035-2050:** During this phase, it is likely that most of the Garden Communities would be gradually built out. Improvements at the Seven Bends junction may be required to cater for increasing demand from development traffic. An A38 Western Link could be provided at some point to provide an alternative east-west route between Tewkesbury and the new developments south of Ashchurch to provide further traffic relief to the downgraded A46 and A438.