

A30 Chiverton to Carland Cross TR010026

7.7 ROUTE SELECTION REPORT

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(Applications: Prescribed Forms and
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**A30 Chiverton to Carland Cross
Development Consent Order 2018**

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1. Introduction

This report explains the methodology and rationale for selecting the preferred option from the better performing alternatives that emerged from non-statutory public consultation events held in autumn 2016 and the information event in February 2017. It supports the summary information presented in the Scheme Assessment Report.

Chapter 2 gives a brief explanation of the background and summarises the work done in producing the Report on Public Consultation. It concludes by listing the better performing alternatives that were recommended for further assessment.

Chapter 3 provides a description of the methodology used to select a preferred route. It explains how a decision was reached by comparing many disparate factors, including impacts associated with government policies and views expressed during the consultation.

Chapter 4 explains the further work done post consultation to augment the information that had been available at public consultation. This includes further understanding of environmental effects as more data was collected, updated cost estimates of the options and further buildability assessment.

Chapters 5 to 8 provide details of the salient issues at each location where there is a selection to be made and explains the rationale for the selection. At each location, the salient issues are distilled from a framework of many factors including costs, benefits and impacts on people and the environment. Chapters 5 to 8 also record the crucial judgements used in taking a decision.

Chapter 9 summarises the reasons each option was selected for each location and recommends a preferred option.

2. Background

Investigation and assessment of the current scheme began in 2015, following inclusion in the Road Investment Strategy for the road period 2015 to 2020. Cornwall Council carried out a public engagement exercise in March 2015, to gather views from the local community on what worked well with the current road layout and what could be improved. This feedback helped inform the strategy and shaping of the scheme.

Following completion of the option identification stage, non-statutory public consultation events were held between 15th October 2016 and 2nd December 2016. These events were widely attended and almost 700 responses were received via online survey, by return of the printed exhibition booklet, or in the form of letters and emails. Of those who responded, 95% agreed that the stretch of the A30 between Chiverton and Carland Cross needs improvement.

Analysis of the consultation responses, and general feedback from the local community, led to consideration being given to a number of suggested alternatives. The Public Consultation Report discusses these alternatives and discounts several. This report focuses on the better performing alternatives recommended for further assessment, which were:

- **Chiverton Cross**
 - Grade separated single gyratory close to existing junction (west) as shown on drawing HA551502-WSP-HGN-0000-DR-D-00041
 - Grade separated single gyratory at consultation location (east) as shown on drawing HA551502-WSP-HGN-0000-DR-D-00042
- **Chybucca**
 - Partially “on-line” alignment as shown on drawing HA551502-WSP-HGN-0000-DR-D-00046
- **Marazanvose**
 - Southern alternative, with local route on existing A30 as shown on drawing HA551502-WSP-HGN-0000-DR-D-00048
 - Northern option 1, with local route on existing A30 through Marazanvose as shown on drawing HA551502-WSP-HGN-0000-DR-D-00047
 - Northern option 2, with diverted local route to the north of the new dual carriageway as shown on drawing HA551502-WSP-HGN-0000-DR-D-00052
- **Carland Cross**
 - Remove the existing A30 through the “barrow group” that includes Warren’s Barrow and divert local route north of the new dual carriageway with dedicated westbound merge from the southern roundabout as shown on drawing HA551502-WSP-HGN-0000-DR-D-00051

The drawings referred to above are provided in Appendix A.

For some of the above locations, the merits or otherwise of additional alternative arrangements or variations were discussed as part of the optioneering process. This sometimes included the height and form of infrastructure, junction design and alignment.

The main purpose of PCF Stage 2 is to arrive at a recommended preferred route, following consultation with the public and stakeholders.

3. Assessment Methodology

This chapter describes the process used to select the preferred option and follows the process of detailed assessment of all competing alternatives arising from the informal public consultation events. Crucial in the process was the convening of an option selection workshop so that all project disciplines were able to represent the disparate issues that had to be weighed.

The process was formed of the following stages:

1. Prior to the option selection workshop:

- Each option for each element of the scheme was developed so that there was a like-for-like comparison in terms of scale, quantum and purpose for example. Each option was clearly identified as a discrete option i.e. that there is a real choice to be made.
- Each project discipline reviewed each option and summarised the assessed impacts in a comparison table, such that the likely impacts and effects of each option are understood (refer to Appendix B). At this stage, it was not necessary to draw out comparisons in the table. It was, however, important to describe the impacts and effects in recognisable qualitative and quantitative terms.
- From analysis of each discipline summary assessment of each option, key risk areas were identified for sharing with the workshop group. These key risks were on areas where, if the wrong selection is made, then there was most risk of refusal of the scheme following a future application for Development Consent. Conversely, where positive outcomes could be achieved then these were also to be identified for assessment.
- The National Policy Statement for National Networks (NPSNN) provides the framework for balancing the relative impacts of each generic impact. Highways England's Guidance Note on Legal and Policy Tests (April 2016) states that policy and legal tests set out in the NPSNN must carry exceptional weight as opposed to equal balance with other options sifting criteria.

2. At the option selection workshop:

- The workshop had drawings of each option assessed and access to the comparison table. Each element was dealt with in turn. The impacts for each option were described by each representative so that there was a common understanding of all salient issues. Such issues were included in the workshop notes.
- Knowing the extent of the difference of an impact or effect depended on the level of assessment and information available at the time. In some cases, without formal assessment, it was still possible to use professional judgement based on experience of similar projects to make comparisons. The opinion of stakeholders and the public also informed the choice of alignment so long as the public opinion was based on a material planning considerations (for example, views and property values are not material considerations).

- Once all salient topics had been listed for each option, then there was a process of pairwise comparison. This consisted of: two options being compared; advantages and disadvantages listed; and conclusions reached on which option was to be carried forward for comparison with any further option. This pairwise comparison process was repeated until a preferred option emerged. This method of comparing options is described in Paragraph 4.5 of TA 30/82 DMRB Volume 5, Section 5.
- The methodology recognises the preferred choice is unlikely to be superior in every respect to the discarded options and so professional judgement is required to balance those factors. The final selection process is therefore one of judging between a number of disparate factors; the NPSNN providing guidance on what is most important, along with the need to comply with relevant legislation.
- The preferred route was then the combination of the preferred option for each location for which alternatives were proposed, plus the sections of the route which were consulted on (Option 6B), for which no alternative was identified following the public consultation.

3. After the options selection workshop

- For each element, the recorded advantages and disadvantages have been incorporated into both this and the Scheme Assessment Report, including impacts, NPSNN policy compliance, relevant legislation, Highways England's Delivery Plan targets and scheme objectives.

4. Post Consultation Development

Further development work undertaken on the alternatives included:

- 3D modelling of realigned sections of new dual carriageway, junctions and side roads
- Ecological surveys
- Landscape assessment
- Scheme (options) cost estimate update (prepared independently by Highways England's Commercial Services)
- Land and compensation cost estimate update (prepared by the District Valuer)
- Refinement of traffic models used for the assessment of junctions
- Third party review by Skanska of the buildability issues associated with online options; including the use of the existing underbridge at Twobarrows and the positioning of the new Chiverton junction
- Stakeholder engagement at the Value Management Workshop 2B held on 27 January 2017

Assessment was then carried out in accordance with the methodology described in Chapter 3.

5. Route Selection – Chiverton Cross

The consultation option provides for a full movement grade-separated junction, constructed 600m east of the existing roundabout, in a ‘dumbbell’ arrangement (two roundabouts either side of the main carriageway connected by a single carriageway link road).

Concerns with this solution include:

- The proposed dumbbell arrangement was judged to pose a risk to future operation and would not be capable of supplementary improvement if traffic flows increased above the modelled flows. An alternative ‘single gyratory’ solution was considered.
- The new dual carriageway would be raised above existing ground level, passing over the new junction on a raised embankment and underbridge. An alternative arrangement, to lower the new dual carriageway into the landscape, with the junction and side roads taken over the dual carriageway on raised embankments and an overbridge was considered.
- The proposed off-line siting of the new junction was perceived to be too remote from the existing desire lines. An alternative layout was developed to the west to reduce the diversion route for north-south traffic. Both overbridge and underbridge options were considered.
- Concerns raised by Historic England regarding the impact of introducing significant amounts of road infrastructure on the setting of several Grade II listed assets and a tumuli group, designated as Scheduled Monuments.
- Concerns raised by Cornwall Council’s landscape team regarding the landscape and visual impact of Option 6B.

To address these concerns, alternatives to the consultation option considered for further assessment include:

- A grade separated (both overbridge and underbridge) single gyratory junction close to existing junction (west – ‘on-line’)
- A grade separated (both overbridge and underbridge) single gyratory junction at consultation location (east – ‘off-line’)

The new dual carriageway follows a common horizontal alignment through this section for both the consultation and alternative junction layouts.

Pairwise comparison between options was undertaken at the option selection workshop held over two days on 28th February and 2nd March 2017.

Table 5-1: Pairwise comparison of single gyratory options at consultation location

Single gyratory at consultation location with overbridges	Single gyratory at consultation location with underbridges	Conclusions
<p>One step below visibility results in a departure from standard.</p> <p>Concerns raised by Cornwall Council's landscape team and Historic England about the overall height of infrastructure as a result of overbridges adversely impacting on heritage assets, sensitive viewpoints and the surrounding countryside.</p>	<p>Provides optimal vertical alignment of the new carriageway</p>	<p>The single gyratory with underbridges would have reduced environmental impact, in particular for cultural heritage and landscape.</p> <p>This is in line with the criteria for good design in the NPSNN, which states that a good design will be one that sustains improvements to operational efficiency for as many years as is practicable, whilst minimising adverse impacts (for example to the environment) (NPSNN Paragraph 4.31).</p> <p>It also aligns with the views of Historic England, which has stated that it would prefer solutions at Chiverton that are designed to last, to avoid future additional harm to cultural heritage in the area.</p> <p>Carry forward single gyratory at consultation location with underbridges.</p>

Table 5-2: Pairwise comparison of single gyratory options at existing junction location

Single gyratory close to existing junction with overbridges	Single gyratory close to existing junction with underbridges	Conclusions
<p>Requires a mainline vertical curve which is one step below the desirable minimum standard (K = 100). This is unavoidable on western side of junction. Slips may be moved on eastern side to improve geometry.</p> <p>Would be three to four times more difficult to construct than Option 6B.</p> <p>Some dwellings at Chiverton would experience less noise.</p>	<p>Level of gyratory some 4m below existing ground and therefore into rock-head. Excessive noise during excavation.</p> <p>Would be five times more difficult to construct than Option 6B.</p> <p>Drainage of the gyratory below ground level will be challenging with long outfalls necessary</p>	<p>Both options would be extremely difficult to build whilst maintaining existing traffic flows and turning movements.</p> <p>Both options require additional bridge at Trevisson to bring A3075 Newquay traffic onto existing A30.</p> <p>Carry forward single gyratory close to existing junction with overbridges as this is slightly less difficult to build, although requiring Departures from Standard. Journey times across and onto the A30 would be less than at present.</p>

Table 5-3: Pairwise comparison of gyratory close to existing junction with gyratory at consultation layout

Single gyratory close to existing junction with overbridges	Single gyratory at consultation location with underbridges	Conclusions
<p>Very difficult to build whilst maintaining existing traffic flows and turning movements.</p> <p>Additional bridge at Trevisson to bring A3075 Newquay traffic onto existing A30 required.</p> <p>Less landscape impact as a result of the junction being built closer to existing infrastructure and other built development. Less intrusion on the open countryside, when compared to the existing situation.</p> <p>This option would be £3 million more expensive.</p>	<p>Has more impact on the surrounding countryside.</p> <p>Introduces a 1.2km long diversion to St Agnes- Truro traffic passing north-south through the new junction.</p> <p>Junction location is more distant and less convenient for cyclists travelling north-south than the existing situation, for example those travelling to Truro; an issue raised during consultation.</p>	<p>Carry forward single gyratory at consultation location as the benefits of building the new junction away from the existing roundabout outweigh the inconvenience to traffic wishing to travel in a north-south direction through the new junction. Journey times would be less than at present and NMU issues are to be considered as opportunity</p>

Table 5-4: Pairwise comparison of consultation option and single gyratory option

Consultation layout	Single gyratory at consultation locations with underbridges	Conclusions
<p>Dumbbell is at capacity for the design year. No scope for improvement in the event of capacity being exceeded.</p>	<p>Extra capacity; less risk of future redevelopment. Possible to add traffic signals in future if necessary.</p> <p>Better road-user safety.</p> <p>One additional bridge.</p>	<p>Carry forward single gyratory, as this arrangement would provide the most resilience to future traffic growth.</p>

Conclusion

An off-line junction at the consultation layout location is preferred, as it would cause significantly less disruption to build the new junction away from the existing roundabout, at a significantly reduced cost. This disruption is not outweighed by the benefits to landscape or to non-motorised users.

At the consultation location, the optimal vertical alignment for the new carriageway allows the new dual carriageway to pass over the new junction on raised embankment (the dual would be approximately 4m above the existing road level) and an underbridge. Although, a single gyratory arrangement would provide the most resilience to future traffic growth, it is recommended that a detailed assessment be carried out at PCF Stage 3, before a junction type is selected.

In line with the views of the Historic England and Cornwall Council's landscape team, and the criteria for good design given at Paragraphs 4.28-4.35 of the NPSNN, the overall height of the infrastructure should be kept as low as possible in order to minimise adverse effects on views, landscape and cultural heritage. This is especially important considering that a junction location closer to the existing roundabout, that might minimise adverse impacts, especially on landscape, has been discarded for practical buildability issues.

6. Route Selection – Chybucca

The alignment of the new dual carriageway proposed in the consultation option followed a line parallel to the existing A30 between chainages 2,500 and 4,000 and offset from it by some 200m. The consultation alignment crossed the existing A30 at Chybucca such that a minimum length of A30 was used in the new route, the strategy being to minimise conflict between the construction works and the existing traffic during construction and reduce disruption to existing statutory undertaker equipment.

Alternatives emerged during public consultation that sought to minimise agricultural land severance and make better use of the existing highway land. An optimised ‘on-line’ option was developed for comparison with the consultation option (Option A; Option B having previously been discarded). This on-line option takes the new dual carriageway closer to the existing road, to both the west and east, of the junction at Chybucca.

A comparison between the options was undertaken at the option selection workshop held over two days on 28th February and 2nd March 2017 to identify the preferred layout:

Table 6-1: Pairwise comparison of consultation option and alternative alignment

Consultation layout	Alternative ‘on-line’ arrangement	Conclusions
<p>Causes significant agricultural severance.</p> <p>Greater impact on Callestick Vean (south) bungalow with new dual carriageway alignment closer to the B3284.</p>	<p>More extensive statutory undertaker (SU) utility diversions.</p> <p>More extensive earthworks to the east of Chybucca as the new dual carriageway alignment cuts through the crest of a hill rather than skirting around it.</p> <p>Makes better use of sections of the existing A30 by minimising areas of redundant carriageway.</p> <p>Potential for provision of enhanced noise mitigation to Callestick Vean (south) bungalow.</p> <p>New dual carriageway alignment passes closer to the woodland ‘Garvinack Brake’, protected by a Tree Preservation Order, and the tumulus.</p>	<p>Both options sever an existing bridleway but this can be diverted across the new dual carriageway via the new overbridge. This solution is acceptable to The Ramblers and the British Horse Society</p> <p>Carry forward the alternative ‘on-line’ arrangement as it provides significant improvement in terms of agricultural land severance relative to the consultation option.</p> <p>Although there are a number disadvantages associated with the alternative arrangement, these are not significant.</p> <p>Further refinement to the alignment of the alternative arrangement will help avoid SU diversions and optimise earthworks. Simple overlay of existing sections of the old A30 rather than full depth construction will greatly reduce possible cost increases over the consultation layout.</p>

Conclusion

In order to reduce severance of agricultural holdings and the impact on a residential property, and make better use of the existing highway, the ‘online’ alternative is the preferred alignment for the new dual carriageway through Chybucca.

7. Route Selection – Marazanvose

The Marazanvose area includes Chyverton Park, a Grade II registered park and garden, as well as Grade II listed Nancarrow farmhouse. Bats are known to use the area for foraging, commuting and roosting.

Being close to the existing A30, many of the dwellings located near to the proposed scheme are already exposed to high noise levels. In particular, the dwellings at Marazanvose and Nancarrow are within a Noise Important Area (NIA), designated by Defra, where high noise levels affect sensitive receptors. Nancarrow Farm, south of the existing alignment in this area, is a diversified agricultural business and also hosts weddings. Chyverton Park contains an equestrian business.

Of all the locations for which alternative options were considered, this area had the most disparate considerations to be balanced and alternatives involved quite different alignments.

Taking account of feedback from members of the public and landowners during the consultation period, the following alternative options were developed:

- (Option 7A) Seeking to reduce impact on agricultural severance by aligning the route to the north of Hill House and using the existing Twobarrows Bridge for the new dual carriageway.
- (Option 7B) Testing the advantages and disadvantages of aligning the route to the north of the existing road at Marazanvose. Two sub-options were developed:
 - Option 1, which makes most use of existing roads for the local route
 - Option 2 provides a new local route to the north of the proposed dual carriageway with the existing A30 retained to provide local access.

The three options above, together with the consultation layout in this area, were then the subject of a supplementary public engagement exercise undertaken on 8 February 2017, which involved potentially affected residents only. Details are contained in an addendum to the Public Consultation Report.

The options selection workshop, held over two days on 28th February and 2nd March 2017, considered the southern consultation option and the southern alternative, then the two northern alternatives, before comparing the better performing northern and southern alternatives. Further refinement and assessment and updated cost estimates then informed a second workshop, held to review previous discussions.

Generally, all options in this area would meet the objectives of the scheme and so more specific and localised environmental, social and economic impacts were critical in the decision on the alignment in Marazanvose location.

Taking account of the features and constraints in the area, as well as feedback from public and landowners and stakeholders, it was agreed at the workshop that the main

topics to weigh up relevant to the choice of road alignment in the Marazanvose area were: design; landscape and visual impact; cultural heritage; biodiversity; noise; impacts on local business; agricultural land-take; and the quality of the land.

Also relevant are: road function (such as journey time and safety); the ability to construct the road; and the viability of the scheme (for example factors such as funding constraints, land area required, cost and value for money). This is because these factors influence the extent to which the scheme is able to provide the social and economic benefits that would arise as a result of upgrading this section of the A30 and may justify any environmental harm that may arise.

Not all of the above topics and factors were relevant for all parts of the pairwise comparison, as they would result in similar impacts. Even if there are slightly different impacts, they would be considered similarly against relevant policy and legislation. The most relevant are summarised in the tables below and the best performing option for each discrete factor is identified. Not all factors carry equal weight and their relative importance is decided with reference to guidance in the NPSNN and the need to conform to any relevant legislation. The comparisons are drawn out under the headings, divided into those which are similar (and therefore not pertinent to the decision) and those where there are differences (and therefore relevant). Where useful, a conclusion is drawn for each topic on the extent to the option is likely to conform to the aims and criteria stipulated in the NPSNN.

Similarities

For these topics, there would either be the same, similar, or marginal differences in impacts and effects, or their ability to deliver the benefits of the scheme. They would therefore be considered similarly against relevant planning policy, legislation and value for money criteria. As such, whilst worth understanding, they are less likely, in themselves, to provide a reason for choosing one option over another.

Differences

In these areas, there is likely to be a difference in impacts and effects as a result of choosing one alignment over the other, and so are more critical to choosing one option over another.

To avoid creating difficulties at PCF Stage 3, where there are multiple and diverse impacts to weigh up, the option that is chosen must be the one that aligns most with the relevant policy and legislative context. This includes meeting the objectives of the scheme and taking account of value for money.

Option selection in this area involved first comparing the alternative southern alignment (Option 7A) with the refined consultation alignment (Option 6C). The better performing of these was then compared with an alternative northern alignment (Option 7B). The better performing of this comparison then formed the recommendation to form part of the overall preferred route. This would be the option considered the most likely to be developed in PCF Stage 3 into a legally compliant, value for money scheme, which meets the scheme objectives and which would be consented.

Stage 1A: Comparing Options 6C (refined public consultation option) with Option 7A (alternative southern alignment)

The following factors are pertinent to this comparison:

Table 7-1: Comparing Option 6C with Option 7A

	Option 6C	Option 7A	Best-performing alternative
Land area acquired (non-highway)	10 ha	8 ha	7A
Risk of delay/cost due to utility works	Less on-line construction, lower risk	More on-line construction, higher risk	6C
Business impacts	Increased adverse impact on Nancarrow Farm, fields severed, farmyard requires relocating	Reduced adverse impact on Nancarrow Farm, possible reduced efficiency of farmyard location	7A
Landscape	Greater adverse impact, route remote from existing alignment	Reduced adverse impact, close to existing alignment	7A
Visual impact	Greater disruption of field pattern & boundary vegetation	Reduced adverse impact, close to existing alignment	7A
Noise	Significant adverse impact on Hill House, slight impact at Nancarrow Farm slight reduction at Marazanvose	Neutral impact (similar to existing) at Hill House, other impacts similar to 6C	7A
Most likely cost	£294.5m	£291.4m	7A

Similarities

Ability to meet the objectives of the scheme

Both options are viable and would successfully enable the benefits of the scheme; resulting in similar broad economic and social benefits to Cornwall, which may be used to justify some adverse effects on the environment.

Biodiversity

Both options would directly affect bat roosts and known commuting routes. It was not possible, due to limited available data, to understand the extent to which each option would affect biodiversity. However, the two options follow the same alignment in locations in which bats are known to roost, such as in buildings at Nancarrow Farm. Generally, consideration under biodiversity policies and legislation would likely be similar for either option. Impacts on biodiversity were therefore not critical in deciding between the two options.

BMV land

Whilst the quality of the land was not known on the day of the workshop if it emerged (after further assessment) to be BMV land then the aim of Paragraph 5.168 of the NPSNN (to avoid BMV land where possible) would also likely be better met with 7A, due to the fact that less land would be required. This could not be confirmed at the workshop although for the purpose of choosing between these two options it was not considered critical.

Differences

Cultural heritage

Though still south of the existing A30, Option 7A's alignment would pass closer to the boundary of the registered park and garden, and so would have a worse impact on the setting of Chyverton Park than Option 6C, which is further from the boundary. The level of additional harm relative to Option 6C is, however, considered to be offset by Option 7A's alignment. Being closer to the existing road, it is more sympathetic to the fabric of the landscape, which in this location is also valuable because it is the immediate landscape setting of Grade II listed Nancarrow Farmhouse.

Generally, both options are likely to be considered similarly against the relevant policy tests for the historic environment, with 7A likely to have slightly less potential to be of detriment to Grade II listed Nancarrow Farmhouse.

Business impacts

Being closer to the existing alignment, Option 7A would also take less land, leaving more for agriculture. It would therefore potentially have a better impact on the agricultural side of Nancarrow's diversified business than Option 6C. So whilst it was not possible with available information to precisely understand the extent of the difference between the impacts on the business as a whole, it can reasonably be deduced that the holding would be less affected by Option 7A than Option 6C, in that it causes less field severance and uses less land. The area in which the alignments differ is not likely to be seen from the areas used by wedding participants, except during construction. Screening may reduce this impact but it is likely that the construction work would be heard from the wedding venue, although it was not possible to say whether this was likely to have a direct impact on the business.

Information on the difference between noise levels as would be experienced by wedding guests was not available. However, it could be reasonably deduced that if there were a perceptible difference in noise levels as a result of the difference in alignments, traffic on the alignment of Option 7A would not have the potential to be louder for guests than traffic on Option 6C.

Overall, Option 7A would therefore be slightly more sustainable than 6C, mainly in that it would reduce field severance and be slightly further from the wedding venue. Therefore it would be likely to have the least detrimental impact on the diversified farm (in accordance with the aims of the planning system as set out in the NPPF and reflected in the NPSNN).

In coming to this conclusion it was recognised that no independent professional advice on the how the business would be affected was available. The potential impacts on the business at Nancarrow Farm were based on engagement with the landowner (captured in the stakeholder database) and advice from specialists, including the landscape architect and noise engineer, both verbally and as captured in Appendix B.

Landscape

Option 7A would minimise harm to the landscape by being closer to the existing alignment and would therefore cause less severance of fields. By minimising harm to the landscape, it accords better than 6C with the aims of NPSNN Paragraphs 4.28-4.35, and 5.143 to 5.161, which deal with good design and landscape.

Noise

Both options would take strategic traffic further from the dwellings at Marazanvose, yet closer to Nancarrow Farm with similar policy implications. Option 6C would cause a significant adverse noise impact on Hill House. Significant noise effects should be avoided according to the noise section of the NPSNN (Paragraphs 5.186-5.200), supported by the guidance in the NPSE and PPG. In contrast, Option 7A would lead to reduced noise levels at Hill House. Overall, Option 7A better accords with the noise section of the NPSNN and associated guidance, especially in respect of avoiding the potential for a significant noise impact on Hill House.

Conclusion

Overall, both options could potentially provide the social and economic benefits that would arise from the scheme as a whole. Whilst there may be some differences in impacts, there would also be similar implications for policy and legal compliance as a result of both options for biodiversity and cultural heritage. This is also likely to be the case for policy relating to development using BMV land.

Option 7A would cause less harm to the landscape, use less agricultural land and create less severance of agricultural holdings, reduce noise impacts at an affected dwelling, and impact less on a diversified farm business than Option 6C.

Although the majority of the public responding to the information event favoured the consultation alignment (Option 6C) at Marazanvose as this route was further away from the properties at the southern end of Zelah, the benefits of Option 7A as set out above were considered to outweigh these concerns. The new dual carriageway would occupy the existing road cutting at this point and where necessary, additional mitigation will be considered. Option 7A is also more cost effective than the consultation option, whilst still meeting the objectives of the scheme.

On balance, Option 7A therefore represented better design and so accorded better than Option 6C to the policy framework provided primarily by the NPSNN.

All agreed therefore that Option 7A be taken forward to the next stage of comparison.

Stage 1 B: Comparing Option 7B, Sub-Option 1 with Option 7B, Sub-Option 2 (both alternative northern alignments).

Similarities

Ability to meet the objectives of the scheme

Both options are viable and would support the benefits of the scheme; resulting in similar broad economic and social benefits to Cornwall, which may be used to justify some harm to the environment.

Landscape

Both options would sever fields and create similar amounts of landscape harm. They are therefore similar when considered against the relevant parts of the NPSNN, such as Paragraphs 4.28-4.35, and 5.143 to 5.161.

Business impacts

Both options would sever fields currently being used as part of an equestrian business that supports Chyverton Park Registered Park and Garden, and so this not a distinguishing factor.

Differences

Noise

Both options would take the main strategic traffic behind the dwellings at Marazanvose and simultaneously reduce noise on the excising A30. Option 7B Sub-option 2 would result in the western side stopped up, and so largely remove traffic altogether from the existing A30 south of these dwellings, with even greater benefits to these dwellings, which are within an NIA.

Stakeholder engagement

Comments received during the engagement with local stakeholders in February 2017 indicated a preference for Option 2 as it would almost eliminate vehicles passing in front of their properties. Further, it was recognised that Option 1 would result in a more tortuous local route that may not operate as satisfactorily as a diversion in comparison with Option 2.

It was concluded that Option 2 should be carried forward and be incorporated into Option 7B for updated cost estimates.

Stage 2: Comparing Option 7A with Option 7B

For this part of the comparison the best performing northern route (Option 2, incorporated as Option 7B), and the best performing southern route (Option 7A) were compared. The following factors were considered to be pertinent to comparing these options:

Table 7-2: Comparing Option 7A (alternative southern alignment) and Option 7B (alternative northern alignment)

	Option 7A	Option 7B	Best-performing alternative
Land area acquired (non-highway)	8 ha	10 ha	7A
Risk of delay/cost due to utility works	Route crosses higher section of Western Power Distribution (WPD) transmission line with higher headroom, 2 pylons may require support	Route crosses higher section of WPD transmission line with lower headroom, 2 pylons may require support	7A
Business impacts	Loss of 1 field and reduces size of 6 fields. Adverse impact on Nancarrow, possible reduced efficiency of farmyard location due to lost field. Possible impact on wedding business during construction if not screened.	Severs 8 fields and reduces size of 1 field. Adverse impact on Chyverton Park eventing area.	7A
Cultural heritage	Adverse impact on listed Nancarrow Farmhouse	Adverse impact on Chyverton Registered Park & Garden	7A
Visual impact	Reduced impact, close to existing alignment	Greater disruption of field pattern & boundary vegetation	7A
Living conditions	Adverse impact on 2 residential properties at Nancarrow	Adverse impact at Marazanvose, roads both sides of 5 residential properties	7A
Noise	Adverse impact on 2 residential properties at Nancarrow, can be mitigated	Adverse impact on 5 residential properties at Marazanvose, can be mitigated	7A
Residential demolition	Marazanvose Barn & Grooms Cottage, Nancarrow		7B
Most likely cost	£291.4m	£301.8m	7A

Similarities

Ability to meet the objectives of the scheme

Whilst the alternative northern alignment would be more expensive to construct, both options are viable and would successfully enable the benefits of the scheme. They would result in similar broad economic and social benefits to Cornwall, which may be used to justify some harm to the environment.

Differences

Landscape:

Option 7B would be more disruptive to the field pattern than Option 7A.

Option 7B would also require a loss of woodland in the immediate setting of Chyverton House and Grounds Registered Park and Garden. The dwellings at Marazanvose would become an island between old and new A30.

Option 7A would be closer to the existing alignment than Option 7B and would therefore better protect the existing field pattern. By minimising harm to the fabric of the landscape it is considered to accord better than Option 7B with the aims of NPSNN Paragraphs 4.28-4.35, and 5.143 to 5.161, which deal with good design and landscape.

Cultural Heritage:

There is a compelling public benefit to delivering the scheme, which must pass through this area. Due to the presence of listed assets both north and south of the existing alignment, some loss of significance to cultural heritage in this area is therefore unlikely to be avoided.

Option 7B, being north of the existing alignment, would lead to a direct loss of woodland. Whilst only land directly outside the boundary of the designated Registered Park and Garden would be affected by Option 7B, the area through which the route would pass is functionally and aesthetically indistinguishable from the designated area, and so might be considered as subject to the designation. It is at the very least a very important part of its setting. Chyverton Park in itself forms the setting for a number of listed buildings within the park, and so there would be indirect adverse effects on these assets as a result of Option 7B.

By being further from the existing alignment than Option 7A, and by severing the field patterns, Option 7B would also be more harmful to the fabric and character of the historic farming landscape that forms the immediate setting of the park.

Any harm to the cultural heritage in this area can be justified by balancing the public benefits that would arise from the scheme (NPSNN, Paragraph 5.132). This takes into account necessity for the route to pass through the Nancarrow and Marazanvose area, and lack of viable alternatives.

On balance, the alignment of Option 7A will lead to less loss of significance to designated heritage assets in the area than Option 7B). This loss of significance can be justified by the public benefits of delivering the scheme (economic and social) and by minimising other environmental effects.

Option 7B would therefore be more difficult to justify using the provisions of NPSNN, Paragraph 5.132, and the stipulations of Paragraph 5.133, which require that any harmful impact on the significance of a heritage asset to be weighed against the public benefit of the development. This should recognise that the greater the harm to the significance of the heritage asset, the greater the requirement for justification for any loss.

Impacts on business:

Option 7A would lead to the loss of one field and would reduce the size of six fields. It would also lead to an adverse impact on Nancarrow, possible reduced efficiency of farmyard location due to lost field and possible impact on the wedding business during construction if not screened.

Option 7B would sever eight fields and reduce the size of one field. It would also directly affect land leading to an adverse impact on an eventing area, part of an equestrian business based at Chyverton Park.

Loss of private property:

Option 7A would lead to the loss of a private residential property (and a building with residential planning permission, which is within the ownership of Nancarrow Farm). This can be justified when compared with Option 7B because Option 7A would minimise environmental impacts (on landscape and cultural heritage) in compliance with NPSNN criteria.

Overall Conclusion

Option 7A was taken forward for inclusion in the recommended preferred route because, for almost all pertinent issues, it emerged as the best performing option in the Marazanvose location. In particular, it would have a lesser environmental impact, especially on landscape and cultural heritage, than both of the northern options, or the consultation option (6C).

The alignment south of the existing A30 (Option 7A) was favoured (in the pairwise comparison) over an alignment north of the existing A30 (Option 7B), primarily as a northern route would further adversely affect cultural heritage and landscape character.

Whilst Option 7A would have worse impacts on listed Nancarrow Farmhouse than Option 7B, this would be offset by preventing greater harm to the registered park and garden.

8. Route Selection – Carland Cross

The consultation layout would retain the existing A30 route through a group of tumuli including Warren's Barrow, for local traffic and for westbound traffic merging onto the new dual carriageway. All affected tumuli are designated Scheduled Monuments. The layout at consultation has been assessed as having an adverse impact on the tumuli group, due to road infrastructure being introduced to the north of Warren's Barrow.

It is possible that additional harm to the barrow group, which is already compromised by the existing road layout severing Warren's Barrow from the rest of the group, would be considered 'substantial' by the Secretary of State. If substantial, this harm should be exceptional and will require very clear and convincing justification to enable it to be consented (NPSNN Paragraph 5.131). Even if considered less than substantial, it is likely that emphasis will still be placed on the extent of measures taken to reduce this harm, which is unlikely to be accepted if it is possible to avoid it, whilst still allowing the scheme to achieve its objectives.

A need to address the impact on tumuli in this area from the consultation layout was raised by Historic England during the consultation period. It was also suggested by Historic England that taking the opportunity to enhance cultural heritage in this area might serve to offset wider harm to the cultural heritage across the route.

The new dual carriageway would follow a common horizontal and vertical alignment through this section for both the refined consultation (Option 6C) and alternative junction layouts (Option 7A). The options in this area did not, therefore, concern the choice of alignment, but rather the choice of junction; a matter for detailed design. The aim is to provide a better outcome for the tumuli group, whilst still providing value for money.

The alternative layout junction design provided for variations as listed below:

1) Local traffic would be diverted to the north of the new dual carriageway and a westbound merge off the southern roundabout provided between Warren's Barrow and the new westbound carriageway.

1a) As above with the existing road returned to landscape.

1b) As above, but keep the existing road in situ but closed to everyday traffic, allowing access for statutory undertakers only and softening the visual impact of the scheme with sympathetic road surfacing and boundary treatments.

Table 8-1: Comparison of Junction Arrangements at Carland Cross

Consultation Layout	Alternative arrangement	Conclusions
<p>Significant impact on historic environment causing high risk of objection from Historic England.</p>	<p>Reunites Warren's Barrow with the rest of the adjacent barrow group. Historic England strongly recommend measures to reunite the barrows.</p> <p>Potential for combined historic environment and biodiversity mitigation.</p> <p>Potential impact on Warren's Barrow by the westbound merge.</p> <p>Increased cost of additional highway works and SU diversions.</p> <p>Safety concerns regarding the alternative junction layout, particularly at the southern roundabout. An internal safety review identified no significant safety issues have been identified with either design options. However, care will be needed when detailing the signing and lining strategy so that it is made clear to drivers which lanes they should be in as they approach the Carland Cross Roundabout, particularly in the alternative layout.</p> <p>Due to the reduction in the wind turbine exclusion zone the local route can be closer to the wind farm. This will reduce the number and extent of retaining structures.</p>	<p>Both options require HP gas main diversionary works to be completed in advance of main contractor works.</p> <p>Historic England's view will determine preferred junction layout option.</p>

Both junction designs would be viable, buildable and enable the wider benefits of the scheme; resulting in similar broad economic and social benefits to Cornwall. Enhancing cultural heritage in this area would also enhance the landscape more generally, and provide a better appearance from areas in which it is possible to see the junction. All other environmental impacts are likely to be similar as a result of both junction designs. They therefore did not need to be considered further.

Because it would necessitate a fifth exit from the roundabout, Cornwall Council's transport team raised concerns that the option most beneficial to the tumuli group, that of returning the existing road to landscape, may confuse drivers, especially tourists using satellite navigation. It has been suggested that this may also compromise safety. As set out in NPSNN, paragraphs 3.10 and 4.60 to 4.66, scheme promoters are expected to

take opportunities to improve road safety, including introducing the most modern and effective safety measures where proportionate.

The extent to which this arrangement would compromise safety has been assessed and considered not to be pertinent in the selection. However, the layout needs to be better understood and carefully balanced against the significant public benefits that would be arise as a result of enhancing the tumuli group in this area. Offsetting the scheme's overall adverse impact on the historic environment should be considered. Paragraph 5.131 of the NPSNN confirms that the government recognises that public benefits from heritage (and conversely public harm from its loss) are multifaceted; potentially being cultural, environmental, social and economic.

A similar balancing exercise might be applied at PCF Stage 3 regarding the monetary cost of moving underground services to better enable this enhancement. Statutory undertakers are often reluctant for their services to be situated under land not designated as highway land. Moving the services would allow the return the existing road to landscape. A compromise would be to keep the road in situ but closed to everyday traffic, allowing access only for statutory undertakers, and softening the visual impact of the scheme with sympathetic road surfacing and boundary treatments.

Whilst this may cost less and would represent a compromise, moving the services may still represent value for money considering the level of enhancement enabled for the historic environment and the extent that this might offset wider harm across the scheme. This should be further explored in PCF Stage 3. The cost and inconvenience of moving services should be balanced against the benefits, with reference to the policy framework provided by the NPSNN. Historic England should also be consulted on the various proposals.

As well as offsetting the wider harm as suggested by Historic England, enhancement would be in line with Paragraph 5.137 of the NPSNN. It asks applicants to look for opportunities to enhance or better reveal the significance of heritage assets and that proposals that do this will be 'treated favourably'.

It should be noted that there is a need to compensate for lost habitat by recreating it elsewhere. There is a potential opportunity to mitigate cultural heritage and biodiversity impacts in the Carland Cross area, as a result of diverting traffic to the north of the new dual carriageway.

Conclusion`

The junction design at Carland does not affect the recommended preferred route, but sufficient land has been included to enable better impacts on cultural heritage. The new dual carriageway alignment would allow an underbridge to facilitate a grade-separated junction whichever layout is carried forward. This would be subject to detailed design at PCF Stage 3, which should include further consultation with Historic England and Cornwall Council.

9. Conclusions and Recommendation – Preferred Route

The preferred options through the key sections that will comprise the preferred route are as follows:

Chiverton Cross

An off-line junction at the consultation layout location. It will cause significantly less disruption to build the new junction away from the existing roundabout, at a significantly reduced cost. This disruption is not outweighed by the benefits to landscape or to non-motorised users from alternative layouts.

At this location, the optimal vertical alignment of the new carriageway allows the new dual carriageway to pass over the new junction on raised embankment and an underbridge. Although a single gyratory arrangement would provide the most resilience to future traffic growth, it is recommended that a detailed assessment be carried out at PCF Stage 3, before a junction type is selected.

In line with the views of the Historic England and Cornwall Council's landscape team, and the criteria for good design given at Paragraphs 4.28-4.35 of the NPSNN, the overall height of the infrastructure should be kept as low as possible in order to minimise adverse effects on views, landscape and cultural heritage. This is especially important considering that a junction location closer to the existing roundabout, that might minimise adverse impacts, especially on landscape, has been discarded for practical buildability issues.

Chybucca

In order to reduce severance and make better use of the existing highway, the '**online alternative**' is the preferred alignment for the new dual carriageway through Chybucca.

Marazanvose

Option 7A was taken forward for inclusion in the recommended preferred route because, for almost all pertinent issues, it emerged as the best performing option in the Marazanvose location. In particular, it would have a lesser environmental impact, especially on landscape and cultural heritage, than both of the northern options, or the consultation option. It is also significantly more cost effective than the consultation option, whilst still meeting the objectives of the scheme.

Carland Cross

The junction design at Carland does not affect the recommended preferred route, but sufficient land has been included to enable better impacts on cultural heritage. The new dual carriageway alignment geometry would allow an underbridge to facilitate a grade separated junction, whichever layout is carried forward. This will be a subject for detailed design at PCF Stage 3, which should include further consultation with Historic England and Cornwall Council's transport team.

Recommendation:

The route presented during the public consultation in the autumn of 2016, amended as above, is recommended for consideration as the preferred route.

This proposed route meets the scheme's transport objectives as follows:

- to contribute to regeneration and sustainable economic growth.
- to support employment & residential development opportunities.
- to improve the safety, operation & efficiency of the transport network.
- improve network reliability and reduce journey times.
- to deliver capacity enhancements to the strategic road network.
- supporting the use of sustainable modes of transport.
- delivering better environmental outcomes, and;
- to improve local and strategic connectivity.

It is the most likely to comply with the policy and legal framework provided by the NPSNN and relevant legislation, and would provide an appropriate balance of social, environmental and economic outcomes. The resulting scheme could therefore be consented by the Secretary of State, following detailed design at PCF Stage 3.

Appendix A. Drawings

See Appendix H of Report on Public Consultation, included as Appendix B1 to the Consultation Report Appendices (Volume 5, Document Reference 5.2).

Appendix B. Option Comparison Table

See Appendix B of the Scheme Assessment Report (Volume 7, Document Reference 7.6).

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