



Transport for NSW
TAP 3 - Kingswood Station
Landscape and Visual Impact Assessment

November 2018

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Terminology and Abbreviations

Table 1 Terminology Table

Terminology	Definition
Impact	The effect of a proposal, which can be adverse or beneficial, when measured against an existing condition.
Landscape character	The combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place.
Landscape character type	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately adjacent.
Magnitude	The measurement of the scale, form and character of a development proposal when compared to the existing conditions. In the case of visual assessment, this also relates to how far the proposal is from the viewer. Combined with sensitivity, magnitude provides a measurement of impact.
Proposal site	The area that would be directly impacted by the Proposal.
Sensitivity	The sensitivity of a LCT or visual receiver and its capacity to absorb change. In the case of visual impact, this also relates to the type of viewer. Combined with magnitude, sensitivity provides a measurement of impact.
Sense of place	The feelings or perceptions people have for a place, often in relation to the characteristics that make a place special or unique.
Study area	Consists of land in the vicinity of, and including, the Proposal site. The study area is a wider area surrounding the Proposal site as defined in this assessment, including land that has the potential to be indirectly impacted by the Proposal.
View	The sight or prospect of a landscape or scene.
Visibility	The state or fact of being visible or seen.

Table 2 Abbreviation Table

Abbreviations	Definition
AHD	Australian Height Datum
GWH	Great Western Highway
LCT	Landscape Character Type
LVIA	Landscape and Visual Impact Assessment
REF	Review of Environmental Factors
ZTV	Zone of Theoretical Visibility

1. Introduction

1.1 Purpose of this report

This Landscape and Visual Impact Assessment (LVIA) has been prepared by GHD on behalf of Transport for NSW (TfNSW). The LVIA investigates the impacts related to the proposed accessibility, security, and technology upgrades associated with TfNSW's Transport Access Program (TAP) at Kingswood Station (the Proposal).

The purpose of this report is to assist in the determination of the Proposal by undertaking landscape and visual impact assessment as part of the overall Review of Environmental Factors, with a view to making recommendations for managing identified landscape and visual issues that may arise from the Proposal.

The report comprises the following:

- an understanding of the landscape and visual attributes of the study area
- identification of sensitivities in relation to landscape and visual change associated with the Proposal
- assessment of potential landscape and visual impacts associated with the Proposal
- provision of recommendations for managing identified landscape and visual impacts arising from the Proposal.

1.2 Overview of the Proposal

The NSW Government is committed to facilitating and encouraging the use of public transport, such as trains, by upgrading stations to make them more accessible, and improving interchanges around stations with other modes of transport such as bicycles, buses and cars. The Transport Access Program is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. Kingswood Station does not currently meet key requirements of the *Disability Standards for Accessible Public Transport* or the Commonwealth *Disability Discrimination Act 1992* (DDA).

The non-compliant access points and stairs to the Kingswood Station concourse and platforms do not facilitate access for people with reduced mobility, parents/carers with prams. There are no lift facilities and the amenities and tactile surfacing to stairs, platforms and interchange facilities are inadequate.

The Proposal would involve upgrade works to Kingswood Station, interchange facilities and surrounding footpaths. The station is located 52 kilometres west of the Sydney Central Business District (CBD) in the suburb of Kingswood and is serviced by the T1 Western Line.

Platform 1 provides train services east towards the CBD and Platform 2 provides train services west towards Penrith. The Proposal is located within Penrith local government area adjacent to the Great Western Highway, Kingswood.

The key features of the Proposal are summarised as follows:

- new station entries at the eastern end of each station platform at the corner of Park Avenue and Richmond Road and the Great Western Highway
- installation of a new lift, canopy and concrete suspended landing on each station platform to the east of the concourse

- installation of new access stairs and new landing at the eastern end of each station platform
- installation of new roof and guttering at the eastern end of the station concourse to allow for the new access stairs and pedestrian access to and from the new lifts
- installation of about 35 solar panels on the new roof of the concourse
- regrade existing platform/concourse surfaces to provide DDA compliant pedestrian routes between new lifts and station entry/exit
- modification of pedestrian access to provide a DDA compliant accessible path of travel from the station concourse to the interchange facilities
- installation of a new 75 kVA high voltage transformer, underground cabling of existing 33 kVA power supply and installation of a new power pole to the north east of the station; upgrade of low voltage systems to account for new infrastructure including aboveground and underground cable containment
- removal of existing landscaping, kerb edge and fencing near Park Avenue and Richmond Road and the Great Western Highway
- internal reconfiguration of existing station building layout (within concourse) to allow for a new communications room, family accessible toilet, ambulant toilet, staff toilet, storage room and cleaner's storeroom. Works would also increase space within the concourse for movement of customers
- ancillary works including adjustments to lighting and ticketing machines, new anti-throw screens, handrails and fencing, minor drainage works on both side of the rail corridor, landscaping, improvements to the station communications systems including closed circuit TV (CCTV) cameras, hearing loops, public announcement (PA system), wayfinding signage, emergency help points, and installation of tactile ground surface indicators (TGSIs).

Subject to planning approval, construction is expected to commence in early 2019 and take around 18 months to complete.

1.3 Scope

This LVIA assesses the landscape character and visual impact of the TAP project for Kingswood Station as proposed by TfNSW. This includes landscape and visual effects of both construction and operational stages of the Proposal.

1.4 Limitations

This report: has been prepared by GHD for Transport for NSW and may only be used and relied on by Transport for NSW for the purpose agreed between GHD and Transport for NSW as set out in this report.

GHD otherwise disclaims responsibility to any person other than Transport for NSW arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Transport for NSW and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Methodology

2.1 Standards and guidance

This landscape and visual impact assessment has been prepared in accordance with the following:

- Environmental Impact Assessment Guidance Note - Guidelines for landscape character and visual impact assessment (EIA-N04), Version 2 (Roads and Maritime, 2013)
- *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition (Landscape Institute and Institute of Environmental Management & Assessment, 2013).

2.2 Landscape and visual existing environment

2.2.1 Review of legislation and policy

A review of key planning designations, policies and guidance was undertaken in relation to landscape and visual amenity within the LVIA study area. The emphasis of the review was to identify elements outlined within legislation, policy and planning documents relevant to landscape and visual character and identity of the study area.

2.2.2 Desktop analysis of the Proposal, landscape and visual resources

Existing data was gathered and reviewed, including:

- Proposal design information and site photographs
- topography, land use, and vegetation maps
- Google Earth and Google Street View.

Using this data, a preliminary assessment of the landscape and visual environment was undertaken to inform the site inspection.

2.2.3 Zone of Theoretical Visibility assessment

Zone of Theoretical Visibility (ZTV) mapping is a computer-generated analysis which identifies land from which it is theoretically possible to view the components of the Proposal. These have been used primarily to guide the area of site analysis and representative viewpoint selection.

ESRI ArcGIS software was used to model the ZTV of the Proposal. A digital elevation model was produced using a combination of one metre contour intervals within the study area. The ZTV was run using the following parameters:

- a viewing height of 1.7 metres, which is the average within the typical viewing level range of an adult
- the indicative levels for the top of proposed lift shafts.

The GIS software then digitally determines the likely extent over which the feature would be visible or not visible. In interpreting the ZTV, the following issues must be considered:

- it only takes into account the landform and does not include land cover factors such as the presence of buildings and trees, therefore it represents the worst-case scenario of potential visual impact
- it does not take into account the effect of distance. Generally, the greater the distance from the Proposal, the lower the impact, as the development will take up a smaller portion

of the view, and atmospheric conditions may reduce the visual prominence of the Proposal.

- the ZTV is only accurate to the resolution of the elevation model.

2.2.4 Site Inspection

A site inspection was undertaken by a Landscape Architect on 10th August 2018. The purpose of the inspection was to:

- inspect the site and appreciate views to / from sensitive visual receivers
- inspect publically accessible locations identified in the desktop study as likely to provide views of the Proposal, including roads, footpaths, station entry points, and platforms
- identify sensitive visual receiver locations
- assess the landscape character of the study area and identify landscape sensitivities
- undertake site photography suitable for photomontage preparation.

The co-ordinate location of each viewpoint was recorded during the site inspection.

2.2.5 Definition of existing landscape and visual environment

A landscape existing conditions assessment was undertaken to determine the existing natural and cultural features within the study area. This includes determination of key landscape and spatial elements, features and values. Key aspects considered include:

- land use and built form
- landform, topography and hydrology
- vegetation
- historical features.

A visual existing conditions assessment was also undertaken to establish the key views, viewsheds, and other visual features within the study area.

2.2.6 Landscape character types

Landscape character considers common landscape types defined by typical features and characteristics identified during the desktop assessment and site inspection. Defining landscape character types identifies areas sharing the same homogenous environmental or cultural qualities or pattern such as topography, vegetation, hydrology, land use and settlement, built form scale and character, cultural and recreational characteristics.

This approach has been used to establish the existing landscape character around the Proposal site and to provide a framework for measuring the impact of the proposal. This assists in:

- defining landscape elements that contribute to defining character
- defining landscape character attributes
- identifying landscape value.

The assessment of the exiting environment also considers factors which have influenced landscape change in the past and those that are likely to do so in the future.

2.2.7 Viewpoint selection

Assessment of visual impacts deals with the effects of change and development on the views available to people and their visual amenity. It assesses how the surroundings of individuals or

groups of people may be specifically affected by changes in the context and character of views as a result of the change or loss of existing elements of the landscape and/or the introduction of new elements.

Visual receivers have been considered in terms of the views they are likely to obtain from within the study area including consideration of any key vantage points, such as lookouts, where there is particular interest in the view. Visual receivers are identified based on:

- proximity of the receivers to the Proposal, as the most affected visual receivers are anticipated to be located closest to the Proposal, unless located at an elevated vantage point
- type of receiver, as different viewer types would have different perceptions of the change.

Based on the analysis of the existing landscape and visual environment, sensitive visual receivers were identified and viewpoint locations selected as representative locations for assessment.

2.3 Impact Assessment

2.3.1 Landscape effects

Landscape character refers to a distinct and recognisable pattern of elements that occur consistently in a particular type of landscape. Particular combinations of geology, landform, soils, vegetation, land use and human settlement create character, which makes each part of the landscape distinct and gives each its particular sense of place.

Assessment of landscape effects deals with the effect of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

The consideration of potential impacts on landscape character is determined based on the sensitivity of the existing landscape to change and the magnitude of change that is likely to occur. The sensitivity of a landscape is judged on the extent to which it can accept change of a particular type and scale without adverse effects on existing landscape character. The level of sensitivity is determined on the basis of:

- the landscape's inherent values and any specific values that may apply such as landscape planning designations
- the landscape's ability to absorb changes associated with the Proposal.

The magnitude of change to landscape character depends on the nature, scale and duration of the change expected to occur. The magnitude of change also depends on the loss, change or addition of any feature to the existing landscape. It is based on that part of the landscape character type which is likely to be impacted to the greatest extent by the Proposal.

The sensitivity and magnitude of landscape effects address the following specific criteria:

- sensitivity of landscape to proposed change, based on susceptibility to change, and value of landscape (refer Table 3)
- magnitude of landscape effect, based on the size or scale of change, the geographical extent of effects, and the duration and reversibility of effects (refer Table 4).

A judgement is made on the overall level of significance of the landscape effects in relation to the existing environment (refer Section 2.3.3).

Table 3 Sensitivity criteria (landscape)

Rating	Criteria
High	<p>Landscape character elements in good or above average condition and/or that make a strong positive contribution to the landscape character. May include nationally important features.</p> <p>The type of development proposed could have a detrimental effect on the landscape character, condition or value. Mitigation measures are unlikely to reduce the impacts of the change.</p>
Moderate	<p>Landscape character elements in reasonably good condition and/or that make an average contribution to the local character, which may include locally important features.</p> <p>Any change caused by the proposed development would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.</p>
Low	<p>Landscape character elements in average condition and/or that are not particularly distinctive local features.</p> <p>Development of this type is unlikely to have an adverse effect on the landscape character, condition or value. Mitigation measures would be effective in neutralising adverse effects.</p>
Negligible	<p>Elements in below average condition and/or that are not distinctive local features.</p> <p>Development of this type is very unlikely to have an adverse effect on the urban landscape character, condition or value. Mitigation measures would be effective in neutralising adverse effects and/or improve the urban landscape character.</p>

Table 4 Magnitude of change criteria (landscape)

Rating	Criteria
High	<p>A substantial/obvious change to the landscape character due to total loss of, or change to, elements, features or characteristics of the landscape. Would cause a landscape to be permanently changed and its quality diminished.</p>
Moderate	<p>Discernible changes in the landscape character due to partial loss of, or change to elements, features or characteristics of the landscape, however has potential to be partly mitigated. The change would be out of scale with the landscape character, and at odds with the local pattern and landform and would leave an adverse impact on the landscape character.</p>
Low	<p>Minor loss or alteration to one or more key landscape character elements, features or characteristics, or the introduction of components that may be new but may not be uncharacteristic within the existing landscape character.</p>
Negligible	<p>Almost imperceptible or no change in the landscape character as there is little or no loss of/or change to the elements, features or characteristics of the landscape.</p>

2.3.2 Visual effects

The evaluation of potential impacts on visual amenity is based on the sensitivity of the viewpoint (and the visual receiver it represents) to change, and the magnitude of change that is likely to occur.

The sensitivity of each viewpoint is considered to be dependent on the:

- importance of the view, its existing scenic qualities and the presence of other existing man-made elements in the view
- type of visual receiver and their likely interest in the view.

The magnitude of change to views and visual amenity depends on the nature, scale and duration of the change that is expected to occur. The magnitude of a change also depends on the loss, change or addition of any feature in the field of view of the receiver including an assessment of the level to which the change contrasts with the existing view or expected view of the landscape. This includes the degree of any change to the backdrop to, or outlook from a viewpoint.

The assessment considers the likely impacts of the Proposal. The level of effects on a view depends on factors such as the extent of visibility, degree of obstruction of existing features, degree of contrast with the existing view, angle of view, duration of view and distance from the Proposal.

Steps undertaken to assess visual effects include:

- identify and map viewpoint locations
- undertake assessment of visual effects, comprising:
 - sensitivity of visual receivers to proposed change, based on: susceptibility of visual receivers to change, and value attached to views (refer Table 5)
 - magnitude of visual effect, based on: size or scale of change; geographical extent of effects, and duration and reversibility of effects (refer Table 6).

An assessment is undertaken of the overall level of significance of the visual effects in relation to the existing view (refer Section 2.3.3).

Table 5 Sensitivity criteria (visual)

Rating	Criteria
High	Occupiers of residential properties, at home or going to or from, with long viewing periods, within close proximity to the proposed development; Communities that place value upon the urban landscape and enjoyment of views of their setting.
Moderate	Outdoor workers who have a key focus on their work who may also have intermittent views of the study area; Viewers at schools, or similar, when outdoor play and recreation areas are located within close proximity but viewing periods are limited; Occupiers of residential properties with long viewing periods, at a distance from or screened from the study area.
Low	Road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the study area and therefore have short term views; Viewers indoor at their place of work, schools or similar.
Negligible	Viewers from locations where there is screening by vegetation or structures where only occasional screened views are available and viewing times are short; Road users in motor vehicles, trains or on transport routes that are passing through/adjacent to the study area and have partially screened views and short viewing times.

Table 6 Magnitude of change criteria (visual)

Rating	Criteria
High	A substantial/obvious change to the existing view due to total loss of, or change to, elements, features or characteristics of the view. Would cause a view to be permanently changed and its quality diminished.
Moderate	Discernible changes in the existing view due to partial loss of, or change to elements, features or characteristics of the view, however has potential to be partly mitigated. The change would be out of scale with the existing view, and would leave an adverse impact on the view.
Low	Minor loss or alteration to one or more key view elements, features or characteristics, or the introduction of components that may be visible but may not be uncharacteristic within the existing view.
Negligible	Almost imperceptible or no change in the view as there is little or no loss of/or change to the elements, features or characteristics of the view.

2.3.3 Significance of impacts

The combination of sensitivity and magnitude determines the significance of the impact on the landscape character or representative viewpoint. Refer Table 7 for the matrix used to determine the significance of impact.

Table 7 Significance of impact matrix

		Magnitude of impact			
		High	Moderate	Low	Negligible
Sensitivity	High	High Impact	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible
		Negligible	Negligible	Negligible	Negligible

2.3.4 Panorama and photomontage

All photographic images were captured using a 50 millimetre fixed focal length lens on a 35 millimetre full frame format camera at a camera height of 1.6 metres. All photograph locations were recorded and mapped.

A series of seven viewpoint locations were chosen and existing views represented using a panorama technique. This technique involves the stitching together of a number of adjoining images using the Adobe Photoshop software program.

Of the seven viewpoint locations, two viewpoints were selected for the production of photomontage images to represent proposed views following the completion of the Proposal. The software used to model and render the photomontages was Autodesk 3D Studio Max. In order to achieve an accurate photomontage of the structure and surrounding landscape, one metre contours were used to model the surrounding landform.

Once the 3D model incorporating both the landscape and new Proposal elements were created, a virtual camera was placed in the software at the same location the photographs were taken.

The film, focal lens and height of the virtual camera matches the real camera utilised to take the photos. The photos of the site were used in 3D Studio Max as a background to accurately match the 3D model with the Proposal elements to the perspective of the photos. From the camera view, rendered images of the Proposal were produced to match the daylight exposure of the photographs. The rendered images were imported into Adobe Photoshop for post-production editing and collation of the photomontages. Refer to Appendix A for photomontages of the Proposal.

The final result is the 3D model of the Proposal shown in the correct 3D location in the photographs (refer Appendix A). The final images were produced to a high resolution, suitable for printing.

2.4 Mitigation measures

Potential mitigation measures may include:

- adopting alternative designs or revisions to the basic engineering and architectural design to prevent and/or minimise negative impacts
- remedial measures such as colour and textural treatment of structural features
- compensatory measures such as landscape design measures to compensate for unavoidable negative impacts and to attempt to generate long-term positive impacts.

2.5 Assumptions and Limitations

This methodology includes the following assumptions and limitations:

- there is no national guidance on the assessment of landscape and visual impacts specific to Australia, however, the industry typically refers to *Guidelines for Landscape and Visual Impact Assessment, Third Edition (2013)* and the *Environmental Impact Assessment Practice Note Guideline for Landscape Character and Visual Impact Assessment EIA-N04 (2013)*
- the assessment aims to be objective and describe any changes factually. While potential changes resulting from the Proposal are defined, the significance of these changes requires qualitative (subjective) judgements. This assessment's conclusion therefore combines objective measurement and professional interpretation. While this assessment aims to be objective, it is recognised that visual impact assessment can be subjective and individuals are likely to associate different visual experiences to the study area
- the assessment is based on the information provided to GHD at the time of writing
- existing conditions were assessed during the site inspection on 10th August 2018
- this assessment assumes tree removal is limited to two trees
- this assessment does not include landscape and visual impact from lighting.

3. Proposal Description

3.1 The Proposal site

The Proposal site is located at Kingswood Station. The rail line runs on an east-west alignment through Kingswood, and the Great Western Highway (GWH) and follows the rail alignment on the southern side of the rail corridor.

The land immediately surrounding the station includes:

- an industrial area to the north-west adjacent to the rail corridor
- Park Avenue to the north-east with residential apartments along the northern edge
- the GWH along the southern edge, with a mixed use area to the south-west, and a residential area south-east.

Key commercial areas are south of the station along the GWH and Bringelly Road. Other nearby land use features include the Nepean Hospital, Chapman Gardens, St Joseph's Primary School, and Kingswood Cemetery.

Kingswood Station consists of two at-grade side platforms and an elevated station building. It is a staffed station with facilities including toilets, a ticket office, stairs and ramps, commuter car parking, bike racks and lockers, kiss & ride and taxi rank, and bus connections.

Refer Figure 1 for Proposal location plan.

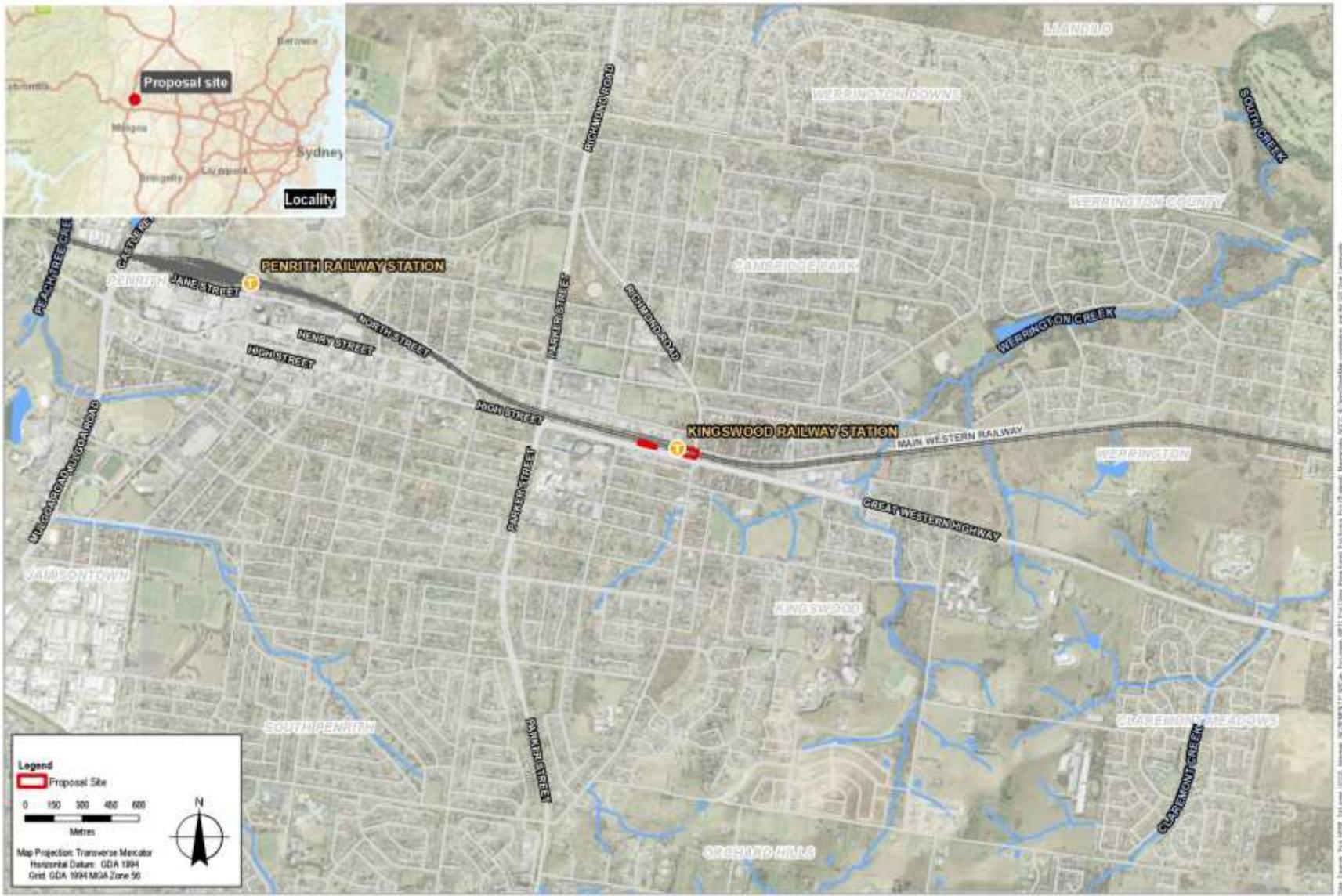


Figure 1 Proposal location plan

3.2 The Proposal

As part of the TAP initiative, TfNSW are proposing accessibility, security, and facilities upgrades to Kingswood Station to improve the public transport customer experience.

3.2.1 Operation phase

The Proposal includes the following key elements:

- two new lifts approximately 10 metres high from platform level, one on each platform, located to the eastern end of the station. The lifts are proposed to be concrete, with a steel lift shaft frame with glass and solid architectural cladding at concourse level
- two new concrete stairs, one adjacent to each new lift, with balustrades and security screens, providing two new station entry points on the north and south sides of the rail corridor
- new station entry paving and fencing to the new station entry points
- new ramp, stair and garden beds to the new station entries at GWH and Richmond Road
- accessibility upgrades to rooms within the existing station building
- a new anti-throw screen, handrail and roof canopy to a portion of the existing elevated concourse at the top of the stairs
- accessibility upgrades to two existing stairs on the western side of the station
- new communications and security systems, including Passenger Information System, Opal Card Readers to new station entry points, CCTV cameras, Emergency Help Points and Station Digital PA
- approximately 35 new solar panels to the new roof canopy over portion of existing concourse
- a new pole mounted electrical transformer on the existing aerial network
- new wayfinding signage
- new station lighting including post top lights
- new signage and line-marking to the existing disabled parking spaces
- new seating for the bus stop at the Richmond Road new station entry.

Refer Figure 2 for Proposal components.

3.2.2 Construction phase

The following activities are likely to be experienced during construction:

- demolition of small sections of entry pavement and fencing on the eastern end of the station near the GWH and Richmond Road
- removal of internal walls, fixtures and fittings of the existing station building
- removal of the existing balustrade to the southern end of the elevated station
- excavation of the existing platform for new lift pits
- excavation to undertake work to underground services
- establishment of a site compound
- construction of the operation phase Proposal components identified in section 3.2.1

- removal of at least one medium sized tree on the northern side of the station
- removal of at least one medium sized tree on the southern side of the station.

Construction work will be undertaken during both weekend possessions and standard construction hours. Any work undertaken during standard hours will be done behind safety screens.

The construction timeframe is proposed to be a period of approximately 18 months, with work undertaken during standard construction hours (Monday to Friday between 7:00am and 6:00pm, and Saturday between 8:00am and 1:00pm with no work on Sunday or Public Holidays) or during possessions (track closure over a 48 hour period usually on a weekend).



Figure 2 Proposal components plan

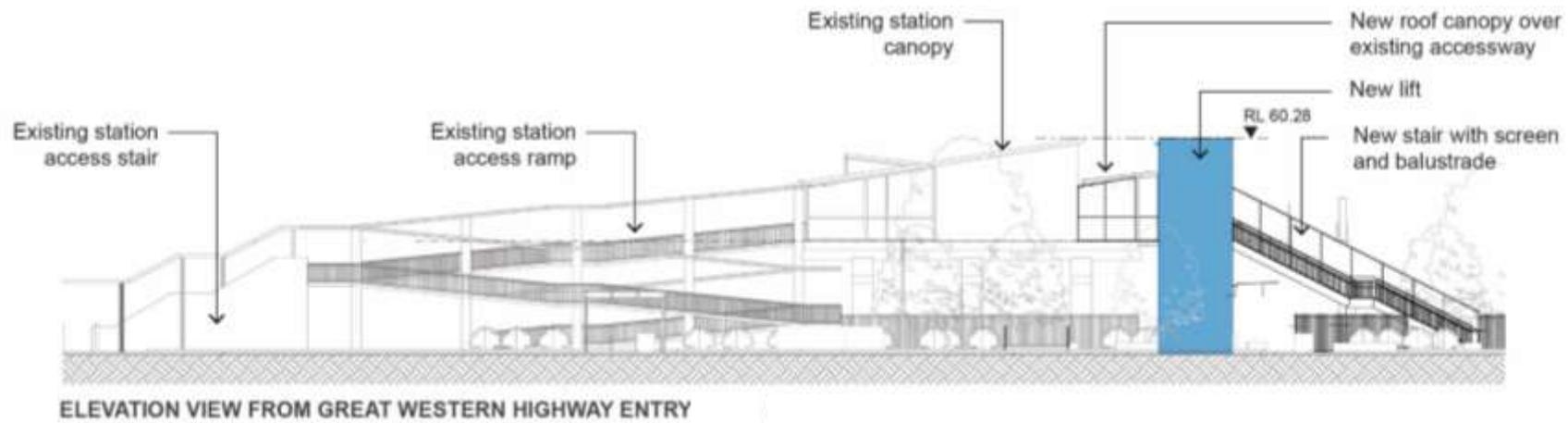
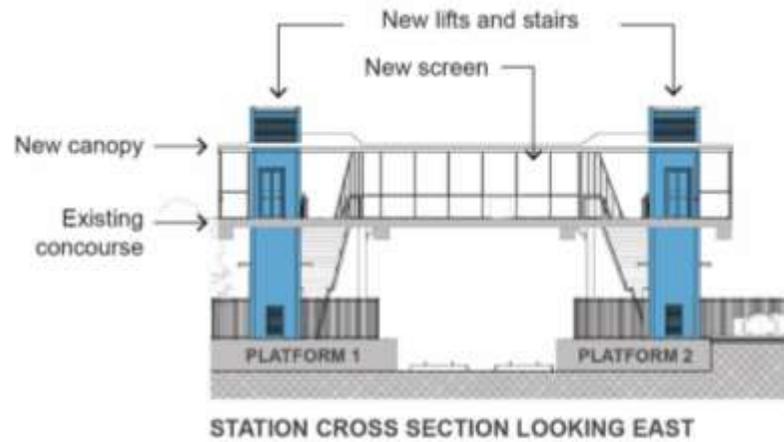


Figure 3 Project components section and elevation

4. Existing Environment

The following section provides an overview of relevant legislation and policy objectives, land use and built form, topography, hydrology and vegetation, and key views and viewsheds in the vicinity of the Proposal site. These features all contribute to the landscape character and visual amenity of the study area. Landscape character types will subsequently be defined and described.

4.1 Study Area

The study area for the LVIA has been defined as land within 600 metres of the Proposal site. This study area has been determined based on the following:

- an analysis of the ZTV mapping (refer Section 2.2.3)
- a desktop study examining aerial photographs and topographic maps considering both landform and land cover
- a site inspection examining the existing visual catchment
- previous studies of a similar nature.

4.2 Legislation and Policy

The following section identifies legislation and policy objectives relevant to the Proposal and the study area chosen for this assessment. These have been used to inform the assessment of both landscape character and visual impact.

Although the Proposal itself is not required to meet specific clauses within the *Penrith Local Environmental Plan* and the *Penrith Development Control Plan*, they have been taken into consideration as the assessment includes the broader visual catchment of the Proposal.

4.2.1 Penrith Local Environmental Plan 2010

The study area is located within the City of Penrith local government area and therefore falls under the *Penrith Local Environmental Plan 2010 (PLEP)*. This plan identifies a number of aims relevant to the landscape and visual amenity of the study area.

One of the particular aims of the PLEP is:

- *'to protect and enhance the environmental values and heritage of Penrith, including places of historical, aesthetic, architectural, natural, cultural, visual and Aboriginal significance'*

Land use zones

Refer to Figure 4 for land uses within the study area.

The following have specific aims relevant to landscape and visual amenity:

Common to Zones R2, R3 and R4

- *'to ensure that a high level of residential amenity is achieved and maintained'*

Zone R2 Low Density Residential

- *'to promote the desired future character by ensuring that development reflects features or qualities of traditional detached dwelling houses that are surrounded by private gardens'*
- *'to enhance the essential character and identity of established residential areas'*

Zone R3 Medium Density Residential

- *'to enhance the essential character and identity of established residential areas*
- *'to ensure that development reflects the desired future character and dwelling densities of the area'*

Zone R4 High Density Residential

- *'to ensure that development reflects the desired future character and dwelling densities of the area'*

Zone RE1 Public Recreation and Zone RE2: Private Recreation

- *'to protect and enhance the natural environment for recreational purposes'*

Zone B4 Mixed Use

- *'to create opportunities to improve public amenity'*

Zone SP1 Special Activities

- *'to facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use...'*

Height of buildings

PLEP includes limitations to the height of buildings within the study area. Objectives of these include:

- *'to ensure that buildings are compatible with the height, bulk and scale of the existing and desired future character of the locality'*
- *'to minimise visual impact, disruption of views, loss of privacy and loss of solar access to existing development and to public areas, including parks, streets and lanes'*
- *'to minimise the adverse impact of development on heritage items, heritage conservation areas and areas of scenic or visual importance'*

Building height limits in the vicinity of the station are as follows:

- 12-12.9 metres to the industrial area north-west of the station
- 15-16.9 metres to the high density residential area north-east of the station
- 23-24.9 metres to the mixed use area south-west of the station across the GWH
- 17-18.9 metres to the mixed use area south-east of the station across the GWH

Refer to Figure 5 for heights of buildings plan.

Heritage conservation

A number of areas with heritage conservation protections are present within the study area. These include the following:

- Penrith General Cemetery
- St Philip's Anglican Church
- GWH Milestone.

Relevant objectives of the heritage conservation protection include:

- *'to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views'*

Refer to Figure 4 showing location of heritage conservation within the study area.

4.2.2 Penrith Development Control Plan 2014

The *Penrith Development Control Plan 2014* (PDCP) includes comprehensive guidance for the development of land within the Penrith Health and Education Precinct, located within the study area. The Penrith Health and Education Precinct (PHEP) incorporates the existing Nepean Hospital site as well as all land currently zoned as mixed use in the immediate surrounds of the hospital as shown in Figure 4.

Relevant key aims and objectives of the PHEP include:

- *'contribute to the growth and character of Kingswood as a specialised medical precinct'*
- *'protect and enhance the public domain'*
- *'to promote high quality urban design, architectural excellence and environmental sustainability in the planning, development and management of the Hospital Precinct'*
- *'to encourage development within the Hospital Precinct that prioritises the public domain and creates an attractive and vibrant centre'*
- *'to achieve an attractive and sustainable precinct'*

4.2.3 Other relevant projects / policy

Nepean Redevelopment

In response to the growing population in Western Sydney and the Blue Mountains, the Nepean Hospital is planned to be redeveloped, with expanded and upgraded hospital and community-based services. The NSW Government have committed more than \$1 billion towards the Nepean Redevelopment, which will be delivered in two stages.

Currently in the design phase, stage one will include a new hospital multi-level building to house an expanded emergency department and other hospital facilities, together with a helipad. A new multi-storey carpark is also proposed as a priority to the corner of Barber Avenue and Parker Street, which will include an interim helipad until the hospital tower is complete. The carpark is currently under construction.

The cancer care centre will also undergo an expansion and upgrade as part of stage one works. This site is located in close proximity to Kingswood Station, on the corner of the GWH and Somerset Street. Investigative site works are currently underway for this part of the Nepean Redevelopment.

Stage two is set to commence soon after stage one is complete in 2023, and will include an additional tower building.

City of Penrith Landscape Character Strategy 2006

The *Landscape Character Strategy* has been developed to protect and enhance the visual amenity of Penrith and its urban, rural and environmental qualities. The strategy includes desired character statements and maps for Penrith. Key components identified include 'iconic places', 'primary visual backdrops', 'rural places', and 'urban places'.

Of relevance to this report, areas within the study area have been identified as 'Garden Suburbs', defined by 'modestly-scaled detached dwellings dating from the nineteenth century through to the mid-twentieth century, surrounded and separated from street frontages and neighbouring properties by "leafy" private gardens that accommodate tall shady trees, and where the street frontages are "addressed" by each dwelling'.

The rail corridor and Nepean Highway are also recognised as places from which to view Penrith's 'primary visual backdrops' or visible lands.

Relevant strategies include the following:

- *'maintain scenic quality and neighbourhood identity by retaining existing trees that are visually prominent in order to minimise the impact of redevelopment upon Penrith City's traditional residential patterns'*
- *'enhance Penrith City's environmental quality and the identity of local streetscapes by promoting corridors of trees along street verges as well as across front and rear gardens throughout the City's residential neighbourhoods'*
- *'within Penrith City's primary visual backdrops, ensure that the highest standards are achieved in relation to landscape planning and scenic quality, as well as the design quality of built form and landscaping to maintain and enhance views and vistas'*

Kingswood Public Domain Manual 2014

The Kingswood Public Domain Manual defines new design standards for the Kingswood public domain, guiding the establishment of a consistent streetscape treatment and hierarchy to define the character of Kingswood.

TfNSW Sustainable Design Guidelines Version 4.0

Relevant principles outlined in the *Sustainable Design Guidelines* in the Urban Design category include the following:

- *'Principle 4: Integrate the project with the surroundings area'*
- *'Principle 5: Maximise the amenity of the public domain'*
- *'Principle 6: Protect and enhance heritage features and significant trees'*
- *'Principle 7: Maximise positive view opportunities'*
- *'Principle 8: Design an efficient and functional transport solution which enhances and contributes to local amenity and prosperity'*

TfNSW Around the Tracks: urban design for heavy and light rail

Relevant principles outlined in *Around the Tracks: urban design for heavy and light rail* include the following:

- *'Principle 1: Draw on a comprehensive site and context analysis to inform the design direction'*
- *'Principle 4: Integrate the project with the surrounding area'*
- *'Principle 5: Maximise the amenity of the public domain'*
- *'Principle 6: Protect and enhance heritage features and significant trees'*
- *'Principle 7: Maximise positive view opportunities'*

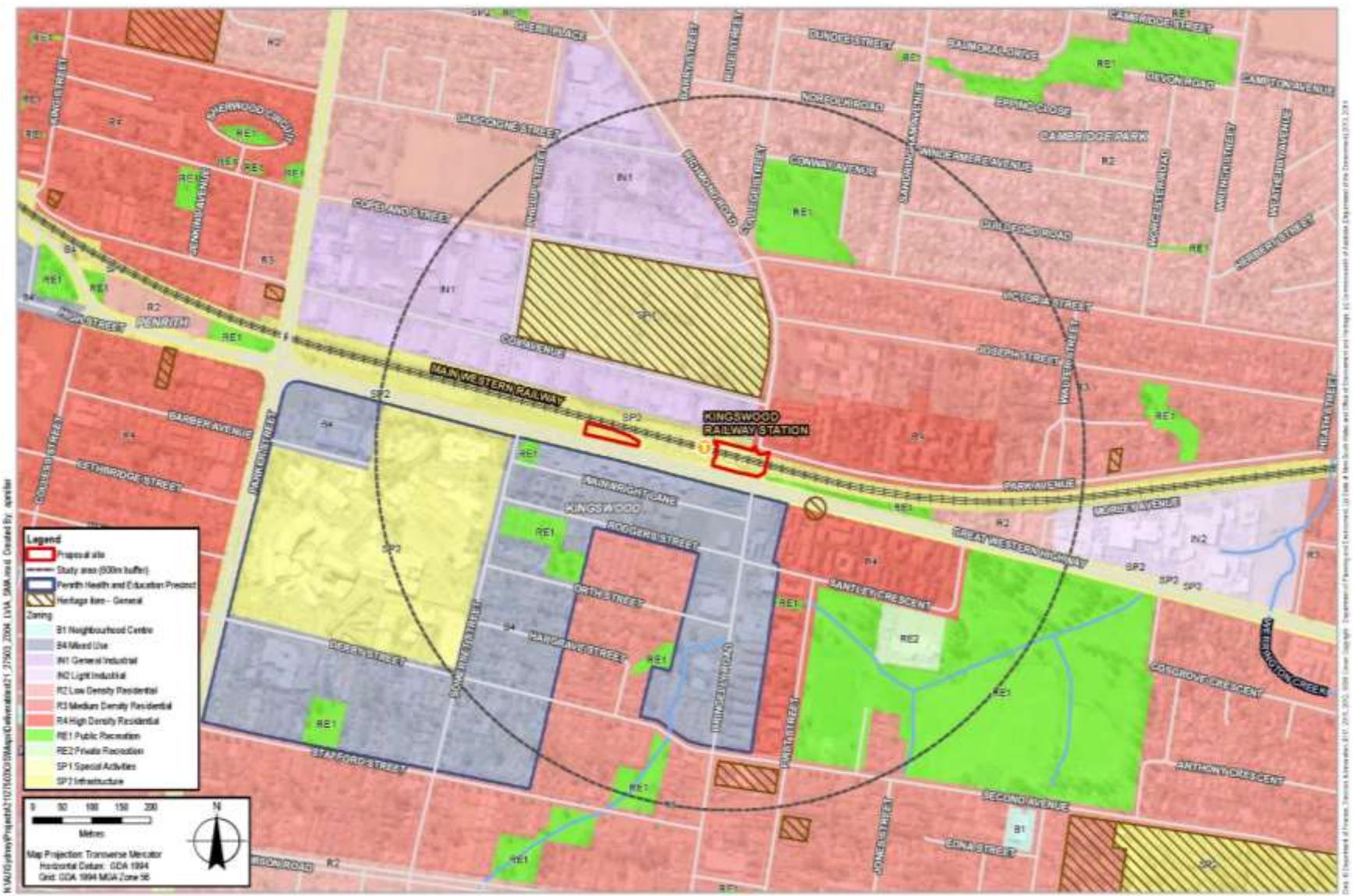


Figure 4 Land use and heritage plan



Figure 5 Building heights plan

4.3 Landscape and visual existing environment

Outlined below is a general description of the study area.

4.3.1 Land use and built form

Kingswood Station is located within Kingswood in Western Sydney, a suburb with a mixed use area on the southern side of the rail corridor and community facilities scattered amongst residential and industrial zones. Key facilities include the Nepean Hospital west of the station on the GWH, and the Western Sydney University Penrith campus south-east of the study area.

Commercial uses are present within the mixed use area south of the station on the GWH between Kingswood Station and the Nepean Hospital, and along Bringelly Road. The Kingswood Neighbourhood Centre provides an anchor to Bringelly Road and a key neighbourhood gathering space.

Residential areas are located to the north and south of the rail corridor and include an equal mix of apartments, typically up to three storeys high, and single storey detached dwellings. Open spaces include Chapman Gardens and a number of smaller local parks within residential areas. Two schools are within the study area, St Joseph's Primary School on Richmond Road and St Dominic's College to the north-west edge of the study area. The Kingswood Cemetery is located north of the station with entry from Cox Avenue. A light industrial area is present along the north-western edge of the rail corridor, with uses typically associated with auto parts and services.

Key transport corridors through the study area include the GWH with adjacent shared path, and the metropolitan rail line.

4.3.2 Topography and hydrology

The Proposal site is located on gently undulating terrain, with flatter slopes to the southern side of the rail corridor. High points follow a ridgeline generally aligned with Richmond Road, reaching an elevation of approximately 76 metres AHD near Conway Avenue, with smaller peaks of approximately 61 metres and 63 metres AHD at St Joseph's Primary School and Kingswood Cemetery. Land to the north of the rail corridor drops away from the ridge to the east and west.

On the southern side of the rail line, high points are located to the south and west of the study area as the landform gradually drops away towards the rail line, and to the east towards Werrington Creek. Kingswood Station is located at an elevation of approximately 49 metres AHD.

No water courses are visually apparent within the study area, however a network of below ground drainage is present within Chapman Gardens and Wainwright Park. The study area is located within the Hawkesbury Nepean catchment, and although the Nepean River is situated west of Kingswood at Penrith, the site generally slopes to the east into the Werrington Creek, which joins South Creek and flows north into the Hawkesbury River at Windsor.

Refer to Figure 6 for hydrology within the study area.

4.3.3 Vegetation

Vegetation consists of canopy trees, roadside vegetation, domestic garden vegetation and open parkland consistent with a typical suburban area. Of note is the predominance of large eucalypt trees scattered throughout the study area within public and private property. These give the area a distinct character and reflect the woodland characteristics once present when the area was originally Cumberland Plain Woodland.

Visually important vegetation

Visually important vegetation has been identified within the immediate vicinity of the station precinct, and includes the existing mature eucalypts within station car park, and all vegetation currently providing visual mitigation to built form elements, including buffer vegetation along the rail corridor boundary, and vegetation mitigating views from sensitive receiver locations. Refer to Figure 7 for the location of visually important vegetation in the immediate vicinity of the station precinct.

The combination of different types of vegetation ranging from hedges to tall trees of differing species creates a layered effect to the visual barrier, effective from different distances and elevation, whilst also contributing to the positive aesthetic and sense of place.

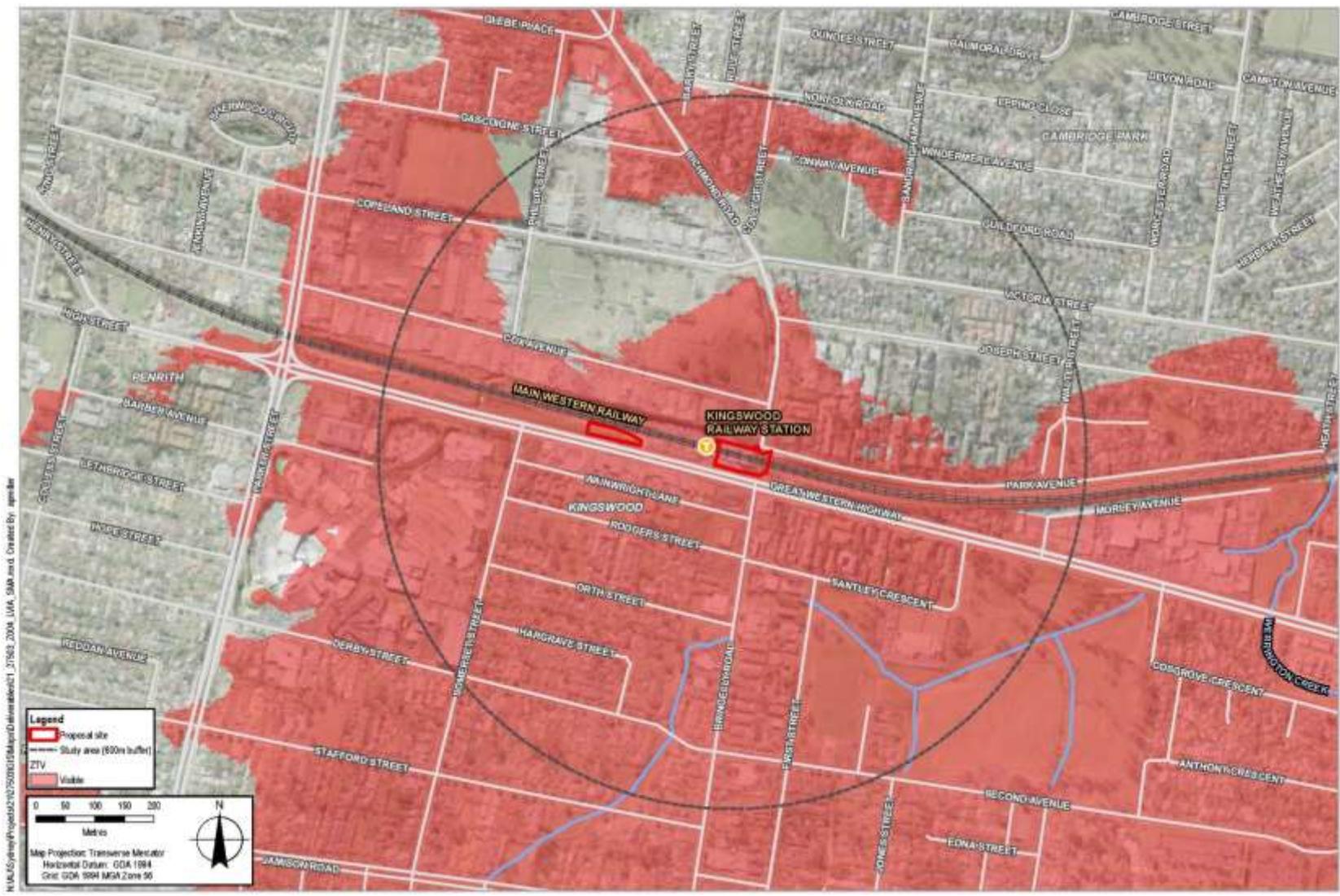
4.3.4 Key views and viewsheds

Key views are typically achieved from elevated locations within the study area. Of note are distant views to the west towards the Blue Mountains from elevated locations such as within the Penrith Cemetery, along Cox Avenue, and along the GWH, as well as from the elevated Kingswood Station. Other views of note include views across the rail corridor from Richmond Road to Bringelly Road.

Visually prominent features within the study area include two new mixed use buildings along the GWH with a height of eight storeys, approximately 26 metres in height. These can be seen from elevated location on the northern side of the rail corridor, such as within the Penrith Cemetery.

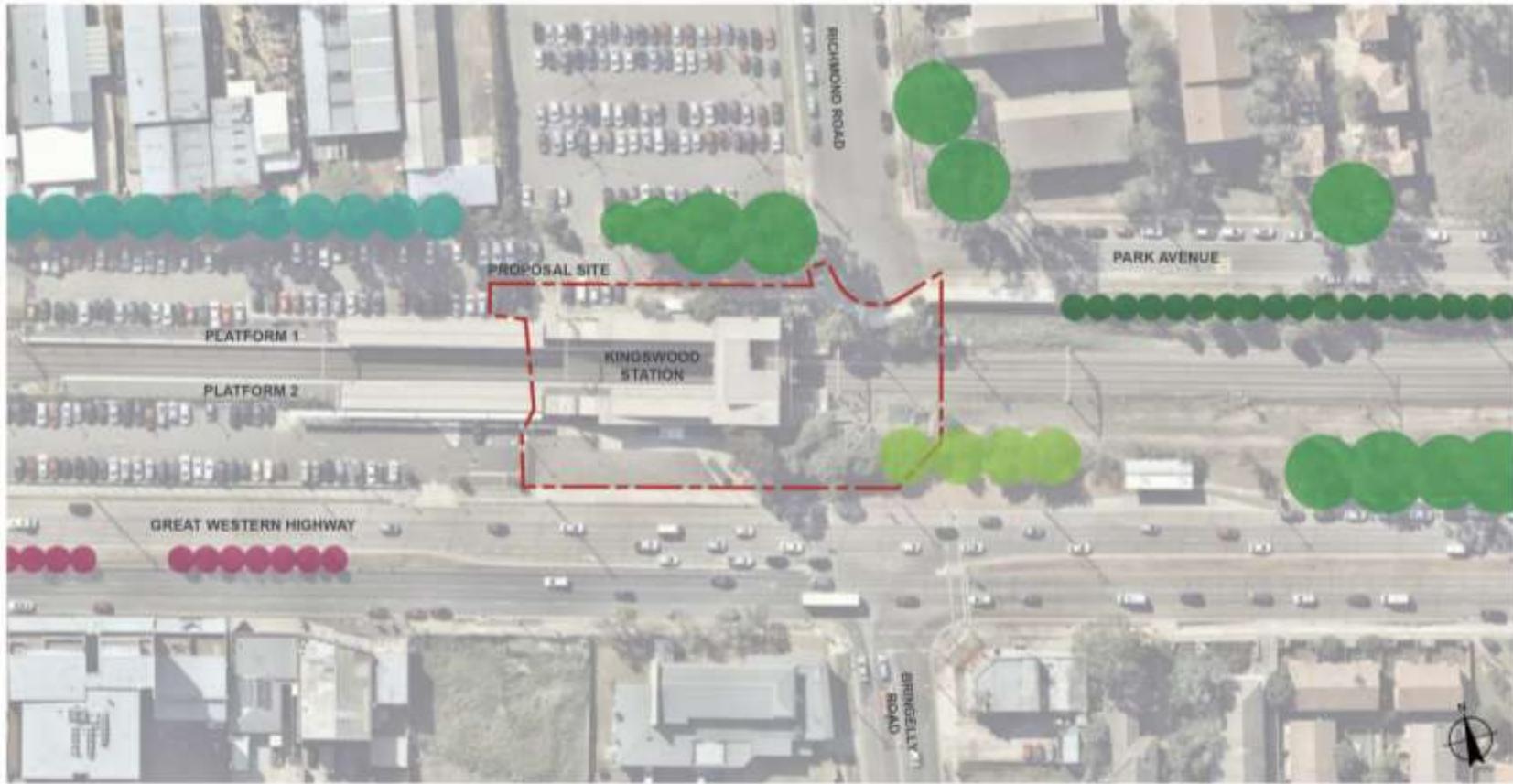
The relative abundance of tall mature eucalypts with broad canopies provides screening or filtering of views within the study area, as well as a green backdrop to the built form. In the vicinity of the station precinct, a combination of existing vegetation currently mitigates the scale and elevation of built form elements including the existing station building, such as the tall eucalypts, small trees and shrubs in the commuter carpark and along the rail corridor boundary.

Figure 6 illustrates the ZTV mapping of the Proposal showing areas of theoretical visibility.



Note: This ZTV is representative only and illustrates the zone in which the lift shaft would be theoretically visible without taking into account the presence of vegetation or buildings.

Figure 6 ZTV and hydrology plan



VISUALLY IMPORTANT VEGETATION PLAN

- Tall mature eucalypts
- Medium native trees
- Rail corridor boundary trees and shrubs
- Great Western Highway small median feature trees
- Park Avenue hedge and small native street trees

Figure 7 Visually important vegetation

4.4 Landscape Character Types

Based on the assessment of natural and cultural influences shaping the landscape, Landscape Character Types (LCT's) have been defined representing broadly homogenous characteristics and urban patterns.

The following LCT's have been identified for the study area:

- LCT1 Residential – detached
- LCT2 Residential - apartments
- LCT3 Mixed use
- LCT4 Open space and cemetery
- LCT5 Industrial
- LCT6 Community infrastructure
- LCT7 Transport infrastructure

Refer Figure 8 for landscape character types plan.



Figure 8 Landscape character types plan

4.4.1 Landscape character type 1: Residential – detached

LCT1 is located to the outer edges of Kingswood’s local commercial centre on the north and south sides of the rail corridor. To the south, LCT1 is located on gently undulating terrain, whereas to the north, its location is on the steeper slopes to the east of Richmond Road.

Key characteristics of LCT1 include the following:

- single storey detached residential dwellings looking on to the street
- typical setbacks of approximately eight metres
- a combination of brick, fibro and metal clad buildings typically with tiled roofs
- local streets with one traffic lane in each direction, with or without a footpath and street trees.

There are no significant landscape characteristics of LCT1 protected under legislation or identified within planning policy.

Photograph 1 and Photograph 2 show images with LCT1 characteristics.



Photograph 1 Residence on Walter Street



Photograph 2 Residences on Glebe Place

4.4.2 Landscape character type 2: Residential – apartment

LCT2 is located to the edges of the commercial centre and station precinct along the GWH, and north-east of the rail corridor along Park Avenue.

Key characteristics of LCT2 include the following:

- apartment buildings two to four storeys high, typically with balconies
- apartment buildings looking onto both the street and towards shared driveways
- building setback are typically between five to ten metres
- buildings are largely constructed of brick, with tiled roofs
- covered parking areas are common to the ground floor, with living areas on the first floor and above, particularly along Park Avenue
- a small number of relative new apartments
- local streets with one traffic lane in each direction, with or without a footpath and street trees.

There are no significant landscape characteristics of LCT2 protected under legislation or identified within planning policy.

Photograph 3 to Photograph 6 show images with LCT2 characteristics.



Photograph 3 Apartments on First Avenue



Photograph 4 Apartment on Park Avenue



Photograph 5 Apartment on Rodgers Street



Photograph 6 Apartments on the Great Western Highway

4.4.3 Landscape character type 3: Mixed use

LCT3 is located along the GWH west of the station, and south along Bringelly Road.

Key characteristics of LCT3 include the following:

- commercial and retail uses to the ground floor, with a limited number of buildings with apartments on the upper levels
- ground level uses are typical of a local neighbourhood, including a post office, hotel, restaurants and cafes, and a small supermarket
- the ground level built form and commercial use is relatively continuous along the GWH, with a continuous awning along the streetscape. However, built form and frontages are disconnected along Bringelly Road, with isolated concentrations of shops at Rodgers Street and Orth Street intersections, and residential apartments or vacant blocks between
- building heights are typically one to two storey, however two new large scale buildings have recently been constructed (one is still underway) to approximately eight storeys high, with balconies looking onto the rail corridor. These are located to the west of the station along the GWH
- footpaths to both sides of Bringelly Road, with native street trees
- this area is increasing in density consistent with planning objectives.

There are no significant landscape characteristics of LCT3 protected under legislation or identified within planning policy.

Photograph 7 to Photograph 10 show images with LCT3 characteristics.



Photograph 7 Shops at Orth Street



Photograph 8 Shops along GWH



Photograph 9 New building under construction on the GWH



Photograph 10 New building recently constructed on the GWH

4.4.4 Landscape character type 4: Open space and cemetery

LCT4 comprises of parkland areas within the study including Chapman Gardens, Wainwright Park, and Steamroller Park, as well as smaller local open spaces and the Penrith Cemetery.

Key characteristics of LCT4 include the following:

- parkland areas with landscape consisting of primarily turf and predominantly native trees
- deciduous feature trees to Wainwright Park adjacent to the Kingswood Neighbourhood Centre
- playing fields and Kingswood Sports Club within Chapman Gardens
- play equipment within Chapman Gardens, Wainwright Park and Steamroller Park
- perimeter fencing, internal roadways and regular gravestones to Penrith Cemetery
- large stands of mature eucalypt trees to the southern boundary of Penrith Cemetery, and scattered large eucalypts and stands of mature brush box trees within the cemetery
- distant views west towards the Blue Mountains from Penrith Cemetery.

Landscape values associated with LCT4 include the local heritage significance of the Penrith Cemetery, which recognises the site as a good example of formally laid out cemetery of the late 19th and early 20th centuries, with aesthetic significance associated with the brush box

plantings, brick kerbs and style of memorial stones. The distant view from the cemetery west towards the Blue Mountains is also a valued part of the LCT4 landscape character, although not formally recognised for its aesthetic value.

Photograph 11 to Photograph 14 show images with LCT4 characteristics.



Photograph 11 Chapman Gardens



Photograph 12 Wainwright Park



Photograph 13 Penrith Cemetery



Photograph 14 Penrith Cemetery

4.4.5 Landscape character type 5: Industrial

LCT5 is located to the north-west of the rail corridor, north of Penrith Cemetery, and to the eastern edge of the study area between the rail line and the GWH.

Key characteristics of LCT5 include the following:

- single storey metal sheds with corrugated roofs
- minimal to no vegetation, with outdoor areas typically concrete or compacted soil
- varying setback, typically around ten metres on Cox Avenue, with parking to the street frontage. The back of properties adjoin the rail corridor
- smaller scale businesses along Cox Avenue with vehicular entries along the street frontage. Larger scale businesses to the west and north of the cemetery, with large outdoor spaces for storage and parking
- uses typically associated with auto services
- large mature eucalypt trees along the boundary edges to the area north of the cemetery.

Photograph 15 and Photograph 16 show images with LCT5 characteristics.



Photograph 15 Industrial edge to Cox Ave.



Photograph 16 Business on Cox Ave.

4.4.6 Landscape character type 6: Community infrastructure

LCT 6 comprises of community facilities within the study area including the Kingswood Neighbourhood Centre, Nepean Hospital, St Joseph's Primary School, St Dominic's College, and St Philip's Anglican Church.

Key characteristics of LCT6 include the following:

- larger scale built form and associated facilities such as outdoor open spaces, roads and car parking areas to cater for community gathering
- more diversity in architectural and landscape style.

Photograph 17 and Photograph 18 show images with LCT6 characteristics.



Photograph 17 Kingswood Neighbourhood Centre



Photograph 18 St Dominic's College playing fields, viewed from Gascoigne Street

4.4.7 Landscape character type 7: Transport infrastructure

LCT7 includes the rail corridor, the GWH, and the Kingswood Station precinct.

Key characteristics of LCT7 include the following:

- the GWH consists of two lanes of traffic in each direction with parking lanes and a central median, planted with groups of small deciduous trees on the western side of Bringelly Road. A shared path is present on the northern side of the GWH west of the station, crossing over the highway at the Bringelly Road intersection east of the station
- the station precinct consists of the elevated concourse with long ramps and stairs. A commuter car park and bus shelters are present to both sides of the station

- vegetation includes small groups of dense native trees to station entry points, tall mature eucalypts within the commuter carpark, and dense hedging and buffer vegetation along the rail corridor boundary alongside industrial properties
- the existing vegetation in the station precinct and the rail corridor boundary visually mitigates the scale of surrounding built form elements, including the elevated station, industrial and multi-storey residential buildings
- the tall eucalypts in the commuter carpark provide continuity to other similar remnant vegetation in the study area, contributing to the overall sense of place of Kingswood.

Refer to Section 3.1 for description of Kingswood Station.

Landscape values associated with LCT7 include a highway marker of local heritage significance located adjacent to the shared path and kerb on Bringelly Road. As mentioned above, existing vegetation within LCT7 is valued for the provision of visual mitigation, character and sense of place to the surrounding area.

Photograph 19 to Photograph 22 show images with LCT7 characteristics.



Photograph 19 Hedge and small trees along rail corridor edge



Photograph 20 Shared path on southern side of GWH



Photograph 21 Ramp access on southern side of Kingswood Station



Photograph 22 Clumps of deciduous trees in median on the GWH

4.5 Sensitive visual receivers and viewpoints

Based on the analysis of the existing landscape and visual environment, sensitive visual receivers were identified and viewpoint locations selected for assessment.

4.5.1 Sensitive visual receivers

Sensitive visual receivers within the Proposal viewshed include the following:

- residents on Park Avenue, Richmond Road, the GWH, and Bringelly Road
- businesses on the GWH and the eastern side of Bringelly Road
- pedestrians and shared path users on the GWH
- pedestrians on Richmond Road, the eastern side of Bringelly Road, Park Avenue, Richmond Road, and Cox Avenue
- road users on Richmond Road, Bringelly Road, the GWH and Cox Avenue
- commuters using the Kingswood Station
- school children at St Joseph's Primary School
- visitors to the Penrith Cemetery
- workers of industrial businesses.

4.5.2 Viewpoint locations

Refer to Figure 9 for selected viewpoints for assessment representing views from the most sensitive visual receivers-

Table 8 Viewpoint locations

Viewpoint	Location	Description
VP1	Richmond Road (north)	This view represents road users and pedestrians on Richmond Road, as well as St Joseph's Primary School users.
VP2	Richmond Road (central)	This view represents residents, pedestrians and road users on Richmond Road near the station.
VP3	Park Avenue	This view represents residents, pedestrians and road users on Park Avenue.
VP4	GWH (east)	This view represents residents, shared path users and road users on the GWH.
VP5	Bringelly Road	This view represents pedestrians on Bringelly Road near close to businesses.
VP6	GWH (west)	This view represents businesses, residents and pedestrians on the GWH.
VP7	GWH (central)	This view represents pedestrians and road users at the intersection of the GWH and Bringelly Road.

5. Impact Assessment

5.1 Landscape impact assessment

The following section includes an assessment of impacts to landscape character from the Proposal. Refer to Figure 8 for location of LCTs.

5.1.1 Landscape character type 1: Residential – detached

No impact as the Proposal has affected no change to the elements that define the landscape character type as described in section 4.4.

5.1.2 Landscape character type 2: Residential – apartment

Refer to Table 9 below for LCT2 impact assessment.

Table 9 LCT2 impact assessment

Landscape character type 2	
Anticipated change to landscape character	Introduction of new lift, stair, and station pedestrian access point to the northern station entry near Richmond Road and Park Avenue, on the boundary of LCT2.
Sensitivity to change	Low , as LCT2 contains no distinctive landscape character features of any designated or aesthetic value; the Proposal is unlikely to have an adverse effect on the defining characteristics of LCT2; the Proposal height is similar to that within LCT2; and the Proposal location is within the adjacent landscape character type.
Magnitude of change	Negligible , as the Proposal is within a site where the existing function and proposed function remains the same, and the anticipated built form features and pedestrian movements are similar to existing.
Significance of impact	Negligible

5.1.3 Landscape character type 3: Mixed use

Refer to Table 10 below for LCT3 impact assessment.

Table 10 LCT3 impact assessment

Landscape character type 3	
Anticipated change to landscape character	Introduction of new lift, stair, and station pedestrian entry point to the southern station entry near the GWH, close to the edge of LCT3.
Sensitivity to change	Negligible , as LCT3 contains no distinctive landscape character features of any designated or aesthetic value; the Proposal is unlikely to have an adverse effect on the defining characteristics of LCT3; the Proposal height is lower than the existing and proposed heights within LCT3; and the Proposal location is within the adjacent landscape character type, across a state highway.
Magnitude of change	Negligible , as the Proposal is within a site where the existing function and proposed function remains the same, and the built form features are similar to existing.

Landscape character type 3

Significance of impact	Negligible
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5.1.4 Landscape character type 4: Open space and cemetery

No impact as the Proposal has affected no change to the elements that define the landscape character type as described in section 4.4.

5.1.5 Landscape character type 5: Industrial

No impact as the Proposal has affected no change to the elements that define the landscape character type as described in section 4.4.

5.1.6 Landscape character type 6: Community infrastructure

No impact as the Proposal has affected no change to the elements that define the landscape character type as described in section 4.4.

5.1.7 Landscape character type 7: Transport infrastructure

Refer to Table 11 below for LCT7 impact assessment.

Table 11 LCT7 impact assessment

Landscape character type 7	
Anticipated change to landscape character	<p>The addition of two new lifts and stairs with balustrades and anti-throw screens, two new station pedestrian entry points with new paving and fencing, and internal upgrades to the existing station building. The main Proposal components will extend the overall size of the station towards the east.</p> <p>At least one medium-sized tree is proposed to be removed to the new northern station entry point, and at least one tree is likely to require removal to the new southern station entry.</p>
Sensitivity to change	Low as no designated values are present within this location of LCT7. The Proposal is expected to have limited impact on the values associated with the existing vegetation within LCT7. Impacts are expected to be isolated with potential for mitigation likely to be effective.
Magnitude of change	Negligible as there is little change to the landscape character due to the additional Proposal components; all Proposal components are within LCT7 and within either the existing building footprint or existing platform footprint; and very few if any existing landscape character features will be lost.
Significance of impact	Negligible

5.2 Visual impact assessment

The following section assesses the visual impact of the Proposal from the following viewpoint locations:

- VP1: Richmond Road (north)
- VP2: Richmond Road (central)
- VP3: Park Avenue
- VP4: GWH (east)
- VP5: Bringelly Road
- VP6: GWH (west)
- VP7: GWH (central).

Refer to Figure 9 for the location of viewpoints, and Table 12 to Table 18 for a description and visual assessment.

This assessment is based on the Proposal in operation, after construction is complete.

5.2.1 Viewpoint location 1

Table 12 VP1 description and visual assessment

Viewpoint location 1 (VP1): Richmond Road (north)



Photograph of existing view towards the Proposal

<p>Description of existing view</p>	<p>VP1 is located on the eastern side of Richmond Road, approximately 160 metres north of the Proposal site, and at the location of the vehicular entry to St Joseph’s Primary School.</p> <p>VP1 is representative of sensitive receivers including local pedestrians walking to Kingswood Station, particularly local residents and school children; and road users of Richmond Road. This view was identified as having some local value as it achieves longer views across the rail corridor to Bringelly Road, from an elevated location.</p> <p>Mature eucalypts are present on both sides of the view, and also to the centre of the view at the entry to Kingswood Station. A small portion of the view offers longer views across the rail corridor to higher elevation on Bringelly Road to the south. The existing station building is shielded by existing vegetation and therefore largely not visible. The bus shelter can be seen towards the centre of the view.</p>
<p>Anticipated change to view</p>	<p>VP1 view is looking south towards the Proposal at the eastern end of the platforms. The anticipated change to view would include the addition of new vertical lifts, access stairs, and fencing.</p> <p>One existing medium sized tree within the view located behind the existing station entry signage is proposed to be removed. The removal of this tree would open up relatively clear views of the stairs, fence, and lower portion of the lifts. The upper lifts shaft are likely to appear visible behind some branches from existing trees hanging in front.</p>
<p>Sensitivity to change</p>	<p>The sensitivity of receivers represented by VP1 to the proposed change is considered to be Low.</p> <p>There is currently no designated value attached to the view. In addition, the receiver types in this location are road users, commuters accessing the station, and school children participating in active outdoor recreation. The type of views of the Proposal from these receivers would be passing and short term.</p>
<p>Magnitude of change</p>	<p>The magnitude of change for VP1 is considered to be Low.</p> <p>This is due to the anticipated minor additions to the view, of which the lifts may be only partially visible, and not uncharacteristic within the existing view.</p>
<p>Significance of impact</p>	<p>The significance of impact for VP1 is therefore Low.</p>

5.2.2 Viewpoint location 2

Table 13 VP2 description and visual assessment

Viewpoint location 2 (VP2): Richmond Road (central)	
 <p style="text-align: center; color: #0056b3; font-weight: bold;">Photograph of existing view towards the Proposal</p>	
Description of existing view	<p>VP2 is located on the northern side of Park Avenue, approximately 40 metres north of the Proposal site, at the bus stop adjacent to number 80 Richmond Road. VP2 is representative of residents of number 80 Richmond Road, as well as views experienced by pedestrians, and road users and commuters.</p> <p>VP2 includes the elevated station building to the centre of the view, partially obscured by vegetation. The kiss and ride shelter and entry signage is to the front of the station, with pedestrian entry path behind. The bus shelter is to the left of the view with the Park Avenue and Richmond Road intersection in the foreground. Existing vegetation is present across the view, with smaller trees along the rail corridor boundary and tall dense eucalypts between the station and commuter carpark. The view is generally a shallow foreground view.</p>
Anticipated change to view	<p>VP2 is looking south-west, therefore the new lifts and northern stair would be an additional feature in the view in front of the existing station building. The new lift would reach the same height as the existing station building canopy, however may appear slightly taller due to scale of perspective. The existing tree to the centre left of the view is proposed to be removed. This will reveal clear views of the proposed new stair, and new pedestrian entry point amenities such as fencing, lighting, and signage.</p> <p>Refer Appendix A for photomontage of VP2.</p>
Sensitivity to change	<p>The sensitivity of receivers represented by VP2 to the proposed change is considered to be High.</p> <p>This is due to the type of sensitive receiver being predominantly residential, who will likely have views towards the Proposal from elevated locations at home, such as balconies and possibly living areas, within relatively close proximity to the Proposal. Viewing periods may be long and frequent.</p> <p>However, no particular value appears to be attached to the view or elements within.</p>
Magnitude of change	<p>The magnitude of change to VP2 is considered to be Low.</p> <p>This is due to the scale of the change within the view which is anticipated to be obvious, however within the characteristics of the existing view. The removal of the tree and new built form elements are the key changes to the view, however there may be potential to mitigate the significance of the change through landscape and urban design treatments.</p>
Significance of impact	<p>The significance of impact for VP2 is Moderate.</p>

5.2.3 Viewpoint location 3

Table 14 VP3 description and visual assessment

Viewpoint location 3 (VP3): Park Avenue



Photograph of existing view towards the Proposal

<p>Description of existing view</p>	<p>VP3 is located on the northern side of Park Avenue approximately 140 metres from the Proposal site.</p> <p>VP3 is representative of nearby residents on Park Avenue, including residents in apartments. VP3 is also representative of views experienced by pedestrians and road users.</p> <p>VP3 is a view looking west along Park Avenue, with boundary rail corridor planting along the left hand side of the view and the streetscape verge and fencing to the right. Towards the centre of the view, tall mature eucalypts can be seen in the middle ground, located within the station precinct. The station building itself can be seen behind the boundary hedging in the background towards the centre of the view. Although the hedge planting shields views of the lower portion of the building, relatively clear views can be achieved to the upper section of the station building. The two new high density mixed use buildings on the GWH both appear in the view behind the station building. Towards the centre of the view, a small portion of distant views are achieved towards the Blue Mountains.</p>
<p>Anticipated change to view</p>	<p>VP3 is looking to the west towards the eastern side of the Proposal. In this location, the proposed new lifts, section of new canopy and new anti-throw screening is likely to be visible. The new stair on the northern side of the station may also be partially visible behind the existing bus shelter.</p>
<p>Sensitivity to change</p>	<p>The sensitivity of receivers represented by VP3 is considered to be Moderate.</p> <p>This is due to the type of sensitive receiver being predominantly residential, who will likely have views towards the Proposal from elevated locations at home, such as balconies and possibly living areas, within relatively close proximity to the Proposal. Viewing periods may be long and frequent.</p> <p>However, no particular value appears to be attached to the view or elements within.</p>
<p>Magnitude of change</p>	<p>The magnitude of change to VP3 is considered to be Low.</p> <p>The new lift shafts within the view would be discernible, however due to its location in front of the existing station building already in the view, the change is characteristic of the type and scale of components already within the view. The change to this view also has the potential to be mitigated.</p>
<p>Significance of impact</p>	<p>The significance of impact for VP3 is therefore Low.</p>

5.2.4 Viewpoint location 4

Table 15 VP4 description and visual assessment

Viewpoint location 4 (VP4): GWH (east)



Photograph of existing view towards the Proposal

<p>Description of existing view</p>	<p>VP4 is located on the southern side of the GWH, approximately 135 metres from the Proposal site and adjacent to the GWH heritage marker. In this location, two storey brick town houses with small setbacks front onto the GWH, and the shared path dominates the verge. No street trees are present.</p> <p>VP4 represents views from surrounding residential townhouses, and specifically from property number 9. Views from shared paths users and road users will also experience this view.</p> <p>VP4 is a perspective streetscape view looking west along the GWH towards the Proposal. The expansive road environment dominates view, stretching from the foreground to the middle ground left of centre. The upper level of the elevated station building appears to the centre of the view, surrounded by trees of various sizes. The station entry signage is small and difficult to discern. The bus stop is in clear view, to the right of the station in the foreground, with station corridor infrastructure seen behind. The apartments on Park Avenue and new high density buildings further along the GWH also appear discretely in the view.</p>
<p>Anticipated change to view</p>	<p>VP4 is directed to the west towards the eastern end of the station, towards the location of the Proposal. The anticipated change to VP4 would include the addition of new lifts and stairs to the front of the existing station building. These new features are likely to appear the same height and scale as the existing station building. Some of the existing vegetation currently shielding views to the platform level of the station from VP4 will be likely also require removal, however this will be isolated to the immediate vicinity of the new station entry point.</p>
<p>Sensitivity to change</p>	<p>The sensitivity of receivers represented by VP4 is considered to be High.</p> <p>This is due to the type of sensitive receiver being predominantly residential, who will likely have views towards the Proposal from elevated locations at home, such as balconies and possibly living areas, within relatively close proximity to the Proposal. Viewing periods may be long and frequent.</p> <p>However, no particular value appears to be attached to the view or elements within.</p>
<p>Magnitude of change</p>	<p>The magnitude of change to VP4 is considered to be Low.</p> <p>The new lift shafts within the view would be discernible, however due to its location in front of the existing station building already in the view, the change is characteristic of the type and scale of components already within the view. The change associated with the likely vegetation removal has the potential to be mitigated with new tree planting.</p>
<p>Significance of impact</p>	<p>The significance of impact for VP4 is therefore Moderate.</p>

5.2.5 Viewpoint location 5

Table 16 VP5 description and visual assessment

Viewpoint location 5 (VP5): Bringelly Road



Photograph of existing view towards the Proposal

Description of existing view	<p>VP5 is located on the eastern side of the pedestrian zebra crossing on Bringelly Road, approximately 245 metres south of the Proposal site. In this location, a cluster of commercial businesses are situated to either side of Bringelly Road.</p> <p>The pedestrian crossing is a key mid-block crossing point for the local community. Therefore, VP5 represents views from pedestrians using the crossing, businesses on the eastern side of Bringelly Road, and road users.</p> <p>VP5 is a streetscape perspective view of Bringelly Road, looking north towards the Proposal site. The road and streetscape features dominate much of the view, stretching from the foreground to the middle ground. To the left of the view, the inconsistent built form edge is seen along Bringelly Road, consisting of single and double storey buildings of various uses and setbacks, with a few isolated street trees. Double storey residential townhouses can be seen to the right of the view. Present within the centre of the view are the large mature eucalypts within the station precinct. The station building itself is just discernible amongst the vegetation.</p>
Anticipated change to view	<p>VP5 is directed to the north towards the eastern end of Kingswood Station towards the Proposal. The anticipated change to VP5 is likely to include the addition of the new lifts shafts and stairs to the right of the existing station building. Due to the existing vegetation to the front of the rail corridor boundary, much of the new stairs may not be seen in the view. However, the upper section of the lift shafts are likely to be discernible, appearing the same height and scale as the existing station building.</p>
Sensitivity to change	<p>The sensitivity of receivers represented by VP5 is considered to be Low.</p> <p>This is due to the type of sensitive receivers and their experience of this view, which would be relatively short, and experienced when travelling between locations when attention is likely to not be focused on this particular view. No specific value is attached to this view or elements of it, nor is indicated within relevant policy documents reviewed.</p>
Magnitude of change	<p>The magnitude of change to VP5 is considered to be Low. The new lift shafts within the view may be visible, however due to its location next to the existing station building only just visible, and the presence of foreground vegetation, the change is characteristic of the type and scale of components already within the view.</p>
Significance of impact	<p>The significance of impact for VP5 is therefore Low.</p>

5.2.6 Viewpoint location 6

Table 17 VP6 description and visual assessment

Viewpoint location 6 (VP6): GWH (west)



Photograph of existing view towards the Proposal

<p>Description of existing view</p>	<p>VP6 is located to the southern side of the GWH, approximately 220 metres to the west of the Proposal, within LCT3 mixed use.</p> <p>VP6 is representative of views from commercial businesses on the ground level as well as pedestrians. It should also be noted that a two high density buildings are present near this location, therefore this view is representative of views from residents entering and leaving their properties.</p> <p>VP6 is a streetscape view looking east along the GWH. The streetscape environment of the GWH dominates the view, including traffic lanes, parked cars, an island median with small tree planting, a strong built form edge to the right of the view and a continuous awning over the footpath. The station appears in view filtered by the median trees to the foreground. The large mature eucalypts are present creating a backdrop to the left portion of the view. The view terminates with a small section of distant views towards Western Sydney University.</p>
<p>Anticipated change to view</p>	<p>VP6 is directed to the east towards the western side of the station. As the Proposal components are situated to the eastern side of the station, the Proposal is not likely to be visible when viewed from this location. Additionally, the existing median vegetation shields both winter and summer views of any aspects of the lift shaft which may be visible adjacent to the existing roof canopy.</p>
<p>Sensitivity to change</p>	<p>The sensitivity of receivers represented by VP6 is considered to be Moderate. This is due to the type of sensitive receivers which would include residents, and their experience of this view from street level. The view experience would be relatively short but frequent, and experienced when travelling between destinations, in and out of residential buildings and shops, when attention is likely not to be focused on the view. No specific value is attached to this view, nor is indicated within relevant policy documents reviewed.</p>
<p>Magnitude of change</p>	<p>The magnitude of change to VP6 is considered to be Negligible. This is due to the barely visible change to the view by the Proposal when viewed from street level.</p>
<p>Significance of impact</p>	<p>The significance of impact for VP6 is therefore Negligible.</p>

5.2.7 Viewpoint location 7

Table 18 VP7 description and visual assessment

Viewpoint location 7 (VP7): GWH (central)



Photograph of existing view towards the Proposal

Description of existing view	<p>VP7 is located to the southern side of the GWH, approximately 44 metres to the south of the Proposal, adjacent to the Milestone Hotel at the GWH Bringelly Road intersection.</p> <p>VP7 is representative of views from the Milestone Hotel, as well as from pedestrians and vehicles travelling north or turning through this intersection.</p> <p>VP7 is a direct view of the southern side of Kingswood Station. The GWH traverses across the foreground of the view. The station building and pedestrian ramps dominate the left hand portion of the view, with existing trees to the front of varying sizes. A gap in vegetation opens views across the rail corridor to residential apartments on Park Avenue, to the right of the view.</p>
Anticipated change to view	<p>VP7 is looking north towards the eastern end of the station. The anticipated change to the view would include the new roof canopy over the existing elevated walkway, new lift shafts to the same height as the existing canopies, new stairs, and new station pedestrian entry point and associated features such as signage and fencing. These elements would appear in the centre of the view to the right hand side of the existing station building. At least one tree is likely to require removal in the immediate vicinity of the new station entry, however, the new stairs may still be partially shielded by the canopy of an existing small tree.</p> <p>Refer to Appendix A for photomontage of VP7.</p>
Sensitivity to change	<p>The sensitivity of receivers represented by VP7 is considered to be Low.</p> <p>This is due to the type of sensitive receivers and their experience of this view level, which would be relatively short, and experienced when travelling between locations, from within the hotel, when attention is likely to not be focused on this particular view. No specific value is attached to this view, nor is indicated within relevant policy documents reviewed.</p>
Magnitude of change	<p>The magnitude of change to VP7 is considered to be Moderate.</p> <p>The scale of change proposed will appear as a significant new element, however the nature of the change is within the characteristics of the existing view. The height of the lift shaft is the same as the existing station canopy. New tree planting will mitigate the effect of tree removal over time.</p>
Significance of impact	<p>The significance of impact for VP7 is therefore Moderate-Low.</p>

5.3 Summary of impacts

The following Table 19 and Table 20 provide a summary of landscape and visual impacts for the Proposal.

Table 19 Summary of landscape impacts

LCT	Description	Sensitivity to change	Magnitude of change	Overall Rating
LCT1	Residential – detached	N/A	N/A	No Impact
LCT2	Residential - apartment	Low	Negligible	Negligible
LCT3	Mixed use	Negligible	Negligible	Negligible
LCT4	Open space and cemetery	N/A	N/A	No Impact
LCT5	Industrial	N/A	N/A	No Impact
LCT6	Community infrastructure	N/A	N/A	No Impact
LCT7	Transport infrastructure	Low	Negligible	Negligible

Table 20 Summary of visual impacts

LCT	Description	Sensitivity to change	Magnitude of change	Overall Rating
VP1	Richmond Road (north)	Low	Low	Low
VP2	Richmond Road (central)	High	Low	Moderate
VP3	Park Avenue	High	Low	Moderate
VP4	GWH (east)	High	Low	Moderate
VP5	Bringelly Road	Low	Low	Low
VP6	GWH (west)	Moderate	Negligible	Negligible
VP7	GWH (central)	Low	Moderate	Moderate-Low

5.4 Landscape and visual impacts during construction

Construction works will result in temporary landscape and visual impacts which may extend beyond the Proposal site. Landscape and visual impacts associated with construction activities are generally of greater magnitude than those associated with operation, however are temporary in nature.

Landscape and visual impacts during construction resulting from those activities outlined in Section 3.2.2 may include:

- the presence of one small crane required for lift construction, and one large crane required to position the small crane
- the presence of an excavator, boom truck, concrete truck, concrete pump, piling rig, and water truck

- temporary safety screens between the work being undertaken and the public domain, platform and concourse
- presence of construction traffic and workers
- temporary parking areas
- importation and storage of construction equipment and plant
- materials stockpiling and the presence of incomplete structures
- tree removal
- construction activities associated with the existing concourse structure, lift and stair, which may be visible above safety screens from ground level.

6. Mitigation Measures

The following section recommends mitigation measures that respond to issues arising within the assessment that have potential to adversely impact on:

- the character of the landscape within which the Proposal is located
- views to the Proposal.

Mitigation measures address the most visual elements of the Proposal as well as referencing any relevant considerations drawn from the legislation and policy review.

6.1 Mitigation recommendations

6.1.1 General recommendations

General considerations for the detailed design phase include:

- incorporate new landscape planting to replace that which is to be removed, including trees, shrubs and groundcovers, to provide visual screening to new vertical built form elements from sensitive receivers, and to soften the visual impact of additional paving and retaining walls. Ensure new landscape planting enhances the public realm
- ensure the design, location and materiality of Proposal components contributes positively to the achievement of a high quality public realm
- ensure the lift, stair and new canopy components of the Proposal integrate well with, and complement, the existing station building through the use of colour and materiality
- ensure the Proposal urban design solution is sympathetic to achieving a positive viewing experience from Richmond Road, Park Avenue and the Bringelly Road intersection, through well considered design for the location of vegetation, signage, shelters, and furniture elements
- ensure the Proposal contributes positively to the existing landscape character
- ensure the Proposal responds to principles and objectives outlined in the TfNSW *Sustainable Design Guidelines Version 4.0, Around the Tracks: urban design for heavy and light rail*, the *Kingswood Public Domain Manual*, and the *City of Penrith Landscape Character Strategy*, as identified in section 4.2.

6.1.2 Construction activity and storage

General considerations for the construction phase include:

- taking all practical measures to ensure construction equipment, stockpiles, and other visible elements are located away from key views to or from the sensitive visual receivers identified in this assessment. Where such equipment or stockpiles are to be located in a visually prominent location for any reasonable period of time, incorporate screening measures and practices to ensure sites are kept tidy.

6.1.3 Retention of visually important vegetation

General considerations for vegetation retention include:

- as the Proposal design progresses, the extent of disturbance on visually important vegetation within the station precinct and along the rail corridor boundary must be

considered, and practical measures should be given to enable retention of visually important vegetation wherever possible

- seek opportunities to retain visually important vegetation, and investigate urban and landscape design solutions to achieve this, such as permeable paving and relocation of belowground services where possible.

6.1.4 Signage and poles

General consideration for signage and poles include:

- avoid locating permanent signage which may impede views. Minimise the amount of services poles in the public realm by utilising built form mounting and combining services on shared poles.

7. Conclusion

This LVIA has been undertaken to understand the potential effects of the accessibility, security and technology upgrades proposed at Kingswood Station as part of the TAP project. At the time of writing, the Proposal was in the schematic design phase.

Kingswood is an urban area near Penrith undergoing change partly driven by the objectives of the Penrith Health and Education Precinct. The built form is therefore increasing in height and density predominantly on the southern side of the rail corridor. Landscape values in the area include large mature eucalypts scattered throughout the suburb, views from elevation towards the Blue Mountains, and the heritage value of the Penrith Cemetery.

A total of seven landscape character types were identified within the 600 metre study area, including residential-detached, residential-apartment, mixed use, open space and cemetery, industrial, community infrastructure, and transport infrastructure. This assessment found there to be no significant landscape character impacts arising from the Proposal.

Sensitive visual receivers in the study area include residents, businesses, pedestrian and shared path users, road users, and commuters. Seven viewpoint locations were chosen to assess the visual impact of the Proposal on sensitive receivers within the study area. Visual impacts were assessed using panoramas of the existing view, and photomontages were created illustrating the proposed view of the Proposal from two viewpoint locations. The assessment found that the Proposal generally has Negligible to Moderate visual impacts on views from viewpoint location one, and viewpoint locations five to seven. The most significant impact was found to be Moderate from viewpoint locations two, three and four associated with nearby residential apartments. This is primarily due to the residential receiver type, and the scale of change to the view, and the location in close proximity to the proposal.

Mitigation measures recommended should be considered for inclusion into the design.

8. References

Arcadis, *Transport Access Program 3 Accelerated Projects (TAP3AP) Kingswood Station Design Report*, 13 August 2018
City of Penrith, *Kingswood Public Domain Manual 2014*

City of Penrith, *Landscape Character Strategy: Character Statements and Maps 2006*

City of Penrith, *Penrith Development Control Plan 2014*

City of Penrith, *Penrith Local Environmental Plan 2010*

DesignInc for TfNSW, *Kingswood Station TAP 3AP - Architectural Accessibility Upgrade*, Issue for SDR, 13.08.18

Landscape Institute and Institute of Environmental Management & Assessment, UK (2013), *Guidelines for Landscape and Visual Impact Assessment, Third Edition*.

Roads and Maritime Services, Australia (2013), *Environmental Impact Assessment Practice Note - Guidelines for Landscape Character and Visual Impact Assessment, EIA-NO4 Version 2.0*.

TfNSW, *Around the Tracks: urban design for heavy and light rail*, December 2016 (interim issue)

TfNSW, *Sustainable Design Guidelines Version 4.0*, May 2017

Appendix A - Photomontages

Appendix A includes photomontages of the proposed view from VP2 and VP7.

Appendices



Existing View



Photomontage of Proposal

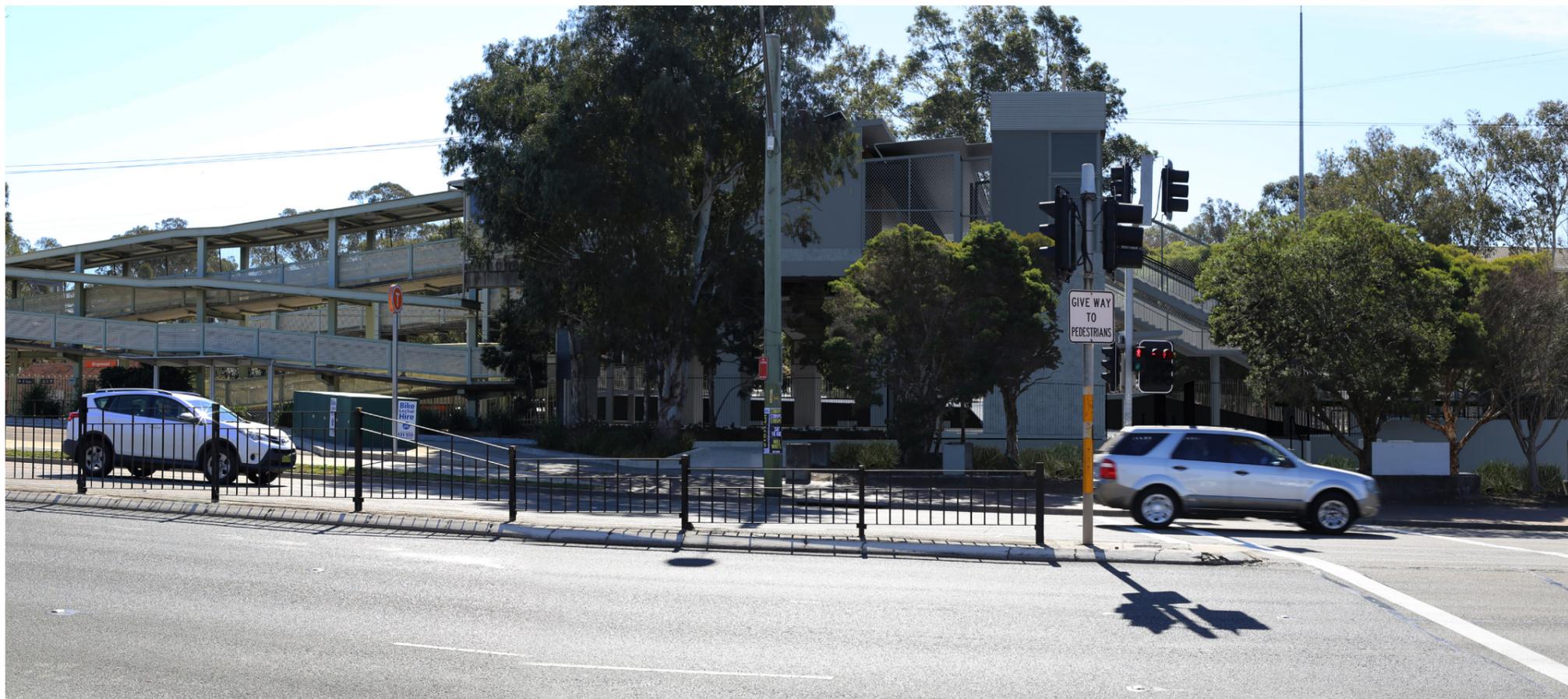
**Project: TAP3 Kingswood Station
PHOTOMONTAGE
VIEWPOINT 2**

Location: Park Avenue
Coordinates: 288 936, 6 262 313
(GDA 1994 MGA Zone 56)
View Direction: South-west
Lens Size: 50 mm
Date of Photography: 10th August 2018
Date of Photomontage: 19th October 2018
Issue: 0





Existing View



Photomontage of Proposal

Project: TAP3 Kingswood Station
PHOTOMONTAGE
VIEWPOINT 7

Location: Great Western Highway
Coordinates: 288 879, 6 262 239 (GDA 1994 MGA Zone 56)
View Direction: North
Lens Size: 50 mm
Date of Photography: 10th August 2018
Date of Photomontage: 19th October 2018
Issue: 0



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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	<u>V.Wheatley</u>	<u>L.Farrell</u>		K. Day		14.11.2018

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