

12. Traffic and Transport

12.1. Introduction

This section of the EIA is concerned with traffic, roads and safety, and mobility issues associated with GARL. The assessment specifically covers:

- Severance and delay for drivers and their passengers including users of public transport.
- Severance and delay for pedestrians and others (including cyclists and equestrians).
- Amenity for pedestrians, cyclists and others.

Traffic and transport impacts principally result at those locations where GARL crosses or otherwise directly impacts on a road, cycleway, footpath or other route used by pedestrians, cyclists or vehicular traffic. Additionally the scheme may result in changes in traffic flow on other routes not directly affected by the scheme's alignment as a result of construction and operation of the scheme. Temporary impacts on rail services during construction are also considered.

12.2. Methods

12.2.1. Information Sources

In describing the existing situation for the route, local authority proposals and policies as stated in the development plans and the Local Transport Strategies have been taken into account. Information on traffic strategy has been taken from the following documents:

- A Local Transport Strategy for Renfrewshire, Renfrewshire Council
- Keep Glasgow Moving, A Local Transport Strategy 2001-2004, Glasgow City Council

Baseline traffic flows have been taken from previous studies where available and from models specifically developed for the scheme. These comprise the following models:

- The surface access model called the Glasgow Airport Access Model (GLAAM), used to predict patronage and mode shift for air passengers; and
- The Glasgow Airport Employee Model (GLEAM), used to predict patronage for non-air travellers and airport employees travelling to and from the airport on the same day. This model was initially underlain by SPT's transport model SITM4, supported by an Incremental Mode Choice (IMC) function within the SITM4 modelling framework.

12.2.2. Assessment Methods

12.2.2.1 General

The Institute of Environmental Management and Assessment (IEMA) has produced *Guidelines for the Environmental Assessment of Road Traffic - Guidance Notes No 1* (IEMA GN1), which have been developed for assessing the environmental impacts of road traffic from new developments. Although the guidelines are not designed for rail developments, the guiding principles have been taken on board in undertaking this assessment.

At a basic level the guidelines indicate that it should be assumed that changes in traffic of less than 10% create no discernable environmental impact. It furthermore suggests that outside any sensitive areas this threshold can be increased to 30%. Such sensitive areas are considered to include all residential areas, all streets where there is a significant pedestrian presence and also conservation areas. Note however, that very little of the scheme passes directly through areas which could be considered sensitive.

The assessment also takes into account the guidance set out in *Design Manual for Roads and Bridges Volume 11 – Environmental Assessment* (DMRB Volume 11) within which Section 3, Part 8 deals with Pedestrians, Cyclists, Equestrians and Community Effects and provides a methodology for assessing such impacts. However neither of these documents provides a complete methodology for dealing with the environmental impacts of traffic, and on traffic, that would result from the scheme. Therefore assessment of impacts is based on a combination of:

- On-site observations;
- A broad assessment of road network capacity; and,
- Experience with similar projects elsewhere.

Note that as there are no environmental assessment methods for determining the impact of temporary disruptions to rail traffic during construction, impacts have been assessed on the potential increase in road traffic that may result.

12.2.2.2 Scope of Assessment including Spatial and Temporal Scope

The spatial scope of the assessment is:

- The route of the GARL itself and the area within the immediate vicinity that may be directly affected by its construction and operation; and
- All road links on which the annual average daily traffic is predicted to change by more than 30%, or in environmentally sensitive areas, for example, residential areas and the vicinity of schools and hospitals, to change by 10%.

Note, however, that the absence of traffic forecasts for the “null situation” and “with scheme” outwith the Glasgow Airport area has rendered assessment of the off-line impacts impracticable.

The temporal scope of the assessment, based on the traffic models discussed above, is:

- The period of construction prior to 2009.
- The opening year 2009.
- After 21 years of operation, i.e. 2030.

12.2.2.3 Baseline Methods

The baseline for the traffic and transport assessment has been based on:

- Examination of the mapping made available from the design team;
- Walkover surveys;
- Local transport strategies; and
- The GLAAM, GLEAM and SITM4 models as discussed above.

12.2.2.4 Assessment Methods including Significance Criteria

Significance of effects has been based on a seven-point scale as follows:

- Major Adverse Impact
- Moderate Adverse Impact
- Minor Adverse Impact
- No Significant Impact
- Minor Beneficial Impact
- Moderate Beneficial Impact
- Major Beneficial Impact

The diversity of traffic and transport impacts is such that it has not been regarded as practical to develop significance criteria that are specific to each category of impact, for example pedestrian diversion or pedestrian safety. A general rule of thumb for significance of on-route impacts has been developed as follows.

Minor adverse impacts are those that can be accepted in practice without undue concern on the part of the receptor. These would include, for example, an increased journey distance of less than 100 metres for a pedestrian or increased distance between a business and the nearest servicing bay of less than 25 metres.

Moderate adverse impacts are those that would result in substantial inconvenience on the part of the receptor. These would include, for example, an increased journey distance of between 100 and 300 metres for a pedestrian or increased distance between a business and the nearest servicing bay of between 25 metres and 50 metres.

Major adverse impacts are those that would result in substantial inconvenience on the part of the receptor and would undermine an activity to the point where it no longer takes place. These would include, for example, an increased journey distance of more than 300 metres for a pedestrian or increased distance between a business and the nearest servicing bay of more than 50 metres.

Benefits would be judged on a similar basis.

For off-route impacts, IEMA GN1 guidance (IEMA, 1993) proposes that 30%, 60% and 90% changes in traffic levels should be considered as ‘minor’, ‘moderate’ and ‘substantial’ (major) impacts respectively. Note that in assessing the significance of impacts, account is also taken of:

- Who or what is affected;
- The probability of the effect occurring;
- Whether the effect has local, district, regional or national implications; and
- The level and nature of impacts.

12.3. Baseline Situation

12.3.1. General

This section sets out the baseline information for the assessment. The main strategic policies based on documents published by Renfrewshire Council and Glasgow City Council are briefly summarised. Thereafter, where baseline information is available for the route, this is set out on a section-by-section basis. Finally a description of the roads and other routes directly affected by the scheme are described.

12.3.2. Policy Background

12.3.2.1 Local Transport Strategy for Renfrewshire 2000 to 2004

This has been prepared by Renfrewshire Council and summarises the overall traffic situation within Renfrewshire. Key policies are to:

- Address transportation issues of a strategic nature within the West of Scotland Transport Forum;
- Maintain network infrastructure to a standard that prevents asset deterioration, ensures public safety and does not hinder accessibility;
- Adopt strategies to manage the growth of trips by private car and to achieve a modal shift to more sustainable modes of transport;
- Adopt strategies to improve and extend walking routes particularly between homes and places of employment;
- Adopt strategies to achieve increased cycle use as set out in the National Cycling Strategy (i.e. doubling of cycle use by 2012);
- In partnership with SPT, to increase the attractiveness of public transport including its quality, comfort and integration;
- Manage demand for parking; and
- Promote network development that:
 - Takes into account the growth corridor which includes Glasgow Airport;
 - Provides a transport system that develops opportunities for employment, housing, etc in terms social inclusion;
 - Promotes safety benefits and reduction in road accidents; and
 - Promotes safety and security of walking and cycling.

12.3.2.2 Keep Glasgow Moving, A Local Transport Strategy 2001-2004

This has been prepared by Glasgow City Council and incorporates the Road Traffic Reduction Report, prepared in response to the Road Traffic Reduction Act 1997. The main aim of the local transport strategy is to alter travel behaviour in the medium to long term to create a change away from the use of the private car where alternative modes of transport exist.

Traffic patterns in and around Glasgow are monitored by the Council and monitoring at the 'mid-conurbation cordon' indicated overall growth between 1990 and 1998 of up to 2.2% per annum with increases at all times of the day / week. In contrast, SPT has indicated a fall of 13% in bus passenger numbers over the last 10 years overall. However, bus priority measures have created 1 million additional bus passenger journeys per annum.

Car ownership in Glasgow increased by 46% between 1984 and 1994, from a very low base level of 163 vehicles per 1,000 population. At 238 vehicles per 1,000 population this represents around 70% of the Scottish and 60% of the UK average.

However, a survey of households in Glasgow indicated that although 81% thought that congestion was getting worse:

- 66% thought that they would walk or cycle more if there were better facilities;
- 61% agreed that priority should be given to public transport, cycling and walking even if general traffic would be inconvenienced; and
- 52% disagreed that the public transport system was efficient and a significant proportion of respondents thought that there were problems with the system, including information and reliability.

The follow table sets out transport to work figures from 1991 showing the level of traffic to and from Glasgow.

Table 12.1 Transport to Work Figures for Glasgow

	TO GLASGOW			FROM GLASGOW		
	All modes	By car	% Using car	All modes	By car	% Using car
Bearsden & Milngavie	10670	8070	76%	1530	920	60%
Cunninghame	3220	2110	66%	470	330	70%
Cumbernauld & Kilsyth	7730	4540	59%	850	630	74%
East Kilbride	9450	6740	71%	3020	2230	74%
Eastwood	15460	11540	75%	2330	1230	53%
Hamilton	8140	5350	66%	1690	1260	75%
Kilmarnock & Loudon	2050	1510	74%	330	290	88%
Renfrew	20140	13100	65%	9070	5730	63%
Strathkelvin	17540	11670	66%	2540	1510	59%
SCOTLAND TOTAL	300450	153080	51%	34050	22490	66%

Source: 1991 Census (Numbers obtained from 10% sample of 1991 census data and numbers using include both drivers and passengers) – quoted in Keep Glasgow Moving.

The Strategy goes on to set out the Council's transport objectives. These are set out in a hierarchy of aims, policies, implementation plans and targets. One of the implementation plans is to "support agencies considering ... a link to Glasgow Airport." In addition, targets for Road Traffic Reduction include:

- A 10% reduction in the rate of growth in private car traffic by 2005 (from 1998 levels); and
- 30% reduction in rate of growth in private car traffic by 2015 (from 1998 levels).

12.3.3. Traffic and Transport Baseline

This section sets out a baseline description of the existing traffic and transport situation along the route of GARL and demonstrates the projected growth that would benefit from development of the proposed scheme.

12.3.3.1 Air Traffic Growth

Air traffic in the UK has seen increased five fold over the past 30 years (*Future of Air Transport*, the White Paper, DfT, 2003) and demand is projected to result in 200 – 300% growth of total UK Air traffic by 2030.

Future projections provided by DfT suggest that Glasgow Airport's passenger figures will grow from 7.7 million in 2005 to 15.1 million in 2029. The predicted growth is less than the historic growth but still results in almost double the current passenger figures using Glasgow Airport by 2030.

This growth in air passengers will result in the requirement for a significant increase in surface access to and from Glasgow Airport. As shown below the current demand for transport to and from the Airport is problematic resulting in increased congestion and variable journey times. Future growth can be expected to significantly exacerbate these problems and therefore the predicted impact of this future growth on surface access is also presented below.

12.3.3.2 Current Airport Access

Glasgow Airport is located to the west of Glasgow; the *Regional Air Service (RAS) study - Edinburgh and Glasgow Study 3 Part A* (DfT, 2002) acknowledges that Glasgow Airport is located in a less accessible position in comparison to the major catchment areas of Scotland, defined as being largely from the Central Belt of Scotland as well as from Glasgow itself, with proportionately high levels of passengers from the Highlands region. The Airport is more difficult to reach for populations in the east and north of Scotland, as all major routes go through the congested Glasgow conurbation.

12.3.3.3 Highway Network

Glasgow Airport is served by road links with access being via the A737 to the south west and via the M8 to the west and east. The M8 is the major road artery connecting the airport with Glasgow city centre and provides a direct route on to Edinburgh in the east. This route is also the access to the north west (Stirling, Perth and Dundee) and to the M74, providing links to the south. This route is severely congested in the peak periods, with average traffic flows exceeding capacity through the city centre.

The RAS study identified that the M8 will need to be substantially upgraded and widened to achieve the target patronage of the airport. Since sections of the M8 are currently already 4-lane, further widening may have to be achieved through segregation of local traffic from longer distance traffic. In addition to its direct effects on adjacent urban areas, the configuration of this on the existing White Cart viaduct and the airport access would require careful consideration.

From the north, road access to the airport is not direct, with no major fast route connecting northern Glasgow over the River Clyde. The three major river crossing options are the Erskine Bridge to the west, the Clyde Tunnel or the M8 Kingston Bridge in Central Glasgow. All three of these routes link to the M8.

Traffic flow information has been provided by the Scottish Executive, which is summarised in Table 12.2 below. This shows that the key approaches from the south west and the east are operating at capacity.

Table 12.2 – Traffic Flow on the Trunk Road Network Approaching Glasgow Airport

Route	Direction	Average Daily Traffic Total ^a	Peak hourly flow ^a	Theoretical capacity ^c
M8 J27 (Arkleston) – J28 (Airport)	East-bound	54,000	5,000	5,600
	West-bound	56,000	5,500	5,600
M8 J30 (Erskine Br) – J29 (St. James)	East-bound	28,000	2,600	4,000
	West-bound	24,255 ^b	2,250 ^b	4,000
A737	North-bound	63,000	4,000	3,600
	South-bound	63,000	4,000	3,600

a Figures are based on an average of March and September (2004) data, where available;

b These figures are based on February data as no March or September data was available.

c The theoretical capacities have been calculated using TD79/99, Volume 5 Section1. These figures are derived based on the classification of road, number of lanes and width of lanes. It should be noted that due to high concentration of junctions and lane manoeuvres, lane gains and lane losses in this area of the network, the actual capacity may be lower than these theoretical values.

The RAS report also identified a list of the relevant current 'pinch-points' on the transport infrastructure network and stated that within any kind of airport expansion scenario, any number of these could potentially cause severe problems to the movement of people and goods across the region:

- Glasgow Airport's main access route to the airport from the Central Belt and Edinburgh, the M8, is currently working at near to capacity. An expanded Glasgow airport would cause severe congestion problems;
- With the expansion of Braehead Shopping Centre to incorporate other uses apart from retail, this section of the M8 will almost certainly experience capacity problems; and
- The majority of Central Belt passengers come through Glasgow and across the Kingston Bridge. The Bridge and its approaches are heavily congested during peak periods. Without a suitable alternative crossing of the river, this bridge will become very congested, both with local and airport traffic.

The car journey between the airport and city centre is estimated to take 15 minutes off-peak. The congestion problems described above have an impact upon this figure, forcing travellers to allow for a worst case scenario, with the result that perceived journey times are much greater. Bus services are scheduled to take 25 minutes, though these too are susceptible to congestion delays.

12.3.3.4 Public Transport Network

Only 6% of trips to the airport are made by public transport (with a further 21% made by taxi). The main public transport access is by bus from Glasgow City Centre although some people choose rail as their main mode of transport with a taxi or bus connection from their train station to the airport. These services are regular and efficient but they are hampered by congestion during the peak period. There are a number of coach services that connect to points other than the city centre. Gourock, Inverness and Skye can all be reached directly. Coaches are also provided as part of package holidays from origins such as Aberdeen and Edinburgh since many package holidays use charter flights that operate from Glasgow Airport.

12.3.3.5 Rail Network

There are rail links around the airport area with the main line being the Glasgow Central to Paisley Gilmour Street Line, which passes to the south of the airport.

The line splits at Wallneuk Junction immediately to the south of the airport:

- The southern branch (the Ayr Line) serves Ayrshire and western Dumfries & Galloway, as well as connecting Prestwick International Airport; and
- The northern branch (the Inverclyde Line) passes close to the west of the airport boundary and provides services between Glasgow and Greenock, Gourock & Wemyss Bay.

Passenger Rail Counts for 2003/2004 indicated a total annual boarding for the two corridors of 11.25 million passengers.

12.3.4. Description of the Route

In describing baseline conditions for convenience the GARL scheme has been divided into the following sections:

- Glasgow Airport to the M8;
- Branch Line from the M8 to the existing main line;
- The existing main line from Paisley Gilmour Street to Shields Junction;
- Central Station;
- Elderslie Loop; and
- Other Roads.

12.3.4.1 Glasgow Airport

Starting from the proposed Airport Station the scheme will cross the following roads:

- Caledonia Way West;
- St Andrew's Drive West;
- Un-named link road located north of the M8 between Jct 29 and St Andrew's Drive West (twice);
- St Andrew's Crescent; and
- The M8.

In addition, a number of roads within the Airport including Caledonia Way, Caledonia Way East and St Andrew's Drive will fall within the limits of the scheme for construction access purposes. The principal roads in the vicinity of the GARL branch line are shown on Figure 12.1.

A cycleway running on or alongside airport roads is also included within the limits. From east to west this runs to the north of St Andrew's Drive, then follows St Andrew's Drive West to St Andrew's Crescent. A footpath/cycleway then runs from the southern end of the St Andrew's Crescent westwards parallel to the M8 before cutting northwest across the Paisley Moss LNR. The GARL scheme will not permanently remove any of these cycleways, although during construction works some of these may need to be diverted temporarily.

Note that a new permanent access road will be constructed to serve the new Fuel Farm which will connect to the local road that links St James Interchange (Jct 29) and St Andrew's Drive West. The cycleway and footpath that runs parallel and north of this local road adjacent to Paisley Moss LNR will be realigned where it crosses this new access road. This realignment is shown on Figure 2.1.

12.3.4.2 Branch Line

Between the M8 and the main line the following roads would be crossed:

- Internal access road within St James Park (leading to the Pavilion);
- The A726;
- McFarlane Street;
- Clark Street; and
- Murray Street.

Note that the route will simply cross these roads by bridge/viaduct. However, because of the requirement to widen the deck of the existing Murray Street Bridge it will be necessary to lower the surface level of Murray Street by approximately 300 mm in order to maintain clearance. Lowering of the road will require the diversion of some utilities beneath the road surface. Note that there are no plans to lower the existing pavements in this area. However, a pedestrian barrier along the edge of the footpath will be provided over the length of the road lowering.

12.3.4.3 Main Line

A large number of public roads cross either above or beneath the main line route. Of these only one will be subject to alteration works as part of the scheme. This is the Hillington Bridge over Sandwood Road, where the existing deck of the rail over-bridge will be replaced, although the bridge itself will not be widened. There are also a number of footbridges along the route but none of these will be altered.

Entry to working sites on the main line will be mainly via existing Network Rail Access points. However, it may be necessary to alter some of these to improve access. Note that delivery of raw materials and equipment for work on the main line will be by a combination of rail and road traffic.

12.3.4.4 Central Station

Within Central Station there is currently provision for car parking, with access through the main station. This access and car parking will be lost as part of the creation of Platform 11A required for the scheme. However, it is SPT's intention to replace the disabled spaces within the adjacent NCP car park, which has direct access onto platform 13.

12.3.4.5 Elderslie Loop

No roads or other routes will be directly affected by the works to be undertaken at the Elderslie Loop.

12.4. Construction Effects

For a description of the proposed works see Chapter 2 of the ES and also Appendix 2.

12.4.1. Potential Impacts

12.4.1.1 General

Potential impacts associated with construction of the scheme may include the following:

- Temporary road closures, narrowing and/or diversions for bridge works and/or utilities diversions;
- Construction traffic;
- Disruption to rail services; and
- Disruption to footpaths and cycleways.

12.4.1.2 Temporary Road Closures

Temporary impacts on roads may result from the proposed works. Such impacts may potentially include:

- Temporary stopping up of roads for varying periods;
- Reduction in parking spaces and business servicing areas or access.
- Narrowing of lanes and/or contra-flow systems; and
- Diversions.

Impacts on individual roads are discussed in section 12.4.3 below. The scale of the impact will relate to the following factors:

- How busy the traffic through this area normally is;
- The length of time the route will be blocked;
- The level of restriction (complete or partial);
- For short-term restrictions, at what time of the day these will be implemented;
- Whether there are sensitive receptors in the vicinity that may be affected; and
- Whether there are adequate alternative routes for traffic to take.

Temporary street closure may also cause community severance by preventing certain movements or requiring traffic to divert around longer routes. Such street closures would be particularly significant where they affect the passing trade of a particular business or impact on residential properties. In addition, the access of emergency services should not be restricted unless alternative routes are provided.

12.4.1.3 Construction Traffic

At this stage it is anticipated that the construction sites required for the scheme will be as follows:

Branch Line

- Area of car park immediately to the east of MSCP No. 2;
- Area surrounding site of existing airport fuel farm;
- Southern half of the playing fields to the west of St Andrew's Crescent (with a temporary access from this road) and also area to the south of the proposed fuel farm site;
- Eastern half of St James' Park (with a temporary access from the A726);
- Car parking area south of Clark Street in Murray Business Area; and
- Site north of Murray Street in the Murray Business Area

To improve access to the St James' Park Construction Compound and to avoid using the entrance on Greenock Road, a new temporary entrance will be constructed at the south-eastern corner of the park, opposite the entrance to McFarlane Road. A temporary signalised junction will be provided at this new four way junction.

Main Line (West to East)

- Area of land immediately to the south of the Paisley viaduct between Renfrew Road and East Buchanan Street owned by NR (with access from East Buchanan Street);
- Area at the junction of the dismantled Arkleston Branch to the north of the main line but within the NR boundary;
- Area of land owned by NR to the south of Arkleston Road bridge next to Barshaw Golf Course (with access from Arkleston Road);
- Area to the south of Fifty Pitches Road immediately to the north of Cardonald Junction (with temporary access from Fifty Pitches Road);
- Area of land owned by SPT to the east of the Transco Gas Holder north of the railway (with access from Broomloan Road near the junction with Paisley Road West);
- Area of land on the site of a demolished works adjacent to the railway at Shields Junction (with access from Cornwall Street South); and
- Area of Central Station undercroft to the south of Midland Street (using an existing access from this street).

The locations of proposed construction compounds are shown on Figures 4.1 to 4.5. In addition, other temporary landtake is included within the LLAU for the scheme. Impacts of such landtake are discussed in the Land Use chapter of this ES.

12.4.1.4 Rail Impacts

Potential impacts include disruption to existing services, either by prompting changes in timetables, or by generating unscheduled delays of services operating through the route. Short-term closure of parts of the route may be required, with the requirement that passengers are provided with or are forced to find, alternative modes of transport.

12.4.1.5 Pedestrians and Cyclists

Two cycleways may be affected by the works. These include the route through Glasgow Airport to Paisley Moss and the cycleway that runs along North Greenhill Road then continues eastwards along the A726.

Disruption for pedestrians may occur where restrictions are applied to footpaths or pavements that cross working areas which would have to be closed during works. In addition, there may be potential closures of footbridges or other bridges used by pedestrians across the main line where works are taking place.

12.4.1.6 Utilities

For convenience potential impacts on utilities are included in this section of the Environmental Statement. Potential impacts during construction include the need for extensive diversions or alterations required by the scheme.

12.4.2. Mitigation

12.4.2.1 General

Generic mitigation will be applied along the whole of the route during construction. This mitigation is summarised by impact type below.

12.4.2.2 Temporary Road Closures

Impacts relating to temporary road closures are discussed in detail in section 12.4.3 below. However, in general where temporary street closures (including Temporary Landtake from Roads) are required these will be mitigated by:

- Minimising the duration of the closures and/or restrictions;
- Managing the timing of closures and/or restriction;
- Avoiding severance by either providing defined routes for pedestrians and cyclists across closed sections of street at regular intervals or by limiting closures to short sections of street; and
- Diverting vehicular traffic away from the construction areas via the shortest possible routes.

The closure of long sections of street (exceeding 50 metres) for extended periods will, if possible, be avoided. This is particularly the case at junctions where there is substantial crossing by pedestrians and cyclists. The need to maintain access by emergency vehicles and to avoid disruption to bus services, taxi operations and for access to the airport should be taken into account.

Where existing cycleways and footpaths are affected by temporary closures, alternative routes will be maintained as close as practicable to the original alignment. Cycleway diversions of 200 metres and pedestrian diversions of 50 metres are regarded as the upper limit of acceptability.

12.4.2.3 Construction Traffic

The construction of the scheme will result in movements of construction traffic as surplus material is taken away and construction materials are brought in. The scale of these movements will be significant only where there are large quantities of excavated material to be taken off-site and where incoming materials, such as bridge segments, girders, etc., are delivered as exceptionally wide or long loads, or where large equipment such as cranes or piling rigs are required.

It should be noted that for the works on the main railway line most heavy materials will be delivered by rail and the therefore the peak traffic movements to construction compounds and access points will be due to personnel arriving and departing. The principal concern with these compounds is access. However, for all of the compounds good access can be made available and the likely level of traffic is not likely to make a major difference to flows in the area. However, there may be impacts on local residences. Therefore a CoCP will be adopted (see Chapter 3), and will consider:

- The delivery of materials and the removal of surplus material outwith peak periods for vehicular and pedestrian traffic to avoid disruption of other road users. Similarly the movement of large vehicles such as piling rigs and cranes will be similarly scheduled;
- The delivery of special loads, such as steel work and bridge sections, at night to avoid disruption of other road users and local residents;
- The need for sheeting of loads and wheel and body cleaning where there is a risk if construction traffic carrying or dispersing fugitive material, principally mud and dust, onto the public road;
- The routing of traffic to and from the construction area to avoid residential areas and other sensitive uses;
- The need for adequate vehicle parking within or in the vicinity of construction compounds to avoid on-street parking, particularly in residential areas; and
- Ensuring that construction traffic is where possible segregated from other road users, including cyclists and pedestrians.

Details of the likely numbers of vehicle movements relating to each access road / haul route are included in the Appendix to Chapter 2, Tables A2.1 and A2.2.

12.4.2.4 Mitigation of Rail Impacts

During construction works on the mainline and other sections of the route there will inevitably be impacts on the operation of the existing rail network. Careful planning of the timing and function of possessions will mitigate these so that disruption of the rail network will be minimised. All works on the railway will obviously have to be agreed with Network Rail, and will be timed as far as possible so as to coincide with other works and possessions planned for the railway. Ensuring that alternative modes of transport, such as bus services, are made available during any closures of the line will mitigate disruption of journeys during construction works.

12.4.2.5 Pedestrians and Cyclists

Mitigation for pedestrians will be to ensure that footpaths remained open where possible and that, where possible, work on public roads is undertaken in such a way as to maintain pedestrian access. Where existing cycleways will be disrupted, alternative routes will be provided to ensure that cycleways are kept open.

12.4.2.6 Utilities

Mitigation for utilities would require ensuring their precise location prior to commencing works to avoid inadvertent damage, ensuring that all disruption to utilities is minimised during works and making sure that they are reinstated appropriately after works.

12.4.3. Residual Impacts

12.4.3.1 General

This section sets out the likely residual impacts of construction on traffic and transport, taking into account the mitigation measures discussed above, and with specific emphasis on disruption to existing roads and other routes. Where possible the significance of the impact has been assessed based on the criteria discussed above. Impacts are discussed for the following sections of the scheme:

- Glasgow Airport
- The M8 crossing
- Branch Line from the M8 to the existing main line
- The existing main line from Paisley Gilmour Street to Shields Junction
- Central Station
- Elderslie Loop

- Other Roads

12.4.3.2 Temporary Road Closures and Construction Impacts

Glasgow Airport

The viaduct that will be constructed from the airport station to the M8 crossing will cross the following roads:

- Caledonia Way West
- St Andrew's Drive West
- Un-named link road located north of the M8 between Jct 29 and St Andrew's Drive West (twice)
- St Andrews Crescent
- The M8

Heavy construction equipment will be needed for the piling works and erection of steel girders. Support cranes would also be required for handling materials. Lane restriction would be necessary for the construction of piers adjacent to Airport Access Road, St Andrew's Drive West and Caledonia Way West.

It is estimated that the construction of each pier will require a period of five weeks. In addition three road closures of up to 12 hours each would be required for the erection of steel girders and casting of deck concrete for each of the above crossings. These closures would be programmed to avoid peak hour traffic and such closures within the Airport boundary would be discussed and agreed by BAA during the detailed design phase of the project. However, assuming that road closures can be minimised and timed as discussed the impact significance of these closures is assessed as being of Minor negative significance.

In addition, the cycleway that runs through the airport will be maintained throughout construction and where required, an alternative route will be provided. As such a Minor negative impact is likely on this route as any diversions will be short term.

Note, however, that the new permanent access road that will be constructed from the link road between Junction 29 and St Andrew's Drive West (see Figure 2.1) will require realignment of the cycleway and footpath. A Moderate negative impact is therefore likely for this feature during construction due to the disruption.

M8 Crossing

The proposed structure is a single span tied arch bridge with a span of approximately 135 metres, supported on reinforced concrete piers with bored pile foundations. The main arch, tie beam and cross girders will be of structural steel with the deck in concrete.

The structural elements of the bridge including the concrete deck would be assembled on the adjacent St James Park site to avoid prolonged motorway closures and transported into position using multi-wheeled transport system during a single night time closure of the M8 motorway and adjacent roads lasting a period of approximately 12 hours. This closure would be scheduled for a period of low flow on the M8 for example early evening Saturday to early morning Sunday.

The piers and foundations of the bridge would be located away from the Airport feeder roads, which are the outer-most roads at this crossing, to avoid any disruption to the Airport operations. Adequate space for piling plant and tanks to maintain pile drilling fluid will be required at the Airport and St James' Park ends of the bridge. Heavy construction equipment would be needed for the piling works and erection of steel sections required for the bridge. Additional support cranes would also be required for handling materials as well for the assembly of the transporter system.

Limited night time lane closures of the M8 would be required for the rail work, which could be minimized by providing temporary boarding along the sides of the bridge before the bridge is moved into position

It is estimated that construction of the bridge would require a period of 78 weeks that would be phased with the construction of St James Park viaduct. The access to this section of site will be via a dedicated access road from A726 road, same as for St James Park. This access will have a temporary signalised junction as discussed in Chapter 2 of the ES.

As the proposed closure of the M8 will be at night at a weekend and will be very short term the impact of the closure have been assessed as of Minor negative impact. In addition, the other short term lane closures that will be required are assessed of being of Negligible to Minor impact depending on when these occur.

Branch Line

Between the M8 and the main line the following roads would be crossed:

- Internal access road within St James Park (leading to the Pavilion)
- The A726 and McFarlane Street

- Clark Street
- Murray Street

Access Road within St James' Park

The proposed St James' Park structure will be a viaduct approximately 500m long and approximately 9 metres above existing ground level (7.5m headroom). The materials used in the construction can all be transported by road to the site, including 25m long steel girders. However, a temporary haul road would be required parallel to the viaduct through the park and the Murray Business Area to deliver the girders to their final position from site access points.

As elsewhere, heavy construction equipment would be needed for the piling works and erection of prefabricated steel girders. Support cranes would also be required for handling materials. Access to the construction compound and working area in St James' Park will be directly from the A726 via a new temporary entrance point that will include a temporary signalised junction.

Note that throughout the construction period access to the remaining football pitches on the western side of the playing fields will be maintained. Any disruption to matches on the remaining pitches will be minimised and preferably avoided altogether. The impact is therefore assessed as being Minor negative as there will be some limited disruption.

A726/McFarlane Street

The proposed structure is a three span bridge with spans of 25m, 30m and 25m. It will comprise prefabricated steel girder and *in-situ* reinforced concrete deck supported on reinforced concrete piers with bored pile foundations. The steel girders are up to 28m long. The materials used in the construction will be transported by road to the site, with vehicles using the M8 and coming off at the St James Interchange. In addition, heavy construction equipment would be needed for the piling works and erection of steel girders. Support cranes would also be required for handling materials.

Five road closures of up to 12 hours each would be required for the erection of steel girders and casting of deck concrete. These closures would be programmed to avoid peak hour traffic. It is estimated that the construction of each pier would require a period of five weeks. Additional lane restriction would be necessary for the construction of intermediate piers and their safety barriers.

It is feasible that diversion routes along McFarlane Street during work on the A726 and vice versa would be available. However, these would need to be agreed with Renfrewshire Council at the detailed design phase of the project. The overall impact on these roads is therefore assessed as being of Minor negative impact because, the works would be of the short duration and road closures would be kept to a minimum.

McFarlane Street - Clark Street Viaduct (through Murray Business Area)

The proposed structure will be a viaduct approximately 200m long and up to 9m above existing ground level stretching between McFarlane Street and Clark Street. It would be similar in construction to the St James structure.

The materials used in the construction can all be transported by road to the site. However, a temporary haul road may need to be constructed immediately adjacent to the viaduct to deliver the girders to their final position from site access points. As before, heavy construction equipment would be needed for the piling works and erection of prefabricated steel girders. Support cranes would also be required for handling materials.

It is estimated that the construction of each pier would require a period of five weeks and access to this section of site will be from Clark Street and McFarlane Street. A Moderate negative impact on traffic and transport is predicted including severance issues from one side of the site to the other during this period.

Clark Street

The structure will comprise prefabricated steel girders with *in-situ* reinforced concrete deck supported on reinforced concrete abutments with bored pile foundations. Construction methods and equipment would be similar to previous structures. Three closures of Clark Street up to 12 hours each would be required for the erection of steel girders and casting of deck concrete. These closures could be programmed to avoid times of high traffic movement, with diversions through Murray Street.

Note that the construction of substructure and foundation will not require road closures, but single lane operation achieved through temporary traffic lights. Precaution would need to be taken to isolate pedestrian from the works by providing a barrier. It is estimated that each abutment construction would require a period of five weeks. The impact through Clark Street is assessed as being of Minor negative significance.

Clark Street to Murray Street Embankment

A piled geo-synthetic reinforced embankment is proposed for the section of Branch Line between Murray Street and Clark Street. This section is approximately 250m long and up to 8m above existing ground level.

The civil works would need to employ heavy construction equipment for the top soil strip, removal of unsuitable material, installation of bored piles or stone/grout columns, construction of load transfer platform and placing and compaction of imported material. Support cranes would also be required for handling materials.

Working space will be required from both sides of the embankment for its efficient construction. The access to this section of site is sought from both Murray Street and Clark Street. The estimated period of construction of the embankment excluding rail works is 26 weeks. Occupation of this parcel of land will not impede access to adjoining parcels and therefore the impact is assessed as Negligible.

Murray Street

A new single span bridge and associated support structure will be required to carry the branch line. Construction will involve similar methods to those discussed previously. However, in order to maintain the existing headroom, the road surface of Murray Street will have to be lowered by approximately 300mm. It is intended that the existing footpaths on Murray Street will be maintained at their present levels to minimise disruption to existing services within footpaths, however, utilities beneath the road surface will have to be altered; however, this would be undertaken during the required road works.

The closure of Murray Street will be required for 50m to 70m either side for about six weeks to complete the road works and construct abutments and north wing wall. The south retaining wall could be constructed without a road closure. However, an additional three closures of up to 12 hours each would be required for the erection of steel girders and casting of deck concrete.

During the closure of Murray Street, traffic could be diverted through Clark Street. Overall, because of the length of the closure the impact has been assessed as of Moderate negative significance.

Hillington Bridge over Sandwood Road

This bridge differs from the others discussed above as it is an existing bridge on the main railway line. In order to accommodate the third line works, renewal of decking at the Hillington Bridge over Sandwood Road is proposed. There are currently two proposed methodologies for this that would involve either a 27m single span or two 13.5m spans supported by a new central pier.

Such works will entail closure of Sandwood Road for short periods as well as requiring possession of railway track. Materials and cranes would be delivered by rail and/or road. The impacts on Sandwood Road and the main line are assessed as being of Moderate significance.

Other Bridges Including Footbridges

No works on other bridges crossing either above or beneath the mainline are proposed as part of the GARL scheme. The impact on these bridges is therefore categorised as Negligible.

General Construction Traffic

The main period of HGV access to site will be during demolition and construction operations when building materials and fill will need to be delivered or removed. However, the majority of vehicle accessing the site will essentially be light vehicles and vans.

Defined haul routes will be used for transporting men and materials to the construction compounds. For the branch line compounds these routes will all be by road, predominantly via the M8. North of the motorway, compounds will be accessed via the local road north of the M8 heading east from Junction 29 (St James' Interchange) and the airport roads, returning to the M8 via Junction 28 and/or 29.

For compounds south of the M8, vehicles will exit the M8 at Junction 29 southwards onto the A726. From this point vehicles will either turn left at the temporary signalised junction into the compound at St James' Park or right, into McFarlane Road. From McFarlane Road, vehicles will use North Greenhill Road to access Clark Street and Murray Street (via McKean Street).

Occasionally, however, where Clark Street and Murray Street are temporary closed, access to the Murray Business Area may be required via Greenock Road and/or Greenhill Road, respectively. Haul routes for the branch line works are shown on Figure 2.2.

For works on the main railway line, the majority of materials will be transported to each construction compound by rail, as these are all adjacent to the railway. However, road access will be required for personnel to enter these sites and the local road network will be utilised in each case. Summary tables showing possible concentrations of movements on particular hauls route relating to the various proposed works stages are included in the Appendix to Chapter 2 (Tables A2.1 and A2.2).

However, based on likely volumes of material imports required over the construction period, construction vehicle flows along major approach roads will represent a small proportion of existing traffic flows and the impact is hence deemed to be Minor. Consequently, predicted changes in traffic volumes during major site construction periods, even with all vehicles deemed HGVs, will be low.

12.4.3.3 Rail Impacts

General

A description of the proposed works is given in Chapter 2 of the ES and details of the construction strategy including information on proposed 'possessions' is included in the Appendix to Chapter 2 in Volume 4 of the ES. Note that a 'possession' is the railway term for when possession of the track is given to Contractors so that works can be undertaken on a live railway. Possessions invariably mean that rail services cannot run as normal along the sections of track subject to such conditions.

As the GARL scheme will require modifications to the existing railway, extensive possessions will be required. However, these will be timed to fall at periods of generally low flow such as weekends, and will be coordinated with other possessions for other on-going work on the railway. However, it should be noted that although most possession are for generally short periods, a number of extended possession will be required, notably a nine day possession to undertake works at Wallneuk Junction / Arkleston Junction is planned. The Outline Construction Programme in Appendix 2 identifies where, and approximates when, the possessions required for constructing the GARL infrastructure will be required.

As discussed above, there are no guidelines for the environmental assessment of disruption to rail services. Instead the impact of such disruption is assessed on the basis of the likely temporary modal shift away from rail to road during any periods where no rail services can use the main line.

The combination of weekend possession and more extended blockades will cause significant inconvenience to rail travellers. However, all rail services disrupted will be substituted by equivalent bus services. Although this will not increase significantly the number of buses using local roads, it will cause inconvenience to rail travellers who would have to make all or part of their journey by bus during the blockade periods and may force some passengers to seek alternative forms of transport during the works. Due to this intermittent disruption that will occur over the construction period, and even though alternative bus services will be provided, the impact on rail travellers is assessed as being of Moderate negative significance.

Glasgow Central Station

During construction there will be impacts on traffic and transport for a number of users. This includes disruption to:

- Pedestrians/rail passengers within the station due to loss of platform area required for construction compounds
- Trains due to realignment of short sections of track to allow creation of platform 11A
- Loss of set down areas within the low-level car park; and
- Loss of short-stay car park within Central Station.

Impact on pedestrians will be of Minor significance, as alternative routes to trains will be maintained. In addition, impact on trains during track works will also be Minor as these works will not be of long duration.

The key impact of the platform extension will be the loss of the 66 space short term car park within the station, including the free 20 minute drop off facility. However, there are many other car parks in the neighbouring area (such as the NCP car park at Oswald Street) that can be used instead. This will therefore constitute a Minor impact. It has also been recommended that disabled access to Gordon Street be provided allowing drop off for Blue Badge holders at the front of the station.

In addition, initial discussions between SPT and NCP have indicated that it would be possible to replace the three disabled spaces within the Oswald Street Car Park. These would be located next to the existing disabled spaces within the Oswald Street Car Park adjacent to the pedestrian access to Platform 13. This will also constitute a Minor impact.

It is further proposed that the existing drop off facility on Union Street be better utilised through the enforcement of existing traffic regulations. This would compensate for the loss of the 20 minute free drop facility although there would still be a residual Minor impact associated with this change.

Elderslie Loop

Construction of the extended Elderslie Loop should only have a Minor impact on trains using the Ayr Line. Delivery of construction materials (mainly ballast) by rail will be required. No roads or other routes will be directly affected by the works to be undertaken at the Elderslie Loop.

12.4.3.4 Pedestrians and Cyclists

Impacts to pedestrians would mainly be confined to the St James Branch section of the scheme. However, where roads are to be occupied such works will be temporary and alternative routes would be provided. Therefore the construction impact of the scheme on pedestrians is assessed as being of Minor significance.

There are two cycleways that would be affected during the construction of the scheme, comprising:

- An on-road cycleway along North Greenhill Road that turns east along the A726/McFarlane St
- The cycleway that passes through Glasgow Airport and then across the Paisley Moss LNR

Both of these routes will be disrupted during construction works. The former route will be affected temporarily by night-time bridging works over the A726/McFarlane Street, although this will be a very short-term impact and therefore Negligible. In addition, the cycleway that passes beneath the viaduct alignment over Caledonia Way West will only be disrupted for a very short time period and, as the route can easily be diverted then impact is therefore Negligible.

However, it is likely that the cycleway near Paisley Moss will be closed during construction works in this area potentially for an extended period, particularly as this area will comprise a construction compound. Diversion via nearby public roads will therefore be required during construction of the fuel farm and its access road as well as during works to realign the cycleway/footpath at this point. Subsequently the realigned cycleway/footpath will be reopened (see Figure 2.1). The impact of the construction works will therefore be of Moderate significance as cyclists will be required to take an alternative route in this area.

12.4.3.5 Utilities

Impacts due to alteration of utilities are assessed as being a Minor impact as these would be included in the required works.

12.5. Permanent and Operational Effects

12.5.1. Potential Impacts

12.5.1.1 General

The principal permanent and operational traffic and transport impacts following the construction of GARL would be the following:

- Permanent landtake and severance and access issues;
- Permanent street closures and restrictions including landtake from roads, cycleways and footpaths;
- On-line impacts of GARL in operation;
- Off-line impacts of GARL in operation; and
- Operation of the airport fuel farm.

12.5.1.2 Permanent Landtake

The scheme would take land from existing uses and routes on a permanent basis. Landtake from roads is dealt with separately from street closures. Where the scheme is constructed off-street, existing land uses may be permanently severed, preventing movement between adjoining land. In addition, footpaths and cycleways may be permanently severed, thus forcing pedestrians and cyclists to divert to other routes.

12.5.1.3 Permanent Street Closures/Restrictions

Street closures would reduce the road space available for existing road users including pedestrians, cyclists, private cars, goods vehicles and public transport vehicles. This may reduce capacity for:

- Traffic of all types; and
- Parked vehicles including vehicles servicing property.

12.5.1.4 On-Line Impacts of the Scheme

Along its alignment the introduction and operation of GARL may potentially impact on other railway traffic, potentially generating timetable conflicts that could lead to reduction in reliability and punctuality of existing services.

12.5.1.5 Off-Line Impacts of the Scheme

The scheme is intended to provide an alternative and reliable mode of transport to Glasgow Airport and its use could lead to reductions in other transport modes, particularly private cars.

12.5.1.6 Fuel Farm

The fuel farm will be relocated and it will be built on a like for like basis with the existing facility, therefore no increase in the number of tankers required for supplying the fuel farm is anticipated.

12.5.2. Mitigation

12.5.2.1 General

Generic mitigation would be applied along the route during construction. This mitigation is summarised by impact type below. Where specific mitigation is required this is described separately for each section.

12.5.2.2 Permanent Landtake

Where permanent landtake creates severance and access issues, alternative access routes could be provided. In addition, where a particular parcel, or parcels of land under the same ownership are bisected, e.g. at St James Park or properties within the Murray Industrial area between McFarlane Street and Clark Street, agreements to allow access beneath the viaduct to limit severance would be made.

12.5.2.3 Permanent Street Closures/Restrictions

No permanent closures or land take from existing roads, cycleways or footpaths are required for the scheme and therefore no mitigation is required.

12.5.2.4 On-Line Impacts

Careful timetabling and planning will be required to ensure that timetable conflicts are minimised and disruption to the network avoided.

12.5.2.5 Off-Line Impacts

Integration of timetables and with other modes of public transport could provide a beneficial impact.

12.5.2.6 Fuel Farm

Scheduling of deliveries to the new fuel farm to ensure that tankers were not using the Airport road network at peak times would minimise impacts on other road users.

12.5.3. Residual Impacts

12.5.3.1 General

Residual impacts are those that remain permanently during operation of the scheme and after mitigation have been taken into account.

12.5.3.2 Permanent Landtake

Permanent landtake issues in general are discussed in detail in the Land Use chapter. In terms of permanent land take that affects access, it is anticipated that examples of this will be limited as a result of the scheme, although there may be places where long vehicles operating in yard areas through which the viaduct passes are slightly reduced or restricted their manoeuvrability. As discussed in the mitigation section above, where a parcel or parcels of land under the same ownership are severed then access would be maintained by agreement beneath the structure. The impact of permanent severance and access of the scheme is therefore assessed as being of Minor significance.

12.5.3.3 Permanent Street Closures including Permanent Land take from Roads

No permanent street closures are planned and therefore the impact of the scheme is assessed as Negligible.

12.5.3.4 On-Line Impacts

On-line impacts have been determined by traffic models used to predict patronage for GARL, as discussed above. Total patronage on GARL can be split into three categories:

- Air Passengers (forecast using GLAAM);
- Airport employees (forecast using GLEAM); and
- Non-Airport related traffic (SITM4 and the Incremental Mode Choice Model).

The main benefit is time-savings to public transport users and potential decongestion benefits. The forecast annual patronage for 2009 and 2030 is shown in the table below.

Table 12.3 Forecast Annual Patronage: Total Number of Trips

	2009	2030
Air passengers	456,000	828,000
Employees	94,000	150,000
Non-Airport related trips	838,000	871,000
Change in the number of trips on the existing services on the Paisley Gilmour Street to Glasgow Central Route	-573,000	-628,000
Total extra trips on rail	815,000	1,222,000
Total trips on GARL	1,388,000	1,849,000

From Table 12.3, the proportions of trips using GARL have been calculated. These percentages are shown in Table 12.4 below. It can be seen that initially nearly two thirds of trips on GARL will be non-airport related. However, by 2030 more than half of trips on GARL will relate to the airport.

Table 12.4 Total GARL Patronage by Trip Type

	2009	2030
Air passengers	33%	45%
Employees	7%	8%
Non Airport related trips	60%	47%
Total trips on GARL	100%	100%

It can be seen that the proportion of the GARL patronage originating/terminating at the airport is around 40% of total usage of the service in the early years of operation. This percentage increases over time due to the relatively rapid growth of the airport. By 2030 over 50% of the patronage will originate or terminate at the airport.

12.5.3.5 Off-Line Impacts

Table 12.5 presents the annual patronage on all services between Paisley Gilmour Street and Glasgow Central for the Do Minimum and Do Something scenarios for 2009 and 2030.

Table 12.5 Annual Patronage on all Services

Year	Without GARL ('000s)	With GARL ('000s)	Difference (%)
2009	7,364	7,585	3
2030	7,883	8,111	3

Increasing the frequency of the service between Paisley Gilmour Street and Glasgow Central from 8 trains per hour to 12, i.e. by 50%, increases the patronage on the corridor by 3%. This will be mostly due to reassignment from buses, with approximately 20% of the increase due to car person trips transferring to GARL in 2009, increasing to approximately 30% in 2030.

Table 12.6 below illustrates the modes from which the Air Passenger and Employees will switch their journeys in 2009 and 2030.

Table 12.6 Sources of Patronage

	Air Passengers		Employees	
	2009	2030	2009	2030
Car	35%	35%	22%	22%
Taxi	46%	46%	15%	15%
Bus	19%	20%	63%	63%

Analysis of the model shift shows that approximately 80% of the Air Passengers using GARL transfer from private car or taxi, along with 35% of Employees, contributing to relief of road congestion and the associated environmental benefits. This modal shift has therefore been assessed as a Major beneficial impact.

However, in terms of overall impact on traffic flows, modelling of flows on the M8 Results in 2009 with the GARL scheme (see Appendix 12), show the maximum reduction in traffic to be a 0.5% decrease in Inter Peak and PM Peak flow eastbound on the M8. In 2030 with the GARL scheme, the maximum reduction in traffic flows is a 0.8% decrease in PM Peak flows eastbound. This represents a very small change on the M8 and therefore the impact of the scheme on M8 traffic flows is Negligible.

12.5.3.6 Fuel Farm

Assuming that the new fuel farm operates on a like for like basis to the existing fuel farm there will be no net change in the impact of the facility. However, there will be a reduction in land side tanker movements

as a large proportion (more than half) of these would be confined to the air side only. This will therefore represent a Minor beneficial impact.

12.5.3.7 Paisley Moss Cycleway/Footpath

The cycleway/footpath that runs from St Andrew's Crescent towards and then across the Paisley Moss will be retained, although its route will cross the access into the new fuel farm. The new route will be realigned so that it crosses the access road at its narrowest point and crossing this road would be similar to any other crossing within the airport road network. As this is a permanent disruption to the cycleway/footpath there will be a Minor negative impact on this route.

12.6. Summary

The residual traffic and transport impacts associated with the scheme are summarised below. During construction there will be Minor to Moderate impacts. However, during operation there will be Negligible to Major Beneficial impacts, particularly due to the predicted modal shift from road to rail and also the increased capacity on the Main Railway Line due improvements to Wallneuk Junction and Arkleston Junction as well as construction of the third line between Arkleston Junction and Shields Junction.

Table 12.3 Summary of Impacts

Impact	Construction	Operation
Airport Access Roads	Minor Negative	Negligible
Airport Cycleway & Footpath	Minor Negative	Negligible
Paisley Moss Cycleway / Footpath	Moderate Negative	Minor Negative
Fuel Farm	Minor Negative	Minor Beneficial
M8 Bridge	Minor Negative	Negligible
St James' Park Access	Minor Negative	Negligible
A726/McFarlane Street	Minor Negative	Negligible
Murray Business Area Viaduct	Moderate Negative	Minor Negative
Clark Street	Minor Negative	Negligible
Murray St Embankment	Negligible	Negligible
Murray Street	Moderate Negative	Negligible
Utilities	Minor Negative	Negligible
Branch Line Junction	Minor Negative	Negligible
Main Line Works (in total)	Moderate Negative	Moderate Beneficial
Hillington Bridge (Sandwood Road)	Moderate Negative	Negligible
Other Bridges & Footbridges	Negligible	Negligible
General Construction Traffic	Minor Negative	N/A
Central Station: Pedestrians	Minor Negative	Negligible
Central Station: Trains	Minor Negative	Minor Beneficial
Central Station: Parking	Minor Negative	Minor Negative
Central Station: Disabled Parking	Minor Negative	Minor Negative
Central Station: Set Downs	Minor Negative	Minor Negative
Elderslie Loop	Minor Negative	Minor Beneficial
Permanent Street Closures	N/A	N/A
Off-Line Impacts (Modal Shift)	Minor Negative	Major Beneficial