

## **6. Development and selection of the SWRL project and alternatives considered**

This Chapter describes the options considered for the SWRL, including the early planning for the rail link, consideration of options for the route alignment, stations, stabling facility and Glenfield Junction, and the engineering, planning, social, environmental and other issues that influenced the selection of a preferred concept for the SWRL. Also included is a discussion of the options assessment process undertaken by TIDC (and others) to arrive at the current preferred alignment.

### **6.1 Overview of the SWRL concept development**

Figure 6-1 and Sections 6.1.1 and 6.1.2 summarise the process of the SWRL concept development, including the key alternative assessments undertaken.

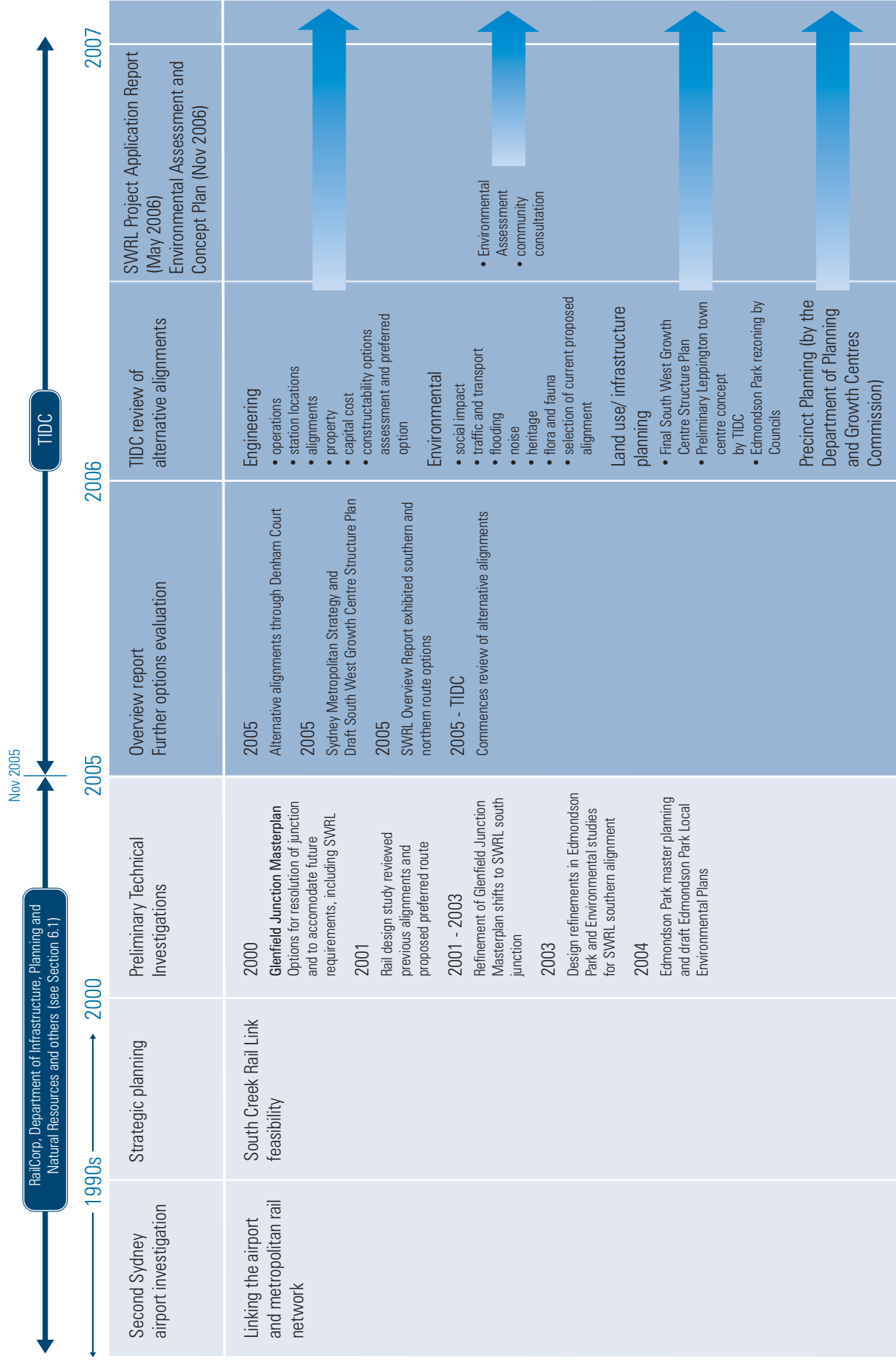
#### **6.1.1 Initial concept development (1990s)**

Planning for a railway serving what is now known as Sydney's South West Growth Centre began in the early 1990s, initially driven by planning for the proposed second Sydney Airport at Badgerys Creek and later by early land use planning for urban development in the South Creek Valley.

In 1991, the former State Rail Authority undertook a study to develop and evaluate alignment options for road/rail corridors between Glenfield and the proposed second Sydney Airport (Kinhill Engineers 1991). Then in 1992, the former State Rail Authority reviewed alignment options for rail-only corridors between Glenfield and Leppington (Kinhill Engineers 1992). During 1994, three subsequent studies were undertaken (Connell Wagner with Hard & Forrester 1994; GHD-Transmark 1994; State Rail 1994) to provide input to the joint Commonwealth/NSW Government Task Force, which was reviewing transport access requirements for the (then) proposed second Sydney Airport (as stated in John S Bryan Consulting 2005).

#### **6.1.2 Subsequent developments of the concept (2000–2006)**

More recent considerations of the SWRL have addressed future planning and development of Sydney's South West Growth Centre to house its growing population and the requirement to provide transport to this population. These studies were managed by a joint NSW Government Project Control Group and led by various individual parties and NSW Government departments, including former state rail agencies (now RailCorp), the Ministry of Transport and the (former) Department of Infrastructure, Planning and Natural Resources—Transport planning division. These studies focused on the feasibility of a rail link and identifying an alignment that would provide the best balance between social, environmental, economic and engineering issues.



Source: DIPNR Overview Report (2005) and TIDC

Figure 6-1 Development of the SWRL concept

From 2000 to 2003, the Rail Access Corporation and then the Rail Infrastructure Corporation prepared a master plan for Glenfield Junction, which in addition to planning for the future operational requirements of the Junction between the Main South Line and the East Hills Line, included plans for a junction with the SWRL to the south of Glenfield Station.

Partly in parallel with this work (between 2001 and 2005), the then State Rail Authority conducted a series of studies to review earlier rail alignment options and develop a concept alignment for a rail link between the Main South Line south of Glenfield Station and Leppington (Connell Wagner 2001, 2003a-g, 2004, 2005a-b, Binary Consultants 2003, Civitas Partnership et al 2003, GHD 2002). Routes were investigated generally along what is now known as the SWRL southern alignment (see Section 6.2.2) and mostly near the existing ground surface. These studies were conducted under the supervision of a Project Control Group, consisting of the former TransportNSW, the NSW Roads and Traffic Authority, the State Rail Authority, the former Rail Infrastructure Corporation and the former Department of Urban Affairs and Planning. A series of preliminary environmental studies were conducted based on this alignment, including assessments of land use, air quality, noise and vibration, heritage, visual, ecology, social impacts, soils and salinity (Connell Wagner 2003a-g).

Also during this period (in late 2004 to early 2005), Draft Edmondson Park Local Environmental Plans were exhibited by the Liverpool and Campbelltown Councils in which the identified southern SWRL corridor alignment was shown. In response to community submissions, a number of alternatives were developed, primarily to address the impacts of a future rail line on existing residential development at Denham Court, the Forest Lawn Memorial Gardens Cemetery and Casa Paloma Caravan Park. These included a new northern alignment option and various vertical alignment alternatives to the southern alignment option.

Between June and October 2005, the NSW Government exhibited the *South West Rail Link Overview Report* (DIPNR 2005). This report outlined the work undertaken to date and identified two alignment options (a northern and a southern alignment, known as 'reference route options') west of the Edmondson Park town centre (refer Figure 6-2). Community submissions were received on various aspects of the project, including the two alignments proposed.

In November 2005, the Transport Infrastructure Development Corporation (TIDC) was directed, by the Minister for Transport, to undertake (amongst other works):

- the necessary technical studies and reviews to confirm and, in some locations, finalise the alignment of the SWRL
- the necessary work and documentation to enable the SWRL to be assessed to allow concept approval to be obtained under Part 3A of the *Environmental Planning and Assessment Act 1979*.

As part of the commission, TIDC comprehensively reviewed the body of work conducted by the various previous organisations and conducted additional technical studies on the two alignment options contained in the Overview Report. The purpose of the review was to take into account the most recent planning information available and to investigate further the potential engineering, operational, economic and environmental issues of the alternative options and how these could best be avoided or reduced.

This review process identified design refinements to the two proposed alignments west of Edmondson Park Station and two new alignment options. These were evaluated through an options assessment process, which is documented in the *South West Rail Link Route Option Report* prepared by TIDC (2006a) and appended to the SWRL Project Application and Preliminary Environmental Assessment (PB 2006b). This process identified the preferred SWRL concept for study in this Environmental Assessment (this document).

Further details on the various options considered are provided in the following Sections.

## 6.2 Alternatives considered

This Section provides further detail on the various alternatives considered for the SWRL project during its development, including consideration of alternative modes, the main SWRL horizontal and vertical alignments, station location options, options at Glenfield Junction, stabling facility options and development staging options.

### 6.2.1 Strategic alternatives

The key strategic alternatives for the development of a transport corridor to serve the South West Growth Centre are:

- a do nothing or do minimum project
- a road corridor option
- a heavy rail option (like the SWRL)
- a light rail option
- a bus transitway option
- a bus network option.

A do nothing or do minimum project would not meet the objectives of the Sydney Metropolitan Strategy, the MREP or the SWRL as detailed in Chapter 1 of this report. The consequences of doing nothing would be significant, as discussed in Section 22.6. Furthermore, there is no real 'do nothing' option for the SWRL project. Should the SWRL not proceed, the need for additional train stabling, the upgrade of Glenfield Station and the Glenfield North Flyover would remain. In particular, the existing Glenfield North Junction is not expected to be able to cope with forecast train numbers beyond 2011. A further need under the 'do nothing' option would be an additional bus interchange and commuter car parking provisions on the existing Main South Line.

Options for road corridors between Glenfield and the proposed Second Sydney Airport were considered in 1991 by Kinhill Engineers for the then State Rail Authority. A road corridor option would be contrary to the objectives of developing transit oriented development and NSW Government objectives to encourage a shift towards greater use of public transport in existing and developing areas of Sydney.

KBR prepared an assessment of heavy rail, light rail, bus transitway and bus network options to serve the South West Growth Centre in its *South West Sector Public Transport Corridor Study* (2004). The best performing options were the heavy rail and transitway options; however, the heavy rail option performed significantly better in regard to the key assessment criteria of enhancing public transport patronage, safety, connectivity, transport system operations, reducing vehicle kilometres travelled and risk (financial and planning

approvals). Although the transitway option was significantly less expensive to build and operate, the overall performance of the heavy rail option was significantly better and was, therefore, recommended as the preferred public transport alternative.

The best performing light rail option was not preferred due to its relatively high cost compared to transitway and its lower connectivity in comparison to the heavy rail and transitway options, which would require less interchange between modes. The bus network options performed the worst overall across all of the assessment criteria.

The preliminary economic and financial appraisal of the SWRL project by PricewaterhouseCoopers (2006) for TIDC, compared the SWRL project with a bus transitway option and a further option where a bus transitway option is converted to a rail link option when patronage increases. That assessment confirmed that a heavy rail option is the most preferable mode from an economic and financial feasibility perspective.

## 6.2.2 Horizontal and vertical alignments

This Section outlines in more detail the key horizontal and vertical alignment options for the SWRL considered since 2005, commencing with the reference route options identified in the *South West Rail Link Overview Report* (DIPNR 2005). Further details of these options and their assessment are provided in the *South West Rail Link Route Option Report* prepared by TIDC (2006), which is provided in Appendix E.

### Reference route options

The *South West Rail Link Overview Report* (DIPNR 2005) identified two reference route options for the SWRL (see Figure 6-2) between Edmondson Park and Leppington, based on the previous investigations conducted.

The northern and southern routes shared a common alignment between Glenfield and Cabramatta Creek, just west of the proposed Edmondson Park Station, as this alignment was set by the need to integrate with the existing rail network at Glenfield Junction and pass through the already planned Edmondson Park town centre. The southern route (the 'southern reference route' option) then travelled west from Edmondson Park and passed through the residential area of Denham Court, the southern section of the Forest Lawn Memorial Gardens Cemetery, and the Casa Paloma Caravan Park, to the proposed Leppington Station near Byron Road. The northern route (the 'northern reference route' option) travelled north-west from Cabramatta Creek, through the northern segment of Forest Lawn Memorial Gardens Cemetery, through a section of Western Sydney Parklands, and then on to the proposed Leppington Station (also near Byron Road). The southern reference route option was generally in a deep cutting through this section, while the northern reference route option was generally at grade (but in a cutting through the Western Sydney Parklands).

Seventy-two submissions were received as a result of the public exhibition of the Overview Report. These raised the following key issues in regard to the options:

- property impacts
- flooding
- noise and vibration
- impacts on terrestrial ecology
- integration of the Leppington town centre

- the location of the stabling facility.

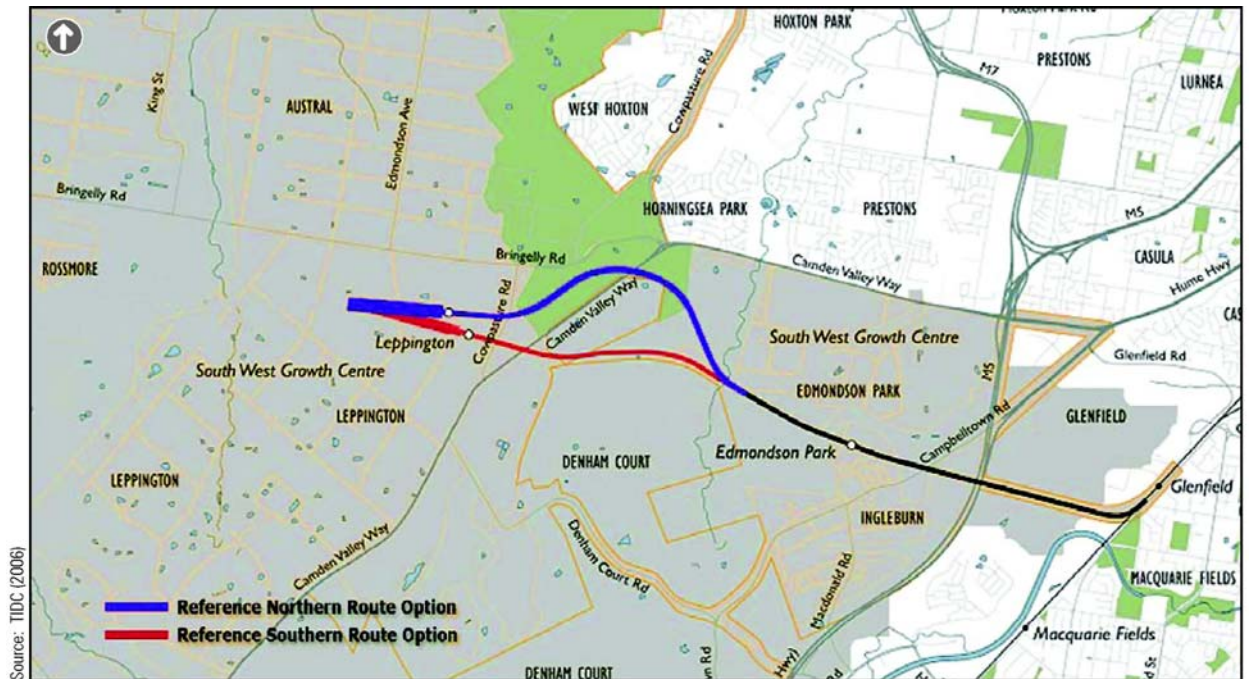


Figure 6-2 Reference route options

In response to the Minister for Transport’s direction regarding the SWRL in November 2005, TIDC commenced technical studies on these and other issues (cited in TIDC 2006a) to confirm and (in some locations) finalise the SWRL alignment, including:

- visual amenity
- flooding
- cultural heritage
- traffic and access issues
- constructability and costs
- urban design/land use planning issues
- operations and engineering.

In particular, the flooding study had significant implications for the proposed location of Leppington Station and the stabling facility. It was recommended that, to avoid floodprone land and facilitate integration with the future Leppington town centre, the station be relocated immediately to the west of Rickard Road, which is not prone to flooding. This location was also identified as an appropriate centre for the future Leppington town centre, which is consistent with providing a high level of access to the future facilities.

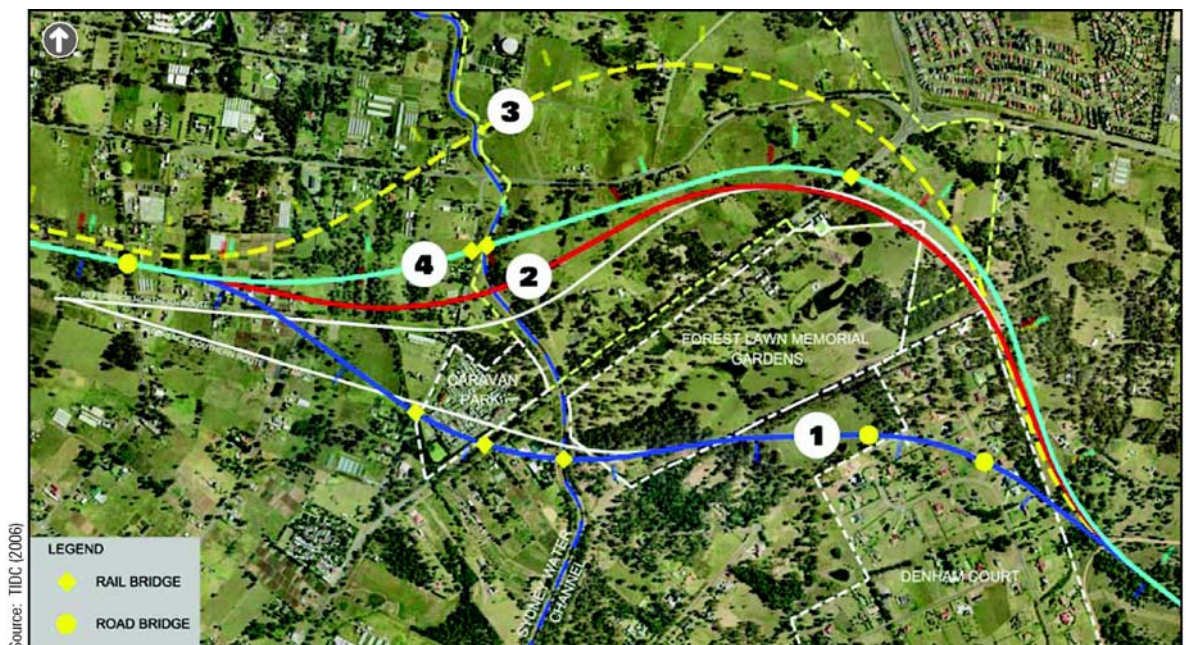
Results from the technical studies also identified that the stabling facility within the town centre was located on floodprone land. Furthermore, submissions to the Department of Planning on the South West Structure Plan received from RailCorp and the community on the Draft South West Structure Plan and the *South West Rail Link Overview Report*, and experience with other stabling facilities in the metropolitan area, identified that placement of the facility within a future town centre would be inappropriate. Therefore, the facility was relocated further to the west to an area with a suitable level. In order to minimise the

acquisition of private property, both Leppington Station and the stabling facility were also moved northward towards Bringelly Road.

### Alternate route options

As a result of the additional studies conducted, four 'alternate route options' were considered by TIDC, as shown in Figure 6-3, with fixed points at Leppington Station and the stabling facility. In summary:

- Option 1 followed the southern reference route through Denham Court (DIPNR 2005), then travelled slightly further south, passing through the southern end of the Forest Lawn Memorial Gardens Cemetery and the Casa Paloma Caravan Park, and north to the new proposed location for Leppington Station to the west of Rickard Road. A variation of Option 1 (Option 1A) followed the same alignment as Option 1, but passed through Denham Court in a tunnel rather than a cutting.
- Option 2 was similar to the northern reference route (DIPNR 2005), but travelled slightly further north and was approximately 500 metres longer than Option 1. It passed through the north-east corner of the Forest Lawn Memorial Gardens Cemetery and through the Western Sydney Parklands to the new proposed location for Leppington Station to the west of Rickard Road.
- Option 3 was developed with an additional objective of potentially better serving the existing residential community at Horningsea Park, with the potential for a third station located near the intersection of Camden Valley Way and Bringelly Road. It was approximately 800 metres longer than Option 1.
- Option 4 was similar to Option 2, but was further optimised (moved slightly northwards) to avoid any direct impact on the Forest Lawn Memorial Gardens Cemetery.



**Figure 6-3** Alternate route options

An internal TIDC workshop was held to systematically screen the options according to common criteria. Option 3 was considered undesirable, based on the difficulty in locating station facilities near a major road intersection and the likely effects on congestion. It would also be difficult for potential passengers to access, given the design of nearby subdivisions. Option 2 was also eliminated based on the desire to reduce impacts on privately owned

properties, particularly the Forest Lawn Memorial Gardens Cemetery. There was no significant differential between the options in regard to rail operations.

Therefore, Options 1 and 4 remained to be considered in more detail as part of a formal options assessment, which is described below.

During the above detailed period of consideration of horizontal alignment options, consideration was also given to various vertical alignments, in particular through Denham Court and Edmondson Park. In 2003, an alternative vertical alignment for the SWRL in a 'deep cutting' through Edmondson Park was proposed in response to concerns regarding connectivity across the rail corridor and integration with the town centre (Civitas Partnership et al 2003). This alignment would be approximately 5–6 metres lower than the previous alignment through Edmondson Park, resulting in a rail level approximately 12 metres below the natural ground surface in this location (Civitas Partnership et al 2003). A review of this alignment found that it would be unfeasible, due to a range of technical and cost issues (Connell Wagner 2004).

### **Assessment of refined route options**

This Section summarises the findings of TIDC's evaluation of the two 'refined route options' (the refined northern route and the refined southern route) between Edmondson Park and Leppington Station, previously described as Options 1 and 4 (refer above). The options assessment process is outlined in more detail in Appendix E.

#### *Assessment process*

Figures 6-4a and 6-4b show the horizontal and vertical alignments of the refined northern and southern route options. The alignment to the east of Edmondson Park Station and west of Leppington Station is common to both options. For this reason, the assessment of the horizontal and vertical alignment options focused on the section of the SWRL between Edmondson Park Station and Leppington Station.

TIDC commissioned a series of technical studies on which to base a comparison of the options, including assessment of:

- visual amenity
- heritage
- flora and fauna
- traffic and access issues
- social impact
- hydrology and flooding
- noise and vibration
- planning and urban design
- constructability
- capital and operating cost
- property acquisition
- railway operations
- design/ engineering.



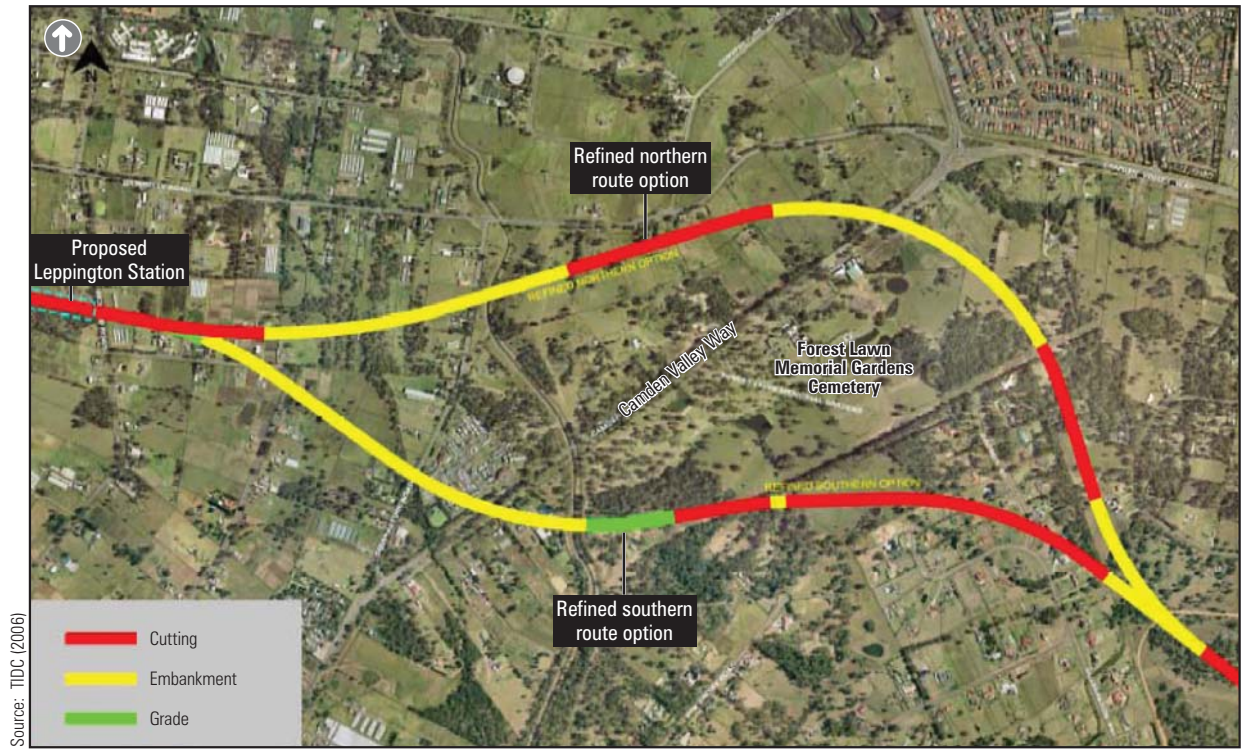


Figure 6-4a Refined route options – horizontal alignment

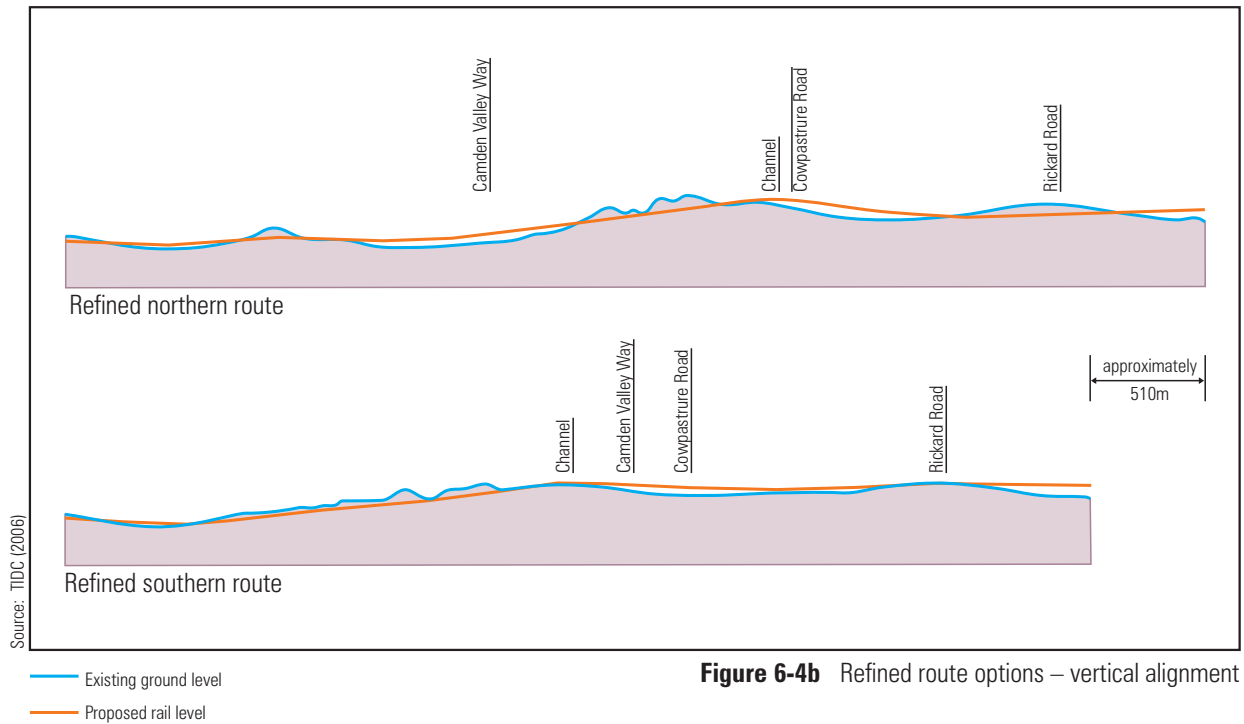


Figure 6-4b Refined route options – vertical alignment

Assessment criteria were developed by the project team and used as the basis for determining the performance of the options. The results of the above studies were collated and assessed by the project team and documented in the *South West Rail Link Route Options Report* (TIDC 2006a), which was attached to the Project Application and Preliminary Environmental Assessment (PB 2006b) that was publicly exhibited in June 2006.

The assessment criteria developed for the option assessment were weighted based on their perceived importance to the project and the preferred option selection was based on the results obtained for the most heavily weighted (most important) criteria. The determining criteria were:

- the number of properties to be acquired and ownership (e.g. private versus government)
- capital cost
- community amenity issues.

The Options Report was reported to the NSW Government by the Project Steering Group in April 2006, and a decision to proceed with the refined northern route (Option 4) in the Environmental Assessment was taken.

#### *Option evaluation*

Table 6-1 below outlines the assessment criteria derived by the project team and summarises the results of the technical assessments conducted. The route options are described relative to each other for those parts of the route options west of Edmondson Park Station (i.e. assessment did not look at entire alignment).

Generally, it was found that the refined southern and northern routes were very similar; although some differences were identified in regard to the route length, operability, vegetation clearance, cultural heritage, noise, visual, social impact, property issues and capital cost criteria as detailed below.

**Table 6-1 Comparison of SWRL route options (west of Edmondson Park Station)**

<b>Category/ criteria</b>	<b>Refined southern route</b>	<b>Refined northern route</b>
<i>Technical and constructability:</i>		
Route length and directness	Route is 500 metres shorter in length	Route is 500 metres longer in length
Constructability	No substantive difference	No substantive difference
Hydrology and flooding	No substantive difference	No substantive difference
Local traffic	No substantive difference	No substantive difference
<i>Operability:</i>		
Travel times between the two stations	One minute less in both directions (Trip to the city approx. 58 mins.)	One minute longer in both directions (Trip to the city approx. 59 mins.)
<i>Environmental:</i>		
Clearing of endangered ecological communities	4.0 hectares	5.6 hectares
Clearing of core/support habitat	3.9 hectares	3.6 hectares

Category/ criteria	Refined southern route	Refined northern route
Cultural heritage	Impacts on known area of probable moderate archaeological sensitivity in Edmondson Park	Impacts on known area of probable high archaeological sensitivity in Edmondson Park
Residences affected by noise	Higher number of existing and future residents potentially affected by noise	Lower number of existing and future residents potentially affected by noise
Visual impact (note: overall visual amenity of the area will change with future development)	Impacts on semi-rural character of Denham Court Impacts where route crosses Camden Valley Way and the Casa Paloma Caravan Park	Impacts on rural character of Western Sydney Parklands Obscures views of scenic hills at Denham Court from Edmondson Park
<i>Property:</i>		
Land holdings affected	44 land holdings affected	44 land holdings affected
Property acquisition	Full acquisition of 24 privately owned properties required. Partial acquisition of 12 privately owned properties required	Full acquisition of 13 privately owned properties required. Partial acquisition of 13 privately owned properties required
Property demolition	8 residential and 4 rural acreage dwellings require demolition	1 residential and 1 rural acreage dwelling require demolition
Open space (including private open space)	Impact on Forest Lawn Memorial Gardens Cemetery	Impact on Western Sydney Parklands
<i>Social and community:</i>		
Effect on residential amenity	Loss of amenity in low density residential area of Denham Court	Loss of recreational land in Precinct 9 (Hoxton Park Ridge) of Western Sydney Parklands
Effect on other amenity	Loss of low income housing at Casa Paloma Caravan Park	No impact to Casa Paloma Caravan Park
<i>Capital cost:</i>		
Cost difference	Capital cost \$11 million greater for the section being compared	Capital cost \$11 million less for the section being compared
Operating and maintenance cost	Approximately \$50,000 less per annum	Approximately \$50,000 more per annum

### **Selection of the preferred option**

Selection of the preferred route option was undertaken following the assessment of the two refined route options against the criteria outlined above. The key distinguishing criteria were capital cost, property acquisition impacts and community amenity.

Based on these distinguishing criteria, the refined northern option was found to have some key advantages over the southern refined option:

- Less impact would occur to private property, with only 13 privately owned properties needing to be acquired.
- Less impact would occur to residential amenity (particularly at Denham Court). Noise targets would be exceeded at fewer existing and future residences.
- The capital cost would be approximately \$11 million less.

The refined northern route was, therefore, adopted as the preferred option for detailed investigation in this Environmental Assessment.

The concept for the SWRL assessed in this report is the refined northern route alignment. Further details of the preferred SWRL project are provided in Chapters 7 and 8 of this report.

### Additional northern alignment alternative option

In response to consultation with stakeholders during preparation of the Environmental Assessment, TIDC considered a further horizontal alignment for the SWRL, which is identified in Figure 6-5. The option was identified by members of the community concerned as an option that would potentially have less direct property impact than the proposed SWRL corridor alignment (the refined northern route alignment described above). TIDC undertook a preliminary rail engineering assessment of the option in August 2006 and confirmed that it would be feasible from an engineering/constructability perspective. The direct impact of the option on property was then compared with the proposed corridor alignment by overlaying the alignment on the cadastre (property boundary coordinates). The comparison is summarised in Table 6.2 below. This property comparison is for the section west of Camden Valley Way only.

**Table 6-2 Comparison of property impacts (proposed and alternative northern alignment) for section west of Camden Valley Way**

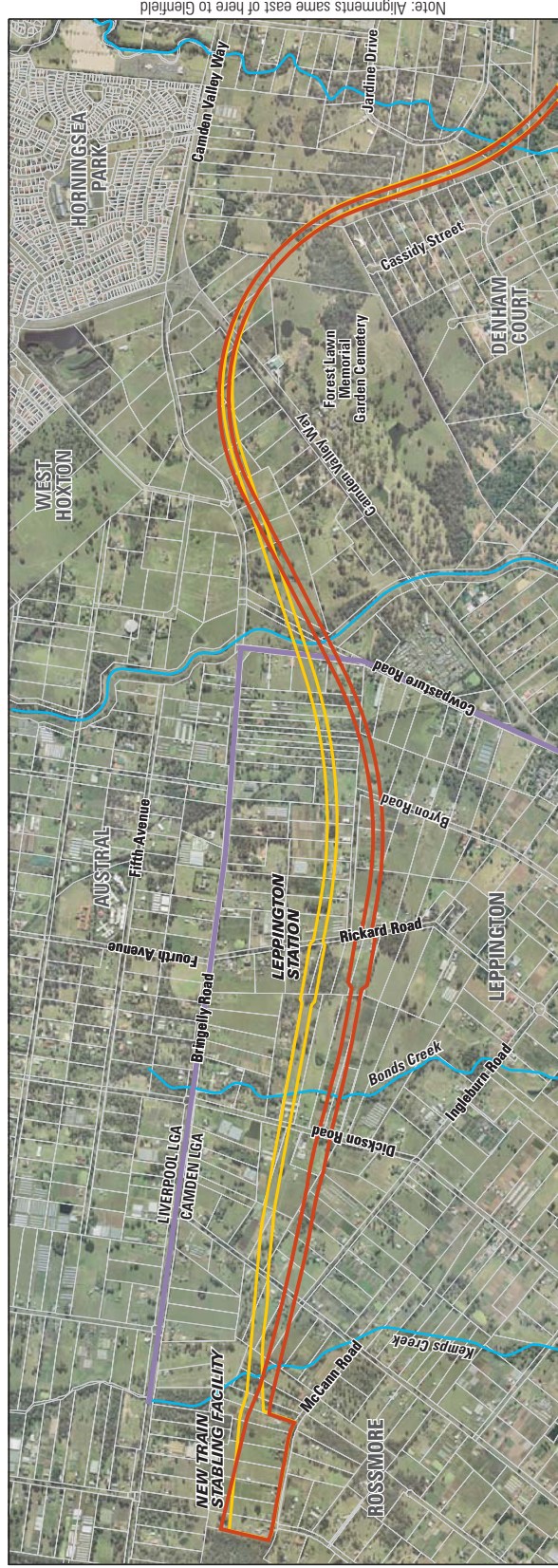
	Roads	Government	Private	Total	Total area
Proposed corridor alignment	7	15	42	64	95.7 ha
Alternative northern alignment	8	16	42	66	100.2 ha
Difference	1	1	0	2	4.5 ha

The results show that the alternative northern alignment would affect two more properties than the proposed corridor alignment. This increase is made up of a road crossing and a parcel of land comprising the Sydney Water Supply Canal. Furthermore, the overall difference in total land area to be acquired would be 4.5 hectares.

Overall, this difference in property impacts is relatively minor. However, the alternative northern alignment is also longer than the proposed alignment. All else being equal, a longer alignment would cost more to construct, operate and maintain. Furthermore, a longer alignment would increase the journey time for rail passengers. For these reasons, the alternative northern alignment was not considered further.

The assessment of property impact was based on a feasible design alternative. Other feasible variations to this alternative alignment could be designed that would result in different properties being affected. However, removing affectation from one property would be likely to result in effects on a different property in a different location.

Based on the assessment, it is considered unlikely that any design alternative would reduce the estimated property affectation enough to warrant pursuing the alternative further, especially given the other operational disadvantages of such an alternative and the future redevelopment of all land in the area.



**Figure 6-5** Additional northern alignment option (compared with proposed SWRL corridor alignment)

Note: Alignments same east of here to Glenfield

## 6.2.3 Station location options

### Edmondson Park and Leppington

The development of the SWRL and the selection of the station locations have targeted areas of future high density development to maximise accessibility to public transport and ensure cost-effectiveness of the infrastructure.

Edmondson Park is one of the first development areas to be released in the South West Growth Centre. The proposed station at Edmondson Park has an important role to play in encouraging sustainable travel patterns. Edmondson Park is also planned to be a ‘transit-oriented’ development with a strategic bus corridor providing high frequency access to the station and higher density residential areas around the station, allowing for a high walk up catchment. Leppington town centre is identified as a regional centre within the South West Growth Centre. For these reasons, these two locations were selected for the provision of new stations.

The location of Edmondson Park Station was determined as part of the rezoning process to optimise integration with the town centre and the proposed strategic bus corridor, as described in Section 6.1. As described in Section 6.2.2, Leppington Station was previously proposed near Byron Road; however the station location was moved to its current proposed location immediately west of Rickard Road to remove the risk of flooding. The new location also facilitated access to future facilities in the future Leppington town centre. Rickard Road is envisaged to form a major north–south link and the Station, which would be in cutting at this location, would facilitate its future integration with the town centre.

### Potential additional station

As described in Section 6.2.2, one of the merits of alternate route Option 3 was the opportunity to provide a third station near the intersection of Camden Valley Way and Bringelly Road; however, this option was considered undesirable for the reasons stated. Despite this, the option of a third station was further considered by TIDC in 2006, as it was suggested by some stakeholders during the consultation process for the Environmental Assessment to have some merits regarding patronage and access (i.e. it would possibly enhance access to the high activity southern precinct of the Western Sydney Parklands and/or could serve the suburb of Horningsea Park, which is currently lacking in public transport access). The option of a station with a major park-and-ride facility at this location was considered, which could potentially remove the need for park-and-ride facilities at Leppington.

Despite these potential benefits, a number of factors make this station location option undesirable and/or infeasible, as described below.

A major roadway (Camden Valley Way) and road intersection (with Cowpasture Road) separates the suburb of Horningsea Park from areas to the south, which would make access to the SWRL very difficult. Furthermore, the suburb was not designed to facilitate access to a rail link. It has a number of cul de sacs, which would make it difficult to create additional road, cycle and pedestrian access southwards towards a station. The alignment could not be shifted further north to serve Horningsea Park, due to the significant property impacts, the limitations of rail design (particularly curvature), and the requirement to serve the planned regional centre of Leppington.

The suburb of Horningsea Park is also located at the high point of a curve in the alignment. It is preferable (mainly for safety reasons) to locate station platforms on straight sections of

track. Therefore, the Station would have to be located further to the west and closer to Bringelly Road, where the SWRL alignment straightens out. Bringelly Road is proposed to be widened, which would further complicate the issue of access at this location.

At station near Bringelly Road would locate the station away from areas that would facilitate patronage and relatively close to Leppington Station, which would make this option unviable. A station less than 2 kilometres from Leppington Station is considered undesirable from a rail operational perspective. Also, given road network constraints, accessibility to Horningsea Park would limit the potential patronage.

This area of Horningsea Park is already well serviced by road transport infrastructure, which is proposed to be substantially augmented in the future. The provision of parking and other ancillary facilities associated with a railway station would result in increased congestion on these roads. This suburb would also be adequately served by the Leppington and Edmondson Park Stations, by providing good bus access to Edmondson Park Station and commuter parking facilities at Leppington Station, as proposed.

Operationally, a third station would increase transit times for passengers, and the land-take required for surface ancillary facilities would increase the impact of the project on the Western Sydney Parklands. Planning of facilities in the Western Sydney Parklands is currently only in the early stages. There is currently no direction as to whether there would be strong demand for public transport access that may result if major regional sporting facilities were to proceed in the southern precinct. Furthermore, people wanting to access the Parklands via public transport would be able to get there by bus links from Leppington Station.

For these reasons, a third station adjacent to Horningsea Park and/or the Western Sydney Parklands is not preferred at this stage. However, the design of the SWRL does not preclude the future provision of a station close to Bringelly Road, if needed in the future.

#### **6.2.4 Glenfield Junction options**

The junction between the East Hills Line and the Main South Line to the north of Glenfield Station is a significant junction in the rail network. A master plan for Glenfield Junction commissioned by the former Rail Access Corporation (GHD and Halcrow 2001) examined options for the development of Glenfield Junction to meet expected future growth in passenger services from Campbelltown, other passenger services such as Countrylink, and freight traffic. The master plan included consideration of a possible future SWRL and the operational relationship between SWRL trains and those of the wider train fleet using Glenfield Junction. The report developed three options to address the functionality requirements of Glenfield Junction. Two of these involved the SWRL tracks leaving the Main South Line at either the north or the south of Glenfield Station, while the third option involved the construction of a grade-separated junction to the north of Glenfield Station. While a preferred option was not identified in the study, it was concluded that an upgrade to the junction would be required prior to the operation of the SWRL.

Options for the Glenfield Junction (north) grade-separation were further investigated by the former Rail Infrastructure Corporation (2003). This resulted in a shifting of the Glenfield South Junction a few hundred metres to the south. This meant that the southern end of the Glenfield Station platforms would need to be shortened and, conversely the northern ends lengthened to accommodate the SWRL (south) junction. This refinement meant that the SWRL alignment was refined again in 2005/06.

Connection of the SWRL to the existing RailCorp tracks at Glenfield South Junction requires the construction of rail flyovers south of Glenfield Station to take the SWRL tracks to turnouts where they join the existing tracks (Connell Wagner 2006b). Two track arrangements were considered for the connection of the SWRL into the network, a 5-track and a 6-track arrangement. The 6 track option was identified as the preferred option for the Glenfield South Junction, on the basis that it maximises the operational flexibility at the junction (Connell Wagner 2006).

## **6.2.5 Stabling facility options**

### **Location options**

The need for a stabling facility in Leppington, including the reasons why Leppington is the preferred location over locations such as Campbelltown, is described in Section 2.4.2.

Within Leppington, two locations have been considered for the stabling facility as the design has progressed.

At the time of the SWRL Overview Report, the train stabling facility was proposed to be located immediately to the west of Leppington Station between Bonds Creek and Byron Road and within the proposed Leppington town centre (DIPNR 2005). As a result of consultation undertaken with the Growth Centres Commission, RailCorp and the community, and design work conducted under the direction of TIDC, it was determined that the location of a stabling facility within the town centre area would be inappropriate, as it would be subject to flooding issues and would result in the loss of a large area of developable land and a significant impact on the amenity of the town centre. The stabling facility was, therefore, moved to the west, at the currently proposed location west of Kemps Creek.

### **Configuration options**

Two main configuration options were considered for the stabling facility, with the facility arranged either symmetrically or asymmetrically about the SWRL (Connell Wagner 2006b). Both configurations could initially accommodate, but ultimately up to 20, eight car train sets. Both configurations would also allow the facility to be partially located within a cutting, which would assist in providing a natural noise and visual barrier. Neither configuration would preclude the future extension of the rail line.

The asymmetrical arrangement was adopted as the preferred configuration as it fits best with the concept that the SWRL would initially terminate at the stabling facility. However, neither option is precluded at this stage. It is intended that the lay-out (either symmetrical or asymmetrical) would be resolved as part of the future design work for the SWRL project.

## **6.2.6 Other options**

### **Construction worksite locations**

The potential locations for construction worksite compounds are identified in Chapter 8. As far as possible, areas within the future SWRL corridor are proposed to be used for construction work areas. The selection of construction work site locations was, in general terms, based on:

- minimising the required land acquisition
- avoiding impacts on biodiversity



- minimising impacts on adjacent land uses
- facilitating the optimal use of sites (consolidation of sites where feasible)
- maximising work within the proposed SWRL corridor boundary
- maximising accessibility (proximity to the rail corridor for convenient access and ease of access for construction equipment, heavy vehicles and construction staff)
- availability of land (e.g. vacant/disused that is appropriate for use as a work site).

### **Development staging**

Given the anticipated time lag between the development of the Edmondson Park and Leppington precincts, consideration was given to staging the development of the railway to match the surrounding land use development. An initial stage of railway development was considered to involve construction of the railway only as far as Edmondson Park Station, with a subsequent future stage constructing the extension to Leppington. This option was not considered viable due to the requirement for significant earthworks and expense.

Furthermore, an important component of the need for the SWRL is the short-term requirement for train stabling in the south of the existing railway network. The construction of a short-term stabling facility to the west of Edmondson Park Station was considered to facilitate this staging, but was not considered feasible because of the high cost and the potential impacts (including impacts on the viability of the Edmondson Park release area). Building the SWRL project in two main development stages would add considerably to the overall capital costs. This option to stage the development of the SWRL was not, therefore, considered further.

As the works required at the Glenfield North Junction are urgently needed regardless of the SWRL, and both the Glenfield South and North Junction flyovers would be complicated and lengthy to construct, the option of staging these works ahead of the main SWRL works was considered and is proposed, as discussed further in Chapter 8. The design of the SWRL at Glenfield Junction is sufficiently developed to allow all necessary environmental assessments to be completed and the potential impacts of these works to be assessed and appropriate mitigation measures identified.

### **Future SWRL extension**

A potential future extension of the SWRL beyond Leppington is being considered by the NSW Government. The precise location of the extension and any future terminus would be determined by operational needs and the patterns of future development and would be subject to further assessment and approval. The development of the SWRL design was undertaken to ensure that any future extension is not precluded.





# PART C – THE SWRL project

