16. Visual

This Chapter assesses the potential visual impacts of the proposed SWRL concept.

The visual impact assessment places special emphasis on identifying impacts to potential viewers from surrounding properties and potential future land uses. It also assesses general visual impacts in terms of landscape character, scenic quality, landscape significance and visual/landscape sensitivity. Mitigation measures have been recommended to reduce the potential extent of visual impact.

For the purposes of the visual assessment, the 'study area' has been broadly defined as the visual catchment of the proposed SWRL, which includes all surrounding areas from where the project would be likely to be seen. It concentrates on potential viewers within one kilometre of the proposed SWRL corridor.

A Technical Paper (Technical Paper 4) has also been prepared to address specific urban design considerations around Glenfield Station, the two new planned stations at Leppington and Edmondson Park and the proposed train stabling facility. Sites identified as having heritage values are also addressed in more detail in Chapter 15.

16.1 Assessment approach

The visual assessment approach for the SWRL is outlined in Figure 16-1.

The assessment approach applied to the visual impact assessment is consistent with a system first developed by the United States Forestry Service (1974) and since adapted for use in Australia (NSW Department of Planning 1988; Forestry Commission of Tasmania 1990; Queensland Main Roads 1997; Australian Council of National Trust 2004).

A specific assessment approach has been tailored that addresses the most notable visual issues associated with the project. The main visual issues identified include:

- potential impacts of the actual rail corridor construction (including vegetation loss) on the mostly semi-rural landscape that would exist at the time of opening of the SWRL
- potential impacts on viewing locations within one kilometre of the SWRL corridor, where there is potential for foreground views
- changes in impact that could occur over time as the planned land use changes occur
- opportunities to reduce the extent of potential impact.

To assess these issues, Sections 5.1.5 (existing visual environment) and 5.3.6 (future visual environment) describe:

- site context — This is described to develop an understanding of the visual and wider landscape in the study area.
- existing and future visual environment — The study area was divided into visual units. For each unit, the existing scenic resources were described and assessed (in regard to landscape character, scenic quality, sensitivity and visibility) and future planned changes for each unit were identified.

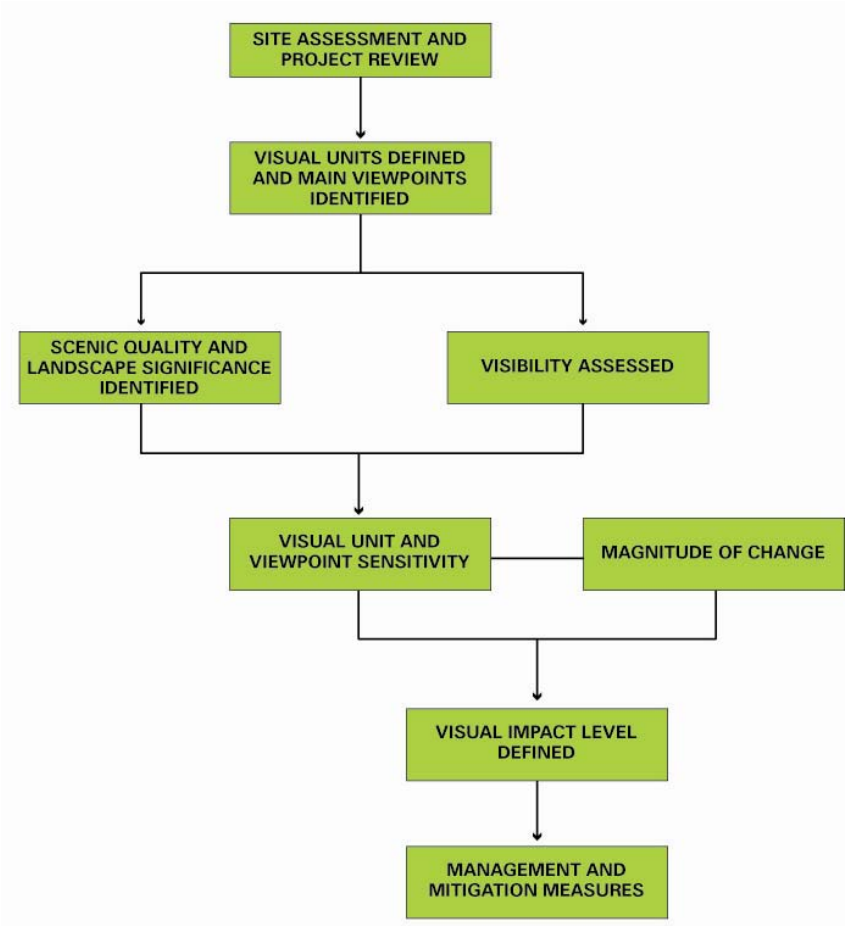

Figure 16-1 Visual assessment approach

This Chapter assesses the following:

- visual impact assessment on opening — Potential impacts on the visual environment at the estimated time of opening of the SWRL (in 2012) were assessed, with particular regard to the main foreground viewpoints.
- visual impact assessment with likely future land use changes — The implications of the potential visual impact within the context of future planned development were assessed.
- proposed management and mitigation measures.

Assessing the likely impact of the proposed SWRL on planned/likely future land use change is problematic, as the relative timing of both is uncertain for any particular point in time and, other than around Edmondson Park, the precinct planning is yet to be undertaken. That is, it is unknown where precisely the land use change would have occurred by the time the SWRL is constructed, and indeed what the timing of the wider South West Growth Centre development will be post-construction of the SWRL. To address this problem, this assessment has adopted the 'on opening scenario' to mean the existing visual environment at the approximate time the assessment was undertaken, taking into account as far as possible other likely planned development that would have occurred by 2012.

Potential impacts on areas that are likely to experience planned land use change after the SWRL is constructed have been separately assessed.

Potential visual impacts on the Sydney Water Canal were not addressed as part of the visual assessment, as any potential impacts were more appropriately assessed in the heritage assessment for the project (see Chapter 15). Potential visual impacts on Hurlstone Agricultural High School, Cowpasture Road, Camden Valley Way and the Ingleburn Military Camp are also only broadly addressed in this Chapter, as these locations are also considered in Chapter 15.

The assessment approach is described in further detail in Appendix D.

16.2 Visual impacts

16.2.1 Potential visual impacts during construction

The proposed SWRL would take approximately 3 years to construct and a number of major work sites are proposed. A site compound would be established on the eastern side of the northern Glenfield flyover to service the construction works. Major work sites would be located at sites such as the flyovers, bridge locations, near the Hume Highway, the three stations and stabling facility as described in Chapter 8.

There may be temporary visual impacts to surrounding residents and from nearby roads when these sites are in use. Visual changes would include security fencing, temporary material storage, heavy machinery and structures as these are constructed. In some instances, it may be appropriate to consider additional material screening of security fencing to minimise views of the site when in sensitive areas. Work and compound sites should also be kept in a tidy condition and kept within clearly defined boundaries.

16.2.2 Potential visual impacts on opening of SWRL (2012)

This Section describes the main potential visual changes and impacts for each visual unit at the time of opening of the SWRL in 2012, focusing on impacts to the main foreground viewpoints within that catchment (i.e. those within a 1 kilometre distance). These main viewpoints have been identified from on-site analysis, topographic maps, aerial topography, previous studies (particularly Connell Wagner, 2003a) and other available, relevant information. The viewpoints are illustrated on Figure 16-2, which also shows the approximate visual separations of 500 metres and 1 kilometre from the proposed SWRL corridor; although not all those within these distances would be able to see it. Figure 16-2 also shows the location of photomontages prepared for key views of the SWRL, which are included in this Chapter.

For each of the identified viewpoints, the visual change is summarised, and the ‘sensitivity’ of the location and ‘magnitude of change’ has been considered and given a ranking of low, moderate or high. These two aspects (sensitivity and magnitude of impact), were then combined to give an overall indication of the potential visual impact as either low, moderate or high.

Of the 21 identified main viewpoints on Figure 16-2, 15 have been assessed as experiencing a potential visual impact of moderate or higher at the time of opening of the SWRL (2012). Management and mitigation measures that could reduce the potential visual impact of the project on many of these viewers are discussed later in this Section.

Figure 16-2 Visual units, view points and photomontage locations

Note: Not all locations within 1 km boundary would be able to see SWRL

Unit 1 – Glenfield Junction (including Station)

The main visual changes within this unit would comprise:

- additional running tracks through the Station, with crossovers and flyovers north (Glenfield North Junction) and south (Glenfield South Junction) of the Station
- new platform and track constructed on eastern side of existing station, resulting in loss of kerbside parking lane along Railway Parade (some potential loss of street trees to south), and repositioning of the station platforms 80 metres to the north
- construction of a new overhead concourse with pedestrian access via stairs and lifts as part of a major reconfiguration of Glenfield Station
- potential need for acoustic barriers along Railway Parade, depending on the results of more detailed noise assessment.
- Figure 16-3 shows the before and after view from photomontage location A (view north from Cambridge Avenue, Glenfield).

The potential visual impact within this unit at the time of opening of the SWRL is summarised in Table 16-1 below.

Table 16-1 Unit 1 – Potential visual impact on opening (2012)

Viewpoint (refer Figure 5-5)	View changes	Sensitivity	Magnitude of change	Visual impact[1]
Viewpoint 1 South Casula and Glenfield Road	▪ Northern flyover evident, appearing as new high bridge-like structure	low	moderate to high (flyovers)	**LM** to **LH** (flyovers)
Viewpoint 2 Glenfield shopping centre and Glenfield Station	▪ New station platform and concourse ▪ Loss of kerbside lane opposite shops ▪ Increased visual scale and bulk of station ▪ Station platforms moved 80 metres north.	moderate	moderate	**MM**
Viewpoint 3 Residents in Railway Parade and further east, including Glenfield Park	▪ Southern flyover seen from some residents and from Glenfield Park	moderate	moderate	**MM**

Notes 1: LL – low, LM/ML – low to moderate, LH/MM – moderate, HM/MH – moderate to high, HH - high

Source: Caldis Cook (2006)

Figure 16-3 Before and after view from photomontage location A (view north, Cambridge Avenue, Glenfield)

Unit 2 – Glenfield to Hume Highway

The main visual changes within this unit would comprise:

- From the southern flyover (Glenfield South Junction), 600 metres south of Glenfield Station, new railway line would be constructed to along the proposed SWRL corridor
- The SWRL would be on an elevated embankment (up to 9 metres high at the highest point) for approximately two-thirds of the distance through this unit.
- The SWRL would then enter a cutting before passing through under the Hume Highway.

Figure 16-4 includes a before and after view from photomontage location B (view north from Macquarie Field House).

The potential visual impact within this unit at the time of opening of the SWRL is summarised in Table 16-2 below.

Table 16-2 Unit 2 – Potential visual impact on opening (2012)

Viewpoint (refer Figure 5-5)	View changes	Sensitivity	Magnitude of change	Visual impact[1]
Viewpoint 4 Macquarie Field House	▪ New railway evident in main outlook to north ▪ Would change existing semi-rural character with a dominant industrial-like element; although distant views still likely over 9 metre embankment	moderate	moderate	**MM**
Viewpoint 5 Hurlstone Agricultural High School (and other adjacent educational uses)	▪ Changes to scale of station due to new overhead concourses would increase urban nature of existing semi-rural outlook near entry ▪ Flyover to south evident (approx. 400 metres away) ▪ Railway on highest point of embankment would be within the foreground rural views from some parts of site, although set several metres lower	moderate	moderate	**MM**
Viewpoint 6 Macquarie Links	▪ Views of railway largely prevented by topography for existing lower urban area ▪ Newer areas to north, two storeys or more, may see part of SWRL	low	low	**LL**
Viewpoint 7 Hume Highway	▪ Due to topography and embankment beside the highway, fleeting, obscured views of SWRL would occur	moderate	low	**ML**

Notes 1: LL – low, LM/ML – low to moderate, LH/MM – moderate, HM/MH – moderate to high, HH - high

Source: Caldis Cook (2006)

Figure 16-4 Before and after view from photomontage location - (view north, Macquarie Field House)

Unit 3 –Hume Highway to Cabramatta Creek

The main visual changes within this unit would comprise:

- After passing under the Hume Highway, the SWRL would emerge from a cutting some 700 metres long, and cross over a short section of embankment.
- Campbelltown Road would be bridged by the SWRL, with approach embankments.
- The SWRL would then be at grade, except for a cutting up to 8 metres deep near the proposed Edmondson Park Station and another to the north of the station.
- The new Edmondson Park Station would also be constructed (in a cutting) and would include paid and unpaid concourse areas, pedestrian overbridges and adjoining facilities.

The location of Edmondson Park Station in a cutting would assist in minimising the potential visual impact of this facility. Figure 16-5 provides an indicative visual impression of Edmondson Park Station.

The potential visual impact within this unit at the time of opening of the SWRL is summarised in Table 16-3 below.

Table 16-3 Unit 3 – Potential visual impact on opening (2012)

Viewpoint (refer Figure 5-5)	View changes	Sensitivity	Magnitude of change	Visual impact[1]
Viewpoint 8 Campbelltown Road	▪ New bridge over Campbelltown Road and approach embankments seen from road (no nearby residents) ▪ Creation of generally a 40 metre corridor (widening around proposed station) that is currently densely vegetated ▪ Semi-rural nature of road greatly altered in vicinity of SWRL (although likely that development of Ingleburn Gardens would have occurred)	low	moderate	**LM**
Viewpoint 9 Rural-residential Croatia Ave (Edmondson Park)	▪ SWRL mostly in a cutting (up to 9 metres high)near current rural-residential (Croatia Avenue), although by 2012 some new planned residential development would have occurred as part of Edmondson Park ▪ SWRL only seen intermittently due to topography and intervening vegetation ▪ Loss of some additional dense vegetation along SWRL corridor, other than that lost by 2012 for new development ▪ some noise barriers may be required, depending on outcome of final noise assessment	moderate	high (some properties)	**MH**

Viewpoint (refer Figure 5-5)	View changes	Sensitivity	Magnitude of change	Visual impact[1]
Viewpoint 10 Ingleburn Military Camp	▪ SWRL in cutting, and vegetation would filter views from main camp area ▪ Top of overhead lines would be seen close to SWRL ▪ SWRL would become more obvious towards western edge when on low embankment ▪ Existing rural character diminished	moderate	moderate	**MM**

Notes 1: LL – low, LM/ML – low to moderate, LH/MM – moderate, HM/MH – moderate to high, HH - high

Unit 4 – Cabramatta Creek to Cowpasture Road

The main visual changes within this unit would comprise:

- At the eastern edge of this unit, the SWRL would cross Cabramatta Creek on an embankment approximately 4.5 metres high, with Cabramatta Creek bridged.
- It would then proceed on a low embankment until just west of Camden Valley Way.
- At Camden Valley Way a bridge would be constructed with approach embankments either side.
- Just west of Camden Valley Way, the SWRL would be in several sections of cutting up to eight metres deep.
- It would then be on a low embankment and bridge over the Sydney Water Supply Canal and rise towards Cowpasture Road.

Figure 16-6 provides a before and after view from photomontage location C (view north from the Forest Lawn Memorial Gardens Cemetery). Figure 16-7 provides a before and after view from photomontage location D (view north-east, Fox Valley Road, Denham Court). Figure 16-8 provides a before and after view from photomontage location E (view north-east, Camden Valley Way, Campbelltown).

Source: Caldis Cook (2006)

Figure 16-5 Visual impression of Edmondson Park Station (Indicative only)

Source: Caldis Cook (2006)

Figure 16-6 Before and after view from photomontage location C (view north, Forest Lawn Memorial Gardens Cemetery)

Source: Caldis Cook (2006)

Figure 16-7 Before and after view from photomontage location D (view north-east, Fox Valley Road, Denham Court)

Source: Caldis Cook (2006)

Figure 16-8 Before and after view from photomontage location E (view north-east, Camden Valley Way, Campbelltown)

The potential visual impact within this unit at the time of opening of the SWRL is summarised in Table 16-4 below.

Table 16-4 Unit 4 – Potential visual impact on opening (2012)

Viewpoint (refer Figure 5-5)	View changes	Sensitivity	Magnitude of change	Visual impact[1]
Viewpoint 11 Cabramatta Creek and rural-residential (Jardine Drive)	▪ Some residents on southern side of Jardine Drive (Edmondson Park) would see SWRL in close proximity (less than 250 metres), although by 2012 some new planned residential development would have occurred as part of Edmondson Park ▪ SWRL would be a dominant industrial-like structure in this existing semi-rural landscape ▪ some noise barriers may be required, depending on outcome of final noise assessment	high (closest residents)	moderate	**HM**
Viewpoint 12 Rural-residential in Denham Court (Culverston Ave & Cassidy St)	▪ Some residents in Cassidy St and Culverston Ave would see SWRL in close proximity (less than 250 metres) ▪ SWRL partially hidden in cutting ▪ Some dense vegetation would be removed ▪ Some noise barriers may be required, depending on outcome of final noise assessment	high (closest residents)	moderate	**HM**
Viewpoint 13 Denham Court viewshed	▪ Views from some parts of Denham Court estate, such as from Fox Valley Road (in addition to viewpoint 12) would potentially see intermittent views of the railway in the vicinity of Ingleburn Military Camp and a loss of vegetation along the rail corridor	moderate (identified as having some heritage value)	moderate	**MM**
Viewpoint 14 Forest Lawn Memorial Cemetery	▪ Views would be possible (unless screened) of SWRL on embankment, approximately 100 metres away from main building	high	moderate	**HM**

Viewpoint (refer Figure 5-5)	View changes	Sensitivity	Magnitude of change	Visual impact[1]
Viewpoint 15 Camden Valley Way	▪ Drivers on Camden Valley Way, which would have been widened by 2012, would see a new rail bridge over the road with approach embankments up to 8 metres high ▪ Vegetation alongside the road and along the SWRL corridor would be removed ▪ The rural character of the road would further decrease around this location and views along it would be interrupted,	moderate	moderate	**MM**
Viewpoint 16 Bringelly Road	▪ Area of SWRL closest to Bringelly Road would be hidden within cutting ▪ Partial views of SWRL east and west of cutting	moderate	moderate	**MM**
Viewpoint 17 Casa Paloma Caravan Park	▪ Caravan park approximately 400 metres away and screened by intervening vegetation	low	low	**LL**

Notes 1: LL – low, LM/ML – low to moderate, LH/MM – moderate, HM/MH – moderate to high, HH - high

Unit 5 – Leppington, west of Cowpasture Road

The main visual changes within this unit would comprise:

- The SWRL would cross Cowpasture Road on embankment, with the road bridged.
- West of Cowpasture Road, the embankment would continue to decrease in height until near Bonds Creek, where a culvert or bridge would be constructed.
- It would then enter a cutting (about 8 metres deep) to pass under Rickard Road, where Leppington Station would be constructed immediately west.
- Leppington Station would include paid and unpaid concourse areas, pedestrian overbridges and associated facilities.
- West of the Station, the SWRL would be on embankment (up to 11 metres high) to bridge over Dickson Road, then within a small cutting west of Dickson Road.
- From there, until the train stabling facility west of Leppington Station, the SWRL would be generally at grade.

The stabling facility would cover an area approximately 500 metres long and 200 metres wide. It would consist of a collection of rail lines in an open air setting, with associated facilities, including a number of buildings (maximum two storeys) for offices and maintenance operations. It would be fenced and would have security lighting. The facility itself would be lit with low level bollard lighting (which is the standard lighting for stabling yards). Potential light spill impacts are further discussed in Section 16.5. Noise walls would be likely to be required around the stabling facility (see Chapter 12).

The location of Leppington Station and the stabling facility, partially in cuttings, would assist in minimising potential visual impacts of these facilities.

Figure 16-9 provides an indicative visual impression of Leppington Station.

The potential visual impact within this unit at the time of opening of the SWRL is summarised in Table 16-5 below.

Table 16-5 Unit 5 – Potential visual impact on opening (2012)

Viewpoint (refer Figure 5-5)	View changes	Sensitivity	Magnitude of change	Visual impact[1]
Viewpoint 18 Cowpasture Road and Rickard Road	▪ SWRL on an 8 metres embankment would be very visible in the foreground views of approximately 45 semi-rural properties within 250 metres, near Cowpasture Road ▪ Views across this fairly flat landscape would be blocked ▪ Rural character substantially decreased by rail structure	moderate	high	**MH**
Viewpoint 19 Semi-rural areas (Rickard Road to Eastwood Road)	▪ Over 40 semi-rural properties lie within 250 metres, but cutting around Rickard Road would hide SWRL from some residents' views ▪ Rural character substantially decreased by rail structure	moderate	high	**MH**
Viewpoint 20 Kemps Creek	▪ Kemps Creek crossed in a culvert or bridge ▪ Some limited vegetation removed	moderate	high	**MH**
Viewpoint 21 McCann Road properties	▪ Over 20 semi-rural properties lie within 250m of SWRL, which would be at grade or on low embankment, then in small cutting around stabling facility ▪ Rural character substantially decreased by industrial-like structure	moderate	high	**MH**

Notes 1: LL – low, LM/ML – low to moderate, LH/MM – moderate, HM/MH – moderate to high, HH - high

16.2.3 Visual impact with future planned development

The main changes associated with the planned future development in the area would occur in Units 2, 3, 4 and 5.

In general, the potential visual impact of the SWRL would be reduced by the planned substantial increase in urban development. The SWRL would become less visually obtrusive, as it would be more integrated into the overall urban fabric than it would be in the current rural and semi-rural areas. Its character would also be more compatible with the future planned urban development, rather than the existing semi-rural, rural and bushland character. As these new areas are planned to be developed with the SWRL as a key element, there are opportunities for good urban design measures to be included in the future planning of these precincts and the SWRL itself to minimise potential visual impacts and create a corridor that becomes a transport and recreational asset.

Source: Caldis Cook (2006)

Figure 16-9 Visual impression of Leppington Station (Indicative only)

The potential visual impact of the stabling facility could be reduced by appropriate land use zoning. For example, light industrial land uses would have a lower visual sensitivity than a residential setting. The location of the stabling facility and stations within cuttings would make them less visually obvious from surrounding areas.

New planned areas with the greatest potential for impact are those along the planned open space and parkland areas, such as the Western Sydney Regional Parklands and the area of proposed regional open space in Edmondson Park. Through these areas, the SWRL would be more visually contrasting and may require some screening and design treatments to minimise potential visual impacts (see Section 16.6.2), depending on planning for the Parkland.

Overall, the potential visual impact of the SWRL would be relatively low given the broader land use development and changes planned for the Growth Centre.

16.2.4 Light spill impacts

Lighting would mainly be installed around the new stations at Edmondson Park and Leppington and at the train stabling facility. Increased light spill would also be likely with the proposed upgrade of Glenfield Station. The lighting at the stations is essential for safety and security reasons and would contribute to a more secure environment. The majority of the SWRL would not be lit.

The stabling facility would have security lighting and would be lit with low level bollard lighting to allow 24 hour activity. New free-standing light poles would be installed at the facility and its approaches. Mitigation measures to reduce the potential impacts of this lighting are described in the next section.

16.3 Recommendations for further assessment and mitigation

16.3.1 Further visual assessment

Further visual assessment would be undertaken as part of the future design. This would be done in association with considering urban design changes and opportunities for improvement. Additional assessments that are likely to be required include visual and urban design consideration of:

- proposed bridging structures
- cutting and embankment treatments
- landscape treatment projects
- detailed design of the stations and stabling facility
- proposed acoustic treatments
- the final width and location of any visual buffer areas.

16.3.2 Management/mitigation recommendations

A detailed Urban and Landscape Design Plan would be prepared for the SWRL project in consultation with the Growth Centres Commission, the Department of Planning, local Councils, RailCorp and land owners involved in precinct planning during the next phase of the design development. This would include detailed urban design and landscape plans for the proposed station works, the stabling facility and the corridor as a whole.

The following recommendations outline more detailed mitigation measures for consideration in the development of future design and for inclusion in a detailed Urban and Landscape Design Plan.

Specific measures

Proposed measures to mitigate potential impacts on those viewpoints identified as having a moderate or high visual impact are outlined in Table 16-6. The references to bushland screens in the table refer to screening alongside the rail corridor, not within in it, and only where this would not provide a risk to safety from falling branches, or obstructed views, etc.

Table 16-6 Proposed specific mitigation measures

Viewpoint	Proposed mitigation measures
Viewpoint 1 South Casula and Glenfield Road	▪ Landscape screening should be established where Hurlstone Agricultural High School and Glenfield Road adjoin the railway (as also supported by the Environmental Assessment for the Southern Sydney Rail Freight Line (ARTC 2006)) — see Figure 16-10.
Viewpoint 2 Glenfield shopping centre and Glenfield Station	▪ High quality urban design near station and shopping centre should be implemented to reduce potential impacts on Railway Parade. ▪ Extensive landscaping and streetscape improvement works should be included as part of overall upgrading scheme.
Viewpoint 3 Residents in Railway Parade and further east, including Glenfield Park	▪ Acoustic barriers (if proposed) should be integrated with and sympathetic to the streetscape. ▪ Additional, large growing street trees could be planted beside SWRL, preferably along both sides of Railway Parade to enhance existing native street trees. ▪ Some additional screen planting should be considered alongside the edge of Glenfield Park.
Viewpoint 4 Macquarie Field House	▪ Additional planting on northern boundary of Macquarie Field House property (in consultation with heritage consultant) should be considered to improve visual separation, but not prevent all views over railway. ▪ Design of the rail formation to minimise visual intrusiveness.
Viewpoint 5 Hurlstone Agricultural High School	▪ A partial screen of trees along northern side of SWRL should be considered to filter views. This would also be of benefit as planned residential areas develop. ▪ Careful urban design should be implemented to minimise the potential impact of changes to Glenfield Station (e.g. using materials and colours, and designing car parking areas, that are sympathetic with the school's entry). ▪ Landscape screening could be established where Hurlstone Agricultural High School and Glenfield Road adjoin the railway (as also supported by the environmental assessment for the Southern Sydney Rail Freight Line (ARTC 2006))
Viewpoint 9 Rural-residential (Croatia Avenue)	▪ A partial screen of trees, where appropriate, along both sides of the SWRL (supplementing existing trees) should be considered to filter views from the north and south. This would also be of benefit as the planned town centre, park and residential areas develop.
Viewpoint 10 Ingleburn Military Camp	▪ A partial screen of trees along both sides of the SWRL (supplementing existing trees) should be considered to filter views from the north and south. This would also be of benefit as the planned town centre, park and residential areas develop. ▪ The SWRL corridor through this area should be reduced as far as possible to minimise removal of vegetation. Existing vegetation to be

Viewpoint	Proposed mitigation measures
	retained would be protected, rehabilitated and further revegetated.
Viewpoint 11 Cabramatta Creek and rural-residential (Jardine Drive)	▪ Where possible, a dense bushland screen should be established along both sides of SWRL to screen views from nearby residents. ▪ Any acoustic barriers (if proposed) should be of a colour that blends with surrounds. Where possible, planting should be undertaken on the outer side of any barriers.
Viewpoint 12 Rural-residential (Culverston Ave & Cassidy St)	▪ Where possible, a dense bushland screen should be established along both sides of the SWRL to screen views from nearby residents. ▪ Any acoustic barriers (if proposed) should be of a colour that blends with surrounds. Where possible, planting is to be undertaken on the outer side of any barriers.
Viewpoint 13 Denham Court viewshed	▪ Where possible, a dense bushland screen should be established along both sides of the SWRL to screen views from nearby residents. ▪ Any acoustic barriers (if proposed) should be of a colour that blends with surrounds. Where possible, planting is to be undertaken on the outer side of any barriers.
Viewpoint 14 Forest Lawn Memorial Cemetery	▪ Where possible, a dense bushland screen should be established along both sides of the SWRL to screen views from the Forest Lawn Cemetery and Western Sydney Parklands to the north. ▪ Design of the rail formation to minimise impacts on views.
Viewpoint 15 Camden Valley Way	▪ Careful urban design of the rail bridge should be implemented to minimise potential impacts on the heritage value of Camden Valley Way.
Viewpoint 16 Bringelly Road	▪ Where possible, a dense bushland screen should be implemented along the northern edge of the SWRL where it passes close to Bringelly Road to screen views from the Road.
Viewpoint 18 Cowpasture Road and Rickard Road	▪ A partial screen of trees along both sides of the SWRL (supplementing existing trees) should be considered to filter views from the north and south. This would also be of benefit as residential areas develop. ▪ Careful urban design of the rail bridge should be implemented to minimise potential impacts on Cowpasture Road.
Viewpoint 19 Semi-rural areas (Rickard Road to Eastwood Road)	▪ A partial screen of trees along both sides of the SWRL (supplementing existing trees) should be considered to filter views from the north and south. This would also be of benefit as the planned town centre, parks and residential areas develop.
Viewpoint 20 Kemps Creek	▪ A management plan should be implemented to minimise potential impacts on Kemps Creek.
Viewpoint 21 McCann Road properties	▪ Where possible, a dense bushland screen should be established along both sides of the SWRL to screen views of the stabling facility from nearby residents and reduce potential light spill impacts.

Figure 16-10 Urban design recommendations of the SSFL Environmental Assessment

General measures

Construction work sites and compounds

As a general measure during construction, construction work and compound sites should be kept in a tidy condition and kept within clearly defined boundaries.

Noise barriers

Where noise walls are required, the potential visual impact should be minimised by detailed urban design measures developed in consultation with adjacent property owners. Such measures should include planting and high quality facings near residential areas.

Earth mounding should be considered where space allows and vegetation would not be lost, such as adjacent to parkland areas.

Bridges

A design theme should be established for bridges and flyovers to tie the overall rail design together and ensure a high quality outcome in both the short term and once the planned urban areas are established. Careful design would ensure the structures are simple, integrated with the surrounding area and finished to a high quality. Fencing and any railing on the bridges should also be integrated with the overall design.

Pedestrian bridges should be considered where connections between adjacent areas are particularly desirable.

Underpasses

In general, pedestrian underpasses are undesirable, except where they would be in high traffic areas that would have outside surveillance. Design considerations for any underpasses should include unobstructed views into and outside of underpass, effective drainage and ventilation, wide corridors, good lighting and no hiding opportunities.

Fencing

The feasibility of not installing traditional security fencing through sensitive sites, such as town centres, should be considered. Aluminium tubular-style fencing of up to 1.5 metres in height (without footholds) should be considered as an alternative. This would have a more open feel and allow better integration of the SWRL corridor with the surrounding area.

Planting and existing vegetation

Planting beside the SWRL corridor should reflect the surrounding environment. Trees should generally be planted near town centre areas to filter views of the SWRL, without creating a dense vegetation screen that could become a public safety issue. Planting in these areas should include a mix of native and exotic trees that reinforce the existing or planned characters of these areas.

Parts of the rail corridor that are adjacent to bushland and parks should generally be more appropriately planted with native species and should have a denser form that prevents views of the SWRL. Species should be proposed in consultation with ecologists familiar with local flora and fauna issues. Existing vegetation along the corridor, to be retained, should be protected during construction.

Embankments and alternatives

There are a substantial number of planned embankments along the proposed SWRL corridor, reaching heights of up to 9–11 metres. These embankments should incorporate mitigation measures to reduce their bulk and also provide for maintenance of the landscape (weeding, etc). The final treatment of these embankments should be further investigated; however, consideration should be given to:

- where embankments are proposed next to parkland, widening the corridor and having a less steep embankment that flows into the surrounding landscape and can accommodate trees and/or grassed areas that can be managed (fencing could remain close to the SWRL tracks)
- trialling native grasses with low ongoing management needs on embankments near bushland areas.

Light spill

Light spill should be minimised as much as possible to reduce potential impacts on surrounding existing and future residents.

At the train stabling facility, which has the greatest potential for light spill impacts, measures to be considered should include:

- lights with baffles to direct light spill onto the facility and away from surrounding land uses
- the use of low to the ground lighting, where possible
- lights designed to throw light only where required
- specific lighting types used that balance the need for subdued lighting with operational and security requirements.

Lighting around stations and car parking areas should also be specifically designed to reduce light spill to nearby residents, whilst still meeting public safety requirements. A specialist in this area of design should be engaged to ensure the best outcome.