Transport Infrastructure Development Corporation

North West Rail Link

Environmental Assessment and Concept Plan

Volume 1

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Submission of Environmental Assessment

Prepared under the Environmental Planning and Assessment Act 1979, Section 75H

Environmental assessment prepared by:	
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Qualifications	Bachelor of Science (Hons) Master of Urban and Regional Planning
Address	GHD Pty Ltd 10 Bond Street Sydney NSW 2000

In respect of:

Project to which Part 3A applies	
Applicant name	Transport Infrastructure Development Corporation
Applicant address	Locked Bag 6501 St Leonards NSW NSW 2065
Land to be developed	As described within the environmental assessment
Proposed development	Construction and operation of the North West Rail Link

Environmental assessment	An environmental assessment is attached

Certificate

I certify that I have prepared the contents of this document and to the best of my knowledge:

- It is in accordance with the requirements of Part 3A;
- It contains all available information that is relevant to the environmental assessment of the development to which it relates; and
- The information contained in the document is neither false or misleading.

Signature	
Name	Amanda Raleigh
Date	6 November 2006

Glossary of terms

Acoustic	Pertaining to the sense of organs of hearing, or to the science of sound.
Ambient	Surrounding or existing.
Annual exceedance probability	The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage.
Area 20	Area 20 is a precinct of land identified for urban development as part of the North West Growth Centre.
Balmoral Road Release Area	An urban release area in the vicinity of Balmoral Road, Baulkham Hills.
Bored tunnel	An underground tunnel constructed by a tunnel boring machine.
Bunding	A bund is an impervious embankment of earth or a brick wall which may form part or all of the perimeter of a compound that is provided to retain liquid.
Consent	Approval to undertake a development received from the consent authority.
Cut and cover tunnel	An underground tunnel constructed by rock breakers or conventional excavators and filled once base and roof slabs have been poured.
Director-General's requirements	Requirements for an environmental impact assessment issued by the Director-General of the Department of Planning in accordance with the EP&A Act.
Down direction	Direction on rail network away from Sydney Central Station.
Embankment	A mound of earth or stone built to hold back water or to support a railway or road.
Emission	The release of material into the surroundings (for example, gas, noise, water).
Environmental management plan	A document setting out the management, control and monitoring measures to implemented during construction and/or operation of a development, to avoid or minimise the potential environmental impacts identified during an environmental impact assessment process.
Floodplain	Area of land which is subject to inundation by floods up to and including the probable maximum flood event, that is, flood prone land.
Flora and fauna	Plants and animals.
Geotechnical	Relating to the form, arrange and structure of geology, soils etc.
Global arc	Term used to describe the area of economic development from Macquarie Park to Botany Bay, which contains nearly a quarter of all of Sydney's jobs and half of the region's professional jobs.
Hydrology	Term given to the study of the rainfall and runoff process.
L_{A1}	The noise level exceeded for 1% of the 15 minute interval.
L_{A10}	The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
L_{Aeq}	The A-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.
L_{A90}	The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
Metropolitan Rail Expansion Program	Collective term for the proposed North West Rail Link, CBD Rail Link and South West Rail Link.
Minister	The Minister for Planning
North West Growth Centre	Area identified for land release and development in the Sydney Metropolitan

	Strategy; includes parts of the Blacktown, Baulkham Hills, and Hawkesbury local government areas.
North West Sydney	Area defined in the Sydney Metropolitan Strategy as covering the local government areas of Blacktown, Baulkham Hills, Hawkesbury, Penrith and the Blue Mountains.
Northern Line	The Sydney suburban rail line running between Hornsby and Strathfield.
Park and ride	Car park provided in the vicinity of a public transport stop for use by commuters.
Probable maximum flood	Flood that could be expected from the most severe combination of meteorological and hydrologic conditions that are reasonably possible in a region.
Project	The construction and operation of the proposed North West Rail Link as considered by this environmental assessment.
Proponent	The person proposing to carry out development comprising all or any part of the project, including any person certified by the Minister for Planning to be the proponent (such certification to be obtained prior to commencement of the relevant part of the project).
Rouse Hill development area	Land suitable for urban development, identified as a release area and subject to Sydney Regional Environmental Plan No.19 – Rouse Hill Development Area.
Rouse Hill Regional Centre	A development for a mixed-use town centre in Rouse Hill.
Slab track	A form of railway track comprising a concrete base to which the fixtures carrying the rails are secured. It eliminates the need for individual 'sleepers'.
Stabling facility	A rail siding or group of sidings that are used for the storage, inspection and cleaning of the rail fleet.
Traction power	Term used for electric power supply used on electric railways to power the movement of trains.
Tunnel portal	The entrance and exit of the rail alignment from the bored tunnel.
Quadruplication	The duplication of a twin-track rail line to provide a total of four rail tracks.
Up direction	Direction on rail network towards Sydney Central Station.
Virgin excavated natural material	Natural material (such as clay, gravel, sand, soil and rock) that: (a) is not mixed with any other type of waste; and (b) has been excavated from areas of land that are not contaminated.
Viaduct	A raised bridge consisting of supporting arches and piers to carry a railway or road over a valley, creek, flood plain etc.

List of abbreviations

AADT	Average annual daily traffic
ABS	Australian Bureau of Statistics
AEP	Annual exceedence probability
CBD	Central business district (of Sydney)
CEMP	Construction environmental management plan
dB	Decibels
dBA	Decibels (A–weighted)
DC	Direct current
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
F3	F3 Freeway
GHD	GHD Pty Ltd
INP	Industrial Noise Policy
km	kilometre
km/h	kilometres per hour
LEP	Local environmental plan
LGA	Local government area
M2	M2 Motorway
m^3	Cubic metre
mg/L	Milligrams per litre
min	Minute
mm/s	Millimetres per second
NWRL	North West Rail Link
OSCAR	Outer suburban cars
PB	Parsons Brinckerhoff Australia Pty Ltd
PMF	Probable Maximum Flood
POEO Act	*Protection of the Environment Operations Act 1997*
QIC	Queensland Investment Corporation
RBL	Rating background level
REP	Regional environmental plan
RIC	Rail Infrastructure Corporation
RTA	Roads and Traffic Authority
SEPP	State environmental planning policy
SKM	Sinclair Knight Merz Pty Ltd
SRA	State Rail Authority (former name for part of RailCorp)

TIDC	Transport Infrastructure Department Corporation
TBM	Tunnel boring machine
TSC Act	*Threatened Species Conservation Act 1995*
VENM	Virgin excavated natural material

Executive summary

Overview of the project

North West Sydney is one of the major growth areas in the Sydney metropolitan region. To improve access to employment and educational opportunities for existing and future residents, and to alleviate the increasing traffic congestion in this area, the NSW Government proposes to build the North West Rail Link, a new heavy rail line linking Epping with the regional centres of Castle Hill and Rouse Hill. The North West Rail Link would be a twin track passenger railway, approximately 23 km in length, connecting with the existing Northern Line between Beecroft and Cheltenham Stations and terminating at Rouse Hill.

The project forms part of the Metropolitan Rail Expansion Program, which includes the North West Rail Link, the South West Rail Link and the CBD Rail Link. These projects would provide links between the major new growth and employment areas of the metropolitan region.

The Transport Infrastructure Development Corporation (TIDC) is seeking the Minister's approval for the concept plan for the project and is responsible for project development. Once construction has been completed, the project would be handed over to RailCorp, who would be responsible for operations along the North West Rail Link as part of the existing CityRail network.

The key features of the project include:

» A 2.5 km surface quadruplication of the Northern Line between north of Epping Station and Beecroft Station (including works at Cheltenham Station);

» A 16 km section in tunnel from the Northern Line to Burns Road, including four underground stations (Franklin Road Station, Castle Hill Station, Hills Centre Station and Norwest Station);

» A 4 km surface section from Burns Road to Rouse Hill, including a short (approximately 1 km) viaduct section and two underground stations (Burns Road Station and Rouse Hill Station);

» An interim train stabling facility at Rouse Hill;

» Ancillary tunnel support facilities such as tunnel ventilation, transformers and a water treatment plant(s); and

» Construction work sites.

Scope of the environmental assessment

This environmental assessment has been prepared by GHD Pty Ltd (GHD) in accordance with the requirements of Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). It has been prepared to support an application to the Minister for Planning for approval of the concept plan for the project. The environmental assessment assesses the key issues

associated with the project as specified by the Director-General's requirements received on 12 July 2006.

The environmental assessment provides:

» Information on the project, including need for the project, its strategic context and the alternatives considered;

» A description of the concept plan for the project;

» An assessment of the potential key environmental impacts of the project identified by the Director-General's requirements; and

» The proponent's commitments to further assessment and measures to minimise and manage potential environmental impacts.

As the environmental assessment has been prepared for a concept plan for the project, detailed information on all aspects and therefore associated impacts is not yet available. The impact assessments undertaken for the environmental assessment have been undertaken to a broad level. Where further more detailed assessment is required, this forms part of the recommended mitigation measures/draft statement of commitments for the project.

Community and stakeholder consultation has been undertaken during preparation of the environmental assessment to provide opportunities for interested people and groups to find out more about the project and provide input with respect to issues and concerns.

Approval for a concept plan is sought

TIDC submitted a project application and preliminary environmental assessment of the project to the Department of Planning on 24 May 2006. The purpose of this application was to seek authorisation from the Minister for Planning to develop a concept plan and to obtain the Director-General's requirements for the environmental assessment. The Minister authorised TIDC to prepare a concept plan on 3 July 2006. The Director-General's requirements for the environmental assessment were received on 12 July 2006.

TIDC is seeking a concept approval for the project for the following reasons:

» The project is a large scale, long-term and complex infrastructure project for which conceptual strategic planning work has already been undertaken. A concept plan approval would ensure better integration of land use and transport planning in the local government areas affected by the project.

» Submission of a concept plan would also enable further community involvement in the strategic planning phase and in the refinement of the project. In addition, it would provide the proponent with a greater level of certainty while retaining the necessary flexibility for the refinement of design.

The project is anticipated to be operational by 2017. A staged delivery scenario would see the project between Epping and Hills Centre Station operational by 2015 and the remainder of the project to Rouse Hill operational by 2017.

Need for the project

The need for the project is driven by the following factors:

» Population and employment growth in North West Sydney:

  – North West Sydney is experiencing significant population and employment growth. By 2031, the population of North West Sydney will be 475,000, three times the 1981 population of 150,000. Eighteen percent of Sydney's anticipated residential growth is expected to occur in North West Sydney. Employment is expected to increase by 350% in the same time period to 129,000.

» Employment growth in the global arc:

  – Major employment destinations for residents from North West Sydney include Macquarie Park (North Ryde), Chatswood, St. Leonards, North Sydney, the Sydney CBD and the commercial area around Sydney Airport. Total employment in these centres (referred to as the 'global arc') is forecast to grow by 21%, from 486,000 jobs in 2001 to 590,000 jobs in 2031.

» The existing capacity of transport infrastructure in North West Sydney is considered to be insufficient to meet the predicted population and employment growth:

  – The main form of existing public transport in this region is bus. Peak demand from buses, commercial and private vehicles cannot be adequately accommodated on the existing arterial road network.

  – The Northern, Western and Richmond Lines currently draw indirect patronage from North West Sydney. Without the project, rail demand is predicted to be well in excess of capacity along the Richmond Line and parts of the Western Line by 2021. Hence, there will be either significant overcrowding on trains east of Blacktown and on the Northern and Richmond Lines, or a move to private motor vehicles.

  – The road network will still be under increasing strain as a result of the growing levels of road traffic if an effective form of mass public transport is not provided to meet the predicted levels of population growth.

» Growth in travel demand:

  – It is anticipated that there will be strong demand for travel from North West Sydney to centres in the global arc, to access employment, educational, recreation and cultural facilities. In 2001, 23% of the 116,500 daily trips to work from North West Sydney were to areas in the global arc. In 2031, it is forecast that the global arc will be the destination for 25% of the 164,000 daily trips to work.

  – The predicted growth in employment within North West Sydney will also attract work trips into the region.

» High levels of car dependency:

  – In 2003, only 7% of the total household trips per day from residents of North West Sydney were on public transport; less than half that of residents in eastern Sydney.

  – On average, each household in North West Sydney makes 6.8 vehicle driver trips per day with each resident travelling 27 kilometres per day by vehicle. In comparison, households

in eastern Sydney make 3.3 trips per day with residents each travelling an average of only 11 kilometres each day.

» Need to improve journey times and vehicle kilometres travelled:

  – The patronage study undertaken by Parsons Brinkerhoff (2005) concluded that with the project, the average distances that people have to travel to a rail station in North West Sydney would decrease by approximately 50%, and the time that people take to reach their ultimate destination would reduce by up to 30 minutes. This would be an important factor in moderating the growth in vehicle kilometres in North West Sydney.

Alternatives considered

The North West Rail Link was initially identified in *Action for Transport 2010*, released in 1998. Since then, a number of studies have been completed by the NSW Government to assess the feasibility of the North West Rail Link, including an assessment of alternative modes and alignment options. Alternative modes and corridors were considered against the need to determine which option (mode or corridor) would best meet the transport, land use, environmental and social objectives and provide the best value for money for the growing North West region. The review of alternatives included consideration of over 140 options. The options were reduced to 20 and then further reduced to a shortlist of 6 options. Based on the detailed assessment of options the heavy rail option - Epping to Rouse Hill via Castle Hill - was selected as the preferred option. This option is the basis for the project described by this environmental assessment.

As part of the project assessment and development undertaken by TIDC two alternate options were identified and investigated. These include:

» An underground rail connection between Epping and Franklin Road ; and

» An elevated rail alignment between Hill Centre and Rouse Hill.

These options do not form part of the concept plan for which approval is sought.

Key assessment requirements

Key environmental impacts are described in Part C of the environmental assessment and the specialist reports provided in Volume 2, and are summarised below.

Land use and acquisition

The project has the potential to act as a catalyst for residential and commercial development, with an increase in land use intensity, in the vicinity of the six new station sites. In particular, there is the potential for development with a transit-oriented focus in the vicinity of Franklin Road, Burns Road and Rouse Hill Stations. Burns Road and Rouse Hill Stations are located within new release areas (the Balmoral Road Release Area and the Rouse Hill Regional Centre) and the presence of a station has already been taken into account in the planning and development of these areas. Existing land uses within the vicinity of the other stations would be

able to take advantage of the increased access that the stations provide. Intensification of existing land uses around Castle Hill, Hills Centre and Norwest Stations may also occur.

The interim stabling facility would be located in Area 20, which forms part of the North West Growth Centre. Precinct planning for Area 20 is expected to commence in 2007/8. An opportunity exists to plan for potential impacts of the proposed stabling facility within Area 20 and avoid the potential for noise impacts by incorporating adjacent land uses appropriate for a train stabling facility.

Based on preliminary investigations, part or full acquisition of approximately 140 properties in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991* may be required. Of these, the NSW Government owns 34 properties.

During construction, impacts and disruption to adjacent properties would occur in the vicinity of construction sites.

Traffic, transport, parking and access impacts

Construction of the project has the potential to impact on local and regional traffic flows. Potential impacts include:

» Increase in the volumes of light and heavy vehicles on local roads surrounding construction work sites and arterial roads, potentially leading to some delays at intersections;

» Temporary deviations to roads, property accesses, footpaths, bicycle routes and bus services, which would be designed to provide safe and appropriate access throughout construction; and

» Temporary increase in parking demand on local streets as stations are constructed.

Further investigations and construction planning would determine the extent of these impacts and appropriate mitigation measures. This would occur in consultation with the RTA, local councils, public transport operators, local communities and other stakeholders to minimise the impacts as far as practicable.

After the project is constructed, a number of operational impacts and benefits could be expected at and around each station. These may include:

» An increase in the number of local traffic movements, which may impact upon the operation of local roads and intersections;

» An improved pedestrian environment and better integration with other transport modes around rail stations; and

» Improved access to Sydney's public transport network, providing improved travel choice and potential for travel time savings.

Future investigations would be undertaken for station precincts to provide adequate priority for pedestrians, cyclists and public transport services, with appropriate traffic management for kiss and ride and park and ride movements. Commuter parking facilities are proposed at Franklin Road, Hills Centre and Burns Road stations and the potential for 'shared use parking' of existing facilities at Castle Hill and Norwest Station is under consideration. Intersections surrounding

the proposed station locations require further investigation to ensure that acceptable operation can be achieved and that all road users can be accommodated.

Noise and vibration

For the proposed quadruplication between Epping and Beecroft, the assessment indicated that without mitigation measures such as noise barriers or bund walls, there is the potential for noise criteria to be exceeded. For electric passenger trains, most of these exceedances could be minimised through the use of noise barriers. However, compliance would be more difficult to achieve with noise barriers for diesel locomotives (freight trains) due to the increased source height of the noise emissions.

For the new sections of proposed track on surface or viaduct, compliance with noise criteria could be achieved at most locations via construction of noise barriers/mounds or incorporating noise mitigation measures as part of the viaduct design. In new release areas, it may be possible to minimise impacts on residential areas by providing buffer distances between the railway corridor and residential development, or locating less sensitive land uses closest to the railway corridor.

The need for mitigation measures for operations, such as source controls, the location and height of noise barriers or bund walls, and building treatments, would be further assessed as part of design development.

For the tunnel section, it is anticipated that compliance with the groundborne noise design goals would be achieved through use of feasible and reasonable mitigation measures such as track bed treatment where appropriate.

The preliminary operational vibration modelling results indicate that none of the existing dwellings lie inside the 110 dB human comfort criterion contour.

For the proposed interim stabling facility, without noise mitigation, the continuous noise emissions would comply with the design goals at existing residential receiver locations on the eastern side of Windsor Road. Without noise mitigation, the noise levels from horn testing during night-time periods would exceed the sleep disturbance screening criterion. Further consultation with the Growth Centre Commission and local councils is required to consider appropriate low sensitivity land uses around the stabling. Further investigation into developing and implementing a low horn test mode is currently being undertaken by RailCorp to reduce this noise source as part of the proposed interim stabling facility.

At the majority of construction sites, exceedances of the noise goals when plant and equipment are located in close proximity to residential receiver locations have been identified. For new track sections, construction works would be limited to daytime hours only (unless essential for traffic management or safety reasons) in order to reduce any potential impacts as much as possible.

Twenty-four hours per day construction is proposed as part of the tunnelling activities including at the proposed tunnelling construction sites located at Hills Centre Station and within the Balmoral Road Release Area. It is considered likely that noise mitigation measures would be required.

Ecological impacts

The proposed alignment has been located to pass through previously developed and urbanised environments and avoid areas of significant vegetation wherever possible; and a significant portion is located in tunnel, thereby minimising disturbance to existing habitat.

The following endangered ecological communities have been identified along the proposed alignment, and construction would result in the clearance of a small portion of these communities:

» The endangered Sydney Turpentine-Ironbark Forest (listed by the TSC Act) was identified in two distinct locations along the proposed alignment. Approximately 0.6 hectares would be cleared, which represents approximately 0.35 % of that remaining within the Baulkham Hills LGA;

» The endangered Cumberland Plain Woodland (listed by the TSC Act and EPBC Act) would be impacted at a number of locations along the proposed alignment. Approximately 1.6 hectares of intact community would be cleared, as well as approximately 18.5 hectares of areas mapped as scattered remnant trees representative of this community. The clearance of the intact community represents approximately 0.41 % of that remaining within the Baulkham Hills LGA; and

» The endangered River-flat Eucalypt Forest on Coastal Floodplains (listed by the TSC Act) occurs at a number of locations adjacent to the proposed alignment, and the project would directly impact on this community at three locations. Approximately 0.9 hectares (approximately 0.16 % of that remaining in the Baulkham Hills LGA) would be cleared.

The need for habitat offsets would be determined in consultation with DEC.

Spoil handling

The majority of spoil from construction of the project would be generated during excavation of tunnels and underground station sites. This spoil would be removed from the construction work site at the Balmoral Road Release Area (and the Hills Centre site under the staged delivery scenario). Relatively smaller quantities of spoil generated by site preparation activities, excavation of vertical access shafts, dive structures, cut and cover tunnels and cut/fill activities for the surface railway component would be removed by truck directly from respective work sites.

The project is expected to generate a total of approximately 5 million tonnes (or 4 million m^3 bulked volume) of spoil. Most of this excavated spoil would be uncontaminated crushed sandstone and shale material, classified as 'virgin excavated natural material'.

A number of potential onsite and offsite spoil reuse/disposal sites were identified. However further investigation into possible locations for spoil reuse/disposal would need to be undertaken closer to the commencement of construction.

Haulage by road is the preferred option for transportation of spoil. A number of likely spoil haulage routes were identified, using key roads that are designated B-double routes, including Beecroft Road, Castle Hill Road, Old Northern Road, Showground Road and Old Windsor Road. It is expected that the highest number of average truck movements would be from removal of spoil from the Balmoral Road worksite.

Indigenous heritage

The project traverses a generally highly modified and disturbed landscape. Potential for intact archaeological deposits is low for most of the proposed alignment. No land was identified as being in pristine condition and the few areas of moderate to good archaeological potential are restricted to small parcels of land with at least some degree of previous land use impact.

Fourteen sites have been identified that could potentially be impacted by the project. Eleven of these sites are located between Burns Road Station and the stabling facility in Rouse Hill, where there is likely to be a high degree of previous disturbance. Two sites are located near proposed stations and could potentially be avoided during construction. One site is located in the vicinity of the quadruplication works, and this would be impacted by the project. Three of the 14 sites are identified to have moderate-high archaeological potential. If these sites cannot be avoided (to be confirmed during the further design phase), they should be subject to salvage excavation prior to any sub-surface impacts.

Non-indigenous heritage

The potential impacts on heritage items are summarised in the table below.

Location (proposed alignment section)	Item and listing	Potential impact
Quadruplication	Listed vegetation (Hornsby LEP)	Potential direct impact.
Cheltenham dive site	Beecroft village green (Hornsby LEP)	Potential for encroachment during construction would be clarified during future design work.
Franklin Road Station	House sites (no heritage listing)	Potential direct impact. Further investigations needed to establish heritage significance.
Hills Centre Station	House sites (no heritage listing)	Potential direct impact. Further investigations needed to establish heritage significance.
Between Burns Road Station and Windsor Road	Archaeological site (no heritage listing)	Potential direct impact.
Between Windsor Road and Rouse Hill Station	Archaeological site (s170 register)	Potential direct impact.
	Mungerie house (Baulkham Hills LEP)	Potential impact on vistas.
Vicinity of the stabling facility	Rouse Hill house (State Heritage Register)	Potential impact on vistas.

Geology and groundwater

Only minimal geotechnical information has been gathered along the proposed alignment to date. As such, a number of project-specific geotechnical requirements need to be addressed as part of the further design phase. This would involve geotechnical site investigations at specific locations.

Two site specific issues were identified, one south of Castle Hill Road relating to soil stability, and one in the vicinity of Second Ponds Creek relating to potential salinity.

Experience gained from tunneling within the Sydney Basin in recent years within geological terrains similar to that likely to be encountered during construction of the project, suggests that groundwater seepage within the tunnel is not likely to cause a significant problem during operation.

Other groundwater-related issues which could arise during construction and operation, include:

» Disposal of turbid, saline or contaminated water collected within the tunnel;

» Contaminants leaking down to the water table where the tunnel is above the water table;

» The water table could rise several metres during unusually wet years with potential impacts on the tunnel;

» Land subsidence could result from under drainage of shallow aquifers, especially unconsolidated alluvial aquifers;

» The lowering of the water table could result in loss of output from wells in the vicinity of the rail line; and

» Leakage into a deep cutting and into the Rouse Hill station excavation.

These issues would be managed through implementation of recommended mitigation measures during the design, construction and operation phases.

Surface water and flooding

Potential impacts associated with the project upon surface water and flooding during the construction and operational phases include:

» Obstructions to flood discharges from insufficient waterway openings or constriction from facilities and buildings located in the floodplain;

» Increased surface water runoff from an increase in impervious areas;

» Stormwater quality impacts; and

» Flood waters entering the tunnel.

These issues would be managed through implementation of recommended mitigation measures during the design, construction and operational phases.

Visual and urban design

Potential visual and urban design impacts during the construction phase would be focussed around surface construction areas where sensitive viewing receptors exist within the visual catchment.

During operation, the six new stations would act as catalysts to change in the visual and urban design elements surrounding the station precincts, enhance connectivity and encourage use of the project.

Surface elements of the project, such as the viaduct, provide an opportunity to introduce urban design features into a newly emerging urban landscape.

Project urban design guidelines would be prepared, including urban design principles to guide the further design of the project. This would ensure a high level of urban design for the project, thus minimising the potential for visual impacts and ensuring that the project is effectively integrated with the surrounding built form.

Social impacts

The construction of the project would have positive social impacts at the metropolitan level, including:

» Employment opportunities;

» Reduced public transport journey times and car dependency – this has the potential to result in air quality improvements and positive health benefits;

» Improvements in access to, from and within North West Sydney; and

» Assistance with the implementation of Metropolitan Strategy initiatives relating to strengthening the role of centres, development of corridors and access to employment and services.

Potential social impacts at the local level include:

» Community identity and interaction:

  – Potential severance impacts are likely to be minimal for the project. In established urban areas, the project would be located in a tunnel. In the newer development areas to the northwest, there would be some surface sections, however these would be located in the vicinity of existing regional road infrastructure and/or in the vicinity of newer development areas.

  – The presence of a community focal point such as a railway station and associated infrastructure has the potential to increase social interaction and promote identity.

  – Positive impacts in relation to community assets include improvements to access. Negative impacts could occur as the result of disruption to the use of these assets, either temporarily during construction, or permanently if acquisition is required.

» Amenity impacts – The construction and operation of the project has the potential to create amenity impacts such as noise and vibration; changes to traffic and parking; visual impacts; and air quality (dust) impacts.

» Access and transport, particularly for people with special needs - the project has the potential to provide significant social benefits in terms of improvements to access, particularly for groups with special needs or impaired mobility. All proposed and upgraded stations would have facilities for easy access.

Economic issues

Potential impacts include the following:

» Increase in business activity - increased demand for food and services by the construction workforce during the construction period, and as a result in increased visitation to areas in the vicinity of stations by commuters (during operation). In particular, it is considered that

the presence of a railway station would support the growth of Castle Hill as a major centre, and Norwest as a specialist business centre.

» Improved access to local businesses.

» Increase in employment opportunities - the construction of the project would have a significant positive impact in terms of the provision of direct jobs in the construction and related industries and numerous other jobs in support industries. The potential for increase in business activity noted above may also lead to an increase in employment.

» Business acquisitions – based on preliminary investigations, part or full acquisition of 40 commercial/employment properties would potentially be required.

» Disruptions during construction - If not managed effectively, there is the potential for impacts on the operation of businesses in the vicinity of construction activities.

Specific impacts would need to be determined at a locality by locality level once the design has been refined and construction details are finalised.

Draft statement of commitments

Part D of the environmental assessment provides the Proponent's commitments for environmental mitigation, management and monitoring. The draft statement of commitments identifies:

» Further investigations required, particularly in and around the station sites; and

» Recommended measures to reduce and avoid identified impacts during subsequent stages of the project planning process.

The statement of commitments would be finalised following the public exhibition of the environmental assessment.

Conclusion

The environmental assessment has been prepared in accordance with the provisions of Part 3A of the *Environmental Planning and Assessment Act 1979* and the requirements of the Director-General of the Department of Planning and issues raised by other statutory agencies.

It provides an assessment of the potential environmental impacts of the project, considering both the potential positive and negative impacts of the project, and recommends management and mitigation measures to protect the environment where required.

Overall, the project would:

» Improve access to employment and services for residents of North West Sydney, and other people needing to travel to North West Sydney;

» Improve the capacity and efficiency of the existing transport system, by relieving the pressure on the local and regional road network and other rail lines;

» Relieve overcrowding on parts of the existing rail network;

» Improve air quality by reducing vehicle kilometres travelled;

» Support the efficient functioning and further development of key economic centres and corridors; and

» Assist in realising the objectives of the Sydney Metropolitan Strategy.

The environmental assessment has examined a number of key issues surrounding the project, including the identification of a number of potential negative impacts. Potentially adverse environmental impacts would be largely confined to temporary disruption during the construction period of approximately six years. The main potential impacts requiring management during the construction period are:

» Noise-related impacts associated with construction activities;

» Visual impacts of construction activities, particularly on construction work sites;

» Temporary road closures and diversions;

» Temporary use of public land for construction work; and

» Management of surface water, run-off, erosion and groundwater.

These impacts would be mitigated through consideration during the further design process, the selection of appropriate construction methodologies, and the implementation of the construction and environmental management practices.

During operation, potential impacts are associated with urban design, precinct planning, noise, traffic and parking.

Further investigations would be undertaken prior to seeking project approval and the commencement of construction. The results of these investigations would assist in further reducing the potential for significant adverse construction and operational impacts.

Where to from here

TIDC is seeking approval from the Minister for Planning for the concept plan for constructing and operating the proposed North West Rail Link.

Subsequent steps in the process are as follows:

» Exhibition of the concept plan and environmental assessment for a minimum of 30 days and invitation for the community and stakeholders to make submissions;

» TIDC prepares a submissions report and, if required, a preferred project report and final statement of commitments;

» The Director-General of the Department of Planning provides an assessment report on the concept plan to the Minister for Planning, who then determines the concept plan and, if approved, sets conditions for further assessment and/or further approvals required.

Following concept approval (if received), TIDC would continue project development, including further design work and any environmental assessments required. Tenders could then be sought for detailed design and construction of the project.

Consultation with the community and stakeholders would continue throughout the further assessment, design and construction phases.