12 Vehicle Travellers

12.1 Introduction

This chapter outlines the assessment undertaken to determine the potential effects of the scheme on the quality of driving conditions for vehicle travellers. This includes the changes to the view from the road and effects of the scheme on driver stress.

'View from the road' is defined as the extent to which vehicle travellers, particularly drivers, are exposed to the different types of scenery through which a route passes.

'Driver stress' relates to three main components; frustration, fear of potential accidents and uncertainty relating to the route being followed. The level of stress incurred by a driver can be affected by many factors, including variations in the driver's skill, experience and knowledge of the road. Frustration can occur due to the driver's inability to drive at a speed consistent with their wishes in terms of the general standard of the road, whilst the level of uncertainty may be raised by lack of route knowledge, the likelihood of pedestrians and poor signage and sight distances.

12.2 Methods

12.2.1 Baseline Methods

Information on baseline conditions was gathered from the review of available data including Ordnance Survey mapping, traffic modelling data derived from a traffic count carried out on Thursday 29th April 2004 and various site visits during 2005 and 2006, combined with local knowledge of the route.

12.2.2 Impact Assessment Methods

This assessment has been carried out following the guidelines set out in Volume 11; Section 3; Part 9 of the DMRB.

As outlined in Chapter 3 (Approach and Methods), impacts are considered in terms of the value or sensitivity of the baseline feature and magnitude of the predicted impact on that feature. The significance of the predicted impacts is determined through a combination of value and magnitude as detailed below.

Value or Sensitivity

The value, or sensitivity, of features was determined as detailed in Table 12.1 below.

With regard to views from the road, a number of aspects were considered to determine value/sensitivity including the types of scenery and landscape, the extent of traveller's views, the quality of the landscape and the presence of features of particular interest or prominence.

Driver stress can be difficult to accurately measure, but components of driver stress relate to road layout, signage, lighting, road surface conditions and sight distances among others. Recommendations in Volume 11, Section 3, Part 9 of the DMRB suggest the use of a three point scale, where new or improved routes, designed in accordance with the Departments current standards will normally have low to moderate driver stress. However, "do minimum" or "do nothing" options may have sections of low, medium and high driver stress, and data on traffic speeds and flows will influence this assessment of driver stress.

Table 12.1. Definition of Value of Views from the Road and Level of Driver Stress.

Value/Level	Criteria	
	Views from the Road	Driver stress
High	The traveller is exposed to extensive views of a high quality landscape, area of unique landscape character or features of particular interest.	Road conditions are expected to result in the driver exhibiting a high level of one or a combination of the following components of driver stress: frustration, fear of accidents and route uncertainty.
Medium	The traveller is exposed to partial/intermittent views of a high quality landscape (or extensive views of a moderate quality landscape), area of unique/distinctive landscape character or features of interest.	Road conditions are expected to result in the driver exhibiting a moderate level of one or a combination of the following components of driver stress: frustration, fear of accidents and route uncertainty.
Low	The traveller is exposed to views of an area of low quality landscape/unremarkable landscape character or has heavily restricted views/no view of the surrounding landscape regardless of quality.	Road conditions are such that the driver is expected to exhibit low levels of frustration, fear of accidents and route uncertainty.

Impact Magnitude

The magnitude of impact was assessed independently of the value or sensitivity of the feature and assigned to one of the categories listed in Table 12.2 below.

Table 12.2. Impact Magnitude Criteria.

Criteria	Definition
Major	A major alteration in views from the road or in driver stress such that the driving experience is significantly affected.
Moderate	An alteration in views from the road or in driver stress such that the driving experience would be changed but to a lesser degree.
Slight	Minimal alteration in views from the road or in driver stress such that there would be a measurable change but this would not significantly affect the driving experience.
Negligible	Very little appreciable change in views from the road or in driver

	stress not considered relevant to have any noticeable effect on the driving experience.

Impact Significance

The significance of impact (beneficial and adverse) was determined as a combination of the value or sensitivity of the feature and the magnitude of impact as shown in Table 12.3 below.

Table 12.3. Assessment of Significance Criteria.

Value or Sensitivity	Magnitude of Impact			
	Major	**Moderate**	**Slight**	**Negligible**
High	Major	Major	Moderate	Slight
Medium	Major	Moderate	Slight	Negligible
Low	Moderate	Slight	Negligible	Negligible

12.3 Baseline Conditions

12.3.1 Views from the Road

Within the area of the proposed scheme options, the A68 is the only route for through traffic. There is a network of minor roads to either side of the A68 as shown in Figure 1.1, the key side roads comprising the B6458 to Tynehead, the U77 to Fala Dam, the U78 to Costerton and the U60 to Longfaugh, all which carry local traffic.

In terms of a driving experience, the existing A68 is an attractive route with the dominant topography of the Moorfoot and Lammermuir Hills providing a significant transition between the Lothians and the Borders. There is an appreciable change from the arable lowlands by the Forth Estuary, to the open moorland plateau at the summit of Soutra Hill, to the valley landscapes of the Leader Water and the River Tweed.

As the A68 crosses over the valley at Fala Tunnel then bends round onto the stretch of road proposed for improvement, the landscape changes from woodland valley to open arable and grazing land. Continuing north and on leaving the bends at Fala Tunnel the road rises out of cut along the straight towards the Tynehead Junction. The driver's view is largely hindered to the west by the mixed native hedgerow. The road then swings through a series of shallow curves and opens onto a straight section which extends between the U77 Fala Dam junction and the U60 Longfaugh junction. The views from this section are of grazing fields to the west and arable fields and woodland to the east. Views to the east are cluttered by the length of safety fencing and pedestrian barrier which run along the road within the adjacent footway. These protect the public from a shear drop, maximum height of 2.7 metres, which is created by a concrete retaining wall on the east side of the road. This wall runs parallel to the road from approximately Salters Burn to the Longfaugh junction. The road swings to the

right, then to the left inbetween two areas of woodland. Magazine Wood lies to the east and a prominent but small area of mature woodland sits on top of the hill to the west of the A68 just after Longfaugh junction. The existing electricity pylons follow the route of the A68 to the south and dominate the skyline when viewed from the road and other visual receptors to the north.

Typical views of and from the section of the A68 proposed for improvement are contained in Figure 12.1.

Views from the side road network are similar to those available from the A68. Although the U77 Fala Dam road sits well below the level of the mainline and thus views to the west from this road are restricted by the A68. The B6458 is a relatively narrow hedge lined road and views are hindered by the hedges. The U60 Longfaugh road rises as it leaves the A68 corridor and this extends the views available although road side hedge lines again restrict such views.

Thus, it is considered that overall the traveller is exposed to extensive views of a moderate quality landscape and the value of the area with respect to views from the road is therefore considered to be **medium**.

12.3.2 Driver Stress

Driver stress has three main components: frustration, fear of potential accidents, and uncertainty relating to the route being followed.

The existing two-way flow on the A68 south of Pathhead is around 9,200 (2004 AADT). The A68 is the principal route from the central borders to Edinburgh, the central belt and the north of Scotland. For southbound traffic the existing road layout starting just north of the proposed scheme undulates over a series of east west ridges to the south of Pathhead. There is limited opportunity to overtake on this stretch of the road, although some vehicles do carry out this manoeuvre resulting in a high level of stress for drivers. The road then curves gently to the left, just past Hope, then to the right as it approaches Magazine Wood, and then left again as it passes the U60 Longfaugh road, further limiting the opportunity to overtake. There is then a short straight section approximately 400m long where some overtaking is possible, followed by gentle right/left hand bends as the road climbs up towards the B6458 Tynehead junction where overtaking is again limited by lack of visibility. It is only at this point, after the Tynehead junction when a straight stretch of some 700m offers the opportunity for more definite overtaking, dependant on the opposing traffic flow. This can result in a build up of vehicles behind slower moving traffic such as agricultural or heavy goods vehicles, causing driver frustration. Drivers that use the route on a regular basis are aware that there is only limited overtaking opportunity until the climbing lane at Soutra Hill, some 3km to the south. This can result in a high level of stress for drivers trying to use the short lengths of opportunistic overtaking with the constant possibility of the sudden appearance of oncoming traffic.

For northbound traffic a similar situation exists albeit in reverse. Drivers that use the route regularly are aware that there are limited overtaking opportunities until north of Pathhead. This can result in a high level of stress for drivers trying to use the short lengths of opportunistic overtaking that do exist with the constant possibility of the conflicts with oncoming traffic.

Fear of potential accidents in either direction is greatest where there are junctions on the main road and the speed of through traffic is high. This situation occurs at the U60 Longfaugh junction; the U77 Fala Dam junction; the B6458 Tynehead junction and the U78 Costerton junction. None of these junctions have a central refuge for right turning traffic and this adds to the fear of a potential accident, thereby increasing driver stress. This is most prominent at the Tynehead junction which is the busiest side road within the proposed scheme limits with an Annual Average Daily Traffic (AADT) flow of 519 vehicles, (2004 figure). The other three junctions are used less frequently (traffic flows less than 100 AADT) and therefore potential conflicts with mainline traffic are reduced. In addition, buses travelling along this section of the route adopt 'a stop on demand' policy and will pick up or let passengers off where required. This often happens at the local junctions and thus adds to driver stress. Motorists trying to overtaking along this section of the route, where visibility is not truly acceptable, also adds to the general fear of a potential accident.

Uncertainty over the route being followed is low in both directions as the A68 follows a consistent northwest to southeast alignment with many clear landmarks and relatively few major road junctions.

The sensitivity of the existing route with respect to driver stress for traffic in either direction is therefore considered to be **high**.

It is useful to compare the above classification which is based on full knowledge of local conditions with guidance only tables contained within DMRB, Volume 11; Section 3; Part 9. Considering current driving conditions the average peak hourly flow per lane on the section of the A68 in question lies between 600-800 units/1 hour and average journey speeds on the route taken from the traffic survey are greater than 70 km/hr. Thus with reference to Table 3 of DMRB, a moderate level of driver stress would be experienced under these conditions. However, local knowledge of the route held by the project team and supplemented by information gained from various site visits and discussions with locals suggests a high level of driver stress.

12.3.3 Accident Data

A detailed assessment of the reported personal injury accidents (PIA) on the A68 over the scheme length has been carried out. This has been based on statistics obtained from TS's accident database between January 1997 and November 2006. A ten year period has been considered in order to give the report an accurate and relevant illustration of the number and type of accidents occurring on the A68. Over this period a total of 15 PIA's have occurred.

Of the 15 accidents reported, two were classified as serious with the remaining 13 being classified as slight. There have been no fatal accidents within this section of the A68 within the last ten years.

The PIA rate per Million Vehicle Kilometres (PIA/Mveh-km) is a useful indicator as to the relative safety of a section of road. Rates are calculated by dividing the number of accidents by the traffic flow, multiplied by the length of road under consideration. This rate is then factored to give a figure in accidents per million vehicle kilometres over a set period. To ensure an accurate comparison with other roads, only accidents in the last three years (2004 – 2006) inclusive have been used in this calculation. The relevant figure for this section of the A68 is 0.191 PIA/Mveh-km which is greater than the 2004 Scottish Trunk Road average for non built up trunk roads of 0.124 PIA/Mveh-km. The level of driver stress for this aspect is considered **medium**.

12.4 Predicted Impacts

12.4.1 Views from the Road

Views from the road will mainly be affected during the construction period and immediately post-construction and this is discussed in Chapter 15 (Disruption due to Construction).

Due to the on-line nature of the proposed scheme views from the A68 will be comparable to the existing situation. Travelling north, the Fala Tunnel tie-in incorporates a slightly larger horizontal curve, requiring the road to cut into the agricultural land to the west of the existing route corridor. The impact of this will not be significant as the views from the road at this location are currently restricted by the existing terrain and hedge.

A similar situation exists along the entire length of the straight towards the B6458 Tynehead junction as existing views are restricted by the roadside hedgerows. This corridor is likely to be opened up on both side of the A68, even although the proposed scheme widening is on one side of the road. The hedgerow to the east is being re-located to the ownership boundary to allow for future maintenance and repair of the existing earthwork slope (existing views shown in Figure 12.1). The replacement hedgerows through this area of the scheme will form part of the landowner's accommodation works and therefore will not be included in the proposed scheme landscape design. The relocation of the hedgerows to the bottom of the earthwork slopes will help to open up views to the east and west in the long term.

Over the remaining length of the proposed scheme, views from the A68 to the east will be extended as the online widening will remove the existing roadside vegetation and hedgerows. In addition replacement hedges are to be planted at the bottom of the new larger embankment slopes and only pockets of woodland planted are proposed as part of the landscaping scheme and as such the new planting will not hinder the drivers' view.

Further improvements will take place on the short straight section between the U77 Fala Dam and U60 Longfaugh junctions as the widening will remove the unsightly safety fence and pedestrian guardrail combination. The shear drop associated with the existing retaining wall will be removed by the earthwork slope associated with the road and verge widening. Some lengths of new safety fencing will be required between the U77 Fala Dam junction and the new side road which replaces it but these will be situated towards the back of the new widened verge and will be less obtrusive.

In terms of side roads, the introduction of the new side road to replace the U77 Fala Dam road and the U78 Costerton road will involve a substantial amount of earthworks as it includes a long length of fill slope and a shorter length of smaller cut slope. The views from this new side road will be different from the existing U77 and U78 roads due to the above mentioned earthworks. The elevated nature of the proposed new junction with the A68 will offer improved views for vehicle travellers.

The realignment of the U60 Longfaugh junction will not differ greatly to the existing arrangement in terms of drivers views. The road will be in a short length of cut, which will restrict views momentarily but the remaining length of the realigned side road will offer similar views of the surrounding area.

It is thus anticipated that views from the road will be slightly enhanced in terms of extended views, improved landscaping, new/replacement hedgerows and a general feeling of openness associated with the widened carriageway and verges.

The impact magnitude on drivers views with regard to the proposed scheme is considered as slight and beneficial, when combined with the medium value or sensitivity of the landscape, this equates to a **slight beneficial** impact significance.

12.4.2 Driver Stress

The proposed scheme will provide 833 metres of dedicated southbound overtaking to the south of the left/right stagger junction commencement section which incorporates the new field access track and the realigned U60 Longfaugh junction. Both these accesses will benefit from the introduction of a right turning refuge as part of the commencement section. Right turning facilities will also be incorporated in the left/right stagger junction changeover section at the B6458 Tynehead. These facilities will provide safer access and egress onto the trunk road for traffic in the surrounding communities. The centre changeover section incorporates the new side road serving Fala Dam/Costerton and the B6458 Tynehead junction whilst allowing the overtaking direction to be changed to a northbound direction. The existing U77 Fala Dam junction and the U78 Costerton junction will be closed to vehicular traffic as part of the scheme as will all field accesses which are currently accessed off the A68. No formal bus stops are proposed as part of the scheme but the wider carriageway and improved forward visibility will ease congestion when buses choose to stop. Schematic details of the proposed scheme are contained in Figure 2.1.

These improvements will have a major beneficial impact with respect to driver stress for southbound traffic. This combined with the high level of existing driver stress will result in an improvement of **major beneficial** significance for southbound traffic.

For northbound traffic the proposed scheme will provide 648 metres of dedicated northbound overtaking following the commencement taper at Fala Tunnel. As discussed in the base line conditions, the 700 metre long straight between Fala Tunnel and Tynehead junction, currently enables overtaking in both directions, without providing full overtaking sight distance. The dedicated northbound overtaking contains the southbound vehicles to the single lane and removes the uncertainty of overtaking and facing a car travelling in the opposite direction. As discussed above in relation to the southbound direction, formal junctions will be created at Tynehead and Longfaugh and these left/right stagger junctions will provide a centre right turning refuge island. All field accesses are to be stopped up and the existing U77 Fala Dam junction and the U78 Costerton junction will be closed to vehicular traffic as part of the scheme.

These improvements will have a major beneficial impact with respect to driver stress for northbound traffic. This combined with the high sensitivity for northbound traffic will result in an improvement of **major beneficial** significance for northbound traffic.

The existing two-way flow on the A68 south of Pathhead is around 9,200 (2004 AADT). The A68 is the principal route from the central borders to Edinburgh, the central belt and the north of Scotland. Improving the A68 by building the proposed scheme may attract slightly more traffic onto the route but due to the short distances involved in reaching Edinburgh and the time required for drivers to reach the A68 from other parts of the central borders it is not considered that this increase will be significant.

12.4.3 Potential Accidents

The provision of a WS2+1 carriageway configuration with additional carriageway width, a definitive separation between opposing traffic flows and formal changeover sections at junctions with provision for right turning vehicles will give vehicles more space to avoid potential collisions.

Uncertainty over the route being followed will remain low as the A68 follows a consistent north west to south east alignment. This will be further improved with the inclusion of improved road signage as part of the proposed scheme.

Unfamiliarity with the WS2+1 road configuration may cause an increase in driver stress in the short term but this will ease with the passing of time as driver appreciation of the road function improves. The impact upon road accidents is therefore considered to be moderate beneficial in magnitude resulting in a **moderate beneficial** overall impact.

12.5 Mitigation

In terms of views from the A68 it is considered that the proposed scheme will present a slight improvement. In addition with regard to the associated realigned and new side

road network it is considered that these will offer a slight improvement in terms of views from the road. Mitigation measures will be incorporated into the design of the proposed scheme to enhance these benefits and to ensure that the scheme blends in with the surrounding landscape as quickly as possible.

Mitigation of the potential impacts on visual amenity is discussed in Chapter 9 (Landscape and Visual Effects). The following measures are also likely to benefit views from the new road:

- Appropriate earthworks - Minimal cut/fill slopes where practicable.
- Appropriate seeding and landscape planting of earthworks to reflect surrounding vegetation.
- Replacement and additional planting of hedgerows and roadside vegetation and the establishment of tree screens where appropriate.
- Replacement planting of any trees lost due to the required land take for the scheme.

The scheme is designed to provide safe, guaranteed overtaking opportunities in both directions along this section of the A68. This combined with improved signage, formal junctions with right turning facilities and clear road markings will significantly reduce all components of driver stress and therefore no further mitigation measures are proposed.

12.6 Residual Impacts

The residual impacts upon driver views and driver stress (with the inclusion of mitigation measures identified above) are summarised in Table 12.4 below. Note as residual impacts on driver stress are considered to be the same in both directions only one entry is included in Table 12.4 below.

Table 12.4. Impacts With and Without Mitigation.

Option	Impact Without Mitigation	Impact With Mitigation (Residual Impact)
Driver Views		
Views from roads	Slight Beneficial	Slight Beneficial
Driver Stress		
Southbound traffic	Major Beneficial	Major Beneficial
Northbound traffic	Major Beneficial	Major Beneficial
Accidents	Moderate Beneficial	Moderate Beneficial