Sydney Light Rail Extension - Stage 1 - Inner West Extension

Preliminary Environmental Assessment

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Contents

1 Introduction

1.1 Background

In February 2010, the NSW Government announced as part of the Metropolitan Transport Plan, a $500M commitment to extend the existing Sydney light rail system in the Inner West along the Rozelle Goods line from Lilyfield to Dulwich Hill and in the CBD from Haymarket to Circular Quay via Barangaroo. This comprised:

- Stage 1 - an Inner West extension of 5.6km along the Rozelle Goods Line from Lilyfield to Dulwich Hill
- Stage 2 - a CBD western corridor extension from Haymarket to Circular Quay via Barangaroo with consideration of a future light rail option from Circular Quay to Central via George Street.

Collectively these two stages are known as the Sydney Light Rail Extensions (SLRE).

In the 2010-11 Budget $55 million is allocated to start construction on the SLRE Stage 1 (the Inner West extension) following the environmental assessment process, as well as to undertake pre-construction work on Stage 2.

1.2 Transport NSW

Transport NSW is the lead public transport agency of the NSW Government, with primary responsibility for transport policy, planning and coordination functions as well as oversight of infrastructure delivery and asset management.

Transport NSW has responsibility for consolidating strategic infrastructure services across the portfolio and for developing specific projects consistent with the Metropolitan Transport Plan, including light rail.

Transport NSW is the governing body responsible for the development and delivery of the Sydney Light Rail Extensions and the proponent for the purposes of the *Environment Planning and Assessment Act 1979*.

1.3 Objectives

In line with the Government's overarching objectives and directions, the key objectives of SLRE Stage 1 Inner West extension are defined as follows:

- Improve public transport access and connections between where people live, work and visit
- Improve the integration of public transport networks by linking existing radial corridors
- Enhance livability by improving local accessibility and amenity along the corridor
- Encourage sustainable travel with greater use of active transport
- Make best use of a disused Government asset

- Deliver a safe and reliable project in a sustainable and environmentally friendly way

Deliver the project in an economically efficient and timely manner, in a close and cooperative manner with the local community, state and local government, contractors and other key stakeholders

1.4 This report

This Preliminary Environmental Assessment (PEA) has been prepared by Transport NSW to support a Project Application for the Sydney Light Rail Extension - Stage 1 (Inner West) in accordance with section 75E, Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report responds to the statutory approval process requirements by characterising the project and the baseline environmental conditions, and undertaking a preliminary assessment of likely environmental impacts. It identifies the key environmental impact issues to be addressed during the detailed Environmental Assessment and seeks environmental assessment requirements for the project in accordance with section 75F(3) of the EP&A Act.

1.5 Structure of this report

This report is structured as follows:

- An overview of stakeholder consultation in Section 2
- An overview of the planning framework and statutory requirements in Section 3.
- An overview of the strategic justification for the project is provided in Section 4.
- A description of the project is provided in the Product Definition Report (PDR).
- An overview of the benefits and potential impacts of identified key environmental issues and the required further studies is provided in Section 6.
- An overview of the benefits and potential impacts of other environmental issues and preliminary management measures is provided in Section 7.
- Concluding statements and a proposed scope for the Environmental Assessment are outlined in Section 8.

2 Stakeholder and community consultation

Earlier this year, NSW Government in partnership with Leichhardt, Ashfield and Marrickville Councils and the City of Sydney commissioned transport services company GHD to prepare a study into extending the Sydney Light Rail. The study is being overseen by a Steering Committee that includes the four councils, Transport NSW, RailCorp, the State Transit Authority, the Roads and Traffic Authority and the Department of Planning.

The Committee is chaired by Transport NSW and there is a co-ordinated, whole of government approach to planning the SLRE Stage 1 and stakeholder consultation.

In order to ensure the wider public is informed, a dedicated section has been established on the Transport NSW website (www.transport.nsw.gov.au), which is regularly updated with the latest project information. Media releases are also being issued. Local residents are receiving advice about early works via letterbox drops and community groups are provided with information to disseminate to their members.

Information sessions, key stakeholder briefings and workshops with interest groups are being held to enable discussions about the project with members of the project team.

There have also been a series of meetings held on-site with interested groups including the GreenWay Sustainability Project Steering Committee, environmental volunteer groups and utilities providers.

To obtain community feedback, a dedicated email address and telephone information line have been established.

In addition to the responses about the Light Rail extensions received during the public consultation phase for the Metropolitan Transport Plan, Transport NSW sought community views on the first part of the GHD study regarding the Inner West. During the three-week consultation period from May 17 to June 7, the study was accessed more than 55,000 times on the Transport NSW website.

Close to 400 submissions and comments were received from individual community members, members of parliament, councils, government agencies, businesses, schools, interest groups and residents. Around 97 per cent of the submissions explicity supported the Stage 1 extension and/or outlined matters for further consideration such as the inclusion of a cycleway and bike path recognising the environmental importance of the corridor, provision of bike facilities, location of stops, ticketing and fares and potential road traffic and parking impacts.

This early consultation with key stakeholders and the wider public has indicated a high level of support and interest in the Inner West extension. The key themes raised during public consultation have been addressed in the development of the project scope.

Table 2.1 Key themes of the community consultation

Theme	Transport NSW response	Report section
Support for the project	• Progress development of SLRE Stage 1 Inner West extension project	1.1.5 PDR document
Cycle path and facilities	• Cycle parking to be provided at all light rail stops • Pedestrian and cycle shared path to be provided along the western side of the light rail corridor • Further design work underway to confirm detailed scope of shared path	3.1.2, 4.4 PDR document
Provision of GreenWay	• Extension to be provided in conjunction with a pedestrian and cycle shared path, integrated within an enhanced and managed environmental corridor (the GreenWay) • Further design work underway to confirm detailed scope of GreenWay components	4.5 PDR document
Integrated fares and ticketing	• Fare structure will be derived from current system • Future integration with 'MyZone' fare system to be investigated	4.6.3 PDR document
Traffic and parking	• Off-street commuter car parking to be considered at Dulwich Hill and Leichhardt North stops • Further design work underway to confirm detailed scope of off-street parking • On-street commuter car parking near stops predicted to be low, but will be subject to further investigation • Consideration of traffic and parking impacts and mitigation measures within Environmental Assessment	4.4.3 PDR document
Bushcare impacts	• Light rail (including stops and access points) and shared path designed to minimise impacts to existing vegetation • Further design work underway to confirm detailed scope of bushcare protection and enhancement measures • Consideration of bushcare impacts and mitigation measures within Environmental Assessment	4.5, 4.7 PDR document
Safety and security	• Stops to include lighting, CCTV, emergency telephone/help point, railings, tactile paving, and warning signs • Appropriate safety fencing or separation of shared path and light rail operations will be provided • A risk management plan will be developed, to include safety and security components • Further design work underway to confirm detailed scope of stop and alignment safety and security elements	4.4.2, 7.2 PDR document
Construction impacts	• Construction will occur along the line of the corridor and at its interfaces, including stop locations and access points • Consideration of construction impacts and mitigation measures within Environmental Assessment	6.2 PDR document 8.0 PEA

Theme	Transport NSW response	Report section
Pedestrian access	• Stops designed for easy access for all users, including stair and lift, and ramped access where appropriate • Further design work underway to confirm detailed scope of stop design and pedestrian facilities	4.4, 4.5 PDR document
Transport integration	• Access and interchange with other modes of travel provided for, including rail and bus where appropriate • Further design work underway to confirm detailed scope of transport access and interchange elements	4.4.3 PDR document
Cost	• Ongoing work to confirm project costs	6.4 PDR document
Operations	• Similar service frequency to existing light rail • Detailed service requirements to be confirmed with operator	4.8 PDR document

On-going information-sharing, discussion and consultation are priorities for the project. It is anticipated that the Environmental Assessment will be placed on public exhibition towards the end of the year. During the exhibition period, the public will be able to make written submissions to the Director-General of Planning.

3 Planning framework and statutory requirements

3.1 Planning approval requirements

Part 3A of the EP&A Act establishes an assessment and approval regime for major projects. Projects to which Part 3A applies are declared to be a Part 3A project by either a State Environmental Planning Policy or Ministerial Order.

On 19 March 2010, an order was gazetted declaring “priority developments for the delivery of the Metropolitan Transport Plan 2010” projects to which Part 3A applies. The declaration states that “development for the purposes of the Light Rail Extension, generally between Lilyfield and Dulwich Hill” is of State and regional environmental planning significance.

The declaration was amended to exclude preliminary investigations, certain minor works and maintenance activities. The amended declaration states:

Priority developments for the delivery of the Metropolitan Transport Plan 2010, being each of the following developments:

a) development for the purpose of the Western Express Line, including (but not necessarily limited to) development for the purposes of the following support projects:

- *City Relief Line;*
- *Traction Supply Upgrade;*
- *Emu Plains Stabling Extension;*
- *Homebush Crossover; and*
- *St Mary’s Turnback;*

b) development for the purposes of the Light Rail Extension, generally between Haymarket and Circular Quay;

c) development for the purposes of the Light Rail Extension, generally between Lilyfield and Dulwich Hill; and

d) development for the purposes of the North West Rail Link, being new rail infrastructure generally from Epping to Rouse Hill.

The developments do not include:

i) investigation (including geotechnical and other testing, surveying and sampling) at, above or below the surface of the ground;

ii) maintenance or repair of an existing rail infrastructure facility;

iii) upgrading or maintenance of landscaping and vegetation management or clearing; and

iv) maintenance of a project.

The Sydney Light Rail Extension – Stage 1 (Inner West) is therefore considered to be a project to which Part 3A applies.

3.1.1 Critical infrastructure declaration

Section 75C of the EP&A Act provides that the Minister for Planning may declare a project or type of project to be critical infrastructure because it is, in the opinion of the Minister, essential for the State for economic, environmental or social reasons.

The critical infrastructure provisions of the EP&A Act:

- Ensure the timely and efficient delivery of essential infrastructure projects.
- Allow the Government and the planning system to rapidly and readily respond to the changing needs of the State.
- Provide certainty in the delivery of these projects.
- Provide for rigorous scrutiny to ensure environmental outcomes are appropriate.
- Focus on delivering outcomes essential to the NSW community.

On 19 March 2010, an order was gazetted declaring that *"development for the purposes of the Light Rail Extension, generally between Lilyfield and Dulwich Hill"* would be a critical infrastructure project under Section 75C of the EP&A Act was gazetted.

The Sydney Light Rail Extension – Stage 1 (Inner West) is therefore considered to be critical infrastructure.

3.2 The proponent

Transport NSW is the lead public transport agency of the NSW Government, with primary responsibility for transport policy, planning and coordination functions as well as oversight of infrastructure delivery and asset management.

It will be the governing body responsible for the development and delivery of the Sydney Light Rail Extension to Dulwich Hill and the proponent for the purposes of the EP&A Act.

Transport NSW was constituted under the *Transport Administration Act 1988* as amended by the *Transport Administration Amendment Act 2010*.

3.3 Environmental assessment process

Transport NSW, as project proponent, now seeks a Project Approval under Part 3A of the EP&A Act for the Sydney Light Rail Extension – Stage 1 (Inner West). This PEA has been prepared to support the Project Application. The following key milestones for the environmental assessment are anticipated:

- Project application (including PEA): 2nd Quarter 2010
- Initial community feedback: 2nd Quarter 2010
- Director General's requirements: 3rd Quarter 2010
- Prepare detailed environmental assessment: 3rd & 4th Quarter 2010
- Community feedback: 3rd & 4th Quarter 2010

- Exhibit environmental assessment: 4th Quarter 2010
- Submissions report 4th Quarter 2010
- Director General's report and project Approval 1st Quarter 2011

3.4 Environmental planning instruments

3.4.1 State Environmental Planning Policies

Section 75R(2) of the EP&A Act states that State Environmental Planning Policies (SEPPs) apply to:

"(a) the declaration of a project as a project to which this Part applies or as a critical infrastructure project, and

(b) the carrying out of a project, but (in the case of a critical infrastructure project) only to the extent that the provisions of such a policy expressly provide that they apply to and in respect of the particular project."

The project has been declared to be a critical infrastructure project. To date there are no SEPPs that *"expressly provide that they apply to and in respect of"* the project.

By reason of the operation of Sections 75J and 75R of the EP&A Act, and the critical infrastructure declaration, the project may be approved notwithstanding a prohibition contained in an environmental planning instrument, including a SEPP, unless that SEPP specifically states that it applies to the critical infrastructure project.

The *Transport Administration Act 1988* and State Environmental Planning Policy (Infrastructure) 2007 contains statutory provisions that permit the construction and operation of the project without the need for development consent under Part 4 of the EP&A Act.

Other SEPPs that may provide useful guidance, as opposed to statutory requirements, regarding potential issues and synergies to be addressed within the EA include *State Environmental Planning Policy No. 55 – Remediation of Land and State Environmental Planning Policy No.33 – Hazardous and Offensive Development.*

3.4.2 Regional Environmental Plans and Local Environmental Plans

Section 75R(2) of the EP&A Act states that *"environmental planning instruments (other than State environmental planning policies) do not apply to or in respect of an approved project".* Further, Section 75J(3) states:

"In deciding whether or not to approve the carrying out of a project, the Minister may (but is not required to) take into account the provisions of any environmental planning instrument that would not (because of section 75R) apply to the project if approved."

As the project is critical infrastructure, Regional Environmental Plans (REPs) and Local Environmental Plans (LEPs) do not apply to the project. The Minister may, but need not, consider these plans when determining the application.

The *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* may apply to the land on which the project will be located, and will be reviewed where relevant as part of the EA.

The following local environmental planning instruments apply to the land on which the project will be located, and will be reviewed where relevant as part of the EA:

- Leichhardt Local Environmental Plan 2000
- Ashfield Local Environmental Plan 1985
- Marrickville Local Environmental Plan 2001

3.5 Other regulatory licences and approvals that may be required

Section 75U(1) of the EP&A Act specifies certain authorisations that are not required for an 'approved project' under Part 3A, namely:

"(a) the concurrence under Part 3 of the Coastal Protection Act 1979 of the Minister administering that Part of the Act,

(b) a permit under section 201, 205 or 219 of the Fisheries Management Act 1994,

(c) an approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,

(d) a permit under section 87 or a consent under section 90 of the National Parks and Wildlife Act 1974,

(e) an authorisation referred to in section 12 of the Native Vegetation Act 2003 (or under any Act to be repealed by that Act) to clear native vegetation,

(f) a permit under Part 3A of the Rivers and Foreshores Improvement Act 1948,

(g) a bush fire safety authority under section 100B of the Rural Fires Act 1997,

(h) a water use approval under section 89, a water management work approval under section 90 or an activity approval under section 91 of the Water Management Act 2000."

Section 75A defines 'approved project' as *"a project to the extent that it is approved by the Minister under this Part, but does not include a project for which only approval for a concept plan has been given"*. Consequently, any approvals that will otherwise be needed will not be required following project approval to carry out the project under Part 3A.

Under Section 75V(1) of the EP&A Act, the following relevant authorisations cannot be refused if necessary for the carrying out of an 'approved project' and are to be substantially consistent with an approval to carry out the project given under Part 3A:

- An Environment Protection Licence under Chapter 3 of the *Protection of the Environment Operations Act 1997*.
- A consent under s138 of the *Roads Act 1993*.

In addition, with respect to a critical infrastructure project, Section 75U(3) provides that the following orders or notices cannot be made or given so as to prevent or interfere with the carrying out of an approved critical infrastructure project:

"(a) an interim protection order (within the meaning of the National Parks and Wildlife Act 1974 or the Threatened Species Conservation Act 1995),

(b) an order under Division 1 (Stop work orders) of Part 6A of the National Parks and Wildlife Act 1974, Division 1 (Stop work orders) of Part 7 of the Threatened Species Conservation Act 1995 or Division 7 (Stop work orders) of Part 7A of the Fisheries Management Act 1994,

(c) an environment protection notice under Chapter 4 of the Protection of the Environment Operations Act 1997,

(d) an order under section 124 of the Local Government Act 1993."

3.5.1 Protection of the Environment Operations Act 1997

Activities for which a licence is required under the *Protection of the Environment Operations Act 1997* (POEO Act) are detailed in Schedule 1 of the Act.

Clause 33 of Schedule 1 relates to 'railway systems activities', which are defined as:

"(a) the installation, on site repair, on site maintenance or on site upgrading of track, including the construction or significant alteration of any ancillary works, or

(b) the operation of rolling stock on track."

In Clause 33, track means *"railway track that forms part of, or consists of, a network of more than 30 kilometres of track, other than railway track that is used solely by railway vehicles that are themselves used solely for heritage purposes".*

The project involves the construction and operation of an additional 5.6 kilometre of railway track as an extension to the 7.2 kilometre existing Light Rail network for a total network when completed of 12.8km. It will not result in a network of more than 30 kilometres of track. The Light Rail network will therefore not require an Environment Protection Licence under the POEO Act.

3.5.2 Roads Act 1993

Section 138(1) of the *Roads Act 1993* (Roads Act) states:

"A person must not:

(a) erect a structure or carry out a work in, on or over a public road, or

(b) dig up or disturb the surface of a public road, or

(c) remove or interfere with a structure, work or tree on a public road, or

(d) pump water into a public road from any land adjoining the road, or

(e) connect a road (whether public or private) to a classified road,

otherwise than with the consent of the appropriate roads authority."

The project is expected to involve erecting structures in, on or over some public roads, as well as temporarily occupying or disturbing the surface of some public roads. Section 104N(2) of the *Transport Administration Act 1988* allows a route along a road to be declared to be the route of a light rail system. However, consent from the appropriate roads authority, being the Roads and Traffic Authority or the local council as relevant, may be required in accordance with section 138 of the Roads Act in respect of work carried out by a *"public authority"* on a classified road.

3.5.3 Transport Administration Act 1988

Section 104P of the *Transport Administration Act 1988* provides that Development for the purposes of a light rail system is an activity within the meaning of Part 5 of the EP&A Act.

3.6 Commonwealth legislation – Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas and species, populations and communities and heritage items.

The approval of the Commonwealth Minister for the Environment is required for:

- An action which has, will have or is likely to have a significant impact on *"matters of National Environmental Significance"* (NES matters). The current NES matters include:
  - The world heritage values of a declared World Heritage property.
  - The National Heritage values of a listed National Heritage place.
  - The ecological character of a declared Ramsar wetland.
  - Listed threatened species and ecological communities.
  - Listed migratory species.
  - The Commonwealth marine environment.
  - Nuclear actions.
- An action by the Commonwealth or a Commonwealth agency which has, will have or is likely to have a significant impact on the environment.
- An action on Commonwealth land which has, will have or is likely to have a significant impact on the environment.
- An action which has will have or is likely to have a significant impact on the environment on Commonwealth land, no matter where it is to be carried out.

NES matters are assessed through a referral process to the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA). If the Commonwealth Minister for the Environment, Heritage and the Arts determines that a project is likely to have a significant impact on a NES matter then the project becomes a controlled action and approval of the Commonwealth Minister for the Environment, Heritage and the Arts will be required before construction could commence.

A preliminary consideration of the project against these triggers has been undertaken. Based on investigations completed to date, a number of ecological communities listed under the EPBC Act are located in close proximity to the project.

The EPBC Act may also be triggered if the proposal impacts upon Commonwealth land or heritage items listed within the Australian Heritage Database. No Commonwealth Heritage Places or Commonwealth land has been identified to date.

At this early stage of assessment, it is considered that approval for the proposal is not required under the EPBC Act and therefore, referral to the Commonwealth Minister for the Environment, Water, Heritage and the Arts is not required. However, this would be considered further during the preparation of the EA when detailed property, flora and fauna and heritage investigations are undertaken.

If the project was likely to result in a 'significant' impact, direct or indirect, upon these NES matters, concurrent Commonwealth approval under the EPBC Act would be required.

4 Strategic context

4.1 Metropolitan planning

Sydney's population is expected to reach six million by 2036 – an increase of 1.7 million since the last census in 2006. That means 760,000 more jobs and 770,000 more homes are needed than in 2006. This growth brings significant implications for transport and infrastructure.

The NSW State Plan and the 2005 Metropolitan Strategy provide the framework to manage Sydney's growth and development to 2031. It provides a shared vision to guide the activities of State agencies and local government in the Metropolitan Region.

A review of the 2005 Metropolitan Strategy is now underway to ensure it is kept up to date and relevant, responsive to new events and challenges, maintaining a long term planning view.

4.1.1 Metropolitan Transport Plan

The 10 year Metropolitan Transport Plan was released in February 2010. The plan outlines the NSW Government's priorities for improving Sydney's transport network. The Metropolitan Transport Plan forms a key component of the revision of the Metropolitan Strategy to further strengthen the planning framework, and have a sustainable plan for meeting the housing and employment growth challenges.

The Metropolitan Transport Plan sets out the Government's direction on light rail in Sydney, based around providing a sustainable transport mode connecting to key destinations and interchange locations in the CBD and Inner West.

The Inner West extension will provide an alternative mode choice for accessing the Inner West, Pyrmont, Darling Harbour and the CBD. It will activate an orbital corridor thereby allowing movement between existing bus and rail corridors radiating from the CBD including the Inner West and Bankstown CityRail Lines.

In the CBD, the Stage 2 light rail extension is intended to link with the extensive development at Barangaroo, and enhance connectivity to the King Street Wharf precinct, the Walsh Bay entertainment precinct and The Rocks.

4.1.2 NSW Bike Plan

The NSW BikePlan was released in May 2010. The plan focuses on the delivery of new cycling infrastructure to transform cycling and to encourage people to ride more often and more safely in NSW. The plan prioritises a Dulwich Hill to Lilyfield cycleway as one of 13 major missing links within the Metro Bike network. The existing freight corridor provides an opportunity to cater for active transport (walking and cycling) and recreation.

The pedestrian and cycle shared path component of the GreenWay as expressed in this report is consistent with the NSW Bike Plan proposal for a cycle link between Dulwich Hill and Lilyfield parallel to the light rail western extension corridor. A combined light rail and pedestrian and cycle corridor would support the NSW Bike Plan's target of 5% travel by bike for all trips in Sydney of less than 10 kilometres by 2016.

4.1.3 GreenWay

The GreenWay Sustainability Project is a partnership between four Inner West Councils of Ashfield, Leichhardt, Marrickville and Canterbury. The GreenWay vision is to design and implement a best practice model for shared responsibility towards achieving a sustainable environmental, cultural and non motorised corridor that links the sub catchments of Cooks River and Iron Cove.

A key feature of the GreenWay project is protecting biodiversity and promoting non motorised transport.

The GreenWay proposed by the four councils is approximately 5km long, extending from the Cooks River at Earlwood in the south to Iron Cove in the north, passing through the four local Government areas, and following the line of the disused Rozelle freight corridor.

A number of GreenWay initiatives have already commenced. A Masterplan and Co-ordination strategy has been developed for the GreenWay initiative by a working group consisting of local councils, key agencies and community representatives through 2007 and 2008. This was placed on joint public exhibition by Ashfield, Leichhardt and Marrickville Councils during 2009. The Masterplan was approved by the Councils in October 2009.

The Inner West extension project seeks to activate a disused public asset for public transport purposes. Its objectives and sustainability principles are closely correlated with those of the GreenWay sustainability project. A key driver for the Sydney Light Rail extension from Lilyfield to Dulwich Hill is to integrate the GreenWay with the light rail project.

Based on the GreenWay Masterplan, the Transport NSW project team has investigated uses of the rail corridor that would complement the Inner West extension, covering both personal transport and environmental considerations.

5 Description of the Project

Details of the project and its key characteristics are outlined in Chapter 4 Product Description in the accompanying document *Product Definition Report (PDR).*

6 Project delivery

6.1 Staging and delivery strategy

6.1.1 Staging of Inner West extension

To fully gain the benefit of utilising the existing corridor it is proposed that the extension should run from Lilyfield to Dulwich Hill and not be terminated at Lewisham. The advantage of this is that it will provide a full service through the Inner West and more fully meets the overall project objectives.

6.1.2 Delivery strategy

A Project Deed, dated 2 December 1994, and with various subsequent amendments, sets out the contractual arrangements between the owner/operator of the existing light rail system - Sydney Light Rail Company (now Metro Transport Sydney), Pyrmont Light Rail Company (a wholly owned subsidiary of Metro Transport Sydney) - and the Department of Transport, now Transport NSW. The Director General of Transport NSW is the Principal under the Deed.

Both the light rail and monorail are currently operated under contract to Metro Transport Sydney by Veolia Transport Sydney (formerly Connex Group Australia). The parent company, Veolia Transport, is a division of French-based Veolia Environment.

The term of the concession for ownership of the light rail system expires on 10th February 2028, after which time ownership of the system reverts to the NSW Government.

Within the Deed the existing owner has the first right to negotiate terms and conditions for any extension of the light rail.

Recognising these provisions the proposed strategy, subject to achieving a value for money outcome for Government, is to negotiate and reach agreement with the existing owner for them to undertake the design, construction and operation of the Inner West extension.

It is proposed that there will be separate negotiation processes for Inner West extension and CBD extension to take account of the different times, nature and characteristics of the two project stages.

Initial negotiations have commenced with the existing owner for the Inner West extension. Subject to reaching agreement on the commercial and financial principles for the extension, it is envisaged that agreement can be reached by Q4 2010 which would allow construction to commence in early 2011. Allowing a 12 month construction period, this would enable operation of the light rail to commence in the first quarter of 2012.

6.1.3 Project governance

The existing light rail project was delivered as a Privately Financed Project (PFP) and therefore it is proposed that the negotiation process will follow the principles outlined in the Working with Government Guidelines on Privately Financed Projects.

Following the guidelines, it is proposed that a Light Rail Steering Committee be formed with representatives from Transport NSW, Premiers and Cabinet, Treasury and RailCorp to oversee the project.

6.2 Construction strategy

6.2.1 Construction activity

Consistent with a corridor project, construction will occur along the line of the corridor and at its interfaces, including stop locations and access points. Types of construction acitivity are outlined below:

Early Works – Track Renewal
RailCorp has been engaged to recondition the existing track with replacement of the sleepers and rail and associated ballast replacements and cleaning. This work will commence in August 2010, subject to environmental assessment, and be complete by October 2010.

This early work will allow a meaningful start to be undertaken on the project and assist in completing a major portion of the works in advance of the Stop and Rail Systems construction works.

Stops and Rail Systems
As part of the negotiations with the existing owner, it is envisaged that they will undertake a competitive tender process for the construction of all capital works. These will include stops, bulk power supply and overhead traction power. The current timetable is to issue design and construct tenders in the first quarter of 2010 which would allow contract award in the fourth quarter of 2010 or first of 2011.

Bridge across Parramatta Road
Based on the outcome of risk workshops with the various stakeholders, it is anticipated that the existing bridge over Parramatta Road will be either strengthened, raised or crash protected as required.

GreenWay components
It is anticipated that the timing for GreenWay works would run in parallel with light rail stop and rail system works.

6.2.2 Construction sites

Construction sites required for construction staff, laydown and secure storage will be considerd at the following locations: *[Note: Locations to be reviewed and agreed]*

1. Dulwich Hill: Open area to the west of the alignment opposite Blackwood Ave;
2. Dulwich Hill: West side of alignment adjacent Johnson Park;
3. Dulwich Hill: East side of alignment at David St;
4. Summer Hill: East side of alignment south of Old Canterbury Rd;
5. Lewisham: East side of alignment north of Longport St;
6. Leichardt: East side of alignment at Beeson St;
7. Leichardt: West side of alignment at existing storage area south of Hawthorne Canal Reserve;
8. Leichardt: West of Charles St; and
9. Lilyfield: Rozelle Goods yard.
10. Leichhardt: Property at 7 Darley Road (disused wahrehouse)

6.3 Project program

The proposed delivery strategy allows for the commencement of construction in January 2011 and the commencement of operations in the first quarter of 2012.

Key milestone dates are given below.

Table 6.1 Project program – key events and milestones

Event or Milestone	Date
Initial discussions with Owner	Underway
Community consultation commencement	Underway and ongoing
Complete Inner West Extension Study for Stage 1 (GHD feasibility study)	July 2010
Submission of project application and Preliminary Environment Assessment	Mid 2010
Commencement of early works – track maintenance and renewal	August 2010
Environmental Assessment Exhibition and community consultation	4th Quarter 2010
Execute Agreement with the Owner for SLRE Stage 1	4th Quarter 2010
Planning Approval	1st Quarter 2011
Award of construction contract by Owner	1st Quarter 2011
Construction commences	1st Quarter 2011
Construction complete	4th Quarter 2011
Start operation of SLRE Stage 1	1st Quarter 2012

6.4 Project costs

Preliminary cost estimation has been undertaken by GHD as part of the Sydney Light Rail Inner West Extension Study to develop indicative capital and operational costs to inform the feasibility assessment of the SLRE Stage 1 Inner West extension.

6.4.1 Capital costs

Capital costs were calculated at a pre-feasibility level based upon a limited design, with inclusion of a 50% contingency to cater for variability. The GHD assessment also excluded any costs associated with the GreenWay, and a number of other exclusions.

The cost of delivering the product scope has been updated from GHD's initial work and is estimated at $120m for the light rail extension (including $25m early works) and Greenway components at $30m – both with 50% contingency. These initial costs will be refined as concept designs are completed.

6.4.2 Operational and maintenance costs

The GHD feasibility study provided estimates of operating costs based upon preliminary service and operational planning assumptions, including a frequency of 5 LRVs per hour and a fleet requirement of 10 vehicles, summarised below:

Table 6.2 Cost estimated (operational)

Extension	Annual operating cost	Opex (per pax km*)	Fleet utilisation
Existing (Central – Lilyfield)	$5.3 million	$0.53	7
SLRE Stage 1 (Central – Dulwich Hill)	$3.3 million (extra)	$0.46	10

Source: GHD Study (2010). *Based on 20 passengers average per vehicle.

Operating costs will be further defined by the operator.

GHD also estimated maintenance costs of approximately $1.5M per year. The additional cost of of extra LRVs is assumed to be approximately $4 million per unit.

7 Identification of key environmental issues

7.1 Overview

Environmental risk analysis enables the identification of potentially significant environmental effects associated with development projects. It is an important part of the Part 3A Environmental Assessment process. Evaluation of the construction and operating characteristics of development projects and the baseline environment assists in deriving important information on potential issues, and further assessment needs. Where relevant, existing assessments in the study area provide useful background information that aids the environmental risk analysis process.

The environmental risk analysis has adopted an iterative evaluation process. This enables environmental risk issues to be incorporated into the project design. The results of this preliminary environmental risk analysis have identified those issues considered to be key issues for the Environmental Assessment. These key issues are discussed, and anticipated requirements for further assessment have been identified.

This section of the Preliminary Environmental Assessment provides the conclusions of the environmental risk analysis and addresses those aspects as they generally relate to the whole project. The Preliminary Environmental Assessment provides information on the key environmental issues that relate to construction and operation of the project.

A number of other non-key issues that could largely be addressed using management measures have also been identified and are addressed in this section.

Table 7.1 presents a summary of the key environmental issues identified.

Table 7.1 Summary of key environmental issues

Key environmental issues	Construction	Operation
Ecology	X	X
Visual impacts		X
Noise and Vibration		X
Land use and property		X
Non-Indigenous heritage	X	
Traffic, transport, parking and access		X

7.2 Ecology

7.2.1 Background

The study area is generally contained within the existing freight rail corridor, which is located within the highly urbanised context of Sydney's Inner West. The wider area has been subject to the ecological pressures associated with clearing and urbanisation over an extended period. This has resulted in a reduction in the abundance and species diversity within native flora and fauna populations and the consequent fragmentation of the remaining vegetation and habitat. There are some isolated remains of the original Sydney Turpentine-Ironbark forest in the surrounding suburbs.

A preliminary desktop analysis has been undertaken including review of:

- Aerial photography and visual assessment of vegetation / habitat;
- Previous reports;
- NSW Department of Environment, Climate Change and Water (DECCW) Atlas of NSW Wildlife Database Records for threatened species and endangered ecological communities listed under the *Threatened Species Conservation Act 1995* (TSC Act) and *Fisheries Management Act 1994*; and
- Commonwealth Department of the Environment, Waater, Heritage and the Arts (DEWHA) Protected Matters Search Tool for matters of national environmental significance listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This preiminary analysis indicated that there are no threatened plant species records in the vicinity of the corridor and there is unlikely to be any threatened plant habitat or endangered ecological communities in the corridor given the extent of clearing and urban development in the locality.

A number of threatened fauna species and their habitats have been identified in the vicinity of the corridor. These include records of the Long-nosed Bandicoot population of Inner Western Sydney and Grey-headed Flying-fox. Some mature native trees and dense understorey vegetation may provide habitat for these species and other native fauna, including microbat species.

7.2.2 Potential issues

While the existing freight rail corridor runs through a highly urbanised part of inner Sydney, the corridor does provide a variety of habitats of potential value to locally occurring threatened species. Key ecological issues for the project include:

- Foraging, nesting and dispersal habitat for the endangered Long-nosed Bandicoot population of Inner Western Sydney, which is listed under the TSC Act. Individuals of this endangered population have been recorded within the rail corridor;
- The potential presence of threatened plant species listed under the TSC and/or the EPBC Act;
- Foraging habitat for the Grey-headed Flying-fox, listed as vulnerable under both the NSW TSC Act and the Commonwealth EPBC Act; and
- Roosting habitat (tunnels, culverts etc) and foraging habitat for threatened or vulnerable microbat species.

Additionally, the GreenWay project is partway through a three-year, $1.83 million Sustainability Project, which involves bush regeneration within the study area, and thus a progressive increase in biodiversity values and fauna habitats within the study area over several years.

7.2.3 Scope of further studies

Any potentially significant impacts on flora and fauna, particularly at proposed light rail stops, will be assessed fully, and measures adopted to mitigate any adverse effects.

7.2.4 Proposed Scope of detailed EA

In accordance with the PEA undertaken for the project, Table 7.2 summarises the proposed scope of the detailed EA, having regard to the issues identified throughout this report.

Table 7.2 Proposed scope of the EA

Issue	Scope of the EA
Ecology	▪ Identification of vegetation and potential habitat in and around the project that may be directly or indirectly affected during construction or operation. ▪ Consideration of the potential impacts to threatened or vulnerable fauna and habitat during operation. ▪ The EA will include the results of field work and address areas relating to the management or protection of vegetation, habitat and bush regeneration areas. ▪ The EA will present a strategy to avoid, mitigate or offset impacts on vegetation, habitat and bush regeneration areas.

7.3 Visual Impact

7.3.1 Background

The project would use 5.6km of existing, disused freight line and associated infrastructure with some modification, and require the construction of eight new stops. Two new electricity substations would also be necessary within the rail corridor.

Visual impacts would be associated with the positioning of eight new stops, accompanying infrastructure and light rail operations. Sensitive receptors are residential dwellings neighbouring the corridor. Industrial and commercial properties are not considered to be as sensitive to impacts as residential receivers.

7.3.2 Potential Issues

Construction and operation of the Light Rail Extension s expected to produce visual impacts as a result of an increase in the number of people using the corridor. Visual impacts are expected due to the placement of new stops in the corridor, which along with the operation of the light rail, would result in people having views into neighbouring properties.

The Light Rail Extension corridor is lined with a large number of visually sensitive receptors, which are predominantly residential dwellings that back on to or front the corridor. The impacts, however, are generally considered low as much of the works would be located within an existing rail corridor and therefore minimise impacts on the surrounding areas.

Visual impacts will be carefully considered in planning activities with a particular focus on the stop localities identified in Table 7.3.

Table 7.3 Visual Impacts of Proposed Stops

Stop	Current Status	Visual Impacts
Leichhardt North	▪ Numerous visually sensitive receptors are located in the vicinity of the stop with the majority of these being residential dwellings.	▪ The construction and operation of the proposed Leichhardt North Stop would result in some potential visual impacts due to the introduction of new infrastructure (e.g. a new light rail stop) into the visual environment for sensitive visual receptors located to the south of the stop.
Hawthorne	▪ Numerous visually sensitive receptors are located in the vicinity of the stop with the majority of these being residential dwellings.	▪ The construction and operation of the proposed Hawthorne Stop would result in some potential visual impacts due to the introduction of new infrastructure (e.g. new light rail stop) into the visual environment for sensitive visual receptors located along Darley Road and Loftus Street.
Marion	▪ Numerous visually sensitive receptors are located in the vicinity of the stop with the majority of these being residential dwellings. ▪ Residential dwellings located to the	▪ The construction and operation of the proposed Marion Stop would result in some potential visual impacts due to the introduction of new infrastructure (e.g. new light rail stop) into the visual receptors

Stop	Current Status	Visual Impacts
	west would have limited view of the stop due to the screening by vegetation along western side of Hawthorne Canal.	located to the west of the stop.
Taverners Hill	▪ Numerous visually sensitive receptors are located in the vicinity of the stop with the majority of these being residential dwellings. Views from sensitive receptors to the east of the stop would be limited to a few residential dwellings, while dwellings to the west of the stop would have limited views of the stop due to vegetation along the eastern edge of the Hawthorne Canal.	▪ The construction and operation of the proposed Taverners Hill Stop would result in some potential visual impacts due to the introduction of new infrastructure (e.g. new light rail stop) into the visual receptors located around the stop.
Lewisham West	▪ Some residential dwellings are located in the vicinity of the stop, however, these dwellings would have limited views of the stop due to its location within a cutting. Future residential development on existing industrial land would result in some additional sensitive receptors.	▪ The construction and operation of the proposed Lewisham West Stop would result in some potential visual impacts due to the introduction of new infrastructure (e.g. new light rail stop) into the visual receptors located around the stop
Waratah Mills	▪ Numerous visually sensitive receptors are located in the vicinity of the proposed stop with the majority of these being residential dwellings. Views of the proposed stop would predominantly be from residential receptors backing onto the corridor north of the Davis Street overbridge.	▪ The construction and operation of the proposed Waratah Mills Stop would result in some potential visual impacts due to the introduction of new infrastructure (e.g. new light rail stop) into the visual receptors located around the stop
Dulwich Grove	▪ Numerous visually sensitive receptors are located in the vicinity of the proposed stop with the majority of these being residential dwellings. Views of the proposed stop would be limited due to its positioning in a cutting. Views of the stop would be possible from the residential units located to the west of the corridor. The remaining receptors are considered to be non sensitive receptors.	▪ The construction and operation of the proposed Dulwich Grove Stop would result in some potential visual impacts due to the introduction of new infrastructure (e.g. new light rail stop) into the visual receptors located around the stop.
Dulwich Hill Interchange	▪ Numerous visually sensitive receptors are located in the vicinity of the proposed stop with the majority of these being residential dwellings.	▪ The construction and operation of the proposed Dulwich Hill Interchange Stop would result in some potential visual impacts due to the introduction of new infrastructure (e.g. new light rail stop) into the environment for sensitive visual receptors located around the stop.

Stop	Current Status	Visual Impacts
		▪ Visual impacts would be relatively high for residents in Bedford Crescent. More distant views of the stop would be possible from the southern side of the existing railway line due to the elevated nature of Bedford Crescent. The stop is also likely to be visible from Dulwich Hill CityRail Station.

Stops would be located and designed to minimise intrusive visual impacts to neighbouring properties.

Any potentially significant visual impacts, particularly at proposed light rail stops, would be assessed fully, and measures adopted to mitigate any adverse effects.

In accordance with the PEA undertaken for the project, Table 7.4 summarises the proposed scope of the detailed EA, having regard to the issues identified throughout this report.

Table 7.4 Proposed scope of the EA

Issue	Scope of the EA
Visual impact	▪ Identification of construction and operational visual impacts at each stop locality • Identification of urban design initiatives to minimize the visual impacts at each stop locality • Identification of landscape design initiatives to minimize visual impacts at each stop locality • Design of access routes to stops to be clearly identifiable, whilst minimising visual impacts to sensitive visual receptors • Identification of visual impacts attributable to the electricity substation and associated light rail infrastructure, other than stops.

7.4 Operational noise and vibration

7.4.1 Background

While background noise is variable across the study area, it is largely characterised by proximity to roads, the freight rail corridor from Lilyfield to Dulwich Hill, aircraft noise, the existing CityRail and existing Sydney Light Rail.

Noise-sensitive land uses in the study area include residences, schools, hospitals, child care facilities and recreational facilities such as parks. Industrial and commercial properties are not considered to be as sensitive to impacts as residential receivers.

7.4.2 Potential issues

Light rail traffic along the converted freight rail corridor would generate some air borne noise and vibration. This is likely to be lower than air borne noise generated from the operation of freight rail trains that operated along the existing corridor. However, there is likely to be more occurrences of air borne noise from the light rail operations than previous freight rail movements. Trackform will be fully renewed and the axel loads will be considerably less than freight vehicles so the track borne noise will be considerably less than previous freight operations.

The key parameters influencing the level of air borne noise are light rail vehicle speed, wheel condition, rail condition, track features, rolling stock design and receiver distance. These parameters would influence the actual noise levels generated and be subject to further assessment during the design phase.

Support structures along the corridor such as bridges, have the potential to increase air borne noise emissions. Other sources of noise from the operation of the light rail include noise horns and bells.

As the alignment is completely above surface, buildings are located adjacent to the surface, where air borne noise dominates, and ground borne noise can generally be disregarded.

7.4.3 Scope of further studies

Any potentially significant operational noise and vibration impacts would be assessed fully, and measures adopted to mitigate any adverse effects.

In accordance with the PEA undertaken for the project, Table 6.5 summarises the proposed scope of the detailed EA, having regard to the issues identified throughout this report. Operational noise and vibration studies and assessment would include the following as outlined in Table 7.5.

Table 7.5 Proposed scope of the EA

Issue	Scope of the EA
Operational Noise and Vibration	• Defining the existing noise environment through monitoring at representative locations. • Establishing applicable noise criteria for the project. • Prediction of likely noise and vibration levels for identified noise catchment areas utilising maximum rail traffic predictions for representative years. • An outline of mitigation strategies for each noise catchment

Issue	Scope of the EA
	area for further consideration during design development. • Noise predictions for all surface buildings and plant will also be conducted in accordance with the *Industrial Noise Policy* and these facilities will be designed to minimise noise impacts. • Attended noise and vibration measurements for existing light rail operations • Ambient noise monitoring • Assessment of the key design parameters including light rail vehicle speed, wheel condition, rail condition, track features, rolling stock design and receiver distance to identify predicted air borne noise levels

7.5 Land use and property

7.5.1 Background

The Sydney Light Rail extension would be located in an established urban corridor and involve the conversion of a disused freight line into commuter transport. The project would pass through Leichhardt, Ashfield and Marrickville Local Government Areas. Much of the corridor has residential zoning consisting of single and multiple dwellings. Other land use zonings located within the study area are general and light industrial, special uses (railways) and open space.

Land use zoning is an indicator of development potential and the planned urban structure and influences the socio-economic profile of an area. Land use along sections of the corridor between stops is dominated by residential uses, however, a wide range of other uses are located along the corridor. The most notable is the open space corridor (containing a walkway/bike path) that follows Hawthorne Canal between Allen Street and Lewisham Interchange Stops.

Land use and property impacts will be carefully considered in planning activities with a particular focus on the eight stop localities identified in Table 7.6.

Table 7.6 Land Use Impact of Proposed Stops

Stop	Land Uses	Land Use Impacts
Leichhardt North	▪ Neighbouring land uses dominated by medium density residential development. ▪ Commercial/business uses are located to the east along Norton Street ▪ Further business use is located between the corridor and Darley Road.	▪ Land use impacts at the proposed stop are considered minimal as works would mostly remain within the corridor and with potential non corridor impacts limited to the currently vacant property located on Darley Road.
Hawthorne	▪ Neighbouring land uses are generally open space associated with the open space corridor along Hawthorne Canal. ▪ Areas to the east of the proposed stop are dominated by medium density residential development. ▪ Further residential areas that form part of the suburb Haberfield are located to the west of the Hawthorne Canal.	▪ Land use impacts at the proposed stop are considered to be minimal as works would mostly remain within the corridor, with some minor impacts to potentially occur to neighbouring land uses.
Marion	▪ Land directly to the east of the proposed stop is used for industrial purposes, open space (Lambert Park) and a childcare centre. ▪ The surrounding area is dominated by medium density residential development. ▪ To the west of the proposed stop are some vegetated areas and a pedestrian/bike path to the north of Marion Street along the banks of Hawthorne Canal. Further to the west is a residential area that is part of the suburb of Haberfield.	▪ Land use impacts at the proposed stop are considered to be minimal as works would mostly remain within the corridor, with some minor impact to potentially to occur to neighbouring land uses.
Taverners Hill	▪ Neighbouring land uses dominated by residential development, however, significant industrial uses are located to the east of the stop along Parramatta Road. ▪ A strip of business/commercial uses are located along Parramatta Road to the west of the proposed stop.	▪ Land use impacts at the proposed stop are considered to be minimal as works would mainly remain within the corridor, with some minor impacts to potentially occur to neighbouring lands.
Lewisham West	▪ Land directly to the north of the proposed stop is used for the CityRail network. ▪ Land to the north east is dominated residential uses, whilst to the south east further residential purposes are located beyond the industrial	▪ Land use impacts at the proposed stop are considered to be minimal as works would remain within the corridor, with some minor impacts to potentially occur to neighbouring land uses.

Stop	Land Uses	Land Use Impacts
	uses. ▪ Land to the north-west is generally for residential development, while south west are for industrial uses with some residential uses located further to the south west. ▪ Parts of the industrial area located to the south of the stop bordered by Longport Street, Old Canterbury Road, Hudson Street and backing on to the freight line are subject to a Part 3A development proposal for redevelopment into mixed use sites with significant residential components.	
Waratah Mills	▪ Neighbouring land uses are dominated by residential development, with a few pockets of open space located throughout the area.	▪ Land use impacts at the proposed stop are considered to be minimal as works would mostly remain within the corridor, with some minor impacts to potentially occur in neighbouring land uses.
Dulwich Grove	▪ Land use to the western side of the corridor in the vicinity of the proposed stop is dominated by residential development. ▪ Land uses to the east of the corridor are varied with industrial uses located adjacent to proposed stop and the Dulwich Hill Primary School located to the south. ▪ Business/commercial uses are located to the east of the proposed stop and are associated with the Dulwich Hill shopping strip along New Canterbury Road. Residential uses are spread throughout the eastern side of the corridor among the abovementioned land uses.	▪ Land use impacts at the proposed stop are considered to be minimal as works would mostly remain within the corridor, with some minor impacts to potentially occur in neighbouring land uses.
Dulwich Hill Interchange	▪ Land use in the area surrounding the proposed stop is dominated by residential uses. Small areas of business/commercial uses are located on either side of the CityRail stop at Dulwich Hill.	▪ Land use impacts at the proposed stop would have minimal impacts to residential uses located adjacent to the proposed stop and access to this stop.

Direct impacts of the Sydney Light Rail extension would result in land use changes within the freight corridor to establish eight stops. Impacts to land uses outside the corridor are considered minimal as works would generally remain within the corridor. However, access to the new stops would need to be afforded and potentially limited car parking provisions established.

Based on the Australian Bureau of Statistics 2006 Census of Population and Housing statistics, using the data for Leichhardt, Ashfield and Marrickville Local Government Areas,

the major demographic characteristics of the Light Rail Extension project relative to the Sydney Statistical Division average are:

- Higher than average proportion of medium and high density housing
- Higher than average proportion of rented dwellings
- Lower than average household size
- Higher than average proportion of people born overseas
- Slightly younger than average age profile
- Slightly higher than average household incomes
- Slightly lower than average rates of unemployment

7.5.2 Potential Issues

Potential minor adverse land use impacts associated with reduced amenity may arrise during construction. Increased noise, traffic and dust levels, access impacts and reduced visual amenity during construction activities could temporarily adversely affect local residents, businesses and other sensitive land uses.

7.5.3 Scope of further studies

Land use and property studies are outlined in Table 7.7.

Table 7.7 Proposed scope of the EA

Issue	Scope of the EA
Land Use and property	▪ Analysis of future land uses ▪ Identification of property and ownership requirements for operation of the light rail and anillary elements ▪ Consideration of local community (services, access and amenity) related changes during construction and propose measures to minimise these impacts

7.6 Non-Indigenous Heritage

7.6.1 Background

The study area passes through some of the earlier established suburbs of Sydney. A preliminary analysis of statutory heritage listings has been undertaken including the State Heritage Register, Section 170 Heritage and Conservation listings of NSW State agencies and following local environmental planning instruments:

- Leichhardt Local Environmental Plan 2000 heritage list
- Ashfield Local Environmental Plan 1985 heritage list
- Marrickville Local Environmental Plan 2001 heritage list

Numerous heritage items are located along the corridor. As construction of the Sydney Light Rail extension is unlikely to go beyond the corridor boundaries, no heritage items besides those within 200 meters of stops would be impacted directly. However, two heritage items identified within 200 metres of the proposed Lewisham stop are located within the corridor. These items are:

- Lewisham Railway Viaduct (listed on the State Heritage Register, RailCorp s170 Register, Ashfield LEP 1985 and Marrickville LEP 2001)
- Lewisham Sewage Viaduct (listed on the State Heritage Register, Sydney Water s170 and Ashfield LEP 1985)

Non-Indigenous heritage items within or in close proximity to stop localities identified through this preliminary review are outlined in Table 7.8.

Table 7.8 Non-indigenous heritage items

Stop	Listed items near stop localities
Leichhardt North	▪ 134 & 136 James Street Leichhardt
Hawthorne	▪ Street trees in Allen Street Leichhardt ▪ Haberfield Conservation Area
Marion	▪ 22 Foster Street Leichhardt ▪ Haberfield Conservation Area ▪ Hawthorne Canal (between Marion Street and Old Canterbury Road)
Taverners Hill	▪ 18 & 20 Beeson Street Leichhardt ▪ Haberfield Conservation Area ▪ Hawthorne Canal (between Marion Street and Old Canterbury Road)
Lewisham West	▪ Lewisham Railway Viaduct over Hawthorn Canal ▪ Lewisham Railway Substation ▪ Lewisham Sewage Aqueduct ▪ Hawthorne Canal (between Marion Street and Old Canterbury Road)
Waratah Mills	▪ Waratah Flour Mills Terry Street Dulwich Hill
Dulwich Grove	▪ Electricity Substation No. 96 Hercules Street Dulwich Hill
Dulwich Hill Interchange	▪ Dulwich Hill Railway Station

7.6.2 Potential issues

Impacts to heritage items due to work along the corridor (excluding works at the proposed stops) are considered minimal as works would generally remain within the corridor. The

exception to this is are the potential impacts to the Lewisham Railway Viaduct and Lewisham Sewage Viaduct which are both State Heritage items located within or across the corridor.

Table 7.9 Potential non-indigenous heritage impacts for items

Listed items near stop localities	Heritage Impacts
Leichhardt North ▪ 134 & 136 James Street Leichhardt	Impacts on heritage items unlikely due to the distance to Leichhardt North Stop. 134 James Street is 60 meters from Leichhardt North Stop location yet separated by the City West Link.
Hawthorne ▪ Street trees in Allen Street Leichhardt ▪ Haberfield Conservation Area	Impacts on these heritage items unlikely to occur in the vicinity of Hawthorne stop due to the small number of items and distance to items.
Marion ▪ 22 Foster Street Leichhardt and Lambert Park ▪ Haberfield Conservation Area ▪ Hawthorne Canal (between Marion Street and Old Canterbury Road)	Impacts on 22 Foster Street unlikely due to distance (approximately 200m) from Marion Stop. Lambert Park comprises two separate elements: Lambert sportsground fronting Marion Street and a local park fronting Marion Street and Foster Road. The two areas are separated by large, blank walls internally and along Marion Street. The proposal is also located adjacent to Hawthorne Canal which is located on the Sydney Water s170 Register. Impacts to this items could potentially occur due to its proximity to the light rail stop.
Taverners Hill ▪ 18 & 20 Beeson Street Leichhardt ▪ Haberfield Conservation Area ▪ Hawthorne Canal (between Marion Street and Old Canterbury Road)	Impacts to heritage in the vicinity of the Taverners Hill Stop are considered limited to some potential impacts to Hawthorne Canal and the Battle Bridge which are located adjacent to the stop. These impacts are considered minimal. The remaining heritage items are considered unlikely to be impacted on due to their distance to the stop.
Lewisham West ▪ Lewisham Railway Viaduct over Hawthorne Canal ▪ Lewisham Railway Substation ▪ Lewisham Sewage Aqueduct ▪ Hawthorne Canal (between Marion Street and Old Canterbury Road)	Impacts on heritage items due to the construction of the Lewisham West stop is unlikely to impact on the three heritage items due to their distance from the proposed stop location. Impacts to the heritage listed section of the Hawthorne Canal could potentially occur due to its proximity to the light rail stop.
Waratah Flour Mills ▪ Waratah Flour Mills 10 Terry Street Dulwich Hill	Impacts to the surrounding area are considered to be minimal as the Waratah Mills has been redeveloped for residential purposes.
Dulwich Grove ▪ Electricity Substation No. 96 Hercules Street Dulwich Hill	Impacts to heritage in the vicinity of Dulwich Grove Stop to be unlikely due to distance to the nearest item

Listed items near stop localities	Heritage Impacts
Dulwich Hill Interchange ▪ Dulwich Hill Railway Station	Impacts to the Dulwich Hill Railway Station are considered minimal due to the Dulwich Hill Interchange Stop being located in the centre of the existing rail corridor

The potential impacts of Light Rail Stops on non-indigenous heritage items will assessed in parallel with the development of the stop design. In addition, where potential vibration impacts on heritage structures are likely during construction, these impacts will be investigated. Heritage significance will also be an important consideration in assessing visual impacts and urban design.

7.6.3 Scope of further studies

In accordance with the PEA undertaken for the project, Table 7.10 summarises the proposed scope of the detailed EA, having regard to the issues identified throughout this report.

Table 7.10 Proposed scope of the EA

Issue	Scope of the EA
Non Indigenous Heritage	• Identification of items of heritage significance in and around the project that may be directly or indirectly affected during construction or operation • Consideration of the potential impacts to the heritage value, settings and integrity of heritage areas and items located in the vicinity of the project.

7.7 Operation traffic and transport

7.7.1 Background

The study area contains a variety of road, rail and pedestrian/cyclist infrastructure, with both the road and rail networks operating at or near capacity in the week day morning and evening peak periods. Heavy road traffic flows are increasingly extending into business hours and weekends as demand for personal, business and freight related travel increases. Traffic congestion impacts on the travel time and travel time reliability of bus services.

Local bus services link residential areas, commercial precincts and railway stations in Sydney's inner west. Pedestrian and cyclist infrastructure is generally focused around CityRail stations and bus stops.

The SLRE will provide an additional mode of public transport with interchanges at Lewisham and Dulwhich Hill City Rail stations. Also stop locations will be identified that optimise interchange between SLRE and bus stops.

7.7.2 Potential issues

Potential traffic and transport issues for the design and operation of the SLRE, relate to:

- Establishing good patronage; and
- Traffic and transport management around stops.

The SLRE will compete with other transport modes for patronage, particularly from rail and bus services. A number of areas will require resolution to ensure that the patronage of the SLRE is maximised, these include:

- Stop location optimisation, identifying:
  - Potential role and function of the stop (origin, destination);
  - Walk-up catchment;
  - Ease of access to the stop location by mode (pedestrians, cars (kiss and ride / park and ride), bus, train, cyclists);
  - Modal interchange / transfers (such as to/from bus or heavy rail services);
  - Distance between potential stop locations; and
  - Potential patronage in relation to existing and projected population and employment.
- Accessibility of the stops and local way-finding;
- Frequency of service;
- Fare structure in relation to integrated ticketing and MyZone.

Traffic and transport management around stops will need to consider the potential for increased private vehicular, cycle and pedestrian traffic around stops, created by users of the SLRE. The interface between these different traffic modes and the existing access arrangements of adjoining properties will require managing.

7.7.3 Scope of further studies

In accordance with the PEA undertaken for the project, Table 7.11 summarises the proposed operational transport studies scope of the detailed EA, having regard to the issues identified throughout this report.

Table 7.11 Proposed scope of the EA

Issue	Scope of the EA
Operational Traffic and Transport	• An analysis of likely transport impacts including: – Forecasting of likely project patronage and potential changes in utilisation of road and rail routes. – Analysis of traffic and transport implications around proposed stop localities. • Stop locations will be located and designed to ensure integration with existing and proposed transport where possible, consistent with the objectives of *Integrated Land Use and Transport* (DUAP, 2001). Appropriate access arrangements at each new stop will give consideration to (but not necessarily be limited to) the following matters: – Road access and parking arrangements. – Bus access arrangements. – Interchange with CityRail services. – Pedestrian and cyclist linkages. • The EA will present a parking strategy for each stop, prepared in consultation with local councils.

8 Other environmental issues

The environmental risk analysis process indicated that the following issues outlined in tables 8.1 to 8.10 could be addressed by standard mitigation and management measures, and subsequently not considered to be key environmental issues for the purpose of the EA.

8.1 Indigenous heritage

Environmental aspect	Potential issues	Preliminary management strategy*
Indigenous heritage	• One Aboriginal site (1 45-6-2278 Lilyfield Cave) is known to occur in close proximity to the study area. However, further analysis is required, including a search of the Aboriginal Heritage Information Management System, to confirm the presence of any Aboriginal heritage sites potentially affected by the project.	• Conduct studies to confirm the presence of any Aboriginal heritage sites potentially affected by the project. • Consider identified sites during reference design development and avoid any direct impacts if practicable. • Stop work during construction if any previously unidentified relics are identified and consult an Aboriginal heritage specialist. Work in the affected areas would not resume until any required approvals have been received.

8.2 Air quality

Environmental aspect	Potential issues	Preliminary management strategy*
Operational air quality	• The project would use electric light rail vehicles which would emit very small quantities of brake dust at locations where they were required to slow or stop. • Emissions from motor vehicles are a major contributor to urban air pollution. As the project would contribute to a mode shift away from private car usage this would have a net positive benefit on roadside air quality.	• Assess the extent of mode shift away from private car usage resulting from the project.
Construction air quality	• There is the potential for dust generation from construction sites. Construction vehicles and plant and equipment would also generate some emissions.	• Standard mitigation measures would be employed to reduce dust emissions. • Plant and equipment would not be left idling when not in use. • Plant and equipment would be regularly maintained and serviced.

8.3 Construction noise and vibration

Environmental aspect	Potential issues	Preliminary management strategy*
Construction Noise and Vibration	Noise and vibration activities include the construction of the light rail stops and ancillary facilities as well as other maintenance activities related to converting the existing freight line to an operational light rail. The extent of construction noise and vibration impact associated with the project would depend on the construction sequencing adopted, plant and equipment utilised and the distance to receivers. Significant construction noise impacts are likely to be intermittent and relatively short term in duration. The areas of highest impact would be around the light rail stop sites. Work activities are expected to take approximately 12 months Construction noise mitigation measures to manage and reduce construction impacts, include: • Scheduling of construction works having regard to the nature of construction activity. • Providing advance notification of the time and duration of the construction activity. • Considering likely noise impacts in determining construction site layouts. • Operating plant and equipment quietly and efficiently • Ensuring plant and equipment is regularly maintained. • Consideration of the use of alternative broadband reversing alarms. • Incorporating noise barriers where practicable. • Providing respite periods where practicable. The EA will present a strategy for maintaining and integrating construction noise and vibration with a focus on activities having the greatest potential for adverse effects from noise and vibration.	• Construction noise and vibration studies and assessment would include: • Construction noise assessment focusing on the main construction sites • Identification of a suite of possible mitigation measures for consideration during construction planning. • Identify applicable construction noise criteria • Ambient noise monitoring • Construction noise modelling • Determining indicative construction equipment scenarios • Outlining the management actions required during construction to minimise noise and vibration

8.4 Hydrology

Environmental aspect	Potential issues	Preliminary management strategy*
Hydrology	• The project would traverse areas within the Cooks River and Iron Cove catchments. It is anticipated that the project is unlikely to have a significant impact on hydrology and flooding given that the works are primarily along the existing rail alignment. • There may be some potential flooding issues at the Lilyfield end of the alignment. • During construction and clearance of vegetation the disturbance of soils at construction sites would create the potential for the mobilisation of sediment.	• Consider potential flooding impacts during design development and avoid any adverse impacts, if practicable. • Identify measures to minimise impacts on water quality during design development and construction planning in accordance with the guideline Soils and Construction, Managing Urban Stormwater (Landcom, 2004). • Determine appropriate water sensitive urban design to ensure that the project is carefully designed, constructed and maintained so as to minimise impacts on the natural water cycle.

8.5 Utilities and services

Environmental aspect	Potential issues	Preliminary management strategy*
Utilities and Services	Detailed investigations yet to be undertaken.	Identify utilities that may be impacted by the [project and, in consultation with the owner, develop appropriate management strategies including consideration of the need for protection or relocation of services.

8.6 Resource and waste management

Environmental aspect	Potential issues	Preliminary management strategy*
Resource and Waste Management	The project will generate waste from a number of streams including building materials, green waste and office waste.	Standard management practices to minimise use of resources will be considered as part of design development, procurement and construction planning. Waste management will be

Environmental aspect	Potential issues	Preliminary management strategy*
		undertaken in accordance with the resources management hierarchy outlined by the NSW Waste Avoidance and Recovery Act 2002 and other relevant policies and guidelines.

8.7 Construction water management

Environmental aspect	Potential issues	Preliminary management strategy*
Construction Water Management	Due to the urbanised nature of the study area, water quality is likely to be influenced by pollutants from various points and diffuse sources, such as stormwater runoff. During construction the disturbance of soils at construction sites will create the potential for the mobilisation of sediment. Existing ballasted areas may be contaminated and this could lead to potential release of contaminants into the stormwater.	Measures to minimise impacts on water quality will be identified during design development and construction planning in accordance with the guideline Soils and Construction, Managing Urban Stormwater (Landcom, 2004). Standard RailCorp practices, to be documented in the EA, will be followed for ballast washing.

8.8 Construction traffic

Environmental aspect	Potential issues	Preliminary management strategy*
Construction Traffic	As access to the construction sites will largely take place from the existing freight corridor the construction of the SLRE is not likely to result major increases in heavy vehicle movements. Where street access is required small localised increase in traffic movements will occur, resulting in the potential to divert pedestrian and cyclist access and potential temporary loss of parking. As the SLRE will be entirely separate from	Construction traffic impacts will be carefully considered in planning construction activities with a particular focus on: ▪ Minimising impacts during peak travel periods to avoid potential traffic safety and congestion impacts. ▪ Avoiding impacts on bus infrastructure and routes where

Environmental aspect	Potential issues	Preliminary management strategy*
	the existing CityRail network, the project is not expected to result in any direct impacts on the CityRail network.	practicable. ▪ Minimising the potential for cumulative impacts across the road networks. ▪ Ensuring that alternative pedestrian and cyclist access is provided where practicable. ▪ Traffic management measures will be employed to minimise the potential for traffic delays during construction, including Traffic Management Plans for construction traffic to be submitted with the EA.

8.9 Energy and greenhouse

Environmental aspect	Potential issues	Preliminary management strategy*
Energy and Greenhouse	The operation of the project would have a net positive benefit on air quality including a reduction in greenhouse gas emissions; however, the construction of stops and upgrade of rail tracks would require some resource inputs including concrete (which also contributes to greenhouse gas emissions) and volumes of waste and spoil. The operation of the project will draw energy from the electricity grid. There are opportunities to identify low carbon options in electricity procurement. The construction of the project will require materials with associated embodied carbon. Electricity and fuel, with associated carbon impacts, will also be used during construction	A number of measures to minimise greenhouse gas emissions would be considered during design development including: ▪ Use of sustainable design including passive systems (natural ventilation and natural light) at stops ▪ Reuse and adaptation of an existing freight line into a light rail line ▪ Use of recycled materials during construction ▪ Minimisation of spoil generation and required materials inputs ▪ Reuse and recycling of spoil where practicable ▪ Consideration of regenerative braking for the rolling stock to determine suitability for the

Environmental aspect	Potential issues	Preliminary management strategy*
		project ▪ Traction power assessment undertaken in design phase ▪ Use of lights powered by renewable energy (photovoltaics) at stops to minimise greenhouse emissions ▪ Minimisation of operational electricity usage through promoting the selection of energy efficient rolling stock) ▪ A carbon management hierarchy will be established that identifies operational and design initiatives to reduce energy demand, improve energy efficiency and identify low carbon electricity supply options. Specific initiatives could include: – regenerative breaking on rolling stock; – use of photovoltaics at stops. ▪ Construction energy demand will be assessed and initiatives to reduce the demand and improve energy efficiency will be identified. ▪ Consideration will be given to low carbon material selection.

8.10 Geotechnical and spoil management

Environmental aspect	Potential issues	Preliminary management strategy*
Geotechnical and Spoil Management	The SLRE lies totally within the existing freight rail corridor from Lilyfield to Dulwich Hill. The corridor is made of fill material including ballast as the upper layer. The corridor is underlain with a variety of geology types but is characterised by Hawkesbury Sandstone, shales and alluvial deposits in the vicinity of waterways.	• Undertake geotechnical investigations as part of design development and implement appropriate mitigation strategies.

9 Conclusion

9.1 Overview

Transport NSW is seeking Project Approval under Part 3A of the EP&A Act for the Sydney Light Rail Extension to Dulwich Hill, a passenger rail system, 5.6 km in length extending from Lilyfield to Dulwich Hill and featuring nine stops.

This PEA for the Sydney Light Rail Extension to Dulwich Hill identifies a number of potential environmental impacts during the construction and operational phases that will require further detailed investigation as part of the detailed EA.

In addition, a number of relatively minor impacts associated with the project have been identified that could be effectively managed and/or adequately mitigated through the design process and application of standard and/or tailored mitigation measures.

9.2 Proposed scope of the detailed EA

In accordance with the PEA undertaken for the project, Table 9.1 summarises the proposed scope of the detailed EA, having regard to the issues identified throughout this report.

Table 9.1 Proposed Scope of the EA

Issue	Scope of the EA
General	▪ Strategic context and project need. ▪ Description of the project. ▪ Consideration of planning and statutory requirements (NSW and Commonwealth). ▪ Consideration of the principles of ecologically sustainable development in the context of the project. ▪ Consideration of any potential cumulative impacts.
Stakeholder consultation	▪ Description of consultation activities conducted during the EA. ▪ Outline of consultation and community strategy.
Operational transport impacts and implications	▪ An analysis of likely transport impacts including: o Forecasting of likely project patronage and potential changes in utilisation of road and rail routes. o Analysis of traffic and transport implications around proposed stop localities. ▪ Stop locations will be located and designed to ensure integration with existing and proposed transport where possible, consistent with the objectives of *Integrated Land Use and Transport* (DUAP, 2001). Appropriate access arrangements at each new stop will give consideration to (but not necessarily be limited to) the following matters: o Road access and parking arrangements.

Issue	Scope of the EA
	○ Bus access arrangements. ○ Interchange with CityRail services. ○ Pedestrian and cyclist linkages. ▪ The EA will present a parking strategy for each stop, prepared in consultation with local councils.
Operational noise and vibration	▪ Defining the existing noise environment through monitoring at representative locations. ▪ Establishing applicable noise criteria for the project. ▪ Prediction of likely noise and vibration levels for identified noise catchment areas utilising maximum rail traffic predictions for representative years. ▪ An outline of mitigation strategies for each noise catchment area for further consideration during design development. ▪ Noise predictions for all surface buildings and plant will also be conducted in accordance with the *Industrial Noise Policy* and these facilities will be designed to minimise noise impacts. ▪ Attended noise and vibration measurements for existing light rail operations ▪ Ambient noise monitoring ▪ Assessment of the key design parameters including light rail vehicle speed, wheel condition, rail condition, track features, rolling stock design and receiver distance to identify predicted air borne noise levels
Land use and property	▪ Identification of property and ownership requirements for operation of the light rail and anillary elements ▪ Consideration of local community (services, access and amenity) related changes during construction and propose measures to minimise these impacts ▪ Analysis of future land uses
Non-indigenous heritage	▪ Identification of items of heritage significance in and around the project that may be directly or indirectly affected during construction or operation ▪ Consideration of the potential impacts to the heritage value, settings and integrity of heritage areas and items located in the vicinity of the project.
Ecology	▪ Identification of vegetation and potential habitat in and around the project that may be directly or indirectly affected during construction or operation. ▪ Consideration of the potential impacts to threatened fauna and habitat during operation. ▪ The EA will include the results of field work and address areas relating to the management or protection of vegetation, habitat and bush regeneration areas.

Issue	Scope of the EA
	▪ The EA will present a strategy to avoid, mitigate or offset impacts on vegetation, habitat and bush regeneration areas.
Visual impacts	▪ Identification of construction and operational visual impacts at each stop locality ▪ Identification of urban design initiatives to minimize the visual impacts at each stop locality ▪ Identification of landscape design initiatives to minimize visual impacts at each stop locality ▪ Design of access routes to stops to be clearly identifiable, whilst minimising visual impacts to sensitive visual receptors ▪ Identification of visual impacts attributable to the electricity substation and associated light rail infrastructure, other than stops.
Other environmental issues	Undertake investigations to determine potential impacts and develop mitigation measures for the following issues: – Indigenous heritage. – Air Quality – Construction noise and vibration – Hydrology and flooding. – Utilities and services – Resources and waste management – Construction water management – Construction traffic – Energy and greenhouse gas emissions – Geotechnical and spoil management
Environmental risk analysis	▪ Identification of potential environmental impacts associated with the project, proposed mitigation measures and any potentially significant residual impacts after the application of proposed mitigation measures. ▪ Should any additional key issues be identified, an appropriately detailed impact assessment will be included in the EA.
Draft Statement of Commitments	A draft list of the measures to avoid, minimise, manage, mitigate, offset and/or monitor impacts.

9.3 Next steps

A Project Application, supported by this PEA, is the first key step in the planning approvals and environmental assessment process for the Sydney Light Rail Extension to Dulwich Hill. It identifies the benefits and potential impacts of the project and outlines the scope of the required further studies. As Transport NSW moves ahead in developing the extension, more information regarding this initiative will become available. The Project Application and a copy of this document have been lodged with the Department of Planning.

In response to the Project Application and PEA, the Director-General of the Department of Planning will issue requirements which outline the key issues that the proponent must address in its detailed EA. These requirements are prepared in consultation with relevant agencies and other key parties.

Following receipt of the Director-General's requirements, the EA will be prepared, supported by specialist studies to address the key issues identified.

The detailed EA will be exhibited in late 2010 for a minimum of 30 days and public comment will be invited. Advertisements will be placed in appropriate newspapers, and relevant State agencies and local councils will be notified, as well as affected and adjacent landowners.

The EA will be exhibited at the Department of Planning's head office, relevant regional offices, local council offices and on the Department's website. During the exhibition period any person is able to make a written submission to the Director-General regarding the project.

Submissions received by the Director-General are provided to the proponent and any relevant public authorities. The proponent may be required to prepare and submit:

- A submissions report, providing a response to the issues raised in the submissions; and/or
- A preferred project report, outlining any proposed changes to the project; and/or
- A revised statement of commitments.

The Director-General will then prepare a report to the Minister for Planning on the EA, for the purposes of the Minister's consideration of the application for approval to carry out the project.

The Minister for Planning will determine whether to approve or refuse the project. A project may be approved with such modifications of the project or on such conditions as may be determined by the Minister.

Appendix A Stop Names

A variety of names have been considered for the nine proposed stops for the Inner West extension. The proposed names outlined below aim to:

- Reflect of the iconic nature of the location
- Maximise community ownership
- Be geographically accurate
- Recognise the historic value of the place
- Be more interesting and defining than simply the name of the road

It should be noted that the names are yet to be endorsed by the NSW Geographical Names Board, following consultation with the local council or the government department that administers the area where the stop is located.

Proposed name	Alternative names - previously used or considered	Rationale for choice of proposed name
Leichhardt North	• Norton • Norton Street • Orange Grove • James	• Norton is potentially misleading due to the significant distance from the restaurant/ shopping strip towards the southern end of Norton Street • Leichhardt North provides link to the suburb of Leichhardt without implying a central location as others do • It is also an interchange point for bus access to the commercial centre of Leichhardt
Hawthorne	• Allen • Allen Street	• Allen Street as a name relates to the Leichhardt side only whereas Hawthorne Canal is the boundary between Leichhardt and Haberfield (Ashfield council) and therefore extends the “reach” of the stop to the west consistent with the canal pedestrian bridge proposals • The proposed stop location is no longer opposite Allen Street • Hawthorne Canal is named after John Hawthorne one time MLA for Leichhardt • Transport NSW and its predecessors has a long standing policy to avoid street names for rail stations as narrow and confusing

Proposed name	Alternative names - previously used or considered	Rationale for choice of proposed name
Marion	• Market Town (sic) • Lambert Park • Lambert • West Leichhardt	• Marion Street is a well-known local thoroughfare and important bus (and former tram) route linking Leichhardt and Haberfield • Marion was the name of the second wife of early landowner, James Norton MLC
Taverners Hill	• Parramatta Road • Battle Bridge	• Well known locality name for area immediately to east along Parramatta Road and extending up to Norton Street near the top of the hill • Historical link with the former Miller's Brewery on Parramatta Road (now the orange Millers Storage building) although name actually commemorates a Mr Tave(r)ner owner of an early inn in this locality
Lewisham West	• Lewisham Interchange • Lewisham Lower • Lewisham West • Lewisham • Mungo Scott	• Retains Lewisham in name but adds link to former industrial uses of site by Allied (former Mungo Scott) Mills • Acknowledges the importance of the local landmark
Waratah Mills	• Waratah • Hoskins (Park)	• Link with industrial past: former Great Western Milling Company's Waratah Flour Mill (now redeveloped as apartments)
Arlington	• Constitution Road • Johnson Park • Abergeldie (Estate)	• Named after Arlington Oval to the north, formerly large brick pits which were filled in in 1932 to form the park • Oval was used for womens' athletic events for the British Empire Games in 1938
Dulwich Grove	• Dulwich Hill Shops • Fern Hill • New Canterbury Road	• Dulwich Grove was the name of one of the area's two earliest land releases and first use of the name 'Dulwich'
Dulwich Hill Interchange	• Dulwich Hill Station	• Reinforces stop as key interchange point with CityRail network

Appendix B Stop locations not recommended

In addition to the nine proposed stops for the Inner West extension, a number of potential additional stops or alternative stop locations have been considered. The table below sets out the rationale for not pursuing these locations.

Name	Location	Rationale for not being proposed
Norton 3 (Charles Street)	Adjacent to Darley Road and the City West Link Road, opposite Charles Street	• Identified by Inner West Extension Study (GHD) as potential alternative location to Norton 2 (James Street) • While easier to construct than the preferred option closer to James Street, this option has more limited catchment to the west and north and is further from bus services operating on Norton Street
William Street	Adjacent to Darley Road, opposite William Street	• Identified by Inner West Extension Study (GHD) as potential future station in conjunction with future urban renewal • Adjacent sites to north have limited potential for future development due to being flood prone; catchment is therefore limited • Less than ideal access from western side • Very close (270m) to Hawthorne stop
Marion 1 (South)	South of the overbridge over Marion Street	• Identified by Inner West Extension Study (GHD) as potential alternative location to Marion 2 (North) • The site to the north side of Marion Street overbridge is preferred because of longer term urban renewal opportunities and a possibly slightly lesser impact on existing vegetation

Name	Location	Rationale for not being proposed
Lewisham Interchange 1 (North)	Between the Main Western rail corridor and Longport Street overbridge	• Identified by Inner West Extension Study (GHD) as potential alternative location to Lewisham Interchange 2 • Although at the closest point to the Main Western rail corridor, it is still 330m from the station entrance. • The location below and between the elevated rail corridor and Longport Street road overbridge is considered to have security and surveillance issues for passengers and is physically separated from future development to the south, and have poor access from surrounding areas • The narrowness of Railway Terrace and absence of a footpath on the northern side east of Old Canterbury Road would require a lengthy elevated pedestrian walkway of approximately 200m length to access Lewisham Station platform (note this in itself is undesirable since it bypasses the ticket office)
Old Canterbury Road	On the northern side of Old Canterbury Road	• Identified in Inner West Extension Study (GHD) as potential deferred (future) stop • Relatively limited catchment and poor access from south • Very close (150m) to Lewisham West stop • Interchange with bus route 413 could also occur at Lewisham West stop • By providing access at this location to the GreenWay, direct pedestrian access can be provided to the Lewisham West stop from Old Canterbury Road and the area to the west
Dulwich Hill Interchange 2		• Identified in Inner West Extension Study (GHD) as potential alternative to Dulwich Hill Interchange 1 • This location would require grade separated access across the existing freight lines to Dulwich Hill Station and would not relate well to the surrounding area.

Figure 9.1 SLRE Stage 1 Inner West extension - proposed and consider/alternative stop locations