5 DISRUPTION DUE TO CONSTRUCTION

5.1 Introduction

This Chapter describes the effect of construction of the Scheme on the built and natural environment. The construction period will include construction of the works, which is estimated to be around 12 months, utility diversions, which could be up to three months prior to the construction of the works, and a five-year contract maintenance period, wherein any construction faults that are found will be repaired. Thus the total period will be approximately 75 months.

The construction of the works is expected to be undertaken via a traditional 'Design & Build' engineering contract with the works being won in competitive tender and constructed by the successful Contractor to Transport Scotland's specification. The programme and method of construction of the works and the plant and equipment needed for construction will be determined by the Contractor, subject to any contractual requirements placed upon the Contractor regarding, for example, restrictions on working hours.

The arrangements for any utility diversions will be agreed with the appropriate utility companies and it is possible that some diversion works will be undertaken in advance of the main works. The Contractor is responsible for liaison with utility companies during utility diversions. It is normal for the Contractor to carry out the civil engineering part of the utility diversion works, such as duct laying and chamber construction. It is anticipated that diversion works will be restricted to the vicinity of the A77 dual carriageways and that associated disruption to services, disruption to traffic and noise effects will be kept to a minimum in accordance with normal procedures for works in and around the public road network and will be for a short time only. Any diversions undertaken within the main works period will be relatively small in scale in comparison with the main construction works.

In the expectation that the works are undertaken in accordance with the specification, any defective works that might arise after completion of the works will be relatively small scale. The tendency is to undertake any such remedial works at the end of the five-year maintenance period and these will be for a short time only.

Thus the comments in this Chapter relate primarily to the construction period.

5.2 Methodology

Disruption due to construction is assessed in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 3. Effects of operation of the Scheme are not considered in this Chapter, which deals only with construction effects.

It is recognised that the environmental effects of the construction of the works will feature in other chapters, for example, the effects of construction noise and dust, and on local water and soils. For the avoidance of doubt, the effects of construction are considered in the following chapters:

- Chapter 3 – Air Quality;
- Chapter 4 – Cultural Heritage;
- Chapter 6 – Ecology and Nature Conservation;
- Chapter 7 – Landscape and Visual Effects;
- Chapter 8 – Land Use;
- Chapter 9 – Traffic and Noise Vibration;
- Chapter 10 – Pedestrians, Cyclists, Equestrians and Community Effects;
- Chapter 12 – Water Resources; and
- Chapter 13 – Geology and Soils.

Although the construction contract will include requirements and restraints to minimise construction impacts, some adverse effects are unavoidable. Assessment of these effects is not precise because their extent, severity and duration will depend on the Contractor's programme, methods of working and external factors such as weather conditions, that cannot be predicted with certainty, and commercial factors, such as sources of material that limit the Contractor's choice of supply.

5.3 Consultations

Consultations were undertaken with a range of organisations and individuals. These consultations were carried out, in part, to gather baseline information on the existing community facilities, activities and characteristics in the study area as well as seeking opinions to the Scheme proposals. For the complete Consultee Response Schedule see Chapter 1. Further consultation will be undertaken in the preparation of contract documents to ensure that appropriate mitigation measures are enshrined as contractual requirements.

Where quantities of material are sourced off-site from borrow pits, consultation with the planning authority will be required. It may be the case that material is sourced from established quarries with planning permission. For this contract it is possible that no material will be taken from the site for disposal; if this is the case arrangements and consultations for off-site disposal will not be required. It is envisaged that material excavated during construction will be used for landscape works associated with the Scheme.

To control the potential nuisance associated with construction noise and vibration, the Contract will include restrictions on noise and vibration levels and working hours where applicable. These restrictions will be agreed with the local authority and monitored throughout the construction period.

Similarly, the Contract will include restrictions on disruption to traffic flows. These will include, for example, the availability of traffic lanes on the A77 and acceptable periods for temporary traffic signals. Consultations with the respective roads authorities for the A77 (Transport Scotland) and the side roads (South Ayrshire Council) will be required.

5.4 Baseline

The baseline conditions are largely those described in other environmental topic chapters.

The proposed construction works will cover an area centred on the existing A77 dual carriageway in the vicinity of Symington and Bogend Toll. It will include areas of agricultural land and a small number of minor watercourses.

Table 5.1 below outlines the main receptors located within 100m of the Scheme.

Table 5.1: Main Receptors Located Within 100m of the Scheme

Receptor	*Issues*
Non-Statutory designation – long established woodland of plantation origin	Sensitive in relation to dust disturbance and potential construction activity.
Non-Statutory designation – Listed Wildlife Site	Sensitive in relation to dust disturbance and potential construction activity.
Statutory designation – Tree Preservation Order (TPO)	Impacts relating to possible accidental damage on a number of TPOs within the construction corridor.
Breeding bird habitat	Potential removal of trees and scrub, which may form part of the local breeding bird habitat.
Agricultural land	Land take will be required of agricultural land currently used for grazing.
Residential properties	Impacts relating to air quality and noise and vibration intrusion during construction.
Residential properties	Potential impacts relating to access/severance.
Residential Properties	Impacts relating to visual amenity.
Watercourses	Potential for pollution due to contamination run-off at Pow Burn and Dow's Burn.
Watercourses	Potential for direct impacts on the Pow Burn and Dow's Burn as a result of construction activity.
Community facilities	Potential disruption/disturbance to community facilities in Symington.
Landscape	Potential impacts on a distinctive landscape within Scotland.
Pedestrians, cyclists, equestrians and vehicular travellers	Potential impacts on movements along the A77 and on side roads.
Protected species	Potential impacts on various protected species at specific locations.

5.5 Environmental Effects

5.5.1 Construction Activities

The main construction activities that will be required are:

- Site clearance;
- Provision of temporary site compound(s);
- Topsoil strip and storage:
- Bulk earthworks;
- Roadworks;
- Drainage;
- Bridge construction; and
- Landscape planting.

Site clearance will be required over approximately 5.7 hectares. It will be situated in largely agricultural land, with some trees and scrub adjacent to the road.

At least one construction site compound will be required. The location of the compound will be for the Contractor to determine with the agreement of the landowners, though it will require discussions with the planning and roads authorities on planning issues and safety of access to the public road network.

It is anticipated that around 10,000m^3 of topsoil could be stripped from the site and will be returned to landscaped areas. Bulk earthworks will be a major construction activity as sections of the proposed Scheme are to be built on embankments.

There will be no rock cuttings however it is possible that there will be localised excavation in bedrock for bridge substructure foundations, subject to the findings of a detailed ground investigation.

Finally, on completion of the Scheme, areas of the works will require tree and shrub planting works.

5.5.2 Effects of Construction

There will be a loss of tree and scrub areas as a consequence of construction, which may currently afford nesting habitat to birds as well as other forms of wildlife. This is discussed in the Chapter 6 on Ecology and Nature Conservation.

Temporary site compounds will have an impact primarily where they are located. This is likely to include loss of agricultural land, additional traffic at the locality, localised construction noise due to vehicle and plant movements, surface water run off into local watercourses and leaching of fuel stores, and possibly litter and other nuisances. These could be severe to moderate adverse impacts if a site is badly chosen and not operated and managed in a sympathetic manner in accordance with best practice.

Site compounds can be a highly sensitive issue of severe to moderate adverse significance. Accordingly, the location and operation of site compounds will be subject to the approval of the planning and roads authorities. Specific issues and measures to control them are discussed in more detail in Chapters 3 – Air Quality; 6 – Ecology and Nature Conservation; 9 – Noise and Vibration; and 12 – Water Resources.

There are a small number of houses and community facilities fronting onto the A77 dual carriageway. Even if the sensitivity of these receptors, and the village of Symington as a whole, were high, the overall significance of the impact will be minor adverse.

The route of any haul roads from outside the study area is unknown, and will be the responsibility of the Contractor to ensure compliance with any statutory requirements.

Subject to the type of material used in the earthworks, there will be attendant dust during drier weather. This could have an impact on properties within 50m of the site and residential properties will be highly sensitive. The significance of the impact could therefore be moderate adverse at the properties nearest the works, but the Contractor will be expected to comply with good practice dust suppression requirements such as the provision of water bowsers to damp down dust. This is discussed in more detail in Chapter 3 – Air Quality.

The earthworks in the embankments and the associated road construction works will be underway throughout the works period and at varying concentrations of activity. There will therefore be construction noise from standard plant and equipment but in compliance with good construction practice. However, the construction plant used at the bridge locations may be of a noisier type, though only for shorter periods. The significance of these activities on nearby residential properties is fully discussed in Chapter 9 – Noise and Vibration.

The method of construction of foundations at the structures is considered in Chapter 13 – Geology and Soils and also Chapter 12 – Water Resources.

There will be large areas of the works to be constructed offline, i.e. not on the public roads. In addition, works are required to make changes to the existing A77, primarily the stopping-up of existing junctions and central reserve openings. These will necessitate some disruption principally to vehicle travellers, but also occasionally to cyclists, pedestrians and equestrians.

There may be disruption to vehicular travellers as a result of speed restrictions and works on the existing carriageway throughout the construction period. Typical annual average daily traffic flows on the A77 at Symington are approximately 36,000 vehicles per day. It is considered that the magnitude of impact will be moderate and the sensitivity is medium, therefore the significance will be minor adverse.

Pedestrians, equestrians and cyclists will generally experience impacts similar to those expected for vehicular travellers, in as much as that they could expect to experience periods during construction where access restrictions and/or diversions are imposed as part of a traffic management plan.

5.6 Mitigation

Mitigation is described below though reference should also be made to the other relevant chapters as noted above.

Approval for site compounds will only be granted through discussions with the planning and roads authorities.

It is expected that measures will be taken to source material as close as possible to the site to minimise construction traffic; it will be within the Contractor's financial interest to minimise costs. Consultations will be required with the planning authority if a source of new material has to be found.

Instructions will be included within contract documents to require the Contractor to install appropriate measures such as wheel washing facilities to avoid deposit of mud on the road as far as is reasonably possible and to remove any deposits that do occasionally arise. It is expected that with such measures impacts as a result of the transfer of dirt from onsite to the road network, will be reduced to minor – negligible adverse significance.

Instructions will be considered for the contract documents to ensure that the Contractor provides suitable access provision during seasonally high traffic periods to reduce the effects of traffic delays on the existing A77. This will ensure that the impact is kept to minor adverse significance.

Instructions will also be included in the contract documents setting out the requirements for traffic lane availability. For example, it is likely to state that one lane in each direction should always be open on the A77 except at certain specified off-peak times. It is expected that with such measures, the delays will be reduced to minor adverse significance.

In order to minimise disruption to cyclists, equestrians and pedestrians, instructions will be considered for the contract documents to restrict some activities during higher use holiday periods and also to require the Contractor to consult representative bodies before commencing works that may affect cycling activity. This will ensure that the impact is kept to minor adverse significance.

5.7 Residual Impacts

It will not be possible to construct the Scheme without some adverse impact arising temporarily during the construction of the works. With the proposed mitigation measures, these adverse impacts will be reduced to acceptable levels. The residual impacts will include:

- The provision of site compounds, minor to negligible adverse;
- The transport of materials and equipment to the site, minor adverse;
- The possibility of mud on the roads during wet weather, minor to negligible adverse;
- The disruption to traffic on the existing A77 dual carriageway, minor adverse;
- The disruption to traffic on the existing side roads, minor adverse; and
- The disruption to cyclists, equestrians and pedestrians, minor adverse.

Other possible residual impacts that are fully discussed in other chapters include:

- Ecology and nature conservation issues, for example during site clearance,
- Effect on soils and water quality, for example from de-watering and removal of water from excavations, and from site compounds,
- Noise and dust problems arising from construction practices.

5.8 Summary

The Scheme will result in a number of impacts as a result of construction activity.

The impacts will relate to the provision and operation of construction compounds during the construction period. There will be disruption to traffic on the A77 dual carriageway and affected side roads due to traffic management measures necessary to ensure the safety and operation of works on those roads. The construction of embankments, cuttings and structures will lead to noise intrusion and the risk of dust in the air and mud on the road will be present. There is a potential for construction operations to cause damage to localised soils and water, if appropriate mitigation measures are not adhered to.

However, measures can be put in place to minimise the impacts and it is considered that with careful management the significance of impacts can be reduced to minor adverse. To achieve this, discussions with the planning and roads authorities will be essential in order to ensure acceptable levels are agreed and implemented. These will be reinforced by requirements in the contract for construction of the works.