



**TRANSPORT
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A96
DUALLING
EAST OF HUNTLY TO ABERDEEN

A96 Dualling

East of Huntly to Aberdeen scheme

DMRB Stage 2 Scheme Assessment Report

**Volume 4a - Part 6 Appendices (Engineering
and Traffic & Economic Assessment)**

December 2020

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A96 Dualling East of Huntly to Aberdeen

DMRB Stage 2 Scheme Assessment Report Volume 4b Appendices

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Contents

	Page
Volume 1: The Scheme and Engineering Assessment	
Volume 2: Environmental Assessment	
Volume 3: Traffic and Economic Assessment, Assessment Summary and Preferred Options Recommendation	
Volume 4a: Engineering Appendices	
Appendix A2.1 Existing Bridge Structures	
Appendix A2.2 Existing Culverts, Retaining Structures and other Minor Structures	
Traffic & Economic Appendices	
Appendix A26.1 Cyan-Pink-Violet Cost Benefit Analysis	
Appendix A26.2 Cyan-Pink-Orange Cost Benefit Analysis	
Appendix A26.3 Cyan-Brown-Violet Cost Benefit Analysis	
Appendix A26.4 Cyan-Brown-Orange Cost Benefit Analysis	
Appendix A26.5 Red-Pink-Violet Cost Benefit Analysis	
Appendix A26.6 Red-Pink-Orange Cost Benefit Analysis	
Appendix A26.7 Red-Brown-Violet Cost Benefit Analysis	
Appendix A26.8 Red-Brown-Orange Cost Benefit Analysis	
Appendix A28.1 Value for Money Workshop Report	
Volume 4b: Environmental Appendices	
Volume 5: Engineering, Environmental and Traffic Figures	

Appendix A2.1 Existing Bridge Structures

Appendix A2.1 Existing Bridge Structures

Reference	Name	Carrying	Obstacle Crossed	Superstructure	Substructure	Foundations	Span Lengths (m)	Deck Width (m)	Skew (degrees)	Carriageway Width (m)	Headroom (m)	Parapets	Principal Inspection	No. category 3 or 4 defects	Maintenance Items	Comments
A96 275	Agricultural Underpass	A96 Single carriageway	Farm access track	Single span reinforced concrete portal	Full-height steel sheet pile integral abutment (reinforced concrete capping beams and concrete faced sheet piles) with 4no. contiguous wingwalls	Steel piles	5.3	18	5	Width available on bridge: 17m	4.48	P2 containment aluminium parapets. Height: 1000mm. Mesh infill to full height.	2014	0	-	Constructed circa 2004
A96 270	Whinbrae Underpass	A96 Single carriageway	Farm access track	Reinforced concrete box	Wingwalls are formed of reinforced concrete splayed trough sections (2no. one at each end of reinforced concrete box)	Base of box section as ground bearing slab (integral with box section)	4.5	24.9	0	Carriageway 12.1m with 2.75m verges each side.	4.38	Steel tensioned safety fencing. Height: 630mm. Timber post and rail fence behind wingwalls and box headwall.	2016	0	-	Constructed circa 1992
A96 260	Bainshole	A96 Single Carriageway	Glen Water (Watercourse)	Reinforced concrete solid slab deck	Mass concrete gravity abutments, concrete with rubble masonry faced wingwalls and rubble masonry parapets	Strip footings bearing on natural ground	6.1	12.8	25	Carriageway 6.2m with 2.8m verges each side.	1.60	Masonry parapet. Height: 900mm.	2016	1	Safety fencing required to LHS.	Constructed circa 1939
A96 250	Kellock	A96 Single carriageway	Kellock Burn (Watercourse)	Reinforced concrete solid slab deck.	Reinforced concrete abutments with concrete and gabion wingwalls. Widened section of deck supported on existing wingwalls.	Reinforced concrete strip footings bearing on natural ground	3.8	26.6	20	Carriageway 9.5m with 4.7m and 3.5m grass verges.	3.00	Steel tensioned safety fencing. Height: 600mm.	2017	2	Pedestrian protective fencing should be erected to the RH wingwall. Cyclic maintenance to remove vegetation (fallen tree lying over watercourse).	Constructed circa 1973 and widened on west side circa 1993
A96 240	Shevock	A96 Single carriageway	Shevock Burn (Watercourse)	Reinforced concrete solid slab deck	Reinforced concrete abutments and wingwalls	Spread footings bearing on natural ground	6.7	15.9	17	Carriageway 7.5m with 3.7m grass verges each side.	1.75	N2 W2 safety barrier and pedestrian parapet.	2017	0	-	Constructed circa 1969

Reference	Name	Carrying	Obstacle Crossed	Superstructure	Substructure	Foundations	Span Lengths (m)	Deck Width (m)	Skew (degrees)	Carriageway Width (m)	Headroom (m)	Parapets	Principal Inspection	No. category 3 or 4 defects	Maintenance Items	Comments
A96 230	Carden	A96 Single carriageway	Gadie Burn (Watercourse)	2-span masonry arch widened with mass concrete arches on east side	Pier: stone wall Abutments: Stone wall	-	5.4 / 5.4	Varies as widened bridge is trapezoidal on plan	-	Carriageway 6.3m with 0.9m grass verge and 1.4m footpath.	0.90 - 2.30	Masonry parapet. Height: 750mm (west) and 900mm (east). Temporary barrier in front of eastern parapet.	2017	Span 1 = 3. Span 2 (widened) = 5. Span 3 = 4. Span 4 (widened) = 7.	All spans. Raise parapet with coping stone to correct height and stop water ingress, repoint parapet. Erect safety fencing end protection to parapet. Spans 2 & 4. Concrete repairs to arch intrados. Waterproofing replacement. Span 3. Watercourse scour protection. Scour up to 300mm undercut, along central pier. Spans 3 & 4. VRS not connected to end of parapet install full height anchorage Span 4. Concrete repairs where major spalling has occurred and undermining of spandrel. Drainage discharge onto face of arch causing concrete spalling.	Constructed circa 1900, widened circa 1936
A96 215	Inveramsay New Rail Bridge	A96 Single carriageway	Railway (Aberdeen-Inverness Line)	No record in database	-	-	-	-	-	-	-	-	None in database	-	-	Constructed circa 2016
A96 213	Inveramsay New Underpass	A96 Single carriageway	Local road	No record in database	-	-	-	-	-	-	-	-	None in database	-	-	Constructed circa 2016
A96 210	Inveramsay Underpass	A96 Single carriageway	Farm access track	Reinforced concrete box	Reinforced concrete abutments and wingwalls	Mass concrete to weathered rock	3.8	15.3	0	Carriageway 9.3m with 2.5m verges each side.	2.88	P2 containment aluminium parapet. Height: 1000mm. Mesh infill to full height on one side only.	2017	0	-	Constructed circa 1990
A96 190	Drimmies Farm Underpass	A96 Single carriageway	Farm access track	Reinforced concrete box	Reinforced concrete abutments and wingwalls	Base of box section as ground bearing slab	4.5	21.9	0	Carriageway 11.6m with 3.7m and 2.35m verges.	4.37	Steel tensioned safety fencing. Height: 750mm.	2017	1	Raise height of LHS safety fencing.	Constructed circa 1990
A96 180	Conglas Cattle Underpass	A96 Single carriageway	Farm access track	Reinforced concrete box	Reinforced concrete abutments and wingwalls	Base of box section as ground bearing slab	3.8	31.6	0	Carriageway 9.3m with 12.5m and 2.8m verges.	2.83	Steel tensioned safety fencing. Height: 750mm.	2017	0	-	Constructed circa 1990

Reference	Name	Carrying	Obstacle Crossed	Superstructure	Substructure	Foundations	Span Lengths (m)	Deck Width (m)	Skew (degrees)	Carriageway Width (m)	Headroom (m)	Parapets	Principal Inspection	No. category 3 or 4 defects	Maintenance Items	Comments
A96 175	Inverurie Underpass	A96 Single carriageway	Pedestrian Way	Single span reinforced concrete portal	Reinforced concrete abutments and wingwalls	Strip footing on natural ground	5.0	14.7	50	Carriageway 9.3m with 1.9m and 2m verges.	2.35	P2 containment aluminium parapet. Height: 1000mm. Mesh infill to full height.	2016	0	-	Constructed circa 2002
A96 170	Inverurie Golf Underpass	A96 Single carriageway	Davah Wood, local road access track to Inverurie Golf Club	Reinforced concrete box	Reinforced concrete abutments and wingwalls	Spread footings on natural ground	4.5	15.3	0	Carriageway 9.3m with 2.5m verges each side.	4.20	P2 containment aluminium parapet. Height: 1000mm. Mesh infill to full height.	2017	0	-	Constructed circa 1990
A96 160	Upperboat Overbridge	Local Road - St. James Place	A96 Single carriageway	Three span continuous deck comprising rolled steel beams acting compositely with a reinforced concrete deck slab	Piers: reinforced concrete leaf Abutments: reinforced concrete skeletal	Spread footing on natural ground	11.0, / 12.2 / 8.9	12.3	29	Carriageway 7.3m with 2m verges each side.	5.36	P2 containment aluminium parapet. Height: 1000mm. Mesh infill to full height.	2017	Span 2 = 5	Repair impact damage to beam 3 and 4 and web stiffener and paint. Painting to replace paint breakdown due to abrasion from vehicle impact. VRS posts severely corroded and should be replaced, reduced containment capacity.	Constructed circa 1990
A96 150	Don Inverurie New (River Don Crossing)	A96 Single carriageway	River Don & flood plain	Four spans of continuous deck comprising steel plate girders acting compositely with a reinforced concrete slab	Piers: reinforced concrete columns Abutments: reinforced concrete bankseat	Spread footing on natural ground	25.0 / 42.5 / 42.5 / 30.0	12.3	0	Carriageway 9.3m with 1m footways on each side.	7.00	P2 containment aluminium parapet. Height: 1000mm. Mesh infill to full height.	2017	Span 1 = 4. Span 2 = 5. Span 3 = 5. Span 4 = 4.	All spans. Cyclic maintenance drainage, road gullies are blocked. Minor localised areas of corrosion. Surfacing rutting and crazing. Spans 2 & 3. Joints repair for tracking of joint in both carriageways. Watercourse scour protection as minor washout of gabions.	Constructed circa 1990
A96 140	Quarry Road Interchange	A96 Dual Carriageway	Local Road - B987	Reinforced concrete box	Reinforced concrete abutments and wingwalls	Base of box section as ground bearing slab	12.3	26.1	0	Carriageway 9.3m with 2.5m central reserve and 2m verges	5.30	P2 containment aluminium parapet. Height: 1000mm. Mesh infill to full height.	2014	0	-	Constructed circa 1998
A96 130	Forrest Road Overbridge	Local Road - Forrest Road	A96 Dual Carriageway	Two span continuous reinforced concrete slab	Pier: reinforced concrete columns Abutments: reinforced concrete full height integral	Spread footing	16.2 / 17.9	13.3	11 (varies)	Carriageway 5.75m with 3.3m footpaths each side	5.62	P2 containment aluminium parapet. Height: 1250mm. Mesh infill to full height.	2014	0	-	Constructed circa 1998
A96 120	Castle Road Underpass	A96 Dual Carriageway	Local Road - Castle Road	Reinforced concrete box	Reinforced concrete abutments and wingwalls	Base of box section as ground bearing slab	4.0	43.4	30	Carriageway 7.3m with 1m hard strips either side of a 5.1m central reserve.	2.80	Steel tensioned safety fencing. Height: 770mm.	2014	0	-	Constructed circa 1998
A96 110	Dunnecht Road Overbridge	Local Road - B977 Gauchhill Road	A96 Dual Carriageway	Two span continuous reinforced concrete slab	Pier: reinforced concrete columns Abutments: reinforced concrete full height integral	Column has spread footing on rock foundation, abutments have spread footing on natural ground	18.5	16.5	8	Carriageway 4.75m with 3m verges each side.	5.55	P2 containment aluminium parapet. Height: 1250mm. Mesh infill to full height.	2014	1	Carriageway top layer breached	Constructed circa 1998

Notes:

1. Carriageway width measured as the distance between kerbs or raised verges.
2. Category 3 (Unacceptable - Action required within 6 years) and Category 4 (Severe - Currently affecting the integrity of the structure) maintenance work items are recorded in the table only.
3. Span stated is clear square span unless stated otherwise.
4. 'Deck Width' is taken as the length along the structure transverse centreline parallel to the centreline of the road being carried, including parapet upstands if applicable.

Appendix A2.2 Existing Culverts, Retaining Structures and other Minor Structures

Appendix A2.2 Existing Culverts, Retaining Structures and other Minor Structures

Culverts

Reference	Name	Carrying	Obstacle Crossed	Description	Span Lengths (m)	Culvert Length	Skew (°)	Carriageway Width (m)	Min. Headroom (m)	Parapets	Principal Inspection	No. category 3 or 4 defects	Maintenance Items	Comments
A96 260 C10	Culvert C10 Wedder Burn	A96 Single carriageway	Wedder Burn (Watercourse)	Masonry arch extended by reinforced concrete box.	1.8	16	0	-	-	Masonry	Unknown	-	-	Constructed circa 1900, no construction date available for extension
A96 260 C5	Culvert C5 Peterden	A96 Single carriageway	Peterden Burn (Watercourse)	Reinforced concrete box and wingwalls	2.4	31	Approx. 10	Carriageway width: 8, verge widths: 1.9 and 2.2	3.3	None	2017	2	Missing through deck safety fencing and pedestrian protective fencing which should be rectified.	Constructed circa 1960
A96 250 C35	Culvert C35 Colpy	A96 Single carriageway	Jordan Burn (Watercourse)	Masonry arch with reinforced concrete extensions to each side and reinforced concrete wingwalls	2.4	20 (Span 1 arch: 10.50 / Span 2 extension: 6.20m / Span 3 extension: 3.30m)	2.5	Carriageway width: 7.5, verge widths: 3.5 and 3.6	1.85	Steel tensioned safety fencing. Height: 590mm.	2017	2	Pedestrian protection fencing should be erected, required on extension spans.	Constructed circa 1900, no construction date available for extensions
A96 230 C80	Culvert C80 Mains of Pitmachie	A96 Single carriageway	Unnamed burn (Watercourse)	Masonry arch	1.9	88	-	-	-	Masonry. Height: 955mm.	1987	-	-	Constructed circa 1900
A96 230 C1	Culvert C1 Carden Flood Arch	A96 Single carriageway	Floodplain	Masonry arch extended with concrete arch on east side	2.4	9 (Span 1 Arch: 8m / Span 2 Extension: 1m)	0	Carriageway width: 6.3	0.9	Masonry. Height: 700mm.	2012	2	Parapet too low for pedestrian containment, copestone required and modifications to safety fencing to provide protection to end of parapet on both spans	Constructed circa 1900 extended circa 1936

Reference	Name	Carrying	Obstacle Crossed	Description	Span Lengths (m)	Culvert Length	Skew (°)	Carriageway Width (m)	Min. Headroom (m)	Parapets	Principal Inspection	No. category 3 or 4 defects	Maintenance Items	Comments
A96 200	Strathnaterick	A96 Single carriageway	Strathnaterick Burn (Watercourse)	Corrugated circular metal buried structure with inset concrete channel. Reinforced concrete headwalls and stone facing to surrounding embankment	3.2	51	17	Carriageway width: 9.2, verge widths 3.6m either side	3.1	Steel tensioned safety fencing. Height: 750mm.	2017	2	Watercourse scour protection for undermining of pitching US and DS. Watercourse debris removal, cyclic maintenance. (Rock traps require clearing).	Constructed circa 1990
A96 130 C58	Culvert C58 Bridgalehouse Burn	A96 Dual Carriageway	Unknown watercourse	Helically wound corrugated steel pipe. Reinforced concrete headwalls	1.8	88	32	Overall embankment width 89m. Slip roads.	1.4	Steel tensioned safety fencing. Height: 610mm.	2014	-	-	Constructed circa 1998

Notes:

1. Carriageway width measured as the distance between kerbs or raised verges.
2. Category 3 (Unacceptable - Action required within 6 years) and Category 4 (Severe - Currently affecting the integrity of the structure) maintenance work items are recorded in the table only.
3. Span stated is clear square span unless stated otherwise.

Retaining Walls

Reference	Name	Description	Maximum Retained Height (m)	Retaining Wall Length (m)	Parapets	Principal Inspection	No. category 3 or 4 defects	Maintenance Items	Comments
A96 60 W31	Retaining Wall Pitcaple W31 (assumed)	Information unavailable in database	-	-	-	-	-	-	No information available – Assumed to be barrier retaining railway embankment east of Pitcaple.
A96 60 W15	Retaining Wall Pitcaple W15 (assumed)	Information unavailable in database	-	-	-	-	-	-	No information available – Assumed to be masonry retaining wall, part of the railway overbridge
Structure not in database.	Pitcaple Retaining Wall	Information unavailable in database	-	-	-	-	-	-	No information available – Assumed to be railway embankment retaining wall west of Pitcaple.
A96 175 W1	Crib Wall W1 Inverurie Underpass	Timber crib wall	3	53.9	Timber fence	2016	0	-	Constructed circa 2002

Notes:

1. Category 3 (Unacceptable - Action required within 6 years) and Category 4 (Severe - Currently affecting the integrity of the structure) maintenance work items are recorded in the table only.

Other Minor Structures

Reference	Name	Description	Parapets	Principal Inspection	No. category 3 or 4 defects	Maintenance Items	Comments
VMS / A96 / 7642 / W	VMS G83 replacement	VMS Sign Support Structures - Steel structure supporting smart signage next to carriageway. 6x12 Verge mounted MS4 type sign	Front face of OBB safety barrier located 2.9m from edge of concrete base next to carriageway.	-	-	-	Installation April 2018 Located Grid Ref. 375392, 822634.

Notes:

1. Category 3 (Unacceptable - Action required within 6 years) and Category 4 (Severe - Currently affecting the integrity of the structure) maintenance work items are recorded in the table only.

Appendix A26.1 Cyan-Pink-Violet Cost Benefit Analysis

Appendix A26.1 Cyan-Pink-Violet Cost Benefit Analysis

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	ALL MODES TOTAL	ROAD Private Cars and LGVs
<u>User benefits</u>		
Travel time	£84.1	£84.1
Vehicle operating costs	-£6.5	-£6.5
NET NON-BUSINESS BENEFITS: COMMUTING	£77.6 (1a)	£77.6
Non-business: Other	ALL MODES TOTAL	ROAD Private Cars and LGVs
<u>User benefits</u>		
Travel time	£75.5	£75.5
Vehicle operating costs	-£12.1	-£12.1
NET NON-BUSINESS BENEFITS: OTHER	£63.4 (1b)	£63.4
Business		Goods Vehicles Business Cars & LGVs
<u>User benefits</u>		
Travel time	£86.0	£67.2 £18.8
Vehicle operating costs	-£6.4	-£5.5 -£0.9
Subtotal	£79.6 (2)	£61.7 £17.9
NET BUSINESS IMPACT	£79.6 (3) = (2)	
TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£220.6 (4) = (1a) + (1b) + (3)	

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Tables

	ALL MODES TOTAL	ROAD INFRASTRUCTURE
Central Government Funding: Transport		
Investment Costs	£496	£496
NET IMPACT	£496 (5)	£496
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-£7.5 (6)	-£7.5
TOTALS		
Broad Transport Budget	£496 (7) = (5)	
Wider Public Finances	-£7.5 (8) = (6)	

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

Analysis of Monetised Costs and Benefits

Greenhouse Gases	-£4.2 (9)	
Accidents	£49.9 (10)	
Economic Efficiency: Consumer Users (Commuting)	£77.6 (1a)	
Economic Efficiency: Consumer Users (Other)	£63.4 (1b)	
Economic Efficiency: Business Users and Providers	£79.6 (3)	
Wider Public Finances (Indirect Taxation Revenues)	£7.5	- (8) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	£274	(PVB) = (9) + (10) + (1a) + (1b) + (3) - (8)
Broad Transport Budget	£496 (7)	
Present Value of Costs (see notes) (PVC)	£496	(PVC) = (7)
OVERALL IMPACTS		
Net Present Value (NPV)	-£222	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.55	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix A26.2 Cyan-Pink-Orange Cost Benefit Analysis

Appendix A26.2 Cyan-Pink-Orange Cost Benefit Analysis

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	ALL MODES TOTAL	ROAD Private Cars and LGVs
<u>User benefits</u>		
Travel time	£92.7	£92.7
Vehicle operating costs	-£3.6	-£3.6
NET NON-BUSINESS BENEFITS: COMMUTING	£89.1 (1a)	£89.1
Non-business: Other	ALL MODES TOTAL	ROAD Private Cars and LGVs
<u>User benefits</u>		
Travel time	£92.9	£92.9
Vehicle operating costs	-£5.7	-£5.7
NET NON-BUSINESS BENEFITS: OTHER	£87.2 (1b)	£87.2
Business		Goods Vehicles Business Cars & LGVs
<u>User benefits</u>		
Travel time	£106.2	£83.4 £22.8
Vehicle operating costs	£5.7	£5.6 £0.1
Subtotal	£111.9 (2)	£89.0 £22.9
NET BUSINESS IMPACT	£111.9 (3) = (2)	
TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£288.2 (4) = (1a) + (1b) + (3)	

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES TOTAL	ROAD INFRASTRUCTURE
Central Government Funding: Transport		
Investment Costs	£501	£501
NET IMPACT	£501 (5)	£501
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-£1.4 (6)	-£1.4
TOTALS		
Broad Transport Budget	£501 (7) = (5)	
Wider Public Finances	-£1.4 (8) = (6)	

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

Analysis of Monetised Costs and Benefits

Greenhouse Gases	-£0.7 (9)	
Accidents	£60.9 (10)	
Economic Efficiency: Consumer Users (Commuting)	£89.1 (1a)	
Economic Efficiency: Consumer Users (Other)	£87.2 (1b)	
Economic Efficiency: Business Users and Providers	£111.9 (3)	
Wider Public Finances (Indirect Taxation Revenues)	£1.4	- (8) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	£350	(PVB) = (9) + (10) + (1a) + (1b) + (3) - (8)
Broad Transport Budget	£501 (7)	
Present Value of Costs (see notes) (PVC)	£501 (PVC) = (7)	
OVERALL IMPACTS		
Net Present Value (NPV)	-£151	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.70	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix A26.3 Cyan-Brown-Violet Cost Benefit Analysis

Appendix A26.3 Cyan-Brown-Violet Cost Benefit Analysis

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	ALL MODES TOTAL	ROAD Private Cars and LGVs
User benefits		
Travel time	£81.7	£81.7
Vehicle operating costs	-£8.0	-£8.0
NET NON-BUSINESS BENEFITS: COMMUTING	£73.7 (1a)	£73.7
Non-business: Other	ALL MODES TOTAL	ROAD Private Cars and LGVs
User benefits		
Travel time	£70.2	£70.2
Vehicle operating costs	-£13.8	-£13.8
NET NON-BUSINESS BENEFITS: OTHER	£56.4 (1b)	£56.4
Business		Goods Vehicles Business Cars & LGVs
User benefits		
Travel time	£72.5	£54.9 £17.6
Vehicle operating costs	-£2.6	-£1.1 -£1.5
Subtotal	£69.9 (2)	£53.8 £16.1
NET BUSINESS IMPACT	£69.9 (3) = (2)	
TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£200.0 (4) = (1a) + (1b) + (3)	

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES TOTAL	ROAD INFRASTRUCTURE
Central Government Funding: Transport		
Investment Costs	£526	£526
NET IMPACT	£526 (5)	£526
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-£6.5 (6)	-£6.5
TOTALS		
Broad Transport Budget	£526 (7) = (5)	
Wider Public Finances	-£6.5 (8) = (6)	

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

Analysis of Monetised Costs and Benefits

Greenhouse Gases	-£3.6 (9)	
Accidents	£47.2 (10)	
Economic Efficiency: Consumer Users (Commuting)	£73.7 (1a)	
Economic Efficiency: Consumer Users (Other)	£56.4 (1b)	
Economic Efficiency: Business Users and Providers	£69.9 (3)	
Wider Public Finances (Indirect Taxation Revenues)	£6.5	- (8) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	£250	(PVB) = (9) + (10) + (1a) + (1b) + (3) - (8)
Broad Transport Budget	£526 (7)	
Present Value of Costs (see notes) (PVC)	£526 (PVC) = (7)	
OVERALL IMPACTS		
Net Present Value (NPV)	-£276	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.48	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix A26.4 Cyan-Brown-Orange Cost Benefit Analysis

Appendix A26.4 Cyan-Brown-Orange Cost Benefit Analysis

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	ALL MODES TOTAL	ROAD Private Cars and LGVs
User benefits		
Travel time	£90.6	£90.6
Vehicle operating costs	-£4.3	-£4.3
NET NON-BUSINESS BENEFITS: COMMUTING	£86.3 (1a)	£86.3
Non-business: Other	ALL MODES TOTAL	ROAD Private Cars and LGVs
User benefits		
Travel time	£89.2	£89.2
Vehicle operating costs	-£7.8	-£7.8
NET NON-BUSINESS BENEFITS: OTHER	£81.4 (1b)	£81.4
Business		Goods Vehicles Business Cars & LGVs
User benefits		
Travel time	£99.2	£77.8 £21.4
Vehicle operating costs	£0.8	£1.0 -£0.2
Subtotal	£100.0 (2)	£78.8 £21.2
NET BUSINESS IMPACT	£100.0 (3) = (2)	
TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£267.7 (4) = (1a) + (1b) + (3)	

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES TOTAL	ROAD INFRASTRUCTURE
Central Government Funding: Transport		
Investment Costs	£521	£521
NET IMPACT	£521 (5)	£521
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-£3.8 (6)	-£3.8
TOTALS		
Broad Transport Budget	£521 (7) = (5)	
Wider Public Finances	-£3.8 (8) = (6)	

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

Analysis of Monetised Costs and Benefits

Greenhouse Gases	-£2.0 (9)	
Accidents	£58.7 (10)	
Economic Efficiency: Consumer Users (Commuting)	£86.3 (1a)	
Economic Efficiency: Consumer Users (Other)	£81.4 (1b)	
Economic Efficiency: Business Users and Providers	£100.0 (3)	
Wider Public Finances (Indirect Taxation Revenues)	£3.8	- (8) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	£328	(PVB) = (9) + (10) + (1a) + (1b) + (3) - (8)
Broad Transport Budget	£521 (7)	
Present Value of Costs (see notes) (PVC)	£521 (PVC) = (7)	
OVERALL IMPACTS		
Net Present Value (NPV)	-£193	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.63	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix A26.5 Red-Pink-Violet Cost Benefit Analysis

Appendix A26.5 Red-Pink-Violet Cost Benefit Analysis

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting		ALL MODES	ROAD
<u>User benefits</u>		TOTAL	Private Cars and LGVs
Travel time		£86.9	£86.9
Vehicle operating costs		-£5.3	-£5.3
NET NON-BUSINESS BENEFITS: COMMUTING		£81.6 (1a)	£81.6
Non-business: Other		ALL MODES	ROAD
<u>User benefits</u>		TOTAL	Private Cars and LGVs
Travel time		£79.4	£79.4
Vehicle operating costs		-£10.6	-£10.6
NET NON-BUSINESS BENEFITS: OTHER		£68.8 (1b)	£68.8
Business			Goods Vehicles Business Cars & LGVs
<u>User benefits</u>			
Travel time		£92.6	£72.6 £20.0
Vehicle operating costs		-£1.7	-£1.3 -£0.4
Subtotal		£90.9 (2)	£71.3 £19.6
NET BUSINESS IMPACT		£90.9 (3) = (2)	
TOTAL			
Present Value of Transport Economic Efficiency Benefits (TEE)		£241.3 (4) = (1a) + (1b) + (3)	

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES	ROAD
Central Government Funding: Transport	TOTAL	INFRASTRUCTURE
Investment Costs	£535	£535
NET IMPACT	£535 (5)	£535
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-£5.4 (6)	-£5.4
TOTALS		
Broad Transport Budget	£535 (7) = (5)	
Wider Public Finances	-£5.4 (8) = (6)	

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

Analysis of Monetised Costs and Benefits

Greenhouse Gases	-£3.0 (9)	
Accidents	£52.8 (10)	
Economic Efficiency: Consumer Users (Commuting)	£81.6 (1a)	
Economic Efficiency: Consumer Users (Other)	£68.8 (1b)	
Economic Efficiency: Business Users and Providers	£90.9 (3)	
Wider Public Finances (Indirect Taxation Revenues)	£5.4	- (8) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	£297	(PVB) = (9) + (10) + (1a) + (1b) + (3) - (8)
Broad Transport Budget	£535 (7)	
Present Value of Costs (see notes) (PVC)	£535 (PVC) = (7)	
OVERALL IMPACTS		
Net Present Value (NPV)	-£238	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.56	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix A26.6 Red-Pink-Orange Cost Benefit Analysis

Appendix A26.6 Red-Pink-Orange Cost Benefit Analysis

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting		ALL MODES	ROAD
<u>User benefits</u>		TOTAL	Private Cars and LGVs
Travel time		£95.5	£95.5
Vehicle operating costs		-£2.5	-£2.5
NET NON-BUSINESS BENEFITS: COMMUTING		£93.0 (1a)	£93.0
Non-business: Other		ALL MODES	ROAD
<u>User benefits</u>		TOTAL	Private Cars and LGVs
Travel time		£96.1	£96.1
Vehicle operating costs		-£4.2	-£4.2
NET NON-BUSINESS BENEFITS: OTHER		£91.9 (1b)	£91.9
Business			Goods Vehicles Business Cars & LGVs
<u>User benefits</u>			
Travel time		£111.9	£87.8 £24.1
Vehicle operating costs		£10.9	£10.5 £0.4
Subtotal		£122.8 (2)	£98.3 £24.5
NET BUSINESS IMPACT		£122.8 (3) = (2)	
TOTAL			
Present Value of Transport Economic Efficiency Benefits (TEE)		£307.7 (4) = (1a) + (1b) + (3)	

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES	ROAD
Central Government Funding: Transport	TOTAL	INFRASTRUCTURE
Investment Costs	£541	£541
NET IMPACT	£541 (5)	£541
Central Government Funding: Non-Transport		
Indirect Tax Revenues	£1.0 (6)	£1.0
TOTALS		
Broad Transport Budget	£541 (7) = (5)	
Wider Public Finances	£1.0 (8) = (6)	

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

Analysis of Monetised Costs and Benefits

Greenhouse Gases	£0.7 (9)	
Accidents	£62.6 (10)	
Economic Efficiency: Consumer Users (Commuting)	£93.0 (1a)	
Economic Efficiency: Consumer Users (Other)	£91.9 (1b)	
Economic Efficiency: Business Users and Providers	£122.8 (3)	
Wider Public Finances (Indirect Taxation Revenues)	-£1.0	- (8) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	£370	(PVB) = (9) + (10) + (1a) + (1b) + (3) - (8)
Broad Transport Budget	£541 (7)	
Present Value of Costs (see notes) (PVC)	£541 (PVC) = (7)	
OVERALL IMPACTS		
Net Present Value (NPV)	-£171	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.68	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix A26.7 Red-Brown-Violet Cost Benefit Analysis

Appendix A26.7 Red-Brown-Violet Cost Benefit Analysis

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	ALL MODES TOTAL	ROAD Private Cars and LGVs
<u>User benefits</u>		
Travel time	£85.2	£85.2
Vehicle operating costs	-£7.2	-£7.2
NET NON-BUSINESS BENEFITS: COMMUTING	£78.0 (1a)	£78.0
Non-business: Other	ALL MODES TOTAL	ROAD Private Cars and LGVs
<u>User benefits</u>		
Travel time	£74.7	£74.7
Vehicle operating costs	-£12.1	-£12.1
NET NON-BUSINESS BENEFITS: OTHER	£62.6 (1b)	£62.6
Business		Goods Vehicles Business Cars & LGVs
<u>User benefits</u>		
Travel time	£78.5	£59.5 £19.0
Vehicle operating costs	£2.2	£3.4 -£1.2
Subtotal	£80.7 (2)	£62.9 £17.8
NET BUSINESS IMPACT	£80.7 (3) = (2)	
TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£221.3 (4) = (1a) + (1b) + (3)	

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES TOTAL	ROAD INFRASTRUCTURE
Central Government Funding: Transport		
Investment Costs	£554	£554
NET IMPACT	£554 (5)	£554
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-£4.3 (6)	-£4.3
TOTALS		
Broad Transport Budget	£554 (7) = (5)	
Wider Public Finances	-£4.3 (8) = (6)	

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

Analysis of Monetised Costs and Benefits

Greenhouse Gases	-£2.3 (9)	
Accidents	£49.2 (10)	
Economic Efficiency: Consumer Users (Commuting)	£78.0 (1a)	
Economic Efficiency: Consumer Users (Other)	£62.6 (1b)	
Economic Efficiency: Business Users and Providers	£80.7 (3)	
Wider Public Finances (Indirect Taxation Revenues)	£4.3	- (8) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	£273	(PVB) = (9) + (10) + (1a) + (1b) + (3) - (8)
Broad Transport Budget	£554 (7)	
Present Value of Costs (see notes) (PVC)	£554 (PVC) = (7)	
OVERALL IMPACTS		
Net Present Value (NPV)	-£281	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.49	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix A26.8 Red-Brown-Orange Cost Benefit Analysis

Appendix A26.8 Red-Brown-Orange Cost Benefit Analysis

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	ALL MODES TOTAL	ROAD Private Cars and LGVs
<u>User benefits</u>		
Travel time	£94.7	£94.7
Vehicle operating costs	-£3.4	-£3.4
NET NON-BUSINESS BENEFITS: COMMUTING	£91.3 (1a)	£91.3
Non-business: Other	ALL MODES TOTAL	ROAD Private Cars and LGVs
<u>User benefits</u>		
Travel time	£93.9	£93.9
Vehicle operating costs	-£5.5	-£5.5
NET NON-BUSINESS BENEFITS: OTHER	£88.4 (1b)	£88.4
Business		
<u>User benefits</u>		Goods Vehicles Business Cars & LGVs
Travel time	£106.8	£84.0 £22.8
Vehicle operating costs	£5.7	£5.5 £0.2
Subtotal	£112.5 (2)	£89.5 £23.0
NET BUSINESS IMPACT	£112.5 (3) = (2)	
TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£292.2 (4) = (1a) + (1b) + (3)	

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES TOTAL	ROAD INFRASTRUCTURE
Central Government Funding: Transport		
Investment Costs	£560	£560
NET IMPACT	£560 (5)	£560
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-£1.4 (6)	-£1.4
TOTALS		
Broad Transport Budget	£560 (7) = (5)	
Wider Public Finances	-£1.4 (8) = (6)	

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

Analysis of Monetised Costs and Benefits

Greenhouse Gases	-£0.7	(9)
Accidents	£61.1	(10)
Economic Efficiency: Consumer Users (Commuting)	£91.3	(1a)
Economic Efficiency: Consumer Users (Other)	£88.4	(1b)
Economic Efficiency: Business Users and Providers	£112.5	(3)
Wider Public Finances (Indirect Taxation Revenues)	£1.4	- (8) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	£354	(PVB) = (9) + (10) + (1a) + (1b) + (3) - (8)
Broad Transport Budget	£560	(7)
Present Value of Costs (see notes) (PVC)	£560	(PVC) = (7)
OVERALL IMPACTS		
Net Present Value (NPV)	-£206	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.63	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix A28.1 Value for Money Workshop Report



A96 DUALLING - EAST OF HUNTLY TO ABERDEEN

STAGE 2 SCHEME OPTIONS ASSESSMENT
VALUE FOR MONEY WORKSHOP
(CVRL Ref: 6214)

REPORT



CONTACTS

Transport Scotland
Major Projects (MP)

AmeyArup

Capital Value & Risk Limited

CONTENTS

1	INTRODUCTION.....	1
2	SCHEME INFORMATION	3
2.1	Scheme Background.....	3
2.2	Scheme Objectives	5
2.3	Route Options.....	6
2.3.1	East Of Huntly To Colpy	7
2.3.2	Colpy To Pitcaple	8
2.3.3	Pitcaple To Kintoure	9
2.4	Key Engineering Constraints	10
2.5	Key Environmental Constraints.....	11
2.6	Scheme Costs.....	11
2.7	Options Assessment	13
3	WORKSHOP OUTPUTS.....	15
3.1	Introduction	15
3.2	Information Session	16
3.2.1	Workshop Issues and Commentary	16
3.3	East Of Huntly To Colpy	17
3.3.1	Workshop Issues and Commentary	17
3.3.2	East Of Huntly To Colpy: Options Assessment Matrix	18
3.4	Colpy To Pitcaple.....	19
3.4.1	Workshop Issues and Commentary	19
3.4.2	Colpy To Pitcaple Options Assessment Matrix	20
3.5	Pitcaple To Kintore	21
3.5.1	Workshop Issues And Commentary	21
3.5.2	Pitcaple To Kintore Options Assessment Matrix	23
3.6	East Of Huntly To Kintore - End To End Route Options.....	24
3.6.1	Workshop Issues and Commentary	24

CONTENTS

3.6.2	East Of Huntly To Kintore: End To End Utility Score Assessments	25
3.6.3	East Of Huntly To Kintore: End To End Utility Score Calculation	26
3.7	Assessment Summary: End To End Assessment.....	27
3.8	Conclusions and Actions.....	28
4	WORKSHOP LOGISTICS.....	29
4.1	Agenda.....	29
4.2	Participants.....	31
4.3	Capital Value & Risk Team.....	32
	APPENDIX A – WORKSHOP PRESENTATIONS	33

1 INTRODUCTION

1 INTRODUCTION

A one-day Stage 2 Value for Money (VfM) Workshop for the A96 Dualling: East of Huntly to Aberdeen scheme was held on 29 September 2020 with representatives from Transport Scotland (TS) and its' consultants, AmeyArup (AA).

Transport Scotland required an independent facilitator to manage the VfM study. Capital Value & Risk Limited (CVRL) was commissioned to undertake the study which incorporated the workshop.

The workshop was preceded by briefing meetings on 2nd and 22nd September 2020 with TS, AA and CVRL.

Due to the Covid-19 Pandemic, the workshop was held remotely via MS Teams.

1.1 WORKSHOP OBJECTIVES

As part of developing the scheme and in accordance with TS VfM procedures, the workshop was convened to undertake a value for money review of the proposed scheme options.

The purpose of the workshop was to reach consensus on the emerging preferred route for the scheme. To facilitate this, the workshop participants were asked to review Option Assessment Tables for the three sections and challenge the provisional assessment scoring assigned by the project team.

Participants were asked to consider:

- Utility scores for each option by section
- Utility scores combined to give an end-end assessment
- End to End capital costs
- End to End value index
- End to End Benefit Cost Ratio (BCR)
- End to End Present Value of Benefits (PVB)
- End to End Net Present Value (NPV) and,
- Overall ranking assessment.

The workshop also addressed any specific issues/actions arising from the assessment process and for completion of Stage 2 assessment.

1 INTRODUCTION

A risk analysis was undertaken by AmeyArup and included in the cost estimates for each option. The key construction risks were highlighted by AmeyArup during the workshop presentations with the full project risk register available for review if required.

The inputs to and outputs from the workshop, are recorded in this Workshop Report.

2 SCHEME INFORMATION

2 SCHEME INFORMATION

2.1 SCHEME BACKGROUND

On 6 December 2011, the then Cabinet Secretary for Infrastructure and Capital Investment launched the Infrastructure Investment Plan (IIP) which provides an overview of the Scottish Government's plans for infrastructure investment over the coming decades. Contained within the document is a commitment to complete the dualling of the A96 between Inverness and Aberdeen by 2030.

The A96 between Inverness and Aberdeen is approximately 160km long and consists mostly of single carriageway and climbing lanes in places with sections of dual carriageway at each end.

Transport Scotland has completed the first phase of design (Design Manual for Roads and Bridges (DMRB) Stage 1 assessment) for the dualling of the A96 east of Nairn to Aberdeen. Based on the outcome of the preliminary assessment work, it was proposed to progress the next stage of design, the DMRB Stage 2 assessment, in three programme wide geographical sections, in addition to the Inverness to Nairn (including Nairn Bypass) section which was at a more advanced stage of development. The sections are based on a western, central and eastern section shown red in the Figure below.



2 SCHEME INFORMATION

The A96 Dualling East of Huntly to Aberdeen scheme (eastern section) will create a new dual carriageway from the tie in to the existing A96 to the east of Huntly to the existing A96 junction with the Aberdeen Western Peripheral Route (AWPR) at Craibstone - a distance of approximately 48km.

In July 2017 Amey OW Ltd and Ove Arup and Partners Ltd (AmeyArup) was appointed to carry out route options assessment (DMRB Stage 2 assessment) and detailed design work for the scheme. AmeyArup have built on the previous DMRB Stage 1 design work that has been completed for the A96 Dualling east of Nairn to Aberdeen.

AmeyArup have considered and sifted potential corridors and route options in an iterative process. Details of this activity can be found at the following address:

<https://www.transport.gov.scot/publication/dmrb-stage-2-early-sifting-reports-east-of-huntly-to-aberdeen-a96-dualling/>

In October 2018 and then in May 2019, public engagement events were held to seek feedback from members of the public on the options being developed. The material published at the exhibitions can be found at the following addresses:

October 2018 exhibition:

<https://www.transport.gov.scot/publication/exhibition-materials-public-exhibitions-october-2018-east-of-huntly-to-aberdeen-a96-dualling/>

May 2019 exhibition:

<https://www.transport.gov.scot/publication/exhibition-materials-may-2019-east-of-huntly-to-aberdeen-a96-dualling/>

The route options have been developed further, following the May 2019 public exhibitions to address feedback received from stakeholders and members of the public, as well as for engineering, environment, traffic and economic reasons.

The DMRB Stage 2 Scheme Assessment is nearing completion for the section of the scheme from East of Huntly to the existing dualled section of the A96 at Kintore.

2 SCHEME INFORMATION

2.2 SCHEME OBJECTIVES

A reminder of the scheme objectives derived from the A96 Programme Objectives are outlined below:

- To improve the operation of the A96 and inter-urban connectivity through:
 - Reduced journey times
 - Improved journey time reliability
 - Increased overtaking opportunities
 - Improved efficiency of freight movements along the transport corridor
 - Reduced conflicts between local traffic and strategic journeys; and
 - Improved network resilience.

- To improve safety for motorised and Non-Motorised Users through:
 - Reduced accident rates and severity
 - Reduced driver stress; and
 - Reduced potential conflicts between Motorised and Non-Motorised Users.

- To provide opportunities to grow the regional economies on the corridor through:
 - Improved access to the wider strategic transport network; and
 - Enhanced access to jobs and services.

- To facilitate active travel in the corridor.

- To facilitate integration with Public Transport Facilities.

- To avoid significant environmental impacts and, where this is not possible, to minimise the environmental effect on:
 - the communities and people in the corridor; and
 - natural and cultural heritage assets.

Route option assessment criteria have been developed which are based on STAG criteria and aligned to these scheme objectives.

2 SCHEME INFORMATION

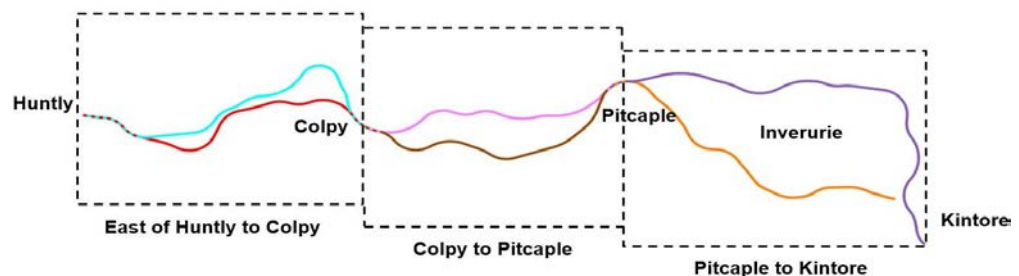
2.3 ROUTE OPTIONS

The existing A96 within the study area between East of Huntly and Inverurie Roundabout is generally a single carriageway, approximately 33 km long, with a climbing lane section, in both the westbound and eastbound directions. The remaining existing A96 between Inverurie Roundabout and Gauchhill Junction at Kintore is a dual 2 lane all-purpose dual carriageway, approximately 5 km long.

Route options have been developed to provide a D2APc dual carriageway with grade separated junctions (in line with DMRB CD 109). At the west end of the scheme, the route options tie-in to the existing A96 to the east of Huntly with a dual carriageway to single carriageway transition that allows a future dualling scheme to be developed westwards towards Huntly and beyond.

At the east end of the scheme, the Orange route option ties into the existing A96 at Tavelty Junction west of Kintore, with the Violet route option tie-in further east at the Gauchhill Junction south of Kintore. The scheme is divided into three distinct sections which contain six route options split geographically as follows:

- East of Huntly to Colpy – Cyan or Red route option.
- Colpy to Pitcaple – Pink or Brown route option; and
- Pitcaple to Kintore – Violet or Orange route option.



The six route options combine to form eight end-to-end options considered under the DMRB Stage 2 assessment process. The existing A96, realigned in places to accommodate the route options, is retained as a local access route.

2 SCHEME INFORMATION

2.3.1 East of Huntly to Colpy

Cyan Route Option

The Cyan route option is 13.3km in length and largely follows the existing A96 corridor. Describing from west to east, the route option starts east of Huntly on the existing A96 just west of Leys of Dummies farm close to a staggered T-junction with a local road access.

The route option follows the existing A96 before diverging southwards at West Adamson passing to the east of the Hill of Dummies before turning south-east at Ramstone Hill. Continuing south-eastwards, the route option crosses the realigned existing A96 west of Broom Hill and runs parallel and to the north of the existing A96 before turning east and crossing the realigned existing A96 and Glen Water. The route option then runs to the south of the existing A96, north of the Hill of Foudland before heading north-east and crossing the realigned existing A96 and running parallel to and between the existing A96 and Glen Water.

The route option turns southwards around the Hill of Skares and runs parallel to the realigned existing A96 and continues south close to the Glen Water to the proposed Colpy Junction. The route option crosses the realigned existing A96 and passes to the west side of Colpy. The Cyan route option then continues south-eastwards, connecting to the Pink and Brown route options.

Red Route Option

The Red route option is 12.2km in length. The route option follows the same alignment as the Cyan route option from east of Huntly before diverging southwards at West Adamson, passing to the east of the Hill of Dummies before turning south-east at Ramstone Hill.

The route option continues south-east to the south of Saddle Hill and north of Cot Hill before turning north-eastwards and crossing the Glen Water. It then turns south-eastwards skirting the edge of the Hill of Foudland.

Continuing south-eastwards, the route option passes to the south of the Hill of Skares and north of Jericho, where the Colpy Junction is proposed before passing to the west of Colpy. The Red route option then turns south-eastwards, connecting to the Pink and Brown route options.

2 SCHEME INFORMATION

2.3.2 Colpy to Pitcaple

Pink Route Option

The Pink route option is 10.0km in length. The route option commences at the tie in with the East of Huntly to Colpy route options (Cyan or Red) running south-eastwards before turning east and crossing the existing A96 and River Urie, where the Kellockbank Junction is proposed.

The route option runs to the north of the B992 Lawrence Road before turning south-eastwards crossing the B992 and the Bonnyton Burn and passing to the south of The Law hill. The route option turns eastwards crossing over the Burn of Durno between Durno to the north and Whiteford to the south.

The Pink route option continues eastwards, connecting to either the Violet or Orange route options.

Brown Route Option

The Brown route option is 11.0km in length and follows the existing A96 corridor for approximately 7km. The route option commences at the tie in with the East of Huntly to Colpy route options (Cyan or Red) running south-eastwards between Mill Croft and Loch Inch Fishery before turning southwards crossing The Kellock watercourse and the B992 where the Kellockbank Junction is proposed.

The route option turns eastwards south of Little Lediken towards the existing A96 before turning in a south-easterly direction and running parallel with the existing A96. On approach to Pitmachie, the route option continues in a south-easterly direction moving closer to the existing A96 and crossing the Shevock Burn. South of Pitmachie, the route option turns to the east running parallel to the existing A96, passing Mill of Pitmedden and continues eastwards where the Carden Junction is proposed.

The route option continues eastwards away from the existing A96 crossing the River Urie through Logie Woodland. Continuing eastwards, the route option crosses the Burn of Durno, midway between Durno and Whiteford.

The Brown route option continues eastwards, connecting to either the Violet or Orange route options.

2 SCHEME INFORMATION

2.3.3 Pitcaple to Kintoure

Violet Route Option

The Violet route option is 17.7km in length and passes Inverurie to the north. The route option commences at the tie-in of the Colpy to Pitcaple route options (Pink or Brown) north of Pitcaple Quarry near the Hill of Den and continues in a south-easterly direction, crossing the realigned B9001 where the Daviot Junction is proposed.

Continuing south-east, the route option runs parallel to the B9001, to the south-west of Hillhead of Lethenty where the Uryside Junction (westbound) is proposed before crossing the Lochter Burn and running parallel to the existing Portstown Link Road and where the Uryside Junction (eastbound) is proposed. The route option crosses the B9170 and continues in a south-easterly direction passing the Hill of Selbie and crossing the realigned B993 before turning south between Isaacstown and Ashlea Grange.

The route option continues southwards, crossing the River Don and its floodplain, and the Aberdeen to Inverness Railway Line. It then continues south-east to the existing Tavelty Junction and ties into the existing A96 dual carriageway.

The existing Tavelty Junction layout is reconfigured to a gyratory roundabout with a lane gain eastbound merge from the realigned existing A96 from Inverurie. The route option continues along the existing A96 to the existing Gauchhill Junction at Kintore where the additional eastbound lane is dropped and where the Violet route option terminates.

Orange Route Option

The Orange route option is 12.8km in length and passes Inverurie to the south. The route option commences at the tie-in of the Colpy to Pitcaple route options (Pink or Brown) and continues south-east across Pitscurry Moss where the Pitscurry Junction is proposed. The route option turns south at Mackstead near Hill of Den before crossing the River Urie, its floodplain, the existing A96, the Aberdeen to Inverness Railway line and an unclassified road near Station Cottages at Inveramsay.

The route option runs parallel to the existing A96 along Gallows Hill before turning south-east where Drimmies junction is proposed, north-west of Drimmies Cottages.

2 SCHEME INFORMATION

The route option continues south crossing the existing Blackhall Road / Newbiggin Access Road where the Blackhall Road Junction is proposed. At Burnside of Manar the route option turns south-east and continues crossing the River Don valley.

The route option passes Shaw Hill and Crichton Plantation and continues south-east where the Thainstone Junction is proposed before continuing south-east passing Thainstone House Hotel with a direct tie-in to the existing A96 dual carriageway adjacent to the Aberdeen and Northern Marts Thainstone Centre. A lane gain eastbound merge from the realigned A96 at Inverurie is proposed from the Thainstone Junction and would be dropped at Tavelty Junction where the Orange route option terminates.

2.4 KEY ENGINEERING CONSTRAINTS

Key engineering constraints that have been considered in route option development are given below:

- Properties and local communities: the route options have been developed to avoid the need for property demolition and, where possible, potential impacts on communities.
- Existing topography: the vertical geometry of each route option has been designed to a maximum gradient of 4% while achieving the required headroom clearances to road, rail, river, watercourse and floodplain crossings, and ensuring adequate road drainage.
- Inverness to Aberdeen Railway: following consultation with Network Rail, the design of the railway crossings accounts for the necessary headroom and span requirements to accommodate potential improvements to the Inverness to Aberdeen Railway including twin tracking and electrification.
- Public utilities: there are a number of underground and overhead utilities, including high pressure gas pipelines and 275kV transmission power lines, throughout the study area.
- Local road network: the route options have been developed taking account of the existing local road network; and
- Junctions and accesses: there are numerous existing direct accesses onto the existing A96, and the local road strategy maintains access to all properties.

2 SCHEME INFORMATION

2.5 KEY ENVIRONMENTAL CONSTRAINTS

Key environmental constraints that have been considered in route option development are given below:

- Communities and scattered properties (noise, visual, air quality, severance, access).
- Historic Battlefields (e.g. Harlaw).
- Gardens and Designed Landscapes (e.g. Keith Hall, Williamston House, and Newton House).
- Cultural heritage sites (e.g. Durno Roman Camp Scheduled Monument).
- Grade A Listed Buildings.
- Areas at risk of flooding.
- Prime Agricultural Land.
- Development sites (severance, loss of land, access, etc.).
- Other designated areas (ecology and landscape) and key watercourses (River Don and River Urie).
- Woodlands (landscape, ecology, recreation interests); and
- Existing NMU routes.

2.6 SCHEME COSTS

Scheme cost estimates for each end-to-end combination of route options have been developed and are shown in the following tables (2018 Q2 prices excluding VAT).

The cost estimates include a quantified risk allowance and 25% optimism bias.

End-to-End Option	Scheme Total (£M)
Cyan-Pink-Violet	£890m
Cyan-Pink-Orange	£899m
Cyan-Brown-Violet	£943m

2 SCHEME INFORMATION

End-to-End Option	Scheme Total (£M)
Cyan-Brown-Orange	£933m
Red-Pink-Violet	£960m
Red-Pink-Orange	£970m
Red-Brown-Violet	£993m
Red-Brown-Orange	£1,003m

Earthworks excavation, transport and construction of embankments is a key constituent of the scheme costs. Earthworks costs have been considered on an end-to-end basis and include costing of their haulage between route options.

The Cyan route option features a number of bridges and retaining structures to cross existing roads and watercourses and for slope retention purposes.

The Red route option features significant earthworks excavation and strategic utility diversions.

The Pink route option features long earthworks cuttings and some moderately sized bridges over watercourses.

The Brown route option features longer bridges over existing floodplains and also long earthworks cuttings.

The Violet route option has extensive cuttings and embankments. Strategic utilities require diversion at two locations. A large viaduct is required to cross the River Don, floodplain and adjacent railway. Significant works are required to the existing A96 at Kintore.

The Orange route option features extensive earthworks. Strategic utilities require diversion at a number of locations. Two major bridges are required – over the River Urie, flood plain and railway and also over the River Don valley.

2 SCHEME INFORMATION

2.7 OPTIONS ASSESSMENT

Ranked scores from a number of scheme assessments are collated to determine the best performing end-to-end combination of route options. These assessments are:

- Utility Score (quantified assessment on performance against STAG criteria and scheme objectives)
- Cost (including risk)
- Value Index (Utility score / Cost)
- Indexed Benefit / Cost Ratio (BCR)
- Net Present Value (NPV)
- Present Value of Benefits (PVB)

The constituent criteria of the Utility Score are:

1. Economy
2. Safety
3. Environment
4. Accessibility
5. Integration
6. Other
 - Construction complexity and minimising disruption during construction
 - Promotability through the statutory process and,
 - Facilitate network resilience.

The scheme objectives have been combined with these themes to ensure the assessment reflects the scheme objectives and established STAG criteria.

The assessments within the Utility Score are a combination of a qualitative and quantitative assessments of the assessment criteria, scored either:

- at a sectional level e.g. for the East of Huntly to Colpy section, how does the Cyan route option perform against the Red route option; or
- at end-to-end level e.g. how the Cyan-Pink-Violet end-to-end combination perform against the other seven end-to-end options.

2 SCHEME INFORMATION

This approach was taken because the performance against some of the criteria is dependent on how the route options within the sections are combined to form an end-to-end option.

The sectional and end-to-end assessment criteria scores are subsequently combined to identify the better performing combinations (end-to-end option assessment).

3 WORKSHOP OUTPUTS

3 WORKSHOP OUTPUTS

3.1 INTRODUCTION

The workshop comprised the following sessions:

- Introduction
 - Information about the scheme and the route options.
 - Explanation of the options assessment process.
- Sectional route options assessment.
- End to End assessment.
- Conclusions.

A series of presentation slides accompanied each of the above sessions and these can be found in Appendix A.

The following sub-sections comprise the participant discussion notes resulting from the various sessions along with the completed option assessment matrices and results.

Changes arising from the discussion to the provisional assessment scoring assigned by the project team are shown in red.

3 WORKSHOP OUTPUTS

3.2 INFORMATION SESSION

3.2.1 Workshop Issues and Commentary

No	Slide Ref	Agenda - Subject	Workshop Q&A / Comments
1		Introduction	No Comments
1.1		Assessment Process and Options Matrices	
1.2	25	Utility Score Assessment Criteria & Weighting	<p>Ques: Weightings: are they focussed on the specifics of the route or are they also mapped to NTS2 priorities? e.g. linked back to principle NTS objectives or concerned mainly with specifics around location.</p> <p>Ans: The scheme objectives/criteria are linked back to higher level NTS objectives (reference slide 8 - Delivering NTS2 Priorities). There are both sectional/local weightings and also End to End weightings. For example, options have been scored End to End in terms of integration, traffic, and economics. In terms of environment and Others, weightings consider those matters pertaining to the route options under review.</p>
1.3	25	Utility Score Assessment Criteria & Weighting	<p>Ques: Please explain further the breakdown of the weightings between end-end and sections. (Note: this question was raised in the next session but moved here as it relates to the assessment process).</p> <p>Ans: By reference to Slide 25 this shows how the weightings are distributed across the three sections and end-end. End-End criteria are: Economy - all sub-criteria Safety - all sub-criteria Accessibility - sub-criteria 3 Integration sub-criteria 4</p> <p>All other criteria are section specific. The different levels of sectional weightings per sub-criteria reflect the different conditions pertaining in each of the three sections and their relative significance.</p>

3 WORKSHOP OUTPUTS

3.3 EAST OF HUNTLY TO COLPY

3.3.1 Workshop Issues and Commentary

No	Slide Ref	Agenda - Subject	Workshop Q&A / Comments
1		East of Huntly to Colpy: Route Options and Matrix Assessment	
1.1	30	Construction and Maintenance	<p>Ques: Earthworks re-use</p> <p>Ans: There is a significant surplus of excavated material in this section. The spoil may be available for re-use on the scheme or require disposal off-site, depending on acceptability. e.g. slate from the area of the Hill of Foudland may have limited potential for re-use within the A96 dualling scheme. The earthworks have been considered across the three sections (cost estimate reflects this approach) although assumptions have been conservative at this stage regarding re-use of material. During Stage 3 the design will seek to optimise the re-use of material.</p>
1.2	30	Construction and Maintenance	Cyan route option has more of an interface with the existing A96 than Red route option but traffic on the existing A96 will be kept running throughout construction period.
1.3	31	Resilience	<p>Ques: Has resilience taken into account weather related issues such as:</p> <p>a) higher periods of rainfall causing more frequent landslips. b) extended periods of rainfall and areas of flood plain. c) extended periods of dryness in summer.</p> <p>Ans:</p> <p>a) Landslips: There is limited ground investigation data available. The earthworks design will take this risk into account and will be addressed in DMRB Stage 3. b) The routes are seeking to avoid where possible impact on flood plains. Retaining walls will be provided to mitigate any impacts. Also, watercourses will be diverted. There has been positive consultation with SEPA and there will be further consultation as the scheme design develops. c) Environmental assessment specifically considers future climate change projections.</p>
1.4	37, 50, 52	Environment - Air Quality	<p>Ques: Why is air quality weighted lower?</p> <p>Ans: Air Quality weighting is lower compared to other sub-criteria as there are no exceedances of limits. It is not a key issue in any of the sections.</p>

3 WORKSHOP OUTPUTS

3.3.2 East of Huntly to Colpy: Options Assessment Matrix

A96 VFM Assessment Criteria

Table 1 - East of Huntly to Colpy

Criteria	Assessment Criteria Reference	Sub-criteria	Weighting	SECTIONAL ASSESSMENT Score (0-10)		WEIGHTED SCORES		Comments	
				CYAN	RED	CYAN	RED		
Environment									
			Weighting total	20	Score /10	Score /10	192.5	163.5	
Environment 1	SO6 STAG 1	To avoid significant environmental impacts and, where this is not possible, to minimise the environmental effect upon: - the communities and people in the corridor; and - natural and cultural heritage assets	Nature Conservation	2	10	7	20	14	Scoring reflects the scale of impact upon the Wildcat Priority Area habitat.
Environment 2			Road Drainage and the Water Environment	1	9	10	9	10	Scoring reflects the realignment on River Urie for the Cyan route option.
Environment 3			Geology, Soils, Contaminated Land and Groundwater	1.5	10	8	15	12	Scoring reflect the impacts on geological resources.
Environment 4			Noise and Vibration	1	10	8	10	8	Scoring reflects the impact upon residential receptors.
Environment 5			Policies and Plans	0.5	9	10	4.5	5	Scoring reflects potential impact upon land associated with LDP policy HE1 (Protecting historic buildings, sites and monuments).
Environment 6			Landscape	2	10	5	20	10	Scoring reflects impact of earthworks upon landscape character.
Environment 7			Visual Effects	2	10	5	20	10	Scoring reflects impact upon visual impact receptors.
Environment 8			People and Communities	1.5	10	9	15	13.5	Scoring reflects impact upon private burial site.
Environment 9			Air Quality	0.5	10	10	5	5	Both route options have similar impacts.
Environment 10			Materials	2	10	8	20	16	Scoring reflects disposal of unsuitable material excavated.
Environment 11			Agriculture, Forestry and Sporting Interests	1.5	10	10	15	15	Both route options have similar impacts.
Environment 12			Cultural Heritage	2	8	10	16	20	Scoring reflects the impact on the setting of Colpy Cottage Palisaded Enclosure Scheduled Monument.
Environment 13			Health	0.5	10	10	5	5	Both route options have similar impacts.
Environment 14			Climate Change	2	9	10	18	20	Scoring reflects aggregated emissions for the 60-year study period.
Accessibility (part)									
			Sectional assessment weighting total	6	Score /10	Score /10	60	56	
Accessibility 1	SO4 STAG 5	To facilitate active travel within the corridor	Impact on existing NMU infrastructure	2	10	10	20	20	Few existing NMU routes affected. (No direct interfaces). No difference between route options.
Accessibility 2			Opportunities for new NMU routes	4	10	9	40	36	Opportunities for both route options for NMU route between Huntly and Colpy. Scoring reflects better opportunities associated with the Cyan route option for NMU users, due to proximity to existing road corridor and properties.
Integration (part)									
			Sectional assessment weighting total	4	Score /10	Score /10	40	40	
Integration 3	STAG 4.3	Integration with plans and policies	Integration with Plans and Policies (LDP)	4	10	10	40	40	No difference between route options. Isolated existing planning applications only.
Others									
			Weighting total	20	Score /10	Score /10	198	154	
Others 1	VFM 1	Construction and maintenance	Construction complexity, construction programme, residual maintenance and residual risk (CDM) Minimising disruption during construction	10	10	7	100	70	Scoring reflects significant utility diversions and larger earthworks excavation required for the Red route option. Existing road interfaces on Cyan can be constructed mainly offline.
Others 2	VFM 2 STAG 8	Promotability	Promotability through the statutory process	2	9	10	18	20	Scoring reflects a close interface with the scheduled monument at Colpy Cottage for the Cyan route option.
Others 3	SO1.6	Resilience	Facilitate Network Resilience	8	10	8	80	64	Scoring reflects the greater exposure of the Red route option to winter conditions through and across Hill of Foudland.

SO x.x Scheme Objective x.x
 STAG Scottish Transport Appraisal Guidance reference
 VFM x AmeyArup Value For Money assessment criteria reference
 Economy, Safety, Accessibility (part) and Integration (part) are assessed on an end-to-end basis.

3 WORKSHOP OUTPUTS

3.4 COLPY TO PITCAPLE

3.4.1 Workshop Issues and Commentary

No	Slide Ref	Agenda - Subject	Workshop Q&A / Comments
1		Colpy to Pitcaple, Route Options and Matrix Assessment	
1.1		Assessment Matrix - Environment Sub criteria: People & Communities (8) and Health (13)	<p>Ques: People & Communities (8) has a rating of Pink 10 and Brown 8 whilst Health (13) has a rating of Pink 10 and Brown 9. Should two sub-criteria ratings be the same?</p> <p>Ans: Agreed to change Health rating of Brown to 8. AA note the importance of community facilities to health and agree with the workshop that this score should be changed from 9 (proposed) to 8 out of 10 to reflect the cumulative impact of the noise score along with the impact on NMU routes and changes in amenity.</p>

3 WORKSHOP OUTPUTS

3.4.2 Colpy to Pitcaple Options Assessment Matrix

A96 VFM Assessment Criteria

PINK BROWN

Table 2 - Colpy to Pitcaple

Criteria	Assessment Criteria Reference	Sub-criteria	Weighting	SECTIONAL ASSESSMENT Score (0-10)		WEIGHTED SCORES		Comments	
				PINK	BROWN	PINK	BROWN		
Environment									
			Weighting total	20	Score /10	Score /10	193.5	170.5	
Environment 1	SO6 STAG 1	To avoid significant environmental impacts and, where this is not possible, to minimise the environmental effect upon: - the communities and people in the corridor; and - natural and cultural heritage assets	Nature Conservation	1.5	10	9	15	13.5	Scoring reflects impact on ancient woodland.
Environment 2			Road Drainage and the Water Environment	1.5	10	10	15	15	Both route options have similar impacts.
Environment 3			Geology, Soils, Contaminated Land and Groundwater	1	10	9	10	9	Scoring reflects impact upon prime agricultural land.
Environment 4			Noise and Vibration	1.5	10	7	15	10.5	Scoring reflects adverse impacts on receptors.
Environment 5			Policies and Plans	0.5	9	10	4.5	5	Scoring reflects greater impact on planned developments.
Environment 6			Landscape	2	10	7	20	14	Scoring reflects Brown route option alignment through Logie House Non-Inventory Designed Landscape
Environment 7			Visual Effects	2	10	8	20	16	Scoring reflects the number of receptors and visibility to long distance views
Environment 8			People and Communities	2	10	8	20	16	Scoring reflects impact on four Non-Motorised User (NMU) routes within Logie/Durno woodland area
Environment 9			Air Quality	0.5	10	10	5	5	Both route options have similar impacts
Environment 10			Materials	0.5	10	9	5	4.5	Scoring reflects earthwork deficit for the Brown route option.
Environment 11			Agriculture, Forestry and Sporting Interests	2	10	8	20	16	Scoring reflects impact upon farm units and proportion of prime agricultural land affected.
Environment 12			Cultural Heritage	2	7	10	14	20	Scoring reflects the impact upon the setting of Scheduled Monuments.
Environment 13			Health	1	10	8	10	8	Scoring reflects adverse impact on health due to impacts on amenity
Environment 14			Climate Change	2	10	9	20	18	Scoring reflects aggregated emissions for the 60-year study period.
			Sectional assessment weighting total	12	Score /10	Score /10	104	116	
Accessibility 1	SO4 STAG 5	To facilitate active travel within the corridor	Impact on existing NMU infrastructure	4	10	9	40	36	Scoring reflects fewer adverse effects upon NMU routes for the Pink route option than for the Brown route option.
Accessibility 2			Opportunities for new NMU routes	8	8	10	64	80	Scoring reflects proximity to existing communities and opportunities to create new connections using existing routes.
			Sectional assessment weighting total	4	Score /10	Score /10	32	40	
Integration 3	STAG 4.3	Integration with plans and policies	Integration with Plans and Policies (LDP)	4	8	10	32	40	Scoring reflects better connections to LDP development sites in Old Rayne and Insch.
Others									
			Weighting total	13	Score /10	Score /10	118	125	
Others 1	VFM 1	Construction and maintenance	Construction complexity, construction programme, residual maintenance and residual risk (CDM) Minimising disruption during construction	5	10	9	50	45	Scoring reflects the size of structures to cross watercourses and flood plain.
Others 2	VFM 2 STAG 8	Promotability	Promotability through the statutory process	2	10	10	20	20	No difference between route options.
Others 3	SO1.6	Resilience	Facilitate Network Resilience	6	8	10	48	60	Scoring reflects better operational resilience via connections to existing A96 and additional junction provision

PINK BROWN PINK BROWN

SO x.x Scheme Objective x.x
 STAG Scottish Transport Appraisal Guidance reference
 VFM x AmeyArup Value For Money assessment criteria reference
 Economy, Safety, Accessibility (part) and Integration (part) are assessed on an end-to-end basis.

3 WORKSHOP OUTPUTS

3.5 PITCAPLE TO KINTORE

3.5.1 Workshop Issues and Commentary

No	Slide Ref	Agenda - Subject	Workshop Q&A / Comments
1		Pitcaple to Kintore, Route Options and Matrix Assessment	
1.1	60	Construction & Maintenance	<p>Ques: Thainstone - what are your assumptions on delivery or non-delivery of a grade separated junction by the developer of the Crichton development? .</p> <p>Ans: - It is assumed that the A96 dualling scheme would need to provide the GSJ at this location.</p>
1.2	60	Construction & Maintenance	<p>Ques: Any preliminary thoughts on traffic control/movements at the Thainstone roundabout?</p> <p>Ans: - Thainstone roundabout is removed and replaced by a grade separated junction. The roundabout at the new junction will be assessed at Stage 3 utilising a microsimulation traffic model to determine the control required.</p>
1.3	60	Construction & Maintenance	<p>Ques: Violet rated as 8 and Orange route rated 10, do we think there is a two-point difference when construction of Thainstone is considered?</p> <p>Ans: Thainstone Junction will be mostly constructed offline as opposed to Tavelty Junction which is mostly online. There is also demolition and replacement of the Forest Road bridge. Both routes have significant structures with long viaducts.</p>
1.4	61	Resilience	<p>Ques: Winter resilience: Has the type of central reserve barrier been considered yet e.g. wire rope or solid concrete barrier? This has an impact on snow blow through or drifting and also carriageway cross-section. Road user safety and ongoing maintenance are key considerations. There are lessons to be learned from the A9 Dualling.</p> <p>Ans: - Central reserve barrier type has not been decided upon at this stage but will consider in detail at Stage 3. TS Standards to be involved in the Stage 3 discussions.</p>

3 WORKSHOP OUTPUTS

No	Slide Ref	Agenda - Subject	Workshop Q&A / Comments
1.5	63	Accessibility 1 & 2 NMU Opportunities	<p>Ques: Should there be a higher weighting in this section (Violet/Orange) compared to the previous section (Pink/Brown), which has also been given a weighting of 12? This section seems to have more existing NMU routes crossing/interfaces?</p> <p>Ans: There are a high number of existing routes in this section and in Pink / Brown. There are important NMU routes e.g. around/over Logie woodland so consider merit in weighting similarly as feedback from consultations has particularly highlighted NMU's on the Pink/Brown section.</p>
1.6	64	Integration 3 - Integration with Policies and Plans (LDP)	<p>Ques: How well do the Orange and Violet routes integrate with Aberdeenshire's LDP? What is the view of Aberdeenshire Council?</p> <p>Ans: The assessment indicates that Orange route option facilitates the large proposed Crichton development and provides better long-term development opportunities to the south and west of Inverurie. It is understood that Aberdeenshire Council has no overall preference and will take cognisance of the preferred end to end option during the preparation of future LDPs.</p>
1.7	67	Environment 8 - matrix assessment	<p>Ques: People & Communities: Violet scored 5 and Orange 10. For Accessibility 1 - Impact on Existing Infrastructure, Violet scored 10 and Orange 9. Is this consistent?</p> <p>Ans: The Violet route option has more adverse effects due to impacts on private property and community facilities whereas the Orange route option has more impact on NMU routes than the Violet route option although this can open up more opportunity for enhancement and wider connectivity.</p>

3 WORKSHOP OUTPUTS

3.5.2 Pitcaple to Kintore Options Assessment Matrix

A96 VFM Assessment Criteria

Table 3 - Pitcaple to Kintore

Criteria	Assessment Criteria Reference	Sub-criteria	Weighting	SECTIONAL ASSESSMENT Score (0-10)		WEIGHTED SCORES		Comments	
				VIOLET	ORANGE	VIOLET	ORANGE		
Environment									
			Weighting total	20	Score /10	Score /10	169.5	174	
Environment 1	SO6 STAG 1	To avoid significant environmental impacts and, where this is not possible, to minimise the environmental effect upon: - the communities and people in the corridor; and - natural and cultural heritage assets	Nature Conservation	1.5	10	6	15	9	Scoring reflects the impact upon Pitscurry Moss LNCS and ancient woodland
Environment 2			Road Drainage and the Water Environment	2	10	10	20	20	New crossings of extensive floodplains for both route options
Environment 3			Geology, Soils, Contaminated Land and Groundwater	1	7	10	7	10	Scoring reflects risk related to historic landfills, and impact upon ground water abstraction points.
Environment 4			Noise and Vibration	1	8	10	8	10	Scoring reflects the number of adverse impacts for receptors.
Environment 5			Policies and Plans	1.5	10	5	15	7.5	Scoring reflects land take of the Crichton development site
Environment 6			Landscape	2	7	10	14	20	Scoring reflects the number of adverse impacts on the landscape character.
Environment 7			Visual Effects	1.5	7	10	10.5	15	Scoring reflects a higher number of visual receptors and visibility within long range views of receptors.
Environment 8			People and Communities	1.5	5	10	7.5	15	Scoring reflects adverse effects due to impacts on private property and community facilities.
Environment 9			Air Quality	0.5	10	9	5	4.5	Scoring reflects number of receptors predicted to experience changes in air quality
Environment 10			Materials	1	9	10	9	10	Scoring reflects fill material quantity required.
Environment 11			Agriculture, Forestry and Sporting Interests	1.5	7	10	10.5	15	Scoring reflects greater number of adverse impacts on farm units and prime agricultural land.
Environment 12			Cultural Heritage	2	10	5	20	10	Scoring reflects the impacts upon the settings of Scheduled Monuments within the Orange route option.
Environment 13			Health	1	10	8	10	8	Orange route has the lowest ranking data zones for deprivation, with impacts on open space, core paths, and existing local routes.
Environment 14			Climate Change	2	9	10	18	20	Scoring reflects aggregated emissions for the 60-year study period.
Accessibility (part)									
			Sectional assessment weighting total	12	Score /10	Score /10	96	116	
Accessibility 1	SO4 STAG 5	To facilitate active travel within the corridor	Impact on existing NMU infrastructure	4	10	9	40	36	Scoring reflects fewer adverse impacts upon NMU routes for the Violet route option than for the Orange route option.
Accessibility 2			Opportunities for new NMU routes	8	7	10	56	80	Scoring reflects better opportunities for new connections between NMU routes, settlements and development areas.
Integration (part)									
			Sectional assessment weighting total	12	Score /10	Score /10	96	120	
Integration 3	STAG 4.3	Integration with plans and policies	Integration with Plans and Policies (LDP)	12	8	10	96	120	Scoring reflects better opportunities for connections to existing and potential LDP development sites.
Others									
			Weighting total	27	Score /10	Score /10	228	258	
Others 1	VFM 1	Construction and maintenance	Construction complexity, construction programme, residual maintenance and residual risk (CDM) Minimising disruption during construction	15	8	10	120	150	Both route options contain significant and complex engineering works. Scoring reflects more extensive, complex works in presence of live traffic at Tavelty Junction and along the Kintore bypass for the Violet route option.
Others 2	VFM 2 STAG 8	Promotability	Promotability through the statutory process	6	10	8	60	48	Scoring reflects interactions with significant scheduled monuments, particularly St Apollinaris Chapel (Orange).
Others 3	SO1.6	Resilience	Facilitate Network Resilience	6	8	10	48	60	Scoring reflects better operational resilience due closer connections to the existing A96 as a diversionary route.

SO x.x Scheme Objective x.x
 STAG Scottish Transport Appraisal Guidance reference
 VFM x AmeyArup Value For Money assessment criteria reference
 Economy, Safety, Accessibility (part) and Integration (part) are assessed on an end-to-end basis.

3 WORKSHOP OUTPUTS

3.6 EAST OF HUNTLY TO KINTORE - END TO END ROUTE OPTIONS

3.6.1 Workshop Issues and Commentary

No	Slide Ref	Agenda - Subject	Workshop Q&A / Comments
1		End to End Route Options Assessment	
1.1	78	Traffic on Local Roads Pitcaple to Kintore	Ques: What are the traffic figures based on? Ans: Traffic figures are derived from the A96 CRAM refined core model scenario.
1.2	80	Economy 2 - to provide opportunities to grow the regional economy on the corridor Pitcaple to Kintore	Ques: Inclusion of Local LDP, or any consideration across regional/national documents? Ans: Have focused on LDP allocations re housing/business for traffic and economics.
1.3	82	Safety & Accessibility - Reduction of traffic in urban areas	Ques: What is the difference in the assessments considering traffic within cordoned areas? Ans: Safety methodology considers the number of vehicles entering and exiting a settlement with reference to population. The Accessibility methodology considers the distance that vehicles are driving within the settlement areas. All options perform well under these objectives.
1.4	85	Integration 2 - to facilitate integration with plans and policies	Ques: The Scottish Government are currently updating the Climate Change Plan. How has Climate Change been considered as part of the assessment? Ans: Transport Scotland are aware that the Climate Change Plan is being updated and will consider its findings following publication. In terms of the DMRB Stage 2 assessment, AA are working to the current available guidance/standards including, for example, the updated DMRB, and have included a chapter on Climate Change in the Environmental Assessment.

3 WORKSHOP OUTPUTS

3.6.2 East of Huntly To Kintore: End to End Utility Score Assessments

A96 VFM Assessment Criteria

Table 4 - East of Huntly to Kintore - End to End Utility Score Assessments

Criteria	Assessment Criteria Reference	Sub-criteria	Weighting	End to end scores								Comments	
				C-P-V	C-P-O	C-Br-V	C-Br-O	R-P-V	R-P-O	R-Br-V	R-Br-O		
Economy				60	Scores /10 on an end to end basis								
Economy 1	SO1	To improve the operation of the A96 and inter-urban connectivity through:	SO1.1 - Reduced journey times;	9.0	9	10	8	9	9	10	9	10	All of the options offer journey time savings. Scoring reflects the length of the end-to-end option.
			SO1.2 - Improved journey time reliability;	8.5	10	10	10	10	10	10	10	10	All of the options improve journey time reliability.
			SO1.3 - Increased overtaking opportunities;	8.5	8	10	7	9	8	10	7	10	Options which attract the most traffic to the dual carriageway score highest as they provide safe overtaking opportunities for the highest number of vehicles.
			SO1.4 - Improved efficiency of freight movements along the transport corridor;	8.5	8	10	7	9	9	10	8	9	All of the options offer peak hour HGV journey time savings. Scoring reflects the length of the end-to-end option and the slower speed of HGV traffic.
			SO1.5 - Reduced conflicts between local traffic and strategic journeys; and	8.5	8	9	7	9	9	10	8	9	All of the options reduce potential conflicts. Scoring reflects the removal of longer distance trips from existing inter-urban roads in favour of a dualled A96.
Economy 2	SO3	To provide opportunities to grow the regional economies on the corridor through:	SO3.1 - Improved access to the wider strategic transport network	8.5	8	10	9	10	8	10	10	10	Scoring reflects the increase in the number of households within 30 minutes peak period driving time of Craibstone (Park and Ride, Aberdeen International Airport and AWRP).
			SO3.2 - Enhanced access to jobs and services	8.5	8	10	8	10	8	10	8	10	Scoring reflects the increase in the number of households within 30 minutes peak period drive of Inverurie (key local hub for jobs and services in Aberdeenshire).
Safety				60	Scores /10 on an end to end basis								
Safety	SO2	To improve safety for motorised and Non-Motorised Users through:	SO2.1 and SO2.2 Reduced accident rates and severity and reduced Driver Stress	30	8	10	7	10	8	10	8	10	All options are predicted to reduce the number of Personal Injury Accidents (PIA). Scoring reflects the proportional reduction in PIAs.
			SO2.3 Reduced potential conflicts between Motorised and Non Motorised Users	30	10	8	10	8	10	8	10	8	Scoring reflects the overall reduction in through traffic in towns and villages within the area of influence.
Accessibility (part)				30	Scores /10 on an end to end basis								
Accessibility 3	SO4 STAG 5	To facilitate active travel within the corridor	Reduction in traffic in urban areas	30	9	10	9	10	9	10	9	10	Scoring reflects the overall reduction in traffic and distance travelled by vehicles within urban areas.
Integration (part)				40	Scores /10 on an end to end basis								
Integration 1	SO5 STAG 4.1 & 4.2	To facilitate integration with Public transport facilities	Bus Services	15	9	9	9	9	10	10	9	9	All options offer journey time savings and improved reliability for buses. Scoring reflects magnitude of benefit to both local and express bus services.
Integration 2			Railway Stations	15	10	9	10	9	10	9	10	9	9
Integration 4	STAG 4.3	Integration with plans and policies	Integration with Plans and Policies (Transport)	10	8	10	8	10	8	10	8	10	Scoring reflects the proximity and ease of access from the new dual carriageway to planned housing and business development areas identified in the Local Development Plan.

- Sectional scores are added together to form the end to end total weighted score for a given end to end combination
- Sectional scores are applicable where impacts and effects are associated only with the geographical location of the route option.
- End to end scores are applicable where the combination of route options could be expected to influence the assessment.
- Environment, Accessibility (part), Integration (part) and Others are assessed on a sectional basis

Cyan	Cyan	Cyan	Cyan	Red	Red	Red	Red
Pink	Pink	Brown	Brown	Pink	Pink	Brown	Brown
Violet	Orange	Violet	Orange	Violet	Orange	Violet	Orange
C-P-V	C-P-O	C-Br-V	C-Br-O	R-P-V	R-P-O	R-Br-V	R-Br-O

3 WORKSHOP OUTPUTS

3.6.3 East of Huntly to Kintore: End to End Utility Score Calculation

A96 VFM Assessment Criteria

Table 5 - East of Huntly to Kintore - End to End Utility Score Calculation

				Overall End to End Utility Score = Sum of weighted scores below							
				3209	3408	3157	3386	3164	3354	3144	3326
Subject	Assessment Criteria Reference	Objective and criteria description		Cyan	Cyan	Cyan	Cyan	Red	Red	Red	Red
				Pink	Pink	Brown	Brown	Pink	Pink	Brown	Brown
				Violet	Orange	Violet	Orange	Violet	Orange	Violet	Orange
				C-P-V	C-P-O	C-Br-V	C-Br-O	R-P-V	R-P-O	R-Br-V	R-Br-O
				End to End Weighted Scores							
Economy				506	592	480	566	523	600	515	583
Economy 1	SO1	To improve the operation of the A96 and inter-urban connectivity through:	SO1.1 - Reduced journey times;	81	90	72	81	81	90	81	90
			SO1.2 - Improved journey time reliability;	85	85	85	85	85	85	85	85
			SO1.3 - Increased overtaking opportunities;	68	85	60	77	68	85	60	85
			SO1.4 - Improved efficiency of freight movements along the transport corridor;	68	85	60	77	77	85	68	77
			SO1.5 - Reduced conflicts between local traffic and strategic journeys; and	68	77	60	77	77	85	68	77
Economy 2	SO3	To provide opportunities to grow the regional economies on the corridor through:	SO3.1 - Improved access to the wider strategic transport network.	68	85	77	85	68	85	85	85
			SO3.2 - Enhanced access to jobs and services	68	85	68	85	68	85	68	85
Safety				540	540	510	540	540	540	540	
Safety	SO2	To improve safety for motorised and Non-Motorised Users through:	SO2.1 and SO2.2 Reduced accident rates and severity and reduced Driver Stress	240	300	210	300	240	300	240	300
			SO2.3 Reduced potential conflicts between Motorised and Non Motorised Users	300	240	300	240	300	240	300	240
Environment				556	560	533	537	527	531	504	508
Environment 1	SO6 STAG 1	To avoid significant environmental impacts and, where this is not possible, to minimise the environmental effect upon: - the communities and people in the corridor; and - natural and cultural heritage assets	Nature Conservation	50	44	49	43	44	38	43	37
Environment 2			Road Drainage and the Water Environment	44	44	44	44	45	45	45	45
Environment 3			Geology, Soils, Contaminated Land and Groundwater	32	35	31	34	29	32	28	31
Environment 4			Noise and Vibration	33	35	29	31	31	33	27	29
Environment 5			Policies and Plans	24	17	25	17	25	17	25	18
Environment 6			Landscape	54	60	48	54	44	50	38	44
Environment 7			Visual Effects	51	55	47	51	41	45	37	41
Environment 8			People and Communities	43	50	39	46	41	49	37	45
Environment 9			Air Quality	15	15	15	15	15	15	15	15
Environment 10			Materials	34	35	34	35	30	31	30	31
Environment 11			Agriculture, Forestry and Sporting Interests	46	50	42	46	46	50	42	46
Environment 12			Cultural Heritage	50	40	56	46	54	44	60	50
Environment 13			Health	25	23	23	21	25	23	23	21
Environment 14			Climate Change	56	58	54	56	58	60	56	58
Accessibility				530	580	542	592	526	576	538	588
Accessibility 1	SO4 STAG 5	To facilitate active travel within the corridor	Impact on existing NMU infrastructure	100	96	96	92	100	96	96	92
Accessibility 2			Opportunities for new NMU routes	160	184	176	200	156	180	172	196
Accessibility 3			Reduction in traffic in urban areas	270	300	270	300	270	300	270	300
Integration				533	562	541	570	548	577	541	570
Integration 1	SO5 STAG 4.1 & 4.2	To facilitate integration with Public transport facilities	Bus Services	135	135	135	135	150	150	135	135
Integration 2			Railway Stations	150	135	150	135	150	135	150	135
Integration 3	STAG 4.3	Integration with plans and policies	Integration with Plans and Policies (LDP)	168	192	176	200	168	192	176	200
Integration 4			Integration with Plans and Policies (Transport)	80	100	80	100	80	100	80	100
Others				544	574	551	581	500	530	507	537
Others 1	VFM 1	Construction and maintenance	Construction complexity, construction programme, residual maintenance and residual risk (CDM) Minimising disruption during construction	270	300	265	295	240	270	235	265
Others 2	VFM 2 STAG 8	Promotability	Promotability through the statutory process	98	86	98	86	100	88	100	88
Others 3	SO1.6	Resilience	Facilitate Network Resilience	176	188	188	200	160	172	172	184

- Sectional scores are added together to form the end to end total weighted score for a given end to end combination
- Sectional scores are applicable where impacts and effects are associated only with the geographical location of the proposed route option.
- End to end scores are applicable where the combination of route options could be expected to influence the assessment.

Cyan	Cyan	Cyan	Cyan	Red	Red	Red	Red
Pink	Pink	Brown	Brown	Pink	Pink	Brown	Brown
Violet	Orange	Violet	Orange	Violet	Orange	Violet	Orange
C-P-V	C-P-O	C-Br-V	C-Br-O	R-P-V	R-P-O	R-Br-V	R-Br-O

3 WORKSHOP OUTPUTS

3.7 ASSESSMENT SUMMARY: END TO END ASSESSMENT

TABLE 6 - ASSESSMENT SUMMARY - END TO END ASSESSMENT

				A96 Utility Score Weighted	A96 Utility Score Weighted Rank	Combined cost including risk (£m)	Combined Cost Rank	A96 Value Index	Value Index Rank	Benefit / Cost ratio (BCR) Indexed	BCR Rank	Present Value of Benefits (PVB, £m)	PVB Rank	Net Present Value (NPV, £m)	NPV Rank	6 Criteria Overall Score	Overall Rank
				a	b	c	d	e = a/c	f	g	h	i	j	k	l	b+d+f+h+j+l	
Cyan	Pink	Orange	C-P-O	3408	1	899	2	3.79	1	100	1	350	3	-151	1	9	1
Cyan	Brown	Orange	C-Br-O	3386	2	933	3	3.63	2	90	3	328	4	-193	3	17	2
Red	Pink	Orange	R-P-O	3354	3	970	6	3.46	4	98	2	370	1	-171	2	18	3
Cyan	Pink	Violet	C-P-V	3209	5	890	1	3.61	3	79	5	274	6	-222	5	25	4
Red	Brown	Orange	R-Br-O	3326	4	1,003	8	3.32	6	90	3	354	2	-206	4	27	5
Red	Pink	Violet	R-P-V	3164	6	960	5	3.30	7	79	5	297	5	-238	6	34	6
Cyan	Brown	Violet	C-Br-V	3157	7	943	4	3.35	5	68	8	250	8	-276	7	39	7
Red	Brown	Violet	R-Br-V	3144	8	993	7	3.16	8	71	7	273	7	-281	8	45	8

3 WORKSHOP OUTPUTS

3.8 CONCLUSIONS AND ACTIONS

Taking account of the assessment outcomes, Cyan-Pink-Orange was confirmed as the proposed preferred option.

Sensitivity of the traffic model was discussed. Variables including Northern Inverurie traffic distribution were discussed. It was demonstrated that the overall conclusion was unaffected.

Design Development Website update is planned for October 2020. Any feedback received will be reviewed against the DMRB Stage 2 assessment undertaken/VfM workshop outcome.

4 WORKSHOP LOGISTICS

4 WORKSHOP LOGISTICS

4.1 AGENDA

The agenda timings were flexible but included all elements.

9.15 **Workshop Open**

9.30 **Introduction** (30mins)

- Introductions, objectives, process, agenda, using MS Teams – CVRL
- Background to A96 Dualling Programme, DMRB Stage 2 Study, scheme objectives, status, and overview –TS (5mins)
- Route options identification, sifting process, overview of current route alignments and sections – AmeyArup (15mins)
- Q&A

10:00 **Introduction to Assessment Process and Options Matrices**

Explanation of the assessment approach and options matrix criteria adopted for route sections and then overall route – AmeyArup (10mins)

Q&A

10.15 **Session 1– East of Huntly to Colpy: Route Options and Matrix Assessment**

- Route section options described and key constraints explained - AmeyArup
- Evaluation criteria to be introduced and initial scoring for each to be provided by AmeyArup
- Discussion on the performance of each option against the criteria
- Undertake any changes to the draft scoring for each criterion if required/agreed.
- Review of overall utility score and highest scoring option

11.15 **Break**

11.25 **Session 2 – Colpy to Pitcaple, Route Options and Matrix Assessment**

- Route section options described and key constraints explained - AmeyArup
- Options Assessment Process as per session 1

4 WORKSHOP LOGISTICS

12.30 **Lunch Break**

13.30 **Session 3 – Pitcaple to Kintore, Route Options and Matrix Assessment**

- Route section options described and key constraints explained- AmeyArup
- Options Assessment Process as per session 1

14:30 **Break**

14:40 **Session 4 – End to End Route Options Assessment and Conclusions**

End to end options assessment criteria and results:

- Overall Utility Scores for each option
- End to End route option costs
- Value Indices for each option
- Review of NPV and BCR values of the end to end options
- Total for individual performance criteria and overall ranking results

Conclusions:

- Taking account of the assessment outcomes what is the emerging end-end preferred route alignment?
- Are there any reasons to change this? E.g. any key issues/risks affecting decision?

15.15 **Workshop Summary and Actions**

- Actions Arising from workshop– Who? What? When?
- Forward programme for the Stage 2 process

15.30 **Workshop Close**

4 WORKSHOP LOGISTICS

4.2 PARTICIPANTS

Transport Scotland
1. Acting Head of Design
2. Head of Design Team 1 and 3
3. A96 Dualling Programme Design Manager
4. Principal Engineer
5. A96 Dualling East of Huntly to Aberdeen Project Manager
6. Strategic Communications Manager
7. Discrete Projects Team Leader
8. Environment and Sustainability Manager
9. Environment and Sustainability Manager
10. Development Management Advisor
11. Bridges and Structures
12. Area Manager - North East
13. Operating Company Manager
14. Geotechnical Specialist Manager
15. Senior Engineer - Standards
16. Head of Infrastructure Planning
17. Transport Consultant
18. Graduate Civil Engineer
19. Graduate Civil Engineer

4 WORKSHOP LOGISTICS

AmeyArup
20. Contract Director
21. Roads and Infrastructure Manager
22. Roads and Infrastructure Manager
23. Roads and Infrastructure Manager
24. Structures Manager
25. Environmental and Landscaping Manager
26. Geotechnical Manager
27. Senior Roads and Infrastructure Design Engineer
28. Roads and Infrastructure Design Engineer
29. Roads and Infrastructure Design Engineer
30. Senior Transportation Specialist
31. Senior Transportation Specialist
32. Senior Environmental Specialist
33. Senior Environmental Specialist
34. Senior Environmental Specialist
35. Environmental Specialist
36. Senior Geotechnical Specialist
37. Stakeholder Co-ordinator

Transport Scotland - Operating Company Manager was unable to attend.

4.3 CAPITAL VALUE & RISK TEAM

- Facilitator
- Assistant/Recorder

APPENDIX A WORKSHOP PRESENTATIONS

APPENDIX A – WORKSHOP PRESENTATIONS



A96 Dualling East of Huntly to Aberdeen
DMRB Stage 2 Value for Money Workshop
29 September 2020



Introduction

Agenda

9.15 Workshop Open

9.30 Introduction

10:00 Introduction to Assessment Process and Options Matrices

10.15 Session 1– East of Huntly to Colpy: Route Options and Matrix Assessment

11.15 Break

11.25 Session 2 – Colpy to Pitcaple, Route Options and Matrix Assessment

12.30 Lunch Break

13.15 Session 3 – Pitcaple to Kintore, Route Options and Matrix Assessment

14:15 Break

14:25 Session 4 – End to End Options Assessment and Conclusions

15.15 Workshop Summary and Actions

15.30 Workshop Close



Welcome

Purpose of Workshop

- Review the assessment relating to the better performing route options
- Reach consensus on the emerging preferred option for the East of Huntly to Aberdeen (Kintore) scheme

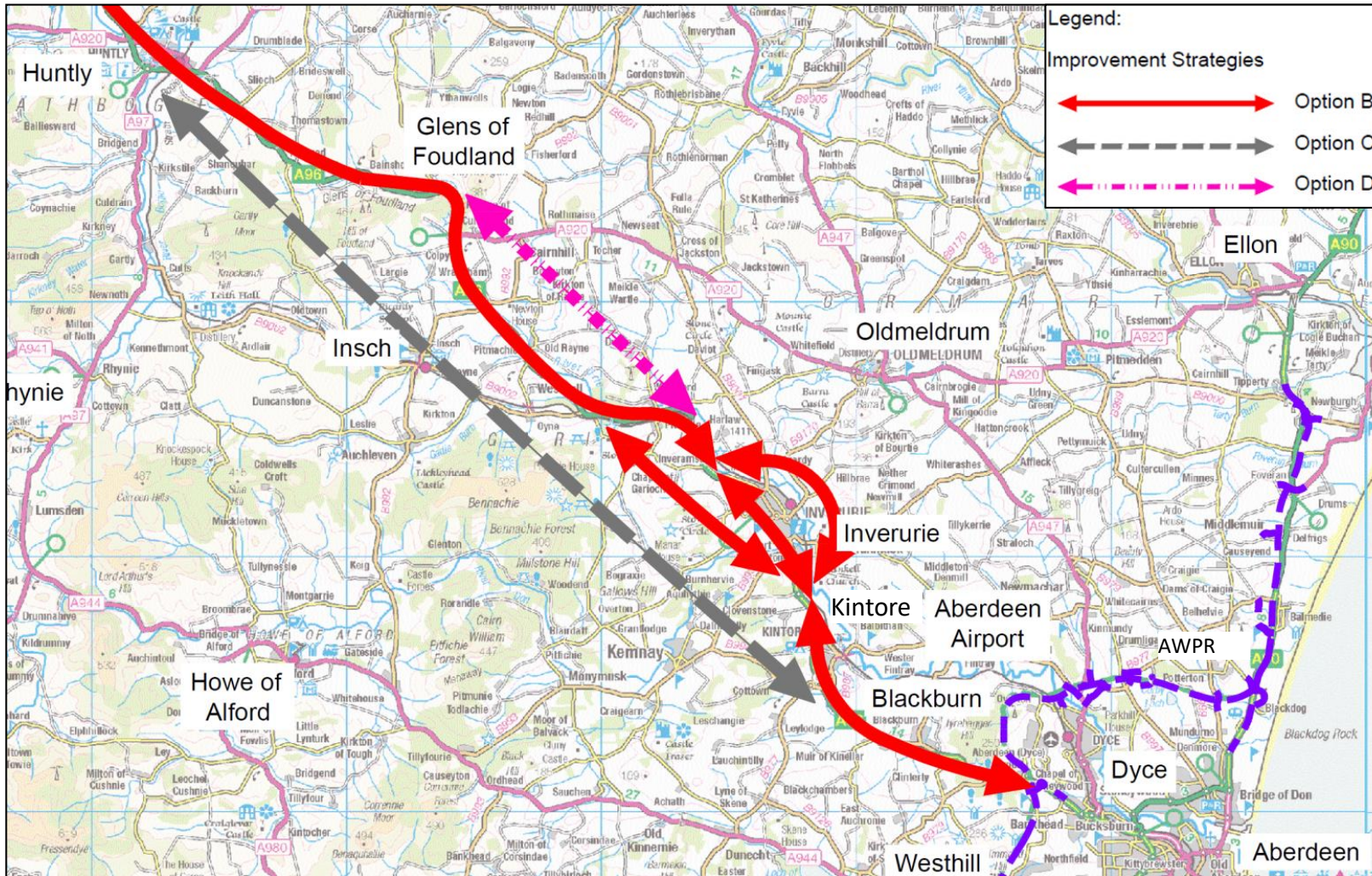


A96 Project History and Status



- Strategic Transport Projects Review (2008) – Intervention to upgrade A96 between Inverness and Nairn to dual carriageway
- Infrastructure Investment Plan 2011– Commitment to dual the A96 between Inverness and Aberdeen by 2030
- Ministerial Announcement, 9th May 2013 – Preliminary engineering and strategic environmental assessment work was announced
- Ministerial Announcement, 11th May 2015 – Based on outcome of preliminary work, next stage of design to be taken forward based on Western (46km), Central (31km) and Eastern (48km) Sections
- AmeyArup appointed in July 2017 to progress the **A96 Dualling East of Huntly to Aberdeen** scheme through the DMRB Scheme Assessment process to publication of Environmental Impact Assessment and draft Orders
- The scheme forms the Eastern Section of the A96 Dualling Programme measuring approximately 48km (30 miles)
- Existing A96 is single carriageway between Huntly and Port Elphinstone (east of Inverurie) and dualled between Port Elphinstone and the AWPR

DMRB Stage 1 Outcome



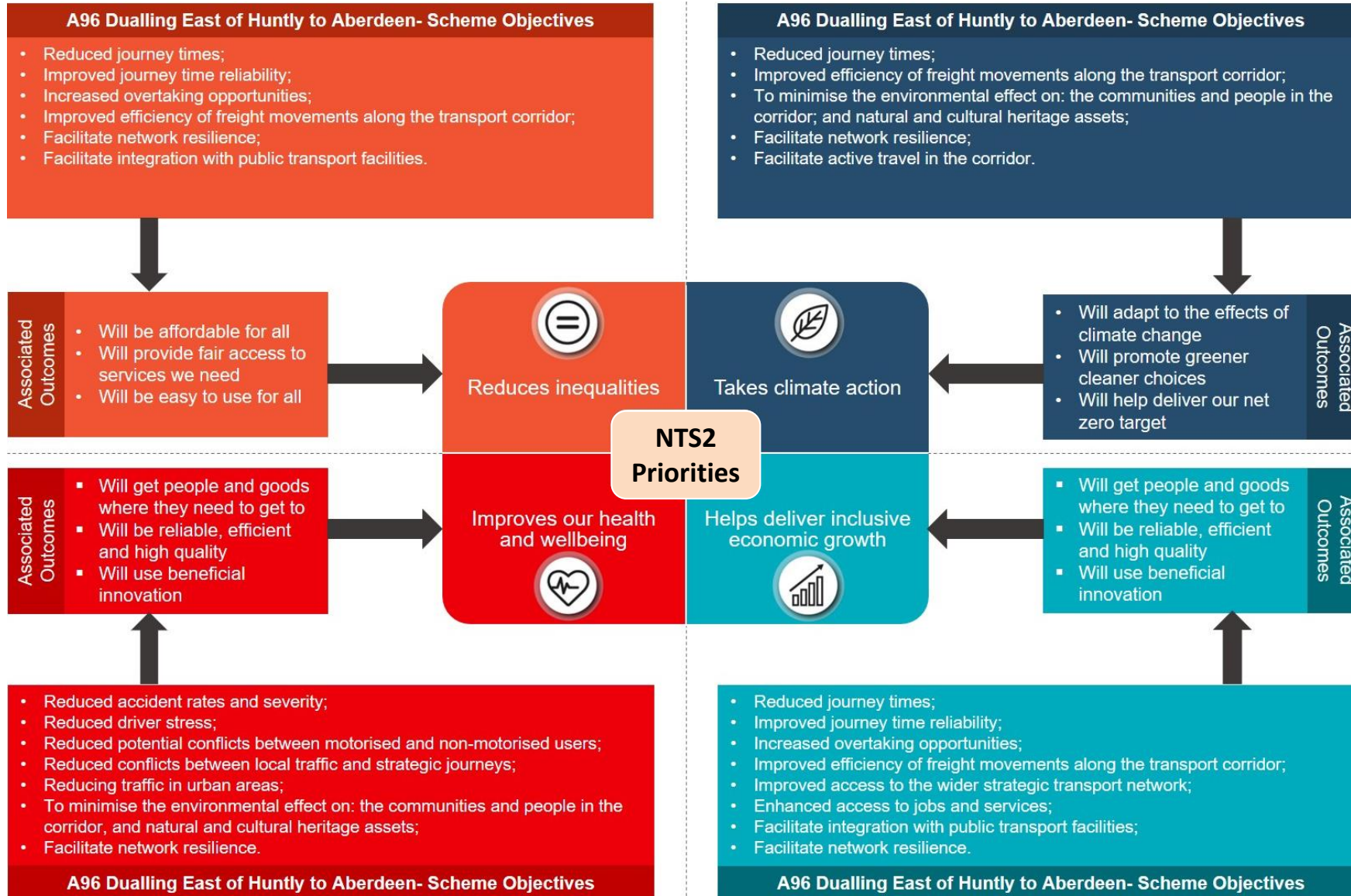
- The main settlements in the study area are Inverurie, Kintore and Blackburn

Scheme Objectives

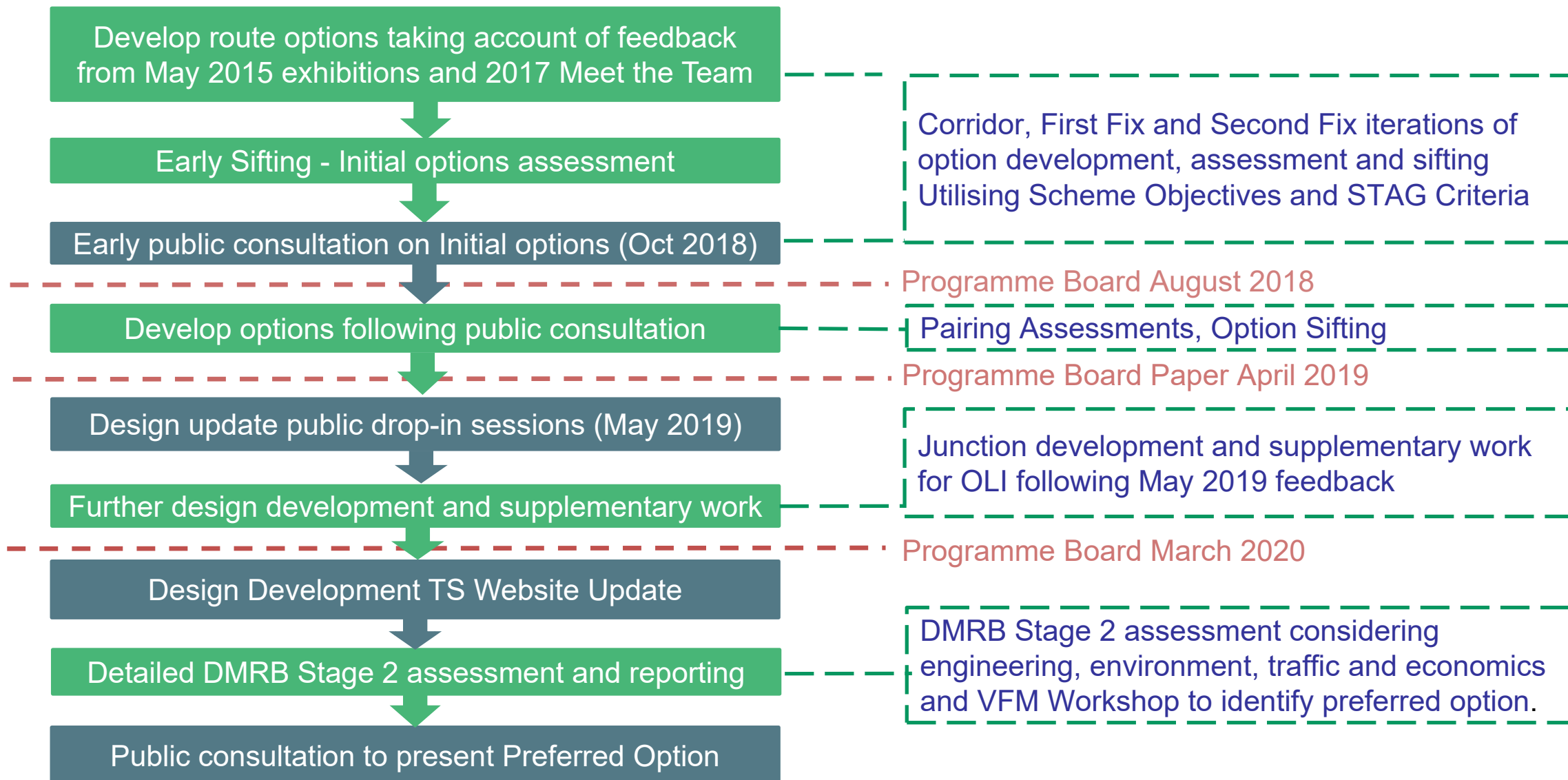


- To improve the operation of the A96 and inter-urban connectivity through:
 - Reduced journey times
 - Improved journey time reliability
 - **Increased overtaking opportunities**
 - **Improved efficiency of freight movements along the transport corridor**
 - Reduced conflicts between local traffic and strategic journeys
 - **Improved network resilience**
- To improve safety for motorised and Non-Motorised Users through:
 - Reduced accident rates and severity
 - Reduced driver stress
 - **Reduced potential conflicts between Motorised and Non-Motorised Users**
- To provide opportunities to grow the regional economies on the corridor through:
 - Improved access to the wider strategic transport network
 - Enhanced access to jobs and services
- To facilitate active travel in the corridor
- To facilitate integration with Public Transport Facilities
- **To avoid significant environmental impacts and, where this is not possible, to minimise the environmental effect on:**
 - **The communities and people in the corridor**
 - **Natural and cultural heritage assets**

Delivering NTS2 Priorities



DMRB Stage 2 Timeline & Key Milestones



DMRB Stage 2 Assessment and Sifting Methodology

Corridors

- 1. Route Development
- 2. Assessment
- 3. Sifting/Choosing Best

First Fix

- 1. Route Development
- 2. Assessment
- 3. Sifting/Choosing Best

Second Fix

- 1. Route Development
- 2. Assessment
- 3. Sifting/Choosing Best

Pairing Assessment

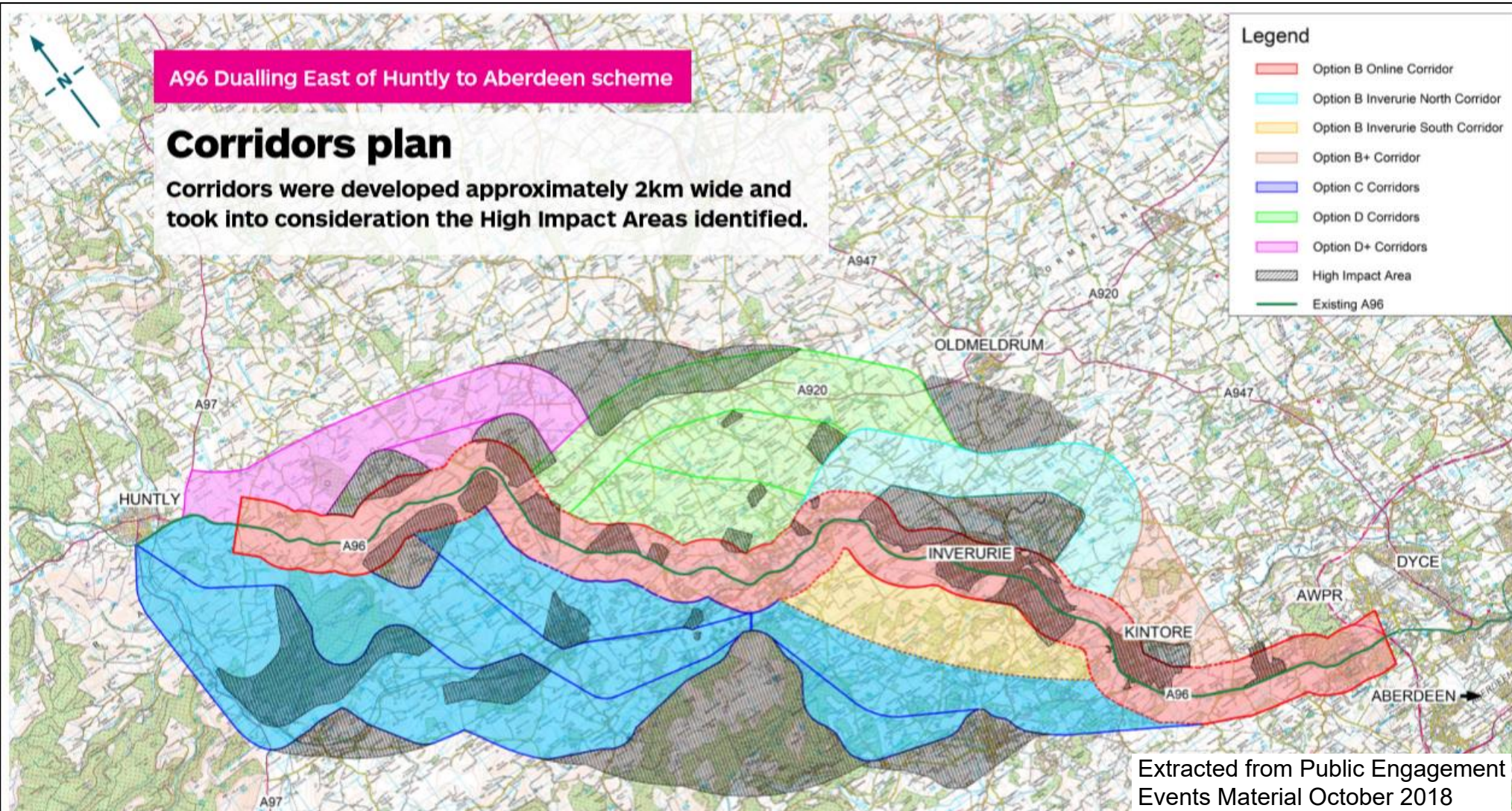
- 1. Route & Junction Development
- 2. Comparative Assessment
- 3. Better/Poorer Performing

Colour Coding	Assessment
	Large Adverse Impact
	Adverse Impact
	Neutral/marginal Impact
	Beneficial Impact
	Large Beneficial Impact

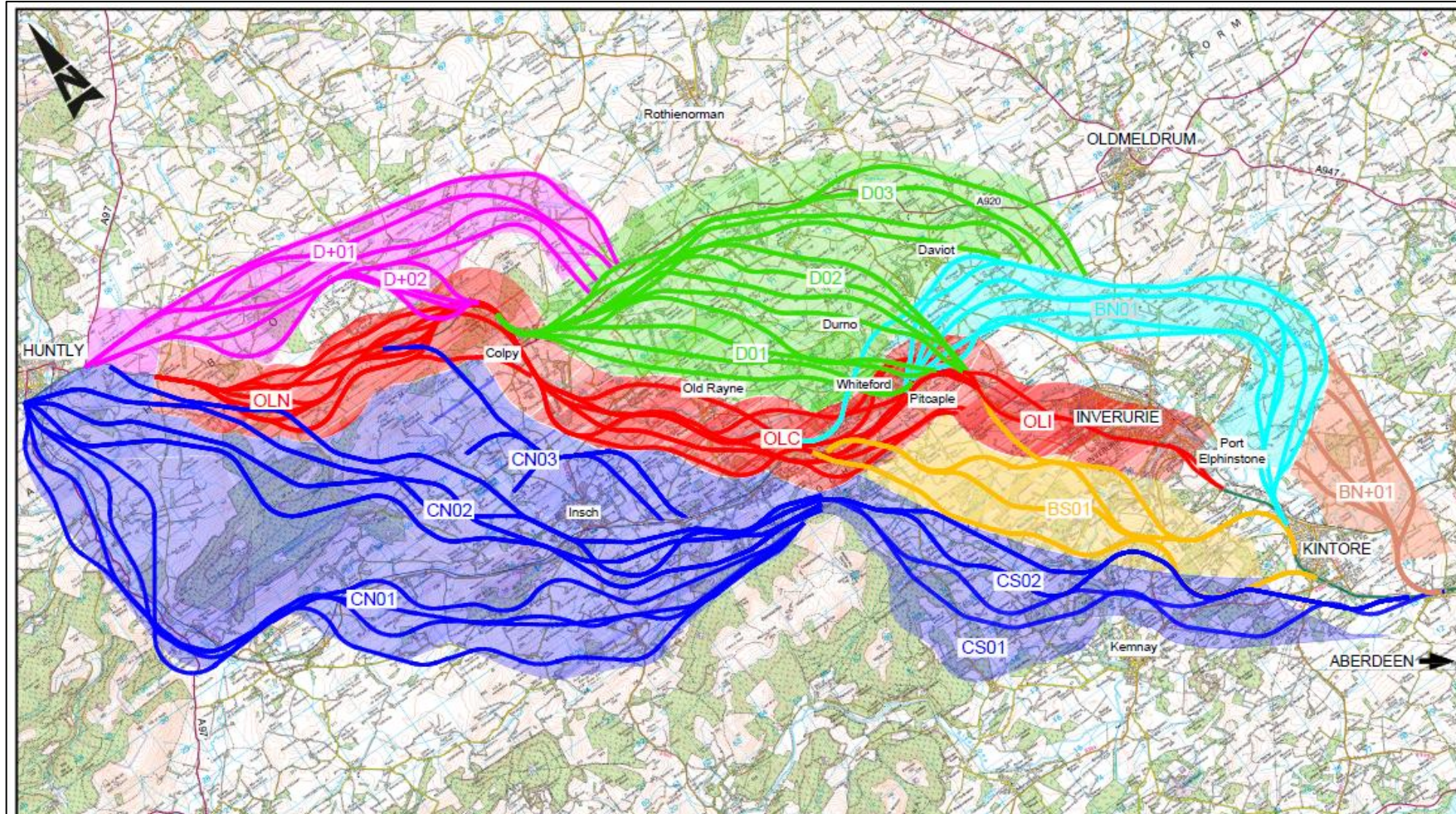
Colour Coding	Assessment
	Major Cost or Negative Impact
	Moderate Cost or Negative Impact
	Minor Cost or Negative Impact
	No Benefit or Impact
	Minor Beneficial Impact
	Moderate Beneficial Impact
	Major Beneficial Impact

Qualitative
Commentary
and
Quantitative
Assessment

Initial Route Options Assessment: Corridors



Initial Route Options Assessment: First Fix



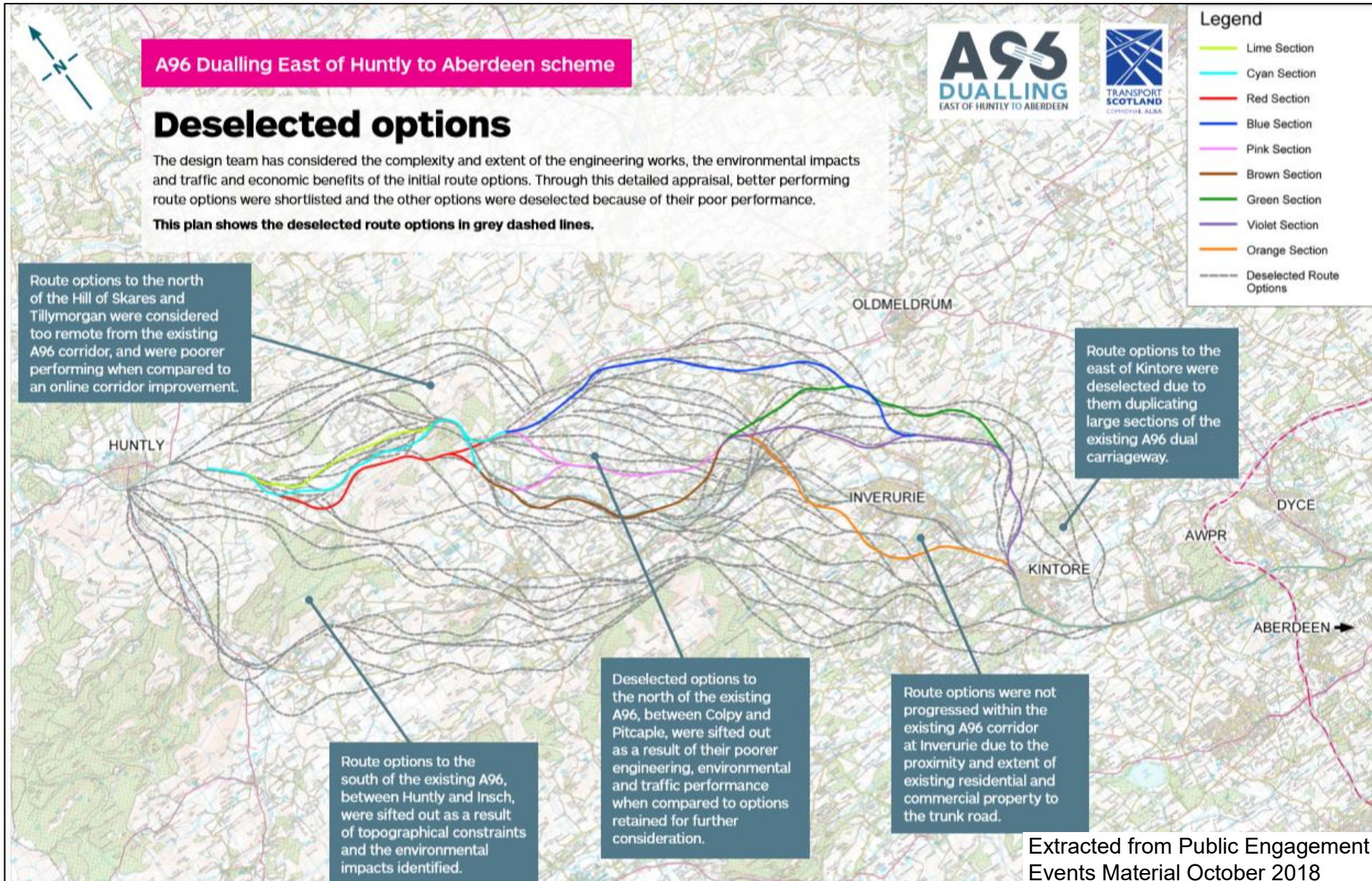
Corridors



First Fix



Initial Route Options Assessment: Early Sifting



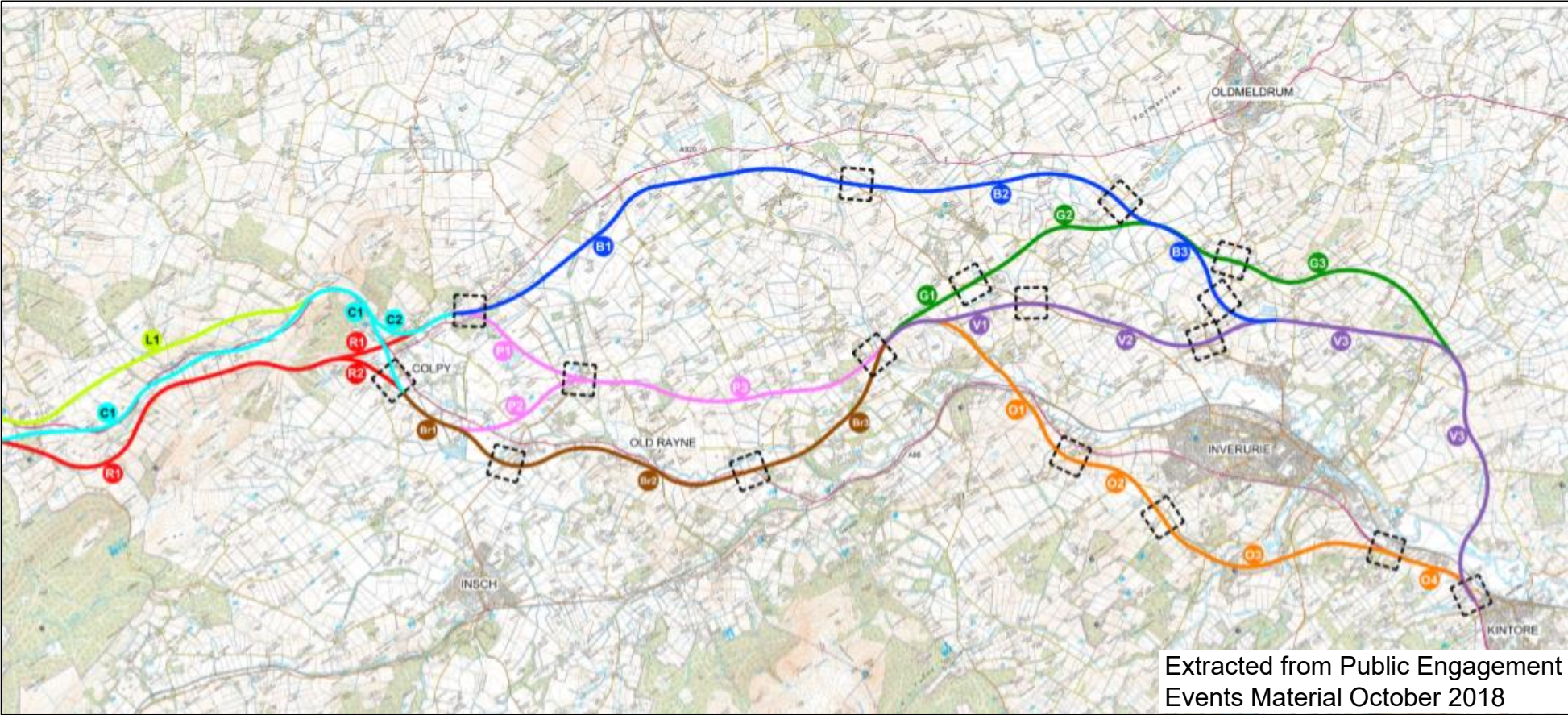
Corridors



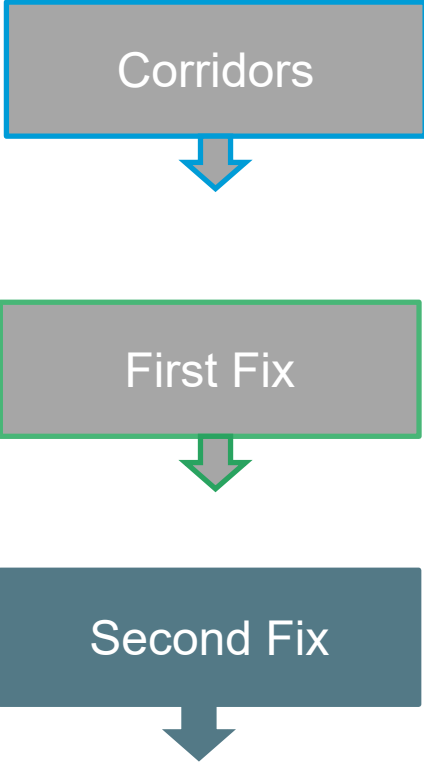
First Fix



Route Options Assessment: Second Fix



Extracted from Public Engagement Events Material October 2018



Pairing Assessment: Deselected Options

The following sections from the initial route options presented in October 2018 were therefore deselected from further consideration:

- Lime Section L1
- Cyan Section C2 and Red Section R1 (part)
- Pink Section P1
- Blue Sections B1, B2 and B3
- Green Sections G1, G2 and G3

These deselected sections are illustrated on this plan in dashed lines. The remaining sections are shown as solid lines.

Comparative Assessment between Cyan and Lime - Lime deselected

- Cyan performed better due to Lime requiring a difficult viaduct crossing of Glen Water and having a greater construction cost
- No clear environmental preference
- Cyan provided better value for money.

Comparative Assessment between Blue and Pink - Blue deselected

- Pink performed better due to having fewer structures and less impact on flooding and drainage than Blue
- Pink performed better than Blue due to a lesser impact on ecologically and culturally designated sites, such as stone circles at Loanhead and Newraig
- Pink performed better due to it attracting more traffic from the existing A96.

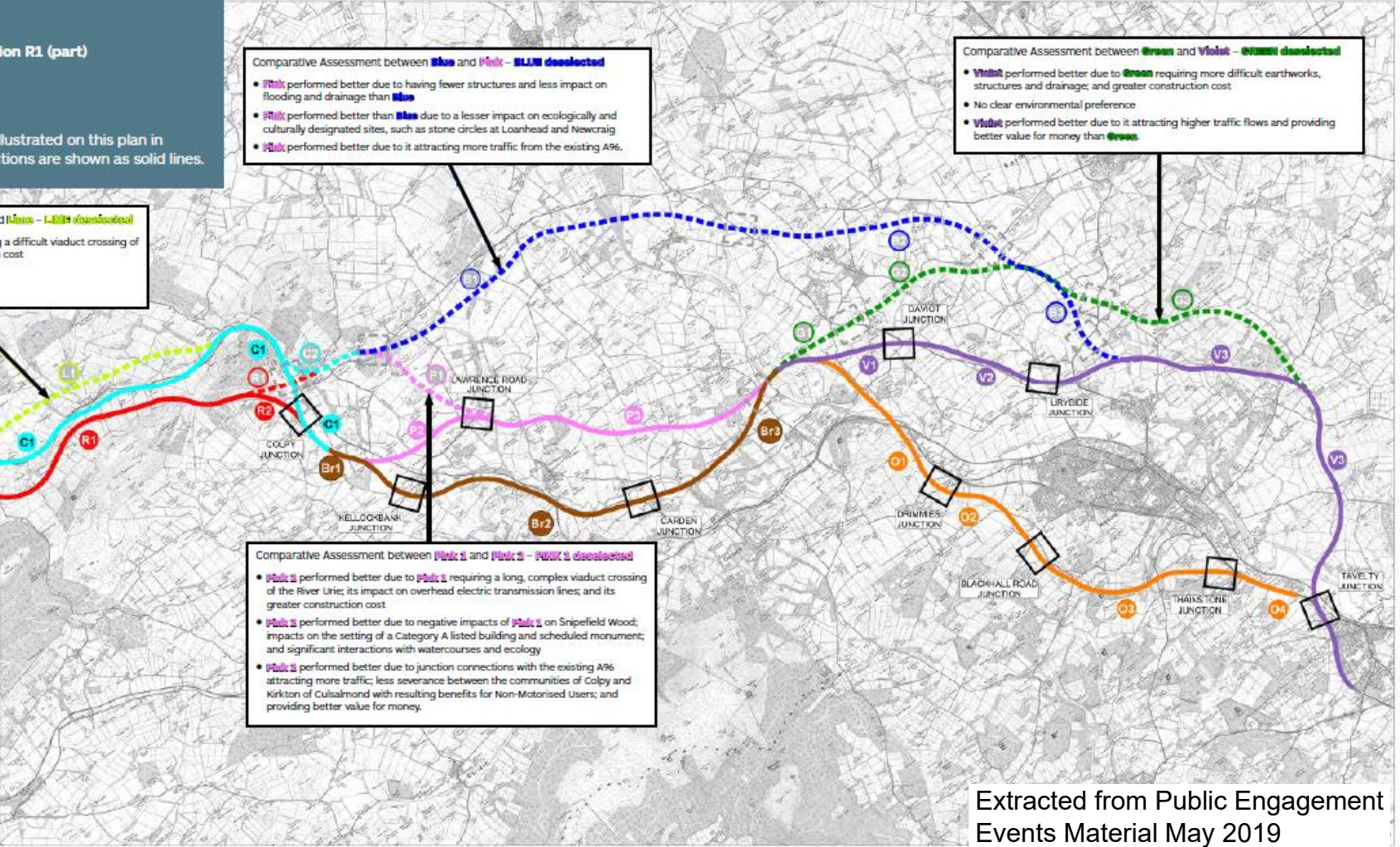
Comparative Assessment between Green and Violet - Green deselected

- Violet performed better due to Green requiring more difficult earthworks, structures and drainage; and greater construction cost
- No clear environmental preference
- Violet performed better due to it attracting higher traffic flows and providing better value for money than Green.

Comparative Assessment between Pink 1 and Pink 2 - Pink 1 deselected

- Pink 2 performed better due to Pink 1 requiring a long, complex viaduct crossing of the River Urie; its impact on overhead electric transmission lines; and its greater construction cost
- Pink 2 performed better due to negative impacts of Pink 1 on Snipefield Wood; impacts on the setting of a Category A listed building and scheduled monument; and significant interactions with watercourses and ecology
- Pink 2 performed better due to junction connections with the existing A96 attracting more traffic; less severance between the communities of Colpy and Kirkton of Culsammond with resulting benefits for Non-Motorised Users; and providing better value for money.

Indicative Grade-Separated Junction Locations	Deselected Grade-Separated Junction Locations
Current Sections (May 2019)	Deselected
Cyan Section	Lime Section
Red Section	Cyan Section
Pink Section	Red Section
Brown Section	Blue Section
Violet Section	Green Section
Orange Section	Pink Section



Corridors

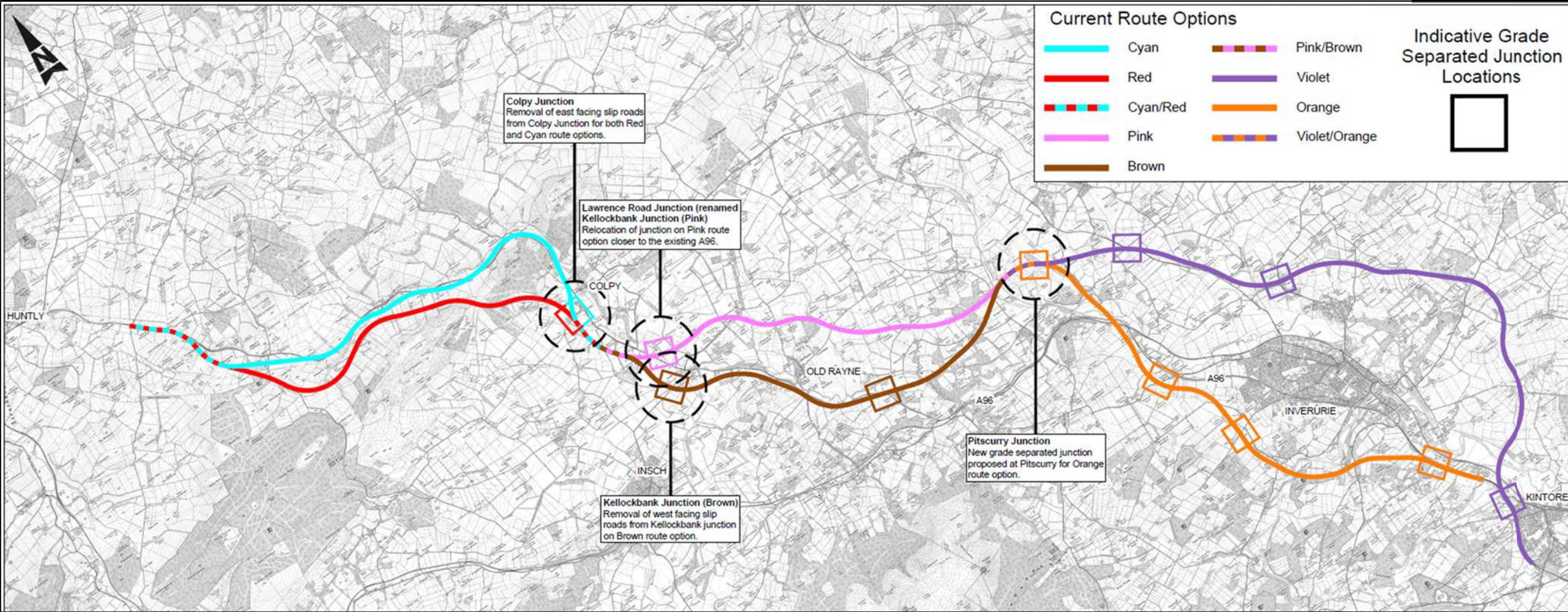
First Fix

Second Fix

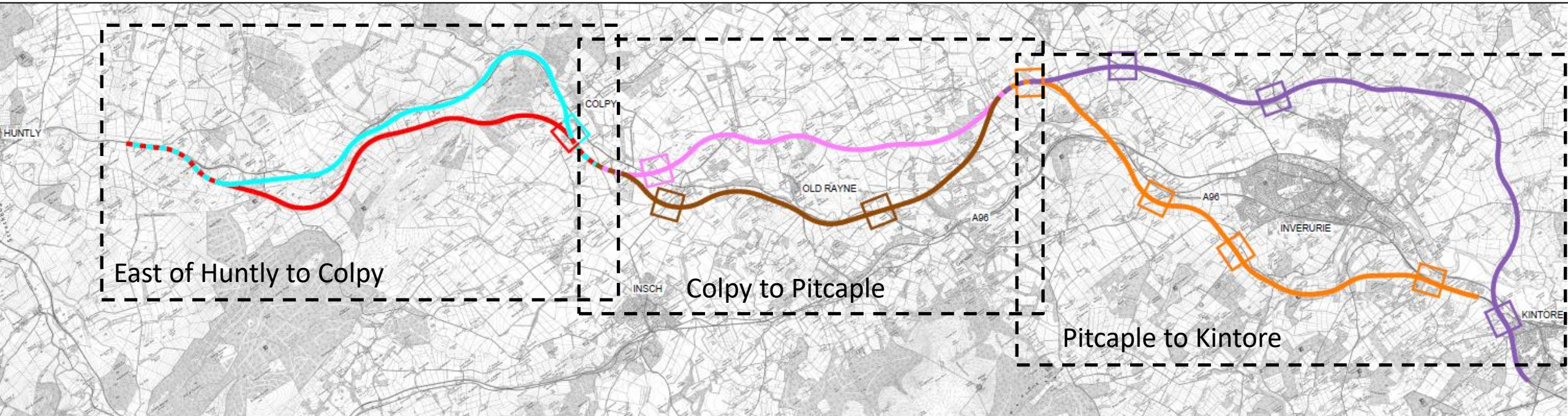
Pairing Assessment

Extracted from Public Engagement Events Material May 2019

Design Development – Junctions



Remaining Better Performing Route Options

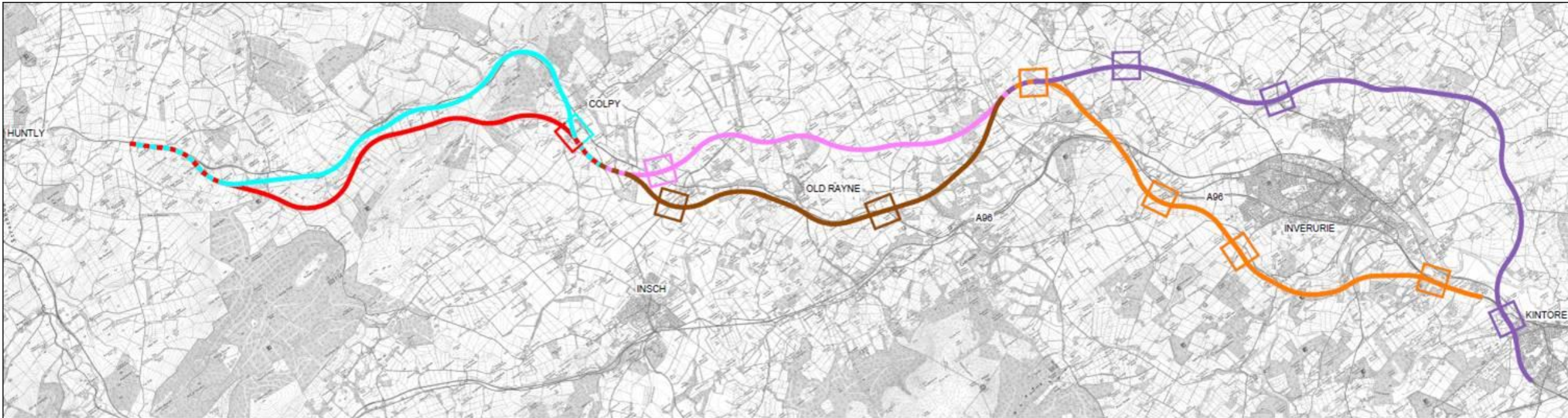


Stakeholder Engagement

- **Public Engagement Events**
 - **Meet the Team** - Nov 2017
 - **Initial Route Options Public Exhibitions** - Oct 2018
 - **Route Options - Design Update Public Drop-in Sessions** - May 2019
- **Statutory consultation** ongoing meetings with Local Authorities, SNH, SEPA and HES including ESGs and LARTPs
- **Stakeholder meetings**
 - Community Council Forums
 - NMU Forums
 - Landowner Meetings/Local Groups
 - Presentations to:
 - Aberdeenshire Full Council and Area Committees/Forums
 - NESTRANS
 - NFU



Key Feedback Themes Across the Scheme



- Impact on wildlife & habitats
- Impact on woodland & plants
- Impact on landscape, visual and noise
- CO2 emissions/air quality
- Negative economic impact on local businesses

- Impact on agricultural land
- Utilising existing infrastructure
- Climate change
- Business case justification
- Proximity to properties
- Insufficient traffic levels

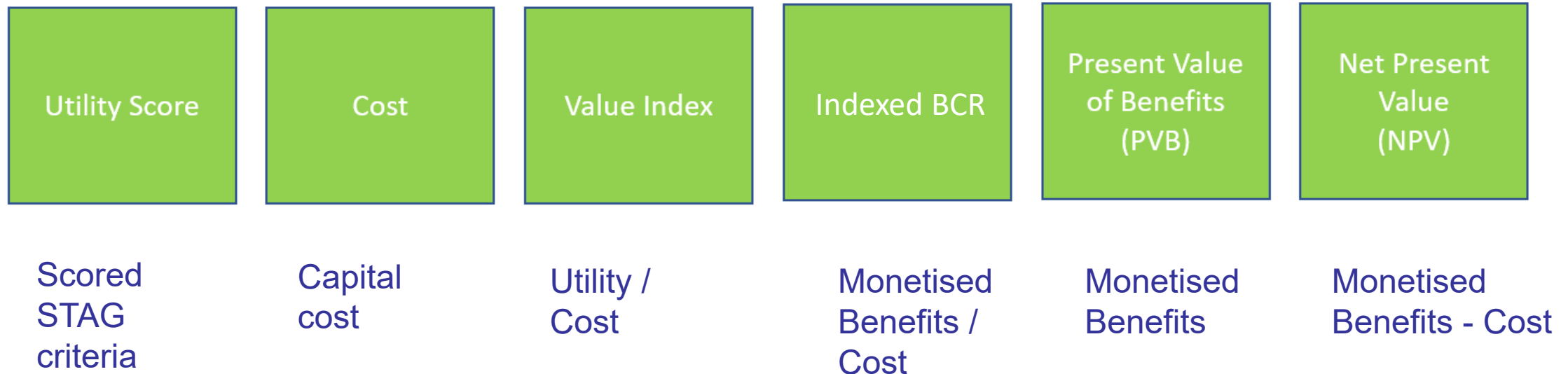
Questions



Introduction to Assessment Process

Assessment Process

- Consistent with other TS schemes
- Scoring of route options appraised against key criteria via Options Assessment Matrix
- Performance of each route option measured and ranked in order
- Ranking results added up and lowest number wins
- Combination of **sectional** and **end-to-end** assessments



Utility Score – Criteria



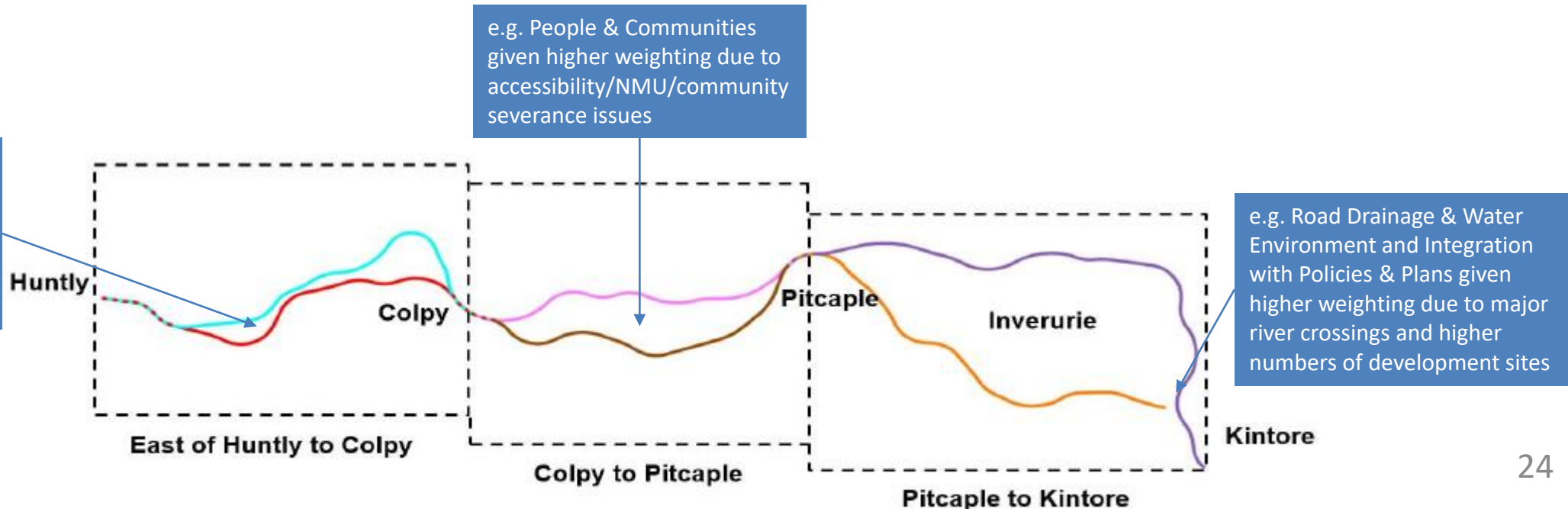
- Method of quantifying performance against the scheme objectives and STAG criteria
- Each of the six criteria below has an equal **weighting** of 60:
 - Economy
 - Safety
 - Environment
 - Accessibility
 - Integration
 - Others
- Each sub criteria is **scored out of 10**

Utility Score – Sub Criteria



- Sub criteria weighting carefully considered to provide a more balanced and informed assessment
- Sectional assessment criteria allocated bespoke weighting for each geographical section due to variations in local environmental receptors and their sensitivity or due the significance of the sub criteria to that location

e.g. Nature Conservation and Cultural Heritage given higher weighting due to wildcat priority area and Colpy Cottage SM



Utility Score – Assessment Criteria & Weighting

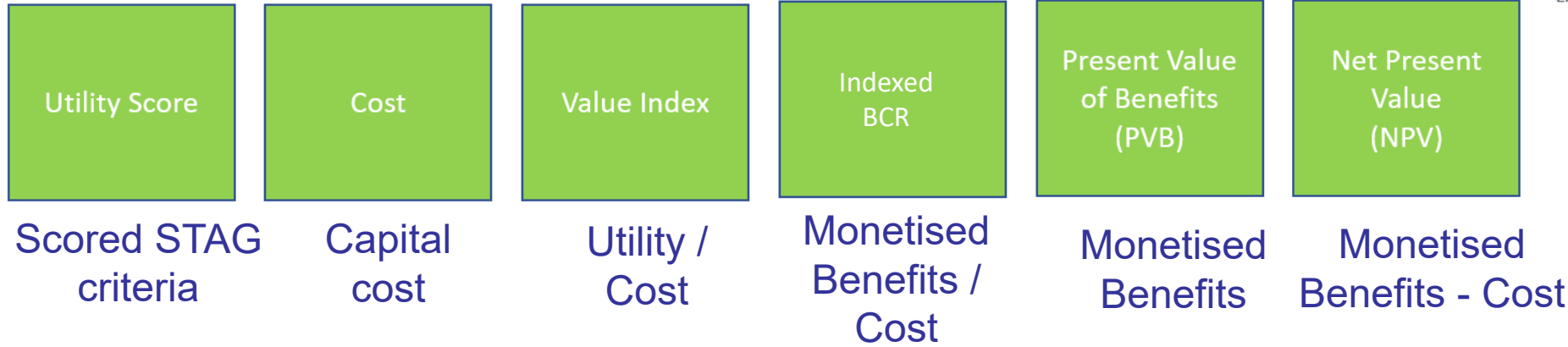


AmeyArup reviewed and developed criteria & sub criteria utilised in previous A96 VFM exercise

Subject	Assessment Criteria Reference	Objective and criteria description	Weighting		
Environment			60		
Environment 1	SO6 STAG 1	Nature Conservation	2	1.5	1.5
Environment 2		Road Drainage and the Water Environment	1	1.5	2
Environment 3		Geology, Soils, Contaminated Land and Groundwater	1.5	1	1
Environment 4		Noise and Vibration	1	1.5	1
Environment 5		Policies and Plans	0.5	0.5	1.5
Environment 6		Landscape	2	2	2
Environment 7		Visual Effects	2	2	1.5
Environment 8		People and Communities	1.5	2	1.5
Environment 9		Air Quality	0.5	0.5	0.5
Environment 10		Materials	2	0.5	1
Environment 11		Agriculture, Forestry and Sporting Interests	1.5	2	1.5
Environment 12		Cultural Heritage	2	2	2
Environment 13		Health	0.5	1	1
Environment 14		Climate Change	2	2	2
Accessibility			60		
Accessibility 1	SO4 STAG 5	Impact on existing NMU infrastructure	2	4	4
Accessibility 2		Opportunities for new NMU routes	4	8	8
Accessibility 3		Reduction in traffic in urban areas	30	End-to-end	
Integration			60		
Integration 1	SO5 STAG 4.1 & 4.2	Bus Services	15	End-to-end	
Integration 2		Railway Stations	15	End-to-end	
Integration 3	STAG 4.3	Integration with Plans and Policies (LDP)	4	4	12
Integration 4		Integration with Plans and Policies (Transport)	10	End-to-end	
Others			60		
Others 1	VFM 1	Construction and maintenance	10	5	15
Others 2	VFM 2 STAG 8	Promotability	2	2	6
Others 3	SO1.6	Resilience	8	6	6

Subject	Assessment Criteria Reference	Objective and criteria description	Weighting	
Economy			60	
Economy 1	SO1	To improve the operation of the A96 and inter-urban connectivity through:	SO1.1 - Reduced journey times;	9.0
			SO1.2 - Improved journey time reliability;	8.5
			SO1.3 - Increased overtaking opportunities;	8.5
			SO1.4 - Improved efficiency of freight movements along the transport corridor;	8.5
			SO1.5 - Reduced conflicts between local traffic and strategic journeys; and	8.5
Economy 2	SO3	To provide opportunities to grow the regional economies on the corridor through:	SO3.1 - Improved access to the wider strategic transport network	8.5
			SO3.2 - Enhanced access to jobs and services	8.5
Safety			60	
Safety	SO2	To improve safety for motorised and Non-Motorised Users through:	SO2.1 and SO2.2 Reduced accident rates and severity and reduced Driver Stress	30
			SO2.3 Reduced potential conflicts between Motorised and Non Motorised Users	30

Best performing end-to-end combination



				A96 Utility Score Weighted	A96 Utility Score Weighted Rank	Combined cost including risk (£m)	Combined Cost Rank	A96 Value Index	Value Index Rank	Benefit / Cost ratio (BCR) Indexed	BCR Rank	Present Value of Benefits (PVB, £m)	PVB Rank	Net Present Value (NPV, £m)	NPV Rank	6 Criteria Overall Score	Overall Rank
				a	b	c	d	e = a/d	f	g	h	i	j	k	l	b+d+f+h+j	
Cyan	Pink	Violet	C-P-V														
Cyan	Pink	Orange	C-P-O														
Cyan	Brown	Violet	C-Br-V														
Cyan	Brown	Orange	C-Br-O														
Red	Pink	Violet	R-P-V														
Red	Pink	Orange	R-P-O														
Red	Brown	Violet	R-Br-V														
Red	Brown	Orange	R-Br-O														

Options Assessment Matrix

Ranking 1 (best performing) to 8 (lesser performing)

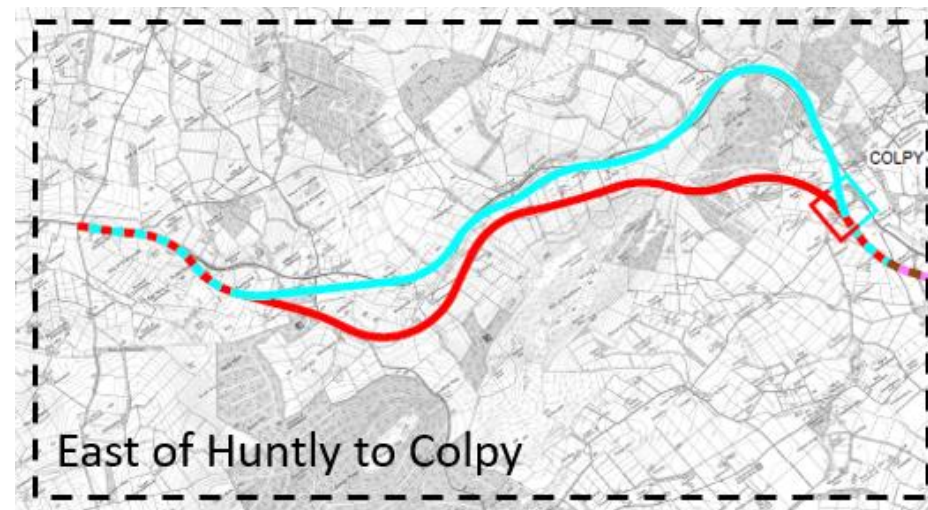
Sum of ranking (lowest is best)

Questions

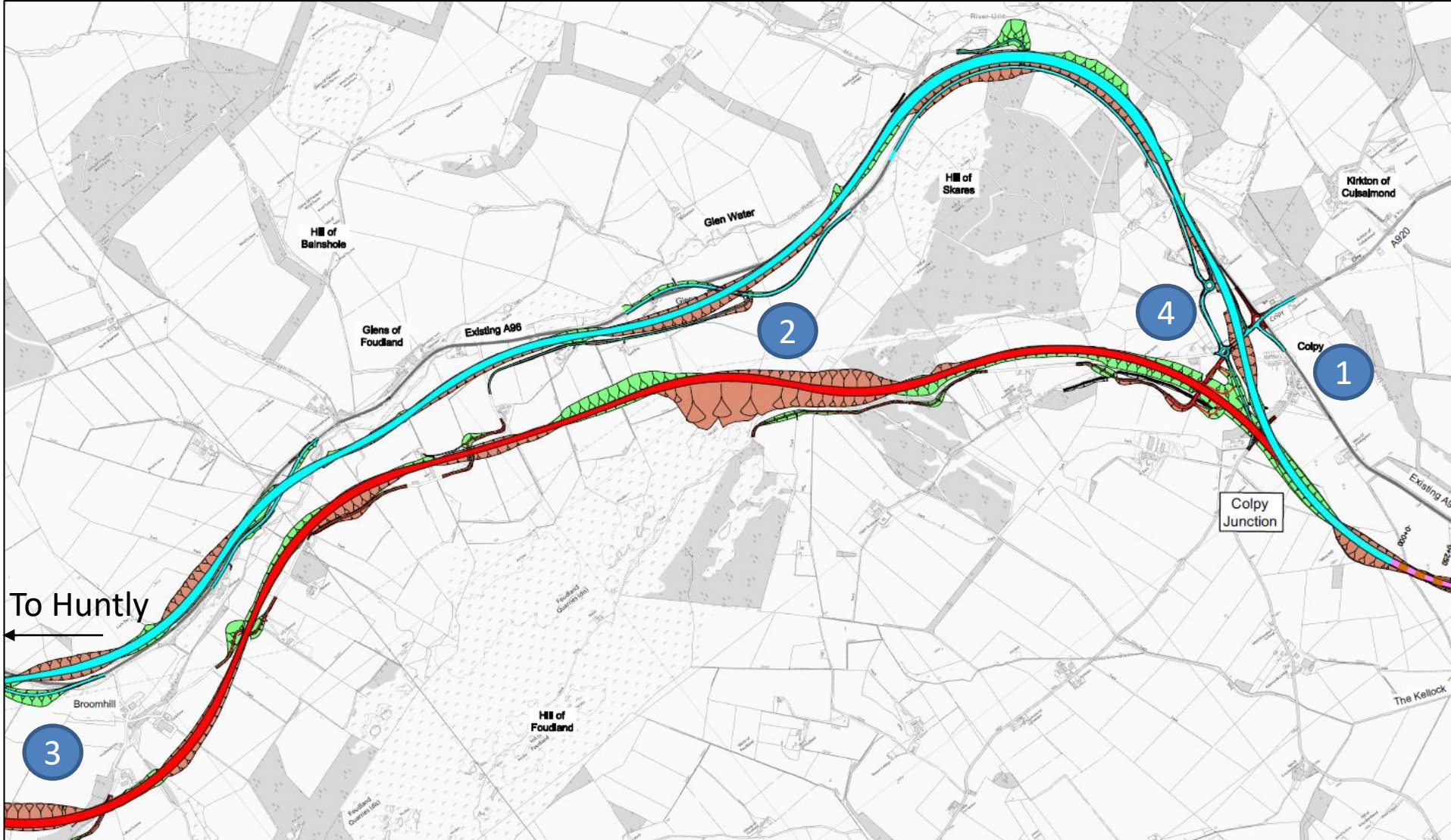




Session 1 – East of Huntly to Colpy (Cyan & Red Route Options)

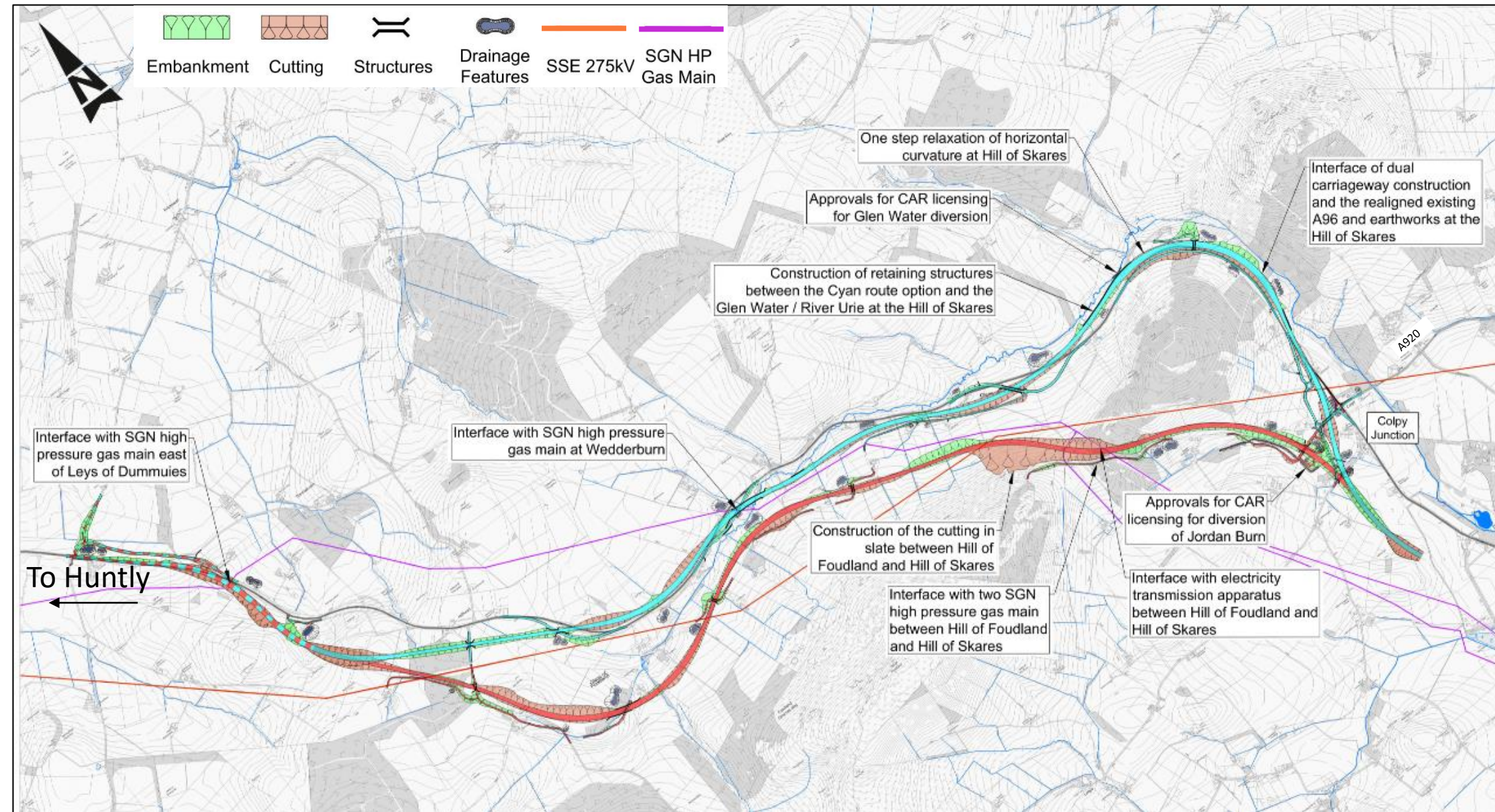


Key Themes from Public Feedback



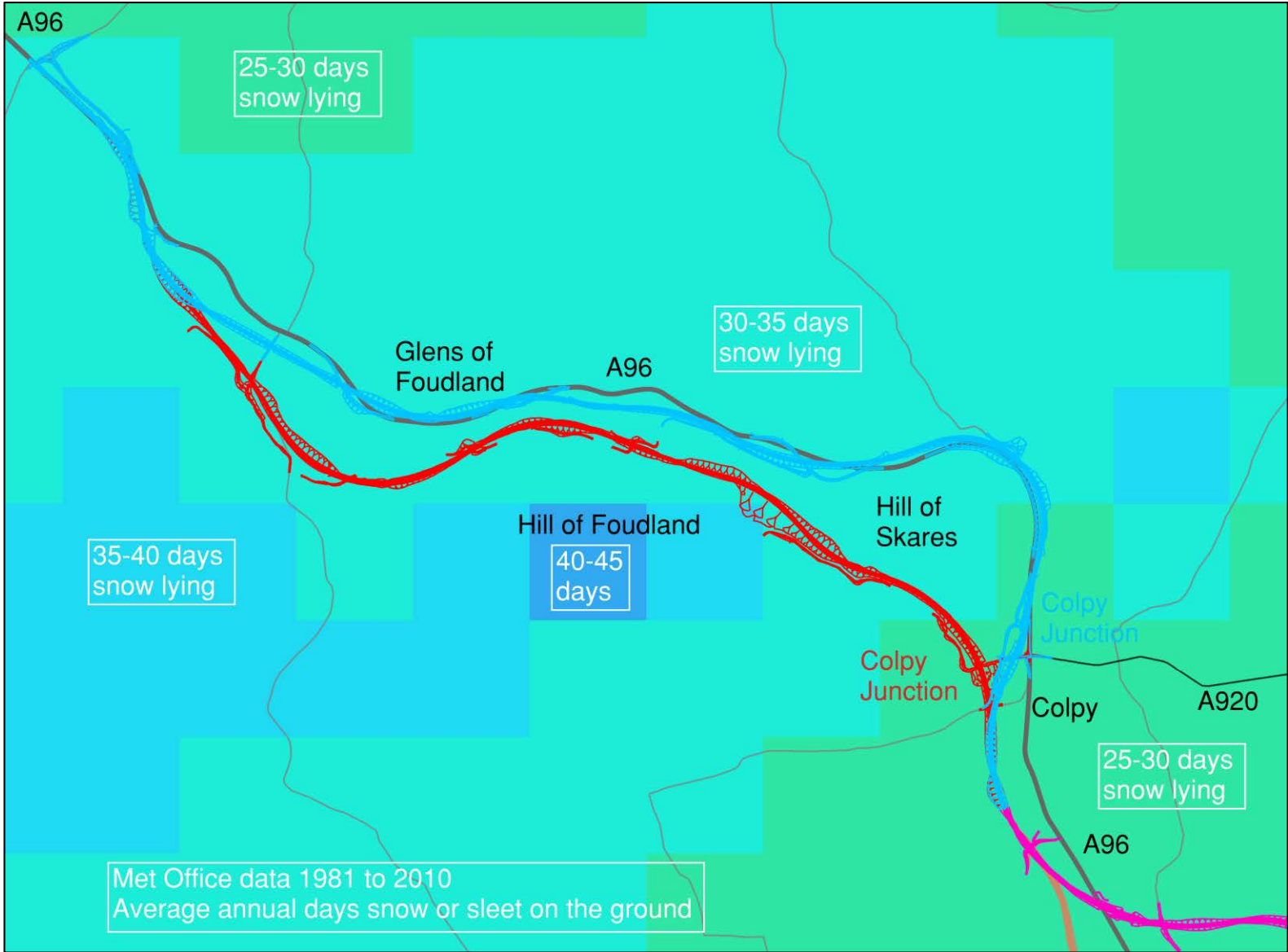
1. Colpy – isolated between roads
2. Winter/weather resilience
3. NMU Provision
4. Junction locations

Construction and Maintenance



Resilience

- Winter resilience
- Network resilience
- Climate change resilience

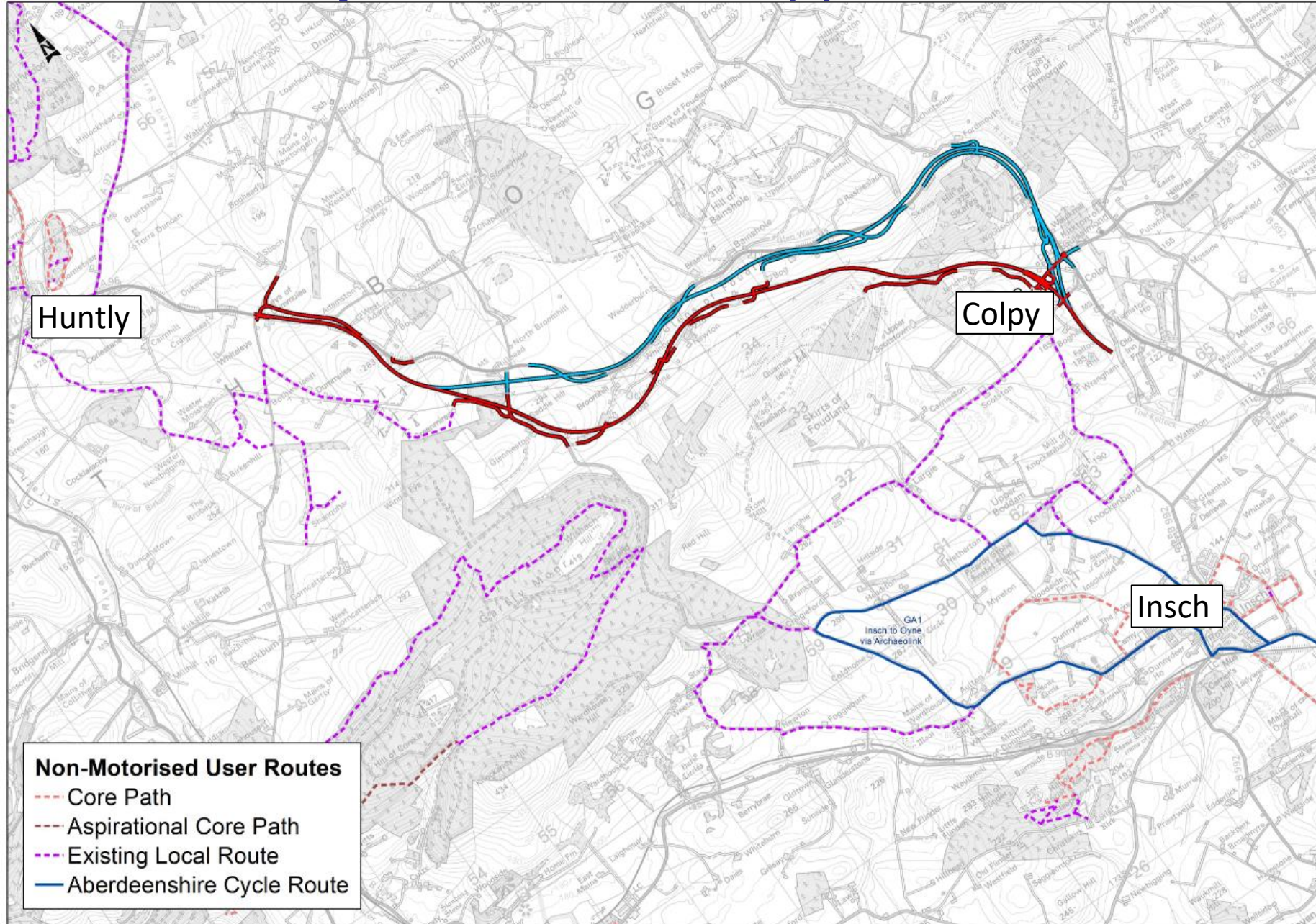


Promotability



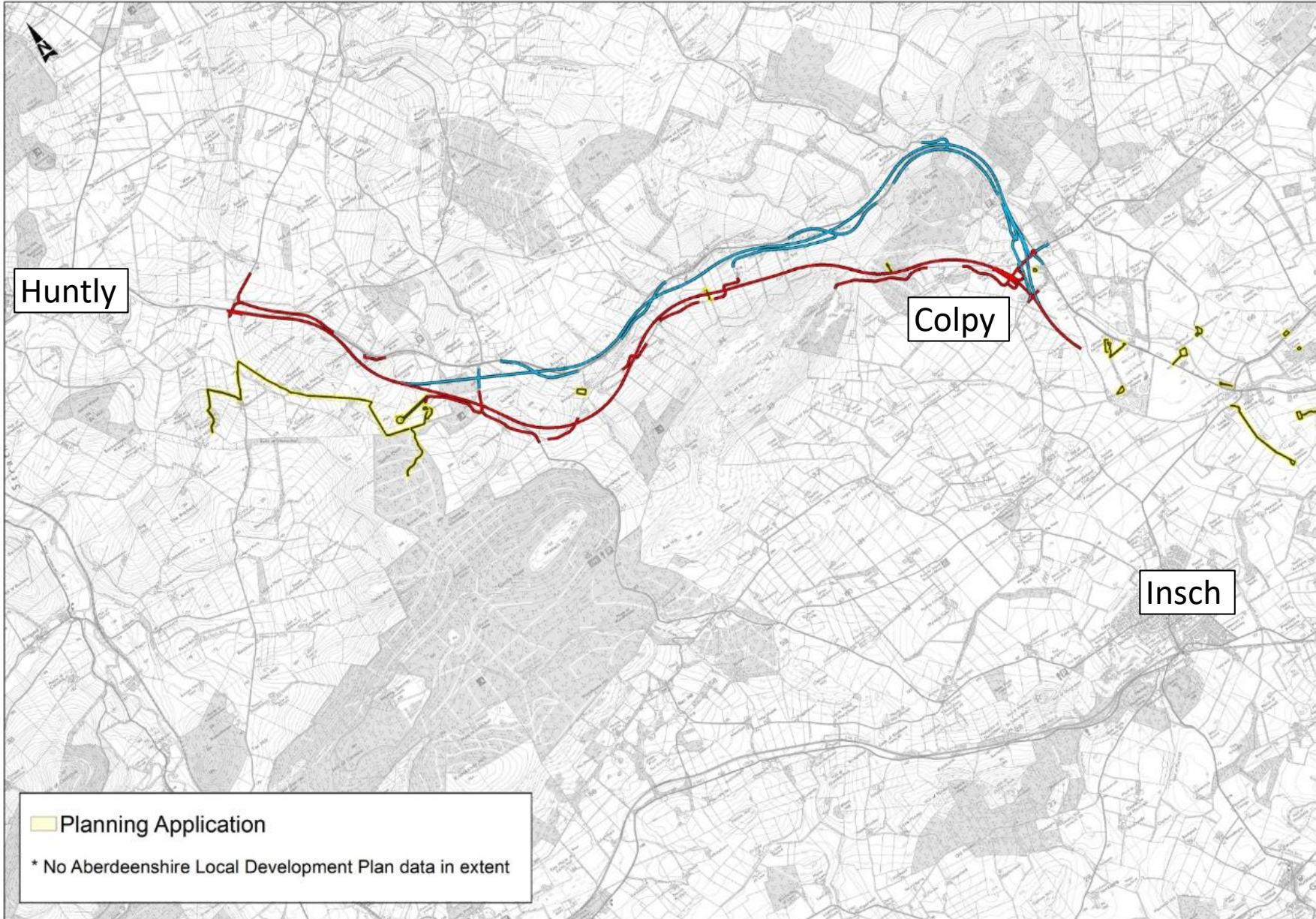
- Cyan & Red route options - Not perceived to be high risk to promotability
- Cyan - Potential adverse residual effects on Scheduled Monument Colpy Cottage palisaded enclosure and setting, however positive, regular dialogue with HES indicates adverse effects likely to be mitigated by sensitive design at DMRB Stage 3
- Cyan - SEPA granting a CAR licence for the re-alignment of the River Urie
- Red - SEPA granting a CAR licence for the re-alignment of the Jordan Burn
- Red - Presence of a private burial site, however there is no statutory/formal status of this site

Accessibility 1 & 2 – NMU opportunities



- Few existing NMU routes affected
- No settlements other than individual properties in a rural setting
- Opportunities to improve connectivity between communities using NMU routes i.e. between Huntly, Colpy and Insch

Integration 3



- Integration with isolated existing planning applications



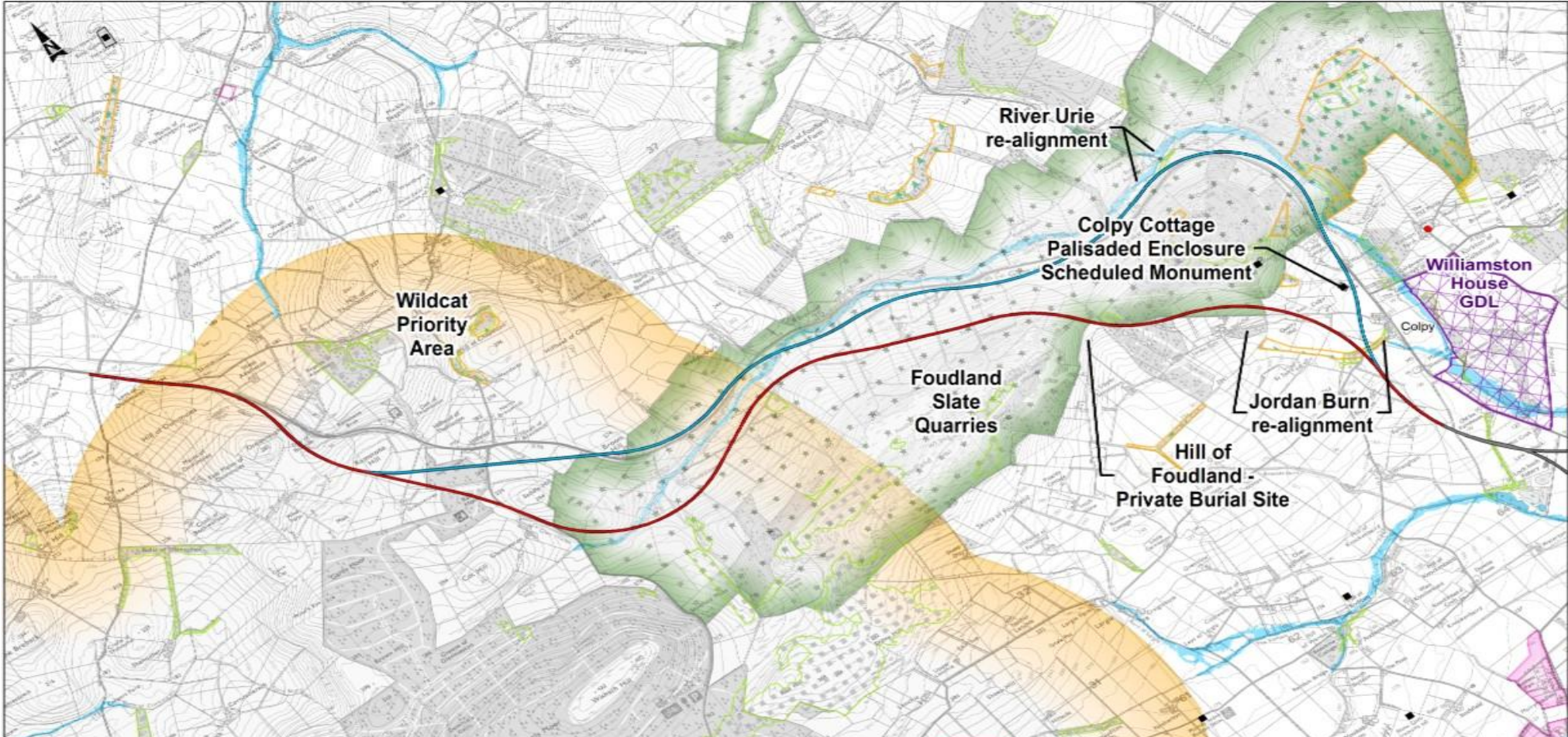
Sectional Assessment: East of Huntly to Colpy (Cyan & Red Route Options)

Utility Score:
Accessibility (Part), Integration (Part) and Others

Questions



Environment – Key Issues



Route Option	● Category A Listed Building	■ Area at Risk of Fluvial Flooding	■ Scheduled Monument	■ Special Landscape Area
— Cyan	■ Ancient Woodland	■ Inventory Gardens and Designed Landscapes	■ Local Development Plan Settlement	■ Wildcat Priority Area
— Red	■ Native Woodland	■ Inventory Historic Battlefield	■ Site of Special Scientific Interest (SSSI)	
— Adjoining	■ Local Nature Conservation Site			

A96 Dualling East of Huntly to Aberdeen
 VFM Workshop
 Cyan and Red Route Options






Topic	Weighting
Nature Conservation	2
Landscape	2
Visual Effects	2
Materials	2
Cultural Heritage	2
Climate	2
Geology, Soils, Contam'd Land & Groundwater	1.5
People & Communities	1.5
Agriculture, Forestry & sporting Interests	1.5
Road Drainage & Water Environment	1
Noise & Vibration	1
Policies & Plans	0.5
Air Quality	0.5
Human Health	0.5

Environment – Key Issues 1 of 2

Topic	Weighting	Key Issue
Nature Conservation	2	Red route option travels through more undisturbed Wildcat Priority Area habitat.
Landscape	2	Red route option has more impact on landscape character from earthworks.
Visual Effects	2	Red route option has more impact on receptors particularly from cutting across north and south facing slopes of Hill of Foudland (467m AOD).
Materials	2	Red route option has insufficient local waste disposal capacity for unsuitable material.
Cultural Heritage	2	Cyan route option impacts on setting of Colpy Cottage Palisaded Enclosure Scheduled Monument.
Climate	2	End-to end options with a Cyan route option have higher aggregated emissions for the 60-year study period.
Geology, Soils, Contaminated Land and Groundwater	1.5	Red route option impacts on geological resources, specifically the Foudland area of safeguarded slate. Both route options have similar impacts on groundwater abstractions and low risk from contaminated land.

Environment – Key Issues 2 of 2

Topic	Weighting	Key Issue
People and Communities	1.5	Red route option impacts on private burial site. Both route options affect two Non-Motorised User routes and the amenity of the Culsalmond Education Centre.
Agriculture, Forestry and Sporting Interests	1.5	Both route options have similar impacts on the number of land holdings and percentage of prime agricultural land affected.
Road Drainage and Water Environment	1	Red route option requires long realignment on Jordan Burn (1km) compared to 200m realignment on River Urie for the Cyan route option.
Noise and Vibration	1	End-to-end options with a Red route option have more adverse impacts for residential receptors.
Policies and Plans	0.5	Both route options have similar impacts. Red route option affects a few small scale planning application sites. Cyan route option potential non-compliance with LDP policy HE1.
Air Quality	0.5	Both route options have similar impacts. No exceedances of Scottish Air Quality Objective thresholds.
Human Health	0.5	Both options similar. Minor adverse effects from changes on landscape amenity. Positive impacts from traffic reduction on existing A96.



Sectional Assessment: East of Huntly to Colpy (Cyan & Red Route Options)

Utility Score: Environment

Questions

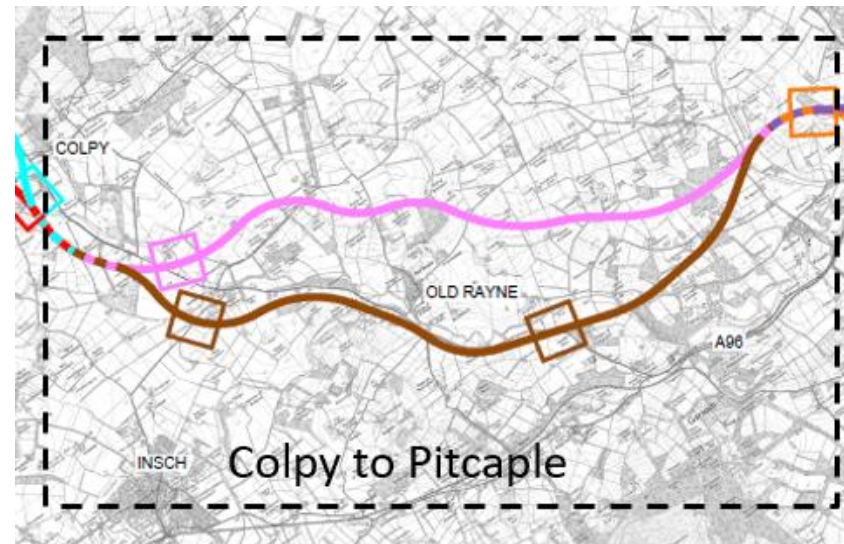




Break

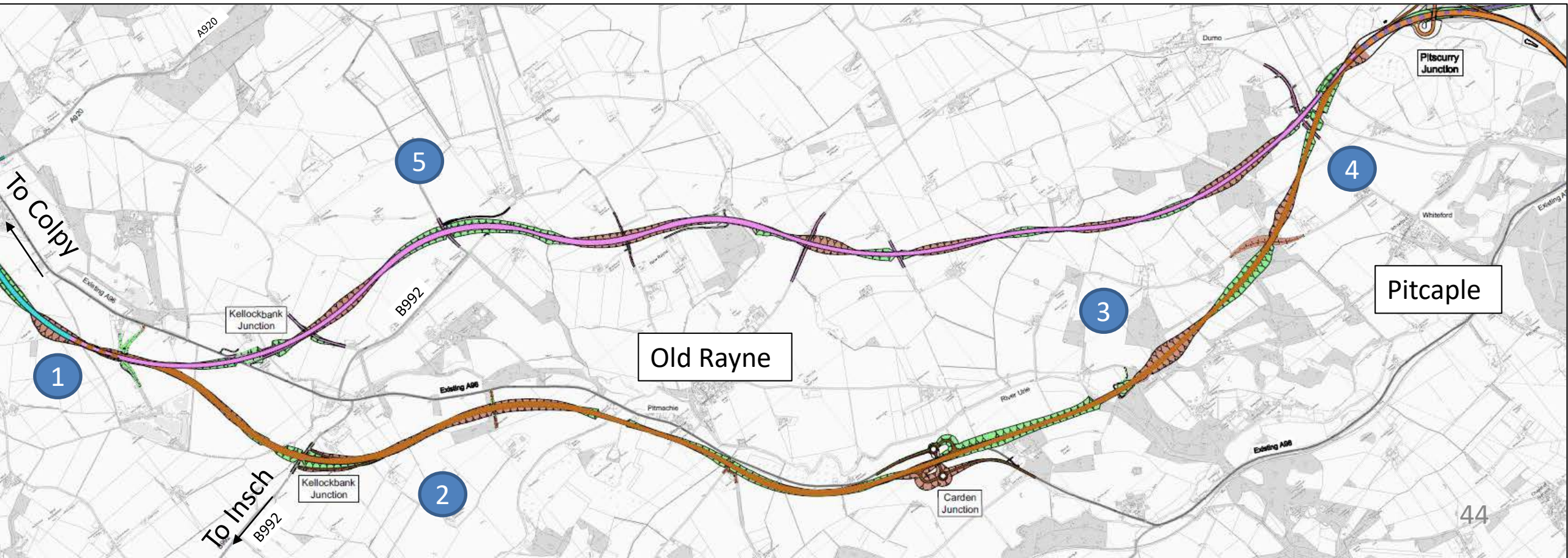


Session 2 – Colpy to Pitcapple (Pink & Brown Route Options)



Key Themes from Public Feedback

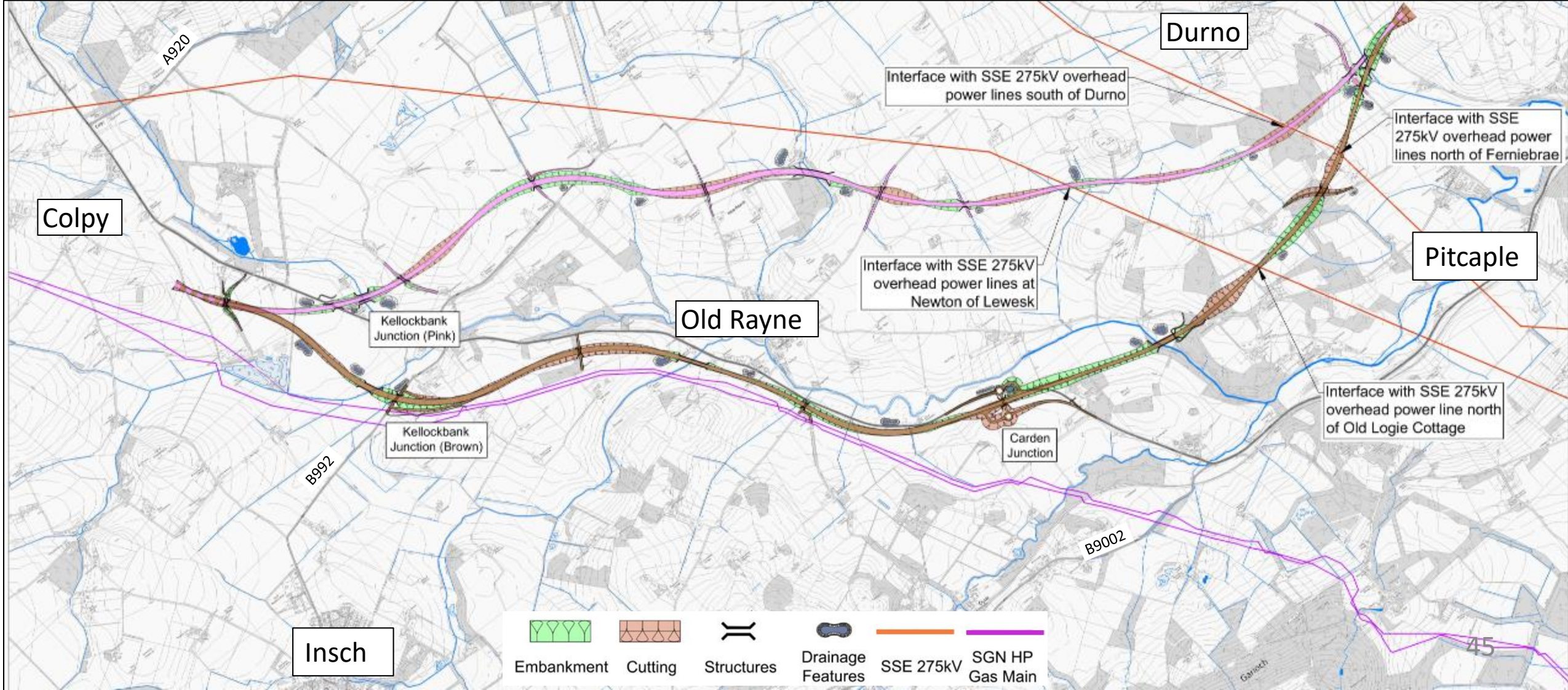
- 1. Impact on local businesses
- 2. Insch local road traffic
- 3. Impact on local woodland
- 4. Old Rayne/Durno/Whiteford – severance
- 5. Junction locations



Construction & Maintenance

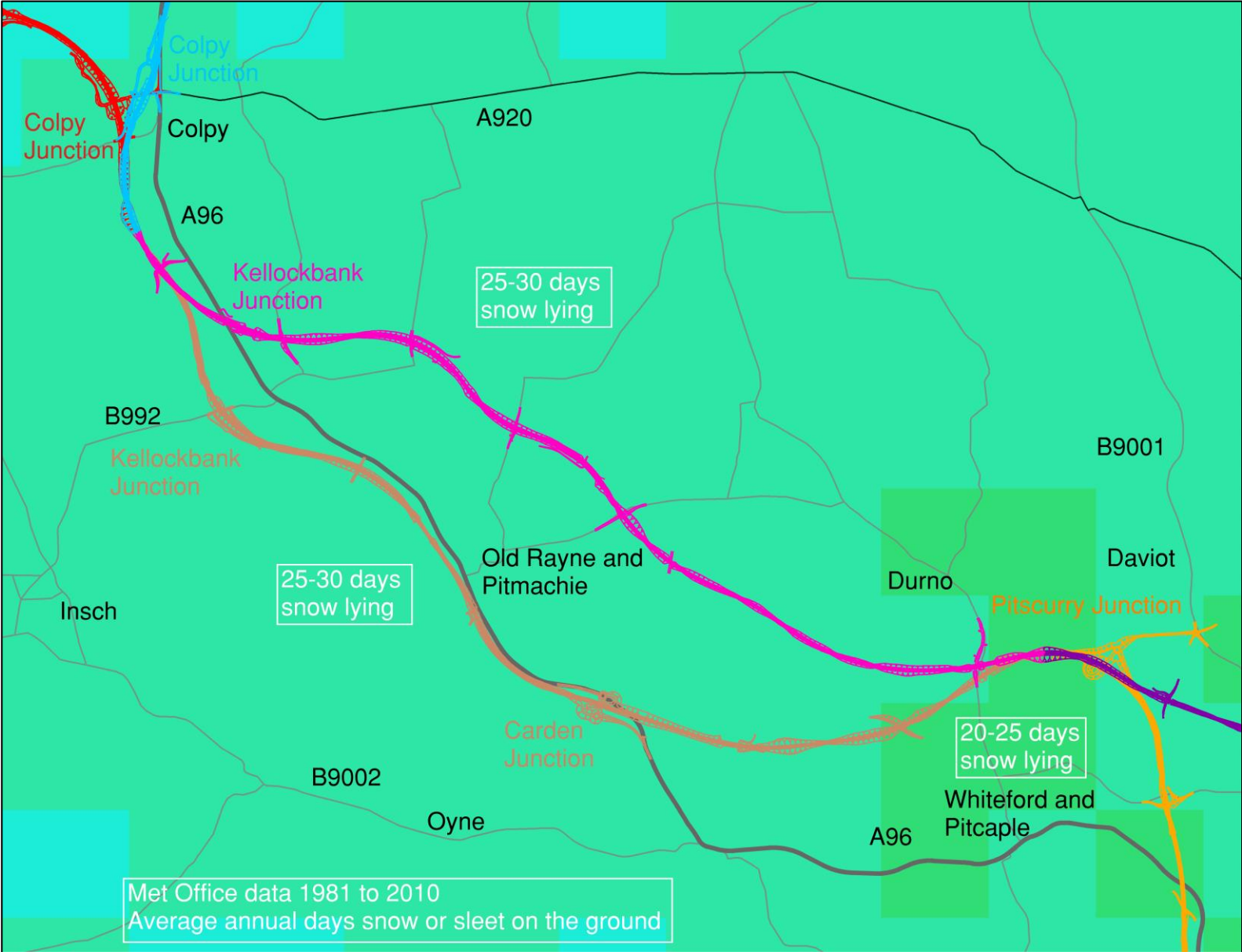


TRANSPORT SCOTLAND
CÒMHDHAIL ALBA



Resilience

- Winter resilience – no real differentiator
- Network resilience – Brown closer to existing A96
- Climate change resilience

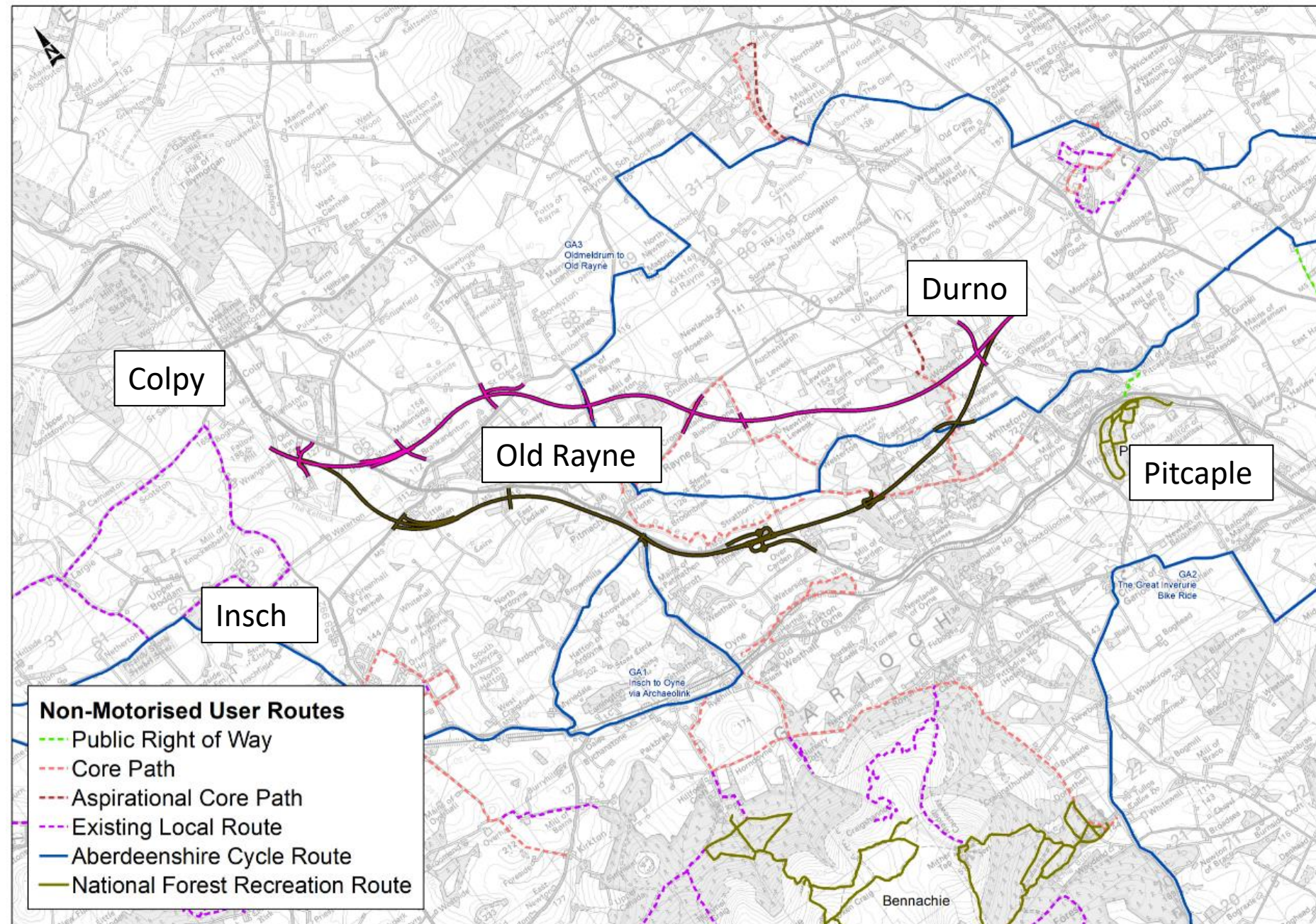


Promotability



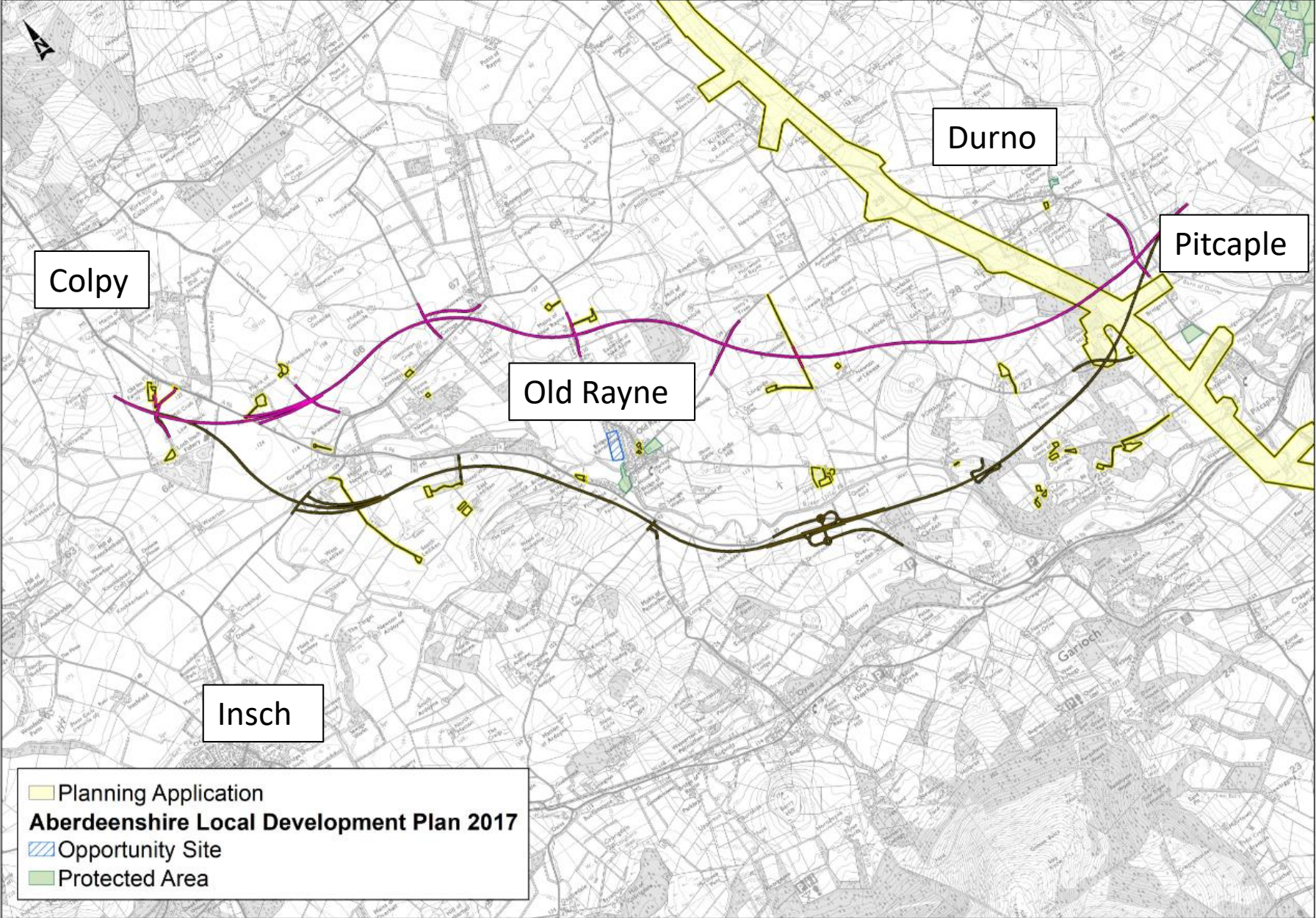
- Pink & Brown route options - Not perceived to be high risk to promotability
- Potential adverse residual effects on the setting of scheduled monuments however positive/regular dialogue with HES indicates adverse effects can be mitigated by sensitive design at Stage 3
 - Pink - Durno Roman Camp, Pitscurry Cairn, Law Cairn, and Newton of Lewesk Enclosure
 - Brown - Durno Roman Camp and Pitscurry Cairn
- Pink & Brown - Potential residual effects on landscape, ecology and to the amenity use of the Logie Woodland

Accessibility 1 & 2 – NMU opportunities



- Several existing NMU routes and further opportunities to connect Colpy, Inch, Old Rayne and Durno, Whiteford/ Pitcaple
- Pink impacts on less NMU routes than Brown
- Both have further opportunities to provide better NMU access between existing communities and local destinations

Integration 3



- Integration with existing LDP sites
- Integration with isolated existing planning applications including SSE overhead power line replacement



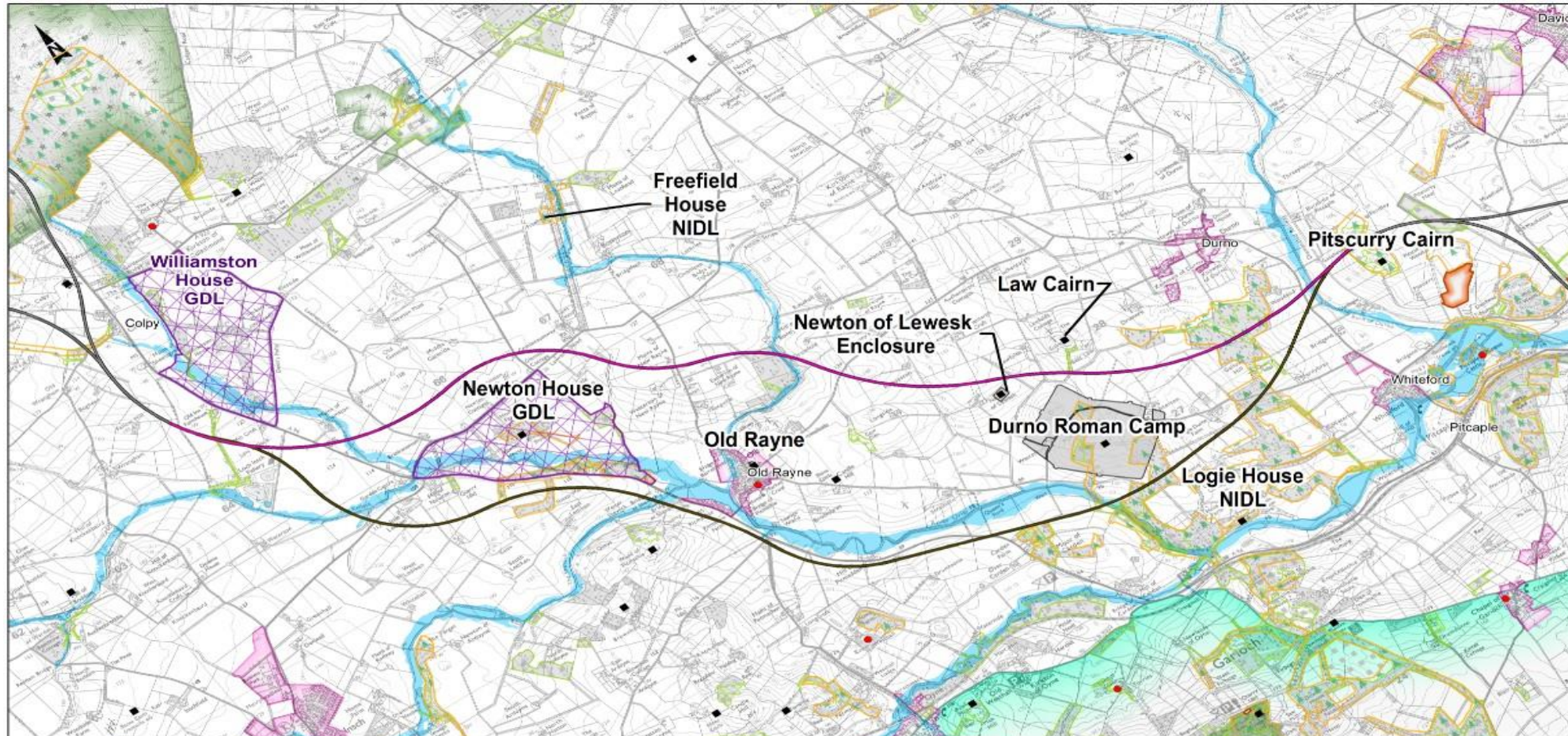
Sectional Assessment: Colpy to Pitcapple (Pink & Brown Route Options)

Utility Score:
Accessibility (Part), Integration (Part) and Others

Questions



Environment – Key Issues



A96 Dualling East of Huntly to Aberdeen
VFM Workshop
Pink and Brown Route Options

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TRANSPORT SCOTLAND
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Topic	Weighting
Landscape	2
Visual Effects	2
People & Communities	2
Agriculture, Forestry & Sporting Interests	2
Cultural Heritage	2
Climate	2
Nature Conservation	1.5
Road Drainage & Water Environment	1.5
Noise & Vibration	1.5
Geology, soils, Contam'd Land & Groundwater	1
Human Health	1
Policies & Plans	0.5
Air Quality	0.5
Materials	0.5

Environment – Key Issues 1 of 2

Topic	Weighting	Key Issue
Landscape	2	Brown route option cuts through Logie House Non-Inventory Designed Landscape.
Visual Effects	2	Brown route option has more receptors and is more open to long distance views.
People and Communities	2	Brown route option adverse effects on four Non-Motorised User (NMU) routes within Logie/Durno woodland area. Pink route option adverse effects on three NMU routes and beneficial effects on one NMU route.
Agriculture , Forestry and Sporting Interests	2	Brown route option affects more farm units and higher percentage prime agricultural land.
Cultural Heritage	2	Pink route option impacts four Scheduled Monuments. Brown route option impacts on two Scheduled monuments and Non-Inventory Designed Landscape.
Climate	2	End-to end options with a Brown route option have higher aggregated emissions for the 60-year study period.
Nature Conservation	1.5	Both route options result in loss of Ancient woodland of long established plantation origin. Habitats likely to be the focus for protected species e.g. badger, red squirrel, bats etc. Brown route option slightly more impact.

Environment – Key Issues 2 of 2

Topic	Weighting	Key Issue
Road Drainage and Water Environment	1.5	Both route options have similar impacts. Both require crossing of Water Framework Directive monitored watercourses.
Noise and Vibration	1.5	End-to-end options with a Brown route option have more adverse impacts for receptors.
Geology, Soils, Contaminated Land and Groundwater	1	Both route options have similar impacts on groundwater abstractions and low risk from contaminated land. Both route options result in loss of Prime Agricultural Land but slightly more is lost with Brown route option.
Human Health	1	Brown route option has more adverse impact on health due to impacts on amenity. Both route options have positive effects from improved amenity and access between local communities, services and facilities.
Policies and Plans	0.5	Both route options impact on Local Development Plan policies. Pink route option impacts more planning sites.
Air Quality	0.5	Both route options have similar impacts. No exceedances of Scottish Air Quality Objective thresholds.
Materials	0.5	Brown route option has earthwork deficit. Requires import of fill material or use of suitable material from elsewhere on the scheme.



Sectional Assessment: Colpy to Pitcapple (Pink & Brown Route Options)

Utility Score: Environment

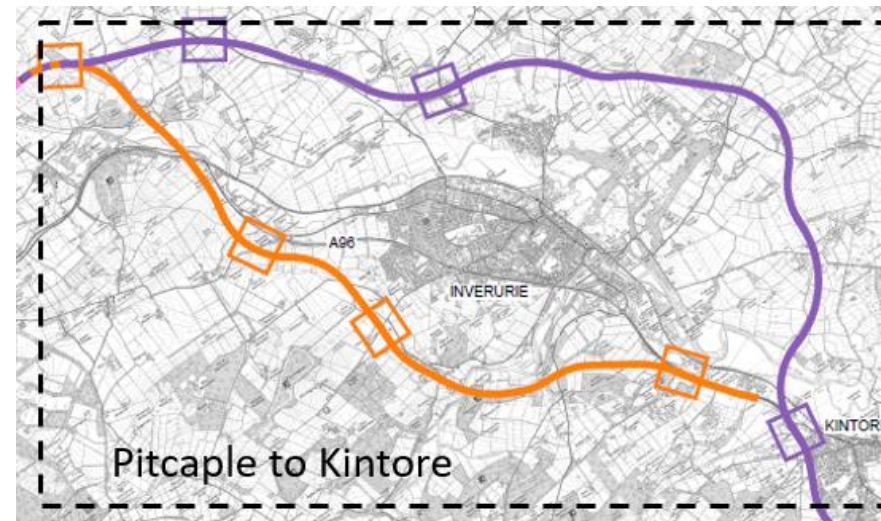
Questions



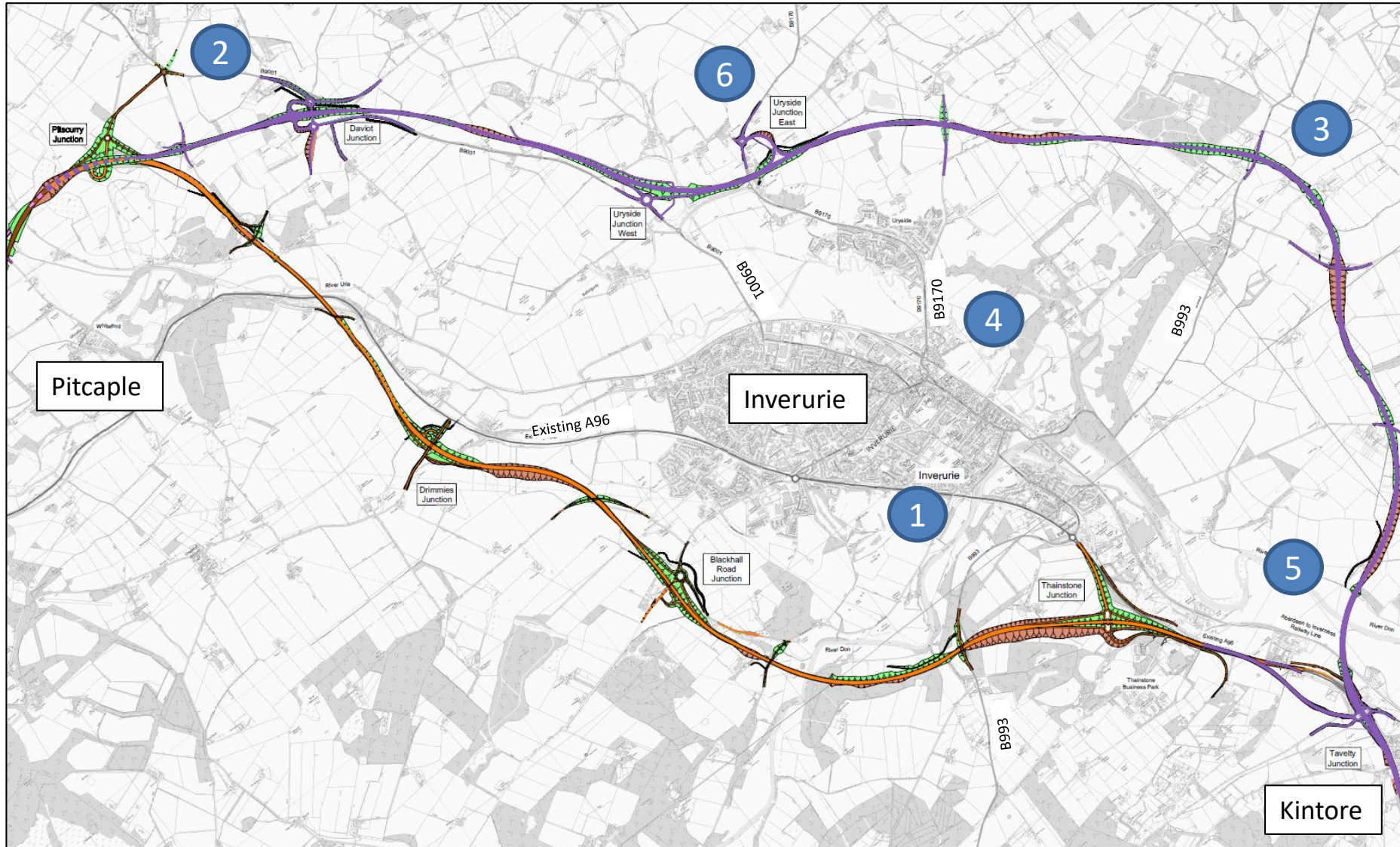
Lunch Break



Session 3 – Pitcapple to Kintore (Violet & Orange Route Options)

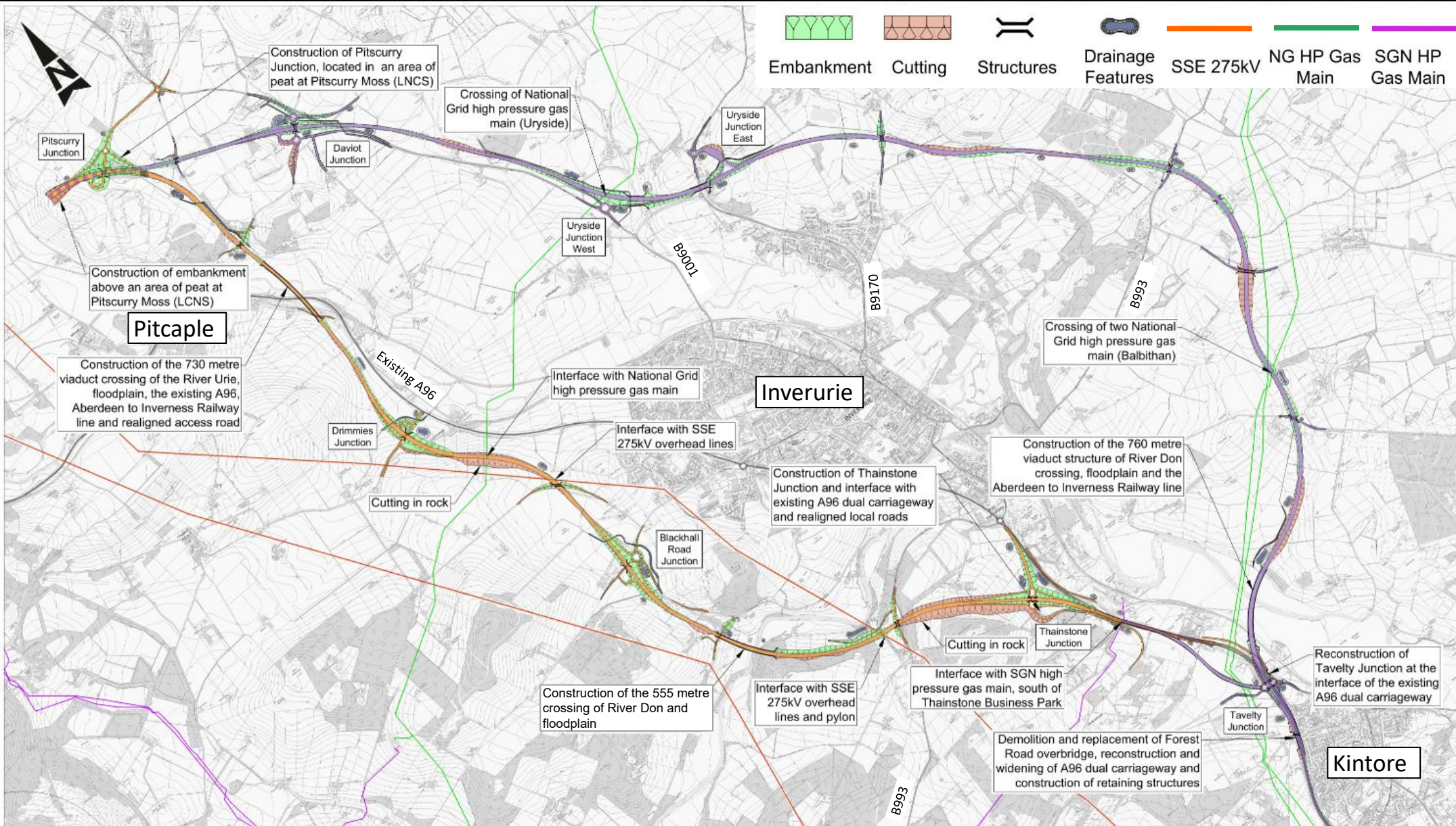


Key Themes from Public Feedback



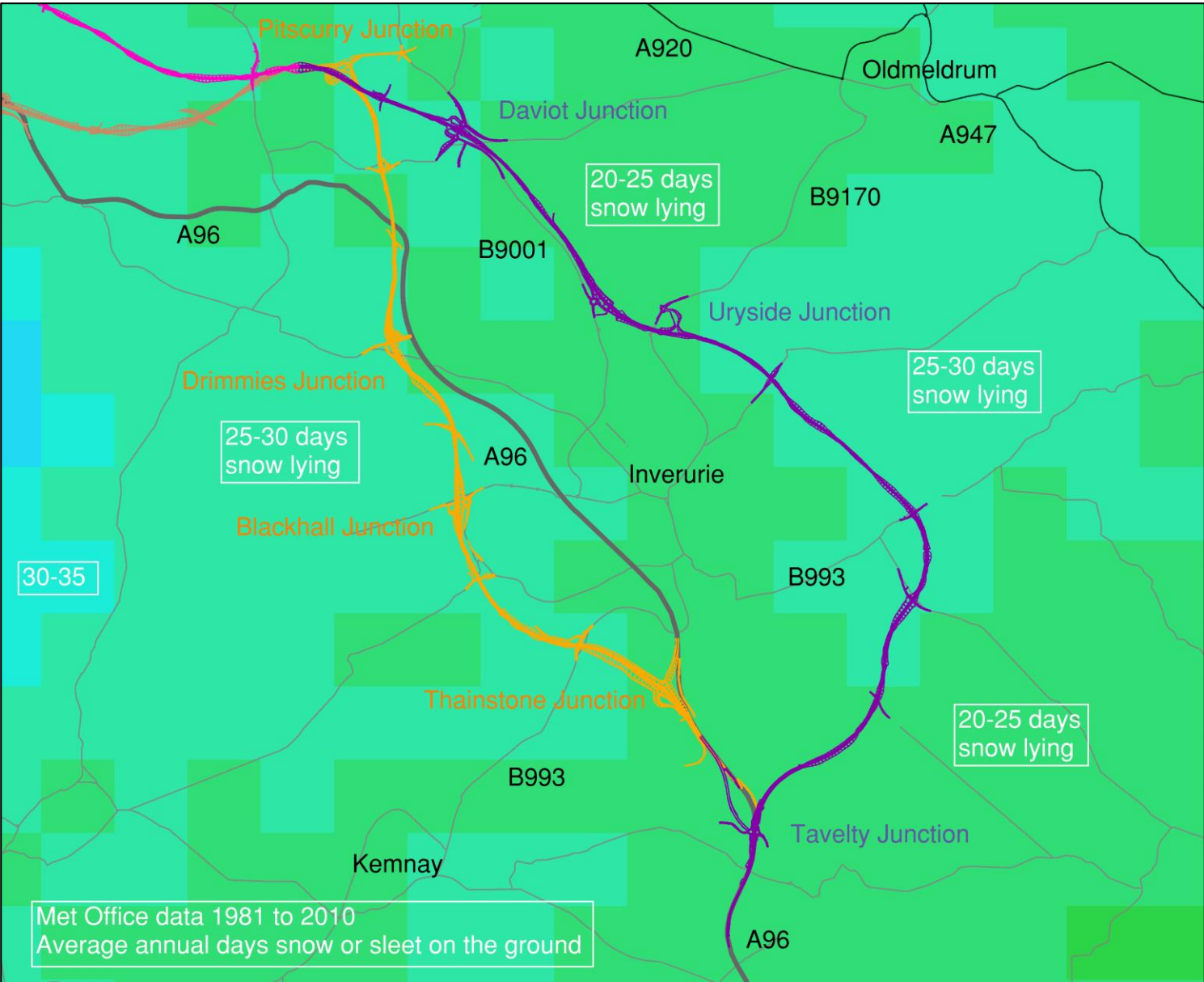
1. Online dualling of existing A96 at Inverurie
2. Increased local road traffic
3. Proximity to community facilities
4. Traffic congestion – Inverurie
5. Flood risk
6. Junction locations

Construction & Maintenance – Key Issues



Resilience

- Winter resilience
- Network resilience
- Climate change resilience

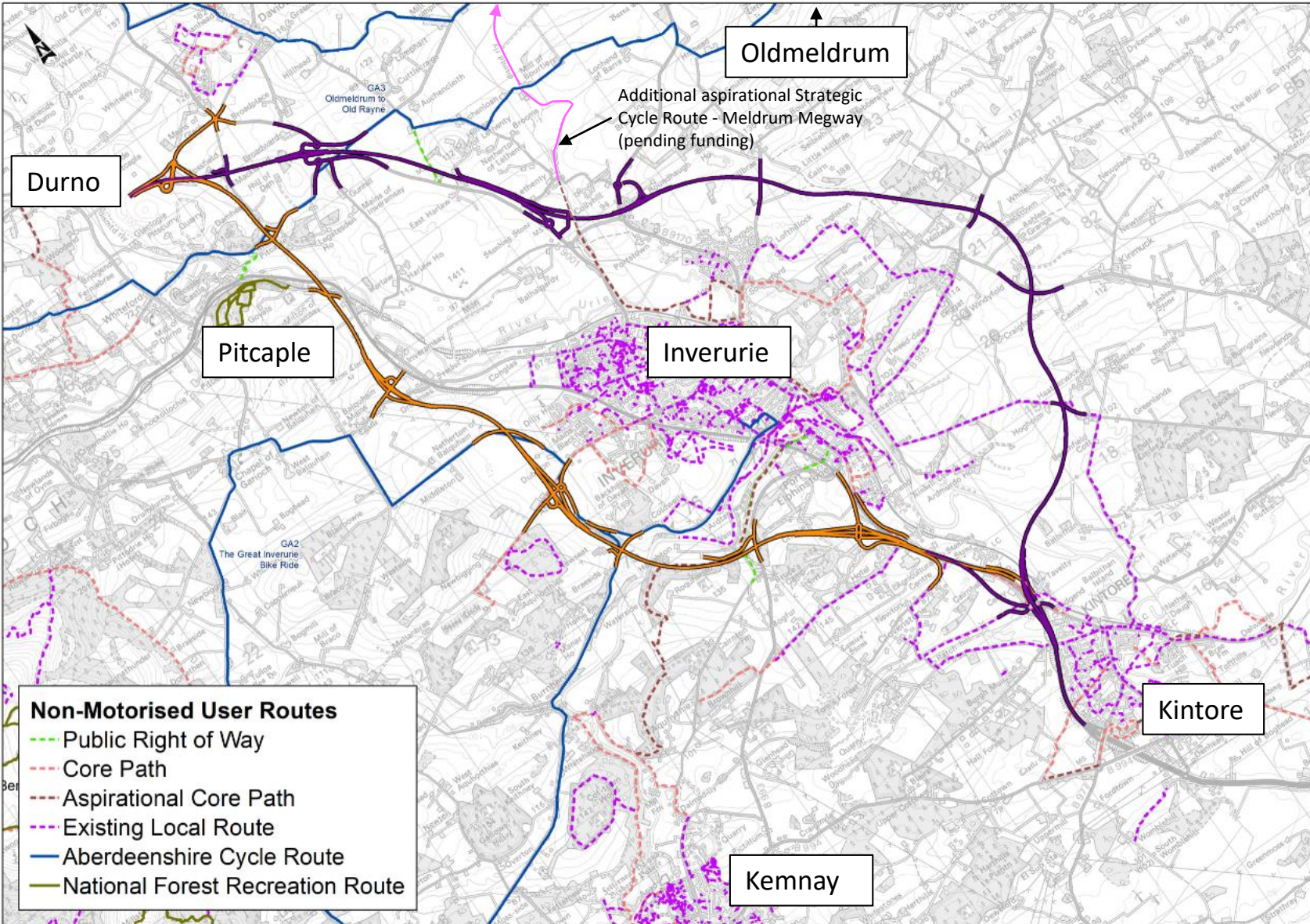


Promotability



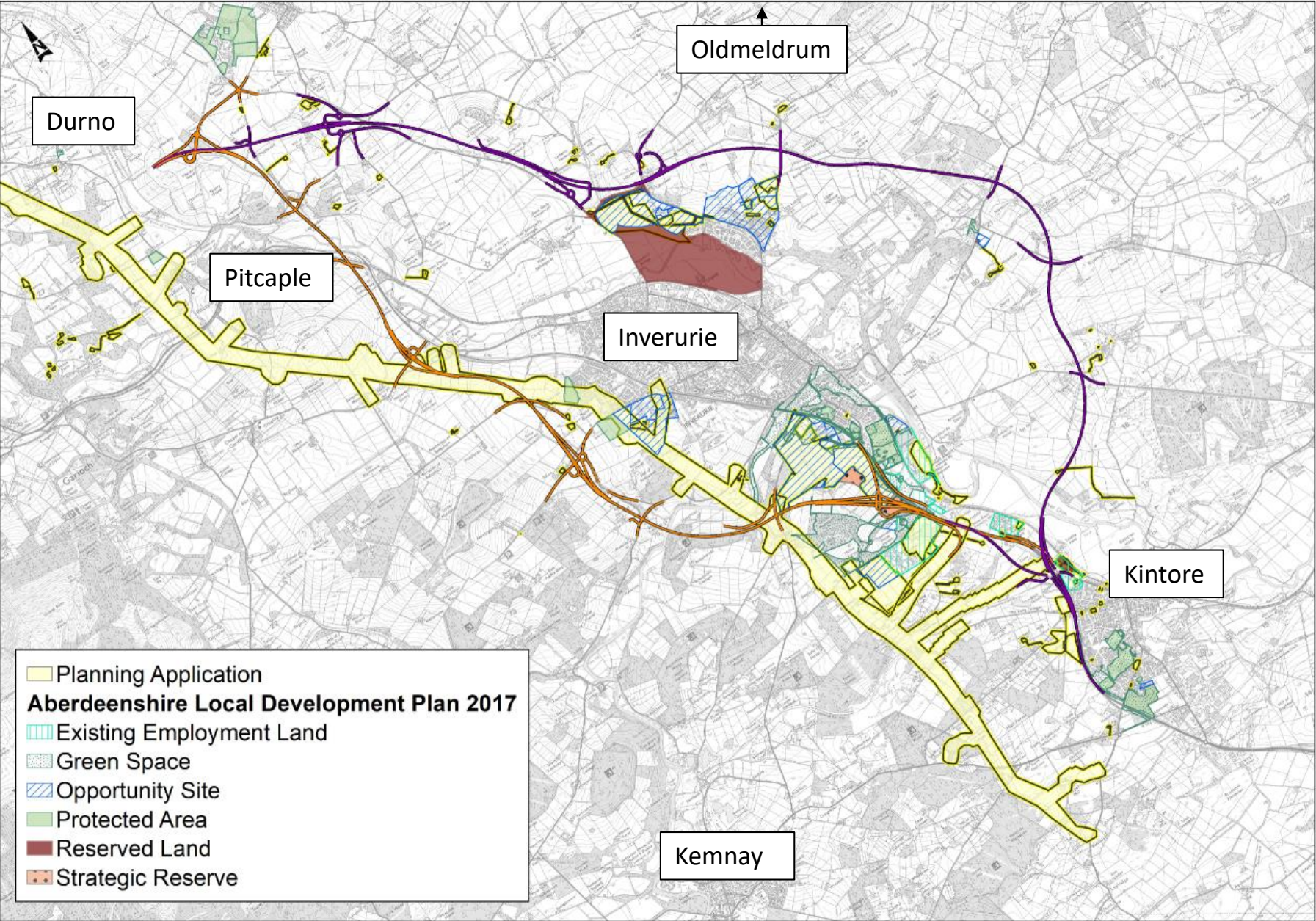
- Violet & Orange route options - Low to medium risk to promotability
- Orange - adverse residual effects on the setting of four Scheduled Monuments. Major adverse effects on the setting of two Scheduled Monuments (St Apolinaris Chapel and Burial Ground and Mains of Balquhain Stone Circle) however positive/regular dialogue with HES indicates adverse effects can be mitigated by sensitive design at Stage 3
- Violet - adverse residual effects on the setting of one Scheduled Monument, one Category A Listed Building, and one inventory GDL
- Violet - SEPA consent for crossing of an extensive floodplain on River Don
- Orange - SEPA consent for crossing of floodplain on River Urie
- Orange - impact on proposed masterplan at Crichton Development, however positive discussions with Aberdeenshire Council indicate that GSJ may facilitate the development
- Violet & Orange - adverse residual effects on Pitscurry Moss LNCS

Accessibility 1 & 2 – NMU Opportunities



- Several existing NMU routes and opportunities to connect Oldmeldrum, Durno, Whiteford & Pitcaple, Daviot, Inverurie, Port Elphinstone, Kemnay and Kintore
- Additional aspirational strategic routes between Inverurie, Kemnay, Kintore and Oldmeldrum identified in Integrated Travel Town masterplan
- Violet affects five NMU routes and Orange affects nine, however Orange offers more opportunity to connect routes.
- There are also further opportunities to provide better NMU access between existing communities and local destinations

Integration 3



- Integration with existing LDP sites
- Integration with existing planning applications including SSE overhead power line replacement



Sectional Assessment: Pitcapple to Kintore (Violet & Orange Route Options)

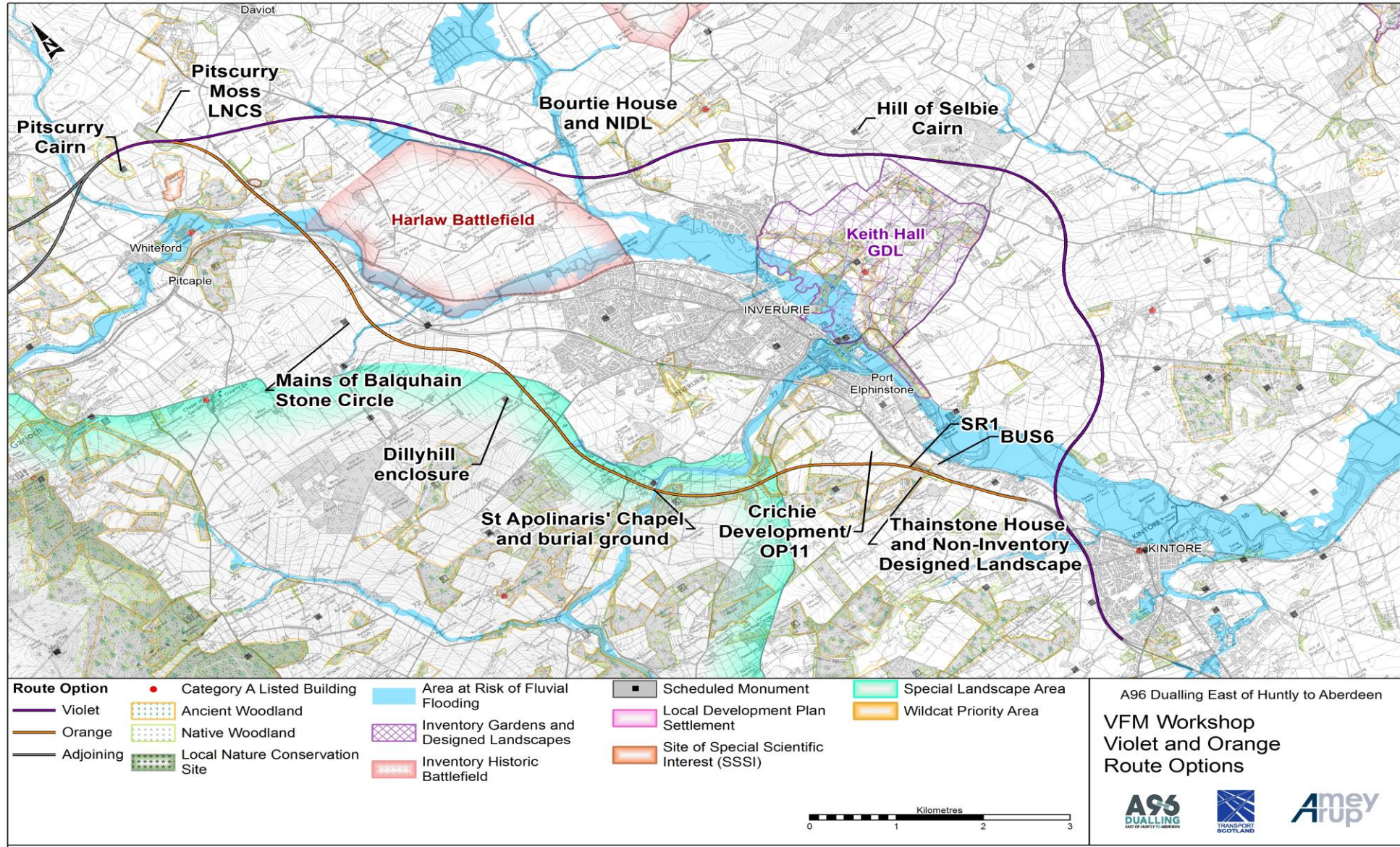
Utility Score:
Accessibility (Part), Integration (Part) and Others



Questions



Environment – Key Issues



Topic	Weighting
Road Drainage & Water Environment	2
Landscape	2
Cultural Heritage	2
Climate	2
Nature Conservation	1.5
Policies & Plans	1.5
Visual Effects	1.5
People & Communities	1.5
Agriculture, Forestry & Sporting Interests	1.5
Geology, Soils, Contam'd Land & Groundwater	1
Noise & Vibration	1
Human Health	1
Materials	1
Air Quality	0.5

Environment – Key Issues 1 of 2

Topic	Weighting	Key Issue
Road Drainage and Water Environment	2	New crossings of extensive floodplain (River Don on Violet route option, River Don and Urie on Orange route option).
Landscape	2	Violet route option has adverse impacts on the landscape character, notably to the south of Daviot and Bourtie House, and the policy woodland of Keith Hall.
Cultural Heritage	2	Orange route option impacts on the settings of six Scheduled Monuments, Violet route option has adverse impacts on the setting of one Scheduled Monument, one Category A Listed Building, one Non-Inventory Designed Landscape.
Climate	2	End-to-end options with a Violet route option have higher aggregated emissions for the 60-year study period.
Nature Conservation	1.5	On Orange route option 60% of the Pitscurry Moss LNCS site would be lost to the scheme, and loss of ancient woodland of long established plantation origin and associated protected species.
Policies and Plans	1.5	Orange route option will occupy 13.3% of the Crichton development site, an application granted in principle for 737 units with associated business, industrial and community use.
Visual Effects	1.5	Violet route option has a higher number of visual receptors and is within more long range views, with less potential for screening.

Environment – Key Issues 2 of 2

Topic	Weighting	Key Issue
People and Communities	1.5	Violet route option adverse impacts amenity and journey times on five Non-Motorised User routes; loss of land from three properties and loss of land from four community facilities.
Agriculture, Forestry and Sporting Interests	1.5	Violet route option has adverse impacts on 21 farm units, and 29% of the landtake is Prime Agricultural Land, compared with 9 and 10% on Orange route option.
Geology, Soils, Contaminated Land and Groundwater	1	Violet route option has moderate risk to human health as the scheme could encounter historic landfills, and has a large number of ground water abstraction points on (498).
Noise and Vibration	1	End-to-end options with a Violet route option have more adverse impacts for receptors.
Human Health	1	Orange route option has the lowest ranking data zones for deprivation, in addition to impacts on open space, core paths, and existing local routes.
Materials	1	The Orange route option requires fill material of 1,040,000m ³ , and the Violet route option requires fill material of 1,660,000m ³
Air Quality	0.5	There are more receptors predicted to experience changes (beneficial and adverse) within 200m of the ARN associated with the Orange route option than Violet.



Sectional Assessment: Pitcapple to Kintore (Violet & Orange Route Options)

Utility Score: Environment

Questions





Break



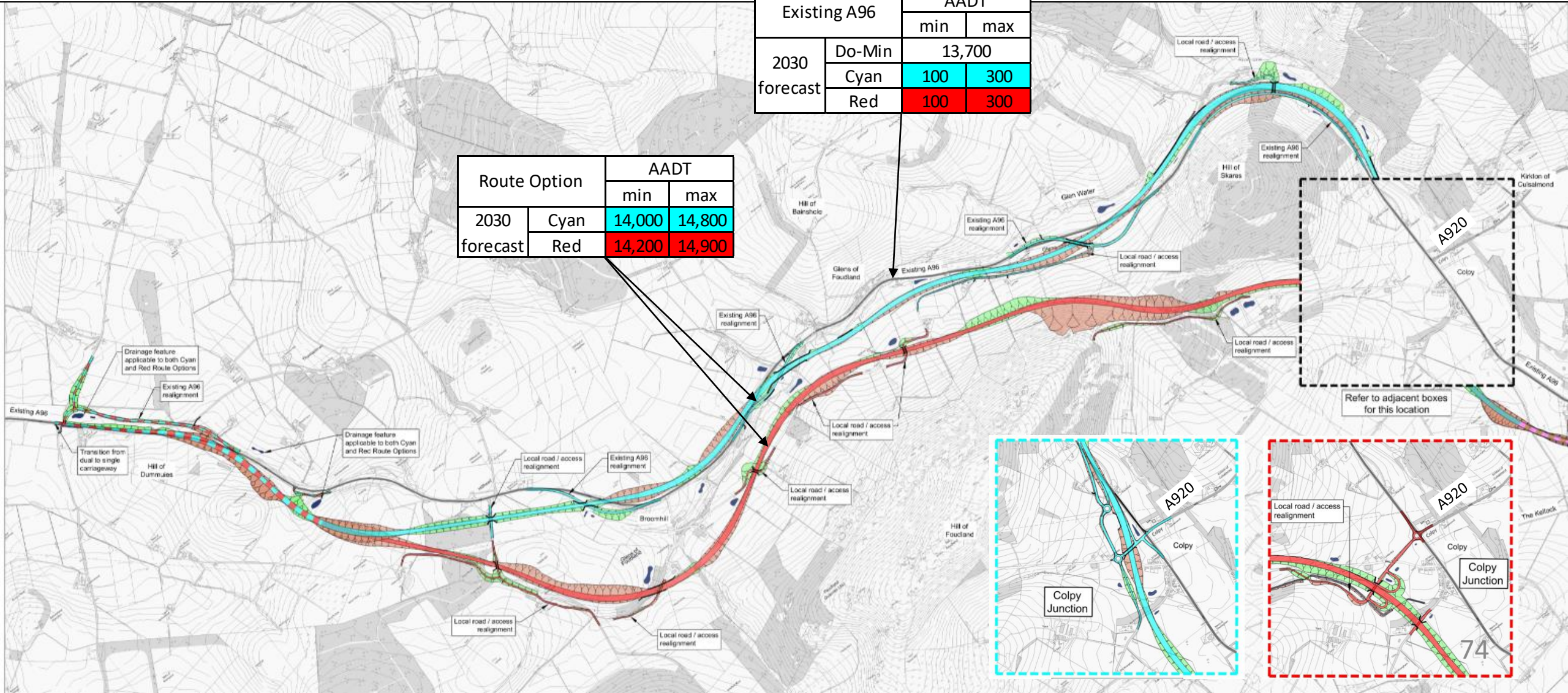
Session 4 – End-to-End Assessment & Conclusions

End-to-End Traffic Ranges (Sheet 1 of 3)

East of Huntly to Colpy: Cyan & Red

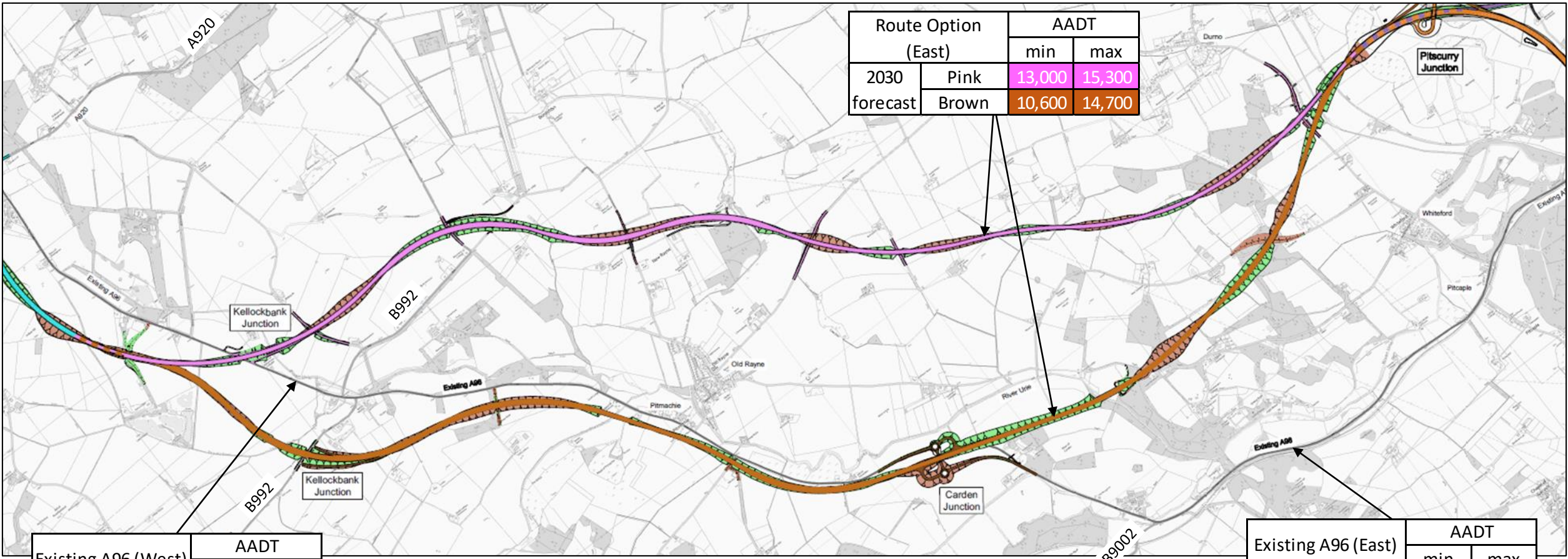
Existing A96		AADT	
		min	max
2030 forecast	Do-Min	13,700	
	Cyan	100	300
	Red	100	300

Route Option		AADT	
		min	max
2030 forecast	Cyan	14,000	14,800
	Red	14,200	14,900



End-to-End Traffic Ranges (Sheet 2 of 3)

Colpy to Pitcapple: Pink & Brown



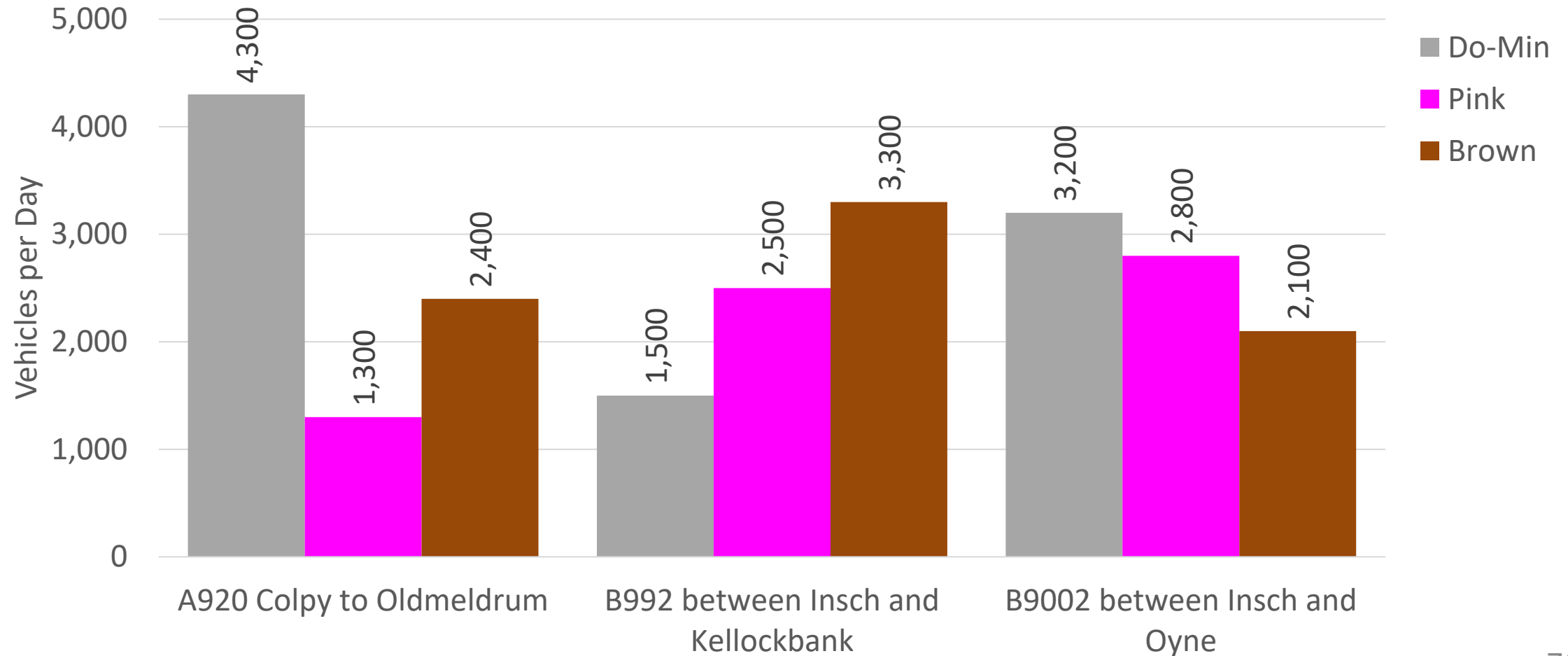
Route Option (East)		AADT	
		min	max
2030 forecast	Pink	13,000	15,300
	Brown	10,600	14,700

Existing A96 (West)		AADT	
		min	max
2030 forecast	Do-Min	10,400	
	Pink	1,700	2,300
	Brown	1,300	1,400

Existing A96 (East)		AADT	
		min	max
2030 forecast	Do-Min	13,100	
	Pink	2,900	4,200
	Brown	2,300	5,200

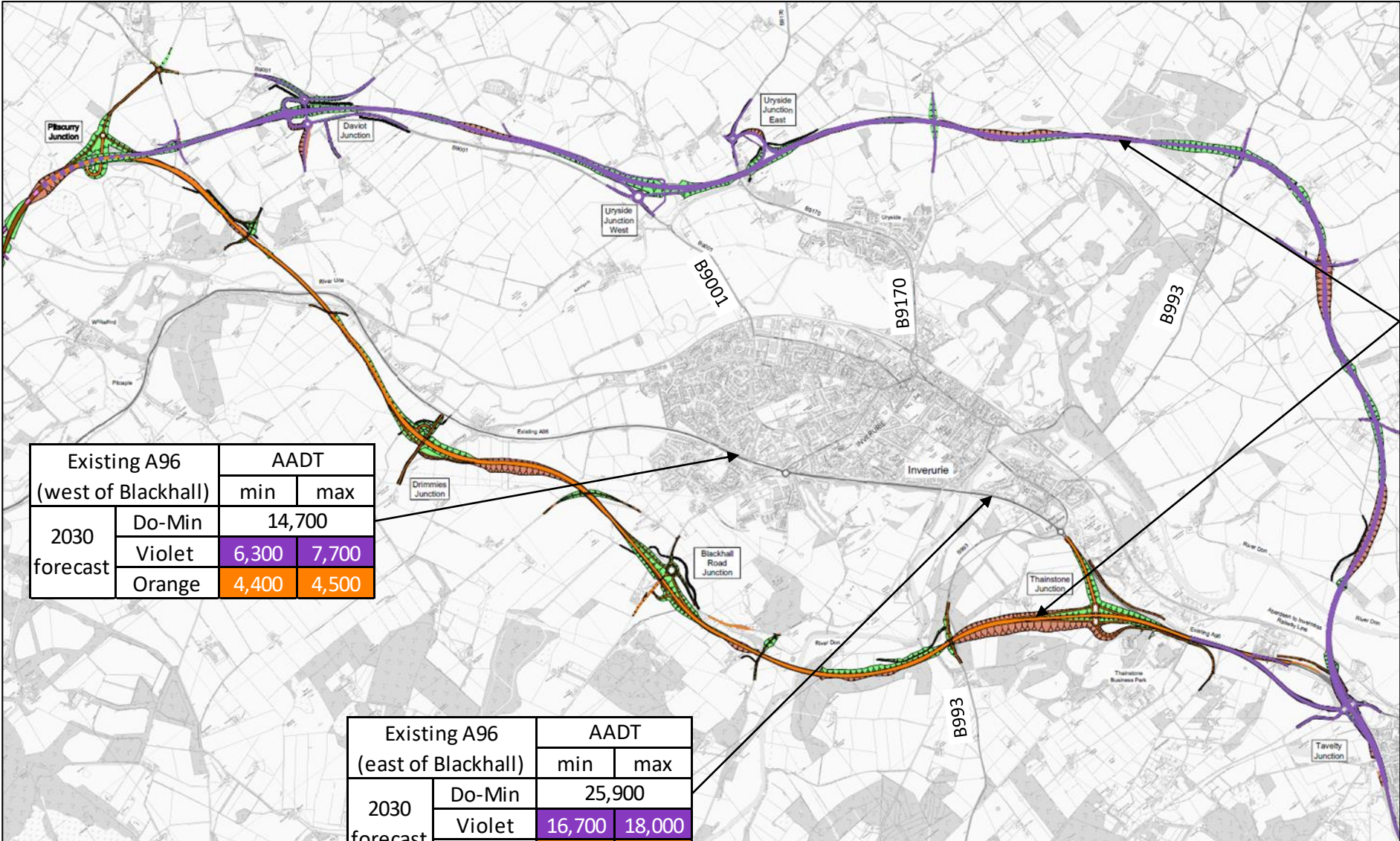
Traffic on Local Roads - Colpy to Pitcapple

2030 Maximum AADT on Local Roads



End-to-End Traffic Ranges (Sheet 3 of 3)

Pitcable to Kintore: Violet & Orange



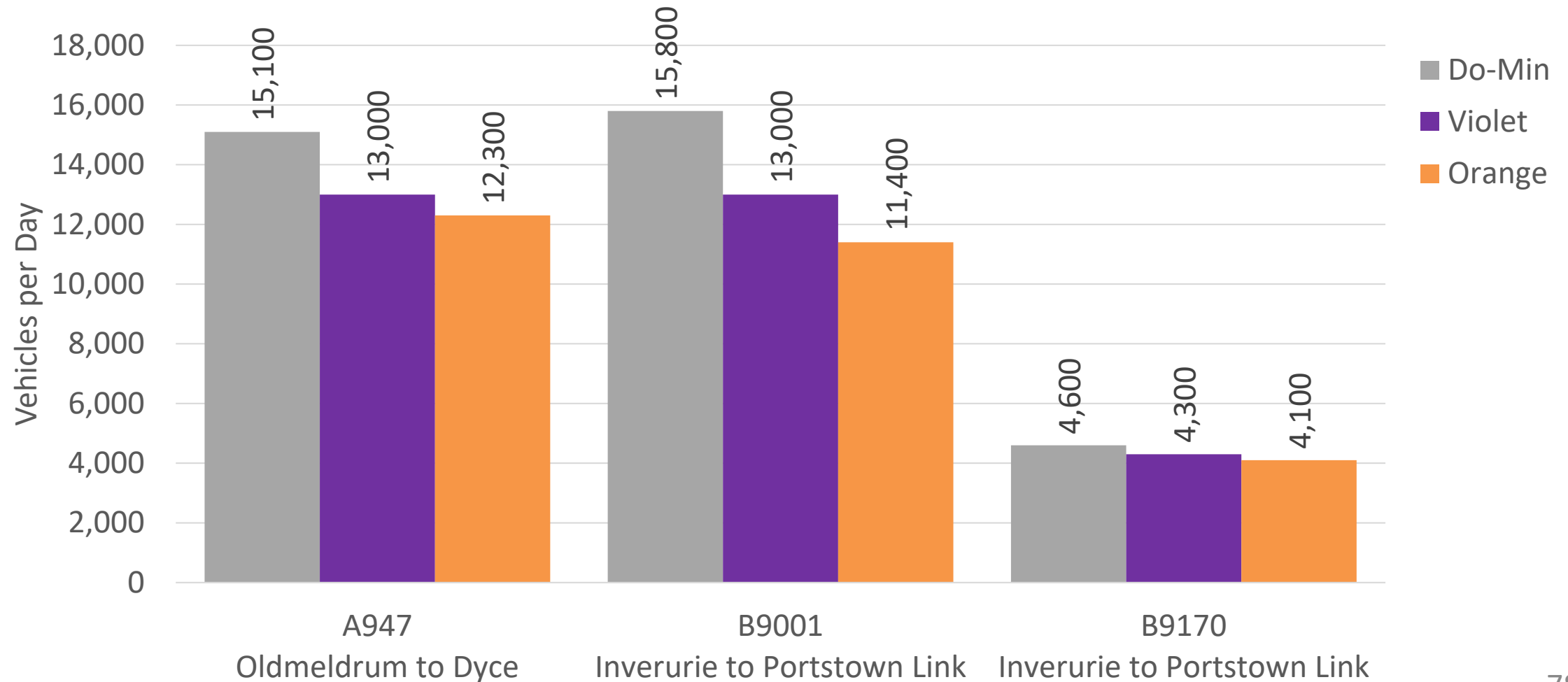
Existing A96 (west of Blackhall)		AADT	
		min	max
2030 forecast	Do-Min	14,700	
	Violet	6,300	7,700
	Orange	4,400	4,500

Existing A96 (east of Blackhall)		AADT	
		min	max
2030 forecast	Do-Min	25,900	
	Violet	16,700	18,000
	Orange	14,200	14,200

Route Option		AADT	
		min	max
2030 forecast	Violet	13,500	15,400
	Orange	18,000	18,500

Traffic on Local Roads – Pitcapple to Kintore

2030 Maximum AADT on Local Roads



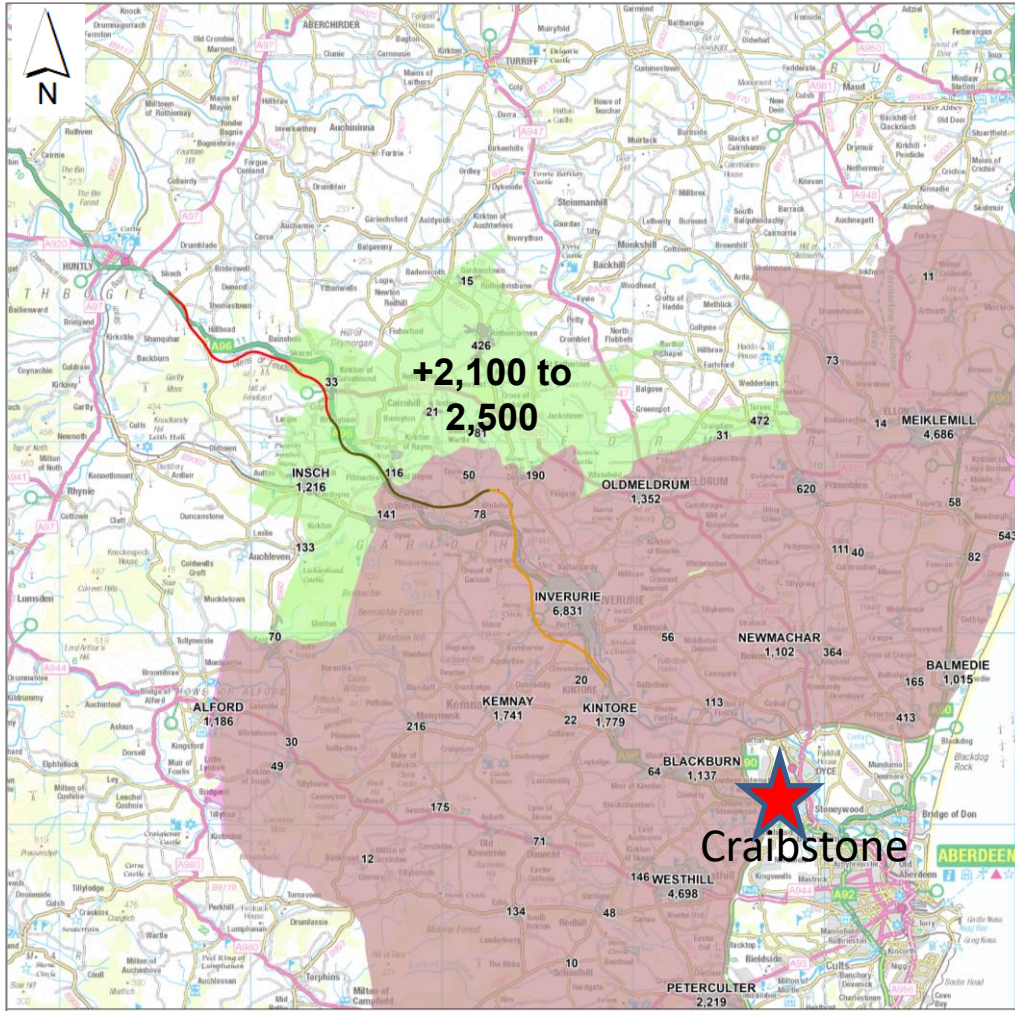
Economy 1 – to improve the operation of the A96 and inter-urban connectivity



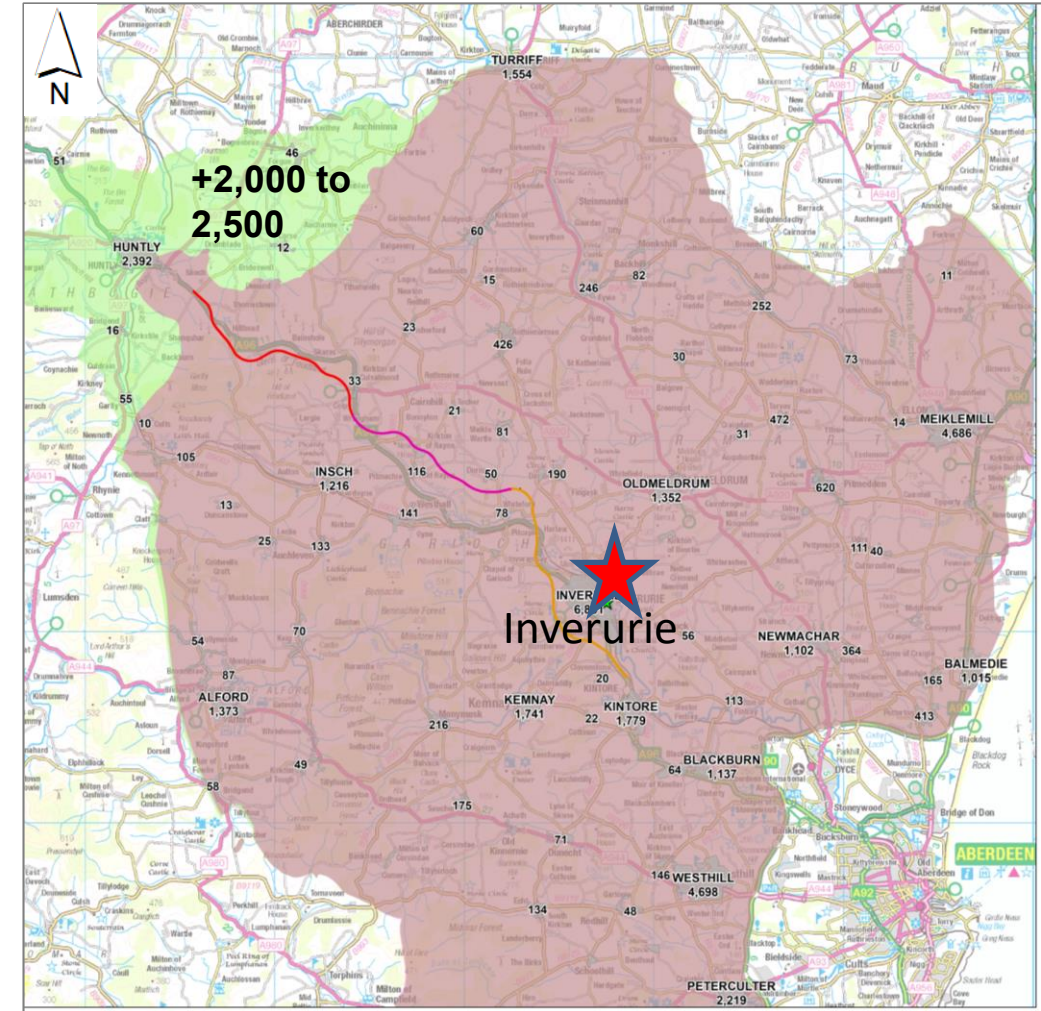
Metric	Range of results for the eight end-to-end options
A96 Peak hour journey times (mm:ss)	Reduction of 12:40-14:50
A96 peak hour HGV journey times (mm:ss)	Reduction of 10:00-13:30
Increased overtaking opportunities (average volume of traffic, AADT, using the new dual-carriageway)	10,400vpd - 15,100vpd
Reduced conflict between strategic and local journeys (average trip distance measured at locations on the existing A96)	Reduced by 34% - 49%
Journey time reliability	All options reduce the difference between peak and interpeak journey times from a do-minimum of 9 minutes to less than 1 minute

Economy 2 – to provide opportunities to grow the regional economy on the corridor

SO3.1 – Households within 30mins of Craibstone
 Do-Min Additional Households



SO3.2 – Households within 30 mins of Inverurie
 Do-Min Additional Households



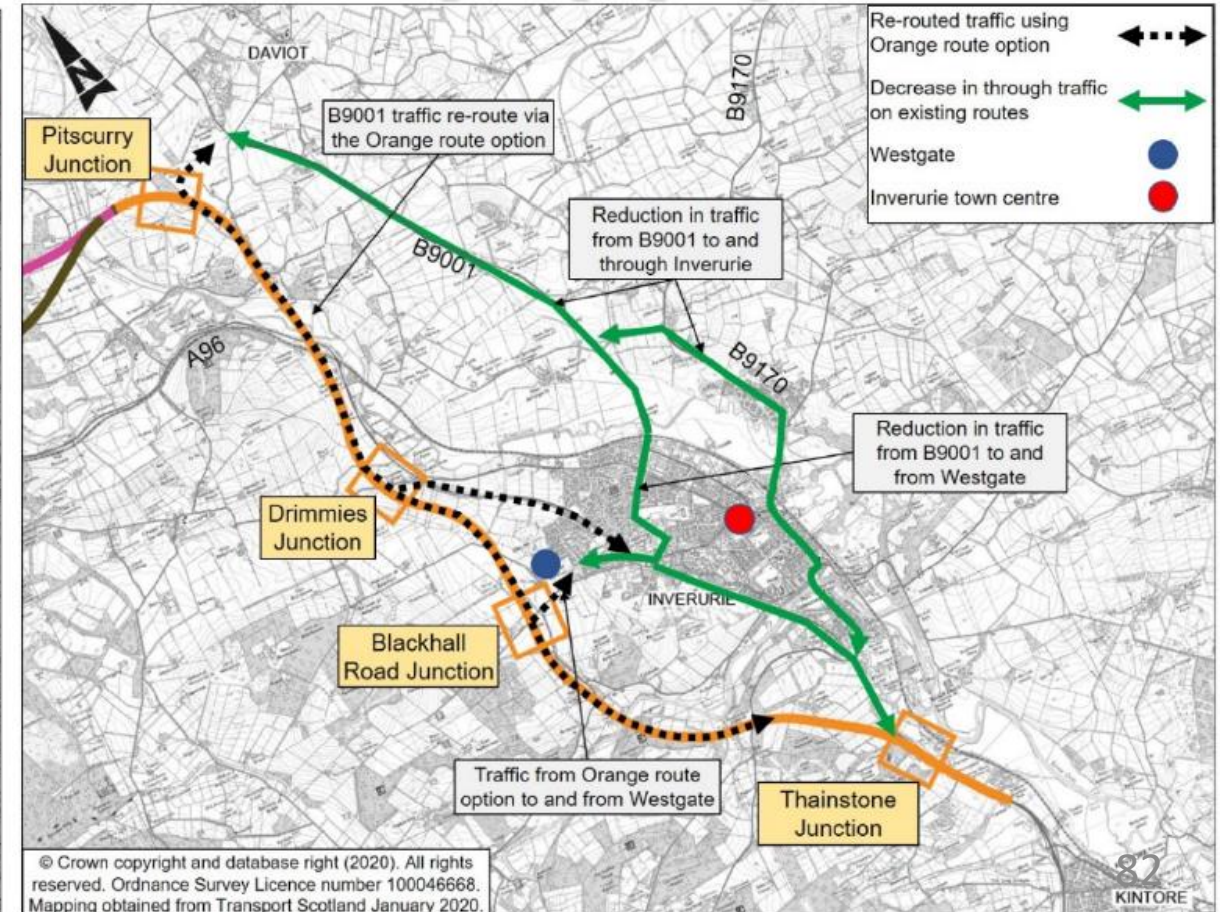
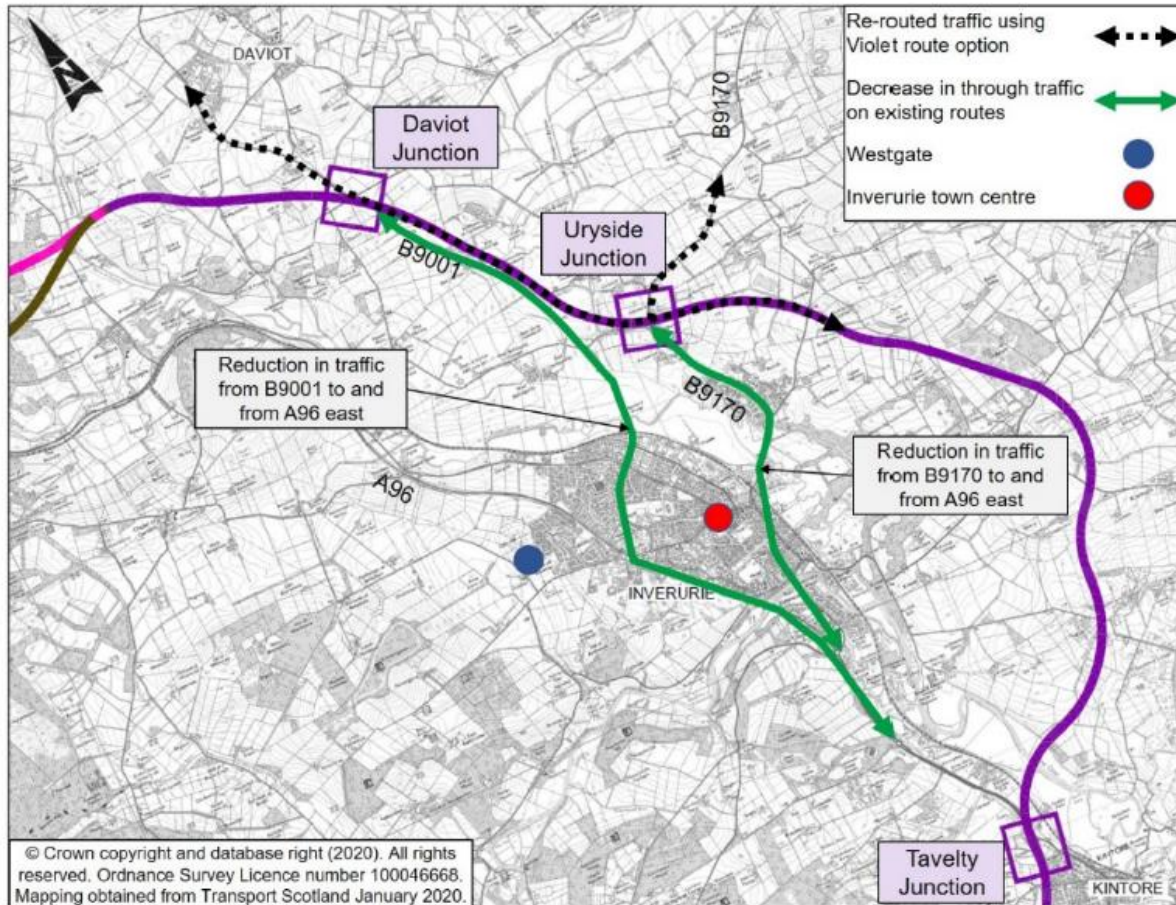
Safety - to improve safety for motorised and non-motorised users



Metric	Range of results for the eight end-to-end options
Accidents within the scheme's area of influenced (COBALT software)	Reduction of 13 - 18 Personal Injury Accidents per year
Reduction in potential conflicts between motorised and non-motorised users (traffic in and out of towns and villages, weighted by population)	Reduction of 3,500vpd - 4,500vpd

Safety & Accessibility – Reduction of traffic in urban areas

- The green lines show routes through Inverurie where traffic is reduced by the end-to-end options. Inverurie is the largest town between Huntly and Aberdeen and a key hub for nearby towns and villages.



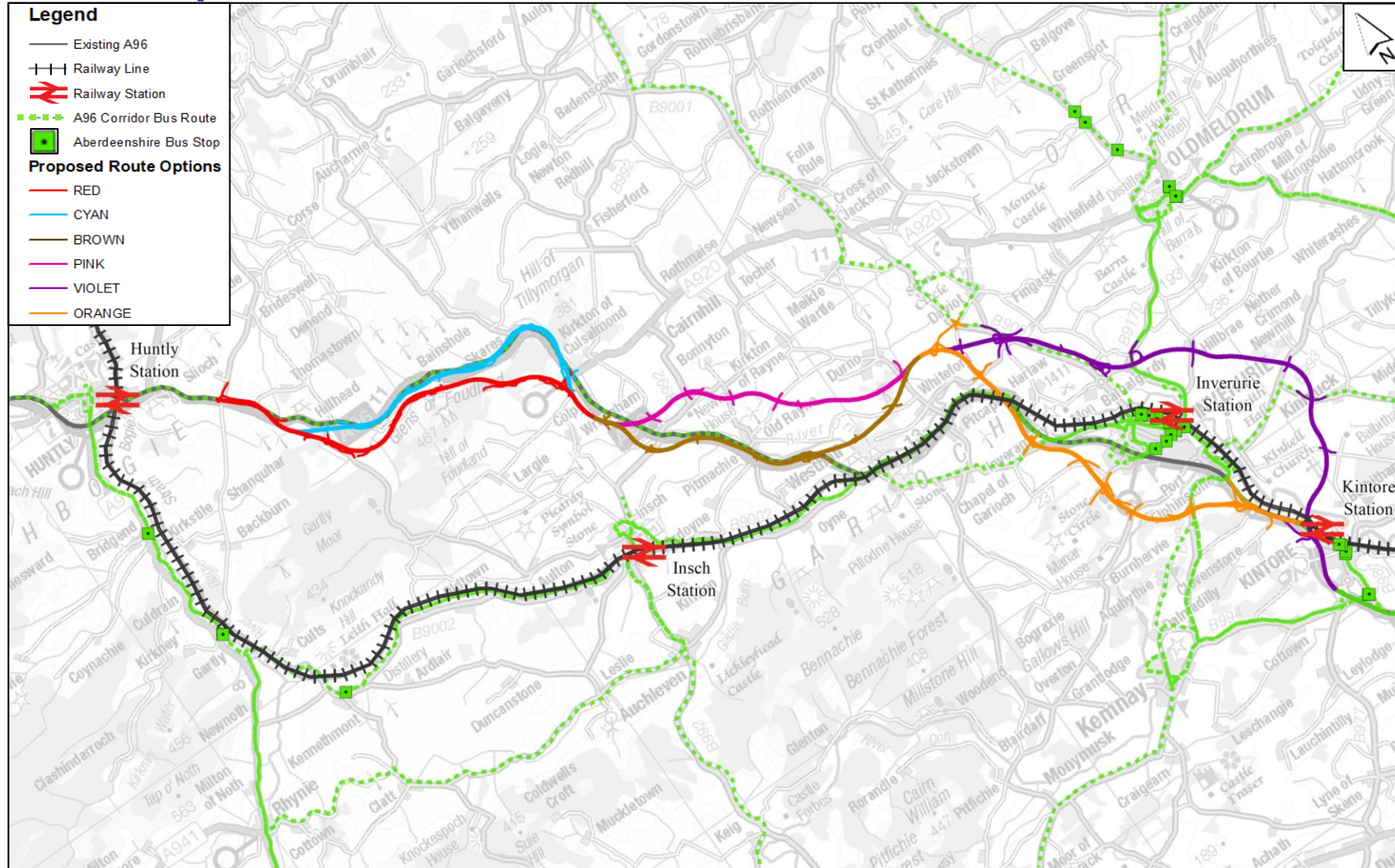
Accessibility 3 - to facilitate active travel in the corridor



Metric	Range of results for the eight end-to-end options
Reduction of traffic in urban areas, where local services and facilities are located (measured by distance travelled by all traffic in urban areas)	Reduction of 14,300 - 16,400 vehicle kilometres

- Accessibility includes the ability to use active methods of travel to access local services and facilities such as shops, council offices, post offices, leisure/sports centres and schools
- Opportunities for new NMU routes and impacts on existing NMU facilities are covered in the sectional assessments

Integration 1 - to facilitate integration with public transport facilities



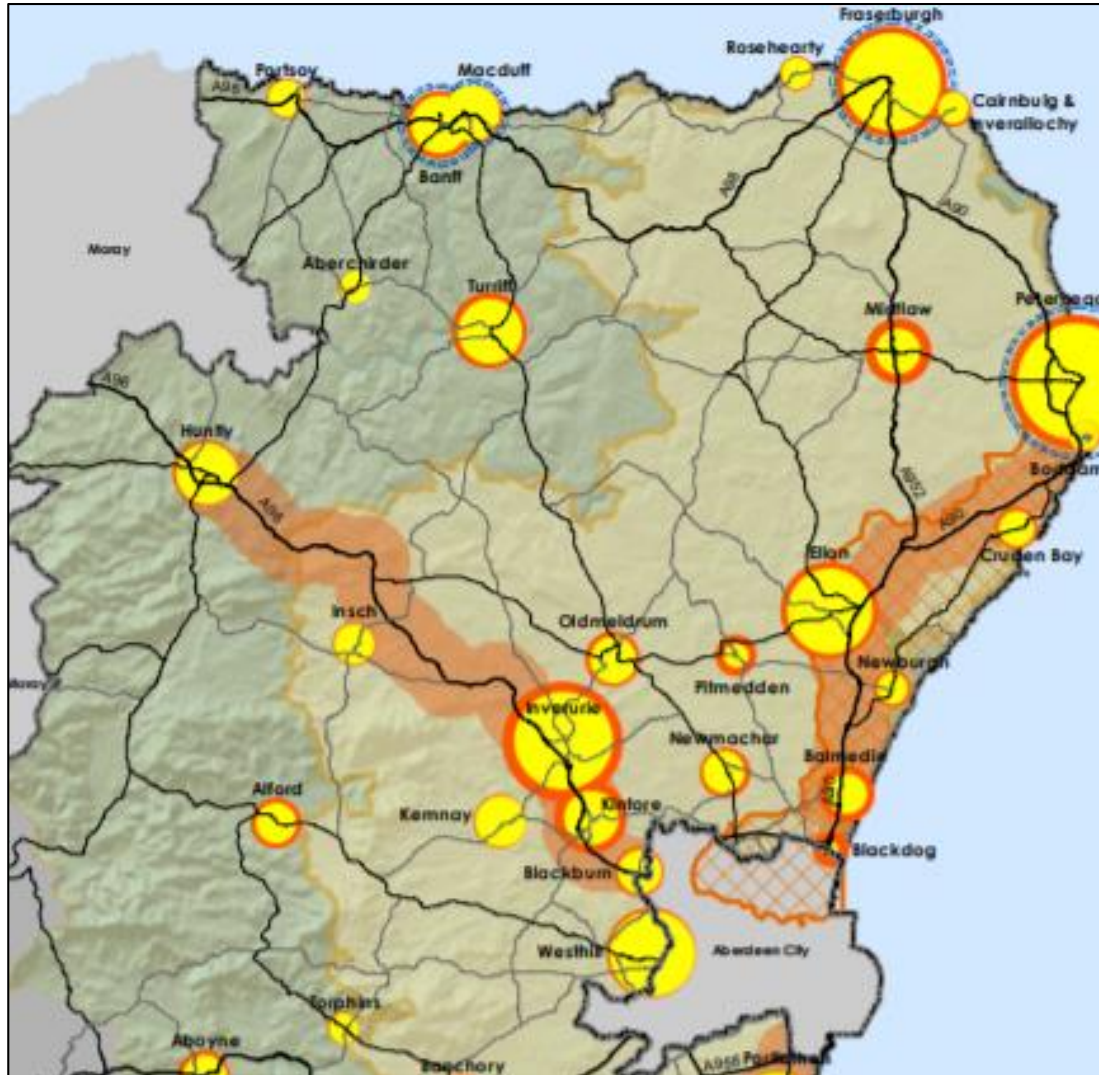
Integration with buses

- Average reduction in bus journey times of 2:30 - 3:10 mins per bus

Integration with rail

- All end-to-end options provide access to Huntly, Inverurie and Kintore railway stations
- Violet route option offers slightly better integration with Inverurie railway station

Integration 2 - to facilitate integration with plans and policies:



- All end-to-end options support Aberdeenshire Council’s LDP which designates the A96 between Huntly and Aberdeen as a strategic growth corridor
- All end-to-end options offer significantly improved commuter journey times between Huntly and Aberdeen
- Options containing Brown offer slightly more direct access to the LDP allocations at Inch
- Options containing Violet offer more direct access to LDP allocations at Portstown, Uryside & Oldmeldrum
- Options containing Orange offer more direct access to the LDP allocations at Westgate and Crichtie

Spatial Strategy

- Number of Existing Homes
- Number of New Homes
- ⊙ Regeneration Priority Areas
- ▨ Energetica
- Strategic Growth Area
- Accessible Rural Area
- Remote Rural Area

Source:

*Aberdeenshire Council – April 2020
Proposed Local Development Plan*

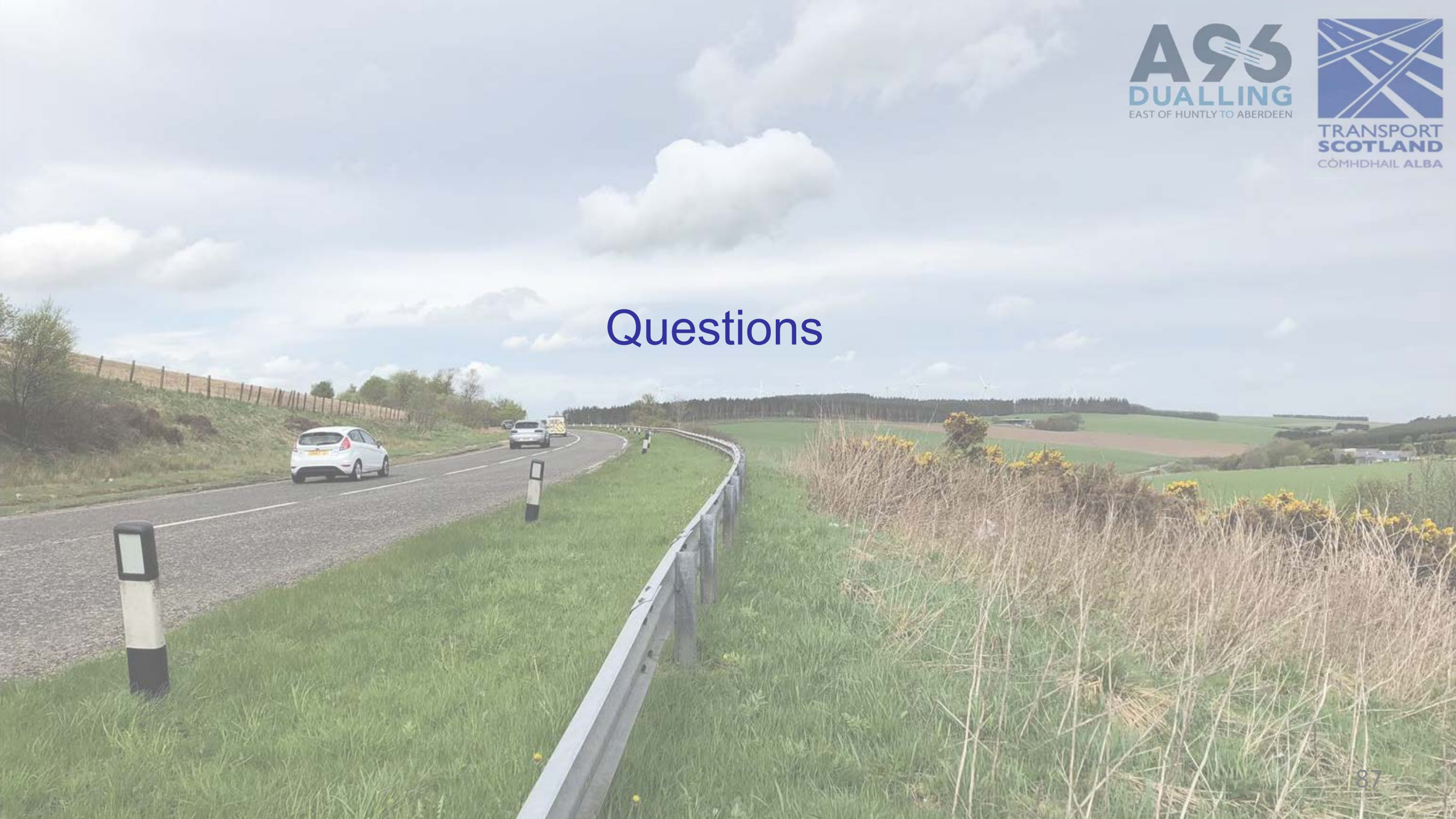


End-to-End Assessment

Utility Score:

Economy, Accessibility (Part), Integration (Part)

Questions



Cost Estimates & Risks

Utility Score

Cost

Value Index

Indexed BCR

Present Value of Benefits (PVB)

Net Present Value (NPV)



End-to-end Option	Capital Cost Including Risk (2018)
Cyan-Pink-Violet	£890m
Cyan-Pink-Orange	£899m
Cyan-Brown-Violet	£943m
Cyan-Brown-Orange	£933m
Red-Pink-Violet	£960m
Red-Pink-Orange	£970m
Red-Brown-Violet	£993m
Red-Brown-Orange	£1,003m

Economic Benefits



End-to-end Option	Total benefits 2010 values and prices
Cyan-Pink-Violet	£274m
Cyan-Pink-Orange	£350m
Cyan-Brown-Violet	£250m
Cyan-Brown-Orange	£328m
Red-Pink-Violet	£297m
Red-Pink-Orange	£370m
Red-Brown-Violet	£273m
Red-Brown-Orange	£354m

Conclusions

Best performing end-to-end combination



				A96 Utility Score Weighted	A96 Utility Score Weighted Rank	Combined cost including risk (£m)	Combined Cost Rank	A96 Value Index	Value Index Rank	Benefit / Cost ratio (BCR) Indexed	BCR Rank	Present Value of Benefits (PVB, £m)	PVB Rank	Net Present Value (NPV, £m)	NPV Rank	6 Criteria Overall Score	Overall Rank
				a	b	c	d	e = a/d	f	g	h	i	j	k	l	b+d+f+h+j	
Cyan	Pink	Violet	C-P-V														
Cyan	Pink	Orange	C-P-O														
Cyan	Brown	Violet	C-Br-V														
Cyan	Brown	Orange	C-Br-O														
Red	Pink	Violet	R-P-V														
Red	Pink	Orange	R-P-O														
Red	Brown	Violet	R-Br-V														
Red	Brown	Orange	R-Br-O														

Ranking 1 (best performing) to 8 (lesser performing)

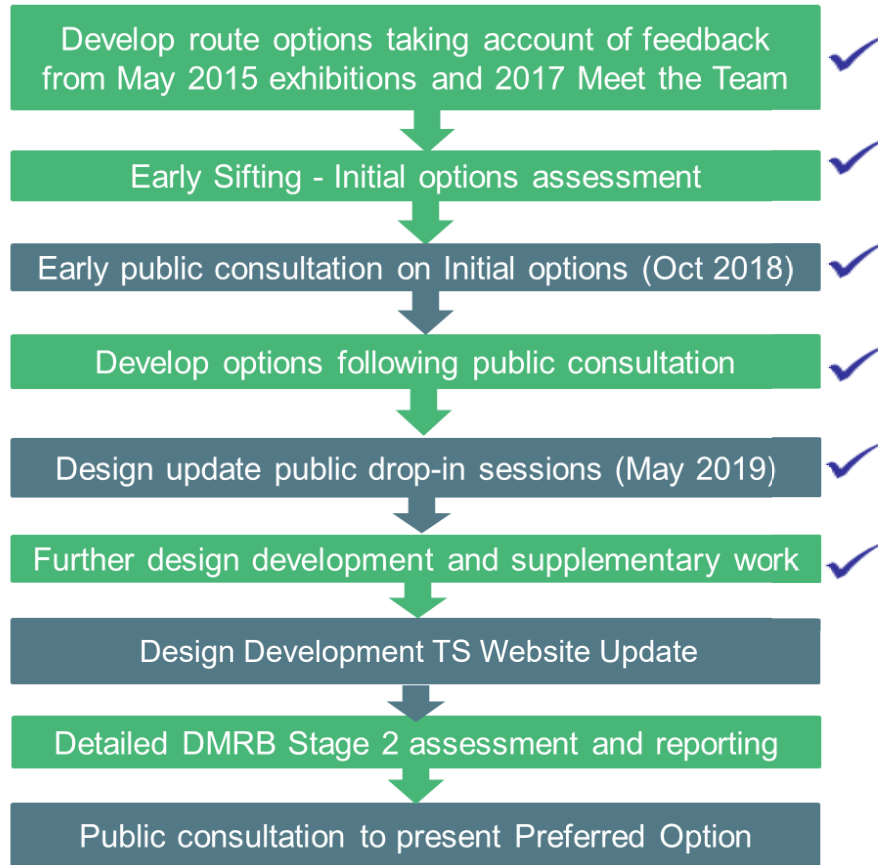
Sum of ranking (lowest is best)

Questions



Workshop Summary & Actions

Forward Programme for DMRB Stage 2



- Design Development TS Website Update – consideration of feedback
- Completion of Stage 2 Reporting
- Programme Board & Ministerial Approval
- Announcement of Preferred Option & Virtual Exhibition

Actions

Workshop Close
Thank You
Stay Safe



**TRANSPORT
SCOTLAND**

CÒMHDHAIL ALBA

A96

DUALLING

EAST OF HUNTLY TO ABERDEEN

**[transport.gov.scot/projects/
a96-dualling-inverness-to-aberdeen/
a96-east-of-huntly-to-aberdeen](https://transport.gov.scot/projects/a96-dualling-inverness-to-aberdeen/a96-east-of-huntly-to-aberdeen)**