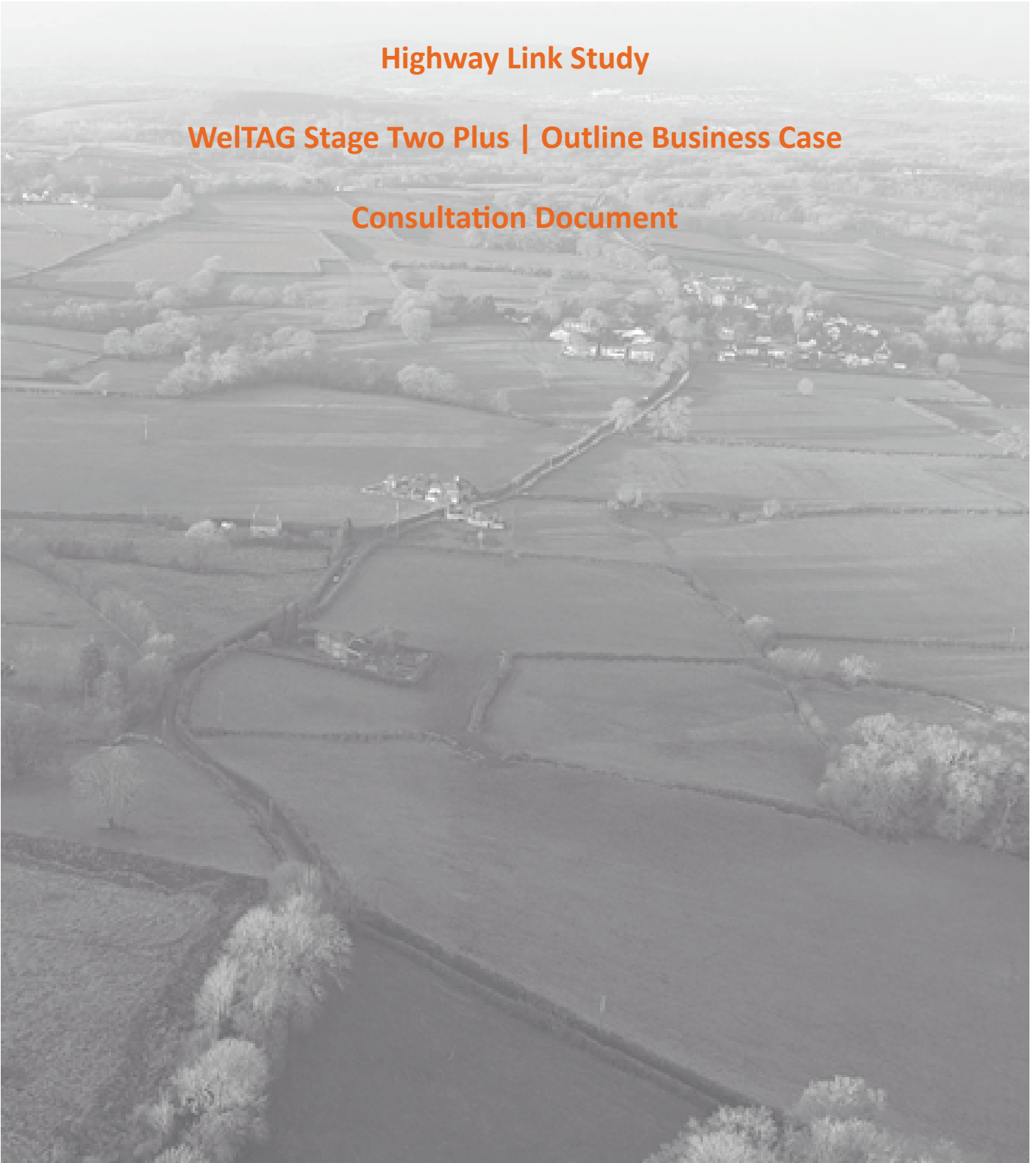


IMPROVING STRATEGIC TRANSPORT ENCOMPASSING CORRIDORS FOR THE M4 JUNCTION 34 TO A48 INCLUDING THE PENDOYLAN CORRIDOR

Highway Link Study

WelTAG Stage Two Plus | Outline Business Case

Consultation Document



INTRODUCING THE STUDY

Welcome to the Consultation


You are invited to consider the potential highway options for improving strategic connectivity in the corridor from M4 Junction 34 to the A48 at Sycamore Cross, which includes Pendoylan. The consultation is an important step in the Welsh Transport Planning and Appraisal Guidance (WelTAG) Stage Two Plus Outline Business Case study which Arcadis Consulting (UK) Limited is undertaking on behalf of the Vale of Glamorgan Council.


The options presented have no status. They have been developed as a basis for consultation. This follows completion of the WelTAG Stage Two study (October 2018) and recommendations made by the Review Group of key stakeholders and the Vale of Glamorgan Council Environment and Regeneration Scrutiny Committee, with endorsement provided by the Council's Cabinet.


The Impacts of Covid-19

As a result of the Covid-19 outbreak in early 2020, the future medium to longer-term implications of Covid-19 at a local, regional, and national level remain extensively unknown and the Stage Two Plus study has not made any assumptions as to the impacts on these scenarios. The appraisal therefore remains based on pre Covid-19 conditions, although future assessment will need to consider any further implications as information, trends and impacts become more widely known and accepted.


The Case for Change: Why are Improvements Needed?


 Cardiff Airport and St Athan Enterprise Zone (EZ) present a strategically important employment opportunity in South Wales. Transport connectivity is a constraint, making it less attractive to both people and investment.


 Transport links across all roads connecting the Vale with the wider Capital Region are experiencing significant congestion and unreliable journey times.


 Improved transport links would support wider capital investment in transport infrastructure in the Cardiff Capital Region, strengthening accessibility to local employment and business opportunities for the areas to the west of Cardiff.

 Surface access to Cardiff International Airport is poor and is constraining route development and passenger numbers.


 Freight access to and from the Vale of Glamorgan is sub-optimal, with issues associated with journey time reliability and routing.


 The Pendoylan corridor from the M4 at Junction 34 to the A48 is of very poor quality with lengthy single-track sections and poor visibility. The route has become a 'rat run' with negative impacts on the communities along the route.

 Public transport and walking and cycling connections in the area and to strategic employment sites are limited. There is a high reliance on the car.

 Improving the transport connectivity of the Vale of Glamorgan is considered necessary to support national, regional and local economic performance.

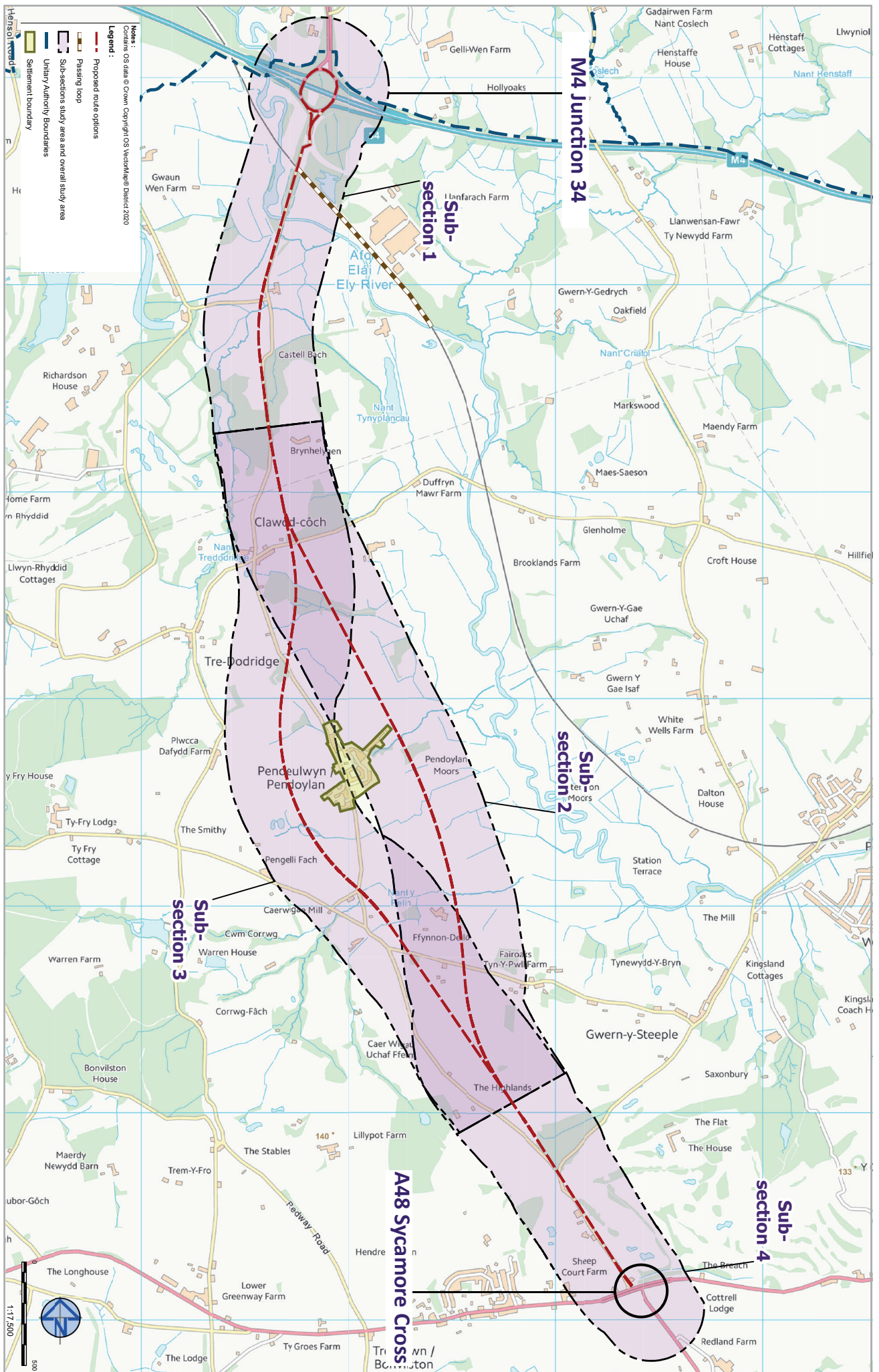
What will Happen if Nothing Changes (the 'Do-Minimum')?

 The existing problems will get much worse with significant forecast increases in traffic on the strategic and local road network and deterioration in the transport network performance and more accidents.

 Transport problems are likely to impact on development aspirations for the area and the attractiveness of the Vale of Glamorgan as a place to work, live and do business.

Link	AM	Inter Peak	PM
1. Pendoylan (minor road)	18%	33%	25%
2. M4 west of Junction 34	33%	42%	32%
3. M4 east of Junction 34	28%	40%	26%
4. A4119	15%	44%	11%
5. M4 east of Junction 33	29%	39%	32%
6. A4232 Link Road	27%	42%	25%
7. A48 east of Sycamore Cross	34%	89%	88%
8. A48 west of Sycamore Cross	25%	31%	18%
9. Five-Mile Lane	46%	151%	80%

Forecast Changes in Traffic Flows between 2015 and 2036 (taken from the South East Wales Transport Model)



WHAT ARE WE TRYING TO ACHIEVE?

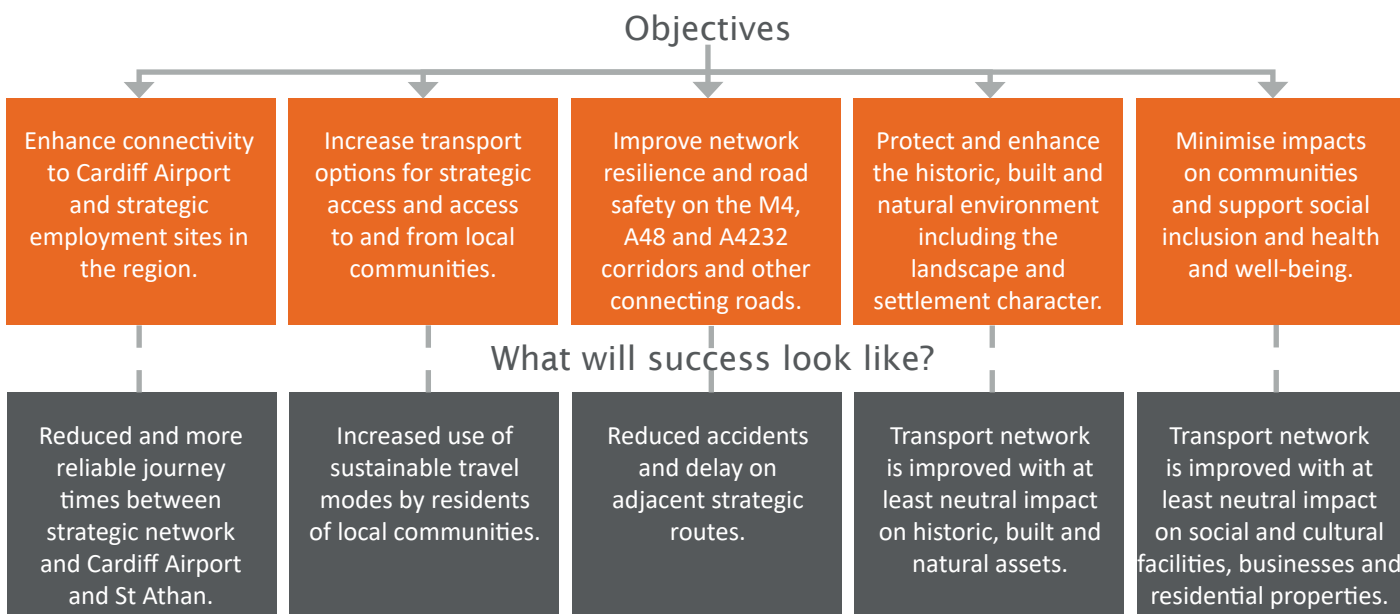
What is WeITAG?

WeITAG is the Welsh Government’s framework for the development, appraisal and evaluation of proposed transport projects in Wales. Any projects requiring public money need to be developed using the process. The five stages of WeITAG are:



WeITAG Stage One Study

A Stage One: Strategic Outline Case was developed in 2017. The study developed objectives to address the identified transport problems and respond to the goals of the Well-being of Future Generations (Wales) Act 2015.



Stage One Recommended Options

Consultation took place on the Stage One study and a long list of options was considered to meet the objectives. In November 2017, the Vale of Glamorgan Council endorsed the recommendation that the following three options should be further investigated in a Stage Two study:

- Highway Option 1 – Highway route east of Pendoylan.
- Highway Option 2 – Highway route west of Pendoylan.
- Gateway (formerly Parkway) Station – a railway station located on the main Cardiff to Bridgend line, with park and ride facility and bus integration near to M4 Junction 34.

Stage Two Plus

A draft Stage Two study was completed in October 2018 following a stakeholder and public consultation exercise, with several recommendations agreed by the project’s Review Group for undertaking in a Stage Two Plus study, including:

- A programme of early stage environmental surveys and investigations.
- More detailed development of the highway link concept designs.
- Completion of Vale of Glamorgan Gateway Station GRIP Stage 1 and GRIP Stage 2 studies.

In July 2019, the Vale of Glamorgan Council endorsed a recommendation for consideration of an additional highway option of improving the existing road infrastructure without the need for a new road bypassing Pendoylan – referred to as the ‘Online’ option. Following consideration of the selected options, it was further recognised that proposals for a Vale of Glamorgan Gateway Station present regional, strategic and sustainable transport opportunities that could be better recognised and scrutinised in isolation from the highway proposals, whilst also allowing a number of rail sub-options to be developed and independently WeITAG assessed. In agreement with Welsh Government, a decision was made by the Vale of Glamorgan Council to separate assessment of the Vale of Glamorgan Gateway Station option from the M4 Junction 34 to A48 highway link options.

DEVELOPMENT OF HIGHWAY OPTIONS

Four highway options have been developed by considering the constraints and seeking to design high standard routes which have the least impact possible on existing communities and the environment. In the Stage Two Plus study, this has led to the further development of an east and west alignment (A & B), and two online options (C1 & C2).

Option A – Highway Route East of Pendoylan Option B – Highway Route West of Pendoylan

Common Design Features

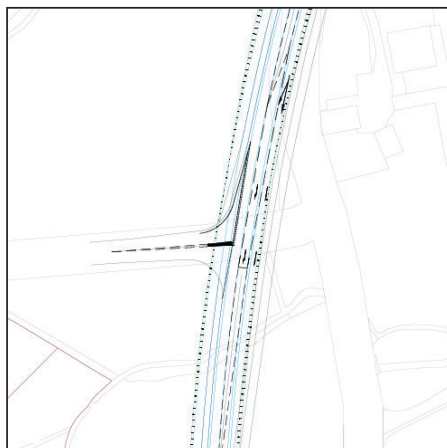
- Single carriageway of national speed limit standard (60mph), with segregated walking and cycling route alongside the carriageway connecting from south of Junction 34 to the A48 at Sycamore Cross.
- The northern and southern sections would involve online improvements to the existing road.
- Accommodation of existing Public Rights of Way.

Access and Junctions

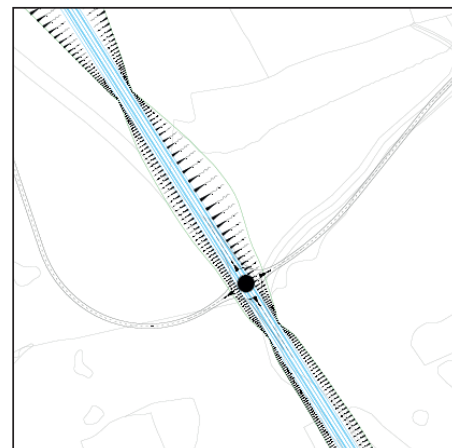
- Access is required from the existing road through Pendoylan onto the new alignment, with junctions needing to be considered to the north (ghost island) and south (roundabout) of Pendoylan village.
- Revised junctions would be needed to provide access to Hensol and Hensol driving range and farm.
- The roundabout option south of Pendoylan village will allow access to Peterston-super-Ely and Gwern-y-Steeple.
- A possible new signalised junction could be provided at Sycamore Cross without the staggered arrangement, which would involve taking some land on the south west side of Five Mile Lane.
- Both options consider closure of two side roads to facilitate the proposed alignments.



Hensol Ghost Island Junction



Ghost Island Junction – North of Pendoylan



Peterston-super-Ely Roundabout - South of Pendoylan

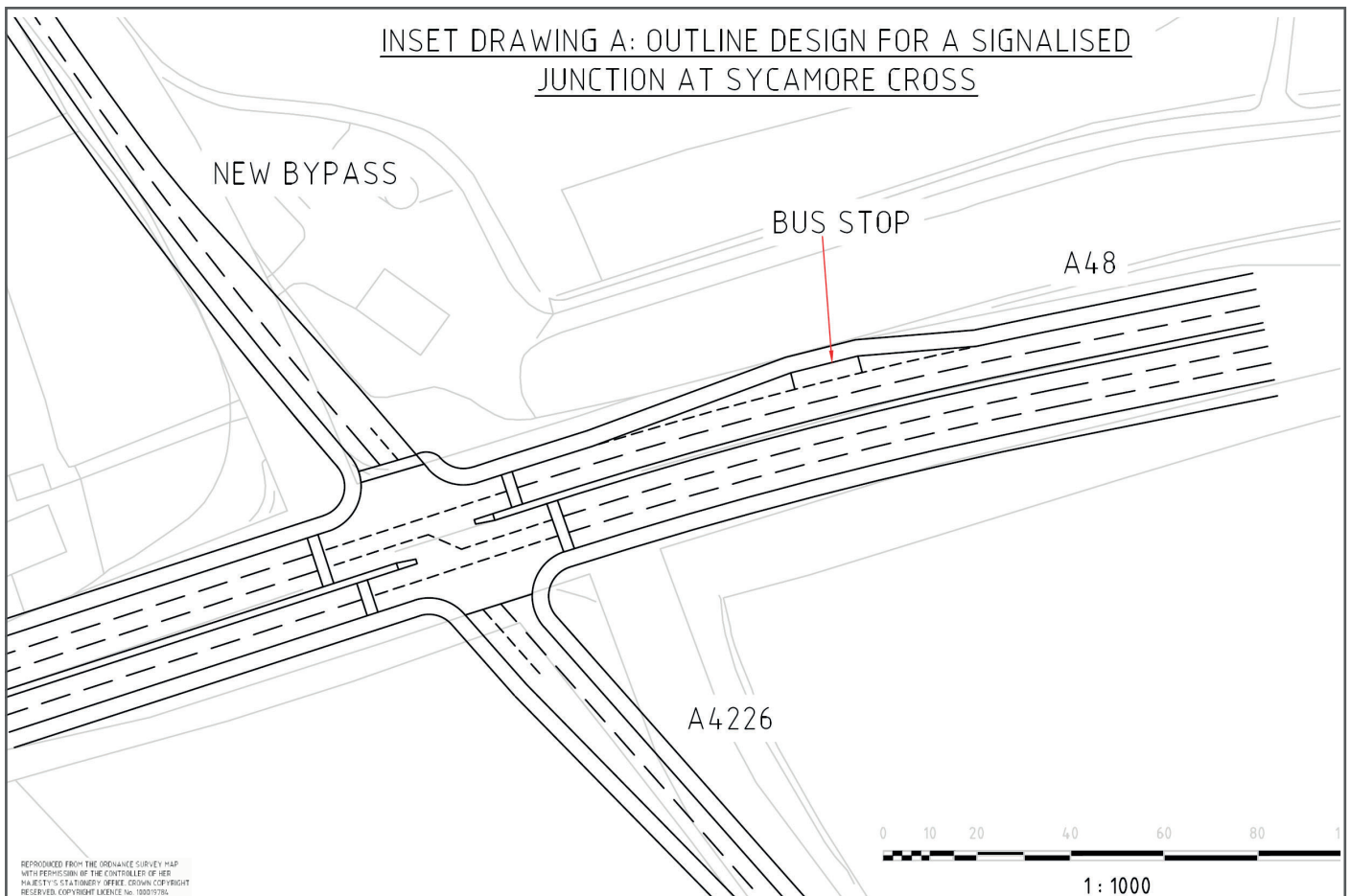
Option C1 – Existing Infrastructure (Online) Enhancement Option C2 – Existing Infrastructure (Online) Enhancement

Common Design Features

- Single carriageway with a 30mph speed limit encompassing improvements to the existing road from south of M4 Junction 34 to the A48 at Sycamore Cross.
- The online options do not include upgrade works through Pendoylan village or Clawdd-Coch as widening would have a significant impact on properties and an existing Conservation Area.
- Access to existing junctions and Public Rights of Way would remain.
- Potential changes are proposed to the Sycamore Cross junction to remove the stagger arrangement.

Access and Junctions

- Access to existing junctions would remain, although there are likely to be some localised impacts on driveways and small farm accesses due to some areas requiring engineering works to achieve a reasonable alignment.
- Option C1 would require more earthworks and have a greater impact on access points to achieve a compliant vertical and horizontal alignment (excluding the section through Pendoylan village and Clawdd-Coch).



Option Costs and Funding

Costs have been estimated for each of the highway options. These costs include technical studies and development costs, design and construction, as well as allowances for statutory undertakers' costs, fees, land compensation, accommodation of access arrangements, risk and optimism bias.

It is assumed that funding for a new road link would need to be met by the Welsh Government with delivery by the Vale of Glamorgan Council. There are no certainties with respect to funding sources for the highway options at present.



HIGHWAY OPTION A: EASTERN ROUTE

Highway Option A is an eastern alignment that would connect from just south of Junction 34 of the M4 to the A48 at Sycamore Cross. The northern and southern sections would involve online improvements. The remainder of the route between these two junctions would be offline and bypass Pendoylan to the east of the village.

Key Features

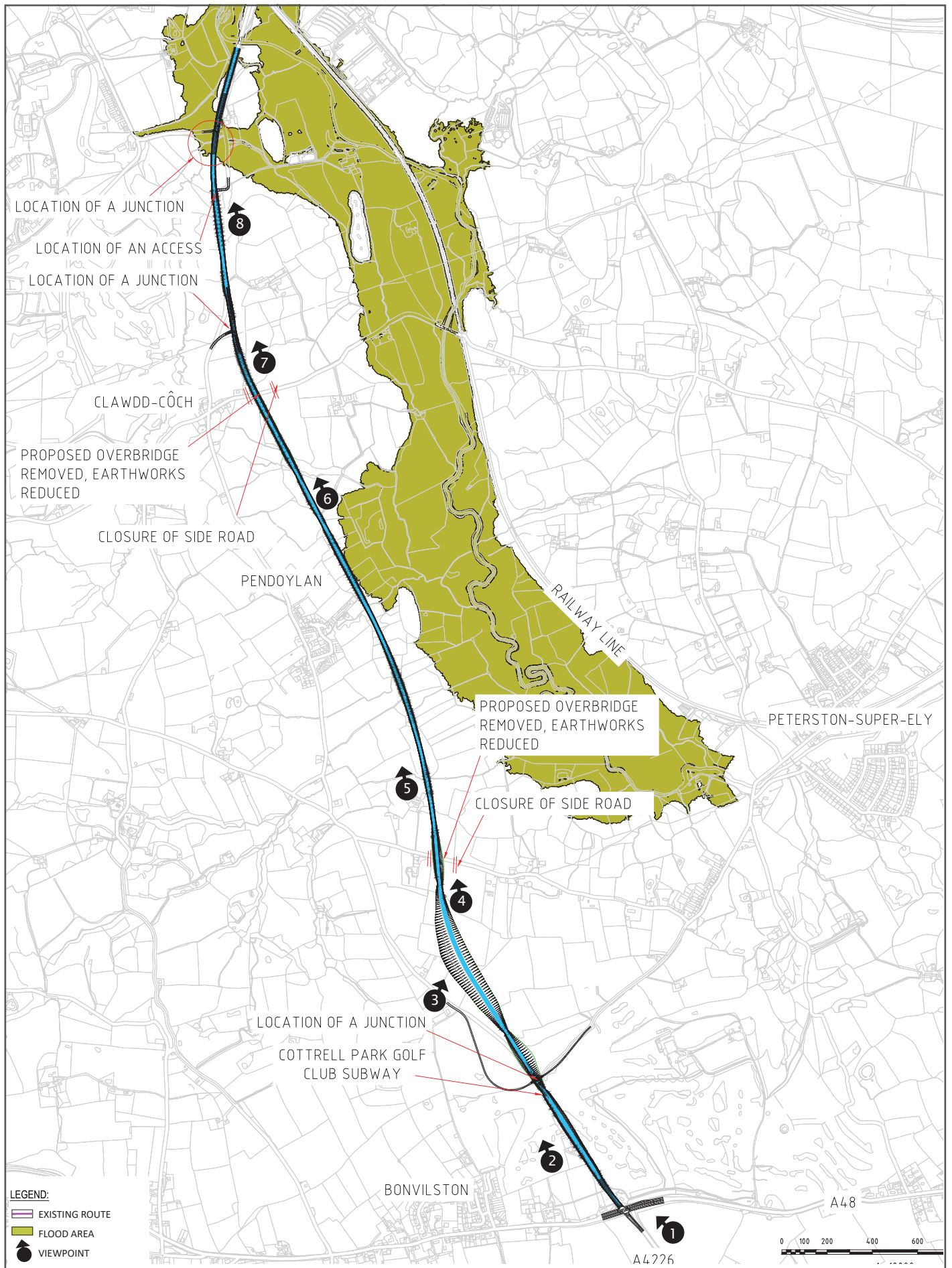
Length of New Bypass	Cut and Fill Balance	Public Rights of Way Impacts	No. of Structures	Length of Floodplain Affected	Total Cost
5,560m	Disposal of 396,500m ³	3 Bridges 1 Culvert	0	100m	£76.844M

Key Issues

- The route would by-pass the existing communities of Pendoylan and Clawdd Coch.
- The environmental impacts are broadly similar between the eastern and western routes, although slight differences have been identified that suggest the western alignment would establish less of an impact on the environment. In comparison to the western route, the eastern route has:
 - A greater potential ecological impact due to the slightly higher number of SINCs, larger area of species-rich Marshy grassland (likely to be classed as a Priority Habitat) and greater number of hedgerows likely to be impacted.
 - A greater potential impact on cultural heritage encompassing extant historic landscape features and the setting of designated heritage assets, whilst also potentially impacting on existing medieval strip fields and a greater number of key views from the Pendoylan Conservation Area.
 - Less favourable ground conditions being Alluvium rather than more favourable Glacial Till on the western route.
- There would be some impacts on Ancient Woodland, although the alignment seeks to minimise impacts.
- Development proposals are likely to affect protected species located along the route.
- Buried archaeological features have the potential to add time and cost to any scheme and may impact on route alignments.

Note – the original WelTAG Stage Two consultation outlined that the eastern route would likely be affected by the River Ely floodplain to the east of Pendoylan based on flood data available at that time. However, following completion of an early stage flood assessment as part of the Stage Two Plus study, this confirmed that the majority of the eastern route is not adversely affected with a floodplain interface comparable to the western route option and the two online options.

HIGHWAY OPTION A: EASTERN ROUTE





① A48 Sycamore Cross



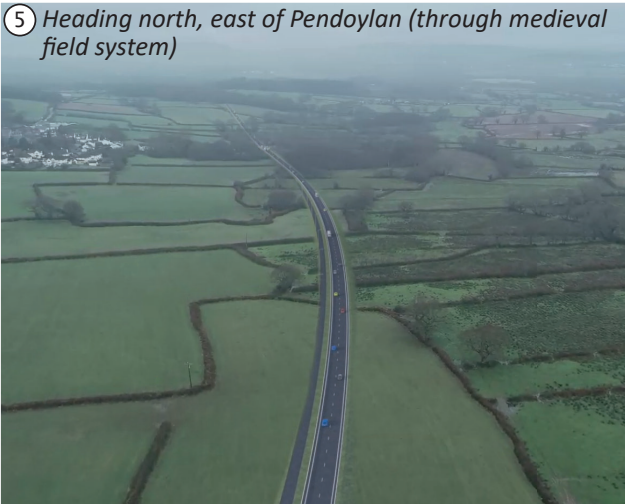
② Peterston-super-Ely Roundabout Junction



③ Cutting north of Roundabout



④ Location of road closure south of Pendoylan



⑤ Heading north, east of Pendoylan (through medieval field system)



⑥ East of Clawdd-Coch



⑦ Ghost Island Junction north of Clawdd-Coch (connecting to existing Pendoylan road)



⑧ Hensol Golf Academy Access (right) and Hensol Ghost Island Access (left)

HIGHWAY OPTION B: WESTERN ROUTE

Highway Option B is a western alignment that would connect from just south of Junction 34 of the M4 to the A48 at Sycamore Cross. The northern and southern sections would involve online improvements. The remainder of the route between these two junctions would be offline and bypass Pendoylan to the west of the village.

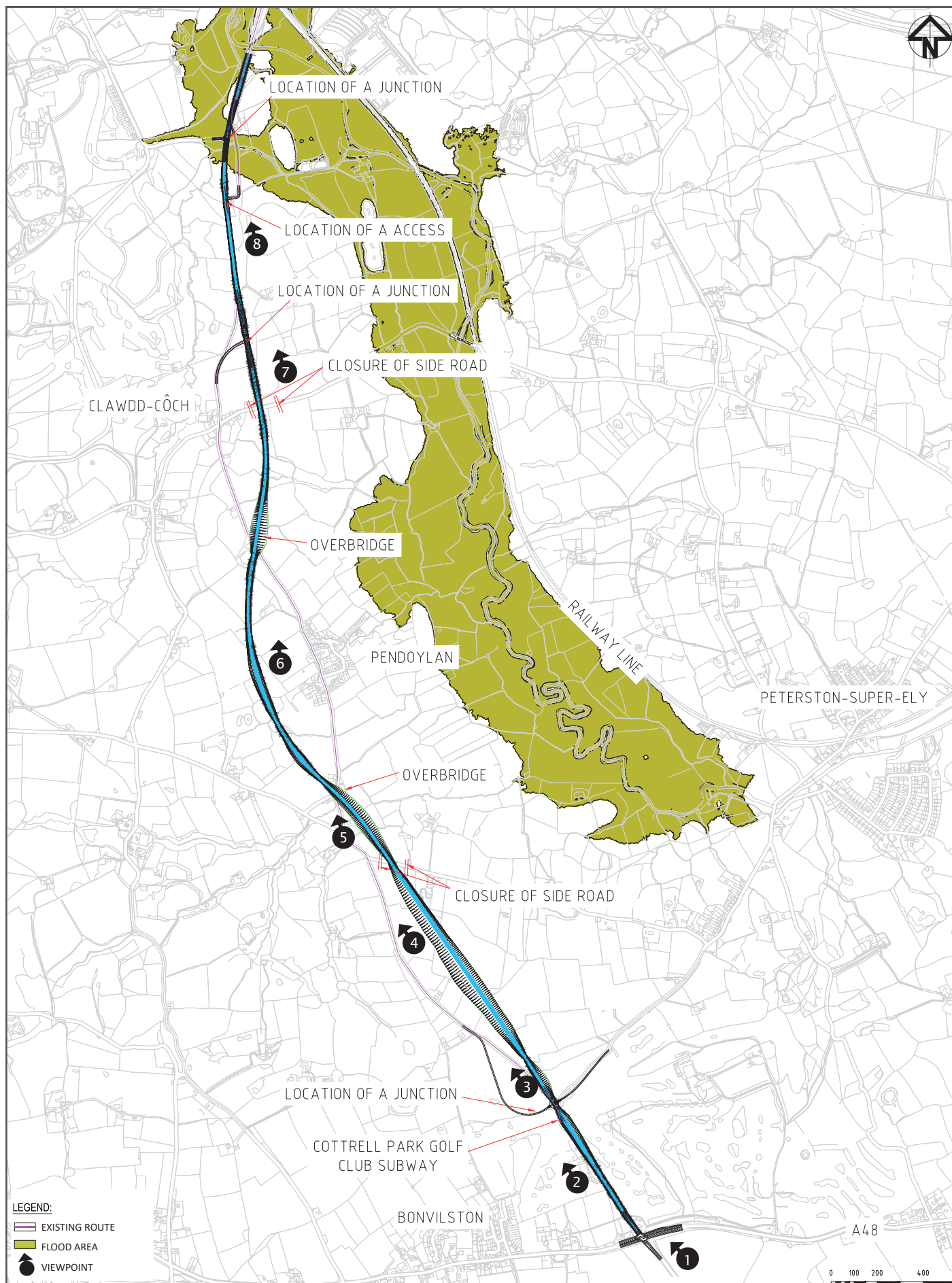
Key Features

Length of New Bypass	Cut and Fill Balance	Public Rights of Way Impacts	No. of Structures	Length of Floodplain Affected	Total Cost
5,691m	Disposal of 318,000m ³	1 Bridge 3 Culverts	2	100m	£66.332M

Key Issues

- The route would by-pass the existing communities of Pendoylan and Clawdd Coch.
- The environmental impacts are broadly similar between the eastern and western routes, although slight differences have been identified that suggest the western alignment would establish less of an impact on the environment. In comparison to the eastern route, the western route has:
 - Less of a potential ecological impact due to the slightly lower number of SINCs, smaller area of species-rich Marshy grassland (likely to be classed as a Priority Habitat) and lesser number of hedgerows likely to be impacted.
 - Less of a potential impact on cultural heritage encompassing extant historic landscape features and the setting of designated heritage assets.
 - More favourable ground conditions being Glacial Till rather than less favourable Alluvium on the eastern route.
- There would be some impacts on Ancient Woodland, although the alignment seeks to minimise impacts, to the edges of woodlands.
- Development proposals are likely to affect protected species located along the route.
- Buried archaeological features have the potential to add time and cost to any scheme and may impact on route alignments.

HIGHWAY OPTION B: WESTERN ROUTE



① A48 Sycamore Cross



② Peterston-super-Ely Roundabout Junction



③ Cutting north of Roundabout



④ Location of road closure south of Pendoylan



⑤ Road bridge #1 over existing road – south of Pendoylan



⑥ Road bridge #2 over existing road – north of Pendoylan towards Clawdd-Coch



⑦ Ghost Island Junction north of Clawdd-Coch (connecting to existing Pendoylan road)



⑧ Hensol Golf Academy Access (right) and Hensol Ghost Island Access (left)



HIGHWAY OPTION C1: ONLINE ROUTE

Highway Option C1 is an online alignment that involves improvements to the existing road from south of Junction 34 of the M4 to the A48 at Sycamore Cross, excluding a section of highway through Pendoylan village and Clawdd-Coch due to the Conservation Area (Pendoylan only) and community constraints.

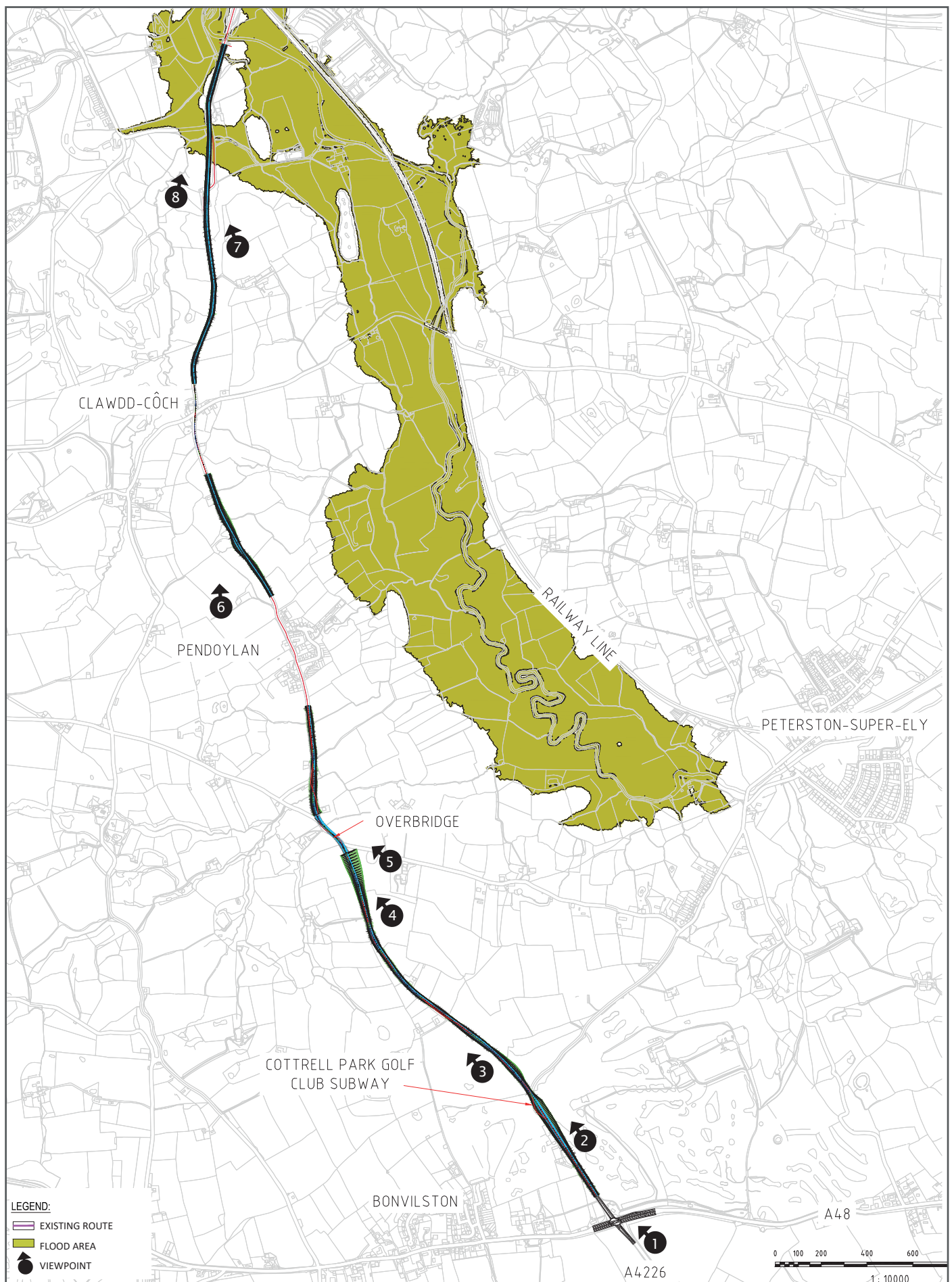
Key Features

Length of New Bypass	Cut and Fill Balance	Public Rights of Way Impacts	No. of Structures	Length of Floodplain Affected	Total Cost
5,107m	Import 96,000m ³	0	1	100m	£59.844M

Key Issues

- The online option has been developed with a 30mph design speed to achieve a DMRB compliant design for all new sections of road.
- The option excludes upgrade works through Pendoylan village and Clawdd-Coch as widening would have a significant impact on properties and, with regard to Pendoylan, the Conservation Area. These sections would therefore remain non-compliant with DMRB highway design standards.
- The gradient at the southern end of the existing road is very steep. Option C1 can achieve a gradient of 8% (representing the maximum relaxation without becoming a departure from design standards).
- The steep gradient does create a significant volume of earthworks, increasing the footprint with a subsequent impact on the landscape.
- There would be a significant impact on the hedgerows adjacent to the existing Pendoylan road to accommodate the improvements. It is likely that over the length of the new road sections, both sides of the hedge would need to be removed to allow for construction.
- There would be substantial impacts during construction, both to the users of the existing Pendoylan road and to residents/business owners within Pendoylan itself. Extensive diversion routes would be required to allow for construction, which would likely be in place for a significant length of time.
- There is potential for protected species to be located along the route.
- Buried archaeological features have the potential to add time and cost to any scheme and may impact on route alignments.

HIGHWAY OPTION C1: ONLINE ROUTE





① A48 Sycamore Cross



② Peterston-super-Ely Junction



③ Heading north towards Pendoylan



④ South of Pendoylan #1



⑤ South of Pendoylan #2



⑥ North of Pendoylan, approaching Clawdd-Coch



⑦ Approaching Hensol Junction



⑧ Hensol Junction and access to Hensol Golf Academy

HIGHWAY OPTION C2: ONLINE ROUTE

Highway Option C2 is an online alignment that encompasses improvements to the existing road alignment from south of Junction 34 of the M4 to the A48 at Sycamore Cross, excluding a section of highway through Pendoylan village and Clawdd-Coch. This design has been established to stay as close to the existing road levels as possible and minimise earthworks. As a consequence, the alignment remains broadly non-compliant to DMRB highway standards.

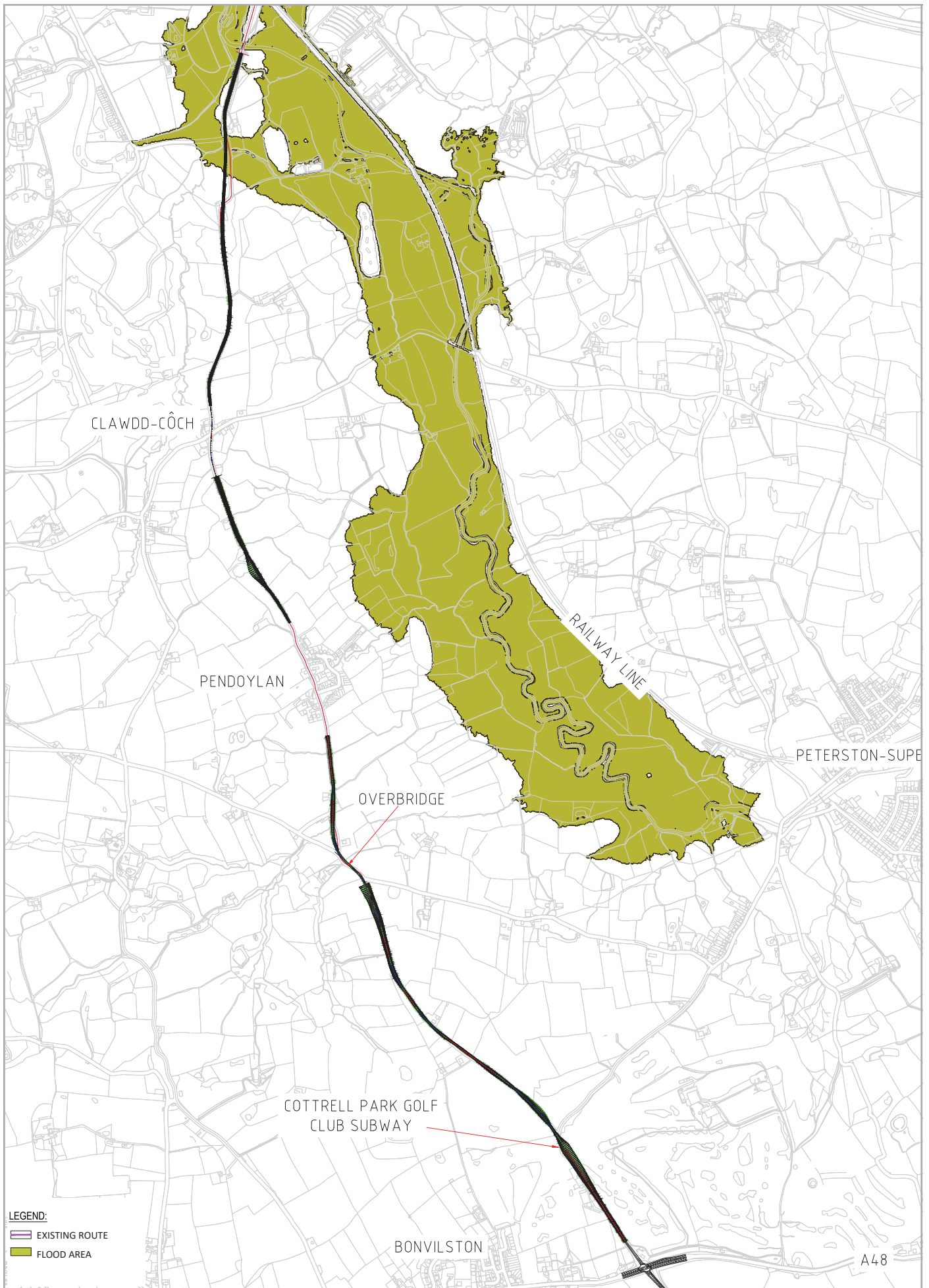
Key Features

Length of New Bypass	Cut and Fill Balance	Public Rights of Way Impacts	No. of Structures	Length of Floodplain Affected	Total Cost
5,107m	Disposal of 77,000m ³	0	1	100m	£40.513M

Key Issues

- Despite Option C2 being designed to a 30mph design speed, the proposal remains non-compliant with DMRB design standards due to the horizontal and vertical alignment of the existing road and would therefore raise issues regarding road safety compliance.
- The option excludes upgrade works through Pendoylan village and Clawdd-Coch as widening would have a significant impact on properties and, with regard to Pendoylan, the Conservation Area. These sections would therefore remain non-compliant with DMRB highway design standards.
- The improved road sections do not include a segregated walking and cycling route alongside the carriageway.
- The gradient at the southern end of the existing road is very steep. In an attempt to stay as close to the existing road levels as possible, Option C2 can only achieve a gradient of 11.83%, significantly above the 8% maximum threshold and therefore well below standard.
- There would be a significant impact on the hedgerows adjacent to the existing Pendoylan road to accommodate the improvements. It is likely that over the length of the new road sections, both sides of the hedge would need to be removed to allow for construction.
- There would be substantial impacts during construction, both to the users of the existing Pendoylan road and to residents/business owners within Pendoylan itself. Extensive diversion routes would be required to allow for construction, which would likely be in place for a significant length of time.
- There is potential for protected species to be located along the route.
- Buried archaeological features have the potential to add time and cost to any scheme and may impact on route alignments.

HIGHWAY OPTION C2: ONLINE ROUTE



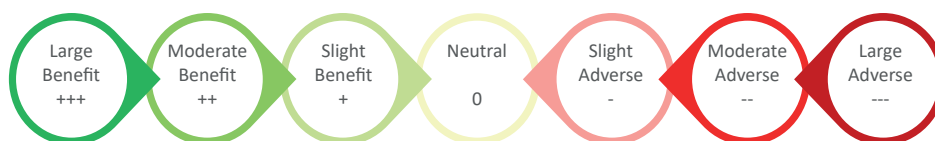
HIGHWAY DESIGN: SUMMARY OF OPTIONS

Element	Option A Highway Route East of Pendoylan	Option B Highway Route West of Pendoylan	Option C1 Existing Infrastructure (Online) Enhancement	Option C2 Existing Infrastructure (Online) Enhancement
Design Speed	60mph	60mph	30mph	30mph
Bypass Pendoylan	To the east	To the west	N/A	N/A
Carriageway Width	7.3m	7.3m	7.3m	6.0m
Length of Proposed Carriageway	5,560m	5,691m	5,107m	5,107m
Segregated Walking/ Cycling Route	Yes	Yes	Yes	No
Earthworks – Cut and Fill Balance	Disposal of 396,500m ³	Disposal of 318,000m ³	Import 96,000m ³	Disposal of 77,000m ³
Public Right of Way Impacts	3 Bridges 1 Culvert	1 Bridge 3 Culverts	0	0
No of Structures	0	2	1	1
Archaeology Affected	0	0	0	0
Length of Floodplain Affected	100m	100m	100m	100m
Ancient Woodland Affected	4 Areas	4 Areas	3 Areas	3 Areas
Tree Preservation Orders Affected	0	1	2	2
Current Day Construction Cost	£41.017M	£34.370M	£28.969M	£16.976M
Current Day Total Scheme Cost	£76.844M	£66.332M	£59.844M	£40.513M

IMPACTS, BENEFITS & VALUE FOR MONEY

What are the Impacts of Each Option?

The study has assessed the options against the positive and negative impacts on people, culture, the environment and the economy.

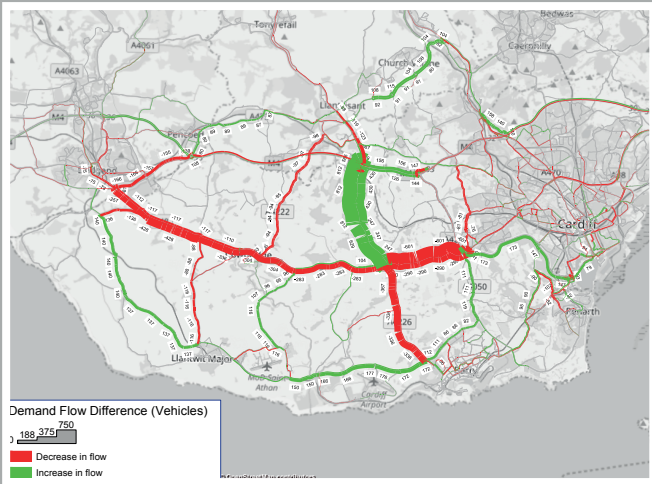


Impact	Do-Minimum (2036 Scenario)	Option A Highway Route East of Pendoylan	Option B Highway Route West of Pendoylan	Option C1 Existing Infrastructure (Online) Enhancement	Option C2 Existing Infrastructure (Online) Enhancement
Social					
Physical Activity	-	+	+	+	0
Journey Quality	-	+++	+++	++	+
Accidents	-	++	++	+	0
Security	0	++	++	+	+
Access to Employment	-	++	++	+	+
Access to Services	-	++	++	+	+
Affordability	-	0	0	0	0
Severance	0	+	+	-	-
Option and Non-Use Values	-	++	++	+	0
Cultural					
Cultural Facilities	-	++	++	+	+
Welsh Language	0	0	0	0	0
Environment					
Noise	0	-	-	-	-
Air Quality	0	-	-	-	-
Greenhouse Gases	0	+	+	0	0
Landscape	0	--	--	--	--
Townscape	0	0	0	0	0
Historic Environment	0	-	-	-	-
Biodiversity	0	--	--	-	-
Water Environment	0	-	-	-	-
Residential Amenity	0	--	--	--	--
Economic					
Journey Time Changes	-	+++	+++	++	+
Journey Time Reliability Changes	-	++	++	+	+
Transport Costs	-	++	++	+	+
Wider Economic Impacts	-	++	++	+	+
Land and Property	0	--	--	--	--
PVB	N/A	£151.295M	£151.295M	N/A	N/A
PVC	N/A	£50.376M	£43.413M	N/A	N/A
NPV	N/A	£100.919M	£107.882M	N/A	N/A
BCR	N/A	3.00	3.49	N/A	N/A

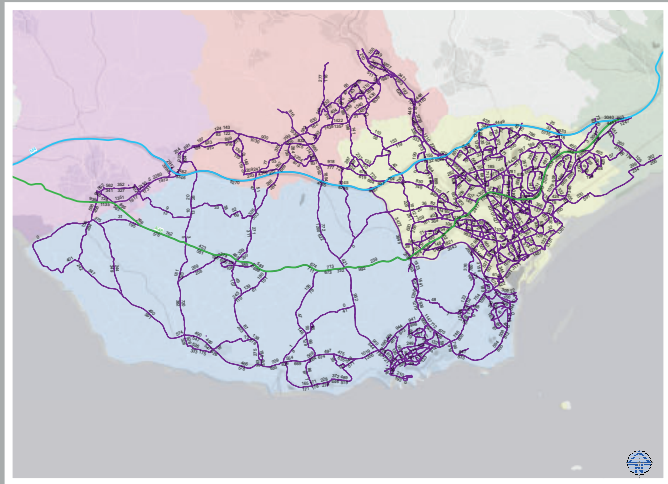
Online options C1 and C2 are considered to perform less favourably than the eastern and western alignments in respect of the economic, social and cultural criteria. With respect to the environment, the online options perform better than the offline options for biodiversity. Option C2 is the least beneficial in terms of social and economic criteria and is not compliant with DMRB highway standards.

Economic Benefits

We have used the South-East Wales Transport Model (SEWTM) to calculate scheme benefits of a new route (either east or west). The forecast traffic for the PM peak (highest peak) in 2036 presents considerable changes across the road network. We would expect benefits to increase with refinements to modelling in a Stage Three study removing the stagger in the A48 Sycamore Cross junction, improving M4 Junction 34 and considering wider economic impacts. This work was done for the Stage Two Study and is intended to be updated for a Full Business Case if an option is taken forward. It allows for a comparison of options.



Forecast change in traffic flows for the PM Peak 2036



Forecast traffic flows for the PM peak 2036

Value for Money

Model flows, journey times and user benefits for the base and future year has enabled Arcadis to undertake a Cost Benefit Analysis and to examine the value for money of each option.

The benefits for the eastern and western alignments have been assumed to be the same with the only difference being introduced with the costs.

The online Options C1 and C2 have not been tested using the SEWTM and thus the comparable benefits are not available. However, the accident and journey time benefits are anticipated to be substantially lower than for Options A and B given the lower standard of the route and the 30mph design speed throughout.

On the basis of greatest economic advantage, Option B (Highway Route West of Pendoylan) is the best performing option, although it is recognised that economic performance is only one of the elements which must be considered in decision making.

With regard to the online options, the overall economic benefits are subsequently considered to be not as high given the lower design speed for both options (30mph) adversely impacting on journey times, and the retention of non-compliant DMRB sections throughout both options impacting on journey time reliability.

Highway Route Option	Benefit to Cost Ratio (BCR)	Net Present Value (NPV)
Option A Eastern Route	3.00	£101m
Option B Western Route	3.49	£108m

FEEDBACK & NEXT STEPS

Thank you for your time.

The closing date for all responses is **23rd December 2020**.

The information panels displayed online will remain accessible via the Vale of Glamorgan Council Website: www.valeofglamorgan.gov.uk/M4J34toA48

Your feedback is important to us, and we would encourage you to please leave comments to inform the conclusions of the WelTAG Stage Two Plus study. This can be done by completing an online feedback form, sending us an email using the following address:

Junction34Transportstudyconsultation@valeofglamorgan.gov.uk, or contacting us by phone on 01446 700111.

Feedback Form

M4 Junction 34 to A48 WelTAG Stage Two Plus | Highway Link Study

Arcadis has been commissioned by the Vale of Glamorgan Council to develop and appraise potential options for improving the strategic transport network encompassing corridors from M4 Junction 34 to the A48 (Five Mile Lane) including the Pendoylan Corridor. We are currently assessing four potential highway options to improve transport connectivity. Please spend a few minutes of your time to complete this feedback form.

1. Please can you give us your opinion for implementation of the following options.
Please tick ONE rating for each option.

Option	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Do Minimum No change – maintain the existing highway network					
Option A Highway Route East of Pendoylan					
Option B Highway Route West of Pendoylan					
Option C1 Existing Infrastructure (Online) Enhancement					
Option C2 Existing Infrastructure (Online) Enhancement					

2. Please can you provide the reason(s) for your choices to Question 1.
Tick all that apply.

Reason	Do Minimum No change – maintain the existing highway network	Option A Highway Route East of Pendoylan	Option B Highway Route West of Pendoylan	Option C1 Existing Infrastructure (Online) Enhancement	Option C2 Existing Infrastructure (Online) Enhancement
Environmental impacts					
Impacts on property					
Improved transport journey					
Reduced impact on community					

Other (please explain):
.....

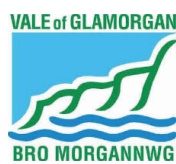
The closing date for all responses is **23rd December 2020**

Next Steps

Following your feedback, we will be reporting back to the Study Review Group, who will consider the report and recommend what should happen next to the Vale of Glamorgan Council.

If one or more of the options go forward, and there is funding available, the next stage will be the preparation of a Full Business Case (WelTAG Stage Three).

The purpose of Stage Three is to make a full and detailed assessment of the preferred option to inform a decision as to whether or not to proceed to implementation.



Improving Strategic Transport Encompassing Corridors for the M4 Junction 34 to A48 Including the Pendoylan Corridor

WelTAG Stage Two Plus | Outline Business Case