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EAST OF HUNTLY TO ABERDEEN

A96 Dualling

East of Huntly to Aberdeen scheme

Blue/Pink Pairing Assessment

Published August 2019

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a96-dualling-inverness-to-aberdeen/
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Blue/Pink Pairing Assessment

Document Ref: A96PEA-AMAR-GEN-SWI-DD-ZZ-000012

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Prepared for:
Transport Scotland
Buchanan House
58 Port Dundas Road
Glasgow
G4 0HF

Prepared by:
AmeyArup JV
Precision House
McNeill Drive
Eurocentral
Motherwell
ML1 4UR

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1 Pairing assessment

1.1 Introduction

This document provides details of the assessments undertaken on the A96 Dualling East of Huntly to Aberdeen scheme where two route options have common start and end points and perform the same function. The assessment is used to deselect poorer performing route options, allowing development of the remaining options to progress through to full DMRB Stage 2 assessment, which will ultimately identify the preferred route option for the scheme.

1.2 Identification of route options for pairing

The location of the Blue and Pink route options identified for pairing assessments is shown on Figure 1 below.

Both route options start from a common point on Cyan, south of the Hill of Skares and finish at a common point at Hillbrae, north of Inverurie on the Violet route option. The Blue route option predominantly follows a route parallel to the existing A920 from Colpy to Oldmeldrum. The Pink route option is also an offline route but is closer to the existing A96 corridor between Colpy and the north of Pitcaple before converging with the Blue route option at Hillbrae north of Inverurie. The route options are made up of sections as follows, as shown on Figure 2 below:

- Blue route option – Sections C2, B1, B2, B3
- Pink route option– Sections C1, Br1, P2, P3, V1 & V2

Section G3 facilitates a variation of the Blue route option at the eastern end of the paired section, as shown on Figure 2 below. It is necessary to consider whether utilising section G3 creates a better performing route option combination than either of the two main route options identified above. Section 4 considers these scenarios.

At the western extent of the paired sections, the Red route option represents an alternative connection for both Blue and Pink route option combinations, as shown on Figure 2 below. Section 5 considers these scenarios.

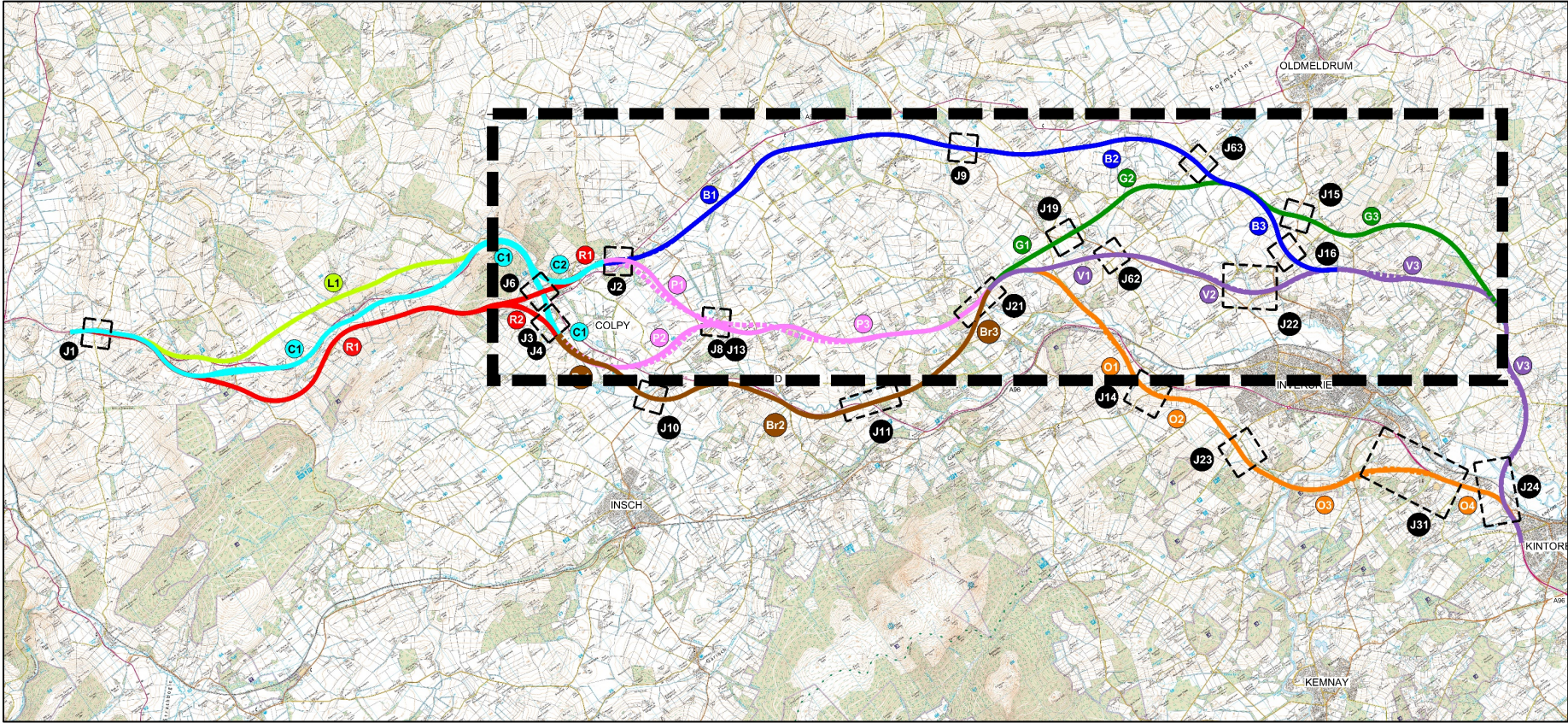


Figure 1 – Location of route options for pairing assessment

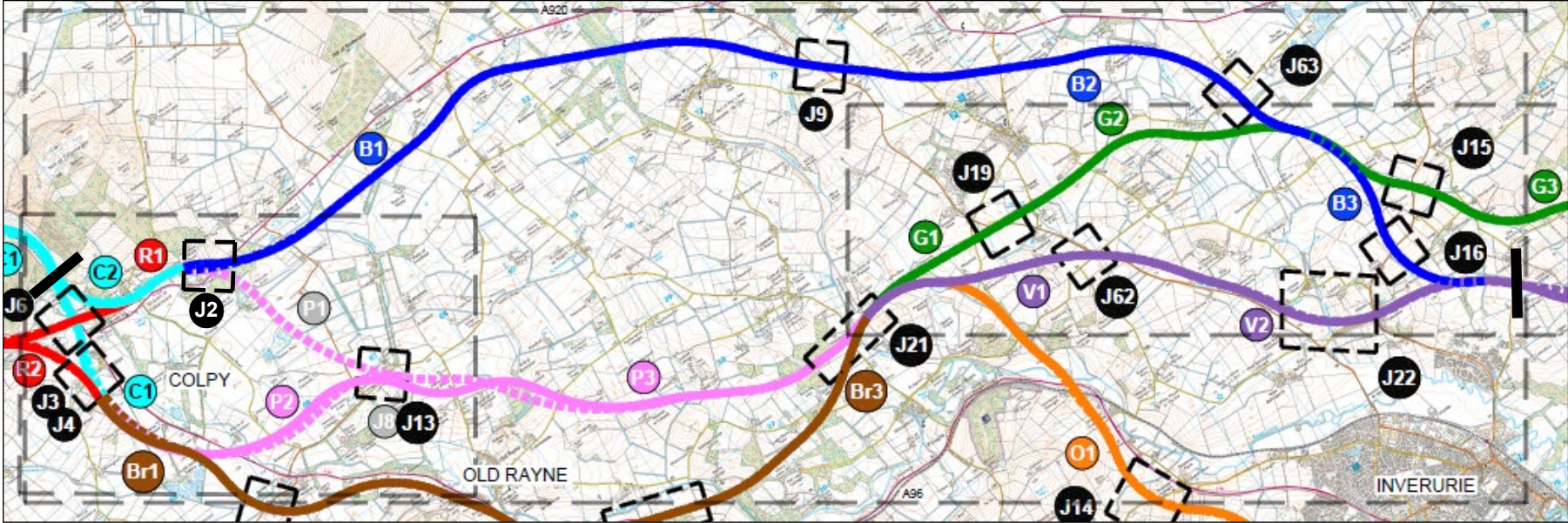


Figure 2 – Route option and junction identifier

2 Pairing assessment basis

The Engineering, Environmental and Traffic/Economic appraisals and key differences have been drawn together into a multi-disciplinary assessment, to determine the better performing route option to be taken forward from each pairing assessment. These appraisals can be found in Appendix A. The engineering and environmental plans associated with the pairings are included in Appendix B and C respectively.

The appraisals are based on the developed third fix alignments, which incorporates the following development:

- Indicative junction layouts in accordance with the Junction Strategy where applicable.
- Application of central reserve and verge widening for visibility.
- Statutory authority consultation.
- Addressing where possible impacts identified during the Second Fix assessment.

The appraisals adopted the 7-point assessment scale consistent with that utilised in the second fix alignments appraisal. The purpose of the pairing assessment was to establish the key comparative differences between the respective route options, and as such the pairing assessments included in Appendix A concentrated on the differences in the Major and Moderate Adverse Impacts to establish the better performing route option

The following colour coding has been used to indicate preferences for each paired element:

	Better Performing
	No preference

3 Pairing assessment Blue vs Pink route options

This assessment considers the following route options:

- Blue route option – sections C2, B1, B2 and B3
- Pink route option – sections C1, Br1, P2, P3, V1 and V2.

3.1 Blue route option description

A96 Dual Carriageway

The Blue route option shown in Figure 2 above runs in a southerly direction from the Hill of Skares crossing the River Urie on a new structure before turning east towards Kirkton of Culsalmond via C2. It continues parallel to the north of the A920 and then crosses over the existing A920 at Snipefield onto B1. The route option runs south of, and parallel to, the existing A920 before passing to the north and east of the settlements of Meikle Wartle and Daviot as section B2. The route option then turns in a southerly direction at Fingask, passing over the Kings Burn and to the south of the Barra Battlefield as B3. The route option traverses the B9170 and links into the Violet route option at Hillbrae, to the north of Inverurie.

The mainline alignment crosses the side road connecting the A920 to Kirkton (Lawrence Road). Due to existing topography and viable proposed road levels, it is not possible to maintain the current route of this side road. A significant diversion of the side road (over 1km) running parallel to the mainline from Kirkton to Hillbrae will be required to cater for existing properties in Culsalmond.

The overall length of the Blue route option under consideration is approximately 20.2km in length.

Colpy Junction (J2)

A grade separated junction in compliance with the Design Manual for Roads and Bridges (DMRB) has been developed on the A920 approximately 1.8km east of Colpy at Snipefield that seeks to minimise impacts on existing properties and land. The junction option is a skewed dumbbell arrangement with all movements allowed. It incorporates the existing A920 through an underbridge and provides connections for new side road links. Access to the existing A96 would be achieved via the A920.

Meikle Wartle Junction (J9)

A DMRB compliant grade-separated junction option has been developed on the B9001 Rothienorman to Inverurie road, that seeks to minimise impacts on existing properties and land. The mainline is on embankment in this location, allowing for a perpendicular underbridge accommodating the re-aligned B9001 between two new junction roundabouts. The junction slip roads also tie into the roundabouts via a loop arrangement. There is also some minor realignment of the existing Meikle Wartle access road into the southern junction roundabout.

Fingask Junction (J63)

A DMRB compliant grade-separated junction option has been developed on the C76C side road from Pitcaple to the A920 just west of Oldmeldrum, that seeks to minimise impacts on existing properties and land. The junction layout is a standard diamond arrangement with slip roads connecting to two new roundabouts located either side of the mainline on the C76C. The mainline is on embankment in this location, crossing over the existing side road which is to be maintained at its current level.

Barra Junction (J16)

A DMRB compliant, grade-separated junction option has been developed on the B9170, Oldmeldrum to Inverurie road at Bructor that seeks to minimise impacts on existing properties and land. The junction layout is a standard loop arrangement with slip roads allowing for all traffic movements that connect to two new roundabouts located either side of the mainline on the existing B9170.

3.2 Pink route option description

A96 Dual Carriageway

The Pink route option shown in Figure 2 above runs in a southerly direction from the Hill of Skares to the west of Colpy village, adjacent to the existing junction with A96 and A920. The route option continues as Br1, running south to Loch Insch Fishery. The route option heads east as P2 to the north of Newton House and the tie-in point with P3 at Lawrence Road.

The route option continues in a south-easterly direction passing the east side of Old Rayne and to the south of Durno. The route option crosses the Durno to Pitcaple side road and the adjacent Burn of Durno. It heads to the north of Pitscurry Hill and tracks around the north and east of the Pitcaple quarry as section V1. The route option continues in a south-easterly direction, crossing the B9001. As section V2, it runs in parallel with the B9001 until the Uryside Link Road. From here, it turns east towards Hillbrae and meets the Blue route option.

The route under consideration is approximately 20.2km in length.

Colpy Junction (J3)

A DMRB compliant, grade-separated loop arrangement has been developed located southwest of Colpy. It is connected to the existing A96 via a link road, approximately 420m long, running west to east passing under the new dual carriageway. The existing junction at the A96/A920 is then maintained for local access to Kirkton of Culsalmond. The new junction caters for all movements on/off the new dual carriageway.

As part of the strategy to maintain local connectivity this solution features approximately 1.2km realignment of the existing A96 parallel and west of the dual carriageway between Morgan McVeighs and the proposed Colpy Junction.

Lawrence Road Junction (J8/J13)

A DMRB compliant, grade-separated junction with east facing slip roads only has been developed on Lawrence Road/B992 that seeks to minimise impacts on existing properties and land. The mainline is on embankment in this location and

allows for a perpendicular underbridge to accommodate the re-aligned Lawrence Road. A roundabout is provided on the north side of the mainline to cater for the realigned B992, eastbound on-slip and Lawrence Road north tie in. The westbound off-slip meets the realigned Lawrence Road at a priority junction. Existing accesses are maintained and realigned where required.

Durno Junction (J21)

A DMRB compliant grade-separated junction option has been developed on the Durno to Pitcaple side road (C83C), that seeks to minimise impacts on existing properties and land. The mainline is on embankment in this location and allows for a perpendicular underbridge to accommodate the re-aligned B9001 via two new junction roundabouts north and south of the mainline. The junction slip roads tie into the roundabouts via a diamond layout on the north and a loop arrangement on the south.

Daviot Junction (J62)

A DMRB compliant grade-separated junction option has been developed on the B9001 Rothienorman, to Inverurie Road, to the south of the settlement of Daviot, that seeks to minimise impacts on existing properties and land. The mainline is on embankment in this location and allows for a perpendicular underbridge to accommodate the re-aligned B9001 via two new junction roundabouts north and south of the mainline. The junction slip roads also tie into the roundabouts via a loop arrangement. There is some realignment of existing B9001 and three side roads to tie into junction roundabouts.

Uryside (Inverurie North) Junction (J22)

A DMRB compliant grade-separated junction option has been developed that seeks to minimise impacts on existing properties and land. The Uryside junction is a split junction due the proximity of the B9001 Rothienorman to Inverurie road and the B9170 Oldmeldrum to Inverurie road. The proposed junction features westbound on/off slips tying into a new roundabout located on the B9001 at Balhalgardy. The eastbound on/off slips tie into the B9170 via a loop and new roundabout. All movements are catered for with interconnectivity between the junction roundabouts via the existing northern link road.

3.3 Blue vs Pink pairing assessment conclusions

The full pairing assessment for Blue (C1/B1/B2/B3) against Pink (C1/Br1/P2/P3/V1/V2) route options is included in Appendix A1.

The engineering appraisal found that the Pink route option performed better than the Blue route option. The Pink route option performed better for Standards Compliance, Structures, Drainage & Hydrology, Residual Hazards and Cost while the Blue route option performed better in only one discipline namely Utilities.

The environmental appraisal concluded that the Pink route option performed better than the Blue route option. The Blue route option performed better for Landscape, Plans and Policies, Noise and Air Quality. However, the Pink route option performed better for Cultural Heritage, Ecology, Communities and Water including impacting fewer ecologically and culturally designated sites and was preferred overall.

The traffic and economics appraisal found that the Pink route option performed better than the Blue route option as it attracts a higher volume of traffic and offers a greater reduction in traffic on the existing A96. The Pink route option also reduces accident rates on the existing and new A96 routes more significantly than the Blue route option and offers better value for money.

The pairing assessment for the Blue against Pink route options concluded that the Pink route option (C1/Br1/P2/P3/V1/V2) is the better performing route option combination.

4 Alternative route option combination utilising section G3

From the Blue route option, it is possible to connect with both the Violet and Green route options to the north of Inverurie.

The Pink vs Blue Pairing Assessment assumed a common point at Hillbrae, to the north of Inverurie, where the Violet and Blue route options converge. An alternative common point exists to the east of this location, where sections G3 and V3 converge to the south of the B993. To understand the potential influence of this alternative connection on the comparison of Blue and Pink route options, a subsequent pairing exercise was carried out on the sections shown in Figure 3 and Figure 4 below.

4.1 Route option descriptions

4.1.1 Blue-Violet route option connection (B3/V3)

From Fingask junction (J63), the route option tracks south across the Lochter Burn to meet the B9170 at Barra Junction (J16, described in Section 3). From here the route option heads east to Hillbrae, then south east past the Hill of Selbie. The route continues south east past Ordiefauld and meets the Green route option to the south of the B993 near to Isaacstown and Ashlea Grange.

4.1.2 Blue-Green route option connection (G3)

From Fingask Junction (J63), the route option tracks southeast, crossing the Lochter Burn to meet the B9170 at Barra Junction (J15), adjacent to Bructor Cottage. From here the route option continues to travel southeast around the southwestern slope of Lawel Hill to Sunnybrae before turning south to meet the Violet route option south of the B993, near to Isaacstown and Ashlea Grange.

Barra Junction (J15)

A DMRB compliant, grade separated junction has been developed on a realigned section of the B9170 road from Oldmeldrum to Inverurie that seeks to minimise impacts on existing properties and land. The junction layout is a standard loop arrangement with slip roads allowing for all traffic movements that connect to two new roundabouts located either side of the mainline on the B9170. The mainline is on embankment in this location over the existing side road to be maintained at its current level. The B9170 is realigned to the east of its current line over a 1.5km length avoiding a direct impact on the Barra Battlefield to the west.

4.2 Alternative route option combination utilising section G3 conclusion

The full pairing assessment for the alternative eastern connection Blue-Violet (B3/V3) against Green (G3) route options is included in Appendix A2.

The pairing exercise found that the B3/V3 and G3 route options performed very similarly and did not influence the overall performance of the Blue route option. Therefore, the conclusions of the main pairing exercise remain valid that the Pink route option is better performing than the Blue route option.

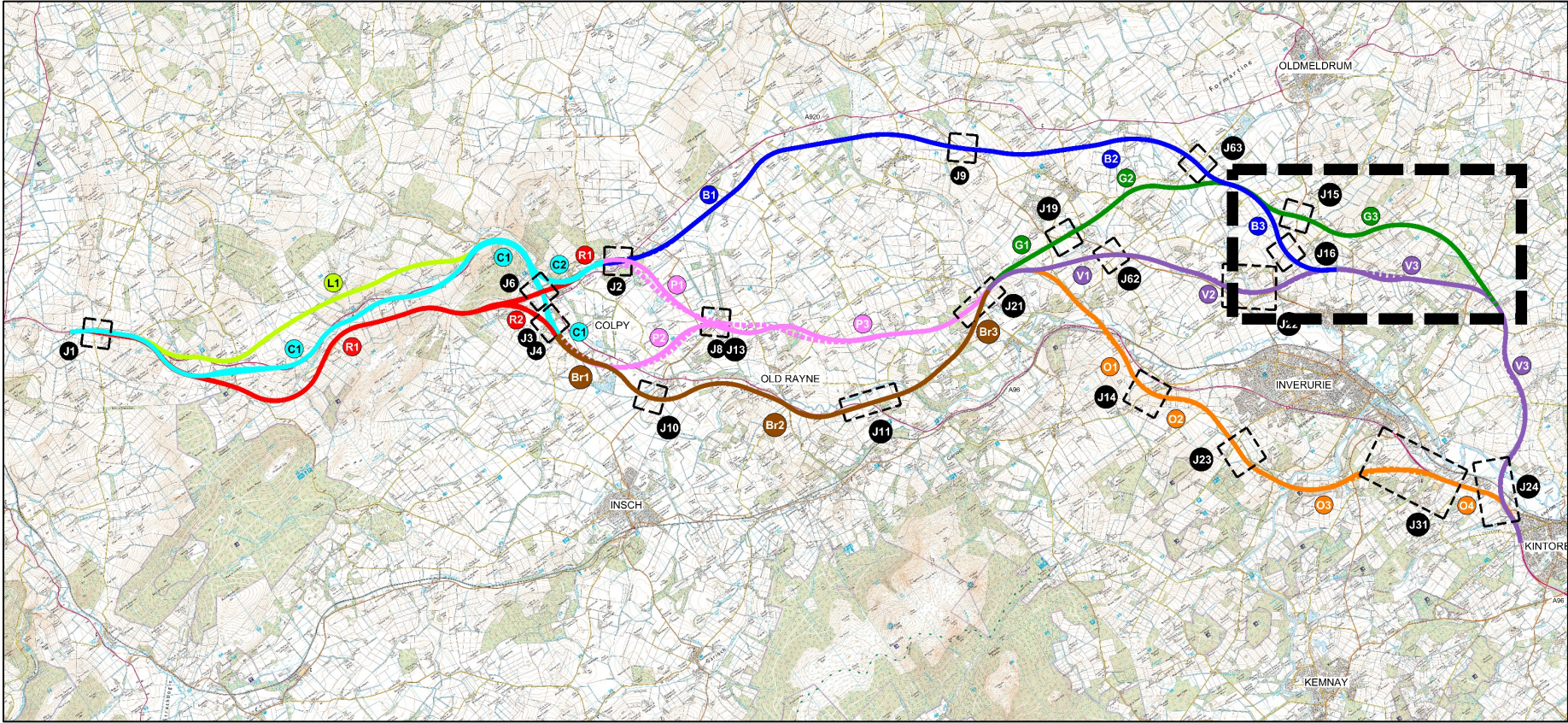


Figure 3 – Alternative connection pairing assessment (B3/V3 vs G3) location

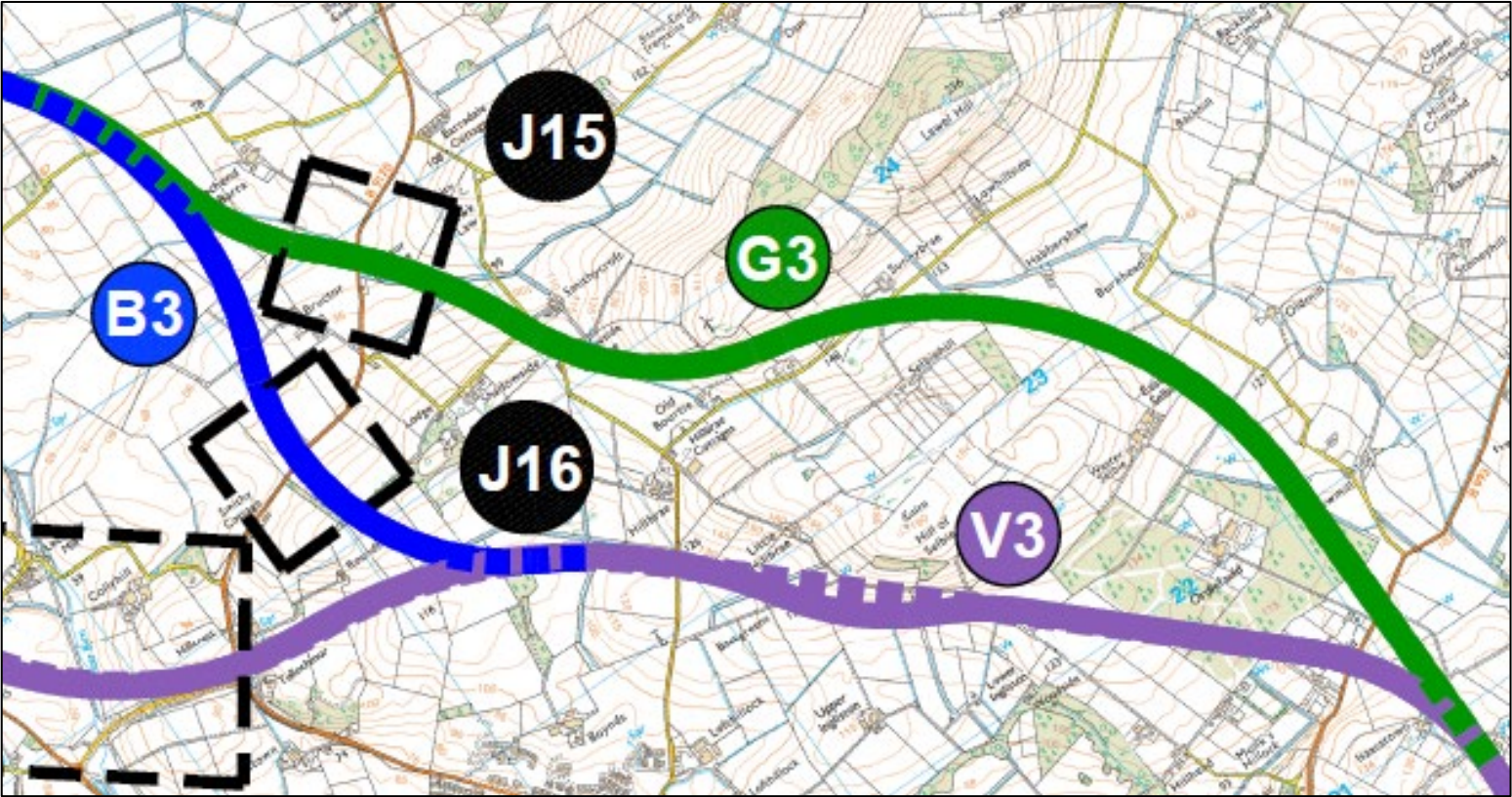


Figure 4 – Alternative connection route option and junction identifier (B3/V3 vs G3)

5 Alternative connection to Red route options

To the west of the study area as shown in Figure 2 above, potential connections exist from both Blue and Pink route options to the Red route option north and west of Colpy.

It is necessary to test whether connections to the Red route option will result in a different conclusion to the pairing exercise undertaken, in comparison to connections to the Cyan route option described in Section 3.

5.1 Route option description

5.1.1 Blue route option connection (R1)

Connections from the Red route option originate north of Jericho on the south slope of the Hill of Skares. The route heads due east across the existing A96 and the River Urie and floodplain. R1 continues east, passing between Kirkton of Culsalmond and the existing A920. R1 connects to B1 north of Snipefield woods.

5.1.2 Pink route option connection (R2)

From a point north of Jericho on the south slope of the Hill of Skares, R2 heads south to meet Br1 south west of Colpy. The route follows the route of the Jordan Burn.

5.2 Previous assessment

The alternative connection to the Red route options utilise the following sections:

- Red to Blue route option – section R1
- Red to Pink route options – sections R2 and Br1

Both sections R1 and R2/Br1 have been considered previously within the Cyan/Red to Pink Pairing Assessments. The full assessment is therefore not repeated and is summarised below for each discipline: Engineering, Environmental and Traffic/Economics.

5.2.1 Engineering considerations

Section R1 was found in the previous assessment to have more challenging engineering works compared to the section R2/Br1:

- Section R1 required a larger viaduct over the River Urie and its floodplain to the south of Kirkton of Culsalmond
- Section R1 required larger earthworks and retaining walls as a result of the proximity of properties at Culsalmond and the Mummer's Reive Scheduled Monument
- Section R1 had major impacts on utilities including up to 1km diversion of SSE overhead electricity transmission lines (275kV, 4 No. Pylons) while sections R2/Br2 had no major or moderate impact on utilities.

Sections R2/Br1 connecting to the Pink route option is therefore a better performing combination than section R1 connecting to the Blue route option. Consideration of the alternative Red route option connection to the Blue and Pink route options, from an engineering perspective, confirms that the Pink route option remains better performing than the Blue route option.

5.2.2 Environmental considerations

Section R1 was found in the previous assessment to have major impacts on the community around Culsalmond and Snipefield, the loss of part of Snipefield Wood, the setting of Woodside, Hut Circles Scheduled Monument, Category A listed building of Culsalmond Old Parish Church and Mummer's Reive Cairn Scheduled Monument which cannot be mitigated.

In addition, section R1 has more interactions with watercourses and identifies greater impact on ecological receptors, particularly in relation to watercourses and riparian habitats.

Sections R2/Br1 was found to have fewer major and moderate impacts and was better performing. Consideration of the alternative Red route option connection to the Blue and Pink route options, from an environmental perspective, confirms that the Pink route option remains better performing than the Blue route option.

5.2.3 Traffic and economics considerations

Sections R2/Br1 were considered to offer greater potential to better connect the settlements of Culsalmond and Colpy through provision of new footpaths and crossing facilities, reduce conflict between motorised and non-motorised users and encourage active travel.

Sections R2/Br1 connecting to the Pink route option is therefore a better performing combination than section R1 connecting to the Blue route option. Consideration of the alternative Red route option connection to the Blue and Pink route options, from a traffic and economic perspective, confirms that the Pink route option remains better performing than the Blue route option.

5.3 Alternative connection to Red route option conclusion

All three disciplines Engineering, Environmental and Traffic/Economics concluded that the Red to Pink route option connection performed better than the Red to Blue route option connection.

Therefore, the conclusions of the main pairing exercise in Section 3 remain valid that the Pink route option (C1/Br1/P2/P3/V1/V2) is better performing than the Blue route option (C2/B1/B2/B3).

6 Durno Junction provision (J21)

In parallel with the pairing assessment stage, the junction strategy for the scheme was being developed. A case for removing the proposed Junction 21 from the scheme was investigated and subjected to multi-disciplinary review. The recommendation from this review was to remove the junction, primarily due to low traffic figures and engineering impact. Therefore, a sensitivity test on the pairing assessment was required to see if the removal of this junction from the scheme caused a change to the overall conclusion.

6.1 Junction 21 location

Junction 21 is located on all route options which pass to the immediate north of Pitcaple (route options P3 or Br3 to route options V1, G1, or O1), as shown in Figure 3. The junction connects with the C83C local road and is intended to serve the small settlements of Durno, Whiteford and Pitcaple. The settlements have a combined population of around 650 residents.

6.2 Impact on pairing assessment

In removing Junction 21 from the scheme, the following impacts on the pairing assessments were identified and assessed:

- The removal of Durno junction 21 was found to result in only a small reduction in traffic volumes using the new dual carriageway on the Pink route option (less than 200 vehicles per day). Journeys to and from Durno will no longer be able to access the dual carriageway directly, however, access will be maintained via the existing A96 which will benefit from lower traffic volumes. The impact on accessibility is therefore considered to be minor.
- The Pink route option continues to attract higher traffic volumes than the Blue route and therefore the removal of junction 21 does not alter the assessment of the Pink and Blue route options.
- The removal of Durno junction (J21), removes the requirement for an additional structure to support the east bound slip road, crossing the Burn of Durno and associated floodplain. This reduces the overall structural impact of the Pink route option but does not alter the assessment as Pink was already better performing with impacts associated with the Durno junction included.
- The removal of Durno junction (J21), removes three moderate impacts, on ancient woodland, Burn of Durno floodplain and prime agricultural land and the impact on the Pitscurry Cairn.

Therefore, not providing junction 21 does not alter the appraisal of the Blue and Pink route options and Pink is preferred.

7 Overall pairing assessment conclusions

The pairing assessments undertaken on the Blue vs Pink route options concluded as follows:

- The pairing assessment concluded that the Pink route option (C1/Br1/P1/P2/V1/V2) is a better performing route option than the Blue route option (C2/B1/B2/B3). Engineering, Environment and Traffic appraisals all determined that the Pink route option performed better than the Blue route option.
- Further pairing assessment concluded that variants of Blue route option to the east (B3/V3 vs G3) perform similarly and do not change the overall assessment that the Pink route option was better performing than the Blue route option.
- A review of alternative connections to the Red route option at the western end of the paired sections also concluded that the Pink route option was better performing than the Blue route option and that removal of J21 Durno does not affect the outcome of the assessment.

It is concluded that the Pink route option (C1/Br1/P1/P2/V1/V2) is the better performing and should be progressed. The Blue route option (C2/B1/B2/B3) should be removed from further consideration.

Appendix A

Pairing assessments

Appendix B

Engineering plans

Appendix C

Environmental plans



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