

9. Environmental risk analysis

9.1 Approach

Environmental Assessment requirements for the SWRL were prepared by the Director-General of the Department of Planning (see Appendix A). These establish the requirements for preparation of the Environmental Assessment under Part 3A of the *Environmental Planning and Assessment Act 1979*.

The requirements were prepared following submission by TIDC to the Department of Planning of the SWRL Project Application and Preliminary Environmental Assessment (PB 2006) and the convening of a planning focus meeting attended by Government stakeholders.

The Director General's Environmental Assessment requirements for the SWRL project are provided in Appendix A. They focus on the following 10 key issues:

- interrelationship with land use and infrastructure planning
- corridor acquisition and land use
- traffic, transport, parking and access
- noise and vibration
- flooding and surface water
- flora and fauna
- Indigenous and non-Indigenous heritage
- visual and urban design
- social impacts
- economic impacts.

The environmental risk assessment in this document has been undertaken in accordance with the Director General's Environmental Assessment requirements. The assessment has also had regard to input from various government agencies and other stakeholders during the consultation process. In addition to the 10 'key issues' prescribed by the Director-General's Environmental Assessment requirements, TIDC has also identified and assessed, in this document, a number of other environmental issues. For the purposes of this document, the assessment of the first two 'key issues' listed above has been combined and is documented as an assessment of 'Land use, property and infrastructure planning' in Chapter 10.

9.2 Key and other environmental issues

Table 9-1 provides a summary of the environmental risk analysis identifying the ‘key’ and ‘other’ environmental issues relating to the SWRL project. Further discussion of the key issues is provided in Chapters 10 to 18 of this report. The environmental issues identified as ‘other’ would be of more minor consequence and can be managed through appropriate management actions and mitigation measures, as identified in Table 9-1 and discussed further in Chapter 19.

Table 9-1 Summary of environmental risk analysis

Issue	Potential impacts	Section of Environmental Assessment addressing impacts and management
<i>Key environmental issues</i>		
Noise and Vibration	Potential noise and vibration impacts would result from both the construction of the SWRL and the operation of trains along it. For existing properties near the rail corridor, a significant change in the acoustic environment would be expected to occur.	Chapter 12 and Technical Paper 5
Indigenous and non-Indigenous Heritage	There are a number of Indigenous and non-Indigenous heritage sites within the vicinity of the proposed SWRL corridor, which could be affected by the construction and/or operation of the project.	Chapter 15 and Technical Papers 6 and 7
Biodiversity	The project requires removal of areas of native vegetation (including endangered ecological communities) and habitats, including core habitats and support for core habitats. It could result in further fragmentation of the remnant bushland habitats, with the potential for a significant potential impact on biodiversity. A number of threatened species are known to exist along the corridor and could be subject to significant impacts.	Chapter 14 and Technical Paper 3
Traffic, transport, parking and access	The SWRL would have significant regional operational benefits for traffic, transport and accessibility. The SWRL would also be associated with impacts during the construction phase on local and regional traffic, existing station facilities (parking and access) and public transport services. The design of the SWRL has had regard to opportunities for the integration of transport modes, access and mobility considerations, pedestrian and cycleway provision to Western Sydney Parklands, and access to station and parking facilities.	Chapter 11 and Technical Paper 1
Flooding and changes in surface water hydraulics	The SWRL corridor traverses the Georges River and Hawkesbury-Nepean River Catchments and would require crossings to be constructed over a number of waterways. Much of the area is already flood-prone. Flood levels and flood hazard in flood-prone areas adjacent to the rail alignment would need to be considered in the design of certain structures associated with the construction and operation of the SWRL. SWRL waterway crossings have the potential to adversely affect hydrology and riparian communities/habitats.	Chapter 13 and Technical Paper 2 Chapters 13 and 14 and Technical Papers 2 and 3

Issue	Potential impacts	Section of Environmental Assessment addressing impacts and management
Visual impacts and urban design	<p>The proposed SWRL would create a dominant visual element in the landscape and may affect views from residential areas, open space/parkland and other facilities. These impacts would be reduced in the long term as the area is developed.</p> <p>Future design of the station precincts will require careful integration with the surrounding town centres.</p>	<p>Chapter 16</p> <p>Section 7.10 and Technical Paper 4 (Urban Design Analysis)</p>
Land use, property and infrastructure planning	<p>The predominant land uses along the SWRL corridor are planned to change significantly with development of the South West Growth Centre. The implications of the project in terms of ongoing planning in the Growth Centre (including planning for other transport infrastructure and any future extension of the SWRL) and the influence of the corridor on adjacent future land uses needs to be considered.</p> <p>The proposed corridor would also directly affect a number of existing land uses/properties.</p>	<p>Chapter 10</p>
Social impacts	<p>The SWRL would produce major social benefits with regard to improved accessibility, connectivity and transport choice and affordability. Social impacts on community facilities and services would have the potential to occur during construction and operation of the proposed SWRL. Specific impacts could include community severance, impacts of relocation of directly affected residents/business, access impacts, amenity impacts during construction and impacts on property values.</p>	<p>Chapter 17 and Technical Paper 8</p>
Economic impacts	<p>The SWRL would have potential direct and indirect impacts on local businesses and regional economic impacts on surrounding centres.</p> <p>Regional economic benefits would be associated with increased accessibility across the region and there would be reduced socio-economic costs associated with reduced road congestion, air pollution and road accidents, and improved transport affordability.</p>	<p>Chapter 18</p>
<i>Other environmental issues</i>		
Air quality and greenhouse gases	<p>Construction of the SWRL would be associated with a temporary increase in air pollution and greenhouse gas emissions, which would be off-set by the likely mode shift from private cars to public transport as a result of the development. Standard environmental management measures are available to adequately manage and mitigate potential construction impacts on air quality.</p>	<p>Chapter 19 and Statement of Commitments</p>
Hazard and risk	<p>Hazards and risk would be associated with construction of the SWRL, particularly over/under major roads/freeways, and within the operational rail corridor, including the storage and use of hazardous materials and heavy machinery. However, standard environmental management measures are available to adequately manage and mitigate potential impacts.</p>	<p>Chapter 19 and Statement of Commitments</p>
Public safety	<p>The SWRL would be associated with out of hours site security issues during construction and operation. However, standard environmental management measures are available to adequately manage and mitigate impacts.</p>	<p>Chapter 19 and Statement of Commitments</p>

Issue	Potential impacts	Section of Environmental Assessment addressing impacts and management
Services and utilities	<p>Given the public safety issues presented by the Sydney Water Supply Canal and the importance of this infrastructure to the supply of water to Sydney, the continued exclusion of public access to the Sydney Water Supply Canal throughout construction and operation of the project needs to be ensured.</p> <p>There are a number of existing services crossing the SWRL corridor. Consequently there is potential for damage to occur to existing services/utilities during construction of the SWRL, with the potential for disruption to services, inconvenience or potentially hazardous situations.</p>	Chapter 19 and Statement of Commitments
Soils and water quality and groundwater	<p>Standard environmental management measures are available to adequately manage and mitigate potential impacts, including any necessary relocations.</p> <p>Soil erosion and sedimentation of nearby waters (including the Sydney Water Supply Canal) could occur during construction and there is the potential for saline groundwater to affect foundations and in deep cuttings. Standard environmental management measures are available to adequately manage and mitigate potential impacts.</p>	Chapter 19 and Statement of Commitments
Waste, energy and demand on resources	<p>The SWRL would be associated with the generation of various construction wastes, increased energy use and increased demand on local and regional resources. However, the potential impacts of these are likely to be manageable.</p>	Chapter 19 and Statement of Commitments
Contaminated land	<p>Land within the Edmondson Park release area was formerly occupied by the Ingleburn Military Camp. As such, there is a potential for buried ordnance (artillery) to be encountered. Additionally, works at Glenfield North Junction would impinge on the edge of the Glenfield Waste Facility land, which could include contaminated/hazardous materials. Current and former agricultural land may be contaminated with materials such as pesticides. Standard environmental management measures are available to adequately manage and mitigate potential impacts; although some further assessment of existing contamination is required.</p>	Chapter 19 and Statement of Commitments

10. Land use, property and infrastructure planning

Existing and future land use and property along the SWRL corridor alignment is described in Sections 5.1.1 and 5.3. The land use and infrastructure planning context for the area was also discussed in Chapter 2. Potential impacts of the SWRL on land uses (including severance and sterilisation), property (including land acquisition) and land use/infrastructure planning are described in this Chapter.

10.1 Impacts on land use planning and infrastructure development

10.1.1 Land use and precinct planning

Construction of the SWRL is currently proposed to commence in 2009, with operation in 2012. Development of the SWRL within this timeframe would make the project the first major infrastructure item delivered within the Leppington area as part of implementation of the South West Growth Centre Structure Plan. As such, the SWRL, together with the first precincts for development (Oran Park and Edmondson Park), are expected to act as drivers of land use change in the South West Growth Centre, particularly in Leppington.

The SWRL corridor would pass through the Western Sydney Parklands and the Edmondson Park, Leppington North, Leppington and Rossmore precincts identified in the recently gazetted State Environmental Planning Policy (Sydney Growth Centres) 2006 (see Figure 3-6). All future land use planning for Leppington North, Leppington and Rossmore precincts would need to make allowance for the SWRL and its potential land use impacts. The SWRL is already accommodated in the zoning of the eastern portion of the Edmondson Park precinct.

The development of the SWRL would coincide with the development of the Edmondson Park release area. Landcom, which is currently a major landholder in the release area and likely to become a leading developer in the release area, anticipates its first lots being available in 2008 (Landcom 2006). (Landcom is a State-owned corporation and is the development arm of the NSW Government.) Development of Edmondson Park town centre is likely to have commenced by 2009 when the SWRL commences construction.

The SWRL concept has been developed in general accordance with the land use planning objectives and initiatives of the Metropolitan Strategy. Specifically:

- The proposed alignment of the SWRL is generally in accordance with one of the two alignment alternatives recognised during preparation of the Metropolitan Strategy.
- The proposed alignment of the SWRL is within the transport corridor contained in the Edmondson Park release area rezoning, including the deferred area in the north-west of the release area.
- The proposed Leppington and Edmondson Park Stations are located at the proposed Leppington regional centre and Edmondson Park town centre respectively.

Development of the SWRL would support and create opportunities for the intense land use changes proposed at the Leppington regional centre and the Edmondson Park town centre.

The viability of the proposed retail and high density residential development at these centres would be improved as a result of the commencement of passenger train services at the stations proposed in these centres.

The SWRL is also expected to encourage the concentration of jobs in centres that support the use of the rail link (e.g. retail and office employment rather than employment in trades).

More broadly, the commencement of operation of the SWRL in 2012 is expected to drive development across the South West Growth Centre, because Leppington is located at the intersection of two corridors of urban development, one running east–west and the other running south–west. Also, the development of the SWRL during the earlier stages of development of the South West Growth Centre is likely to encourage public transport patronage by residents and visitors to the area. Lower public transport patronage would be likely if the SWRL were to be built during the later stages of development of the South West Growth Centre if private vehicle use had already become the dominant mode of transport, as a change in transport patterns would be required. The potential for buses to satisfy the transport needs of the first stages of the development of the South West Growth Centre may partially diminish this benefit.

While the early development of the SWRL is expected to encourage the land use change proposed in the Metropolitan Strategy, it would also have a significant influence on the future urban form, particularly in Leppington and Edmondson Park. Assuming the Leppington major centre is designed and developed in accordance with best practice design principles (i.e. integration of land use and transport), development of the SWRL would establish the focus for future modifications to the location of the centres themselves, the surrounding road alignments, transport interchanges, bus networks and medium density residential development. The South West Growth Centre Structure Plan guides development over 25 to 30 years.

The project would strongly influence planning of the proposed major town centre at Leppington. The proposed SWRL corridor and Leppington Station could create a physical barrier; although this would be minimised by the proposed location of the Station in a cutting (which would also minimise potential noise and visual impacts). However, the Station and interchange would also provide a hub for activity in the town centre, particularly given its proposed location in a cutting. Masterplanning of the town centre would be required to optimise transport accessibility benefits of the Station and minimise the potential impacts of severance caused by the proposed SWRL corridor by optimising the number and location of corridor crossings.

Masterplanning of the town centre would need to carefully consider the location of land uses associated with the Station, including the provision of commuter parking and a bus interchange. The masterplan would need to ensure that commuter parking provision and bus interchange are appropriately sized and located relative to both Leppington Station and the town centre. It would also need to address potential security issues around the station, interchange and commuter parking area, and between these locations and the town centre.

Masterplanning for the Rossmore precinct would also need to consider the physical barrier created by the proposed train stabling facility and the potential severance caused by this facility. Surrounding land uses would need to be compatible with the noise, light spill and 24-hour operation of the facility; although the partial location of the facility in a cutting would help to minimise potential noise and visual impacts. Other parts of the facility would be at grade or on embankment and, therefore, mitigation of potential noise and visual impacts

would be more difficult. Light industrial uses would be compatible with the stabling facility and are indicated as the recommended future land use for this area in Figure 5-9.

10.1.2 Passenger and rail freight infrastructure

A number of other passenger and rail freight infrastructure projects are proposed in the vicinity of the SWRL. The potential impacts, if any, of the SWRL on these projects are discussed in this Section.

Proposed Southern Sydney Freight Line (SSFL)

From north of Glenfield Station to north of Ingleburn Station, the proposed SSFL would use an existing dedicated freight track along the western side of the Main South Line corridor. The proposed SWRL would require relocation of this existing freight track in the vicinity of the proposed Glenfield South Junction to a parallel alignment to the west of its present location. This is to ensure that the rail corridor can be widened to accommodate the additional tracks required for the flyover ramps (Connell Wagner 2006b).

The proposed reconfiguration of Glenfield Station is designed to enable the SSFL to operate independently of passenger train services. The SWRL would cross over the proposed SSFL at Glenfield South Junction.

Construction of the proposed SSFL is scheduled to commence in late 2006 and continue for up to 2.5 years (Australian Rail Track Corporation 2006). Therefore, construction of the proposed SSFL should be completed prior to the anticipated commencement of construction of the SWRL in 2009. As construction of the SWRL would closely follow construction of the proposed SSFL, land uses in the community of Glenfield would be located adjacent to major construction works for an extended period of time.

Future dedicated freight line

The proposed SSFL, including the proposed flyover north of Glenfield North Junction, has been designed to enable the potential future development of a dedicated freight line along the eastern side of the existing Main South Line corridor in the long term. This potential future freight line would connect the Southern Sydney Freight Line on the northern side of the proposed flyover to the existing Macarthur Intermodal Shipping Terminal at Minto, and on the eastern side of the Main South Line corridor. The line would enable freight trains to access the Macarthur terminal from the SSFL without having to use the RailCorp network. The Glenfield Junction and Station works proposed as part of the SWRL would not preclude this potential future track.

Rail Clearways Program

The NSW Government's Rail Clearways Program comprises 15 key projects that will separate the CityRail network's 14 metropolitan rail routes into five independent clearways. The SWRL would operate on Sector 2 as described in Chapter 8. The Program is due for completion in 2010. The SWRL would not affect any of the Rail Clearway Program projects.

Kingsgrove to Revesby Quadruplication project

Quadruplication of the East Hills Line between Kingsgrove and Revesby is proposed by TIDC to enable the complete physical separation of slow and express services operating on the line. The project is currently at the concept design stage and, if the project were to proceed, construction would likely commence in mid-2008 and be complete in 2010 (TIDC

2006b). The project is required as a precursor to the SWRL as it would provide the additional capacity on the East Hills Line to run the additional trains.

Train stabling

The train stabling facility would supplement existing passenger train stabling facilities on the CityRail network. As discussed in Chapter 2 (Project need), if stabling is not provided on the SWRL at Leppington, additional train stabling would be required at Campbelltown or elsewhere on the outer metropolitan network.

10.1.3 Other infrastructure planning

Infrastructure proposed for the South West Growth Centre is identified in the Preliminary Infrastructure Report for the North West and South West Growth Centres (NSW Government 2005) and Chapter 2 (Project Need). As described in Chapter 2, proposed transport infrastructure relevant to the SWRL includes:

- an upgrade of Campbelltown Road including between Camden Valley Way and Zouch Road
- an upgrade of Bringelly Road
- an upgrade of Camden Valley Way, including between Bringelly Road and Cowpasture Road (south)
- an upgrade of Eastern Road between Bringelly Road and Alma Road from two lanes to four lanes
- an upgrade of Ingleburn Road between Camden Valley Way and Eastern Road
- an upgrade of Rickard Road between Bringelly Road and Heath Road from two lanes to four lanes
- a bus-rail interchange at Leppington
- regional bus corridors, including between Leppington and Ingleburn, Liverpool, Narellan, Oran Park and Rossmore (NSW Government 2005).

The SWRL concept has been designed to take account of the proposed transport infrastructure planning, where necessary. The proposed road crossings have been designed to allow for the proposed road widenings (including Camden Valley Way) and a bus interchange is proposed at Leppington Station as part of the concept. The SWRL would, however, provide a constraint to future projects to alter the alignment and/or width of road upgrades and modifications to bus routes.

Other proposed infrastructure in the South West Growth Centre includes schools, a TAFE college, community and primary health centre, emergency services, open spaces and water and wastewater infrastructure. A number of these facilities are expected to be located within or in close proximity to Leppington town centre due to the accessibility of the town centre and its geographic location near the centre of the South West Growth Centre. The exact location of social, health, education and recreational infrastructure within the precincts surrounding the SWRL would be determined during the future precinct planning.

The location of social, health, education and recreational infrastructure at Edmondson Park is reflected in the rezoning (see Figure 5-9) and the draft Section 94 contributions plan for the release area. Infrastructure proposed at or in proximity to Edmondson Park town centre includes a regional park, high school and district level social facilities (library and district level community centre and youth centre) (Civitas Partnership 2004).

10.1.4 SWRL potential future extension

The SWRL has been designed so as not to preclude future extension beyond Leppington. The western endpoint of the SWRL corridor would define the starting point for any future extension planning. This will need to be considered in the future precinct and transport planning. Any project for future extension of the SWRL would be the subject to further environmental assessment and approval.

10.2 Existing and future land use and property impacts

10.2.1 Directly affected properties

Construction

Properties identified as being directly affected include properties crossed by the proposed SWRL corridor itself, and construction work sites, storage areas and access routes. Construction impacts on property would be temporary. Properties identified as being directly affected by construction of the SWRL concept are shown in Figure 8-2 and include:

- a site compound in the south-western corner of the Glenfield Waste Facility at the junction of the East Hills Line and Main South Line, to enable construction of the proposed Glenfield North Junction flyover
- construction sites in road reserves either side of the Main South Line between Glenfield North Junction and Glenfield South Junction
- a construction site and construction access route in the James Meehan Estate to enable construction of the proposed Glenfield South Junction flyover and Hume Highway crossing (The James Meehan Estate is owned by the Department of Planning.)
- a 25 metre wide access road to Edmondson Park Station from the north across private property, a construction site at the Station on vacant land owned by Landcom and rural-residential land use in Edmondson Park
- access to a culvert under the SWRL corridor across rural-residential land use in Edmondson Park
- a construction site on part of the Western Sydney Parklands on the southern side of Camden Valley Way
- various construction sites on rural-residential land in Leppington to enable construction of road crossings, stockpiling of fill and the Leppington Station and stabling facility.

As the SWRL project has only been developed to a concept stage, the proposed work compounds identified in Chapter 8 are subject to change as the design and construction plan develops.

Operation

If concept approval for the SWRL is obtained, the proposed SWRL corridor shown in Figures 7-1a to 7-1d would be permanently acquired. The corridor would generally be 40 metres in width. Wider strips of land would be permanently acquired for the proposed Edmondson Park and Leppington Stations and the train stabling facility. Additional land is also likely to be required for bus interchanges, commuter parking, access to the stabling facility and ancillary facilities including power supply and drainage services.

Potential permanent impacts on directly affected properties are detailed in Table 10-1.

Acquisition of land would be by agreement or compulsory process in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991*. The Department of Planning is currently responsible for acquiring land for the project, and is authorised to acquire land by compulsory process under the Act.

The Department of Planning has commenced negotiations for acquisition of properties that would be directly affected by the SWRL and which would be affected by the SWRL corridor's future inclusion in an environmental planning instrument, including a local environmental plan or state environmental planning policy. Under the Act, the owners of land within the zoned rail corridor may require the Department of Planning to acquire their property where they would suffer hardship if there is any delay in the acquisition of the land.

Acquired land deemed surplus at the completion of the construction of the SWRL would be available for disposal.

Table 10-1 Summary of directly affected properties (permanent impacts)

Land ownership and existing land use	Full acquisition	Partial acquisition	Total
<i>Private ownership</i>			
Rural-residential lots (Edmondson Park)	7	5	12
Rural residential lots (Leppington)	32	10	42
Sub-total	39	15	54
<i>Government ownership</i>			
Department of Planning	-	13	13
Sydney Catchment Authority	-	1	1
Public roads	-	9	9
Commonwealth land (former Ingleburn Army Camp)	-	3	3
Landcom	-	2	2
Sub-total	0	28	28
TOTAL	39	43	82

Direct property impacts could have social consequences for owners of the properties affected, as detailed in Chapter 17 (Social). However, the direct property impact of the SWRL must be considered in the context of the proposed development of the wider South West Growth Centre (i.e. many of these properties are likely to be subject to future redevelopment as identified in the South West Growth Centre Structure Plan).

10.2.2 Land use severance and sterilisation

The design of the SWRL corridor has sought to minimise land severance and sterilisation. Land use severance in the context of this assessment refers to the creation of a physical barrier between a property and the existing road access to that property. Land use sterilisation refers to the situation where properties/land uses are severed into fragments of a size and/or shape that makes use of that land unfeasible. In the case of the SWRL project, this only relates to properties east of the Forest Lawn Memorial Gardens Cemetery, as all private properties to the west of the Cemetery are to be fully acquired.

The land acquisition strategy for the SWRL corridor addresses issues of land severance and sterilisation. Where there is potential for the SWRL corridor to cause land severance or sterilisation, the strategy identifies the affected lots for acquisition in their entirety. Rectification of land severance could then occur by amalgamating lots and creating new accesses to the affected properties. The Department of Planning is expected to amalgamate any surplus land in its ownership that has been severed and/or sterilised by the project into marketable parcels and sold.

Edmondson Park

The SWRL corridor passes directly through the Edmondson Park release area and would, therefore, heavily influence the ongoing locality planning for the area. However, the rezoning of the Edmondson Park release area, gazetted in March 2006, partially addressed the potential for land severance and sterilisation by the SWRL corridor within the release area. Ongoing planning of the precinct localities is also expected to address these issues. Should the proposed SWRL corridor be approved, the proposed zoning of the 'deferred area' would need to be reviewed.

Western Sydney Parklands

The SWRL would bisect Sub-precinct 9.7 of the Western Sydney Parklands. The SWRL would be on an embankment through this section of the parklands. The portion of the parklands on the southern side of the SWRL would be severed. The severed portions of these lots would be inaccessible from Camden Valley Way. The only existing access to the severed land would be from the Forest Lawn Memorial Cemetery and Cassidy Street in Denham Court.

The SWRL would run through the northern portion of Sub-precinct 9.6 of the Western Sydney Parklands. The SWRL would be on a high embankment through this section of the parklands. There would be no access across the SWRL between the northern and southern section of the sub-precinct. The northern portion of the sub-precinct would remain accessible from the proposed entrance to the parklands on Bringelly Road just west of the intersection with Camden Valley Way and Cowpasture Road. The portion of the parklands on the southern side of the SWRL would be accessible from Camden Valley Way to the east.

Planning for the Western Sydney Parklands in Precinct 9 is at an early stage only and there is potential for further planning of the precinct to address the SWRL corridor.

Consultation will be undertaken with the Department of Planning to ensure the rail line can be integrated with planning for sub-precincts 9.7 and 9.6 of the Western Sydney Parklands and, where relevant, appropriate measures will be implemented to minimise the visual, noise and access impacts of the project on these sub-precincts.

Leppington and Rossmore

The SWRL would bisect a number of lots in Leppington and Rossmore. All the affected lots are proposed for acquisition in their entirety, thereby avoiding severance of individual properties and accesses. The wider issue of severance of the precincts would need to be addressed in the future precinct planning of the area. TIDC would liaise with agencies responsible for future precinct planning in Leppington and Rossmore to ensure the detailed design of the SWRL makes allowance for measures to improve connectivity across the corridor to mitigate potential severance impacts, including opportunities for pedestrian bridges and other access.

10.2.3 Adjacent land uses

Construction of the SWRL would adversely affect the amenity of some adjoining land uses during construction due to:

- noise from construction vehicles
- dust generated by construction vehicles and construction works
- traffic disruptions caused by construction traffic
- potential visual impacts caused by land clearing, stockpiles and construction vehicles and equipment.

As the works at Glenfield would occur immediately after the proposed Southern Sydney Freight Line works, there is potential for these land uses to experience 'construction fatigue'.

Operation of the SWRL would adversely affect the amenity of some adjoining land uses due to:

- noise including noise from train operations, station activities (e.g. station announcements), stabling activities (e.g. horn testing) and maintenance activities
- visual intrusion
- commuter traffic accessing rail stations
- shadowing where the SWRL is developed on an embankment or where noise walls are proposed.

Operation of the SWRL is also expected to influence future land use and urban design by:

- encouraging land uses either side of the SWRL corridor that would buffer sensitive receivers from potential noise, vibration and visual impacts (Examples of buffering land uses include linear open space corridors like cycleways, other open spaces and roads)
- encouraging planning controls requiring residential set-backs from the corridor
- encouraging land uses either side of the SWRL corridor that are not sensitive to the potential noise and visual impacts of the project
- encouraging urban design that minimises potential noise and vibration impacts on any future residential development alongside the SWRL corridor (e.g. acoustic treatment of dwellings and configuring dwelling layouts to minimise potential impacts to living areas)
- encouraging maximum complimentary land uses in the vicinity of the train stabling facility, due to potential noise, light spill and traffic impacts (Light industrial land use is recommended for this area and has been shown as such in Figure 5-9.)

- facilitating high intensity land use in the vicinity of the Leppington and Edmondson Park Stations, including retail, commercial and high density residential development
- focusing transport interchange at the Leppington and Edmondson Park Stations.

All of the above issues have been considered in this Environmental Assessment.

10.3 Recommendations for further assessment and mitigation

Further assessment

The following further assessments of land use and property impacts of the SWRL are required in the next phase of the project:

- more detailed assessment of the land use and property impacts of the proposed Edmondson Park and Leppington Stations and surrounding infrastructure
- confirmation of the location of construction sites
- detailed assessment to define the footprint of the SWRL and, therefore, confirm the full extent of properties directly affected, including survey, geotechnical investigations and detailed design of batter slopes.

Although this Concept Plan and Environmental Assessment identifies the potential impacts of the SWRL corridor in regard to these issues, the corridor is yet to be surveyed and geotechnical and other investigations are required to confirm the precise extent of the footprint.

Management/mitigation

To minimise the land use and property impacts of the SWRL, the following measures should be considered:

- consultation with the Department of Planning to ensure the feasibility of land uses proposed for sub-precincts 9.7 and 9.6 of the Western Sydney Parklands and appropriate measures are implemented to minimise the visual, noise and access impacts of the proposal on these sub-precincts
- preparation of a Land Asset Management Plan to address 'land surplus to use', post construction will be developed in consultation with Growth Centres Commission (and Councils where relevant). This plan would investigate opportunities for land amalgamation of parcels severed by the SWRL and identify opportunities for development that is consistent with land use planning, in particular the South West Growth Centre Structure Plan.
- liaison with agencies responsible for future precinct planning in the South West Growth Centre to ensure the detailed design of the SWRL makes allowance for:
 - any required measures to improve connectivity across the corridor to mitigate severance impacts, including opportunities for pedestrian bridges and other access
 - potential collocation of utilities or other beneficial land uses of the rail corridor
 - planning and allowing for utility crossings of the rail corridor.

