

## **47 Vehicle Travellers**

**This chapter assesses the impact on vehicle travellers in terms of view from the road and driver stress. The expected views for travellers during a journey along the Fastlink section of the proposed scheme are described and compared with those gained from the existing A90(T).**

**Almost half of the views from the Fastlink would be enclosed by mitigation planting, but elsewhere there would be a range of attractive, open, and rural views, across the rolling farmland, hills and woodland areas.**

**Driver stress is caused by frustration, fear of a potential accident and uncertainty of the route which is being followed. Current levels of driver stress for the existing road network during peak hours are generally Moderate or Low, except on the northbound A90(T) Portlethen to Charleston Junction, where stress is assessed as High. Driver stress over the majority of the existing road network in the vicinity of the Fastlink would reduce with the proposed scheme in place, with Low driver stress predicted for vehicle travellers on the Fastlink.**

### **47.1 Introduction**

- 47.1.1 This chapter presents an assessment of the impact on vehicle travellers in terms of view from the road and driver stress for the Fastlink of the proposed scheme.
- 47.1.2 View from the road is defined as the extent to which vehicle travellers are exposed to different types of scenery through which the proposed scheme passes. The existence of a new road might enable more people to view the landscape than previously. In areas of high quality scenic landscape, the road may allow travellers to appreciate the area and their location in relation to distinctive landscape features, by allowing appropriate views. Views out from a new road or section of a road may potentially help to alleviate driver stress although views are not considered in driver stress assessment. Conversely, where views from a road are restricted by the topography of a new construction, this may cause frustration or contribute to driver boredom.
- 47.1.3 Driver stress is defined, for the purpose of the assessment, as the mental and physiological effects experienced by a driver using a road network. Factors influencing the level of driver stress include the road layout and geometry, surface riding characteristics, junction frequency and the speed and flow per lane. In general, drivers will choose the route that they believe to give the shortest reliable journey time, taking account of expected variability and coping with associated stress.
- 47.1.4 The three main components of driver stress are frustration, fear of a potential accident, and uncertainty of the route which is being followed. These components are discussed in the following paragraphs.
- 47.1.5 Frustration is caused by a driver being unable to drive at a speed at which they wish, in relation to the conditions of the road. The level of frustration increases as the travelling speed falls in relation to expectations and may be caused by high flow levels, intersections, road works, or difficulties in overtaking slower moving traffic.
- 47.1.6 The main factors leading to fear are the presence of other vehicles, inadequate sight distances and the likelihood of pedestrians stepping on to the road. Other factors include complex junctions and roundabouts, and poorly maintained road surfaces. Fear is highest when speeds, flows and the proportion of heavy vehicles are all high.
- 47.1.7 Route uncertainty is caused primarily by signage that is inadequate for the individual's purposes. Good design and layout and/or signs should help eliminate this cause of stress for drivers. Poor lighting may also cause uncertainty as turnings and junctions may not be seen in advance.

## **47.2 Approach and Methods**

### **View from the Road**

- 47.2.1 Views from the road have been assessed in accordance with the DMRB (Volume 11, Section 3, Part 9, 1993).
- 47.2.2 The assessment takes into account the types of scenery or landscape character, the extent to which travellers would be able to view the scene, the quality of the landscape and features of particular interest or the prominence of the view.
- 47.2.3 The extent to which travellers will be able to perceive the landscape through which they are passing will vary with the relative level of the road and its surrounding topography and vegetation. The categories used in assessing this are:
- No view – road in very deep cutting or contained by earth bunds, environmental barriers or adjacent structures;
  - Restricted view – road in frequent cuttings, or with deep cuttings across slopes, with frequent environmental barriers or adjacent structures blocking the view;
  - Intermittent view – road generally at grade but with shallow cuttings, environmental barriers or structures at intervals; and
  - Open view – road generally at grade or on embankment with views extending over the wider landscape or only restricted by existing landscape features.

### **Driver Stress**

- 47.2.4 The available research evidence does not permit the use of finely graded assessments of Driver stress. Thus, driver stress has been assessed in accordance with DMRB Volume 11, Section 3, Part 9 Vehicle Travellers, June 1993 using the three point scale:
- High;
  - Moderate; and
  - Low.
- 47.2.5 This is based on estimating the average peak hourly flow per lane in 'flow units' and the average journey speed of the route. Flow units are calculated whereby a car or light van is equal to one unit and a commercial vehicle over 1.5 tonnes unladen or public service vehicle is equal to three flow units. Traffic speed is based on average journey speed.
- 47.2.6 The assessment has been carried out for the existing traffic conditions, using 2005 traffic flows, and for the Design year (2027). Tables 47.1 and 47.2 present the guidance provided by DMRB on the appropriate category of stress levels for varying flow, speed and standard of road for dual carriageway and single carriageway roads respectively. The categories only apply to those sections of road where traffic flows and speeds are known for over 1km of the route.

**Table 47.1 – Driver Stress Levels on Dual Carriageway Roads**

Average Peak Hourly Flow per Lane <sup>1</sup> (flow units/hour)	Average Journey speed km/hr		
	Under 60	60 – 80	Over 80
Under 1200	High <sup>2</sup>	Moderate	Low
1200 – 1600	High	Moderate	Moderate
Over 1600	High	High	High

**Table 47.2 – Driver Stress Levels on Single Carriageway Roads**

Average Peak Hourly Flow per Lane <sup>1</sup> (flow units/hour)	Average Journey speed km/hr		
	Under 50	50 – 70	Over 70
Under 600	High <sup>2</sup>	Moderate	Low
600 – 800	High	Moderate	Moderate
Over 800	High	High	High

1 A car or light van equals one flow unit. A commercial vehicle over 1.5 tonnes' unladen weight or a public service vehicle equals 3 flow units.

2 "Moderate" in urban areas

- 47.2.7 The guidance states that for new or improved routes, designed in accordance with the Scottish Executive's current standards, the appropriate stress category will normally be 'moderate' or 'low'. In the assessment of stress on existing roads, the level of stress is based primarily on traffic flows and speeds.
- 47.2.8 Traffic forecasting data and existing speeds and flow rates, used as the basis for the numerical analysis of driver stress were provided by MVA.
- 47.2.9 In accordance with the guidance in DMRB, the assessment of driver stress is made for the highest traffic flow in the first 15 years after opening. This will be the Design Year (2027).

### **47.3 Baseline Conditions**

#### **View from the Road**

- 47.3.1 The Fastlink would offer an alternative route to the A90(T) for the journey from Stonehaven to the west of Aberdeen and beyond. As the proposed Fastlink is an entirely new construction, a detailed comparison of the baseline view from the road with the view from the proposed road has not been possible. However, a description of the views from the existing A90(T) journey from Stonehaven to Charleston and an overview of views from the existing road network which serves the area along the proposed scheme is provided below. A summary description of the landscape visible across the length of the proposed scheme can be found in Chapter 41 (Landscape).

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##### **Existing A90(T)**

- 47.3.2 As the A90(T) passes the northern edge of Stonehaven and crosses the Cowie Water, northbound traffic has views along the carriageway towards the North Sea, with views across the rural hillside to the north of the town as the road heads north. There are glimpsed views along the riparian valley around the Limpet Burn and along the Burn of Muchalls to the north of Stonehaven, but the views are generally of rolling farmland. The road follows the coast as it passes the Bridge of Muchalls with limited views across the hillside alongside to the road, before heading inland. The majority of views from the northbound carriageway are relatively open, across the rolling farmland adjacent to the road for the rest of the journey to Charleston, punctuated by occasional woodland areas and a number of small roadside settlements. A significant landmark in the journey occurs at Portlethen Junction, where there are substantial slip roads and an overbridge for the junction that provides access to the industrial estates at Badentoy and Portlethen.
- 47.3.3 For the southbound carriageway, the views are slightly more enclosed by the cuttings through the adjacent rolling farmland and by the larger settlements along the coast. The buildings and existing vegetation of Portlethen and Newtonhill provide significant obstruction to views to the east. The topography of the coastal strip obstructs views to the North Sea for much of the journey from Charleston to Stonehaven. Clear views to the North Sea are only available once the road passes Muchalls and moves closer to the coast, although cliffs generally obscure views of the waters edge. As the road crosses the Limpet Burn and begins to pass the Hill of Megray, travellers have views across Stonehaven Bay and Stonehaven, towards the war memorial on Black Hill.

##### **Other roads**

- 47.3.4 While the A90(T) provides the major transport link from Stonehaven to Aberdeen and through the city of Aberdeen itself, there are numerous other roads serving the rural areas to the south of the city. The busiest road is the B979, which runs from Stonehaven to Milltimber and is used as an unofficial bypass by many travellers, including heavy goods vehicles. There is a relatively high volume of traffic on the road all day, particularly during rush hour periods, which results in additional traffic passing through Stonehaven to join the southbound A90(T)
- 47.3.5 With the exception of the access road that runs to Badentoy Park industrial estate, all the other routes across the area are minor roads providing access to the scattered rural dwellings and small settlements. Several of the roads, such as that from Lairhillock to the south of Portlethen, are relatively busy for minor rural roads and appear to be used to avoid congestion in other areas.

##### **Driver Stress**

- 47.3.6 The current level of driver stress has been assessed for sections of the existing road network where traffic flows will change following construction of the scheme. In the assessment of driver stress, the highest peak level of traffic has been analysed for the am or pm peak.
- 47.3.7 The results, which are shown in Table 47.3, show that existing stress levels during peak hours are generally Moderate along the existing road network with Low stress on the southbound A90(T) Stonehaven to Newtonhill and High stress on the northbound A90(T) Portlethen to Charleston Junction.

**Table 47.3 – Driver Stress Levels on Existing Road Network in 2005**

Link Description	Direction	Road Class <sup>1</sup>	Average Peak Hourly Flow per Lane <sup>2</sup> (Flow Units/Hour)	Average Vehicle Speed (km/h)	Driver Stress
A90 (T) Stonehaven to Newtonhill	N/B	DC	1218	100	Moderate
	S/B		1119	100	Low
A90 (T) Newtonhill to Portlethen	N/B	DC	1462	100	Moderate
	S/B		1312	100	Moderate
A90 (T) Portlethen to Charleston Junction	N/B	DC	1904	89	High
	S/B		1594	96	Moderate
B979 Netherley Road	N/B	SC	351	53	Moderate
	S/B		339	53	Moderate

<sup>1</sup> Road Class: DC = Dual Carriageway, and SC = Single Carriageway.

<sup>2</sup> Derived Flow Units/Hour: A car or light vehicles equal one flow unit. A commercial vehicle or HGV over 1.5 tonnes' weight or a public service vehicle equals 3 flow units.

## 47.4 Potential Impacts

### View from the Road

47.4.1 Potential impacts are presented as views from the proposed scheme in Winter Year of Opening and are determined by the extent to which travellers will be able to perceive the landscape through which they are passing. They are essentially similar to the residual impacts, which are presented as views from proposed scheme in Summer 15 Years of Opening, before mitigation planting has become established. These views are addressed in section 47.6 and detailed in Table 47.6. Graphic representations are shown in Figures 47.1 a-f.

### Driver Stress

47.4.2 Potential impacts of the proposed scheme on driver stress are essentially similar to the residual impacts, which have been assessed by comparing stress levels on the road network for the Do Minimum option in 2027, with the stress levels on the road network with the proposed scheme in 2027 as addressed in section 47.6 and summarised in Table 47.7.

## 47.5 Mitigation

### View from the Road

47.5.1 Measures to mitigate potentially adverse impacts on the landscape will be incorporated into the scheme design. The main elements of the proposals are summarised below and details are provided in Chapter 41 (Landscape).

47.5.2 Mitigation measures designed to minimise adverse impacts on the view from the road and the potential for driver stress include the following:

- where possible, the established trees, woodland and drystone walls adjacent to the road will be protected to maintain the character of the landscape affected by proposals;
- planting proposals using broadleaved, mixed and scrub woodland, as well as occasional groups of feathered and lines of standard trees are proposed to create a diverse range of species along the route;
- planting on the slopes of deep cuttings and screening bunds will help to soften the sense of enclosure created by the earthworks;

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- new drystone walls will be built to mark realigned field boundaries in areas where they form an important part of the landscape character;
- the visual impact of noise barriers will be minimised by the use of mitigation planting where possible and earth bunds to reduce the height of the fencing element. Drystone walls are also proposed where possible to integrate the barrier with surrounding landscape elements;
- most of the verges will be seeded by species rich grassland and rock cuts will be soiled and seeded in niches with native grasses to enhance visual amenity from the carriageway;
- attenuation ponds required as part of the road drainage system and ecological ponds required to offset the habitat loss for local wildlife will be designed to look as natural as possible, with riparian and wetland planting around them to create new habitats and visual interest; and
- the earthworks required for the road will be graded out to tie smoothly into the surrounding landscape, and where possible, the land adjacent to the road will be regraded to allow for its return to agricultural use.

#### Future potential design of Focal Points/Gateways

47.5.3 Two locations along the proposed Fastlink route have been identified as having the potential for development as focal points and/or gateways. They present an opportunity to enhance the experience of vehicle travellers and mark the transition from one area to another:

- Stonehaven Junction (gateway to Stonehaven, start of Fastlink)
- Cleanhill Junction (focal point marking junction between Fastlink and Southern Leg)

#### **Driver Stress**

47.5.4 The proposed scheme will generally be designed to appropriate roads design standards in accordance with the DMRB and as such, further mitigation measures are not required. Where the design does not comply with the DMRB standards, departures from standards applications will be prepared and these will detail appropriate mitigation for these specific locations. A summary of measures employed to address potential impacts on vehicle travellers is included in Table 47.4.

47.5.5 Relief of frustration has been achieved via the design of the proposed scheme, so that under normal conditions the flow of traffic will be acceptable to most drivers and is anticipated to produce little frustration.

47.5.6 Relief of fear has been achieved through the design of sight distances that comply with the current standards giving a clear view of the carriageway ahead. The absence of pedestrians on the Fastlink will also remove a significant fear of accidents. Additionally, the provision of adequate lighting at the junctions of the proposed scheme will reduce fear in vehicle travellers. Current design standards do not require road lighting for the full length of the Fastlink.

47.5.7 Driver stress in terms of route uncertainty will be alleviated by the provision of signs designed in accordance with the appropriate standards.

**Table 47.4 – Summary of Measures Employed to Address Potential Impacts on Vehicle Travellers**

Type of Measure	Description
Prevent	None provided.
Reduce	Grading out of embankments and landscape work proposals to assimilate the proposed scheme into the rural landscape and enhance the sense of travelling through the landscape. Planting of mixed woodland to screen views of negative landscape elements. Planting and seeding to provide roadside interest. Flow of traffic along proposed road will be acceptable to drivers such that little frustration is envisaged. Sight distances along the proposed road will give a clear view of the carriageway ahead and adequate lighting will be provided at the scheme's junctions, removing most of the fear of accidents. Road signage will be of an appropriate standard to remove any uncertainty concerning the routes.
Remedy/Offset	None provided.
Enhance	None provided.

## 47.6 Residual Impacts

### View from the Road

- 47.6.1 Views from the proposed Fastlink are described in Table 47.6 at the end of this section, with descriptions of the views in the winter year of opening (with all earthworks and planting in place but without the benefits of established planting) and then in the summer fifteen years after opening, when proposed planting will have become established. Graphic representations are shown in Figures 47.1 a-f.
- 47.6.2 In the winter year of opening, 67.7% of the Fastlink would have open views and 20.7% intermittent views. The open views would generally overlook areas of rolling farmland with scattered dwellings or small settlements. Many of the views would be long range, across the rolling farmland to the south of the River Dee. The only significantly developed areas that would be visible to northbound travellers, as they cross Stranog Hill, are Milltimber and Peterculter. Stonehaven would also be visible from the southbound carriageway as it descends the Hill of Megray. Intermittent views would tend to be gained where there are smaller cuttings or patches of established vegetation close to the new road. There are few areas where deeper cuttings would be required, with the main exceptions being relatively short stretches of road through higher ground at Cookney, Rothnick and Stranog Hill. 10.0% of the proposed scheme would have restricted views during the winter year of opening, and only 1.6% would have no view. Establishment of proposed woodland and scrub mitigation planting will restrict open views in a number of areas so that by the summer 15 years after opening they will have been reduced to 30.0%, with the intermittent views increasing to 40.9%. The proportion of the road with 'no view' will increase to 13.8% and the restricted views will increase to 15.3% in the long term.
- 47.6.3 The majority of views from the existing A90(T) are also rural, but views from the Fastlink would generally be more open across the rolling farmland, hills and woodland areas and would be very similar to existing views from the B979.

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#### Driver Stress

- 47.6.4 The impact of the proposed scheme on driver stress has been assessed by comparing stress levels on the road network for the Do Minimum option in 2027, with the stress levels on the road network with the scheme in 2027 as shown in Table 47.7 Driver stress for the proposed Fastlink mainline in 2027 has been assessed in accordance with the DMRB in order to determine stress levels on this route in the first 15 years after opening. The highest peak level of traffic has been analysed in the driver stress assessment.
- 47.6.5 The main sections of road network where driver stress levels are predicted to decrease due to the proposed scheme are as follows:
- The A90 (T) Stonehaven to Newtonhill would change from Moderate to Low;
  - The A90 (T) Newtonhill to Portlethen northbound would change from High to Moderate and southbound would change from Moderate to Low; and
  - The B979 Netherley Road southbound would change from High to Moderate.
- 47.6.6 There are no sections of the road network which have been assessed where driver stress levels are predicted to increase as a result of the proposed scheme.
- 47.6.7 Table 47.5, shows that driver stress along the proposed Fastlink in the Design Year (2027) is Low along the whole route.

**Table 47.5 – Driver Stress Levels for the Fastlink 2027**

Link Description	Direction	Proposed Scheme			
		Road Class <sup>1</sup>	Average Peak Hourly Flow per Lane <sup>2</sup> (Flow units/Hour)	Average Vehicle Speed (km/h)	Driver Stress
Fastlink (Stonehaven to Cleanhill Junction)	N/B	DC	633	110	Low
	S/B		587	110	Low

<sup>1</sup> Road Class: DC = Dual Carriageway, and SC = Single Carriageway.

<sup>2</sup> Derived Flow Units/Hour: A car or light vehicles equal one flow unit. A commercial vehicle or HGV over 1.5 tonnes' weight or a public service vehicle equals 3 flow units.

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**Table 47.6 – View from the Road, Fastlink**

Chainages	Landscape/Settlement Character Area(s)	View from Northbound Carriageway (NBC) or Southbound Carriageway (SBC)	View from Proposed Road, Winter Year of Opening	View from Proposed Road, Summer 15 Years of Opening
0-1100	Megray open farmland	NBC	<b>Intermittent view:</b> View to the west across rolling farmland towards the woodland around the Ury House estate would be partially contained by graded out cutting. New mixed and riparian woodland clumps across the slopes of the cutting.	<b>Intermittent view:</b> Established mixed and riparian planting will add to the restriction of longer views but views across rolling farmland will generally only receive minor obstruction.
0-300	Megray open farmland	SBC	<b>Intermittent view:</b> The road would be in shallow cutting graded out to integrate with existing landform, with views across the surrounding rolling farmland. Views along the carriageway towards the North Sea would be partially obstructed by the existing A90. New mixed woodland planting adjacent to the road.	<b>No view:</b> The established mixed woodland planting adjacent to the road will obstruct views out to the east of the carriageway. Views along the carriageway towards the North Sea will be partially obstructed by the existing A90.
300-1300	Megray open farmland & Kempstone wooded farmland	SBC	<b>Intermittent view:</b> Views to the east over the rolling farmland across the Hill of Megray would be partially contained by shallow cutting. Views to the south along the carriageway towards the North Sea and Stonehaven.	<b>Intermittent view:</b> Views to the east over the rolling farmland across the Hill of Megray will be partially contained by shallow cutting. Views to the south along the carriageway towards the North Sea and Stonehaven.
1100-1560	Megray open farmland & Kempstone wooded farmland	NBC	<b>Open view:</b> Road would move from shallow cutting onto embankment for the Limpet Burn bridge. Views to the west along the valley, with the range of views limited by Megray Wood. New riparian and scrub woodland planting along embankments.	<b>Intermittent view:</b> Views to Foresters Croft woodland to the west will be interrupted by the established riparian and scrub woodland along the bridge embankments.
1300-1560	Kempstone wooded farmland	SBC	<b>Open view:</b> The road would have views to the east along the rolling farmland and wooded valley of the Limpet Burn as it crosses the valley on embankment and the new bridge. New riparian woodland planting across the bridge embankments.	<b>Intermittent view:</b> The established riparian woodland around the bridge will partially obstruct views to the east along the valley.
1560-1940	Kempstone wooded farmland	NBC	<b>No view:</b> Existing woodland at Megray Wood would obstruct views out from the road. New drystone wall adjacent to the road to replace section of drystone wall removed during construction.	<b>No view:</b> Existing woodland at Megray Wood would obstruct views out from the road. New drystone wall adjacent to the road to replace section of drystone wall removed during construction.
1560-3400	Kempstone wooded farmland & Muchalls open farmland	SBC	<b>Open view:</b> Views to the east across the rolling farmland and scrubby hillside of Kempstone Hill from embankment and shallow cutting. New mixed, broadleaf and scrub woodland planting adjacent to the road. New drystone wall noise barrier adjacent to road at Kempstone Hill.	<b>Intermittent view:</b> The established mixed, broadleaf and scrub woodland planting adjacent to the road will contain the majority of views to the west, with occasional views across the surrounding farmland where there are gaps between the planting.

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Chainages	Landscape/Settlement Character Area(s)	View from Northbound Carriageway (NBC) or Southbound Carriageway (SBC)	View from Proposed Road, Winter Year of Opening	View from Proposed Road, Summer 15 Years of Opening
1940-2600	Kempstone wooded farmland	NBC	<b>Open view:</b> The road would be on low embankment, allowing views across gently rolling farmland towards the wooded areas around Coneyhatch. New clumps of scrub woodland planting adjacent to the road.	<b>Intermittent view:</b> The road will be on low embankment, allowing views across gently rolling farmland towards the wooded areas around Coneyhatch. Established clumps of scrub woodland planting adjacent to the road.
2600-3050	Kempstone wooded farmland & Muchalls open farmland	NBC	<b>Open view:</b> Views to the west across rolling farmland to Fishermyre and the nearby B979. Some views limited in range by existing woodland areas. New mixed and scrub woodland planting across embankments.	<b>Restricted view:</b> Established mixed and scrub woodland will obstruct the majority of views to the west.
3050-3900	Muchalls open farmland	NBC	<b>Open view:</b> The road would have clear views across the rolling farmland as it rises gently to the west. New clumps of broadleaf and scrub woodland planting adjacent to road.	<b>Intermittent view:</b> Views across the rolling farmland to the west between established clumps of broadleaf and scrub woodland planting.
3900-4400	Muchalls open farmland	NBC	<b>Open view:</b> The road would have clear views across the rolling farmland as it rises gently to the west	<b>Open view:</b> The road would have clear views across the rolling farmland as it rises gently to the west
3400-4400	Muchalls open farmland	SBC	<b>Open view:</b> The road would be at grade or in minor cutting as it crosses to the south of Cookney, with views to the east across the rolling farmland towards the Burn of Muchalls valley. New clumps of scrub woodland planting and sections of drystone wall.	<b>Intermittent view:</b> The road will be at grade or in minor cutting as it crosses to the south of Cookney, with views over drystone walls across the rolling farmland towards the Burn of Muchalls valley between established scrub woodland planting adjacent to the road.
4400-4700	Muchalls open farmland & Burn of Muchalls valley	NBC	<b>Intermittent view:</b> The road would be on slight embankment as it approaches the bridge to cross the Burn of Muchalls, with minor disruption to views to the west across rolling farmland from existing riparian woodland in the valley. New scrub woodland along the bridge embankments.	<b>Restricted view:</b> The established scrub woodland will contain the majority of views to the west along the riparian valley.
4400-4700	Muchalls open farmland & Burn of Muchalls valley	SBC	<b>Intermittent view:</b> Views across the rolling farmland running down into the Burn of Muchalls valley would be partially disrupted by existing riparian woodland areas around the burn. A noise barrier above a small cutting blocks views to the east at Strathgyle Cottage. New scrub woodland planting across the embankments of the new bridge.	<b>Restricted view:</b> A noise barrier above a small cutting blocks views to the east at Strathgyle Cottage. Established scrub woodland planting adjacent to the road will further obstruct views to the east.
4700-4900	Burn of Muchalls valley	NBC	<b>Open view:</b> Views to the west along the rolling farmland of the Burn of Muchalls valley from embankment and the new bridge. New riparian woodland planting along the embankments.	<b>Intermittent view:</b> Partial disruption of views along the valley from the established riparian woodland.

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Chainages	Landscape/Settlement Character Area(s)	View from Northbound Carriageway (NBC) or Southbound Carriageway (SBC)	View from Proposed Road, Winter Year of Opening	View from Proposed Road, Summer 15 Years of Opening
4700-4900	Burn of Muchalls valley	SBC	<b>Open view:</b> The road would be on embankment as it approaches the bridge to cross the Burn of Muchalls, with views to the east across the rolling farmland and riparian vegetation along the Burn of Muchalls valley. New riparian woodland planting along the embankments.	<b>Intermittent view:</b> The established riparian woodland across the bridge embankments will partially disrupt views to the east along the valley.
4900-5300	Burn of Muchalls valley & Muchalls open farmland	NBC	<b>Intermittent view:</b> Road would be in cutting as it crosses the valley to the south of Cookney, with limited views to the west across rolling farmland towards Elrick. New mixed woodland planting along the slopes of the cutting.	<b>Restricted view:</b> Established mixed woodland will strengthen the screening of views from the cutting, limiting views to the west.
4900-5200	Burn of Muchalls valley & Muchalls open farmland	SBC	<b>Intermittent view:</b> The views along the valley to the east would be partially obstructed by cutting as the route passes under the road from the Bridge of Muchalls.	<b>Restricted view:</b> The views along the valley to the east would be partially obstructed by cutting as the route passes under the road from the Bridge of Muchalls.
5200-6000	Muchalls open farmland	SBC	<b>Open view:</b> Views to the east across the adjacent farmland from low embankment and shallow cutting towards the hillside north of Bridge of Muchalls.	<b>Open view:</b> Views to the east across the adjacent farmland from low embankment and shallow cutting towards the hillside north of Bridge of Muchalls.
5300-5900	Muchalls open farmland	NBC	<b>Open view:</b> The road would be at grade or in shallow cutting, allowing views to the west across the rolling farmland to the south of Cookney. New mixed woodland planting adjacent to the road.	<b>Intermittent view:</b> Established mixed woodland will allow some views to the west across the rolling farmland to the south of Cookney.
5900-6350	Muchalls open farmland & Stranog Hill	NBC	<b>Restricted view:</b> The majority of views to the west would be contained by cutting as the road runs through the hillside of Cookney. New mixed woodland planting across the slopes of the cutting. New noise barrier at North Cookney Croft further restricts views to the west.	<b>No view:</b> The established mixed woodland planting along the cutting will strengthen the screening from the earthworks, containing views to the west.
6000-6400	Muchalls open farmland & Stranog Hill	SBC	<b>Intermittent view:</b> Views to the east across the rolling farmland around Cookney would be partially disrupted by shallow cutting and drystone wall and the embankments and structure for the local access road past Harecraig Farm. New scrub and mixed woodland planting across the bridge embankments and to screen North Cookney Farm.	<b>No view:</b> The established mixed and scrub woodland planting around the new overbridge will contain views to the east across the surrounding farmland.
6350-7000	Stranog Hill	NBC	<b>Open view:</b> Views across rolling farmland as it rises to the west. New mixed and scrub woodland planting adjacent to the road.	<b>Intermittent view:</b> Views will be partially contained by the established mixed and scrub woodland planting beside the road.

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Chainages	Landscape/Settlement Character Area(s)	View from Northbound Carriageway (NBC) or Southbound Carriageway (SBC)	View from Proposed Road, Winter Year of Opening	View from Proposed Road, Summer 15 Years of Opening
6400-8400	Stranog Hill	SBC	<b>Open view:</b> The road would be moving between shallow cutting and embankment as it crosses the undulating farmland to the east of Cookney, with views to the east towards Burnside of Newhall. Small block of new mixed woodland planting and drystone wall around Meadowbank.	<b>Open view:</b> The road will be moving between shallow cutting and embankment as it crosses the undulating farmland to the east of Cookney, with views to the east towards Burnside of Newhall. Small block of established mixed woodland planting around Meadowbank will not affect views.
7000-7300	Stranog Hill	NBC	<b>Restricted view:</b> The road would be in cutting as it runs to the east of West Stoneyhill Farm, which would contain the majority of views to the west across rolling farmland. New mixed woodland planting across the slopes of the cutting.	<b>No view:</b> Established mixed woodland planting adjacent to the road will increase the level of screening from the cutting to contain views to the west.
7300-8200	Stranog Hill	NBC	<b>Open view:</b> The road would be on low embankment with clear views across the rolling farmland around North Rothnick. New scrub woodland planting to provide screening for South Rothnick.	<b>Intermittent view:</b> The road will be on low embankment with views across the rolling farmland around North Rothnick between established scrub woodland planting providing screening for South Rothnick.
8200-8750	Stranog Hill	NBC	<b>Restricted view:</b> The majority of views out from the carriageway would be contained by cutting as the road runs through the hillside to the north of North Rothnick Farm. New mixed and scrub woodland planting across the hillside and along the slopes of the cutting.	<b>No view:</b> The established mixed and scrub woodland planting on the hillside will strengthen the screening from the cutting to contain views out to the west.
8400-8660	Stranog Hill	SBC	<b>Intermittent view:</b> Views to the east across the rolling farmland around East Rothnick would be partially disrupted by cutting for the road as it runs through the small hill to the east of Berry Top, with further obstruction from the structure of the bridge for the realigned local road. New scrub woodland planting on the hillside around the bridge.	<b>Restricted view:</b> Screening from the cutting and overbridge will be reinforced by the established scrub woodland planting adjacent to the road, containing the majority of views to the east.
8750-9500	Stranog Hill	NBC	<b>Open view:</b> The road would be on low embankment with clear views across to Stranog Hill and the surrounding rolling farmland.	<b>Open view:</b> The road will be on low embankment with clear views across to Stranog Hill and the surrounding rolling farmland.
8660-9500	Stranog Hill	SBC	<b>Open view:</b> The road would be crossing the lower slopes of Stranog Hill on a low embankment, with views to the east across the rolling farmland and woodland areas around East Crossley and across the southern slopes of Wedderhill.	<b>Open view:</b> The road will be crossing the lower slopes of Stranog Hill on a low embankment, with views to the east across the rolling farmland and woodland areas around East Crossley and across the southern slopes of Wedderhill.

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Chainages	Landscape/Settlement Character Area(s)	View from Northbound Carriageway (NBC) or Southbound Carriageway (SBC)	View from Proposed Road, Winter Year of Opening	View from Proposed Road, Summer 15 Years of Opening
9500-9900	Stranog Hill	NBC	<b>Restricted view:</b> The road would be in cutting as it passes through the eastern side of Stranog Hill. Views along the carriageway across farmland towards Milltimber and Peterculter.	<b>Restricted view:</b> The road will be in cutting as it passes through the eastern side of Stranog Hill. Views along the carriageway across farmland towards Milltimber and Peterculter.
9500-9900	Stranog Hill	SBC	<b>Restricted view:</b> The road would be in cutting as it crosses the ridgeline that extends east from Stranog Hill, which would contain the majority of views to the east.	<b>Restricted view:</b> The road will be in cutting as it crosses the ridgeline that extends east from Stranog Hill, which will contain the majority of views to the east.
9900-10200	Stranog Hill	NBC	<b>Open view:</b> The road would be on embankment as it leaves the ridgeline that runs east from Stranog Hill, with open views over young woodland plantation to the west across the rolling farmland of the hillside. New mixed woodland planting along the embankment and edge of the plantation.	<b>Restricted view:</b> Established plantation woodland and mixed woodland planting adjacent to the road will contain views in this area.
9900-10200	Stranog Hill	SBC	<b>Open view:</b> The road would be on embankment with open views over young woodland plantation to the east. New mixed woodland planting along the embankment and edge of the plantation.	<b>Restricted view:</b> Established plantation woodland and mixed woodland planting adjacent to the road will contain views in this area.
10200-11200	Stranog Hill & Blaikiewell open farmland	NBC	<b>Open view:</b> The road would be on embankment as it leaves the ridgeline that runs east from Stranog Hill, with open views to the west across the rolling farmland of the hillside. It would remain on embankment as it cross the relatively flat farmland around Blaikiewell Farm, although the embankment would be graded out for potential return to agriculture. Views across the surrounding farmland.	<b>Open view:</b> The road will be on embankment as it leaves the ridgeline that runs east from Stranog Hill, with open views to the west across the rolling farmland of the hillside. It will remain on embankment as it cross the relatively flat farmland around Blaikiewell Farm, although the embankment will be graded out for potential return to agriculture. Views across the surrounding farmland.
10200-11200	Stranog Hill & Blaikiewell open farmland	SBC	<b>Open view:</b> As the road crosses the relatively flat farmland to the north of Stranog Hill, it would be running on an embankment graded out for return to agriculture, with views to the east across the rising farmland to the south of the settlement at Burnhead. It would remain on embankment as it continues south across the lower slopes of the ridgeline that extends east from Stranog Hill, with views across the rolling farmland.	<b>Open view:</b> As the road crosses the relatively flat farmland to the north of Stranog Hill, it will be running on an embankment graded out for return to agriculture, with views to the east across the rising farmland to the south of the settlement at Burnhead. It will remain on embankment as it continues south across the lower slopes of the ridgeline that extends east from Stranog Hill, with views across the rolling farmland.
11200-11500	Blaikiewell open farmland	NBC	<b>Open view:</b> The road would be on a graded embankment as it crosses the gently rolling farmland to the east of Blaikiewell Farm and approaches the Cleanhill Junction roundabout. New mixed woodland planting adjacent to the road.	<b>No view:</b> Established mixed woodland planting adjacent to the road as it approaches the Cleanhill Junction roundabout will contain views across the surrounding farmland.

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Chainages	Landscape/Settlement Character Area(s)	View from Northbound Carriageway (NBC) or Southbound Carriageway (SBC)	View from Proposed Road, Winter Year of Opening	View from Proposed Road, Summer 15 Years of Opening
11200-11500	Blaikiewell open farmland	SBC	<b>Open view:</b> Views to the east across the gently rolling farmland immediately to the north of the Burnhead settlement as the road heads south from the Cleanhill Junction roundabout. New scrub woodland planting adjacent to the roundabout.	<b>No view:</b> The established scrub woodland planting will obstruct views to the east.
Overall % of the route with:				
Open View			15560m 67.7%	6890m 30.0%
Intermittent View			4760m 20.7%	9420m 40.9%
Restricted View			2300m 10.0%	3510m 15.3%
No View			380 1.6%	3180m 13.8%

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**Table 47.7 – Comparison of Driver Stress Levels, Do Minimum 2027 and Proposed Scheme 2027**

Link Description	Direction	Do Minimum				Proposed Scheme			
		Road Class <sup>1</sup>	Average Peak Hourly Flow per Lane <sup>2</sup> (Flow Units/Hour)	Average Vehicle Speed (km/h)	Driver Stress	Road Class <sup>1</sup>	Average Peak Hourly Flow per Lane <sup>2</sup> (Flow Units/Hour)	Average Vehicle Speed (km/h)	Driver Stress
A90 (T) Stonehaven to Newtonhill	N/B	DC	1410	99	Moderate	DC	999	101	Low
	S/B		1287	100	Moderate		960	101	Low
A90 (T) Newtonhill to Portlethen	N/B	DC	1720	95	High	DC	1255	100	Moderate
	S/B		1528	100	Moderate		1161	100	Low
A90 (T) Portlethen to Charleston Junction	N/B	DC	2288	80	High	DC	1907	89	High
	S/B		1971	88	High		1646	95	High
B979 Netherley Road	N/B	SC	500	50	Moderate	SC	158	56	Moderate
	S/B		538	49	High		158	56	Moderate
Fastlink (Stonehaven to Cleanhill Junction)	N/B	-	-	-	-	DC	633	110	Low
	S/B		-	-	-		587	110	Low

<sup>1</sup> Road Class: DC = Dual Carriageway, and SC = Single Carriageway

<sup>2</sup> Derived Flow Units/Hour: A car or light vehicles equal one flow unit. A commercial vehicle or HGV over 1.5 tonnes' weight or a public service vehicle equals 3 flow units.

A 60/40 split has been assumed for the division of the average peak hourly flow per lane.