HERITAGE REFERENCE COMMITTEE
TO BE HELD ON THURSDAY, 5 AUGUST 2021 AT 12:00PM
LEVEL 3 ANTE ROOM

A G E N D A

** ** ** ** ** **

WELCOME BY CHAIRPERSON COUNCILLOR ANDERSON

APOLOGIES

DECLARATIONS OF INTEREST

CONFIRMATION OF MINUTES

Minutes of Heritage Reference Committee

File: CY00413/9
Meeting held 24 June 2021

GENERAL BUSINESS

GB.1 **Presentation from Manager Events - Heritage Festival Summary** **3**

File: CY00413/9

GB.2 **2 Torokina Avenue, St Ives** **4**

File: CY00413/9

GB.3 **Requests For Heritage Listing - Moonview and Horse Trough** **8**

File: CY00413/9

GB.4 **Glengarry Preliminary Heritage Assessment** **29**

File: CY00413/9

GB.5 **Railway Stations Update - Killara, Roseville, Pymble and Wahroonga** **41**

File: CY00413/9

OTHER BUSINESS

** ** ** ** ** **

PRESENTATION FROM MANAGER EVENTS - HERITAGE FESTIVAL SUMMARY

BACKGROUND:	At the HRC meeting held on 15 April 2021, the Manager of Visitor Experience and Events, Melanie Morson, gave a presentation on the inaugural Ku-ring-gai Heritage Festival. Melanie is back to give a brief presentation on the success of the festival.
COMMENTS:	HRC are welcome provide feedback or comments.

Vanessa Holtham
Heritage Planner Specialist

Antony Fabbro
Manager Urban & Heritage Planning

2 TOROKINA AVENUE, ST IVES

BACKGROUND:

Council recently received correspondence:

I would like the council to consider listing 2Torokina Ave St Ives as a heritage home.

The correspondence claims the property was built is 1962 and was the first brick veneer Petitt and Sevitt designed home built in Australia. The property is currently for sale and the real estate agents are proposing that the house be demolished and the large block rebuilt on.

The house is a classic example of mid century architecture and has historic and aesthetic significance and representative value at a local level. These same values are evident externally and internally through the building's strong association with the designer of mid century architecture, Petitt and Sevitt. So many of these fine buildings have been demolished and replaced with large "Mc Mansions" destroying the history of St Ives and Ku Ring Gai.

It is important that the council immediately places a temporary stop and any changes to this building.

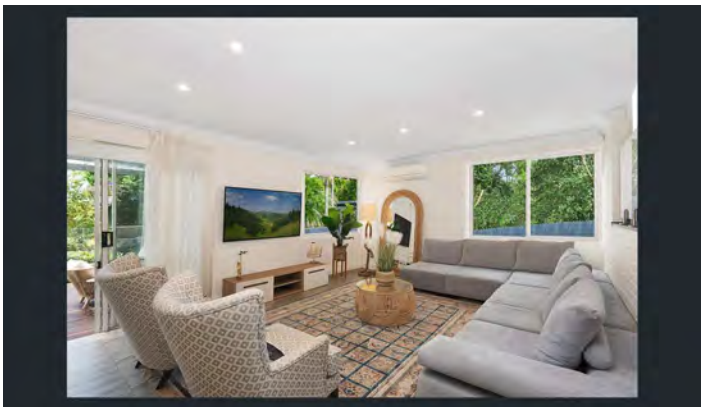
It is evident that the materials of the exterior of the house should not be altered as the external form of the house, and the materials with which it is constructed, is of exceptional significance given its mid century design. It meets the criteria for listing as a local item of environmental heritage under the Ku-ring-gai LEP under the following criteria:

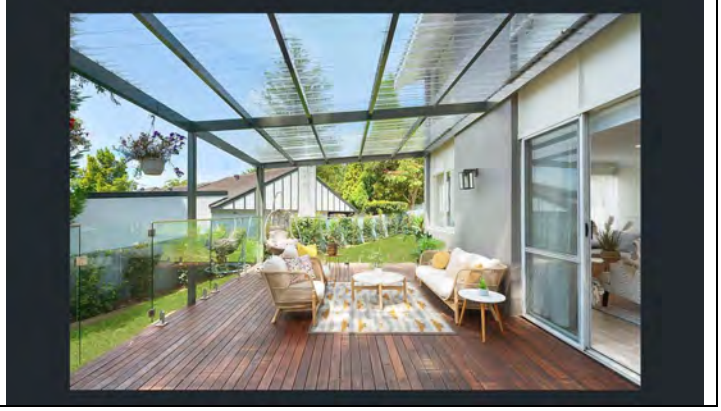
- Historical significance
- Associative significance
- Aesthetic significance
- Rarity

Please consider this application and let me know what else I need to do to expedite this.

Having reviewed Council's files, it is apparent that the property was approved for demolition last year as part of DA0245/20.

Some images are provided below :





(Sources: www.realesateview.com, www.realesate.com)

COMMENTS: HRC to provide comments.

Vanessa Holtham
Heritage Planner Specialist

Antony Fabbro
Manager Urban & Heritage Planning

REQUESTS FOR HERITAGE LISTING - MOONVIEW AND HORSE TROUGH

BACKGROUND:	A community member has requested that HRC review the information put forward is his email in relation to a Horse Trough on Mona Vale Road (Attachment A1) and Moonview Ecological Cottage (Attachment A2) A second community member has requested that HRC review information in relation to the same Horse Trough on Mona Vale Road (Attachment A3).
COMMENTS:	HRC to provide any comments on these items.

Vanessa Holtham
Heritage Planner Specialist

Antony Fabbro
Manager Urban & Heritage Planning

Attachments:	A1	HRC August 2021 Attachment 1A_Bills trough_heritage nomination	2021/227810
	A2	HRC August 2021 - Attachment 1B_Moonview Ecological House_email from John Byrnes	2021/227812
	A3	HRC August 2021 Attachment 1C_Bills trough_heritage nomination	2021/227808

Vanessa Holtham

From: john.sydneygeo@bigpond.com
Sent: Saturday, 10 April 2021 10:11 PM
To: Vanessa Holtham
Subject: Re: FW: St Ives heritage (nomination of horse trough)

Hi Vanessa,

Thanks.

I went and looked at it again today .. is in pretty good condition.

There's just been two bad accidents there on Mona Vale Road .. had you heard of them?

Remembering back to when you rang me from Browns Forest .... I came down there and also showed you some other spots ... including about the graves said to be under the unmade portion of Dorset Drive.

Later you told me you passed that to the heritage advisory committee .. can you give me a link to them please.

I have a small grant doing Browns and Browns Forest.

Recently some very interesting stuff cropping up.

I'll begin to send it to you (Telstra is currently playing up though with many dropouts).

More soon.

Cheers, John

~~~~

From: "Vanessa Holtham" <vholtham@kmc.nsw.gov.au>
To: "john.sydneygeo@bigpond.com" <john.sydneygeo@bigpond.com>
Sent: Friday, 9 Apr, 2021 At 3:56 PM
Subject: FW: St Ives heritage (nomination of horse trough)

Hi John,

We have added the Horse Trough on Mona Vale Road to the list of potential heritage items.

Vanessa
~~~~

Vanessa Holtham | Heritage Specialist Planner | Ku-ring-gai Council

P: 9424 0929 • vholtham@kmc.nsw.gov.au • kmc.nsw.gov.au

Ku-ring-gai ♥ Sydney's green heart FOLLOW US [FB] [TW] [IG] [LI]

NSW ARB 8614

My Working days are Tuesday, Wednesday & Friday.

From: john.sydneygeo@bigpond.com <john.sydneygeo@bigpond.com>
Sent: Sunday, 4 April 2021 12:24 AM
To: KMC <kmc@kmc.nsw.gov.au>
Subject: St Ives heritage (nomination of horse trough)

Re: St Ives heritage (nomination of horse trough)

Dear Council (Attn. Heritage Officer),

I write to nominate as minor local heritage the concrete horse trough on Mona Vale Road at Hassall's Park.

St Ives History group have been collecting information on this.

I sent draft of that to the Mayor and ward councillors a little while ago; and also the heritage officer with assistant a while back visited to look at these noted places of interest in St Ives:

1) Nancarrow's shed on Macquarie Farm grant (Nominated).

2) Old house remains in Brown's Forest.

3) Reputed burials (by the illegal distillers family, ?Johnsons, along Distillery Creek) .. graves said to be besides an old well [This is found in "The Story of St Ives" book ~ the major book on St Ives history).

Tomorrow or the day after I'll send the complete statement of anything known that may be relevant to the horse trough in St Ives.

It is one of many hundreds of these made from money left for the purpose by Mr George Bills (https://billswatertroughs.wordpress.com/2015/05/31/location-list-for-bill-troughs).

I have also sent what we have gathered to Mr George Gemmill, 25 Brudenell Street Stanhope (Ph 03 58572352), hoping he might look it over before being submitted to Council. Mr Gemmill for years has been doing a massive study on the "Bills" horse troughs.

A total of around 700 of these troughs were distributed in Australia, and ~50 in several other countries.

The St Ives one is believed to be the last horse tough surviving in Ku-Ring-gai.

Between the two of us, my wife and I also knew three old horse troughs ~~ one near the Hume Highway at Bankstown (Viz. https://www.rahs.org.au/wp-content/uploads/2015/07/Bankstown-Historical-Tour.pdf), one in Wentworth Road in Burwood, and one outside the Ashfield Hotel, at Liverpool Road, Ashfield.

Bankstown Historical Society in 1997 (reference above) wrote it would be a pity if the horse trough were removed (attached = would-be-a-pity-if-removed.jpg) yet I wonder if the Society thought to nominate it as heritage? I shall enquire.

We visited the site of the Burwood one today but found it has vanished (was Burwood Historical Society aware of it ..?... I shall enquire).

I have not been back to Ashfield (where I was born) recently to see if the one outside the hotel is still there.

Cheers, John Byrnes

Vanessa Holtham

From: john.sydneygeo@bigpond.com
Sent: Tuesday, 8 June 2021 1:13 PM
To: Vanessa Holtham
Subject: Re: RE: "Moonview" ecological house (planned as an environmental teaching house)

Thanks Vanessa,

Also am planning a 'Bat Valley' tour that will take that in as one of three or four spots to visit, would you like to come on that.

Might do it either privately or put it under the name of the St Ives local history group.

Can you please mention to Heritage Reference group that re Moonview I am seeking more info on John now, from multiple 'likely' knowledgeable sources ... and will be starting a Wikipedia entry on him.

I'm sorta "okay" (just ~ but by a whisker only) on Wikipedia editiing; but certainly could do with some help from anyone who understands Wikipedia well (With Wikipedia anyone at all can enter stuff but it does have complicated rules and mores at times). My main Wikipedia "successes" so far (and constantly monitored ~ as you then have to be rechecking that others don't delete what you write) entries are for Edward Giles Stone (= https://en.wikipedia.org/wiki/Edward_Giles_Stone) [I was born in a house built by his father, Jasper Stone] and Bungarro (https://en.wikipedia.org/wiki/Bungaroo).

Also, can you tell me again please what the Reference Committee said on the matter of the reported (within "Story of St Ives") graves near old well just east of Browns Forest (at unmade portion of Dorset Drive, alongside Distillery Creek). I've been talking to more people both about there and about Browns Forest and the Browns.

And guess what .. at the Doctor's in St Ives .. where I went for the Astrozenica jab (AND got a reaction to it !) I encountered a woman who says she has been here for a long time and is the 'Grand daughter of Sgt Hickey' ~~~ referring to the central figure, victim, of the biggest mystery in St Ives history.

The Police said Brown shot Hickey with a revolver (https://www.australianpolice.com.au/edwin-stuart-hickey). The newspapers straight away published that Brown has shot Sgt Hickey.

Hickey was buried, at Gordon, almost straight away .. with a grand procession, drawn in a waggon by horses with feather plumes on their heads. There was great public sympathy for Sgt Hickey and his family.

Brown was put on trial and within minutes the Jury said "Guilty"; and he was then sentenced to hang.

Brown's lawyer then called an appeal and many witnesses were possible, including eye-witnesseses .... called to support Brown's claim that he was framed by the Police.

Brown was then found not guilty, and the Judge said he was free to go.

But before Brown could join family or friends waiting for him outside the building, he was again seized by Police, inside the building .. on the suspicion of being insane.

He was sent to Callum Park .. but there was difficulty there in finding any medico to say he was insane. (Most thought he was quite sane, it would seem !?).

But Brown was somewhat of a a thorn in the side of Gov. as he would not stop saying the entire government was corrupt, from top to bottom (similar to President Trump and conspiracy theorists more or less ?).

Therefore they secretly deported him to America to be rid of him.

Or at least it was attempted to be secret. The Gov. asked all the newspapers NOT to report that this was happening .. BUT the Sydney Morning Herald published it would not be party to such a cover up.

The Browns story goes on and on, and is a very complicated story.

Where was Brown's house where Hickey was shot (NB: *all* versions agree that Sgt Hickey received his mortal shot to the stomach with a revolver bullet in that house .. what they disagree on is *who* fired the shot that killed Brown. There were at least three versions of what happened inside the house. ..... Currently I suspect the house sat immediately on the St Ives side of St. Canisius.

Cheers, John

From: "Vanessa Holtham" <vholtham@kmc.nsw.gov.au>
To: "'john.sydneygeo@bigpond.com'" <john.sydneygeo@bigpond.com>
Sent: Tuesday, 8 Jun, 2021 At 11:15 AM
Subject: RE: "Moonview" ecological house (planned as an environmental teaching house)

Hi John,

I am going to bring this up with Heritage Reference Committee at the luly meeting.

Hope all is well.

Vanessa

Vanessa Holtham | Heritage Specialist Planner | Ku-ring-gai Council

P: 9424 0929 • vholtham@kmc.nsw.gov.au • kmc.nsw.gov.au
Ku-ring-gai ♥ Sydney's green heart FOLLOW US | FB | TW | IG | LI

NSW ARB 8614

My Working days are Tuesday, Wednesday & Friday.

From: john.sydneygeo@bigpond.com <john.sydneygeo@bigpond.com>
Sent: Saturday, 8 May 2021 5:03 AM
To: KMC <kmc@kmc.nsw.gov.au>
Subject: Re: "Moonview" ecological house (planned as an environmental teaching house)

Re: "Moonview" ecological house

Dear Council,

I write to nominate a house well-known to Council ("Moonview" on the edge of the bat valley) as heritage.

I am not confident that this will really meet requirements to be heritage listed (and I am very aware of all the controversy that there has been over latter-day or 'modern' heritage in KMC area), yet it is nonetheless a significant place and I am interested if it can be preserved and fully appreciated.

The builder John Pearman has just recently had his ashes dispersed I think ... and it was his fondest hope, as best I know, that this demonstration eco house and his associated works live on after him in some way to hopefully influence or inspire others.
(... I knew him myself from his Sydney Teachers College days .... but he had taught apparently at many places from which some further information ought to be obtainable.)

John Pearman (6.6.1936 - 21.2.2021) passed away in Neringah Hospital, Wahroonga, having been transferred from Christophorus House where he had been cared for during the past 2.5 years. He was privately cremated as was his wish and his ashes might have been dispersed at Lane Cove River national park near Fullers Bridge (I am seeking details ... the spreading of his ashes may also have been somehow delayed due to Covid I suspect?). My wife and I had been intending to pay a visit to John ..... and had phoned him to that effect .... but Covid made visitation impossible he informed us, and then he died.

His demonstration ecological house "Moonview" I think if ever approved for demolition by a Private Certifier should have a heritage protection order sought on it, and I suggest Council should then give consideration to buying it, in order to protect it and continue John's preferred use of it as an eco-principles demonstration centre.

In "MINUTES OF ORDINARY MEETING OF COUNCIL HELD ON TUESDAY, 17 JULY 2007", under the Environmental Levy Small Grants Scheme - Round Four (File: S04553) - Council awarded $5,000 for "John Pearman – 'Moonview' sustainable house DVD". Could I please arrange to get copy of the DVD? I shall also write to Sydney University, the National Trust and others to see what further information might be obtainable. Some information that I presently do have at hand I place
below.

With Best Regards,

Yours sincerely,

Dr John Byrnes

(Sydney geologist, and co-founder of the better composting and recycling study group which has recently launched the website [a Facebook page] named "St Ives Towards Sustainability)

(Woodside Services, PO Box 121 BURWOOD 1805)

:::::: JOHN PEARMAN AND MOONVIEW ::::::::::::::::::

https://www.smh.com.au/environment/making-a-greener-blueprint-20070904-gdr0w9.html

Gordon

John Pearman

MOONVIEW

Water heating is usually the single largest ongoing use of energy, and electric hot water systems are the most inefficient option.

John
Pearman got around this by installing a 10-metre long bank of photovoltaic solar panels above the entrance to his Gordon house, a modern two-bedder perched on a precipice overlooking the Gordon Valley.

"The solar panels generate just about all my electricity," says Pearman, who is a retired environmental science lecturer at the University of Sydney.

Moonview is a house loaded with eco-features, including a Clivus Multrum waterless composting toilet, recycled timbers, double-glazed windows and laser-etched skylights, which let in the heat in winter and block it out in summer. Pearman has also installed seven high-density polyethylene plastic rainwater tanks with a total capacity of 20,000 litres.
"Because of the awkward layout and position of the house, I couldn't have one big tank," Pearman says.
"One of the tanks is on the roof so it can gravity feed the house in case the pump breaks down."
But perhaps the most remarkable feature is the 800-millimetre thick layer of soil that is piled on the roof, a concept known as "earth-sheltering".

"Soil is the ultimate form of insulation," Pearman says. "It heats slowly from the top down, so that it shelters you from the sun in summer, and by the time you get to winter you have a warm blanket on the roof." The soil weighs 150 tonnes (double that when wet), and complicated the building of the house.

"I had a very conservative architect," Pearman says, pointing to the concrete foundation pillars under the house. "He put enough support under here to hold up a seven-storey apartment block."

The soil certainly works: when Sydney hit 46 degrees on New Year's Day last year Pearman's house was a frisky 20 degrees.

Moonview was planned as an environmental teaching house, and Pearman has decorated the rooms with educational motifs: each of the main rooms features a themed carpet - "something to remind you of the basic facts of life on Earth," he says.

In the living room, for example, there is a large green sun carpet, "which shows the connection between the sun and plants, which produce food and oxygen".

"Plants are the most important organisms on the planet," Pearman says. "Take them away and humans wouldn't last five minutes, despite our big egos."

.....

.....

https://www.youtube.com/watch?v=3wACSY5zFOI

Green Architecture Envirotube #4 Eco Cottage

1,269
views

• 21 Oct 2009

2 COMMENTS

Backyardsoul

11
years ago

Was the cost of the home comparable to a conventional home? Will a bank finance the construction? When will these features ever become the "norm" in housing construction? Excellent House! Should have a sprinkler system on the roof for flash fire protection!

6

REPLY

ENVIROTUBE

11
years ago

@pgm98387 thanks for your comments. We'll find out the answers to your questions and let you know

Application for heritage listing

BILLS WATER TROUGH,
Mona Vale Road, Hassall Park St Ives

Christiane Berlioz

DESCRIPTION

The trough is in concrete, it consists of two sections (one for the cistern has an intact lockable metal cover), at one end there is a smaller reservoir at ground level for small animals and dogs.
A curved pediment on the back of the trough bears a plaque with the inscription: 'DONATED BY ANNIS & GEORGE BILLS AUSTRALIA'

Photographed June 2021. *Photo: Christiane Berlioz*

Photographed October 1998. *Photo: Wendy Low*

Application for heritage listing

BILLS WATER TROUGH,
Mona Vale Road, Hassall Park St Ives

Christiane Berlioz

HISTORY

The trough was installed in 1939 on Mona Vale Road (known as Pittwater Road at the time). After 39 years the trough was moved 50 metres down the road to its current location due to concerns by locals about damage from vehicles. It has been remained on its current site at the corner of Mona Vale Road and Palm Street since 1978.

In 1978 the North Shore Times reported Ku-ring-gai Council engineer, Mr. R. Mors' claim cthat it was the sole remaining trough on a public road. Mr Mors also stated, *"The trough has historic significance in the area and has been in this location since 1939".* The council representative was also reported as saying that after moving the trough it would continue to service the increasing numbers of horses in the area.
*(*North Shore Times, *Horse Trough to be Moved,* 9th July 1978)

The trough is intact. Although it is believed to be functional, it is no longer used as a water trough but as a planter.

SIGNIFICANCE

The Bills water trough Mona Vale Road, St Ives

- Is associated with philanthropist George Bills who lobbied for the welfare of animals when consciousness of animal welfare was a new concept.
- Is a reminder of an era when horses were the norm.
- is evidence of a way of life before the dominance of motor vehicles.
- Is the only Bills water trough that has survived in Ku-ring-gai.
- has a strong association with the community of St Ives.
- dates from 1939. It is intact, in excellent condition and believed to be functional.
- is located only 50 metres from its original location 80 years ago.

HISTORICAL BACKGROUND

The water trough on Mona Vale Road at Hassall Park in St Ives is associated with George Bills a philanthropist who during his lifetime contributed generously to the welfare of animals including to the SPCA (Society for the Prevention of Cruelty to Animals, later to become the RSPCA). He became life Governor of the RSPCA in 1924.

George Bills was born in Brighton, England in 1859. He migrated with his family first to New Zealand then to Australia, settling in Victoria in 1873. George moved to Brisbane in 1882 where he ran a bird dealership. In 1885 he married Annis Swann; they never had children.

Two of George's brothers moved into the business of manufacturing wire mattresses, patenting machinery for weaving them. By 1888 George and Annis had relocated to Sydney, and George joined the successful wire mattress making business. It is believed that royalties from patents on mattress wire weaving machines contributed to his wealth. He retired in about 1907 and moved to Victoria and it seems started funding of water troughs in Melbourne. The first troughs were erected by the Bills couple in Melbourne in 1909. Annis died in 1910 during a visit to England. George died at Hawthorn in Victoria on 14th December 1927.

Application for heritage listing

BILLS WATER TROUGH,
Mona Vale Road, Hassall Park St Ives

Christiane Berlioz

In his last will, George made provision for his Executors to use funds from his estate

"...to construct and erect and pay for horse troughs wherever they may be of the opinion that such horse troughs are necessary or desirable for the relief of horses or other dumb animals either in Australasia, in the British Isles, or in any other part of the world, subject to the content of proper authorities".
(Laureen Breen, *'For the relief of horses': a gift from Annis & George Bills*, 14 May 2014. The People and Environment Blog).
https://pateblog.nma.gov.au/2014/05/14/for-the-relief-of-horses-a-gift-from-annis-and-george-bills/

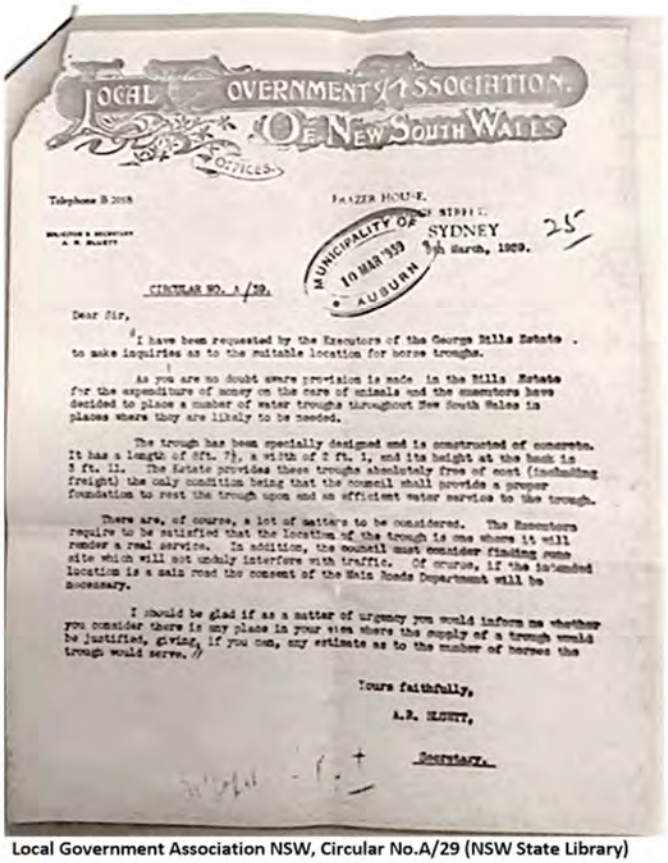
After providing for many personal bequests, Bills stipulated the remaining income from his £80,000 estate was to be put to alleviating suffering animals. All troughs funded from the estate were to be 'suitably inscribed with the names of Annis &George Bills Australia". Approximately 700 Bill's troughs were erected in Australia (about 500 in Victoria) some before his death but most between 1930 and 1939, and several went overseas. Mr George Gemmill, passionate researcher of the troughs, has created a register of around 300 Bills' troughs remaining in the country, including the trough in St Ives.
George Gemill, *Locations for Bills Troughs*, 2021
https://billswatertroughs.wordpress.com/2012/08/31/locations-for-bills-troughs/#comment-419

On 8th March 1929, the Local Government Association of NSW issued a letter to all NSW councils advising that the Executors of the George Bills Estate had *'decided to place a number of water troughs throughout New South Wales in places where they are likely to be needed'*. The troughs including freight were free, but councils had to cover the cost of proper foundations and efficient water service.
(A.R. Bluett to Municipality of Auburn, Circular No. A/39 Local Government Association, 8th March 1939).

Application for heritage listing

BILLS WATER TROUGH,
Mona Vale Road, Hassall Park St Ives

Christiane Berlioz



LOCAL GOVERNMENT ASSOCIATION OF NEW SOUTH WALES

Offices:

Telephone B 2018

FRAZER HOUSE,

SYDNEY

MUNICIPALITY OF AUBURN 10 MAR 1939

9th March, 1939.

25

CIRCULAR NO. A/29.

Dear Sir,

I have been requested by the Executors of the George Bills Estate to make inquiries as to the suitable location for horse troughs.

As you are no doubt aware provision is made in the Bills Estate for the expenditure of money on the care of animals and the executors have decided to place a number of water troughs throughout New South Wales in places where they are likely to be needed.

The trough has been specially designed and is constructed of concrete. It has a length of 8ft. 7½, a width of 2 ft. 1, and its height at the back is 3 ft. 11. The Estate provides these troughs absolutely free of cost (including freight) the only condition being that the council shall provide a proper foundation to rest the trough upon and an efficient water service to the trough.

There are, of course, a lot of matters to be considered. The Executors require to be satisfied that the location of the trough is one where it will render a real service. In addition, the council must consider finding some site which will not unduly interfere with traffic. Of course, if the intended location is a main road the consent of the Main Roads Department will be necessary.

I should be glad if as a matter of urgency you would inform me whether you consider there is any place in your area where the supply of a trough would be justified, giving, if you can, any estimate as to the number of horses the trough would serve.

Yours faithfully,

A.R. BLOTT,

Secretary.

Local Government Association NSW, Circular No.A/29 (NSW State Library)

It is unclear how many troughs were requested by Ku-ring-gai Council.

- According to the Ku-ring-gai Minutes of Ordinary Council Meeting held on the 21st March 1939, council resolved to accept three troughs offered by the George Bills Trust. This includes the trough at Hassall Park.

  Provision of water troughs from George Bills Trust: Report by Engineer. 49/3486.
  Resolved that the offer of three troughs by the George Bills Trust be accepted, that one trough be provided at Hassall Park, St. Ives, one near the intersection of Cowan Road and Pittwater Roads and one in Balfour Street, Lindfield, and that the sum of £13.8.0 be voted to cover the cost of installation.

  (Ku-ring-gai Municipal Council, pp 4-5 of Minutes Ordinary Meeting of 21st March 1939. (pp.130-131 of Minute Book).)

Application for heritage listing

BILLS WATER TROUGH,
Mona Vale Road, Hassall Park St Ives

Christiane Berlioz

A letter dated 23rd February 1987, from St Ives resident Roy Gole to the Director of Engineering and Parks at Ku-ring-gai Council, refers to the circular distributed by the Local Government Association of NSW on March 8th, 1939. Mr Gole believed that Ku-ring-gai Council made application on 21st December 1937 for six troughs at Roseville, Lindfield, Turramurra, Wahroonga, Gordon and St Ives. *(Roy Gole, to Mr Pollock Director Engineering and Parks Department Ku-ring-gai Municipal Council,* letter dated 23rd February 1987).

Minutes of Ordinary Meeting of Council for 21stDecember 1937 and minutes either side of the date do not refer to these troughs. The exact number of troughs finally installed in Ku-ring-gai remains unclear.

OTHER TROUGHS IN KU-RING-GAI

The Bills water trough in St Ives is unique.

- There exist historical records of several water-troughs in Ku-ring-gai, however there is no evidence that any of these have survived.

  1. Gordon *'There was a trough on the east side of Pacific Highway at Gordon, just south of Mona Vale Road, which survived until at least the late 1970s.'*
     (Wendy Low, *Horse Troughs in Ku-ring-gai*, The Historian KHS Vol 28 No2 pp56-57).

  2. Lindfield, a horse and dog trough dedicated in 1909.
     (Wendy Low, *Horse Troughs in Ku-ring-gai*, The Historian KHS Vol 28 No2 pp56-57).

  3. Turramurra, corner of Kissing Point Road and Pacific Highway.
     (John Akehurst, *The Historian* KHS Vol 35 No1, p72).

  4. Turramurra, corner of Duff Avenue and Pacific Highway.
     (John Akehurst, *The Historian* KHS Vol 35 No1, p72).

  5. Wahroonga, Ada Avenue.
     Corona Adams, *The Historian* KHS Vol 40 p102

- There are three horse troughs in St Ives Showground. Two of them bear the inscription of their maker, Richard Taylor Ltd Marrickville, and both are in use. The third trough of different design bears no visible inscription and is abandoned.

- Troughs at Avondale Pony Club are insignificant or improvised e.g., bathtub.

HISTORICAL CONTEXT

Water troughs for horses and stock were once common in towns as well as regional areas across Australia. Until the introduction of motor vehicles in the early 20th century, in Australia horses played a vital role in everyday life. They served in transportation of people and goods, they were used to haul and carry goods and in farming. Motorised vehicle numbers increased slowly in Australia, and it wasn't until mass production mid-20th century that horse numbers declined.
(Lester Gerald Hovenden, *The Motor Car in NSW 1900-1937*.pdf Thesis MA Sydney University (May 1982))

Application for heritage listing

BILLS WATER TROUGH,
Mona Vale Road, Hassall Park St Ives

Christiane Berlioz

Horses remained numerous in the Ku-ring-gai area and water troughs common in the 20th century. Locals who grew up in the area recall delivery of ice, bread, milk and other goods by horse drawn carts in the 1950's, and riding to school as late as the 1970s and 1980s.

St Ives has had a long association with horses.

- In 1978 Council engineer Mr. Mors believed the trough at Hassall Park would continue to service the increasing numbers of horses in the area.
  (North Shore Times, *Horse Trough to be Moved,* 9th July 1978)

- St Ives remained rural with farms, flower and fruit gardens, dairies, and horse paddocks until rezoning of the district to residential in 1959.

- Until 2020 three private properties with paddocks and horses remained. The last of these properties sold for redevelopment in 2021.

- The Princess Anne Arena at the St Ives Showground and The Avondale Pony Club in Catherine Street are sites that remain active for horse riding and equine events to this day.

Water troughs were often on main roads and disappeared or were relocated to museums or other sites with road widening. It is remarkable that the Bills water trough in St Ives remains intact and in proximity to its original location when installed in 1939.

Reference

North Shore Times, *Horse Trough to be Moved,* 9th July 1978

Laura Breen, Curator National Museum of Australia, *'For the relief of horses: a gift from Annis and George Bills'*, (2014)
https://pateblog.nma.gov.au/2014/05/14/for-the-relief-of-horses-a-gift-from-annis-and-george-bills/

George Gemmil, State Library Victoria, National Library Australia et alia, *Annis & George Bills Troughs,* Artworkz Heritage Series Fact sheet #168 (2021)
http://www.esplash.me/pdf/fs_168_annis_and_george_bills_troughs.pdf

A.R.Bluett to Municipality of Auburn, Circular No.A/39 Local Government Association, 8th March 1939.
Ku-ring-gai Municipal Council, pp 4-5 of Minutes Ordinary Meeting of 21st March 1939.
(pp.130-131 of Minute Book).

Roy Gole, to Mr Pollock Director Engineering and Parks Department Ku-ring-gai Municipal Council, letter dated 23rd February 1987.

Wendy Low, *Horse Troughs in Ku-ring-gai*, The Historian KHS Vol 28 No2

John Akehurst, *The Historian* KHS Vol 35 No1, p72

Corona Adams, The Historian KHS Vol. 40, p102

John Low, *The Lost Horse Troughs of Audley*

Application for heritage listing

BILLS WATER TROUGH,

Mona Vale Road, Hassall Park St Ives

Christiane Berlioz

George Gemmil, Bills horse troughs
https://billswatertroughs.wordpress.com/2020/07/22/the-lost-troughs-of-audley/

Lester Gerald Hovenden, *The Motor Car in NSW 1900-1937*.pdf Thesis MA Sydney University (May 1982)

Margaret McWilliam, *History of the George and Annis Bills Horse Troughs*, together with research notes, ca. 1983, NSW State Library.

GLENGARRY PRELIMINARY HERITAGE ASSESSMENT

BACKGROUND:	As discussed at the June HRC meeting, further research has been undertaken and a very preliminary heritage assessment has been prepared in relation to the Glengarry site. It is recognised that further research needs to be incorporated and a full site investigation is required to determine extant fabric. See Attachment A1.
COMMENTS:	HRC to provide comments and feedback particularly in relation to the possible heritage curtilage.

Vanessa Holtham
Heritage Planner Specialist

Antony Fabbro
Manager Urban & Heritage Planning

Attachments: A1 Preliminary Heritage Assessment - Glengarry 2021/227814

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021

SITES' LEGAL DESCRIPTIONS AND ZONINGS:

Address	Lot & DP	Zoning	Owner	Map
50 Curagul Road, North Turramurra	Lot 322 DP 752031	E2 Environmental Conservation	Crown	

Vanessa Holtham (NSW ARB 8614)

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021

48 Curagul Road, North Turramurra	Lot 324 DP 752031	E2 Environmental Conservation	The Girl Guide Association Trust

Vanessa Holtham (NSW ARB 8614)

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021

61 Mowera Road, North Turramurra	Lot 323 DP 752031	RE2 Private Recreation	Lin Jinwen Gallery Australia Incorporated

Vanessa Holtham (NSW ARB 8614)

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021

18 Jemimas Place, North Turramurra	Lot 1 DP 270923	E2 Environmental Conservation E4 Environmental Living	Fuforfour Pty. Ltd.

Vanessa Holtham (NSW ARB 8614)

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021

BACKGROUND

The sites tabulated above are within the Glengarry Guide Girl Camp precinct. The site identified as 61 Miowera Road was recently been sold by the Girl Guide Association Trust and the Girl Guide community are calling for it to be heritage listed. The adjoining site at 48 Curagul Road appears to be still in the ownership of the Girl Guide Association Trust.

None of the sites appear to have ever been listed as a heritage item on the (former) Ku-ring-gai Planning Scheme Ordinance nor on Schedule 5 of the current Ku-ring-gai Local Environmental Plan 2015. Representatives from NSW Heritage informed Council staff and representatives of the Girl Guides that at least part of the Glengarry site has been identified as a local heritage item since 04 Nov 1989. However, this listing is not reflected on the updated Heritage NSW website.

Council staff noted the following findings from their research through Council files:

- The site was included in the first revision of the Heritage Study, prepared in July 1987.
- The site was included in the second revision of the Heritage Study, prepared in September 1987.
- The site was not included in the third revision of the Heritage Study, revised in November 1987.
- No record found of discussions around the Heritage Study within OMC minutes between September and November of the building
- In the 1996 heritage study, none of the sites were included in the list of excluded, deleted or deferred items from the 1987 Heritage Study.

Further investigation into file notes of a previous Council heritage advisor outlined the following in relation to the development of 59 Miowera Road:

The site at 59 Miowera Road, North Turramurra is not listed as a heritage item, within the vicinity of a heritage item or included in a Heritage Conservation area.

Apparently, the site was identified in a planning review of the North Turramurra area in 2001 undertaken by GML, Tony Prescott and others. The report recommended establishing Milton Road as a small heritage conservation area primarily due to its intactness as a group of simple post war timber and fibro cottages and listing the girl guides camp as an individual item for its historic, social and aesthetic values. The site is the first girl guides site in Australia and remains the main camp for their activities. The site contains a c 1960s hall of some architectural significance and a collection of smaller timber and fibro structures some appear to have been used as dwellings for caretakers and accommodation for the girl guides and some basic facilities.

Prior to purchase the site by the Girl Guides, it was used as a farm, however it is unclear whether it was a dairy or market garden. The existing timber and fibro cottage was the farmhouse and can be seen on the 1943 aerial photograph. At that time, most of the western part of the land was cleared and grassed although the eastern end towards the creek was largely undisturbed. It is understood when acquired by the Girl Guides that parcel of land was actively used for camping with toilets, taps and other simple structures being erected on the grassed portion of the site. The former farmhouse was occupied by a caretaker.

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021

SUMMARY HISTORY OF GLENGARRY GIRL GUIDES SITE

Established in England in c1911, New South Wales saw the commencement of the Girl Guiding in 1920. Partly anonymously donated to the Girl Guide Association, the sites associated with Glengarry was established in 1931, during a visit to Sydney by Girl Guide founder Lord Baden-Powell. It was later revealed that the 20 acres of land had been donated by Donald Frederick Milnes (2) an early pioneer of Turramurra and owner of the original cottage on the Glengarry land, to facilitate the development of outdoor skills such as camping. Milnes wished for the donated land to be named after his mother Mary Everard; this land was known as 'Mary Everard Campsite'. Milnes also sold the adjoining land known as 'Glengarrie' to the Girl Guide Association on an interest-free loan basis.

In 1933 Glengarry was dedicated for use as a place for gathering and the then Commissioner for Training, Margaret Radford, resigned soon after. Radford's contributions are recognised through the Margaret Radford Hut, which was donated in 1933 and used as a training centre, and the entrance gates. Guiding continued to be flourish in NSW and with the outbreak of war in 1939, the Girl Guide War Relief Fund was initiated. In 1943 the Guide International Service, which was launched in Britain, was established in Australia and Glengarry was used to train volunteers.

The popularity and use of the Glengarry site continued into the 1950 and in October 1956, after the adjoining 'Braeside Farm' site was acquired, Brownie Cottage was officially opened.

Having been associated with a number of notable people, including Lord and Lady Baden-Powell, Lady David, Donald Frederick Milnes, Margaret Radford and others over the course of its almost 90 year life, Glengarry has continued its association with Girl Guiding, used as a training facility and for wider community uses such as conference facilities.[1]

Further and more detailed historic information is available for Glengarry and this should be considered as part of a more extended heritage assessment.

A forensic site investigation is required to ascertain the remaining facilities, the extant landscape features and the relationship between the respective parcels of land with each other and the Glengarry Girl Guides site.

The following images were sourced from the Glengarry Book, Compiled by Margaret Coleman.

[1] The Glengarry Book, Compiled by Margaret Coleman.

The Warden's Cottage Built in 1936

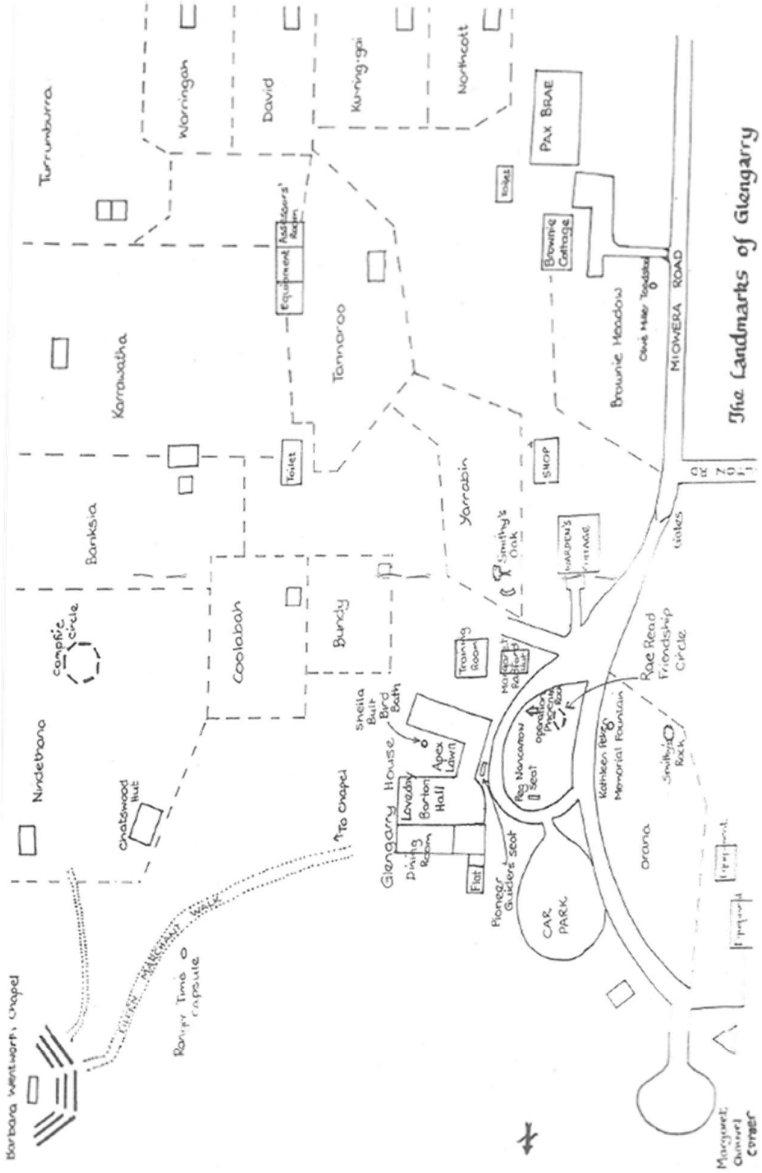
Glengarry Training Centre opened 26 March 1960

Glengarry Cottage

The Brownie Cottage, purchased in 1955 (former Braeside farm).

Vanessa Holtham (NSW ARB 8614)

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021



The landmarks of Glengarry provided the Girl Guide Association.

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021

PRELIMINARY ASSESSMENT AGAINST THE NSW HERITAGE LISTING CRITERIA

The significance of the Glengarry Girl Guides sites has been preliminarily considered against the NSW Heritage criteria as outlined below.

a) an item is important in the course, or pattern, of NSW's cultural or natural history:

Glengarry is the first Girl Guide site in Australia and remains the main camp for their activities. Since its establishment in the early 1930s by Donald Frederick Milnes, an early pioneer of Turramurra, the site has continued to demonstrate strong links to the Girl Guides community.

b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history:

Glengarry is iconic for its direct links to, and representation of, the Girl Guide movement, which was originally established in England in 1911.

Glengarry is also associated with a number of notable individuals including Lord and Lady Baden-Powell, who founded Girl Guides, and Donald Frederick Milnes, who initially donated his land with a clear vision for it to facilitate the development of the Girl Guide community in Australia.

c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW:

The Glengarry Girl Guides site was originally set within a visually distinct bushland setting, relatively close to Ku-ring-gai National Park and removed from Sydney's urban development. As urban sprawl has resulted in neighbouring housing development, the Glengarry site has maintained its visual prominence and landmark qualities through its recreational and bushland characteristics, which provides a distinct buffer between the suburban precinct and National Park.

The site contains a c 1960s hall of some architectural significance and possibly some smaller structures used as dwellings for caretakers, accommodation for the girl guides and for training. At this stage, the extant built and landscape fabric requires further investigation.

d) an item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons:

Glengarry has provided a significant sense of place and identity to the Girl Guide community of NSW for about 90 years.

e) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history:

Without further research, it is not known whether the site would meet the threshold for this criterion however the Aboriginal Heritage Office have previously identified the high potential for unrecorded Aboriginal sites in the area

f) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history:

Established as the first Girl Guides site in Australia and soon after the establishment of Girl Guiding in England, the site has the potential to reach this threshold as a rare and continued historic example of a large bushland site established exclusively its purpose as a Girl Guide camp. This is supported by the continued investment in infrastructure since the 1930s to support and nurture this use.

g) an item is important in demonstrating the principal characteristics of a class of NSW's
- cultural or natural places; or
- cultural or natural environments.

The history of Glengarry and built fabric that has evolved is somewhat representative of the increase in popularity of Girl Guides. The site represents an evolution of facilities to accommodate the Girl Guide movement, responding to varying social contexts including World War 2. Glengarry has maintained a continued existence, notwithstanding the loss of 59 Miowera Road to subdivision, alongside a continually developing urban neighbourhood.

Statement of Significance

Glengarry has historic significance as the first Girl Guide site in Australia and remains the main camp for their activities. Since its establishment in the early 1930s by Donald Frederick Milnes, an early pioneer of Turramurra, the site has continued to provide a sense of place and identity to the Girl Guides community.

Glengarry has associational significance through its iconic links to, and representation of, the Girl Guide movement, which was originally established in England in 1911. It is also associated with a number of notable individuals including Lord and Lady Baden-Powell, who founded Girl Guides, and Donald Frederick Milnes, who initially donated his land with a clear vision for it to facilitate the development of the Girl Guide community in Australia.

Originally set within a visually distinct bushland setting, relatively close to Ku-ring-gai National Park and removed from Sydney's urban development, the Glengarry site has maintained aesthetic significance, through its visual prominence and landmark qualities through its recreational and bushland characteristics, which provides a distinct buffer between the suburban precinct and National Park. The site contains a c 1960s hall of some architectural significance and possibly some smaller structures used as dwellings for caretakers, accommodation for the girl guides and for training. At this stage, the extant built and landscape fabric requires further investigation.

The history of Glengarry and built fabric that has evolved is somewhat representative of the increase in popularity of Girl Guides. The site represents an evolution of facilities to accommodate the Girl Guide movement, responding to varying social contexts including World War 2. Glengarry has maintained a continued existence, notwithstanding the loss of 59 Miowera Road to subdivision, alongside a continually developing urban neighbourhood.

GLENGARRY GIRL GUIDES SITE
DRAFT PRELIMINARY HERITAGE ASSESSMENT JULY 2021

SUMMARY AND RECOMMENDATION

Based on this initial assessment, the Glengarry Girl Guides sites have the high potential to meet the threshold for local listing when considered against the standard criteria for listing outlined by the Heritage Council of New South Wales. It is therefore recommended that Council proceed with preparing a planning proposal to list the sites (or part thereof) as a local heritage item on Schedule 5 of the Ku-ring-gai Local Environmental Plan 2015.

If in the meantime, there is any threat of imminent harm to the nominated sites, it is recommended that Council request that NSW Heritage make an IHO on both properties to enable them to have protection from that harm until a Planning Proposal can be progressed to Gateway Determination.

RAILWAY STATIONS UPDATE - KILLARA, ROSEVILLE, PYMBLE AND WAHROONGA

BACKGROUND:

Wahroonga and Roseville Railway Stations

The upgrade works continue in the construction phase at Wahroonga and Roseville Railway Stations.

Pymble Railway Station

Council staff were due to be briefed on Pymble Railway Station however, this meeting was cancelled due to the Covid-19 restrictions. The current proposal, which was received recently, is at Attachment A1.

Killara Railway Station

Council staff have been recently reviewing the proposed REF scheme for Killara Railway Station. The images can be found at Attachment A2 and the Heritage Impact Statement at Attachment A3.

In relation to Killara Station, the following comments have been provided so far from a heritage perspective:

Clarification is required due to possible discrepancies between the previous proposal presented to Council on 26 May 2021, the published REF and the proposal presented to Council on 6 July 2021. In general, additional details are essential to enable a full assessment to be undertaken.

Clarification is sought around the relationship between the original footbridge hut documented from 1925 onwards and the existing footbridge building to be demolished. The HIS notes that the existing structure was constructed c.1980s-1990s and is intrusive however Council was unable to access the SHI form at the time of writing to verify this.

The station is largely currently concealed from the public domain, demarcated by the existing pitched roof and timber clad hut located in the middle of the historic footbridge. Whilst little architectural detail has been offered in relation to the proposed works, based on the photomontages presented, it is likely that the new structures will sustainably change the character of the

existing railway station. The height and visual dominance of the new canopy proposed is exacerbated by the existing topography. In addition, it appears that the landscaping has already been cleared within the corridor on the Culworth Avenue side, which will make the proposed new structure more visually dominant and incongruous with its surrounding context.

The positioning and connectivity of the new footbridge will change the composition of the original footbridge and result in adverse impacts on the integrity of the overall station complex. The loss of historic handrail, a key and original component of the simple overbridge structure will affect the symmetry and overall presentation of the overbridge. Combined with the other new elements, the addition of anti-throw screens would totally conceal the historic station elements from the south and mar its appearance from the north, including from distance views, such as from the Stanhope Road ridge.

Council would encourage the retention of as much vegetation as possible as well as the existing configuration of garden beds formed of sandstone/flagging on the Werona Avenue side of the station. Council would encourage the use of asphalt/bitumen and recycled brick/stone/paving elements for ground surfaces in lieu of concrete where possible.

COMMENTS: The attachments are provided for the information of HRC and any comments are welcomed.

Vanessa Holtham
Heritage Planner Specialist

Antony Fabbro
Manager Urban & Heritage Planning

Attachments:

A1	HRC August 2021 _ Attachment 3c _Pymble Station Upgrade - Project update August September 2020(2)	2021/227827
A2	HRC August 2021_ Attachment 3a _Killara Station Upgrade_REF_	2021/227817

A3	HRC August 2021 - Attachment 3b - Killara Station Upgrade_SoHI_V2_250621	2021/227822

NSW GOVERNMENT

Transport Access Program

Pymble Station Upgrade

COMMUNITY NOTIFICATION **AUGUST AND SEPTEMBER 2021**

Artist's impression of Pymble Station Upgrade. Subject to detailed design

The Pymble Station Upgrade is part of the Transport Access Program, a NSW Government initiative to provide a station that is accessible to people with a disability, limited mobility, parents/carers with prams and customers with luggage.

Pause on construction

In line with recent restrictions introduced by the NSW Government on 17 July 2021 to help keep our communities safe, construction activities on Pymble Station Upgrade are paused until Friday 30 July. We are making arrangements for our work activities to safely recommence from 31 July 2021, as detailed in this notification. Should these restrictions change based on advice by the NSW Government, which may impact the timing of our work, the community will be notified. We encourage you to subscribe to our project email distribution for the latest information, by calling us on 1800 684 490 or emailing projects@transport.nsw.gov.au

The safety and wellbeing of our workforce and the wider community is our highest priority. You may see some of our workers on site as they prepare the sites for work to recommence. Please be assured our people and worksites follow NSW Health's COVID-19 requirements and will continue to do so.

For more information call **1800 684 490**, email projects@transport.nsw.gov.au or **visit transport.nsw.gov.au/pymble**
For urgent enquiries or complaints regarding construction activities, please call 24 hours **1800 775 465**

Upcoming work

Throughout August and September, from Monday 2 August to Friday 3 September (weekdays only), we will be working within and around Pymble Station to undertake the following activities:

- Site preparation work including installation of hoarding around our work zones
- Underground service investigation work
- Identifying and relocating services within the rail corridor
- Disconnection of services to allow for the kiosk to be removed safely
- Demolition of kiosk on platform and relocation of platform furniture
- Installation of piling pad prior to the commencement of excavation and piling work
- Excavation and piling work in preparation for the new lifts
- Removal of spoil within the rail corridor
- Vegetation removal

Equipment to be used throughout the month includes excavators, hi-rail crane, mobile crane, piling rig, hi-rail dump truck, concrete truck with pump, vacuum truck, core hole drill, work vehicles, elevated working platforms, flatbed truck, dump truck, concrete saw, shovel and various hand and power tools. Work may be noisy at times.

The following measures will be implemented to reduce impacts wherever practicable, including turning off vehicles when not in use, positioning construction equipment will be positioned as far away from residential areas as possible, using non-tonal reversing beepers, and monitoring noise levels. We apologise for any inconvenience and thank you for your patience during this important work.

Night work – 3 August to 6 August 2021

For the safety of pedestrians, customers and motorists, work will take place between **7pm to 4am Tuesday 3 August to Friday 6 August 2021**.The work includes the removal of the kiosk structure on the station footbridge to enable future lift installation. Temporary fencing and hoarding will be installed around the work area.

Construction plant and equipment will access the rail corridor via the access gates on Grandview Street between Station Road and Wellesley Road, and Wellesley Road and Fern Street, Pymble and the rail access gates within the Pacific Highway car park.

Temporary removal of parking – 5 and 6 August 2021

From **7pm Thursday 5 August to 4am Friday 6 August**, approximately 8 car parking spaces within the Pacific Highway car park will be temporarily unavaliable. This is to allow for a crane to be

mobilsed to remove the kiosk from the station platform. Access to and from the Pacific Highway car park will be maintained.

Map of work area

Construction hours

Standard construction hours are **7am to 6pm Monday to Friday, and 8am to 1pm Saturdays**.

Keep in touch

We will continue to keep the community informed with regular project updates published on the project website **transport.nsw.gov.au/pymble.** If you would like to be added to the project distribution list or for more information on the Pymble Station Upgrade, please contact projects@transport.nsw.gov.au or call the Project Infoline on **1800 684 490**.

For all urgent enquiries or complaints regarding our construction activities, please call our 24-hour Construction Response Line on **1800 775 465**.

This document contains important information about public transport projects in your area. If you require the services of an interpreter, please contact the Translating and Interpreting Service on **131 450** and ask them to call Transport for NSW on **1800 684 490**. The interpreter will then assist you with translation.

For more information call **1800 684 490,** email projects@transport.nsw.gov.au or **visit** transport.nsw.gov.au/pymble
For urgent enquiries or complaints regarding construction activities, please call 24 hours **1800 775 465**

NSW GOVERNMENT

Transport Access Program

Killara Station Upgrade

Review of Environmental Factors

Artist's impression of the proposed Killara Station Upgrade, subject to detailed design

June 2021

Contents

Abbreviations 6

Definitions 9

Executive summary 11

1 Introduction 17
- 1.1 Overview of the Proposal 17
- 1.2 Location of the Proposal 18
- 1.3 Existing infrastructure and land uses 19
- 1.4 Purpose of this Review of Environmental Factors 26

2 Need for the Proposal 27
- 2.1 Strategic justification 27
- 2.2 Objectives of the Transport Access Program 31
- 2.3 Objectives of the Proposal 31
- 2.4 Design development 31
- 2.5 Alternative options considered 32
- 2.6 Justification for the preferred option 33

3 Proposal description 34
- 3.1 The Proposal 34
- 3.2 Scope of work 36
- 3.3 Design development 38
- 3.4 Construction activities 39
- 3.5 Property acquisition 45
- 3.6 Operation and maintenance 45

4 Statutory considerations 46
- 4.1 Commonwealth legislation 46
- 4.2 NSW legislation and regulations 47
- 4.3 Ecologically sustainable development 53

5 Community and stakeholder consultation 54
- 5.1 Stakeholder consultation during scoping design 54
- 5.2 Consultation requirements under the Infrastructure SEPP 55
- 5.3 Consultation strategy 56
- 5.4 Public display 57
- 5.5 Aboriginal community involvement 58
- 5.6 Ongoing consultation 58

6 Environmental impact assessment 59
- 6.1 Traffic and transport 59
- 6.2 Urban design, landscape and visual amenity 65
- 6.3 Noise and vibration 78
- 6.4 Aboriginal heritage 93
- 6.5 Non-Aboriginal heritage 94
- 6.6 Socio-economic impacts 108
- 6.7 Biodiversity 113
- 6.8 Contamination, landform, geology and soils 117
- 6.9 Hydrology and water quality 120
- 6.10 Air quality 122
- 6.11 Waste 123
- 6.12 Sustainability 123
- 6.13 Climate change 124

6.14 Greenhouse gas emissions 124
6.15 Cumulative impacts 125

7 Environmental management 127
7.1 Environmental management plans 127
7.2 Mitigation measures 127

8 Conclusion 139

References 140

Appendix A Consideration of matters of National Environmental Significance 142

Appendix B Consideration of clause 228 143

Document control	
Status:	Final
Date of issue:	25 June 2021
Version:	Final
Document author:	AECOM
Document reviewers:	Rosemary Snowdon, Zoe Rourke, Shane Brady, Michelle Quinn, Simon Kinvig, Chiara Le-Gerrard, Ben Groth, Sally Durham

Figures

Figure 1-1 Regional context 18
Figure 1-2 Site locality map 20
Figure 1-3 Platform stairs and footbridge 21
Figure 1-4 Cantilevered retail kiosk (currently not leased) located on the footbridge 21
Figure 1-5 Deck of footbridge, looking east with cantilevered kiosk on the right (AECOM, 2021c) 22
Figure 1-6 Station building 22
Figure 1-7 Culworth Avenue station entrance and existing bus shelter 23
Figure 1-8 View from footbridge to Werona Avenue (east of Killara Station) 23
Figure 1-9 Werona Avenue footpath looking north towards bus stop 24
Figure 1-10 Werona Avenue footpath and bus stop seating area 25
Figure 1-11 Bus stop and seating area on Werona Avenue 26
Figure 3-1 Key features of the Proposal (indicative only, subject to detailed design) 35
Figure 3-2 Proposal area 44
Figure 4-1 Land use zoning surrounding the Proposal 52
Figure 6-1 Access modes to Killara Station by customers (data from AECOM, 2015) 60
Figure 6-2 Landscape character zones 67
Figure 6-3 Representative viewpoints for visual impact assessment and nearby building height (Source: AECOM, 2021a) 69
Figure 6-4 Viewpoint 3 - existing view looking north-east towards Killara Station from 18 Culworth Avenue (Source: AECOM, 2021a) 76
Figure 6-5 Photomontage showing the proposed changes to the existing view from viewpoint 3 (Source: AECOM, 2021a) 76
Figure 6-6 Viewpoint 4 - existing view looking west towards Killara Station from the southern corner of the intersection of Werona Avenue and Locksley Street (Source: AECOM, 2021a) 77
Figure 6-7 Photomontage showing the proposed changes to the existing view from viewpoint 4 (Source: AECOM, 2021a) 77
Figure 6-8 Noise and vibration receivers, NCAs and logger locations 82
Figure 6-9 Representative receiver locations 83
Figure 6-10 Location of nearby heritage items and heritage conservation areas 98
Figure 6-11 Vegetation to be removed to facilitate the lift installation on Culworth Avenue ... 115
Figure 6-12 Vegetation to be trimmed or removed around the existing transformer 116

Tables

Table 2-1 Key NSW Government policies and strategies applicable to the Proposal 27
Table 2-2 Alternative options considered 32
Table 3-1 Indicative construction staging for key activities 40
Table 4-1 Other Commonwealth legislation applicable to the Proposal 46
Table 4-2 Other legislation applicable to the Proposal 48
Table 4-3 Relevant provisions of the Ku-ring-gai LEP 51
Table 5-1 Infrastructure SEPP consultation requirements 55
Table 6-1 Landscape character and visual impact grading matrix 66
Table 6-2 Viewpoints chosen to assess visual impacts due to the Proposal 68
Table 6-3 Operational landscape character impact assessment 71
Table 6-4 Operational visual impact assessment 74
Table 6-5 Representative residential receivers 79
Table 6-6 Representative non-residential receivers 81
Table 6-7 Existing background and ambient noise levels 84
Table 6-8 Attended noise measurements 84
Table 6-9 Construction noise management levels – residential receivers 85
Table 6-10 Construction noise management levels – non-residential receivers 85
Table 6-11 Sleep disturbance criteria 86
Table 6-12 Summary of environmental noise emission criteria 87
Table 6-13 Predicted noise impacts at representative residential receivers for each work stage during standard hours 88
Table 6-14 Predicted noise impacts at representative residential receivers for each work stage outside standard hours 90
Table 6-15 Predicted noise impacts at representative non-residential receivers 91
Table 6-16 Minimum working distances of vibration intensive equipment to be used during the Proposal 93
Table 6-17 Summary of listed heritage items within and adjacent to the Proposal area 96
Table 6-18 Significance assessment – Killara Railway Station Group 99
Table 6-19 Killara Station grading of fabric (Heritage NSW, 2009) 101
Table 6-20 Assessment of impacts to heritage significance of the Killara Railway Station Group (Heritage NSW, 2009) 102
Table 6-21 Summary of the nature of the direct impacts 105
Table 6-22 Ku-ring-gai Council's strategic planning priorities 111
Table 6-23 Proposed developments within one kilometre of the Proposal 125
Table 7-1 Proposed mitigation measures 127

Abbreviations

Term	Meaning
ADIP	*Access and Disability Inclusion Plan 2019 – 2023*
AHIMS	Aboriginal Heritage Information Management System
ARI	Average Recurrence Interval
ASS	Acid Sulfate Soils
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CBD	Central Business District
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CNVMP	Construction Noise and Vibration Management Plan
CPTED	Crime Prevention Through Environmental Design
CSP	Community Strategic Plan
CTMP	Construction Traffic Management Plan
DDA	*Disability Discrimination Act 1992* (Cwlth)
DPIE	NSW Department of Planning, Industry and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
ECM	Environmental Controls Map
EES	NSW Environment, Energy and Science (Division of NSW Department of Planning Industry and Environment) (formerly OEH)
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)

Term	Meaning
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
IS rating	Infrastructure Sustainability rating under ISCA rating tool (v 1.2)
ISCA	Infrastructure Sustainability Council of Australia
LCVIA	Landscape Character and Visual Impact Assessment
LCZ	Landscape Character Zone
LEP	Local Environmental Plan
LGA	Local government area
LSPS	Local Strategic Planning Statement
NES	National Environmental Significance
NML	Noise Management Level
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	(former) NSW Office of the Environment and Heritage
PA system	Public Address system
PDP	Public Domain Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
ROL	Road Occupancy Licence
SEED	Sharing and Enabling Environmental Data
SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
TAHE	Transport Asset Holding Entity of New South Wales
TCP	Traffic Control Plan

Term	Meaning
Transport for NSW	Transport for New South Wales
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
UDP	Urban Design Plan
VDV	Vibration Dose Value
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WMP	Waste Management Plan

Definitions

Term	Meaning
Average Recurrence Interval	The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Detailed design	Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the scoping design to a design suitable for construction (subject to Transport for NSW acceptance).
Determining Authority	A Minister or public authority on whose behalf an activity is to be carried out or public authority whose approval is required to carry out an activity (under the EP&A Act).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.
Feasible	A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
Kiss and ride bay	A kiss and ride bay allows for quick entry and exit by vehicles, which helps minimise congestion and risk when used properly. These types of bays operate under the same conditions as no parking zones, which means a customer may stop to drop off or pick up others for a maximum of two minutes. They are required to remain in, or within three metres of their vehicle (Service NSW, 2016).
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).
NSW Trains	From 1 July 2013, NSW Trains became the new rail provider of services for regional rail customers.
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.
Out of hours work	Defined as work *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).

Term	Meaning
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
Rail shutdown	Shutdown is the term used by railway building/maintenance personnel to indicate that they have taken possession of the track (usually a section of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
Scoping design	The scoping design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
Sydney Trains	From 1 July 2013, Sydney Trains replaced CityRail as the provider of metropolitan train services for Sydney.
Tactile	Tactile tiles or Tactile Ground Surface Indicators are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms.
The Proposal	The construction and operation of the Killara Station Upgrade.
Vegetation Offset Guide	The Transport for NSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act. The Guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15 cm.

Executive summary

Overview

The NSW Government is improving accessibility at Killara Station. This project is being delivered as part of the Transport Access Program, a NSW Government Initiative to provide a better experience for public transport customers by delivering accessible, modern secure and integrated transport infrastructure.

As part of this program, the Killara Station Upgrade (the Proposal) would provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams, and customers with luggage.

The Proposal would include the following key features:

- construction of three new lifts to provide access to the station platforms and existing footbridge, including associated lift landings, canopies, throw screens and support structures
- widening of the existing footbridge to accommodate the new lift landing areas
- provision of seating and canopies at existing boarding assistance zones on the platform
- provision of a new pedestrian crossing, a kiss and ride bay with two spaces (including one accessible space), two new accessible parking spaces and new bike hoops on Culworth Avenue
- upgrade of the existing shelter on Culworth Avenue to provide accessible seating and a wheelchair waiting area
- upgrade of existing footpath along Culworth Avenue to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces
- regrading a section of the existing pedestrian footpath along Werona Avenue and provision of a ramp to the existing bus stop
- relocation of existing bike hoops and provision of new bike hoops on Werona Avenue
- reconfiguration of the existing toilet facilities in the station building to provide a family accessible toilet and a unisex ambulant toilet
- ancillary work including platform regrading, minor station building modifications, station power supply upgrade, protection and relocation of services and utilities, new or reinstatement of Tactile Ground Surface Indicators (tactiles) where required, upgrades to stairs, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

Transport for New South Wales (Transport for NSW) is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the Proposal.

This Review of Environmental Factors (REF) has been prepared to assess all matters affecting or likely to affect the environment by reason of the construction and operation of the Proposal under the provisions of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Subject to approval, construction is expected to commence in late-2021 and take around 18 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF. An overview of the Proposal is shown in Figure ES- 1.

Figure ES- 1 Key features of the Proposal (indicative only - subject to detailed design)

Need for the Proposal

The Proposal would ensure that Killara Station would meet legislative requirements under the *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

The Proposal is designed to drive a stronger customer experience outcome, to deliver improved travel to and between modes, encourage greater public transport use and better integrate interchanges with the role and function of town centres. The Proposal would also assist in responding to forecasted growth in the region and as such would support growth in commercial and residential development.

Chapter 2 of this REF further describes the need for the proposal and outlines the options considered in developing the design.

Community and stakeholder consultation

Community consultation activities for the Proposal would be undertaken during the public display period of this REF with the public invited to submit feedback to help Transport for NSW understand what is important to customers and the community. During public display, a digital version of this REF will also be available, including an interactive map and information presented in this REF. The REF would be displayed for a period of four weeks. Further information about these specific consultation activities is included in Section 5 of this REF.

During the display period, a Project Infoline (1800 684 490) and email address (projects@transport.nsw.gov.au) would also be available for members of the public to make enquiries.

In accordance with the requirements of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), consultation is required with local councils and/or public authorities in certain circumstances, including where council managed infrastructure is affected. Consultation has been undertaken with Sydney Trains, Transport for NSW and Ku-ring-gai Council during the development of design options and the preferred option. Consultation with these stakeholders would continue through the detailed design and construction of the Proposal.

Feedback can be sent to:

- projects@transport.nsw.gov.au
- Transport Access Program – Killara Station Upgrade
  Associate Director Environmental Impact Assessment
  Transport for NSW
  PO Box K659
  Haymarket NSW 1240

Or submitted:

- via nsw.gov.au/improving-nsw/have-your-say/killara-station-upgrade

Transport for NSW would review and assess all feedback received during the public display period, prior to determining whether or not to proceed with the Proposal.

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure ES- 2 shows the planning approval and consultation process for the Proposal.

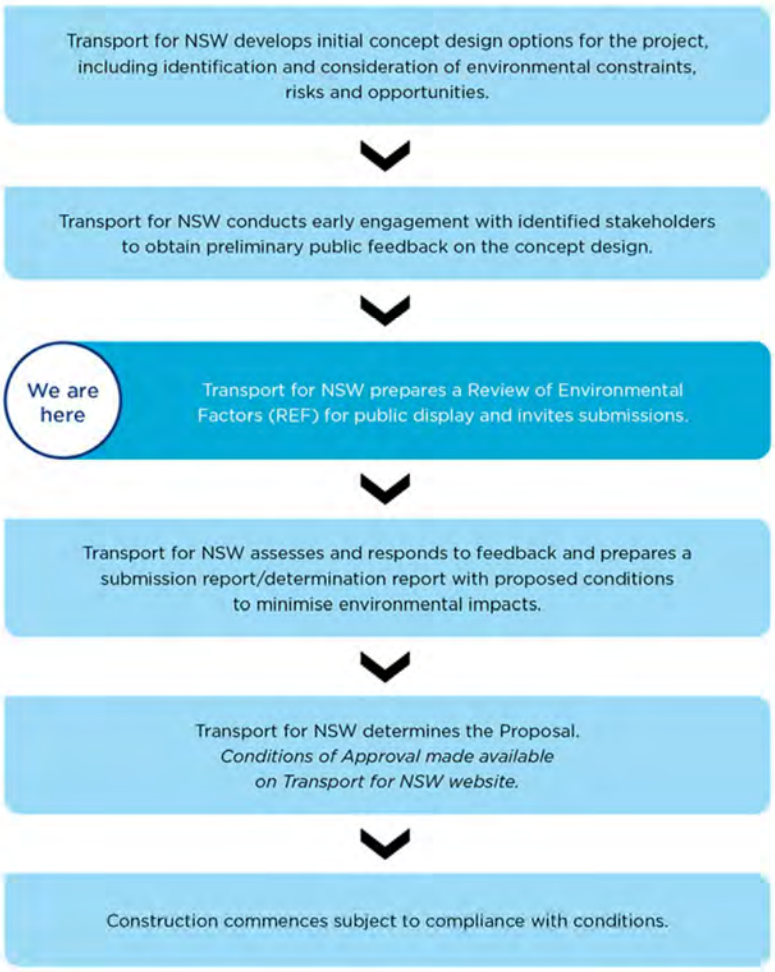


Figure ES- 2 Planning approval and consultation process for the Proposal

Environmental impact assessment

This REF identifies the potential environmental benefits and impacts of the Proposal and outlines the mitigation measures to reduce the identified impacts.

The Proposal would provide the following benefits:

- improved and equitable access to Killara Station for customers resulting from the installation of lifts, accessible parking, upgraded accessible paths and boarding assistance zones
- improved station amenity and safety for customers at the station resulting from the installation of the family accessible toilet, unisex ambulant toilet, new lighting and CCTV
- improved safety of the existing platform stairs by installing new tactiles, new nosings and handrails.

The following key impacts have been identified should the Proposal proceed:

- temporary changes to vehicle and pedestrian movements in and around the station during construction including temporary footpath diversions
- temporary changes to parking arrangements (including kiss and ride and temporary loss of timed parking spaces) around the station precinct during construction
- visual changes due to the introduction and removal of elements into the existing environment including three new lifts, removal of the retail kiosk (currently not leased) located on the footbridge and removal of vegetation on both sides of the station
- temporary visual changes during construction due to the introduction of construction compounds and work areas
- temporary noise and vibration impacts during construction
- impacts to the heritage fabric of the station through the installation of the new lifts, modifications to the station entrance and station platform.

Further information regarding these impacts is provided in Chapter 6 of the REF.

Conclusion

This REF has been prepared having regard to Sections 5.5 and 5.7 of the EP&A Act, and clause 228 of the EP&A Regulation, to ensure that Transport for NSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The detailed design of the Proposal would be in accordance with the Infrastructure Sustainable Council of Australia (ISCA) Infrastructure Sustainable (IS) Rating Tool (v 1.2) taking into account the principles of ecologically sustainable development (ESD).

Should the Proposal proceed, any potential associated adverse impacts would be appropriately managed in accordance with the mitigation measures outlined in this REF, and the Conditions of Approval imposed in the Determination Report. This would ensure the Proposal is delivered to maximise benefit to the community and minimise adverse impacts on the environment.

In considering the overall potential impacts and proposed mitigation measures outlined in this REF, the Proposal is unlikely to significantly affect the environment including critical habitat or threatened species, populations, ecological communities or their habitats.

A photomontage of the Proposal is shown in Figure ES- 3.

Figure ES- 3 Photomontage of the Proposal at Killara Station, Werona Avenue (indicative only - subject to detailed design)

1 Introduction

Transport for NSW is responsible for strategy, planning, policy, procurement, regulation, funding allocation and other non-service delivery functions for all modes of transport in NSW including road, rail, ferry, light rail, point to point, cycling and walking. Transport for NSW is the proponent for the Killara Station Upgrade (the 'Proposal').

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

The Killara Station Upgrade, the subject of this Review of Environmental Factors (REF), forms part of the Transport Access Program. This Program is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

The Proposal would improve accessibility of the station in line with the requirements of the *Commonwealth Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT). The needs and objectives of the Proposal are further discussed in Chapter 2 of this REF.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- construction of three new lifts to provide access to the station platforms and existing footbridge, including associated lift landings, canopies, throw screens and support structures
- widening of the existing footbridge to accommodate the new lift landing areas
- provision of seating and canopies at existing boarding assistance zones on the platform
- provision of a new pedestrian crossing, a kiss and ride bay with two spaces (including one accessible space), two new accessible parking spaces and new bike hoops on Culworth Avenue
- upgrade of the existing shelter on Culworth Avenue to provide accessible seating and a wheelchair waiting area
- upgrade of existing footpath along Culworth Avenue to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces
- regrading a section of the existing pedestrian footpath along Werona Avenue and provision of a ramp to the existing bus stop
- relocation of existing bike hoops and provision of new bike hoops on Werona Avenue
- reconfiguration of the existing toilet facilities in the station building to provide a family accessible toilet and a unisex ambulant toilet
- ancillary work including platform regrading, minor station building modifications, station power supply upgrade, protection and relocation of services and utilities, new or reinstatement of Tactile Ground Surface Indicators (tactiles) where required, upgrades to stairs, handrails and fencing, new ticketing facilities

including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

Subject to planning approval, construction is expected to commence in late-2021 and take around 18 months to complete.

A detailed description of the Proposal is provided in Chapter 3 of this REF.

1.2 Location of the Proposal

The Proposal would involve upgrade work to Killara Station, which is located in the suburb of Killara in the Ku-ring-gai Council local government area (LGA) approximately 16 kilometres north-west of the Sydney Central Business District (CBD). The location of the station and its regional context is shown in Figure 1-1.

Killara Station consists of a single island platform and is serviced by the T1 North Shore and Western Line and T9 Northern Line. It is bound by Werona Avenue to the east and Culworth Avenue to the west, with a footbridge crossing over the rail corridor, providing pedestrian access to the station. The Proposal includes upgrades to Killara Station on land owned by the NSW Transport Asset Holding Entity (TAHE), and managed by Sydney Trains within the station precinct, with some work also proposed along the station entrances and adjoining footpaths which are managed by Ku-ring-gai Council.

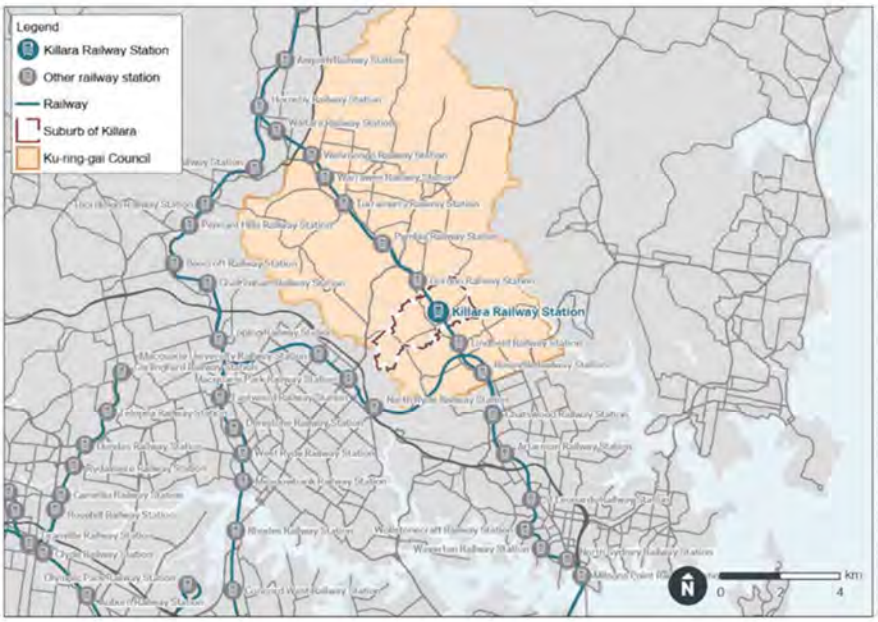


Figure 1-1 Regional context

1.3 Existing infrastructure and land uses

1.3.1 Killara Station

Killara Station has a single island platform which is accessed from Werona Avenue from the east and Culworth Avenue from the west. Access to the station is via a footbridge which connects to the southern end of the platform via a set of stairs from the footbridge. Pedestrian access to the footbridge is from a set of stairs at each side of the station. A small kiosk is located on the footbridge. The kiosk is not currently leased.

There is a single building on the station platform which consists of an office, storeroom, and male and female toilets. Platform 1 provides services to Central Station and Platform 2 provides services to Hornsby/Berowra.

A commuter car park is located to the west of Culworth Avenue and accessed from Culworth Avenue. There are approximately 80 parking spaces at this car park, two of which are currently designated as accessible parking spaces. A council operated (time limited) car park is also located off Culworth Avenue, to the south of the commuter car park with approximately 40 spaces. Time limited street parking is also available on Culworth Avenue. Untimed street parking is available on Werona Avenue and is commonly used by customers who access the station. A bus stop is located on Culworth Avenue and is used for replacement buses during rail shutdowns.

A bus stop is located on Werona Avenue, approximately 25 metres to the north of the station entrance, which services school buses. There are no public bus services which currently service the station. There is a no parking zone in front of the bus stop on Culworth Avenue which is likely used as an informal kiss and ride area. There are bike hoops on either side of the station, providing capacity for nine bicycles in total.

Killara Railway Station Group is listed on the TAHE Section 170 Heritage and Conservation Register (s170 register). Killara Station has significance at a local level as a typical suburban station which demonstrates the impact of the railway in facilitating settlement in the northern suburbs of Sydney. The ornamental gardens form part of the listing and have significance as one of the most intact railway gardens in the region.

Killara Railway Station Group is also listed as a heritage item of local significance under Schedule 5 of the *Ku-ring-gai Local Environmental Plan 2015* (Ku-ring-gai LEP).

1.3.2 Land uses

The suburb of Killara comprises single dwellings, multi-unit complexes, local parks and open space, recreational facilities, aged care services and businesses.

Within Killara Station there is a retail kiosk located on the footbridge at the top of the platform stairs. The kiosk is not currently leased or in use.

The local area to the east of the station primarily consists of detached residential houses, and some recreational facilities to the south-east such as the Killara Bowling Club and Killara Lawn Tennis Club. There are also two local parks, the Abbotsholme Glen located on Lynwood Avenue and Selkirk Park located on Marian Street.

The local area to the west of the station comprises detached residential houses, multi-unit complexes and a car park with timed and commuter parking. There are also some community and recreational facilities such as Selkirk Park and the Marian Street Theatre on Marian Street, and Regimental Park on Lorne Avenue (including a croquet green and tennis courts). The Killara Soldiers Memorial, a war memorial, is also located on Marian Street.

There are a variety of land uses within an 800 metre radius of the station, including three churches (St Martins Anglican Church, Killara Uniting Church, Gordon Pymble Uniting Church,

low to medium density residential areas comprising houses and multi-unit complexes, an aged care facility (Pathways Killara), local parks and recreational facilities.

The location of the Proposal, including construction compound areas, and surrounding key features is shown in Figure 1-2.

Photographs of the existing station and surrounds are provided in Figure 1-3 to Figure 1-11.

Figure 1-2 Site locality map

Figure 1-3 Platform stairs and footbridge

Figure 1-4 Cantilevered retail kiosk (currently not leased) located on the footbridge

Figure 1-5 Deck of footbridge, looking east with cantilevered kiosk on the right (AECOM, 2021c)

Figure 1-6 Station building

Figure 1-7 Culworth Avenue station entrance and existing bus shelter

Figure 1-8 View from footbridge to Werona Avenue (east of Killara Station)

Figure 1-9 Werona Avenue footpath looking north towards bus stop

Figure 1-10 Werona Avenue footpath and bus stop seating area

Figure 1-11 Bus stop and seating area on Werona Avenue

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by AECOM on behalf of Transport for NSW to assess the potential impacts of the Killara Station Upgrade. For the purposes of these work, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this REF is to describe the Proposal, to assess the likely impacts of the Proposal having regard to the provisions of Section 5.5 of the EP&A Act, and to identify mitigation measures to reduce the likely impacts of the Proposal. This REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (EP&A Regulation).

This assessment has also considered the relevant provisions of other relevant environmental legislation, including the *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and the *Roads Act 1993* (Roads Act).

Having regard to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this REF considers the potential for the Proposal to have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of Agriculture, Water and Environment for any necessary approvals under the EPBC Act. Refer to Chapter 4 for more information on statutory considerations.

2 Need for the Proposal

Chapter 2 discusses the need and objectives of the Proposal, having regard to the objectives of the Transport Access Program and the specific objectives of the Proposal. This chapter also provides a summary of the options that have been considered during development of the Proposal and why the preferred option has been chosen.

2.1 Strategic justification

Improving transport customer experience is the focus of the NSW Government's transport initiatives. Transport interchanges and train stations are the important gateways to the transport system and as such play a critical role in shaping the customer's experience and perception of public transport.

The Killara Station Upgrade, the subject of this REF, forms part of the Transport Access Program. This program is designed to drive a stronger customer experience outcome to deliver seamless travel to and between modes, encourage greater public transport use and better integrate station interchanges for all customers, with the role and function of enhancing town centres associated with train stations within the metropolitan area and developing urban centres in regional areas of NSW.

Table 2-1 provides an overview of NSW Government policies and strategies relevant to the Proposal.

Table 2-1 Key NSW Government policies and strategies applicable to the Proposal

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (Transport for NSW, 2018)	*Future Transport 2056* is an update of NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the state. *Future Transport 2056* identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport. Customer outcomes relevant to the Proposal includes: • a safe transport system for every customer with the aim for zero deaths or serious injuries on the network by 2056 • fully accessible transport for all customers.	The Proposal aligns with *Future Transport 2056* by providing accessible services for people who find it difficult to access public transport services. New lifts and access paths proposed would provide a more physically accessible and safe network allowing greater choice for people with mobility constraints to access public transport. Greater accessibility would also mean better connections to places and opportunities for employment, education, business and recreation.
Disability Inclusion Action Plan (2018-2022) (Transport for NSW, 2017)	The *Disability Inclusion Action Plan 2018-2022* was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which consists of representatives from peak disability and ageing organisations within NSW. The Disability Plan identifies the challenges, the achievements to date, the	The Proposal has been developed with consideration of the objectives outlined in this plan and seeks to improve and provide equitable access to public transport facilities.

Policy / Strategy	Overview	How the Proposal aligns
	considerable undertaking that is required to finish the job and provides a solid and practical foundation for future progress over the next five years.	
A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	The *Greater Sydney Region Plan* is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City. The vision brings new thinking to land use and transport patterns to boost Greater Sydney's liveability. To deliver a 30-minute city, connections to existing infrastructure need to be improved. Importantly, transport corridors need to be upgraded to ensure efficiency and accessibility to accommodate the projections in population growth across Sydney.	The Proposal is located in the North District, between the Eastern Harbour City and the Central River City, and has been developed to improve the accessibility of Killara Station, providing easier access to the Sydney CBD, Hornsby and surrounding areas for customers.
North District Plan (Greater Sydney Commission, 2018b)	The *North District Plan* is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. It is a guide for implementing A Metropolis of Three Cities, at a district level and is a bridge between regional and local planning. Killara is part of the North District Plan. The North district forms a large part of the Eastern Harbour City, and its economy leans to the Harbour CBD. The vision for Greater Sydney as a 30 minute city means residents in the North District would have quicker and easier access to a wider range of jobs, housing types and activities. The vision would improve the District's lifestyle and environmental assets.	The Proposal has been developed to improve the accessibility of Killara Station, providing easier access to the Sydney CBD and surrounding areas for customers.
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	The *State Infrastructure Strategy 2018-2038* makes recommendations for each of NSW's key infrastructure sectors including transport. The strategy sets out the government's priorities for the next 20 years and combined with the Future Transport Strategy 2056 brings together infrastructure investment and land-use planning for NSW's cities and regions. Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal.	The Proposal supports investment in rail infrastructure and aligns with the need to continue to provide public transport to support Sydney's increasing population. The Proposal is also consistent with overall aims and objectives of the Future Transport Strategy 2056 to improve transport infrastructure across NSW.

Policy / Strategy	Overview	How the Proposal aligns
NSW: Premier's Priorities ***(NSW Government, 2019)*** https://www.nsw.gov.au/improving-nsw/premiers-priorities/	In June 2019, 14 new Premier's Priorities were announced that would allow the Government to measure and deliver in areas where NSW can do better. The key policy priorities, include the following: • a strong economy • highest quality education • well-connected communities with quality local environments • putting customer at the centre of everything we do • breaking the cycle of disadvantage. A key Premier Priority is the delivery of infrastructure, specifically noting the importance of every NSW community receiving its fair share of local projects and extra services.	The Proposal is aligned with the Premier's Priorities as it is a part of the wider delivery of key infrastructure projects across NSW.
Ku-ring-gai Local Strategic Planning Statement (LSPS) (Ku-ring-gai Council, 2019a)	The Ku-ring-gai LSPS provides a 20-year vision for land use within Ku-ring-gai and outlines how this change will be managed. The key priorities detailed in the Ku-ring-gai LSPS relevant to the Proposal include: • K1 – providing well-planned and sustainable local infrastructure to support growth and change • K2 – collaborating with State Government Agencies and the community to deliver infrastructure projects • K13 – identifying and conserving Ku-ring-gai's environmental heritage • K22 – providing improved and expanded district and regional connections through a range of integrated transport and infrastructure to enable effective movement to, from and within Ku-ring-gai • K33 – providing a network of walking and cycling links for leisure and recreation. Within the Ku-ring-gai LSPS, Killara is identified as a secondary local centre, indicating that it contains a local railway station and meets the criteria for 30 minute access to a strategic centre, and is supported by retail and other services predominantly utilised by a localised residential population. The LSPS includes an action to "advocate to Transport for NSW to increase priority and accelerate the delivery of infrastructure improvements identified in Future Transport 2056 that connects Ku-ring-gai internally and with nearby centres, including...	The Proposal is aligned with the Ku-ring-gai LSPS as it responds to key priorities and implementation actions by: • K1 – providing improvements to and increasing the accessibility of Killara Station, which would support growth in the region • K2 – delivering rail infrastructure and an access upgrade to Killara Station, which Ku-ring-gai Council had advocated for in the LSPS • K13 – conserving the heritage value of the station and its surrounds during construction and operation • K22 – improving rail infrastructure at Killara Station and providing active transport facilities to allow for effective movement to, from and within Ku-ring-gai • K33 – supporting the local walking and cycling network through the provision of a new pedestrian crossing on Culworth Avenue and new bike hoops. The Proposal also directly supports the action identified in the LSPS for Ku-ring-gai Council to advocate for an access upgrade to Killara Station.

Policy / Strategy	Overview	How the Proposal aligns
	implementation of access upgrade to Killara railway station" (p. 122).	
Our Ku-ring-gai 2038 – Community Strategic Plan (Ku-ring-gai Council, 2018)	*Our Ku-ring-gai 2038* is the Community Strategic Plan (CSP) for the LGA which provides long term direction for the Council to align its delivery of the community's policies, programs, projects and services. It also acts as a guide for stakeholders (such as government agencies) in planning and delivering services for the LGA. Key long-term objectives identified in the Plan relevant to the Proposal include: • C1.1 – an equitable and inclusive community that cares and provides for its members • C4.1 – a community that embraces healthier lifestyle choices and practices • P5.1 – Ku-ring-gai's heritage is protected, promoted and responsibly managed • P8.1 – an improved standard of infrastructure that meets the community's service level standards and Council's obligations as the custodian of our community assets • T1.1 – a range of integrated transport choices are available to enable effective movement to, from and around Ku-ring-gai • T3.1 – an accessible public transport and regional road network that meets the diverse and changing needs of the community.	The Proposal is aligned with the CSP as it responds to key objectives for the LGA by: • C1.1 – supporting an equitable and inclusive community through improving accessibility to Killara Station • C4.1 – supporting community wellbeing and health by improving accessibility to public and active transport • P5.1 – conserving the heritage value of the station and surrounds during construction and operation • P8.1 – providing accessibility improvements to rail infrastructure, allowing it to meet a higher standard • T1.1 – improving rail infrastructure at Killara Station and providing active transport facilities to allow for effective movement to, from and within Ku-ring-gai • T3.1 – supporting an accessible public transport network through accessibility improvements to Killara Station.
Access and Disability Inclusion Plan 2014-2018[1] (Ku-ring-gai Council, 2014)	The *Access and Disability Inclusion Plan 2019 – 2023* (ADIP) identifies key strategies to address access barriers or access opportunities, ensuring that all organisational practices are proactive in meeting the needs of all people of all abilities and information is inclusive for all members of the community. Relevant actions identified in the plan include: • access in the built environment • public transport and parking.	The Proposal would assist in achieving the long term goal of the Access and Disability Inclusion Plan as it would help provide an accessible public transport option that meets the diverse and changing needs of the community in the Ku-ring-gai LGA.

Notes:

1 *A new version of the Disability Services Inclusion Plan is currently being prepared and presented to Ku-ring-gai Council. Until its approval, the 2014-2018 version remains in place*

2.2 Objectives of the Transport Access Program

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. The program aims to provide:

- stations that are accessible to those with people with disabilities or limited mobility, and parents/carers with prams and customers with luggage
- modern buildings and facilities for all modes of transport that meet the needs of a growing population
- modern interchanges that support an integrated network and allow seamless transfers between all modes of transport for all customers
- safety improvements including extra lighting, lift alarm, fences and security measures for car parks and interchanges, including stations, bus stops and wharves
- signage improvements so customers can more easily use public transport and transfer between modes at interchanges
- other improvements and maintenance such as painting, new fencing and roof replacements.

2.3 Objectives of the Proposal

The specific objectives of the Killara Station Upgrade are to:

- provide a station that is accessible to people with disability, limited mobility, parents/carers with prams and customers with luggage
- improve customer experience (weather protection, improved interchange facilities and visual appearance)
- improve integration with surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- respond to the heritage values of the station
- improve customer amenity
- maintain cross corridor access/pedestrian links between Culworth Avenue and Werona Avenue.

2.4 Design development

In 2015, options for improving access to Killara Station were developed following workshops with a stakeholder working group that included representatives from Transport for NSW and the design team.

In 2021, Option 1 was further refined giving consideration to accessibility, customer experience and minimising impacts to heritage elements including the heritage gardens and footbridge.

These options are outlined further in Section 2.5.

2.5 Alternative options considered

Options considered for the Proposal are detailed in Table 2-2.

Table 2-2 Alternative options considered

Option	Key features
2015 Options	
Option 1	• retention of a portion of the existing footbridge and platform stairs • provision of a new lift to provide access from the existing footbridge to the platform, including removal of the existing kiosk to accommodate lift installation and lift landing • provision of a new lift and stairs at Werona Avenue to provide access to the station footbridge from the east • provision of new ramp and stairs at Culworth Avenue to provide access to the station footbridge from the west • provision of canopy cover from the new lifts to the station building as well as existing footbridge • reconfiguration of the existing station building to provide an ambulant staff toilet and family accessible toilet.
Option 2	• demolition of the existing footbridge, ramps and stairs and construction of new footbridge north of the existing footbridge • provision of a new lift and stairs at Werona Avenue to provide access to the station footbridge from the east • provision of a new ramp and stairs at Culworth Avenue to provide access to the station footbridge from the west • provision of a new lift to access the platform from the new footbridge • provision of canopy cover from the new lifts to the existing station building as well as new footbridge • reconfiguration of the existing station building to provide an ambulant staff toilet and family accessible toilet.
2021 Option	
Option 1b (preferred option)	• retention of the existing footbridge and platform stairs • provision of a new lift to provide access from the existing footbridge to the platform, including removal of the existing kiosk to accommodate lift installation and lift landing • provision of a new lift at Werona Avenue to provide access to the station footbridge from the east • provision of a new lift at Culworth Avenue to provide access to the station footbridge from the west • widening of the existing footbridge to accommodate the new lift landing areas • reconfiguration of the existing toilet facilities in the station building to provide a family accessible toilet and a unisex ambulant toilet • provision of seating and canopies at existing boarding assistance zones on the platform.

2.5.1 The 'do-nothing' option

Under a 'do-nothing' option, existing access to the footbridge and platform would remain the same and there would be no changes to the way the station and interchange currently operates.

The NSW Government has identified the need for improving the accessibility of transport interchanges, train stations and commuter car parks across NSW as a priority under the Transport Access Program.

The 'do nothing' option was not considered a feasible alternative as it is inconsistent with NSW Government objectives, it would not encourage the use of public transport and it would not meet the needs of the Killara community.

2.5.2 Assessment of identified options

The options were assessed in a multi criteria analysis that included factors such as customer experience, accessibility, urban form and land use integration, transport integration, engineering constrains, facility operations and maintenance, and heritage and environment, to select a preferred option.

2.6 Justification for the preferred option

In 2015, Option 1 was identified to best meet the specific objectives of the Proposal (as outlined in Section 2.3) and the wider Transport Access Program. The multi criteria analysis showed that Option 1 scored the highest in customer experience, urban built form and land use integration, engineering constraints, facility operation and maintenance, and heritage and environment categories.

Option 1 would involve retaining the existing footbridge, and therefore was considered to be the preferred option for maximising retention of the heritage significance and character of the Killara Railway Station Group. Option 1 was also considered to be relatively more sympathetic to the existing architecture and character of the local area with less impact to the heritage gardens.

Since the identification of Option 1 as the preferred option, ongoing design development and consultation has been undertaken to refine the scope of the Proposal and Option 1b was developed. In response an additional lift is proposed at the Culworth Avenue station entrance and the existing footbridge retained and widened to improve accessibility and customer experience. The revised layout retains the significant heritage footbridge, including stairs, and minimises impact on the heritage gardens.

The Proposal subject to this REF is described in Section 3.1.

3 Proposal description

Chapter 3 describes the Proposal and summarises key design parameters, construction method, and associated infrastructure and activities. The description of the Proposal is based on the scoping design and is subject to detailed design.

3.1 The Proposal

As described in Section 1.1, the Proposal involves an accessibility upgrade of Killara Station as part of the Transport Access Program which would improve accessibility and amenities for customers.

The Proposal would include the following key features:

- construction of three new lifts to provide access to the station platforms and existing footbridge, including associated lift landings, canopies, throw screens and support structures
- widening of the existing footbridge to accommodate the new lift landing areas
- provision of seating and canopies at existing boarding assistance zones on the platform
- provision of a new pedestrian crossing, a kiss and ride bay with two spaces (including one accessible space), two new accessible parking spaces and new bike hoops on Culworth Avenue
- upgrade of the existing shelter on Culworth Avenue to provide accessible seating and wheelchair waiting area
- upgrade of existing footpath along Culworth Avenue to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces
- regrading a section of the existing pedestrian footpath along Werona Avenue and provision of a ramp to the existing bus stop
- relocation of existing bike hoops and provision of new bike hoops on Werona Avenue
- reconfiguration of the existing toilet facilities in the station building to provide a family accessible toilet and a unisex ambulant toilet
- ancillary work including platform regrading, minor station building modifications, station power supply upgrade, protection and relocation of services and utilities, new or reinstatement of tactiles where required, upgrades to stairs, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

Figure 3-1 shows the general layout of key features for the Proposal.

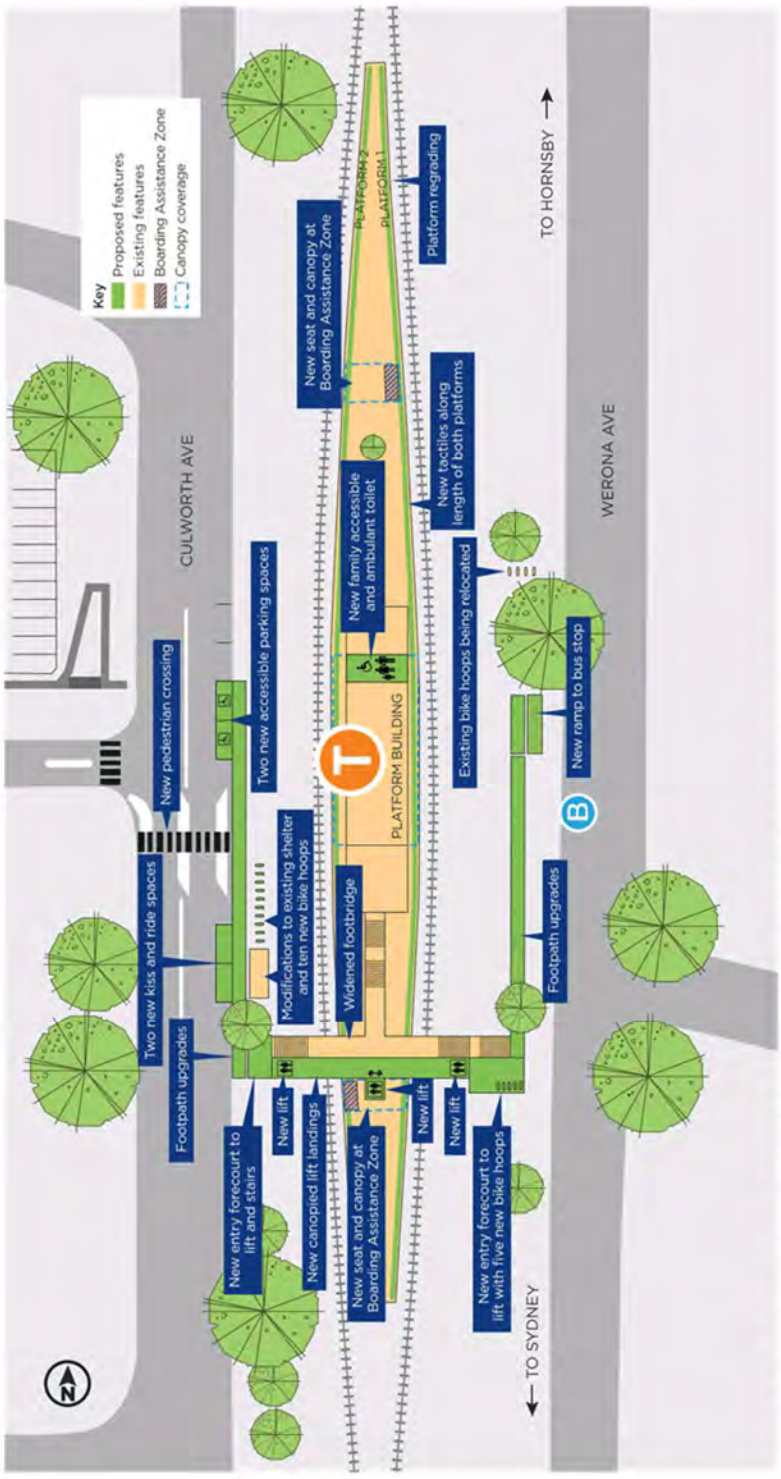


Figure 3-1 Key features of the Proposal (indicative only, subject to detailed design)

3.2 Scope of work

This section provides a more detailed explanation of the Proposal which would improve accessibility at Killara Station.

3.2.1 Station upgrade

Details of the proposed work to take place at the station to improve accessibility and customer experience are provided below:

- installation of three new lifts (and lift landings) connecting to the existing footbridge including:
  - removal of vegetation and the existing seat on Culworth Avenue to accommodate the new lift
  - installation of a new lift to provide access from the Culworth Avenue station entrance to the existing footbridge
  - installation of a new lift to provide access from the Werona Avenue station entrance to the existing footbridge
  - installation of a new lift to provide access from the existing footbridge to the station platforms
  - installation of weather protection canopies at the lift landings
  - removal of the retail kiosk on the existing footbridge to facilitate installation of the new lift
- widening of the existing footbridge to accommodate the new lift landing areas
- provision of seating and canopies at the existing boarding assistance zones
- regrading the platform to achieve compliant gradients
- upgrade of the existing tactiles along the entire length of the platforms.

3.2.2 Station building modifications

Proposed work to the station building would include:

- reconfiguration of the existing toilets to include a family accessible toilet and a unisex ambulant toilet
- conversion of the existing storeroom into a communications room.

3.2.3 Interchange facilities

Interchange upgrade work to improve connectivity within the station precinct would include:

- upgrades to the interchange facilities on the western side of the station (Culworth Avenue) including:
  - provision of a kiss and ride bay with two spaces (including one accessible space) and two accessible parking spaces
  - upgrade of the existing footpath to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces
  - provision of 10 new bike hoops
  - provision of a new pedestrian crossing at the existing pedestrian refuge

- upgrade of the existing shelter on Culworth Avenue to provide accessible seating and wheelchair waiting area
- new pavement around the new lift.

- upgrades to the interchange facilities on the eastern side of the station (Werona Avenue) including:
- removal of the bench seat located on the raised level of the Werona Avenue bus stop and clearance of landscaped vegetation to install the ramp to the bus stop
  - regrading a section of the existing pedestrian footpath along Werona Avenue and provision of a ramp to the existing bus stop
  - relocation of existing bike hoops and provision of five new bike hoops at the station entrance
  - new pavement around the new lift.

3.2.4 Ancillary work

Additional ancillary work within the station precinct would include:

- upgrades to lighting and CCTV cameras
- protection and relocation of services and utilities
- electrical upgrades to support the new lifts
- station power supply upgrade work, which could include an upgrade to the existing transformer and earthing/bonding provisions (specific power requirements to be determined during detailed design)
- new fencing and upgrades to existing fencing
- upgrades to the public address (PA) system, including relocating existing speakers and extending the system to the new lift areas
- other work including installation of new opal card readers and relocation of existing opal card readers and wayfinding signage
- relocation and suitable reinstatement of existing infrastructure (e.g. seats, signage, fencing and rubbish bins) which may be required to be temporarily removed to construct the Proposal
- provision of anti-graffiti coating to all new and modified hard surfaces
- landscaping work.

3.2.5 Materials and finishes

Materials and finishes for the Proposal have been selected based on the criteria of durability, low maintenance and cost effectiveness, to accord with heritage requirements, to minimise visual impacts, and to be aesthetically pleasing.

Availability and constructability are also important criteria to ensure that materials are readily available and the structure can be built with ease and efficiencies. Materials would also be selected based on their suitability for meeting design requirements. Materials selection would also consider sustainability aspects, including consideration of supply chain and sourcing materials locally where possible, prioritising the use of reused and recycled materials where practicable, and investigating use of materials that have environmental labels.

Each of the upgraded or new facilities would be constructed from a range of different materials, with a different palette for each architectural element. Subject to detailed design, the Proposal would include the following:

- lift shafts – concrete lift shaft and steel frame
- lift doors – stainless steel
- lift glass – clear
- lift roof and canopies – consistent or complementary with station roofing
- platform – asphalt
- footpath – concrete.

The design would be presented to Transport for NSW's Design Review Panel for comment before being accepted by Transport for NSW. An Urban Design Plan (UDP) would also be prepared by the Contractor, prior to finalisation of detailed design for endorsement by Transport for NSW.

3.3 Design development

3.3.1 Engineering constraints

There are a number of constraints which have influenced the design development of the Proposal.

Existing structures: the placement and integrity of existing structures needed to be considered during the development of the design – these structures included the platform, station building, footbridge, stairs and existing heritage significant elements of the station.

Sydney Trains' requirements: modifications for existing structures and new structures within the rail corridor must be designed and constructed with consideration of train impact loads, structural clearances to the track, and safe working provisions.

Heritage: the Killara Railway Station Group has significance at a local level as a typical suburban station which demonstrates the impact of the railway in facilitating settlement in the northern suburbs of Sydney. The ornamental gardens form part of the listing and have significance as one of the most intact railway gardens in the region. The Proposal would involve impacts to the Killara Railway Station Group. Efforts to minimise potential heritage impacts have been considered during the design development for the Proposal. Potential impacts to non-Indigenous heritage are assessed in Section 6.5.

Construction access: customer access to the station is required to be maintained throughout the construction period, except during rail shutdown periods.

3.3.2 Design standards

The Proposal would be designed having regard to the following:

- DSAPT (issued under the *Commonwealth Disability Discrimination Act 1992*)
- Building Code of Australia
- relevant Australian Standards
- Asset Standards Branch standards
- Sydney Trains standards

- Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability Rating Scheme (V1.2) or the Transport for NSW Sustainable Design Guideline v4
- Guidelines for the Development of Public Transport Interchange Facilities (Ministry of Transport, 2008)
- Crime Prevention Through Environmental Design (CPTED) principles
- other Transport for NSW policies and guidelines
- council standards where appropriate.

3.3.3 Sustainability in design

The Proposal is targeting a rating of 'Excellent' using the ISCA Infrastructure Sustainability Rating Scheme (v1.2) or equivalent in the Transport for NSW Sustainable Design Guideline v4. The rating schemes provide an independent and consistent methodology for the application and evaluation of sustainability outcomes in infrastructure projects. The sustainability outcomes address environmental, social, economic and governance aspects.

The development of the scoping design for the Proposal has been undertaken in accordance with the targets identified in the program wide Transport Access Program 3 Sustainability Strategy.

The Sustainability Strategy sets targets across the following key areas:

- management and governance
- using resources
- emissions, pollution and waste
- ecology
- people and place
- innovation.

Key design elements and strategies developed during the scoping design would be used to further develop the design and construction.

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to commence in late-2021 and take around 18 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with Transport for NSW.

The proposed construction activities for the Proposal are identified in Table 3-1. This staging is indicative and is based on the current scoping design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

Table 3-1 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling work	• establishment of site compounds (i.e. erect fencing, site offices, amenities and plant/material storage areas) • establishment of temporary facilities as required (e.g. hoarding, temporary toilets etc.) • relocation of services • survey investigations
New lifts and platform upgrades	• removal of the retail kiosk on the existing footbridge to accommodate installation of new lift • widening of the existing footbridge to accommodate the new lift landing areas • platform modifications, including piling and foundations for lift shafts • construction of lift shafts and fencing • installation of lifts • regrading of the platform • provision of seating and canopies at the existing boarding assistance zones • installation of weather protection canopies at the lift landings • installation of fixtures, tactiles, lighting, signage and CCTV cameras
Interchange work	• upgrade of the existing shelter on Culworth Avenue to provide accessible seating and wheelchair waiting area • installation of a kiss and ride bay with two spaces (including one accessible space) and two accessible parking spaces on Culworth Avenue, including line-marking and signage • provision of 10 new bike hoops on Culworth Avenue • upgrade of existing footpath along Culworth Avenue to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces • regrading a section of the existing pedestrian footpath along Werona Avenue and provision of a ramp to the existing bus stop • relocation of existing bike hoops and provision of five new bike hoops at the station entrance on Werona Avenue • installation of wayfinding signage and other statutory/regulatory signage • electrical and power supply upgrade work
Station building reconfiguration work	• reconfiguration of the existing toilets to include a family accessible toilet and a unisex ambulant toilet • conversion of the existing storeroom into a communications room
Demobilisation, testing and commissioning	• dismantling of existing site compounds/hoarding areas • testing electrical, communications and signaling components

3.4.2 Plant and equipment

The plant and equipment likely to be used during construction includes:

- bobcat
- chainsaws
- concrete pump
- concrete saws
- concrete truck
- coring machines
- cranes
- elevated working platforms
- excavators
- forklifts
- franna cranes
- generators
- grinders
- hand tools
- hi-rail (type of truck that is able to travel on railway tracks)
- impact wrenches
- jack hammers
- light construction vehicles
- lighting tower
- pavement laying machine
- piling rig (bored)
- power tools
- rock anchoring rig
- sand blasting plant
- shotcrete machine
- sucker truck
- trucks (semi-trailer and tipper)
- vibrating roller
- concrete vibrators
- water truck
- welding tools

3.4.3 Working hours

The majority of work required for the Proposal would be undertaken during standard (NSW) Environment Protection Authority (EPA) construction hours, which are as follows:

- 7.00 am to 6.00 pm Monday to Friday
- 8.00 am to 1.00 pm Saturdays
- no work on Sundays or public holidays.

Certain work may need to occur outside standard hours and would include night work and work during routine rail shutdowns which are scheduled closures that would occur regardless of the Proposal when part of the rail network is temporarily closed and trains are not operating.

Out of hours work is required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers and to ensure the safety of railway workers and operational assets. It is estimated that approximately six weekend rail shutdowns would be required to facilitate the following:

- modification of electrical cables
- installation of piles (using piling rig) for the lifts
- foundation slab construction (concreting), delivery and craning in the new lift segments and lift cars
- platform regrading
- widening of existing footbridge
- piling, excavation of pits and installation of lift shafts
- installation of electrical containment
- services relocations.

Out of hours work may also be scheduled outside rail shutdowns. Approval from Transport for NSW would be required for any out of hours work and the affected community would be notified as outlined in Transport for NSW's *Construction Noise and Vibration Strategy* (Transport for NSW, 2019a) (refer to Section 6.3 for further details).

3.4.4 Extended Working Hours during COVID-19

The Minister for Planning and Public Spaces has made a number of Orders under Section 10.17 of the EP&A Act in response to the COVID-19 pandemic. This includes the *Environmental Planning and Assessment (COVID-19 Development – Infrastructure Construction Work Days No. 2) Order 2020* (the 'Order'), which commenced on 24 December 2020, and is applicable to construction activities for projects which have been subject to an assessment under Division 5.1, or approval under Division 5.2 of the EP&A Act. The Order extends the standard construction hours to allow infrastructure construction work on Saturday, Sunday and Public holidays (7am to 6pm), without the need for any approval (excluding high noise generating works such as rock breaking or pile driving and the like).

These extended working hours were due to expire on 25 March 2021. However, on Wednesday 24 March 2021, the NSW Government introduced the COVID-19 Legislation Amendment (Emergency Measures) Bill 2020, which was subsequently passed by parliament, and came into effect on 25 March 2021. A section of the Bill enabled the extension of the extended working hours until 31 March 2022.

Whilst no further assessment of the environmental impacts are required for these extended working hours, in the event that Transport for NSW would seek to utilise the extended working hours permitted by the Order, advance notification would be provided to the community.

3.4.5 Earthworks

Excavations and earthworks would generally be required for the following:

- the foundations and pits for the new lift shafts and lifts, which would require excavation at each proposed lift location
- the construction of regraded footpaths (e.g. pavement resurfacing) and station entrances
- other minor civil work including platform regrading, footings and foundations and drainage/stormwater work.

The Proposal would require the excavation of approximately 300 to 350 cubic metres of material, which would be reused onsite, or disposed of in accordance with relevant legislative requirements. The detailed design would confirm the volume of materials excavated to accommodate the lift pits and foundations, and other ancillary work.

Any fill material that is odorous and suspected of being potentially contaminated would be sampled and treated and/or disposed in accordance with relevant legislative and sustainability requirements. Specific locations for temporary spoil placement would generally be on site within the rail corridor, however this would be agreed with Transport for NSW and the Contractor during the delivery phase.

3.4.6 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal and would consider the requirements of the ISCA Infrastructure Sustainability Rating Scheme (v1.2) or the Transport for NSW Sustainable Design Guideline v4. Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.4.7 Traffic access and vehicle movements

Traffic and transport impacts associated with the Proposal are assessed in Section 6.1 of this REF. The potential traffic and access impacts expected during the construction of the Proposal include:

- temporary loss of parking availability in the council operated (time limited) car park off Culworth Avenue to accommodate the construction compound
- temporary disruptions to the existing pedestrian facilities surrounding the station, particularly for pedestrians accessing the station when construction work for the lifts, footbridge and footpaths is being undertaken
- temporary reduction in available parking spaces on the surrounding street network for residents and visitors from construction vehicle parking
- potentially higher level of platform congestion arising from restricted access to certain areas of the platform such as near the lift construction
- a minor increase in traffic on the local road network associated with construction vehicle movements.

A detailed construction methodology and associated management plans (such as a Construction Environmental Management Plan (CEMP)) would be developed during the next design phase of the Proposal to manage potential traffic and access impacts.

3.4.8 Ancillary facilities

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. An area for a construction compound has been proposed within the council operated (time limited) car park off Culworth Avenue (refer to Figure 3-2). The area nominated for the compound is on land owned by Ku-ring-gai Council and comprises timed parking.

Two additional temporary areas for laydown and storage have been proposed on the corner of Culworth Avenue and Powell Street (refer to Figure 3-2). These areas are located within the rail corridor to the west of the rail line.

Potential impacts associated with utilising these compound and laydown areas have been considered in Chapter 6 of this REF.

Other areas within the rail corridor may also be used for short term temporary laydown during rail shutdown periods. These areas would not be used outside of rail shutdown periods.

Figure 3-2 Proposal area

3.4.9 Public utility adjustments

The Proposal would require the power supply to be upgraded to accommodate the new lifts. This would most likely take the form of an upgrade to an existing transformer which is located within the rail corridor on the eastern side of the station. In addition, a new cable route would be provided from the transformer to a new electrical distribution board in the station building.

Further investigation may be required during detailed design to establish the extent of the connection. Service relocation and adjustment would be undertaken as required by the construction contractor's activities. This would be confirmed during detailed design and would be planned and undertaken with the relevant service provider.

3.5 Property acquisition

Transport for NSW does not propose to acquire any property as part of the Proposal.

Transport for NSW would obtain temporary licenses in order to occupy or lease land from Ku-ring-gai Council for the temporary use of the council operated (time limited) car park off Culworth Avenue as a construction site compound. A discussion of temporary licenses required is provided in Section 4.2.3.

3.6 Operation and maintenance

The future operation and maintenance of Killara Station is subject to further discussions with Sydney Trains, Transport for NSW and Ku-ring-gai Council. Structures constructed under this Proposal would be maintained by Sydney Trains. However, it is expected that footpaths and adjacent garden/landscape areas would continue to be maintained by Ku-ring-gai Council.

4 Statutory considerations

Chapter 4 provides a summary of the statutory considerations relating to the Proposal including a consideration of NSW Government polices/strategies, NSW legislation (particularly the EP&A Act), environmental planning instruments, and Commonwealth legislation.

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The (Commonwealth) EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as 'matters of National Environmental Significance (NES)'. The EPBC Act requires the assessment of whether the Proposal is likely to significantly impact on matters of NES or Commonwealth land. These matters are considered in full in Appendix A.

As the Proposal would not or is not likely to have a significant impact on any matters of NES or on Commonwealth land, a referral to the Commonwealth Minister for the Environment is not required.

4.1.2 Other Commonwealth legislation

Other Commonwealth legislation applicable to the Proposal is discussed in Table 4-1.

Table 4-1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. The Proposal does not include any previously identified Aboriginal sites and/or places (refer to Section 6.4). However, procedures for unexpected finds are detailed in mitigation measures (refer to Section 7.2).
Disability Discrimination Act 1992 (DDA)	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of Killara Station which is consistent with the objectives of this Act.
Native Title Act 1983	This Act aims to provide for the recognition and protection of Native Title, how Native Title land is used and establishes a mechanism for determining claims to Native Title. There are no pending or approved Native Title claims over the Proposal land.

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

The *Transport Administration Act 1988* establishes Transport for NSW as a public authority which is to exercise its functions in a manner that promotes certain common objectives, including to promote the delivery of transport services in an environmentally sustainable manner.

This REF has been prepared having regard to, among other things, the specific objectives of Transport for NSW under the *Transport Administration Act 1988*, including:

2A Objects of Act

...

a) *to provide an efficient and accountable framework for the governance of the delivery of transport services,*

b) *to promote the integration of the transport system,*

c) *to enable effective planning and delivery of transport infrastructure and services,*

d) *to facilitate the mobilisation and prioritisation of key resources across the transport sector,*

e) *to co-ordinate the activities of those engaged in the delivery of transport services,*

f) *to maintain independent regulatory arrangements for securing the safety of transport services.*

2B Common objectives and service delivery priorities of public transport agencies

...

(a) ***Environmental sustainability***
To promote the delivery of transport services in an environmentally sustainable manner

(b) ***Social benefits***
To contribute to the delivery of social benefits for customers, including greater inclusiveness, accessibility and quality of life.

4.2.2 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of Division 5.1 of the EP&A Act. Division 5.1 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as Transport for NSW, which do not require development consent under Part 4 of the Act.

In accordance with section 5.5 of the EP&A Act, Transport for NSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal.

Clause 228 of the EP&A Regulation defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has or is likely to have a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

4.2.3 Other NSW legislation and regulations

Table 4-2 provides a list of other relevant legislation applicable to the Proposal.

Table 4-2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016 (BC Act) (NSW)	The Proposal area does not contain suitable habitat for any listed threatened species or community and is unlikely to have a significant impact on any threatened species or community (refer Section 6.7).
Biosecurity Act 2015 (NSW)	Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the Ku-ring-gai LGA are identified (refer Section 6.7).
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the Department of Planning, Industry and Environment (DPIE), and potentially investigate and remediate land if contamination is above EPA guideline levels. The site has not been declared under the CLM Act as being significantly contaminated (refer to Section 6.8).
Crown Lands Act 1987 (NSW)	The Proposal does not involve work on any Crown land.
Disability Discrimination Act 1992 (DDA Act) (Cwlth)	The Proposal would be designed having regard to the requirements of this Act.
Heritage Act 1977 (Heritage Act) (NSW)	The following sections of the Heritage Act contain requirements for impacts to heritage listed items or exposure of relics: • Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted • Sections 139 and 140 (permit) where relics are likely to be exposed • Section 170 where items listed on a government agency Heritage and Conservation Register are to be impacted. The Proposal would involve work within the locally listed Killara Railway Station Group (which is listed under the TAHE Section 170 Heritage and Conservation Register). The Proposal was assessed as having minor heritage impact to the station. The Proposal would improve safety and accessibility and the station would be enhanced following its refurbishment. The construction of the new lift structures would enable access to, and appreciation of, the station (including its heritage by a wider demographic (refer to Section 6.5).
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from DPIE Environment, Energy and Science (EES) for the destruction or damage of Indigenous objects. The Proposal is unlikely to disturb any Indigenous objects (refer to Section 6.4). However, if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Proposal, all work would cease and appropriate advice would be sought.

Applicable legislation	Considerations
Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, Transport for NSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor.
Roads Act 1993 (Roads Act) (NSW)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for work on unclassified roads. The Proposal would include works on Culworth Avenue and Werona Avenue, which are local roads under the control of Ku-ring-gai Council. Road Occupancy Licence/s (ROL) would be obtained from the relevant roads authority for road work and any temporary road closures where required. Traffic impacts of the Proposal are discussed further in Section 6.1.
Sydney Water Act 1994 (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	Transport for NSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.
Water Management Act 2000 (NSW)	The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management work, drainage or flood work, controlled activities or aquifer interference.

4.2.4 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP is the key environmental planning instrument which determines the permissibility of a proposal and under which part of the EP&A Act an activity or development may be assessed.

Division 15, Clause 79 of the Infrastructure SEPP allows for certain types of development to be carried out by or on behalf of a public authority without consent on any land (i.e. assessable under Division 5.1 of the EP&A Act). Specifically, Clause 79(1) of the Infrastructure SEPP states that:

> *'Development for the purpose of a railway or rail infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land.'*

Clause 78 defines 'rail infrastructure facilities' as including elements such as:

> *(a) 'railway tracks, associated track structures, cuttings, drainage systems, fences, tunnels, ventilation shafts, emergency accessways, bridges, embankments, level crossings and roads, pedestrian and cycleway facilities.'*
>
> *(d) 'railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms'*
>
> *(e) public amenities for commuters*
>
> *(f) associated public transport facilities for railway stations…'*

Consequently, development consent is not required for the Proposal which is classified as a rail infrastructure facility, however the environmental impacts of the Proposal have been assessed under the provisions of Division 5.1 of the EP&A Act.

Part 2 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other agencies prior to the commencement of certain types of development. Section 5.2 of this REF discusses the consultation undertaken under the requirements of the Infrastructure SEPP.

The Infrastructure SEPP prevails over all other environmental planning instruments except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018*. The Proposal does not require consideration under these State Environmental Planning policies (SEPPs) and therefore do not require further consideration as part of this REF.

State Environmental Planning Policy 55 – Remediation of Land

State Environmental Planning Policy No.55 — Remediation of Land (SEPP 55) provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. While consent for the Proposal is not required, the provisions of SEPP 55 have still been considered in the preparation of this REF.

Section 6.8 of this REF contains an assessment of the potential contamination impacts of the Proposal. It is not expected that any large-scale remediation (Category 1) work would be required as part of the Proposal. The proposed land use would not differ to the existing use and therefore is unlikely to be affected by any potential contaminants that exist within the rail corridor.

4.2.5 Ku-ring-gai Local Environmental Plan 2015

The Proposal is located within the Ku-ring-gai LGA. The Infrastructure SEPP prevails over all other environmental planning instruments (such as LEPs) except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018*. During the preparation of this REF, the provisions of Ku-ring-gai LEP were considered (refer to Table 4-3).

Table 4-3 Relevant provisions of the Ku-ring-gai LEP

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Table	Under the Ku-ring-gai LEP • the rail corridor and majority of the Proposal area is zoned SP2 – Infrastructure (Railway) • the land to the immediate east of the Proposal area, and a small portion of the proposal area, is zoned R2 – Low Density Residential • the western extent of the Proposal area and land immediately to the west along Culworth Avenue is zoned R4 – High Density Residential. Land use zoning surrounding the Proposal area is shown in Figure 4-1. The Proposal area would be primarily located within the rail corridor (land zoned SP2). One construction laydown area would be in the existing council operated (time limited) car park, which is zoned R4. The Proposal is consistent with the objectives of the SP2 infrastructure zoning as it would provide for infrastructure uses associated with the railway and would ensure that the scale and character of the development is compatible with the landscape setting and built form of surrounding development.
Clause 5.10 – Heritage conservation	Clause 5.10 of the Ku-ring-gai LEP aims to conserve the environmental heritage within the LGA. Killara Railway Station Group is listed as a heritage item of local significance under Schedule 5 of the Ku-ring-gai LEP. The Proposal area is also partially located within the Springdale Heritage Conservation Area, which overlaps with the southern portion of Killara Station. There are also several listed heritage items and conservation areas within proximity of the Proposal area. A Statement of Heritage Impact (SoHI) has been prepared as part of this REF which considers the impact the Proposal would have on these heritage items and concludes there would be no adverse impacts. Potential impacts to Aboriginal and non-Aboriginal heritage are assessed in Section 6.5 and 6.4 respectively.
Clause 5.12 – Infrastructure development and use of existing buildings of the Crown	Clause 5.12 of the Ku-ring-gai LEP does not restrict or prohibit the carrying out of any development, by or on behalf of a public authority, which is permitted to be carried out with or without development consent. The Proposal would be undertaken by a public authority and is permitted without development consent.
Clause 6.1 – Acid sulfate soils	The Proposal is located on land classified as Class 5 acid sulfate soils (ASS) under the Ku-ring-gai LEP. Consideration of the potential effects of ASS is provided within Section 6.6 of this REF.
Clause 6.2 – Earthworks	Clause 6.2 of the Ku-ring-gai LEP aims to ensure that earthworks for which development consent is required would not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land. By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent; however, consideration of the potential impacts and mitigation measures for earthworks associated with the Proposal is outlined in Section 7.2.

Provision description	Relevance to the Proposal
Clause 6.3 – Biodiversity protection	Clause 6.3 of the Ku-ring-gai LEP is aimed at protecting, maintaining and improving the diversity and condition of native vegetation and habitat. By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the clearing of vegetation for the Proposal is permissible without development consent. A discussion of potential impacts to biodiversity is discussed in Section 6.6.

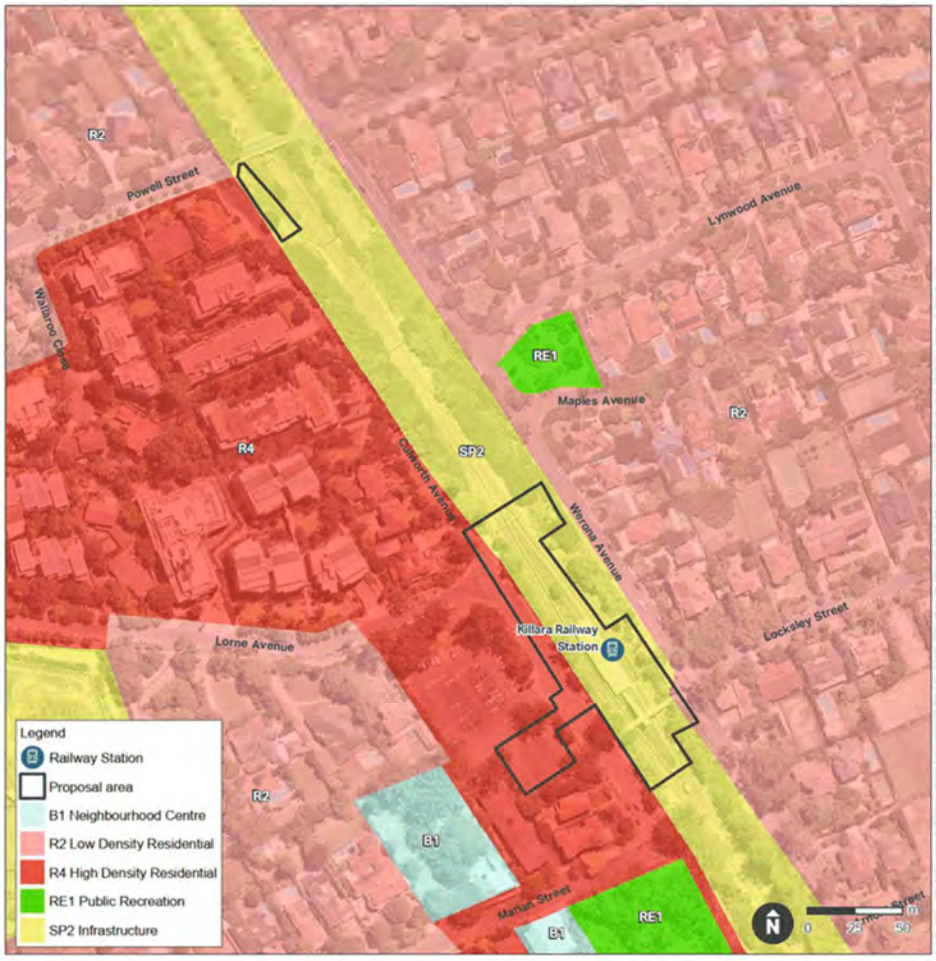


Figure 4-1 Land use zoning surrounding the Proposal

4.3 Ecologically sustainable development

Transport for NSW is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ecologically sustainable development (ESD). The principles of ESD are generally defined under the provisions of clause 7(4) of Schedule 2 to the EP&A Regulation as:

- the precautionary principle – If there are threats of serious or irreversible damage, a lack of full scientific uncertainty should not be used as a reason for postponing measures to prevent environmental degradation
- intergenerational equity – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
- conservation of biological diversity and ecological integrity – the diversity of genes, species, populations and their communities, as well as the ecosystems and habitats they belong to, should be maintained or improved to ensure their survival
- improved valuation, pricing and incentive mechanisms – environmental factors should be included in the valuation of assets and services.

The principles of ESD have been adopted by Transport for NSW throughout the development and assessment of the Killara Station Upgrade. Section 6.12 and Section 6.13 include consideration of the potential impacts of the Proposal in relation to sustainability and climate change, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

Chapter 5 discusses the consultation undertaken to date for the Proposal and the consultation proposed for the future. This chapter discusses the consultation strategy adopted for the Proposal and the results of consultation with the community, relevant government agencies and stakeholders.

5.1 Stakeholder consultation during scoping design

Key stakeholders for Killara Station, including Ku-ring-gai Council, Sydney Trains and Transport for NSW, were engaged during development of the scoping design to provide insights into the scope of work for the Proposal, and to also participate in the development and assessment of the station improvement options.

Early engagement was undertaken between 17 and 31 May 2021 to provide the community an opportunity to have their say on the early scoping design. Transport for NSW advertised this early engagement period via:

- letterbox drop within a 500 metre radius of Killara Station
- notification handed out at the station during morning and afternoon peaks on 17 May
- signage installed at the station, with flyers made available to customers via Sydney Trains staff
- a dedicated project web page with a web feedback form to collect feedback from the community
- geo-targeted social media post inviting the community to have their say.

Community sentiment was generally supportive of the scoping design. The Proposal received 25 submissions during the scoping design engagement period. The feedback received from the community included:

- support for the Proposal
- requests to preserve the character of the station
- requests for additional lighting and CCTV to increase customer safety
- requests to consider additional commuter car parking.

This feedback was provided to the project team for consideration and to help inform the planning process and this REF.

5.1.1 Community consultation during COVID-19

In response to the evolving COVID-19 situation, Transport for NSW is following NSW Health advice and changing the way it approaches community consultation for important transport infrastructure projects.

It is important for the community to have their say on all transport infrastructure projects and while this isn't business as usual, Transport for NSW will ensure all appropriate community consultation is carried out.

This means consultation will be carried out in different ways, including via the website, social media and video conferencing where appropriate, to ensure the community can practice social distancing and limit the spread of COVID-19.

Transport for NSW will continue to deliver projects across NSW, while ensuring the safety of all staff and the community.

5.2 Consultation requirements under the Infrastructure SEPP

Part 2, Division 1 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Clauses 13, 14, 15 and 16 of the Infrastructure SEPP require that public authorities undertake consultation with councils and other agencies, when proposing to carry out development without consent.

Table 5-1 provides details of consultation requirements under the Infrastructure SEPP for the Proposal.

Table 5-1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 | Consultation with Councils – development with impacts on council related infrastructure and services	Consultation is required where the Proposal would result in: • substantial impact on stormwater management services • generating traffic that would place a local road system under strain • involve connection to or impact on a council owned sewerage system • involve connection to and substantial use of council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes work that would: • disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control • impact on Council-operated footpaths. • connection to the existing Council-operated stormwater system. Consultation with Ku-ring-gai Council has been ongoing throughout the initial development of the Proposal, and would continue throughout the detailed design and construction phases.
Clause 14 | Consultation with Councils – development with impacts on local heritage	Where railway station work would: • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	Killara Railway Station Group is listed as a heritage item of local significance under Schedule 5 of the Ku-ring-gai LEP. The Proposal area is also partially located within the Springdale Heritage Conservation Area, which overlaps with the southern portion of Killara Station. As such, consultation with Ku-ring-gai Council in relation to non-Aboriginal heritage would be undertaken for the Proposal.
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Where railway station work would: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land*.	The Proposal is not located on land that has been identified as prone to flooding. Accordingly, consultation with Council is not required in regard to this aspect. Refer to Section 6.9

Clause	Clause particulars	Relevance to the Proposal
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	Where railway station work would: • impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land	Killara Station is not located on land that is within a coastal vulnerability area and therefore this clause does not apply. Accordingly, consultation with Council is not required in regard to this aspect.
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station work would: • impact on flood liable land -written notice must be given (together with a scope of work) to the State Emergency Services and take into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	The Proposal is not located on land that has been identified as prone to flooding. Accordingly, consultation with State Emergency Services is not required in regard to this aspect. Refer to Section 6.9.
Clause 16 | Consultation with public authorities other than Councils	For specified development, which includes consultation with the DPIE for development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974*, and other agencies specified by the Infrastructure SEPP where relevant. Although not a specific Infrastructure SEPP requirement, other agencies Transport for NSW may consult with could include • Sydney Trains • NSW Train Link • DPIE.	The Proposal is not located adjacent to land reserved under the *National Parks and Wildlife Act 1974*. Accordingly, consultation with the DPIE on this matter is not required. The Proposal is not considered to be specified development under Clause 16 of the Infrastructure SEPP. Consultation with Sydney Trains has occurred throughout the optioneering and scoping design process and would continue during detailed design of the Proposal

5.3 Consultation strategy

The consultation strategy for the Proposal was developed to encourage stakeholder and community involvement and foster interaction between stakeholders, the community and the project team. The consultation strategy that was developed, having regard to the requirements of the planning process ensures that stakeholders, customers and the community are informed of the Proposal and have the opportunity to provide input.

The objectives of the consultation strategy are to:

- provide accurate and timely information about the Proposal and REF process to relevant stakeholders
- raise awareness of the various components of the Proposal and the specialist environmental investigations
- ensure that the directly impacted community are aware of the REF and consulted where appropriate
- provide opportunities for stakeholders and the community to express their view about the Proposal

- understand and access valuable local knowledge from the community and stakeholders
- record the details and input from community engagement activities
- build positive relations with identified community stakeholders
- ensure a comprehensive and transparent approach.

5.4 Public display

Community consultation activities for the Proposal would be undertaken during the public display of this REF. The display period of the REF would be advertised in the week that the public display commences. The REF would be displayed for a period of four weeks. At the time of public display of the REF, consideration would be given to include face to face engagement including a community information session, based on the latest COVID-19 health advice.

The REF display strategy adopts a range of consultation mechanisms, including:

- public display of the REF on the project webpage, with feedback from the community and other stakeholders invited between 30 June and 27 July (https://www.transport.nsw.gov.au/projects/current-projects/killara-station-upgrade)
- display of a digital REF, including an interactive map and information presented in this REF
- distribution of a project update to local community and rail customers, outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspapers with a link to the Transport for NSW website that includes a summary of the Proposal, links to the REF and supporting document and information on how to provide feedback
- a geo-targeted social media campaign during the public display period (Facebook)
- emails to members of the community who have registered to the project contact list
- information signage at the station with QR code taking customers to the project webpage
- consultation with Ku-ring-gai Council, Sydney Trains, NSW Trains and other non-community stakeholders.

Further information on the Proposal may be requested by contacting the Project Infoline on 1800 684 490 or by email at projects@transport.nsw.gov.au.

During the display period feedback from the community is invited and can be submitted in the following ways:

- email: projects@transport.nsw.gov.au
- Transport for NSW website: http://transport.nsw.gov.au/projects/current-projects/killara-station-upgrade
- Mail: Associate Director Environmental Impact Assessment – PO Box K659 Haymarket NSW 1240.

Following consideration of feedback received during the public display period, Transport for NSW would determine whether to proceed with the Proposal and what conditions would be imposed on the Proposal should it be determined to proceed.

5.5 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal (the area around Killara Station) plus a 50 metre radius, on 22 April 2021. The search result indicated no Aboriginal sites or items within the search area.

The extensive landscape modification that has occurred across the Proposal area suggests that intact evidence of Aboriginal land use is unlikely to occur within the boundaries of the Proposal area. Similarly, the high level of disturbance would suggest that the archaeological potential of the area is low. Therefore it was not considered necessary to undertake specific Aboriginal consultation.

5.6 Ongoing consultation

At the conclusion of the public display period for this REF, Transport for NSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by Transport for NSW before determining whether to proceed with the Proposal.

Should Transport for NSW determine to proceed with the Proposal, the Determination Report would be made available on the Transport for NSW website and would summarise the key impacts identified in this REF, demonstrate how Transport for NSW considered issues raised during the public display period, and include a summary of mitigation measures proposed to minimise the impacts of the Proposal.

Should Transport for NSW determine to proceed with the Proposal, the project team would keep the community, councils and other key stakeholders informed of the process, identify any further issues as they arise, and develop additional mitigation measures to minimise the impacts of the Proposal. The interaction with the community would be undertaken in accordance with a Community Liaison Plan to be developed prior to the commencement of construction.

6 Environmental impact assessment

Chapter 6 of the REF provides a detailed description of the likely environmental impacts associated with the construction and operation of the Proposal. For each likely impact, the existing environment is characterised and then an assessment is undertaken as to how the Proposal would impact on the existing environment.

This environmental impact assessment has been undertaken in accordance with clause 228 of the EP&A Regulation. A checklist of clause 228 factors and how they have been specifically addressed in this REF is included at Appendix B.

6.1 Traffic and transport

6.1.1 Existing environment

Killara Station

Killara Station is serviced by the T1 North Shore and Western Line and T9 Northern Line with services to Sydney CBD, Hornsby, Berowra, North Sydney, Parramatta and Blacktown. The adjacent stations to Killara Station are Gordon Station (to the north) and Lindfield Station (to the south).

The station is located between Culworth Avenue (to the west) and Werona Avenue (to the east) and is accessed by a footbridge between these two streets. The station has one island platform (Platform 1 and 2). Platform 1 provides train services to the city and Platform 2 provides services to Berowra.

During weekdays, both platforms have services up to every 12 minutes during peak periods (7:30am to 8:30am and 6pm to 7pm) and every 15 minutes outside the peak period.

Station barrier counts obtained from the Bureau of Transport Statistics indicate that in 2013, Killara Station was the 106th busiest station on the Sydney Trains network, with approximately 4,620 trips recorded during an average weekday.

Accessibility to the station is currently limited for people with mobility issues as stairs from the station entrances on Culworth Avenue and Werona Avenue up to the footbridge, and down to the platform provide the only means of access to the platform. The footbridge also provides a means for pedestrians and cyclists to cross the railway corridor.

Station facilities including toilets and a payphone are located on the platform level. Interchange facilities include the car park located off Culworth Avenue, which includes the commuter car park (with accessible car spaces) and council operated (time limited) car park. Ten minute timed parking on Culworth Avenue provides an informal kerbside kiss and ride facility.

The modes used to access Killara Station are summarised in Figure 6-1. The access modes are based on a pedestrian count undertaken by Austraffic in 2015 during the morning peak period, from 6am to 9am. The largest access mode for the station is walking (55 per cent) while 44 per cent of customers accessed the station by car, either as a passenger or driver (AECOM, 2015).

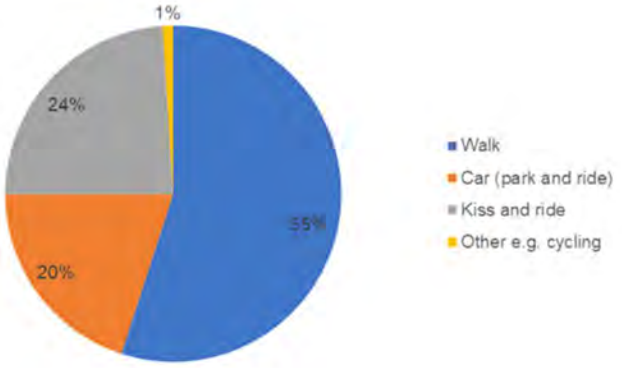


Figure 6-1 Access modes to Killara Station by customers (data from AECOM, 2015)

Pedestrian facilities

Footpaths are present on both sides of Culworth Avenue and Werona Avenue. It is approximately a 40 metre walk to the platform from the Culworth Avenue (west) and Werona Avenue (east) station entrances

A pedestrian refuge is located on Culworth Avenue, south of the car park entrance. A signalised pedestrian crossing is located at the station entrance on Werona Avenue.

The footbridge provides a permeable street network, allowing pedestrians to cross the rail corridor between Culworth Avenue and Werona Avenue.

Bicycle network and facilities

There is currently limited bicycle connectivity to Killara Station, with no formal cycle routes connecting the station. A section of Stanhope Road, an east-west road approximately 325 metres south of Killara Station, has been identified as a 'useful cycling route' by Ku-ring-gai Council (Ku-ring-gai Council, 2012a).

The Ku-ring-gai Bike Plan (Ku-ring-gai Council, 2012b) identifies locations for cycling improvements and potential new cycle routes, based on consultation with Ku-ring-gai Council, key stakeholders and the local community. The Plan identified a potential on road cycle route on Werona Avenue, alongside the rail line. This potential route would provide connections to other local stations along the rail line including Gordon and Pymble in the north, and Lindfield and Roseville in the south.

At Killara Station, there are three bike hoops on Culworth Avenue, next to the existing shelter approximately 15 metres north of the station entrance. There are also bike hoops on Werona Avenue, approximately 40 metres north of the station entrance, with capacity for six bicycles.

Public transport

A bus stop is located on Werona Avenue, approximately 25 metres to the north of the station entrance, which services school buses. Another bus stop for school bus services is located on Locksley Street, approximately 35 metres to the east of the station. These bus stops are likely to operate during before school and after school hours.

There are no public bus services which currently service the station. The nearest bus stop from which public bus services operate is located on Karranga Avenue opposite Powell Street, approximately 800 metres walking distance from the station. The stop provides a loop service from Lindfield to East Killara (bus route 556).

There are also likely to be other community bus services around the station such as those offered for residents of the retirement villages located nearby.

Road network

The key existing roads in the vicinity of the Proposal include Culworth Avenue (west of the Killara Station) and Werona Avenue (east of Killara Station) as shown in Figure 1-2. The nearest major arterial road is the Pacific Highway, which runs north-south and is located to the west of the rail line.

Culworth Avenue is a two-way, single lane local road which generally runs north-south alongside the rail line. Parking is provided on either side of Culworth Avenue in some sections. Several local east-west roads provide a connection between Culworth Avenue and the Pacific Highway, including Powell Street, Lorne Avenue, Marian Street and Stanhope Road. Culworth Avenue primarily provides access to the station and commuter car park, as well as residential properties.

Werona Avenue is a two-way, single lane local road which generally runs north-south alongside the rail line, with parking provided on either side in some sections. Werona Avenue primarily provides access to the station and nearby residential properties.

Within the vicinity of Killara Station, both Culworth Avenue and Werona Avenue have a posted speed limit of 50 km/h.

Parking

Car parking facilities are currently provided on both sides of Killara Station.

A dedicated off-street commuter car park is located on the western side of the station off Culworth Avenue which provides 83 unrestricted parking spaces for station customers. Two of these spaces are accessible parking spaces. A timed parking area (10P, ticketed on weekdays from 8:30 am to 6:00 pm) operated by Ku-ring-gai Council is located to the south of the commuter car park, providing 40 spaces. An additional timed parking area providing 42 spaces (10P, ticketed) can be accessed via Marian Avenue or from the Culworth Avenue car park.

Ten minute timed parking on Culworth Avenue provides an informal kiss and ride area within the vicinity of the station entrance. A mix of 4P timed and untimed parking is also available on Culworth Avenue, from approximately 50 metres north of the station entrance.

Parking is not permitted within the immediate vicinity of the station entrance on Werona Avenue. Untimed kerbside parking spaces are available on either side of Werona Avenue, between Locksley Street and Maples Avenue.

Taxi activity for the station is likely to be limited, however, taxis are expected to occasionally use the informal kiss and ride area on Culworth Avenue to pick-up and drop-off passengers.

6.1.2 Potential impacts

Construction phase

Pedestrians

During construction, pedestrian access to the station would be maintained and pedestrian diversions would be minimised. Cross-corridor access across the station would also be maintained for pedestrians where possible, however the footbridge would likely be closed during rail shutdowns which would inhibit the use of the pedestrian crossover. It is not

expected however that many pedestrians would use the footbridge during this time. Temporary pedestrian diversions or disruptions around the construction work areas have the potential to increase risk to pedestrian safety, due to potential interactions with construction plant and vehicles.

The presence of construction vehicles could present a potential safety risk to pedestrians if they are not managed appropriately.

The presence of construction work on the platform would reduce the amount of space available on the platform and temporarily impact pedestrian movements. There potentially would be a higher level of platform congestion arising from restricted access to certain areas of the platform such as near the lift construction (due to construction work or storage areas) and work at the station entrances and footpaths.

The lift locations would also result in the permanent removal of the existing seating bench on Culworth Avenue.

Cyclists

The three bike hoops located on Culworth Avenue would be temporarily unavailable, for a duration of approximately five days during upgrades to the existing shelter and cycle parking. The six bike hoops on Werona Avenue would only be temporarily unavailable (within one day) during the relocation from its existing location to the new location adjacent to the proposed lift on the eastern side of the station. .

It is not expected that cyclists would be significantly affected, as impacts would be temporary, and cycling is not one of the main modes used to access the station.

While there are no formal bicycle paths in surrounding streets, cyclists using Culworth Avenue or Werona Avenue to access the station may be temporarily affected during construction of upgraded footpaths.

Public transport

Killara Station would remain operational during the normal day to day construction periods. Train services would be affected during planned rail shutdown periods, although these are not specific to the proposed upgrade and would occur regardless of the Proposal. Buses would replace trains during rail shutdown periods.

No impacts are anticipated to the operation of existing public bus services during construction. Overall, impacts to public transport services during the construction of the Proposal would be limited.

Potential impacts to school bus services which operate on Werona Avenue would be managed in consultation with the relevant bus operator.

Road network

Construction vehicles would travel along the Pacific Highway, and then via Powell Street, Lorne Avenue, Stanhope Road or Killara Avenue to Culworth Avenue. The CTMP for the Proposal would confirm these routes.

Traffic generated by construction vehicles, including staff vehicles, is likely to be low given the nature of the work proposed and would fluctuate depending on the construction stage.

For work undertaken during a rail shutdown period, up to five heavy vehicles and 30 light vehicles per shift are expected to travel to and from the Proposal area, while during a normal weekday up to three heavy vehicles and 20 light vehicles are expected.

It is anticipated that this level of traffic would not have a significant impact on existing traffic conditions. Traffic control (e.g. signage) would be in place around work areas to inform motorists of construction works.

Localised traffic control during construction would be essential to maintaining functionality of the road network. Work zones to construct the proposed pedestrian crossing on Culworth Avenue may require temporary or partial lane closures and/or traffic diversions. Consultation with Ku-ring-gai Council would be undertaken, if this is required. Road work would be undertaken progressively and in the minimum area and timeframe required to undertake the particular phase of work.

Access for emergency vehicles would be maintained at the station in accordance with emergency vehicle requirements. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes.

Parking

The commuter car park off Culworth Avenue would remain available for commuter use during the construction of the Proposal.

A temporary construction compound required to accommodate a site office, amenities, laydown and storage area for materials is proposed to be located within the council operated (time limited) car park off Culworth Avenue (refer to Figure 3-2). As such, there would be a temporary loss of up to 40 time limited parking spaces in the council operated car park for the duration of construction. Additionally, the area of timed parking on Culworth Avenue would be temporarily unavailable during the construction of the new accessible parking spaces and the kiss and ride bay.

This impact would temporarily reduce the availability of timed parking on the western side of the station (at Culworth Avenue) and has the potential to increase demand on surrounding streets. Surrounding streets where increased demand may potentially be accommodated could include, but would not be limited to, Lorne Avenue and Culworth Avenue. This would result in some additional walking distance for customers accessing Killara Station who would need to park in alternative locations.

This impact would be for approximately seven months and is not expected to be significant, however prior notice would be provided to customers where a temporary loss to existing car parking is required during construction.

Parking spaces would not be provided for construction staff vehicles within or adjacent to the construction site. Construction workers would be required to park around the Proposal area (avoiding the commuter car parks) and be encouraged to car-pool or use public transport services. However, it is expected that workers would travel via private vehicles which may marginally increase the demand for parking surrounding the station during the construction period.

The CTMP would be prepared to manage the impacts of construction traffic parking with construction workers encouraged to park away from the station and residential areas where possible. Prior notice would be provided to customers if a temporary loss to existing car parking is required during construction.

Property access

It is expected that property access would be maintained during construction.

Prior to construction, the construction Contractor would obtain any licences / approvals required for operating a crane within private airspace where required. Proposed work within private airspace (if required) would be undertaken in accordance with the requirement of any relevant licences / approvals and in consultation with affected property owners and the contactor would adhere to all relevant requirements to ensure the safe operation of the crane.

Operational phase

Pedestrians

The Proposal would include the provision of regraded pedestrian footpaths on sections of Culworth Avenue and Werona Avenue, as well as a new pedestrian crossing on Culworth Avenue. The installation of three new lifts would enable access to the station platform from either side of the existing footbridge. These features would improve pedestrian access to the station. Customer connectivity would also be improved by the provision of the kiss and ride bay (including one accessible space) and new accessible parking spaces on Culworth Avenue.

As a priority, the Proposal would aim to maintain existing paths of travel used by customers, minimising impacts and changes to pedestrian routes.

The Proposal would improve user experience in the vicinity of the station with the potential to encourage more customers to walk to the station.

Cyclists

The Proposal would include the provision of 10 new bike hoops at the bus shelter on Culworth Avenue, which would replace the three existing bike hoops. The Proposal would also include the provision of five new bike hoops at the station entrance on Werona Avenue.

The provision of new bike hoops would encourage bike storage at the station and potentially encourage more customers to cycle to the station.

Public transport

The Proposal does not include changes to rail or bus services and would not impact on the operation (service operation or timetabling) of public transport in the vicinity of Killara Station. The Proposal includes improved facilities and access to Killara Station, which may increase rail patronage.

The Proposal would result in the permanent removal of a bench seat located on the raised level of the Werona Avenue bus stop to make way for the installation of the proposed ramp to the existing bus stop.

Road network

The Proposal would assist in making public transport infrastructure more accessible to rail customers and in providing an improved transition between transport modes, which would likely increase patronage. It is anticipated that the improved customer experience and upgraded facilities may have a marginal increase in traffic (from people accessing the station by car), however this would have a negligible impact on the surrounding road network.

Parking

The Proposal includes the provision of a kiss and ride bay with two spaces (including one accessible space) and provision of two new accessible parking spaces on Culworth Avenue. No formal taxi zone has been proposed as part of the Proposal.

The Proposal would improve the accessibility at Killara Station by reconfiguring the existing parking arrangements to provide a DDA compliant path of travel from the upgraded kiss and ride bay and new accessible parking spaces to the station platform. This would result in the loss of up to four car parking spaces in the 4P timed area on Culworth Avenue.

Overall, given the existing number of car parking spaces available at Killara Station, including kerbside parking and in the commuter car park and council operated (time limited) car park off Culworth Avenue, it is not expected that the loss of four car parking spaces would have a major impact on car parking demand.

Property access

No changes to private property access would be required as part of the operation of the Proposal.

6.1.3 Mitigation measures

A CTMP would be prepared by the Contractor in consultation with Transport for NSW and provided to Ku-ring-gai Council. The CTMP would be the primary tool to manage potential traffic and pedestrian impacts associated with each phase of construction. The CTMP, at a minimum, would include:

- procedures for preparing and implementing Traffic Control Plans (TCPs) which would provide details for signage and timing of any detours and traffic controls to manage temporary road disruptions such as the provision of a pedestrian crossing on Culworth Avenue and the delivery of large plant and materials
- identification of final construction traffic access routes, ancillary facilities, contractor parking and loading zones
- nomination of access routes to and from the local road network and contractor parking
- scheduling of work / deliveries to avoid peak times and limiting of work in the road carriageway as much as practicable to limit traffic and parking impacts and maintain customer access to the station
- measures to:
  - limit temporary parking losses
  - maintain pedestrian overpass cross corridor access and customer access to the station through traffic and pedestrian diversions
  - maintain private property access unless otherwise agreed
  - identify changed traffic/pedestrian conditions including details of construction signage including signposts and variable message signs, traffic controllers and other community notifications.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.2 Urban design, landscape and visual amenity

A Landscape Character and Visual Impact Assessment (LCVIA) was undertaken for the Proposal (AECOM, 2021a). The assessment included a desktop review, visual envelope mapping, site visit (6 April 2021), landscape character assessment, visual impact assessment and preparation of photomontages. The photomontages provide an indication of what the Proposal may look like from key viewing areas upon completion and the likely scale of the Proposal's features.

The LCVIA assesses the Proposal at operation and also provides a brief high-level commentary around visual impacts arising from construction. The method distinguishes between the 'impact' (defined as the action being taken), and the 'effect' (defined as the change resulting from that action).

An impact grading matrix for sensitivity and magnitude was used to assess both landscape and visual impacts. Sensitivity relates to the ability of the landscape to accept a change (such as the introduction of lifts) without adverse impact on its character. Magnitude relates to the degree of change affecting a landscape.

The matrix is used to combine the ratings for sensitivity and magnitude to provide an overall 'Significance of Landscape Effects' rating and 'Significance of Visual Effects' rating. Ratings of high and high-moderate are considered to be significant. This matrix is presented in Table 6-1. A qualitative assessment further assigns a rating of Adverse, Neutral or Positive to the change in the views seen by receivers.

Table 6-1 Landscape character and visual impact grading matrix

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High	High to Moderate	Moderate	Negligible
	Moderate	High to Moderate	Moderate	Moderate to Low	Negligible
	Low	Moderate	Moderate to Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

6.2.1 Existing environment

Landscape character

A study area comprising a 750 metre radius from the Proposal was selected for this assessment. This was considered conservative given the gently sloping topography, the modest built form of the station and the visual screening provided by vegetation within the rail corridor and adjacent built form.

As outlined in Section 1.2, Killara Station is located approximately 16 kilometres north-west of the Sydney CBD. The topography within the Proposal area includes a side ridgeline that spans between the Pacific Highway on the western edge and the rail corridor and Werona Avenue to the east. The landscape slopes steeply to the west on the western side of the Pacific Highway, and more gently to the east from the Highway. A secondary ridgeline extends north east from south of Killara Station, approximately following Stanhope and Springdale Roads. There are no creeks or rivers within the study area, although the area surrounding Killara Station drains to the north east.

The area surrounding Killara Station is predominantly a mix of low, and low to high density residential development to the east and west of the rail corridor respectively, with small pockets of other land uses including public recreation spaces and a neighbourhood centre.

Landscape character zones

A landscape character assessment was undertaken which identified what makes Killara Station and its surroundings distinctive, without necessarily assigning a value to it. Distinct parts of the overall landscape have been separately defined and mapped as Landscape Character Zones (LCZ) to provide a framework to describe the Proposal area. The LCZs help assess how the Proposal would affect the elements that make up the landscape, aesthetic and perceptual aspects of the landscape and its distinctive character.

Six LCZs have been identified within the study area (refer to Figure 6-2):

- LCZ 1: Rail Corridor
- LCZ 2: Major Road Corridor
- LCZ 3: High Density Residential
- LCZ 4: Low Density Residential
- LCZ 5: Public Open Space
- LCZ 6: Commercial

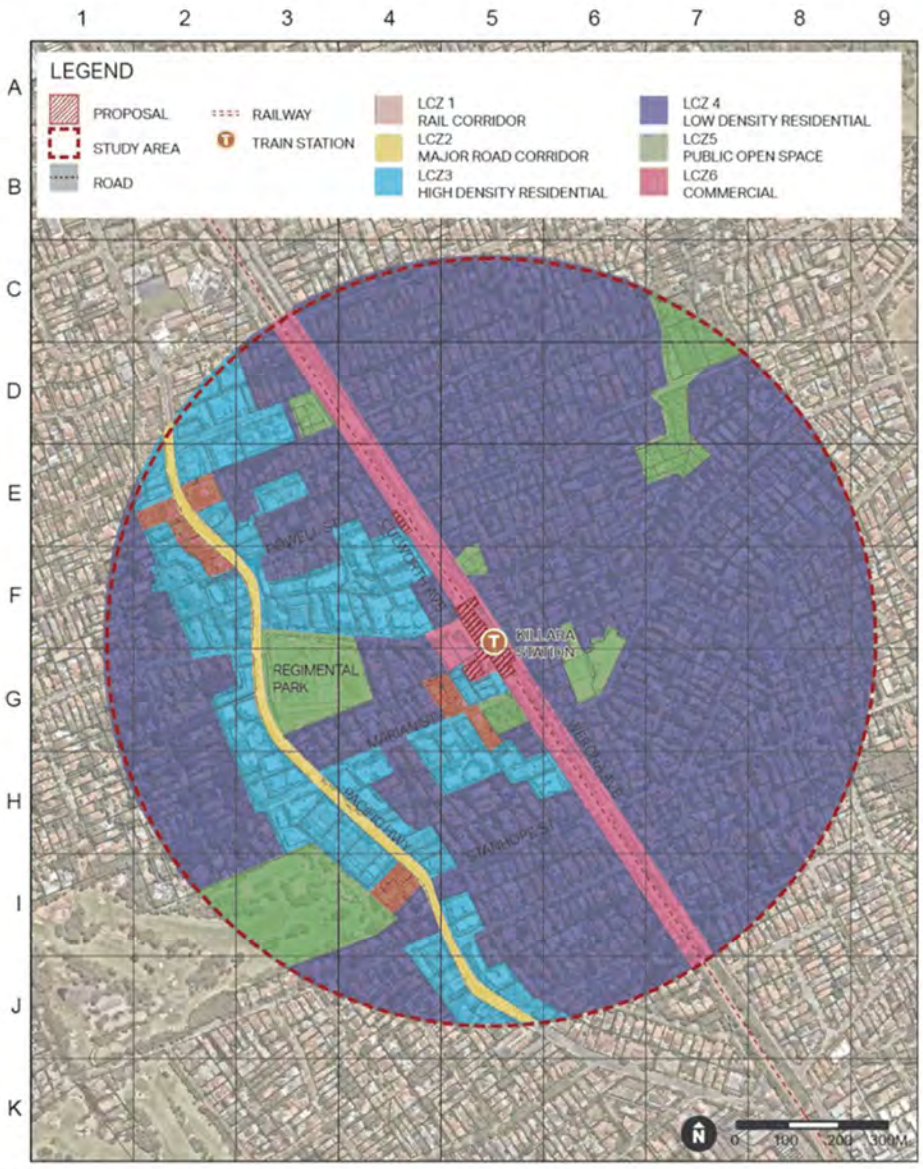


Figure 6-2 Landscape character zones

Visual receivers

Visual receivers are individuals and/or groups of people whose views may be affected by the Proposal. Key visual receivers include:

- rail commuters accessing or passing through the station
- commuters and passers-by on nearby roads (pedestrians, cyclists, motorists)
- workers or visitors to the nearby business enterprises and community facilities
- residents in adjacent streets to the station to the east and west.

Five representative viewpoints have been chosen to represent the change in views from publicly accessible areas due to the Proposal. The justification for the choice of viewpoints is described in Table 6-2 and their location is shown in Figure 6-3.

Table 6-2 Viewpoints chosen to assess visual impacts due to the Proposal

Viewpoint and location	Viewpoint description	Distance from the Proposal
Viewpoint 1 Culworth Avenue and Lorne Avenue	Assesses the view from the intersection of Culworth and Lorne Avenues with visual receivers including passers-by and local residents	120 metres
Viewpoint 2: Culworth Avenue council car park	Assesses the view from the pedestrian entry point of the council operated (time limited) car park on Culworth Avenue with visual receivers including commuters and passers-by.	25 metres
Viewpoint 3: 18 Culworth Avenue	Assesses the view from the apartment block at 18 Culworth Avenue with visual receivers including passers-by and local residents.	35 metres
Viewpoint 4: Werona Avenue and Locksley Street	Assesses the view from the intersection of Werona Avenue and Locksley Street with visual receivers including passers-by and local residents. This viewpoint lies adjacent to two heritage items on Werona Avenue.	15 metres
Viewpoint 5: 25 Werona Avenue	Assesses the view from 25 Werona Avenue with visual receivers including passers-by and local residents.	50 metres

Notes:

1. *Distance is measured between the viewpoint to the nearest proposed lift as this is considered to be the most visually prominent proposed change at operation*

Figure 6-3 Representative viewpoints for visual impact assessment and nearby building height (Source: AECOM, 2021a)

6.2.2 Potential impacts

Construction phase

Visible construction elements would be expected to typically include a range of site sheds, hoardings and construction plant including for excavation of lift wells, a crane to place the lifts, and heavy vehicles bringing in and unloading materials. A temporary construction compound within the council operated (time limited) car park off Culworth Avenue would be required to accommodate a site office, amenities, laydown and storage area for materials. Another temporary construction compound would be required on the corner of Culworth Avenue and Powell Street for laydown and storage area for materials (Figure 3-2). These visual impacts would be visually prominent but are considered to be consistent with similar temporary construction work sites, and transitory.

The most visually prominent construction activity would be associated with the construction of the three lifts, widening of the footbridge, upgrade works to the footpath and kerbs / parking areas on Culworth Avenue and Werona Avenue near the station entrance and the construction compounds. The most sensitive visual receivers viewing the construction activity are residential receivers viewing the changes from their homes, particularly residents in the apartment blocks to the south and west of the proposed construction compound on Culworth Avenue and on the corner of Powell Street.

Overall, views to the construction compounds and other construction activity due to the Proposal are considered to be relatively minor and majority of the receivers would have a low sensitivity to the changes. Changes would be consistent with similar temporary construction work sites and activities, and transitory over a period of approximately 18 months until completion of the Proposal.

a) Operational phase

Landscape character zones

While six LCZs have been identified for this assessment, changes due to the Proposal:

- only occur within one LCZ (LCZ 1)
- lie within close proximity of three other LCZs (LCZ 3, LCZ 4 and LCZ 6).

The Proposal would result in no changes to LCZ 2 and LCZ 5 due to their distance from the Proposal and/or screening by built form, topography and vegetation, therefore these, while identified within the study area, have not been described in detail or assessed in this report.

A summary of potential impacts to the relevant LCZs using the impact grading matrix is shown in Table 6-3

Table 6-3 Operational landscape character impact assessment

Zone	Anticipated change	Sensitivity to change	Magnitude of change	Rating
LCZ 1: Rail Corridor	Key changes due to the Proposal include the most visible elements including the removal of vegetation, addition of three lift structures, widening of the existing footbridge, removal of the retail kiosk on the station's footbridge and upgrade of footpaths on either side of the station.	Susceptibility to change is mostly influenced by the most visible elements. Considering the existing station heritage structures, vegetation surroundings especially considering the heritage listing associations with the gardens, and the level of current station precinct maintenance. The sensitivity of LCZ 1 is considered to be Moderate.	The magnitude of change is considered to be moderate as the scale of the proposed changes would be slightly larger than the pieces of existing infrastructure at the station, the materials proposed would be different with rail infrastructure. However the changes would affect a small area (station and immediate surrounds) which only affects a small proportion of the LCZ.	Moderate
LCZ 3: High Density Residential	Only a small portion of the proposed works would lie near to a small portion of the LCZ at the southern end of the station on Culworth Avenue. The majority of the LCZ lies to the west of the Proposal. The changes adjacent to the LCZ at Culworth Avenue would not alter the character within the LCZ. It is concluded that the Proposal would not affect the character of LCZ 3: High Density Residential.	N/A	N/A	No change
LCZ 4: Low Density Residential	Key changes due to the Proposal include the new lift (connected to the footbridge on Werona Avenue), removal of vegetation, widening of the existing footbridge, and upgrade of footpaths on the eastern side of the station.	Susceptibility to change is mostly influenced by the most visible elements. The topography, built form and existing vegetation within the road verges and within private properties would lower the susceptibility to change by limiting the visual prominence of the changes. However, the value of the landscape considers the station's heritage importance and valued urban vegetation along the rail corridor and especially the station gardens. Overall, the sensitivity of LCZ 4 is considered to be Moderate.	The magnitude of change is considered to be low as the scale of the proposed changes would be similar to existing infrastructure at the station, vegetation on the edge of the station on the eastern side would minimise any change due to removal of vegetation, and the geographical extent of changes are very small	Moderate to Low

Zone	Anticipated change	Sensitivity to change	Magnitude of change	Rating
LCZ 6: Commercial	No changes due to the Proposal would occur within or adjacent to this LCZ. Minor changes would occur near the LCZ (near Marian Street shops) but would have no impact on the character of LCZ 6: Commercial due to the distance from the Proposal.	N/A	N/A	No change

Visual impact

An assessment of the visual sensitivity and magnitude of change at five visual receiver locations was undertaken for the operational phase of the Proposal. The results of this assessment are provided in Table 6-4. A photomontage was produced to illustrate the proposed changes from two key viewpoints. These are shown in Figure 6-4 to Figure 6-7.

The most visually prominent changes resulting from the Proposal would include the introduction of three new lifts, widening of the footbridge, removal of vegetation and changes to the footpaths and station infrastructure. Due to the topography at Killara Station, the tallest proposed elements (the three lifts attached to the existing footbridge) would potentially be seen from the immediate surrounds of the station including the mostly residential development surrounding the station. However, these may be screened by existing trees which obstruct views to the station.

Overall, the Proposal would result in Low (neutral) to Moderate (adverse) visual impacts to receivers, with no viewpoints assessed as having a significant change in views. The sensitivity of the visual receivers surrounding the station (particularly from the more sensitive residential receivers to the north of the rail corridor) is generally low given the presence of screening vegetation along the rail corridor edge.

Due to the visually recessive nature of the majority of changes and the upgrade of rail infrastructure, the assessment resulted in a 'neutral' qualitative rating from four out of the five viewpoints. One 'adverse' qualitative rating was due to the change to the suburban station setting with the addition of the proposed lift structures.

Table 6-4 Operational visual impact assessment

Viewpoint and location	Anticipated change	Sensitivity to change	Magnitude of change	Rating
Viewpoint 1: Culworth Avenue and Lorne Avenue	The key changes to the view due to the Proposal would comprise the accessible parking spaces, the regraded footpath, the new pedestrian crossing, the top of the new lift and lift canopy, the removal of some vegetation and replacement or new fencing.	The sensitivity is considered to be low as passers-by generally only view the area for short periods of time and because the greenery is already dominated by utilitarian rail corridor features and weedy vegetation.	The magnitude of change for this viewpoint has been assessed as low mainly given the small scale of change, replacement of similar elements, and given the partial screening of vegetation.	Neutral
Viewpoint 2: Culworth Avenue council car park	The key changes to the view due to the Proposal would comprise the new lifts from Culworth Avenue and to the station platform and associated canopies, widening of the pedestrian footpath, removal of vegetation (one large eucalypt), and upgrades on Culworth Avenue including the kiss and ride bay and accessible parking, and new pedestrian crossing	The sensitivity is considered to be low as council operated (time limited) car park users and passers-by (pedestrians, cyclists and motorists) are only likely to view the area for short periods of time and because the greenery is already dominated by utilitarian rail corridor features and weedy vegetation.	The magnitude of change is considered to be moderate mainly due to the size and scale of the proposed lifts. These changes would be seen from close proximity and in a reasonable amount of detail, with remaining vegetation assisting in reducing the visual prominence of the proposed lifts.	Moderate to Low (neutral)
Viewpoint 3: 18 Culworth Avenue	The key changes to the view due to the Proposal would comprise of the new lifts near Culworth Avenue and to the platform station and associated weather canopies, widening of the pedestrian footpath, removal of vegetation (one large eucalypt), and upgrades on Culworth Avenue including the kiss and ride bay and accessible parking, and new pedestrian crossing.	The sensitivity is considered to be moderate due to more sensitive receivers including residents with elevated views to the surrounding landscape. In addition, other receivers include passers-by (pedestrians, cyclists and motorists).	The magnitude of change is considered to be moderate mainly due to the size and scale of the proposed lifts, the change of the footpath on Culworth Avenue as well as parking, bus shelter and station infrastructure, and the removal of vegetation, which would be seen from close proximity.	Neutral
Viewpoint 4: Werona Avenue and Locksley Street	Key changes to the view due to the Proposal would include the new lifts and associated canopies (on Werona Avenue and to the station footbridge) and upgrades to the interchange facilities on Werona Avenue	The sensitivity is considered to be moderate due to the gardens seen on the western side of the street which contribute to the heritage listing of Killara Station, although the viewpoint is received mainly by passers by.	The magnitude of change is considered moderate mainly due to the size and scale of the proposed lifts.	Moderate (adverse)

Viewpoint and location	Anticipated change	Sensitivity to change	Magnitude of change	Rating
Viewpoint 5: 25 Werona Avenue	Key changes to the view due to the Proposal would include upgrades to the interchange facilities on Werona Avenue (footpath upgrades, vegetation removal, and other upgrades)	The sensitivity is considered to be moderate due to the main receivers including residents who would be sensitive to changes of views to greenery from their residences and the view of 25 Werona Avenue as a locally listed heritage item	The magnitude of change is considered low mainly due to the size and scale of change likely to be minor (most visible elements would include changes to the bus stop, footpath and ramp on Werona Avenue).	Moderate-Low (neutral)

Figure 6-4 Viewpoint 3 - existing view looking north-east towards Killara Station from 18 Culworth Avenue (Source: AECOM, 2021a)

Figure 6-5 Photomontage showing the proposed changes to the existing view from viewpoint 3 (Source: AECOM, 2021a)

Figure 6-6 Viewpoint 4 - existing view looking west towards Killara Station from the southern corner of the intersection of Werona Avenue and Locksley Street (Source: AECOM, 2021a)

Figure 6-7 Photomontage showing the proposed changes to the existing view from viewpoint 4 (Source: AECOM, 2021a)

6.2.3 Mitigation measures

Mitigation measures would be reviewed where appropriate during detailed design development and construction planning to minimise the level of visual impact of the construction and operation phases of the Proposal.

The detailed design of the Proposal is to be undertaken with reference to the recommendations included in the Landscape Character and Visual Impact Assessment (AECOM, 2021a). Key project specific mitigation measures include:

- landscaping within the road verges and along the rail corridor edges (including potential planting of street trees or shrubs, if possible) would be considered along Werona Avenue
- design elements would be considered to reference the heritage character of the station and surrounding landscape while maintaining the visual quality of a 'new' piece of infrastructure rather than replicating heritage items
- the heritage gardens on the eastern side of the station would be protected to preserve the character of the suburban station within its heritage setting
- light spill from the construction area into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution
- finishes and materials for the station would be complementary to the existing locality and landscape and reflective surfaces would be minimised with a preferred use of muted colours
- disturbance of vegetation would be limited to the minimum amount necessary to construct the proposal.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.3 Noise and vibration

A Noise and Vibration Impact Assessment (AECOM, 2021b) was undertaken for the Proposal, which included the following scope:

- establish the existing background noise levels in the vicinity of the Proposal
- establish construction noise management levels (NMLs) and vibration limits that would apply to the Proposal
- predict environmental noise and vibration levels at nearby residential and other sensitive receivers due to the Proposal
- recommend mitigation measures, where necessary, to reduce and manage noise and vibration impacts from the Proposal to comply with established construction NMLs and vibration limits
- consider noise from the operation of the upgraded Killara Station.

The findings of this assessment are summarised below.

6.3.1 Existing environment

Killara Station is located within a residential suburban environment. Receivers within a 500 metre radius of the station are predominantly comprised of residential properties. Multi-storey apartment buildings are located to the north, west and south of Killara Station, whilst receivers to the east of the rail track are generally one and two storey buildings.

The closest residential receivers are located on either side of Killara Station along Werona Avenue to the east (around 33 metres) and Culworth Avenue to the west (around 30 metres). Recreation facilities and public parks are located within the vicinity of the station.

Traffic movements along the Pacific Highway, which runs to the west of the station, are a key noise source contributing to the existing noise environment.

To provide a comprehensive assessment, 43 representative residential receivers surrounding the Proposal (including the station and proposed compound areas) have been selected to represent the potential noise impacts associated with the Proposal. These receivers are listed in Table 6-5.

Table 6-5 Representative residential receivers

Receiver ID	Noise Catchment Area (NCA)	Receiver Address	Building Type	Distance from the Proposal (metres)
R1	2	1/25 Werona Avenue, Killara	Detached	43
R2	2	23A Werona Avenue, Killara	Detached	47
R3	2	1/18 Culworth Avenue, Killara	Detached	57
R4	2	30 Culworth Avenue, Killara	Detached	80
R5	2	33 Werona Avenue, Killara	Detached	90
R6	2	6 Lorne Avenue, Killara	Detached	95
R7	2	3 Lynwood Avenue, Killara	Detached	146
R8	2	1/2 Arnold Street, Killara	Detached	148
R9	2	12 Culworth Avenue, Killara	Detached	175
R10	2	15/36-40 Culworth Avenue, Killara	Multi-Storey	179
R11	2	2 Lynwood Avenue, Killara	Detached	194
R12	2	1 Arnold Street, Killara	Detached	198
R13	1	14 Lorne Avenue, Killara	Detached	203
R14	1	1/18 Marian Street, Killara	Multi-Storey	207
R15	2	19 Locksley Street, Killara	Detached	217
R16	2	6-8 Culworth Avenue, Killara	Multi-Storey	250
R17	2	23 Powell Street, Killara	Detached	264
R18	2	28 Lynwood Avenue, Killara	Detached	267
R19	2	21a Powell Street, Killara	Detached	281

Receiver ID	Noise Catchment Area (NCA)	Receiver Address	Building Type	Distance from the Proposal (metres)
R20	2	20 Karranga Avenue, Killara	Detached	284
R21	1	9/5 Wallaroo Close, Killara	Multi-Storey	298
R22	2	20 Stanhope Road, Killara	Detached	324
R23	1	3 Caithness Street, Killara	Detached	327
R24	2	22 Powell Street, Killara	Detached	329
R25	2	24 Stanhope Road, Killara	Detached	341
R26	2	20 Powell Street, Killara	Detached	344
R27	2	21 Stanhope Road, Killara	Detached	392
R28	2	40 Powell Street, Killara	Detached	399
R29	2	1/23 Stanhope Road, Killara	Detached	406
R30	1	9-19 Greengate Road, Killara	Multi-Storey	431
R31	1	18/2-6 Buckingham Road, Killara	Multi-Storey	446
R32	1	9/1-9 Buckingham Road, Killara	Multi-Storey	450
R33	2	28 Greengate Road, Killara	Detached	451
R34	2	5 Springdale Road, Killara	Detached	452
R35	1	610 Pacific Highway, Killara	Detached	454
R36	1	1/592-604 Pacific Highway, Killara	Detached	459
R37	2	42 Greengate Road, Killara	Detached	463
R38	1	544 Pacific Highway, Killara	Detached	469
R39	2	26 Greengate Road, Killara	Detached	473
R40	1	2/640 Pacific Highway, Killara	Detached	477
R41	2	2 Northcote Avenue, Killara	Detached	522
R42	1	9-23 Bruce Avenue, Killara	Multi-Storey	558
R43	2	3 Elva Avenue, Killara	Detached	623

Impacts were also assessed at four representative non-residential receivers as listed in Table 6-6.

Table 6-6 Representative non-residential receivers

Receiver ID	Receiver address	Distance from the Proposal (metres)
N1	Marian Street Theatre, 2 Marian Street, Killara - Theatre[1]	126
N2	Killara Lawn Tennis Club, 6 Arnold Street, Killara - Community	180
N3	Dalcross Wellness Hospital, 28 Stanhope Road, Killara - Hospital	332
N4	Killara Uniting Church, 29A Arnold Street, Killara - Church	356

Notes:

1. *The Marian Street Theatre is currently closed due to public safety concerns raised in December 2013. Council has been working with the Save Marian Street Theatre Committee to develop a plan for the theatres future. Currently a DA (DA0144/20) is under assessment regarding alterations and additions to the theatre.*

To assist in determining noise criteria for the receivers surrounding the Proposal, two noise catchment areas (NCAs) were identified. The noise environment at each of the residential receivers within each NCA is considered to be similar.

The representative receivers and NCAs are shown in Figure 6-8 and shown by receiver ID in Figure 6-9. The applicable NCA for the representative residential receivers are identified in Table 6-5. NCA 1 includes receivers 250 metres west of the station adjacent to the Pacific Highway and generally has a higher background noise level associated with traffic movements on the Pacific Highway. NCA 2 includes receivers further away from the Pacific Highway directly around the station including those on the eastern side of the station spanning up to Karranga Avenue which generally have a lower background noise level being further away from the Pacific Highway.

Figure 6-8 Noise and vibration receivers, NCAs and logger locations

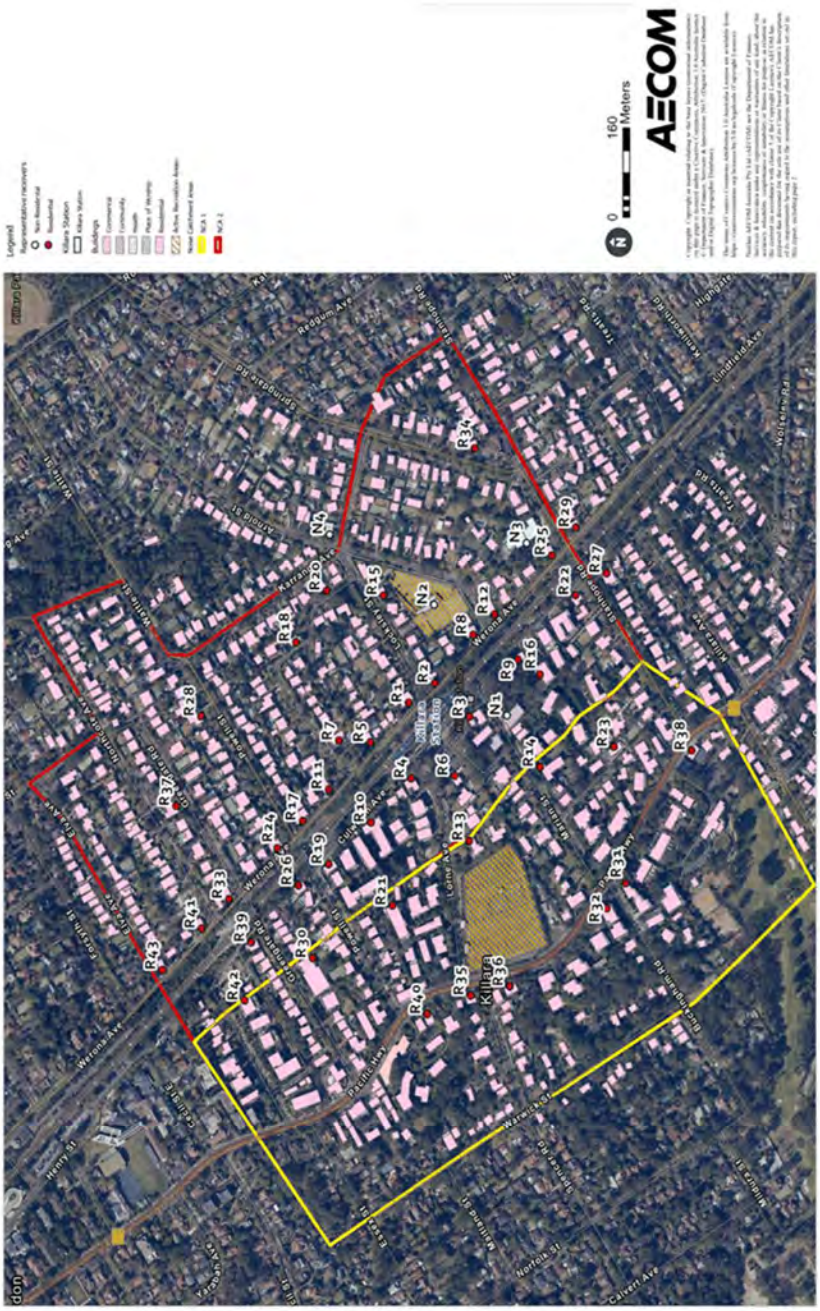


Figure 6-9 Representative receiver locations

Background noise levels

Long term unattended and short term attended measurements were undertaken to establish the existing ambient and background noise environment at potentially affected receivers.

Unattended noise monitoring

Long term unattended noise monitoring was conducted between 23 March and 1 April 2021 at 29 Marian Street (logger 1), and 31 Werona Avenue (logger 2). The locations of the two noise loggers are shown in Figure 6-8. Table 6-7 presents the existing overall representative L_{Aeq} ambient noise level and the background L_{A90} noise levels for the day, evening and night periods. The L_{A90} noise levels are the levels exceeded for 90 per cent of the measurement period, while the L_{Aeq} level is the equivalent continuous sound level.

Table 6-7 Existing background and ambient noise levels

Location	Rating background level, L_{A90}, dB(A)			Ambient L_{Aeq} noise levels, dB(A)		
	Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
NCA 1	40	40[2]	38	57	56	52
NCA 2	42	42[2]	33	62	60	54

Notes

2 Day is defined as 7:00 am to 6:00 pm, Monday to Saturday and 8:00 am to 6:00 pm Sundays & Public Holidays. Evening is defined as 6:00 pm to 10:00 pm, Monday to Sunday & Public Holidays. Night is defined as 10:00 pm to 7:00 am, Monday to Saturday and 10:00 pm to 8:00 am Sundays & Public Holidays.

Attended noise monitoring

Attended noise measurements were conducted at logger locations 1 and 2 on 1 April 2021. The measurements were conducted over a 15 minute period for each location. Weather conditions were sunny on the day of monitoring, with no wind. The results of the attended noise monitoring are presented in Table 6-8.

Table 6-8 Attended noise measurements

Logger	Date	Time	L_{Aeq} dB(A)	L_{A90} dB(A)	Comments
1	01/04/2021	9:44	61	46	Dominated by bird calls 60 dB(A), distant road traffic noise on Pacific Highway 47 dB(A) and car pass by on Marian Street 60 dB(A).
2	01/04/2021	10:09	73	45	Dominated by road traffic noise on Werona Avenue 59 dB(A), truck pass by 53 dB(A), train pass by 65 dB(A), water feature in front yard of neighbouring property 44 dB(A) and bird calls audible occasionally 50 dB(A).

The acoustic environment is dominated by bird calls on the Culworth Avenue side of the station and road traffic noise on the Werona Avenue side of the station. Road noise and bird calls are common at both logger locations. These characteristics are typical of a suburban environment.

6.3.2 Noise assessment criteria

Construction noise criteria

The EPA's *Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change, 2009) is the principal guideline for the assessment and management of construction noise in NSW. The ICNG recommends standard hours of construction as:

- Monday to Friday: 7:00am to 6:00pm
- Saturday: 8:00am to 1:00pm
- Sundays and public holidays: no work.

The ICNG also states that during recommended standard hours where construction noise levels reach 75 dB(A) at residences, residential receivers can be considered as 'highly noise affected' and the proponent may be required to consider restricting hours of very noisy work to provide respite periods.

Further, NMLs were developed for the Proposal. Where NMLs are predicted to be exceeded, the ICNG recommends certain measures to be implemented to minimise adverse impacts. NMLs for the Proposal during standard construction hours is the applicable rating background level (RBL) + 10 dB(A), while the NML outside of recommended standard hours is the applicable RBL + 5 dB(A).

The construction NMLs for the residential and non-residential receivers are detailed in Table 6-9 and Table 6-10.

Table 6-9 Construction noise management levels – residential receivers

NCA	Period	RBL, L_{A90} dB(A)	Standard hours noise management levels, $L_{Aeq,15min}$, dB(A)	Out-of-hours noise management levels, $L_{Aeq,15min}$, dB(A)
1	Day	40	50 75 (highly noise affected level)	45
	Evening	40	N/A	45
	Night	38	N/A	43
2	Day	42	52 75 (highly noise affected level)	47
	Evening	42	N/A	47
	Night	33	N/A	38

Table 6-10 Construction noise management levels – non-residential receivers

Land use	Noise management levels, $L_{Aeq,15min}$ (applies when properties are in use)
Place of worship	55 dB(A)[1]
Hospital wards and operating theatres and school classrooms	55 dB(A) [1]
Community Hall	55 dB(A)[1]
Commercial premises (including offices, retail outlets)	70 dB(A)
Active recreational area	65 dB(A)

Notes:

1 *This external management level is based upon a 45 dB(A) internal noise management level and a 10 dB reduction from outside to inside through an open window.*

Sleep disturbance criteria

Sleep disturbance noise goals have also been established for residential receivers which are based on the *NSW Road Noise Policy* (Department of Environment, Climate Change and Water, 2011). Based on the measured background noise levels during the night, the sleep disturbance criteria for the nearest noise sensitive residential receivers are presented in Table 6-11.

Table 6-11 Sleep disturbance criteria

NCA	Background noise level	Sleep disturbance criteria, $L_{A1(1\ minute)}$, dB(A) (external)	
	(L_{A90}), dB(A)	Screening level	Awakening reaction
1	38	53	60 – 65
2	33	48	60 – 65

Construction traffic noise criteria

To assess noise impacts from construction traffic an initial screening test is required, by evaluating whether existing road traffic noise levels would increase by more than 2 dB(A), in line with the *Road Noise Policy*. Where the predicted noise increase is 2 dB(A) or less, then no further assessment is required. However, where the predicted noise level increase is greater than 2 dB(A), and the predicted road traffic noise level exceeds the road category specific criterion then noise mitigation would be considered for those receivers affected.

Construction vibration criteria

When assessing vibration there are two categories of vibration criteria: one related to the impact of vibration to human comfort (tactile vibration) and one relating to structural damage.

Structural damage to buildings

At present, no Australian Standards exist for the assessment of building damage caused by vibration.

The German standard (DIN 4150) provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration. DIN 4150 states that buildings exposed to higher levels of vibration than recommended limits would not necessarily result in damage.

Human comfort

The assessment of intermittent vibration outlined in the A*ssessing Vibration: A Technical Guideline* is based on Vibration Dose Values (VDVs). The VDV accumulates the vibration energy received over the daytime and night-time periods.

The VDV criteria are based on the likelihood that a person would be annoyed by the level of vibration over the entire assessment period.

Operational noise criteria

The NSW *Noise Policy for Industry* (NPfI) (NSW EPA, 2017) provides guidance in relation to acceptable noise limits for industrial noise emissions, which includes, but is not limited to, noise emissions from mechanical plant (NSW EPA, 2017). The assessment procedure in the NPfI has two components:

- controlling intrusive noise impacts in the short term for residences
- maintaining noise level amenity for residences and other land uses.

Both components are assessed at the boundary of the noise sensitive receiver site, or if the site boundary is more than 30 metres from the noise sensitive building, a distance of 30 metres from the noise sensitive building.

The specific noise levels established for the operation of the Proposal are summarised in Table 6-12 and are based on the lower of the intrusive and amenity criteria. The criteria apply to environmental noise emissions from plant and equipment installed as part of the Proposal.

Table 6-12 Summary of environmental noise emission criteria

Location	Time of day	Intrusive criteria L_{Aeq}, dB(A)	Amenity criteria L_{Aeq}, dB(A)	Project specific noise levels criteria[1] L_{Aeq}, dB(A)
NCA 1	Day	45	50	45
	Evening	45	40	43
	Night	43	35	38
NCA 2	Day	47	50	47
	Evening	47	40	43
	Night	38	35	38
Hospital wards and operating theatres and school classrooms	Noisiest 1-hour period when in use	-	50	48
Place of worship	When in use	-	50	53
Active recreation area	When in use	-	55	58
Commercial premises	When in use	-	65	68

Notes:

1 *Project noise trigger levels represent the lower of the intrusive and amenity criteria*

6.3.3 Potential impacts

Construction phase

Noise

Five distinct work stages, each consisting of a number of construction activities, were assessed for the Proposal. All work stages have been assessed with the exception of the final stage 5 Demobilising, testing and commissioning, as this is expected to be a relatively low noise impact activity. The work stages would occur in line with the following scheduling:

1. Site establishment and enabling work
2. New lifts and platform upgrades
3. Interchange work
4. Station building reconfiguration work
5. Demobilisation, testing and commission

Noise from activities within the construction compounds has been assumed to be minor in comparison to the noise generated by the worst case work stage assessed.

In order to assess noise impacts from the site during construction, a noise model was created to represent 'reasonable' worst periods of upgrade work.

Residential receivers

A summary of the predicted construction noise levels for each work stage during standard working hours for residential receivers is shown in Table 6-13. The results show construction noise levels are predicted to exceed the NMLs during standard hours for all assessed construction work stages at the majority of representative receivers (shaded grey). The largest number of exceedances occur during work stage 3 – Interchange work. These works also generate noise levels which exceed the highly noise affected level of 75 dB(A) at receivers R1, R2 and R3, shown as red in Table 6-13. Exceedance of the highly affected noise level is also predicted at R19 during work stage 1 due to the location of the construction compound to the north of the station.

Table 6-13 Predicted noise impacts at representative residential receivers for each work stage during standard hours

Receiver ID[2]	NCA	Distance (Metres)	Standard hours NML, dB(A)	Highly affected noise level, dB(A)	Work stage[3]			
					1	2	3	4
R1	2	43	52	75	67	74	83	76
R2	2	47	52	75	66	77	75	66
R3	2	57	52	75	75	78	78	69
R4	2	80	52	75	66	67	70	69
R5	2	90	52	75	63	65	68	66
R6	2	95	52	75	72	68	71	68
R7	2	146	52	75	61	57	60	53
R8	2	148	52	75	61	67	66	61
R9	2	175	52	75	59	65	64	60
R10	2	179	52	75	67	62	62	61
R11	2	194	52	75	66	60	63	60
R12	2	198	52	75	58	63	63	58
R13	1	203	50	75	57	59	63	60
R14	1	207	50	75	57	48	52	47
R15	2	217	52	75	46	41	51	46
R16	2	250	52	75	58	66	63	59
R17	2	264	52	75	70	59	61	60
R18	2	267	52	75	53	49	52	57
R19	2	281	52	75	80	57	58	56
R20	2	284	52	75	49	51	50	42
R21	1	298	50	75	49	46	55	55
R22	2	324	52	75	46	58	58	54
R23	1	327	50	75	48	48	48	42
R24	2	329	52	75	67	51	55	51

Receiver ID[2]	NCA	Distance (Metres)	Standard hours NML, dB(A)	Highly affected noise level, dB(A)	Work stage[3]			
					1	2	3	4
R25	2	341	52	75	53	56	57	54
R26	2	344	52	75	69	55	57	54
R27	2	392	52	75	35	48	50	41
R28	2	399	52	75	54	52	54	53
R29	2	406	52	75	51	55	56	52
R30	1	431	50	75	43	38	40	36
R31	1	446	50	75	40	35	40	41
R32	1	450	50	75	51	45	53	47
R33	2	451	52	75	60	36	46	37
R34	2	452	52	75	52	53	54	48
R35	1	454	50	75	42	43	52	52
R36	1	459	50	75	48	39	53	49
R37	2	463	52	75	47	39	42	39
R38	1	469	50	75	32	34	32	27
R39	2	473	52	75	41	35	38	35
R40	1	477	50	75	38	39	41	32
R41	2	522	52	75	55	35	46	36
R42	1	558	50	75	46	41	42	38
R43	2	623	52	75	37	27	32	23

Notes:

1. *Items shaded in grey indicate the predicted noise levels at this receiver during this work stage exceed the daytime NMLs. Items in red indicate the receiver is highly noise affected during this work stage.*
2. *Addresses of receiver and noise catchment areas are provided in Table 6-9*
3. *Details of work stages provided in Table 3-1.*

A summary of the predicted construction noise levels for each work stage outside standard working hours for residential receivers is shown in Table 6-14.

These results show construction noise levels are predicted to exceed the NMLs during night work for all assessed work stages at most representative receivers. The highest noise levels would be experienced during Work stage 3 – Interchange Works. Noise levels at receivers R1, R2 and R3 are predicted to exceed the NMLs by more than 30 dB(A) at times during work stages 2 and/or 3. Noise levels at receiver R4 are predicted to exceed the NML by more than 20 dB(A) during Work packages 3 and 4. Noise levels at receiver R5 are predicted to exceed the NML by more than 20 dB(A) at times during Work package 3. Noise levels at R6 are predicted to exceed the NML by more than 20 dB(A) at times during Work packages 1, 2, 3 and 4.

Noise levels at residential receivers (R17, R19 and R26) are predicted to exceed the NMLs by more than 20 dB(A) at times during Work package 1. These exceedances would be limited to the rail shutdown periods and some night work. In addition, night work would not be undertaken for more than two consecutive nights.

Table 6-14 Predicted noise impacts at representative residential receivers for each work stage outside standard hours

Receiver ID[2]	NCA	Distance (metres)	Night-time NML, dB(A)	Work stage[3]			
				1	2	3	4
R1	2	43	47	67	74	83	76
R2	2	47	47	66	77	75	66
R3	2	57	47	75	78	78	69
R4	2	80	47	66	67	70	69
R5	2	90	47	63	65	68	66
R6	2	95	47	72	68	71	68
R7	2	146	47	61	57	60	53
R8	2	148	47	61	67	66	61
R9	2	175	47	59	65	64	60
R10	2	179	47	67	62	62	61
R11	2	194	47	66	60	63	60
R12	2	198	47	58	63	63	58
R13	1	203	45	57	59	63	60
R14	1	207	45	57	48	52	47
R15	2	217	47	46	41	51	46
R16	2	250	47	58	66	63	59
R17	2	264	47	70	59	61	60
R18	2	267	47	53	49	52	57
R19	2	281	47	80	57	58	56
R20	2	284	47	49	51	50	42
R21	1	298	45	49	46	55	55
R22	2	324	47	46	58	58	54
R23	1	327	45	48	48	48	42
R24	2	329	47	67	51	55	51
R25	2	341	47	53	56	57	54
R26	2	344	47	69	55	57	54
R27	2	392	47	35	48	50	41
R28	2	399	47	54	52	54	53
R29	2	406	47	51	55	56	52
R30	1	431	45	43	38	40	36
R31	1	446	45	40	35	40	41

Receiver ID[2]	NCA	Distance (metres)	Night-time NML, dB(A)	Work stage[3]			
				1	2	3	4
R32	1	450	45	51	45	53	47
R33	2	451	47	60	36	46	37
R34	2	452	47	52	53	54	48
R35	1	454	45	42	43	52	52
R36	1	459	45	48	39	53	49
R37	2	463	47	47	39	42	39
R38	1	469	45	32	34	32	27
R39	2	473	47	41	35	38	35
R40	1	477	45	38	39	41	32
R41	2	522	47	55	35	46	36
R42	1	558	45	46	41	42	38
R43	2	623	47	37	27	32	23

Notes:

1. *Items shaded in grey indicate the predicted noise levels at this receiver during this work stage exceed the night-time NML*
2. *Addresses of receiver and noise catchment areas are provided in Table 6-9*
3. *Details of work stages provided in Table 3-1.*

Non-residential receivers

A summary of the predicted construction noise levels for non-residential receivers is shown in Table 6-15. All four non-residential receivers are predicted to be exposed to noise levels which exceed the NMLs as shaded in grey in Table 6-15 particularly during Work stages 1, 2 and 3.

Key noisy activities include the use of concrete saws and jack hammers. It is also noted that the predicted noise levels are based on all equipment operating at once and at the closest location to each receiver, therefore noise levels would be less for significant periods of time. Predicted exceedances of 1-2 dB(A) at the Killara Uniting Church (N4) are considered negligible. The Marian Street Theatre (N1) is currently closed. Currently a DA (DA0144/20) is under assessment regarding alterations and additions to the theatre. It is anticipated that the theatre would remain closed for the duration of construction works of the Proposal.

Table 6-15 Predicted noise impacts at representative non-residential receivers

Receiver ID[2]	Distance (metres)	NML, dB(A)	Work stage[3]			
			1	2	3	4
N1	126	55	65	63	59	52
N2	180	55	55	63	58	46
N3	332	55	57	60	61	58
N4	356	55	54	55	56	45

Notes:

1. *Items shaded in grey indicate predicted noise levels at this receiver during this work stage exceed the NML*
2. *Addresses of receiver and noise catchment areas are provided in Table 6-9*
3. *Details of work stages provided in Table 3-1.*

Sleep disturbance

A sleep disturbance assessment was undertaken to assess work potentially required during the night-time period (e.g. during weekend rail shutdown periods). The awakening reaction criterion of 65 dB(A) is predicted to be exceeded at residential receivers along Werona Avenue and Culworth Avenue during all Work stages and at residential receivers along Powell Street and Stanhope Road during Work stage 1.

The typical outdoor to indoor noise reductions provided by most standard dwellings (i.e. without acoustical treatment) is generally accepted as being 10 dB with windows slightly open and a minimum of 20 dB with windows closed. Therefore, if residents close their windows during noisy activities, they can potentially attenuate external noise levels by 20 dB to below the sleep awakening criterion.

In addition, the predicted construction noise levels are typically the worst case noise levels, therefore the majority of the actual $L_{A1(1min)}$ noise levels are likely to be less than those predicted.

Construction activities would be undertaken during the daytime where feasible.

Construction traffic

The Proposal would generate up to 30 light and five heavy vehicles per day during peak construction periods coinciding with railway possessions. Vehicles would access the site primarily via Culworth Avenue and Lorne Avenue for the southern construction compound and Powell Street for the northern storage and laydown construction compound.

Traffic noise levels during construction would not increase by more than 2 dB on Culworth Avenue and Powell Street, which complies with the RNP criteria.

Construction vibration

Vibration intensive work may include the use of the following items of equipment:

- jackhammer
- bored piling rig.

The minimum working distances of these items of equipment from off-site receivers are shown in Table 6-16 which is based on recommendations of the CNVS. If these minimum working distances are complied with, no adverse impacts from vibration intensive work are likely in terms of human response or cosmetic damage. The station platform, building and footbridge are recognised specifically for their relative intactness and contribution to the heritage significance of the station. Therefore, the cosmetic damage levels for heritage items would be considered.

Vibration intensive work would likely be required within the minimum working distances of the significant heritage elements associated with the station (such as the station platform, building and footbridge). If these minimum working distances are complied with, no adverse impacts from vibration intensive work is likely in terms of human response or cosmetic damage.

It is unlikely that work would be undertaken within the minimum working distances for heritage, commercial and residential receivers during the proposed vibration intensive work, with the exception of heritage items at the station itself. Should work be required within the minimum working distances, the recommended additional mitigation measures would be implemented.

If vibration intensive work is required within these minimum working distances, mitigation measures to control excessive vibration would be implemented as outlined in Section 7.2.

Table 6-16 Minimum working distances of vibration intensive equipment to be used during the Proposal

Plant	Rating/ description	Cosmetic damage - heritage	Cosmetic damage - residential/commercial	Human response
Jackhammer	Handheld	1 metre (nominal)	1 metre (nominal)	Avoid contact with structure
Bored piling	≤ 800 mm	4 metres	2 metres	N/A

Operational phase

Additional operational equipment at the station would include three new lifts and new family accessible and ambulant toilet facilities which would not produce significant noise emissions. Additional car parking is not proposed as part of the Proposal. As such, the operational noise environment is expected to remain largely unchanged. Standard noise controls such as appropriate selection of mechanical plant would reduce any impacts. If required, operational noise emissions shall be addressed during the detailed design phase in order to comply with operational noise criteria as per the Noise Policy for Industry.

6.3.4 Mitigation measures

Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the CNVS and the Noise and Vibration Impact Assessment (AECOM, 2021b) and in consultation with impacted receivers.

The CNVMP would prescribe reasonable and feasible mitigation measures to minimise construction noise and vibration. The measures would focus on contractor inductions, selection and operation of plant and equipment, work scheduling (including respite periods), prescribing safe working distances for vibration intensive equipment, procedures for noise and vibration monitoring and obtaining approvals for out of standard hours work. The CNVMP would also detail requirements for managing potential vibration impacts to heritage structures through monitoring and safe working distances.

For any highly affected noise receivers (over 75 dB), Transport for NSW would communicate with the impacted residents regarding the duration and noise level of the work, and by describing any respite periods that would be provided.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.4 Aboriginal heritage

6.4.1 Existing environment

The Proposal is located on the traditional lands of the Darug and Guringai people who occupied and thrived in the Ku-ring-gai area prior to European occupation.

An AHIMS search was undertaken for the area covered by the Proposal plus a 50 metre radius on 22 April 2021. The search result indicated no Aboriginal sites or items within the search area.

Certain landscape features, such as waterways, sand dune systems, ridge tops, ridge lines, headlands, cliff faces and rock caves/shelters, can indicate the likely presence of Aboriginal sites. None of these features are present immediately surrounding the station, which is located within a disturbed and developed area (i.e. a rail corridor surrounded by predominantly residential and commercial development). Therefore, the Proposal is not considered to be located within a high-risk landscape for Aboriginal heritage potential. The extensive landscape modification and high level of disturbance that has occurred due to development of the rail corridor across the Proposal area suggests that the presence of culturally sensitive buried items is unlikely within the boundaries of the Proposal.

6.4.2 Potential impacts

Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbance, including:

- the foundations and pits for the new lift shafts and lifts, which would require excavation at each proposed lift location
- the construction of regraded footpaths (e.g. pavement resurfacing) and station entrances
- other minor civil work including platform regrading, footings and foundations and power/drainage/stormwater work.

Ground disturbing activities have the potential to impact Aboriginal sites if present. As no known Aboriginal heritage items are located in the vicinity of the Proposal and no high-risk landscaping features are located at or near the Proposal, the potential for unknown items to be present is considered to be low. As such, the Proposal is unlikely to affect Aboriginal heritage during construction.

Operational phase

There would be no risks to Aboriginal heritage from the operation of the Proposal.

6.4.3 Mitigation measures

If previously unidentified Aboriginal sites or objects are uncovered during construction, work would cease in the vicinity of the find in accordance with Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019d). The Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager would be notified immediately to assist in coordinating the next steps, which are likely to involve consultation with an archaeologist, Heritage NSW and the Local Aboriginal Land Council/s. If human remains are found, work would cease, the site would be secured and the NSW Police and Heritage NSW would be notified.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.5 Non-Aboriginal heritage

A SoHI was prepared by AECOM for the Proposal (AECOM, 2021c). The SoHI was prepared in order to provide an understanding of the impact of the Proposal to heritage items within the Proposal area, namely the Killara Railway Station Group.

6.5.1 Existing environment

A desktop search of non-Aboriginal heritage registers was undertaken to assess the extent of known historical heritage items in proximity to the Proposal. This included a search of the:

- World Heritage List
- Commonwealth Heritage List
- Register of the National Estate (non-statutory archive)
- NSW State Heritage Register (SHR)
- TAHE Section 170 Heritage and Conservation Register
- Ku-ring-gai LEP 2015.

Heritage items

The Killara Railway Station Group has been identified on the TAHE Section 170 Heritage and Conservation Register under the State Heritage Inventory (SHI) database (SHI # 4802058). It is also listed under the Ku-ring-gai LEP (I1106).

The Proposal area is also partially located within the Springdale Heritage Conservation Area, which overlaps with the southern portion of Killara Station. Items adjacent to the Proposal area and part of the conservation area include Lynwood Avenue Heritage Conservation Area (C23) and Marian Street Heritage Conservation Area (C24).

These items and other heritage listed items within the vicinity of the Proposal are shown in Figure 6-10 and listed in Table 6-17.

No heritage items were found from the World Heritage List, the National Heritage List, the Commonwealth Heritage List, the Register of the National Estate and the SHR.

Table 6-17 Summary of listed heritage items within and adjacent to the Proposal area

Heritage list	Items within the Proposal area	Level of significance	Items adjacent to the Proposal area	Level of significance	Distance to Proposal area
World Heritage List	Nil	n/a	Nil	n/a	n/a
National Heritage List	Nil	n/a	Nil	n/a	n/a
Commonwealth Heritage List	Nil	n/a	Nil	n/a	n/a
Register of the National Estate (non-statutory)	Nil	n/a	Nil	n/a	n/a
State Heritage Register	Nil	n/a	Nil	n/a	n/a
TAHE Section 170 Heritage and Conservation Register	Killara Railway Station Group (SHI #4801066)	Local	Nil	n/a	n/a
Ku-ring-gai LEP 2015	Killara Railway Station Group (I1106)	Local	Dorchester Flats 1 Marian St Killara (I320)	Local	46 metres south-east
			Newsagent, chemist 11-15 Marian St Killara (I328)	Local	90 metres south-east
			Dwelling House 6 Lorne St Killara (I302)	Local	90 metres west
			Lynwood Cottage 4 Lynwood Ave Killara (I308)	Local	75 metres north-east
			"Lynwood" dwelling house 10 Lynwood Ave Killara (I310)	Local	100 metres north-east
			"Morningside" dwelling house 1 Maples Ave Killara (I319)	Local	25 metres east

Heritage list	Items within the Proposal area	Level of significance	Items adjacent to the Proposal area	Level of significance	Distance to Proposal area
			Dwelling house 25A Werona Ave Killara (I408)	Local	20 metres east
			"Maple House" 25 Werona Ave Killara (I406)	Local	20 metres east
			Killara Post Office 23A Werona Avenue Killara (I407)	Local	20 metres east
			Dwelling House 5 Locksley St Killara (I298)	Local	80 metres east
			Dwelling House 7 Locksley St Killara (I299)	Local	95 metres east
	Springdale Heritage Conservation Area	Local	Lynwood Avenue Heritage Conservation Area (C23)	Local	20 metres east
			Marian Street Heritage Conservation Area (C24)	Local	20 metres west

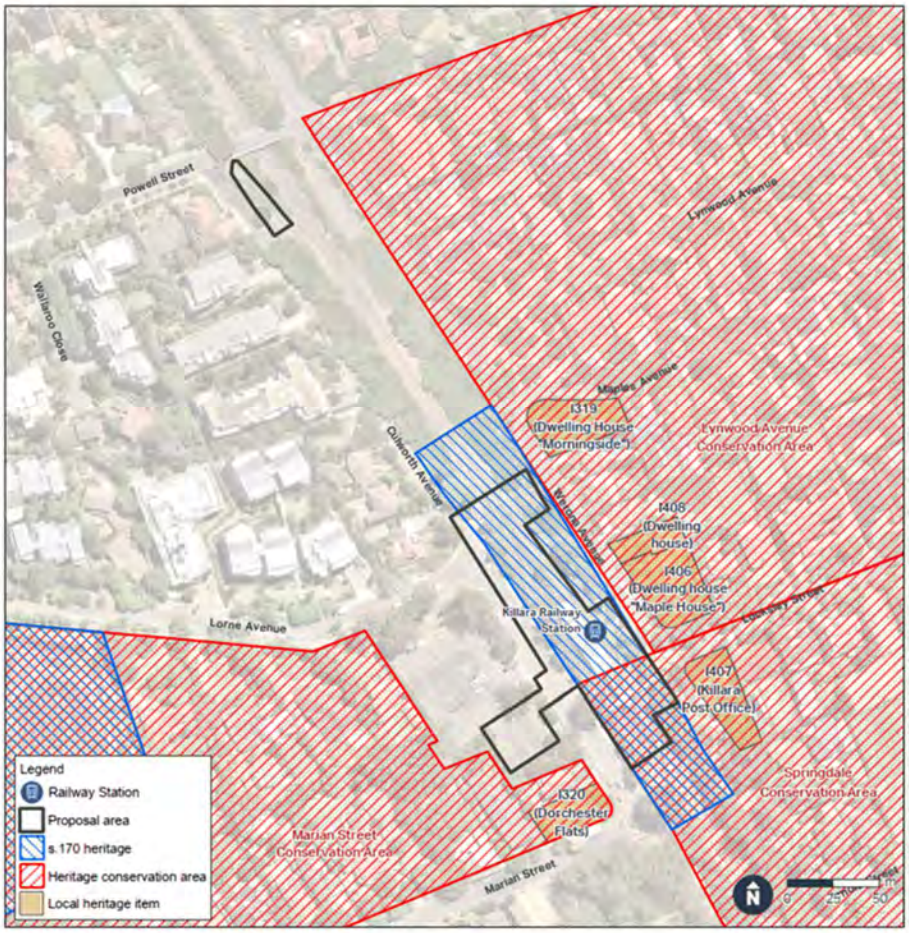


Figure 6-10 Location of nearby heritage items and heritage conservation areas

Historical context

Killara Station

Killara Station was not conceived until the early 1890s, when land for subdivisions to the south of Hornsby were called for. The original Killara Station consisted of a single platform that was converted to an island platform following duplication.

Killara Station has been subject to a number of modifications since its opening in 1887. The original fabric and known upgrades include:

- 1905 – garden commenced
- 1906 – single line brick station building constructed
- 1909 – island platform is built
- 1909 – duplication of the train line from Hornsby to North Sydney
- 1909 – type A8 station design used on the Northern Line

- 1910 – overhead footbridge constructed
- 1928 – electrification and installation of automatic signalling, signal frame removed and extension of awning
- 1976 – station building badly burned when station left unattended
- 1984-1993 – construction of footbridge kiosk
- 1993 – modifications to canopies and stairs
- 2014 – hazardous materials removal/maintenance
- 2018 – station refresh
- 2019 – platform resurfacing.

Springdale Heritage Conservation Area

The earliest land grants were made in the vicinity of Killara from the early 19th century. The land comprising Killara Station was part of two such land grants, the northern portion being a parcel of 80 acres granted to Edwin Booker in 1821 and the southern portion being part of a 160 acre grant to Jane McGillivray made in 1839. The McGillivray Grant was made to John Dunmore Lang and Jane McGillivray's father, James Bradley, in trust for Jane McGillivray. She lived in a house called "Springdale" and much of the grant is now part of the Springdale Heritage Conservation Area.

The area has aesthetic value for the high number of intact Federation and Inter-war buildings, as well as significant twentieth century development. The area is characterised by medium to large lots with well-established gardens. Architectural styles present include Federation Queen Anne, Arts and Crafts and Bungalow, and Inter-war Old English, Spanish Mission, Mediterranean, Californian Bungalow and many houses retain period landscape features including sweeping drives, borders of mixed shrubberies and planted out beds (Ku-ring-gai, 2015).

Significance criteria

Killara Railway Station Group has been assessed against the heritage criteria in the Section 170 Heritage and Conservation Register listing to determine the level of significance and related statutory protection as outlined in Table 6-18.

Table 6-18 Significance assessment – Killara Railway Station Group

Significance criteria	Application of criteria
Historical significance SHR criteria (a)	Killara Railway Station's significance at a local level is due to its use as a North Shore line station, in facilitating settlement in the northern suburbs of Sydney, the Railway Stations Gardens Competition, and the station garden, footbridge and platform as representative of a former era.
Historical association significance SHR criteria (b)	The item does not meet this criterion
Aesthetic significance SHR criteria (c)	The aesthetics significance of the Station is due to the largely intact and unique railway station gardens with a rich collection of historic exotic plantings. Other aesthetic qualities include the station building as an early twentieth century railway station design which has been compromised by changes over time, and the former Killara Post Office and the treed setting.
Social significance	The social significance of the Station is largely due to the intact railway/municipal ornamental garden on its eastern side representative of

Significance criteria	Application of criteria
SHR criteria (d)	a source of pride in the local community. It also represents strong association with the once famous Railway Stations Garden Competition and is featured on the cover of Sydney metropolitan railway timetables for many years.
Technical/Research significance SHR criteria (e)	The item does not meet this criterion.
Rarity SHR criteria (f)	The rarity of the Station is largely due to the intact garden on its eastern side, which is one of the most impressive in the region with the exception of the Wahroonga Station garden. The gardens represent civic pride and the social element within the community associated with railways at the time. The station contributes to the overall character of the North Shore line.
Representativeness SHR criteria (g)	The representativeness of the Station is mainly reflective of railway station gardening that was once common throughout the network. In addition, the footbridge was identified as an item of moderate heritage significance.
Integrity/Intactness	Killara Station has a largely intact garden setting which adds greatly to the heritage significance of the place. The station building and footbridge however, have undergone a number of changes that have resulted in a significant loss of both integrity and intactness. The removal of the original roof on the station building has had the most detrimental effect on the site and results in the station being a poor example of its type along the North Shore line.

The existing Statement of Significance reads as follows:

> *Killara Railway Station Group has heritage significance at a local level. It is a typical suburban station with associated ornamental gardens, and one of the few stations in the region where there has been relatively little change to the appearance of the overall setting. It is one of a number of stations that demonstrate the significant impact of the railway in facilitating settlement in the northern suburbs of Sydney and is an important station on the first purely suburban line in NSW. The station has local significance in terms of its association with the formerly prestigious Railway Stations Gardens Competition. It is one of the most important and intact railway gardens in the region. The grouping of the station building, platform and footbridge in their landscape setting, contribute to the characteristic nature of the North Shore line, with its homogenous early twentieth century station designs and garden settings. The replacement of the original roof form of the station building with a poorly designed substitute structure detracts from the overall setting and significance.*

This Statement of Significance was last updated 11 May 2009.

Grading of significant elements to Killara Railway Station

Different features of Killara Railway Station have different contributions to its overall heritage significance. As part of the heritage assessment undertaken for the Proposal, features were graded in accordance with the NSW Heritage Division (NSW Heritage Office, 2001) grading criteria, in the following descending order from greatest to lowest (detracting) contribution to the item's heritage significance:

- exceptional
- high
- moderate

- little
- intrusive.

Features within the Killara Railway Station group have been graded as outlined in Table 6-19.

Table 6-19 Killara Station grading of fabric (Heritage NSW, 2009)

Grading	Element meeting criteria
Exceptional	Form and character of the station gardens and their interaction with the local suburban setting.
High	General form and character of the station building.
Moderate	Fabric of the footbridge within the rail corridor and proximity and association with the Killara Post Office on Werona Avenue.
Little	Nil
Intrusive	Replacement roof on the station building and cantilevered kiosk on footbridge.

Archaeological potential

The potential for the presence of archaeological relics in particular places is significantly affected by activities which may have caused ground disturbance. These processes include the physical development of the site and the activities that occurred there. The likelihood for the presence of these relics (i.e. their archaeological potential) is distinct from the archaeological/heritage significance of these remains, should any exist. For example, there may be 'low potential' for certain relics to survive, but if they do, they may be assessed as being of 'high significance'.

The archaeological potential at Killara Station is considered low. There are known subsurface features, such as the historic out-of shed structure, the original platform alignment on Platform 2 and some garden and landscape structures.

6.5.2 Potential impacts

Construction phase

Potential impacts to the heritage significance of Killara Station as a result of the Proposal are summarised in Table 6-20.

Table 6-20 Assessment of impacts to heritage significance of the Killara Railway Station Group (Heritage NSW, 2009)

Criterion	Description of impacts
Historical significance SHR criteria (a)	***New lifts and footbridge widening*** The addition of three new lifts is not expected to impact on the historical significance of the station. The configuration of the station and its key elements that contribute to the station's historical significance (station building and gardens) would remain largely intact, however the installation of the lifts on the eastern (Werona Avenue) side occupy a small footprint within the existing garden. The widening of the footbridge and canopy addition is also not expected to alter the historical significance of the station overall. The footbridge postdates the station platform by a year and allowed access to the station. The footbridge is considered to be of moderate historical significance and would be of a higher grading but for the modification of its original fabric. Most of the remaining original fabric would be retained, and the balustrading to be removed in the widening would be reinstated, thereby maintaining its historical significance. The canopy addition would be to the new section of the footbridge only, leaving the original section of the footbridge without a canopy/awning.
	Station building modifications The Proposal includes the reconfiguration of the existing male and female toilets. Both existing toilets appear to have been upgraded in 1993, with all interior walls, floor, ceiling and door being upgraded. The internal fixings are also modern. Given the extensive remodelling of the toilets in 1993, it is unlikely that the reconfiguration of the internal areas would impact on historically significant fabric. The Proposal would only result in internal modifications to the room layouts and no impacts are expected to the external façade brickwork. The proposed alterations to the station building would not have an impact on the historical significance of the station as the item would continue to act as a tangible link to the development of the railway network and to the surrounding area.
	Boarding assistance zones The configuration of the station and its key elements that contribute to the station's historical significance (station building) would remain intact. The provision of seating and canopies at the two existing boarding assistance zones would have little or no impact to the historical significance of the station.
	Station platform upgrade Other ancillary works, including platform regrading, tactiles, handrails, new ticketing facilities and CCTV upgrades would have a negligible impact to the station's historic heritage significance. The transformer at the northern end of the garden would be modified and connected with the power supply on the station platform for the proposed power supply upgrade. This connection would be made via horizontal directional drilling. Given its proximity to the garden and the garden's high heritage significance, it is recommended that no longitudinal galvanised service trough (GST) is to pass through heritage garden.

Criterion	Description of impacts
Aesthetic significance SHR criteria (c)	***New lifts and footbridge widening*** The construction of the proposed lifts would have a moderate adverse impact on the aesthetic significance of the station. The placement of two new lifts on either side of the footbridge would create new elevated elements that would be visible. The central lift from the footbridge to the station platform would have an adverse impact on the station platform, however it would be separated from the station building by the footbridge supports and platform access stairs. Siting the lift away from the station building allows for views of the station building to be retained. In addition, material selection would be further developed and confirmed through detailed design to respond to the existing heritage context of the station.
	Station building modifications The reconfiguration of the internal male and female toilets would not have an impact to the aesthetic significance associated with the station. Both toilets were recently renovated, and there are no original fixtures remaining in either toilet.
	Boarding assistance zones The introduction of seating and canopies at the two existing boarding assistance zones would have a little adverse impact on the aesthetic significance of the station. The station is lower than the surrounding landscape and is screened from the adjacent streetscape by mature vegetation. The boarding assistance zones are currently located at a reasonable distance from the key elements of Killara Station. Design features would be taken to make the features visually recessive.
	Station platform upgrade The ancillary works, including platform regrading, tactiles, handrails, new ticketing facilities and CCTV upgrades are not expected to have an impact to the station's aesthetic heritage significance.
Social significance SHR criteria (d)	***New lifts and footbridge widening*** The construction of lifts would provide equitable access to the platform, would allow for the continued use of the station, and would retain the connection between the local community, the railway station and the wider rail network.
	Station building modifications The proposed removal of the current male and female toilet fittings and fixtures and installation of family accessible toilet are unlikely to have a negative adverse impact on the social significance associated with this station as the proposed alterations would make the toilets more user friendly.
	Boarding assistance zones The addition of seating and canopy infrastructure at the existing boarding assistance zones would not have an impact to the social significance associated with the station.
	Station platform upgrade The proposed ancillary works would have no impact on the social significance associated with the station.

Criterion	Description of impacts
Rarity SHR criteria (f)	***New lifts and footbridge widening*** Overall, the construction of the lifts and widening of the footbridge would have a minor impact on the rarity of the garden. The lift on the southern (Werona Avenue) side of the footbridge is proposed to be placed within the garden area of the station. As no images or plans of the gardens to the south of the footbridge have been located, the layout of this section of the garden is uncertain, however are not anticipated to be of high significance as the garden is mainly associated to the footbridge's north. It should also be noted that while the gardens are still well-cared for and maintained, they no longer have the same level of formality and complexity as displayed in the 1950s. Design elements such as garden bed edging and plants were altered over time and their provenance is uncertain. The approximate location for the proposed lift at Werona Avenue is in an overgrown garden bed adjacent and to the south of the existing footbridge. This southern part of the garden near the footbridge was not featured in photographs or promotional material with the section of the garden to the north of the footbridge having been more comprehensively recorded. While the lift installation would cause an adverse impact to the garden, this can be partially mitigated by the redesign of the garden. Given that the section of garden to the south of the footbridge is different in character to the section to the north of the footbridge (comprising only trees, no formal beds), the installation of the lift could represent an opportunity to redesign both sections of the garden as a whole.
	Station building modifications There are no rarity values attached to the toilets. The reconfiguration works are not expected to have an impact to the rarity values associated with the station.
	Boarding assistance zones The addition of seating and canopy infrastructure at the existing boarding assistance zones would not have an impact to the rarity values associated with the station.
	Station platform upgrade The ancillary works, including platform regrading, tactiles, handrails, new ticketing facilities and CCTV upgrades are not expected to have an impact to the station's rarity values.
Representativeness SHR criteria (g)	***New lifts and footbridge widening*** Overall, the construction of the lifts and widening of the footbridge is not expected to have an impact to the representativeness associated with the station. The installation of the new lift to access the footbridge would be away from the principal garden beds and would have a minimal impact on the garden. The footbridge would also be retained in an altered form, with the existing original fabric – an important component of the moderate heritage significance grading in the Railway Footbridges Conservation Management Strategy (2016), retained. If the balustrading removed during the widening can be retained and reused on the widened footbridge, this would maintain the original fabric of the footbridge and therefore the grading of significance.
	Station building modifications Both the current male and female toilets have recently been reconfigured, including with new internal fixtures. As such, the internal refitting of both toilets as a family accessible toilet and unisex ambulant toilet would not have a negative impact to the significance under this criterion.

Criterion	Description of impacts
	Boarding assistance zones
	The addition of seating and canopy infrastructure at the existing boarding assistance zones would not have a direct impact to the representative significance associated with Killara Station as the new structures would not have a physical impact to the station building or its other key elements. The new structures would be new visible structures, however, they would be easily recognisable as being modern, and would be reversible without impacting the significant fabric associated with the station.
	Station platform upgrade
	The ancillary works, including platform regrading, tactiles, handrails, new ticketing facilities and CCTV upgrades are not expected to have an impact to the station's representativeness heritage significance

Summary of heritage impacts

The potential impacts to the Killara Railway Station Group have been assessed against the criteria outlined in the NSW Heritage Division guidelines (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). A summary of the impacts and their grading is outlined in Table 6-21.

Table 6-21 Summary of the nature of the direct impacts

Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	None
Moderate negative impacts (irreversible loss of fabric or values of local significance, minor impacts on State significance)	The construction of the new lift to access the footbridge at the southern (Werona Avenue) side of the station would have a moderate negative impact to significant heritage fabric. The widening of the footbridge and associated canopy would have a moderate negative impact to significant heritage fabric. The modification of the two new boarding assistance zones to provide seating and canopies on the platform would have a low to moderate negative impact to the aesthetic significance associated with the station.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance, loss of fabric not of significance but which supports or buffers local significance values)	The visual impact from the construction of the new lifts on either side of the footbridge is assessed as minor and can be mitigated to minimise the visual impact.
Negligible or no impacts (does not affect heritage values either negatively or positively)	The reconfiguration of the existing toilets into the new ambulant toilet, and creation of a family accessible toilet is considered to have a neutral heritage impact. The proposed work would be contained within the existing toilets, which were also upgraded in 1993. All current fixtures and fittings, including tiles, are not original. The regrading of the station platform surface and installation of the tactiles would have a negligible impact to the heritage significance associated with the station.

Impact Type	Impact
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	The Proposal would improve safety and accessibility and the station would be enhanced following its reconfiguration. The construction of the new lift structures would enable access to and appreciation of the station by a wider demographic.

Potential archaeological impacts

The archaeological potential at Killara Station is considered low. There is potential for archaeological remains to be present associated with the historic out-of shed structure, the original platform alignment on Platform 2 and some garden and landscape structures. Should any remains be exposed during construction, the Transport for NSW *Unexpected Heritage Finds Guidelines* would be followed. In the event that any archaeological remains are discovered during construction work, the Heritage Council must be notified under Section 146 of the *Heritage Act 1977*.

Operational phase

The Proposal would not substantially impact non-Aboriginal or archaeological heritage. While there would be minor permanent visual impacts on the heritage setting of the station, this would be offset by the long term benefits by improving accessibility at Killara Station.

6.5.3 Mitigation measures

A number of site-specific mitigation measures are proposed to minimise the potential heritage impact of the Proposal on the Killara Railway Station Group. These include:

- a heritage architect must be engaged to provide ongoing heritage and conservation advice throughout the detailed design process and would:
  - confirm and document options analysis around impacts to significant elements and design mitigation to avoid or reduce adverse impacts
  - ensure adherence to relevant policies, including *Heritage Platforms Conservation Management Strategy*, *Railway Footbridges Heritage Conservation Strategy*, *Canopies and Shelters: Design Guide for Heritage Stations* and the *Station Access Heritage Conservation Guide*
  - supervise work to significant fabric, including to the handrails, balustrades and newel posts of the footbridge handrails, connection of the widened footbridge elements and all original fabric of the station building, the platform and in the vicinity of the garden.
- Transport for NSW would continue to consult with Sydney Trains Heritage throughout the design process to address preliminary feedback on subjects including the form and materials of the lift and generally, landscaping and works associated with new and existing services
- during the detailed design phase of the Proposal, a landscape plan would be provided either by, or with the input of, a qualified heritage landscape specialist which would include mitigation measures for any necessary tree removal and include species for replanting that are appropriate to the heritage landscape.

- related to the proposed lifts and widened footbridge, detailed design would investigate:
  - options to minimise impacts to the railway garden
  - retention of the original fabric of the footbridge, in particular the star newels at the bottom of the stairs, hand rails and balustrades
  - re-use of the original balustrade on the footbridge at the areas of footbridge widening. Where supplementary balustrades and handrails are required, these would be designed to be compatible with the retained elements in terms of form, placement and materiality
  - options to minimise impacts to the brickwork associated with the platform, including the edge coping walls
- related to the station building upgrade:
  - care would be taken when undertaking all demolition works so as not to damage significant fabric
  - any new brickwork would match the original and new interior tiling would consider the Sydney Trains *Draft – NSW Heritage Station Passenger Tile Finishes (2020)*
  - new services, outlets, wall units and brackets would be located internally in areas already modified and/or consolidated in one location
  - impacts to the detailed architraves around the current toilet entry door and transom window would be minimised
- as close as possible, the height of the eaves associated with the two new boarding assistance zone canopies would match the height of the eaves associated with the station building. The proposed canopies would aim to reduce impact to significant fabric and the visual impact of the Proposal through recessive materials and sympathetic design
- platform regrading work would not cover any existing wall vents that have been installed along the lower course of the brickwork to the station building. If cast iron gratings are removed, these would be stored for future reuse
- a heritage interpretation plan would be prepared and implemented for the station in accordance with *Interpreting Heritage Places and Items and the Sydney Trains Heritage Interpretation Guideline* and would investigate methods of reinstating of the original footbridge lighting as a primary interpretation element. The Proposal is considered a medium/major project in terms of evaluating interpretation options and therefore a nominal score of 70 in accordance with the guidelines should be achieved
- prior to any construction, a photographic recording would be undertaken of the station, including (but not limited to) the station building, platform, footbridge and garden in accordance with *Photographic Recording of Heritage Items using Film or Digital Capture* (Heritage Council of NSW, 2006)
- a heritage induction would be provided to all on-site staff and contractors involved in the Proposal. The induction would clearly describe the heritage constraints of the site
- a stop work procedure would be implemented in accordance with *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019d) to manage activities in the unlikely event that intact archaeological relics or deposits are encountered.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.6 Socio-economic impacts

6.6.1 Existing environment

Killara is a secondary local centre within the Ku-ring-gai LGA. Surrounding land uses include high density and low density residential development, with some shops in the nearby neighbourhood centres, and recreational and sporting facilities at the nearby Regimental Park. There is also currently a retail kiosk (currently not leased) located on the station's footbridge. The Killara neighbourhood centre includes a post office, two retail shops, the Marion Street theatre (currently closed for renovations) and a café. Other facilities within the residential zone to the west of the station include a lawn bowls and tennis club, churches, schools and a wellness hospital. Half a kilometre to the west running parallel to the station is the Pacific Highway which also provides a north-south transport route for motorists travelling from the Sydney CBD northwards.

Land use surrounding the station is predominately residential comprising single and double-storey detached brick dwellings to the east of the station and a mixture of low and high density residential developments to the west side of the station.

Demographics

A review of the Australian Bureau of Statistics 2016 census data provides a brief demographic overview. The suburb of Killara has:

- a population of 10,574 people with a median age of 40
- approximately 53.7 per cent of the population born in Australia
- 61 per cent of people (who are over the age of 15) in full time employment
- 81 per cent of all households as family households, while 17 per cent of all households as single person households and 2 per cent as group households
- 17 per cent of the population are aged over 65
- approximately a quarter of the employed population (25.8 percent) using the train as their primary method of travel to work.

Travel behaviours

Killara Station is a busy station servicing the northern suburbs of Sydney to and from the Sydney CBD. According to pedestrian counts undertaken in 2015 (AECOM, 2015), the average daily AM peak hour patronage at Killara Station was 1193 and is forecast to increase to 2328 by 2036 (which includes an additional 15 percent to account for potential increases in population).

Over a quarter (25.8 percent) of the suburb's employed population or 1242 people travel to work by train. This is compared with the Greater Sydney area average of 10.9 percent (ABS, 2016). The train therefore accounts for a relatively large proportion of travel choices for commuters. In 2006, 790 or just under 20 percent of people travelled to work by train (ABS, 2006). The combined effect of population growth as well as proportional rise in those choosing to travel by train show local growth in the area and change of travel behaviours.

Strategic outlook

The Ku-ring-gai LSPS identifies Killara as a secondary local centre. Local centres are defined as areas that contain a local railway station or bus route on an arterial road corridor, meet the criteria for 30 minute access to a strategic centre (the nearest being Chatswood), and are

supported by retail and other services predominantly utilised by a localised residential population. According to the LSPS (Ku-ring-gai Council, 2020a), population growth over the past five years have been concentrated in the suburbs of Lindfield, Killara, Gordon and St Ives, driven by an increase in the provision of high density housing along major roads and the North Shore rail line.

6.6.2 Potential impacts

Construction phase

Construction of the Proposal has the potential to temporarily impact customers, pedestrians, residents, motorists, local businesses and other receivers because of:

- temporary disruptions to the existing pedestrian facilities surrounding the station, particularly for pedestrians accessing the station when construction work for the lifts, footbridge and footpaths is being undertaken
- temporary disruptions to local traffic movements near the station
- temporary loss of parking availability in the council operated (time limited) car park off Culworth Avenue to accommodate the construction compound
- temporary reduction in available parking spaces on the surrounding street network for residents and visitors from construction vehicle parking, including construction worker vehicles
- closure of the retail kiosk on the station's footbridge
- increased truck and vehicle movements due to the delivery of materials and equipment and the transportation of waste
- construction noise and vibration impacts
- air quality, dust and visual impacts.

Station access would be maintained at all times, except when construction work occurs during a rail shutdown. Rail shutdowns are standard practice for work in the rail corridor that cannot be undertaken while there are regular train movements. Disruptions from rail shutdowns (e.g. requirement for replacement buses) would be as per normal Sydney Trains practice and would occur regardless of the Proposal.

Temporary pedestrian diversions would be placed around the construction areas on the eastern and western sides of the station and on the station platform. Impacts would mainly result from construction for the lift installation. Other impacts would result from partial footpath upgrades including an upgrade to a kiss and ride bay on Culworth Avenue and regraded access to the bus stop on Werona Avenue. Near the station building temporary diversions would include those for the reconfiguration of the existing toilets and storeroom. Construction fencing and pedestrian diversions may also impact those accessing the station from the car park off Culworth Avenue.

Customer parking at the station would be impacted during construction as there would be a construction compound and laydown area located within the council operated (time limited) car park off Culworth Avenue. There would be a temporary loss of up to 40 timed parking spaces in the council operated (time limited) car park for the duration of construction.

Additionally, the area of timed parking on Culworth Avenue would be temporarily unavailable during the construction of the new accessible parking spaces. This impact would temporarily reduce the availability of parking on the western side of the station (at Culworth Avenue) and has the potential to increase demand on surrounding streets. This impact would be temporary and is not expected to be significant, however prior notice would be provided to customers if a temporary loss to existing car parking is required during construction.

There may also be temporary minor disruptions to nearby on-street parking as a result of construction workers parking around the Proposal area. Three cycle parking spaces located on Culworth Avenue would be temporarily unavailable for a short period during upgrades to the existing shelter and cycle parking.

In general, the small number of businesses in the area, including the café and retail premises near Marian Street Theatre, are unlikely to be adversely affected by the proposed work. Although the nearby council operated (time limited) car park would be used as a construction compound site, there is ample street parking available for potential customers to these businesses. There is potential for a minor temporary increase in retail and other purchases from construction workers during the construction period.

Operational phase

Operation of the Proposal would likely result in socio-economic benefits to the Killara community and the wider Ku-ring-gai LGA including:

- improved accessibility for customers on the Killara Station platform by providing three new lifts, wheelchair seating spaces, weather canopies and boarding assistance zones
- improving pedestrian and wheelchair access safety through provision of a new pedestrian crossing, upgrade of the existing footpath along Culworth Avenue, regrading of a section of the existing pedestrian footpath along Werona Avenue
- supporting access to the station by other modes of access including:
  - kiss and ride and accessible parking options: by providing a kiss and ride bay with an accessible space and accessible parking spaces for people with disabilities or limited mobility
  - cycling: relocating existing bike hoops and provision of new bike hoops on Werona Avenue and Culworth Avenue to support those that cycle to the station
  - bus travel: regrading a section of the existing pedestrian footpath along Werona Avenue to provide a level access ramp to the existing bus stop for those that require wheelchair access to be able to easily access connecting bus routes
- additional CCTV cameras contributing to positive CPTED outcomes for the station
- improved toilet facilities including the reconfiguration of the existing toilets to provide a family accessible toilet and a unisex ambulant toilet
- potential economic improvements to surrounding businesses because of increased patronage to the station as a result of improved access.

The Proposal would also involve the permanent closure of the retail kiosk located on the station's footbridge. Given the retail kiosk is currently not leased, and that there is a café located on Marian Street about 150 metres away from the station, the impact of the removal of the retail kiosk is likely to be minor.

Strategic outlook

The Proposal would provide the current and future local Killara community with numerous socio-economic benefits by aligning with key strategic priorities for the area.

The strategic plans outlined in Section 2.1 provide a plan of action to achieve attractive places for the Killara community to live and are focussed around history, heritage and addressing future needs such as population growth and other demographic changes. New infrastructure should address the strategic objectives of these plans in order to respond to present and future socio-economic needs. An assessment of how the Proposal meets the objectives of the

relevant strategic plans including the Ku-ring-gai LSPS, the Ku-ring-gai CSP and Ku-ring-gai ADIP is provided in Table 6-22.

Table 6-22 Ku-ring-gai Council's strategic planning priorities

Theme	Objective/Priority	How the Proposal Aligns
Sustainable infrastructure	LSPS: K1 – Providing well-planned and sustainable local infrastructure to support growth and change. CSP: C4.1 – A community that embraces healthier lifestyle choices and practices	Train travel is an increasingly sustainable form of transport as Sydney's population grows, roads become busier, and the cumulative effect of vehicle emissions continue to contribute heavily to climate change. By increasing accessibility of the station, the Proposal supports train travel as a sustainable travel mode. By encouraging a travel mode that emits less CO^2 than private vehicles, the Proposal would support intergenerational health benefits by decreasing the amount of CO^2 emissions produced by other forms of travel. In addition, by supporting upgrades to cycling and walking infrastructure at and surrounding the station, the Proposal continues to support cycling and walking as active transport modes.
	CSP: T3.1 – An accessible public transport and regional road network that meets the diverse and changing needs of the community	The Proposal would support an accessible public transport network through accessibility improvements to Killara Station. By increasing the accessibility of the station and providing other station upgrades, the Proposal acknowledges and responds to the increasing use of train travel in the area and the diversity of those requiring use of the public transport system.
Infrastructure delivery	LSPS: K2 – Collaborating with State Government Agencies and the community to deliver infrastructure projects	Ku-ring-gai Council has advocated for the upgrade of Killara Station in the LSPS, and therefore the Proposal responds directly to this request for collaboration to deliver infrastructure. To date, there has been collaboration between Transport for NSW, Sydney Trains and Ku-ring-gai Council during the scoping design phase to ensure input to the options selection process. Further opportunities for stakeholder engagement and collaboration would be provided throughout the Proposal's development, including Transport for NSW's Infrastructure SEPP requirements to Council. In addition, the REF would be publicly displayed and presented as a digital REF and Transport for NSW would respond to community issues raised in submissions on the REF. There would also be monthly public notices generated before the construction period begins.
Heritage	LSPS: K13 – Identifying and conserving Ku-ring-gai's environmental heritage CSP: P5.1 – Ku-ring-gai's heritage is protected, promoted and responsibly managed	A SoHI has been prepared as part of this REF which considers the impact the Proposal would have on Killara Railway Station Group and other heritage items and concludes there would be no adverse impacts. The SoHI outlines recommendations to minimise any heritage impact including onboarding a heritage architect, a specialist construction contractor experienced in working with heritage fabric, and other measures as described in Section 6.5.

Theme	Objective/Priority	How the Proposal Aligns
Integrated transport	LSPS: Priority K22: 'Providing improved and expanded district and regional connections through a range of integrated transport and infrastructure to enable effective movement to, from and within Ku-ring-gai'	The Proposal would improve opportunities for intermodal journeys by providing accessible kiss and ride and new active transport facilities. The proposed upgrades would also include regrading footpaths, providing level access to an existing bus stop and accessible pathways to and from the station. These works would ensure a variety of access points are accessible for a range of transport modes at the station.
	CSP: Theme 4, T1.1: 'A range of integrated transport choices are available to enable effective movement to, from and around Ku-ring-gai'	
Accessible public transport	CSP: Theme 1, C1.1 – supporting an equitable and inclusive community through improving accessibility to Killara Station	The Proposal would increase the accessibility of the station to people with disabilities, people that are less mobile and customers travelling with children and/or luggage with lifts provided for less mobile passengers. Other interchange upgrades that would facilitate this growth and change include a kiss and ride bay with an accessible space, new accessible parking spaces, and bike hoops as these provisions would likely encourage more user types to access the station. The Proposal would provide accessibility improvements to rail infrastructure, allowing it to meet a higher standard.
	CSP: P8.1 – An improved standard of infrastructure that meets the community's service level standards and Council's obligations as the custodian of our community assets	
	ADIP: Access in the built environment	The Proposal would address some key priorities of this objective, one of which is to provide tactiles along the station platforms.
	ADIP: Public transport and parking	The Proposal would respond to many aspects within this focus area of public transport and parking in the ADIP. These include, but are not limited to, "continue to maintain and upgrade bus stops across the Ku-ring-gai LGA to meet the Accessible Public Transport 2002 standards" This includes providing accessible paths (including unhindered passages) to and from bus stops

6.6.3 Mitigation measures

A number of mitigation measures are recommended to minimise potential impacts on the community with a particular focus on keeping the community informed, including:

- mitigation measures in respect of potential impacts to amenity (e.g. noise, dust and visual) as assessed in the relevant sections of this report and listed in Section 7.2 of this report
- development of a Community Liaison Management Plan (prior to construction), which would identify potential stakeholders and methods for consultation with these groups during construction. The plan would also encourage feedback and

facilitate opportunities for the community and stakeholders to have input where possible

- informing the community of construction progress, activities and impacts in accordance with the Community Liaison Management Plan
- providing contact details for a Project Infoline (24-hour construction response line) and email address to enable ongoing stakeholder contact throughout the construction phase.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.7 Biodiversity

This section provides a summary of the potential biodiversity and tree impacts as a result of the Proposal and was informed by a site inspection of Killara Station by an ecologist and arborist on 23 April 2021. The detailed methodology for the Arboricultural Impact Assessment is provided in the full arboricultural report (Birds Tree Consultancy, 2021).

6.7.1 Existing environment

Landscape context

Killara Station is located within a highly modified and urbanised environment. The area is generally characterised by the rail line, the station itself, car parking, landscaping, pedestrian thoroughfares and operational railway areas.

The landform within which the station sits is generally flat, with a moderate slope down to the north-east. There are no natural waterways in the vicinity of the station, with the closest being Links Creek, approximately 680 metres to the south-west, over the crest of a hill. The nearest waterway downslope from the station is Rocky Creek near Harry Seidler reserve, approximately 700 metres to the north-east. Gordon Creek is also located approximately 1.5 kilometres to the south-east.

The local area has been subject to progressive urbanisation since the late 19th century, with the vast majority of original vegetation being removed during the intervening period and replaced with exotic and native landscaping species.

Database assessment

Database searches do not provide the exact species that are located within or around the Proposal area. They provide an indication of the species that may, are likely, or known to occur in the area based on species' sightings, favoured habitats and behaviours.

A search of the Atlas of NSW Wildlife (NSW BioNet) in April 2021 found records of 83 threatened species listed under the BC Act within a 10 square kilometre area around the Proposal area. This includes Grey-headed Flying Fox (nearest record 180 metres), Little bent-wing bat (nearest record 1.7 kilometres) and *Acacia bynoeana* (nearest record 220 metres).

A further search of the EPBC Act Protected Matters Search Tool in April 2021 indicated the potential presence of up to 80 threatened species and 10 threatened ecological communities within a five kilometre radius of the Proposal area.

No records of threatened species were located within the Proposal area. The nearest fauna record is the Grey-headed flying fox, approximately 180 metres to the south-west, with the nearest flora record being a historic 1927 record of *Acacia bynoeana* approximately 220 metres in the same direction.

Vegetation mapping was also reviewed for the Proposal area. Parts of the station and its surrounds are mapped in the Native Vegetation of the Sydney Metropolitan Area (VIS ID 4489)

as Plant Community Type (PCT) 1237, *Sydney Blue Gum - Blackbutt - Smooth-barked Apple moist shrubby open forest on shale ridges of the Hornsby Plateau, Sydney Basin Bioregion*.

Site inspection

Conditions during the site inspection were cool, approximately 18 degrees and sunny. There had been no rain events throughout the week prior to the survey. There was no evidence of active water flow within any trackside drains or guttering.

The Proposal area has very little remnant native vegetation cover, though has substantial landscape plantings and naturally propagated environmental weeds. The rail corridor immediately around the rail line and station itself appear to be regularly maintained through pruning and mowing. This includes a variety of generally mid-century garden species and common urban environmental weeds of the Sydney region.

On the periphery of the Proposal area, adjacent to the stairs leading to Culworth Avenue are several native trees including *Angophora floribunda* and *Eucalyptus sideroxylon*.

The overall habitat value of the Proposal area (for both flora and fauna) is considered to be low. This is based on the relatively low density of mature native vegetation and the absence of complex habitat features such as coarse woody debris, leaf litter or fallen logs. However, despite the site's urban context, it is likely to be used by both urban-adapted common native and exotic fauna.

Habitat for migratory birds was noted to be absent during the site inspection.

Flora

Vegetation observed within the landscaped areas of the station comprises a mix of native and exotic species and includes:

- *Angophora floribunda*
- Sydney blue gum (*Eucalyptus saligna*)
- Spotted gum (*Corymbia maculata*)
- Red ironbark (*Eucalyptus sideroxylon*)
- Blueberry Ash *(Elaeocarpus reticulatus)*
- Lantana (*Lantana camara*)
- Common fern (*Athyrium filix-femina*)
- Elk horn fern (*Platycerium bifurcatum*)
- Jacaranda (*Jacaranda mimosifolia*)
- *Camellia oleifera*
- Bamboo.

Fauna

Targeted surveys for threatened or migratory fauna were not conducted during the site inspection based upon the lack of any previous records of threatened species within the vicinity of the station. The Proposal area is highly disturbed and is subject to ongoing human activity including train and pedestrian movements throughout the day and night. As such the potential habitat value for threatened or migratory fauna is likely to be low.

There was no immediate evidence of extensive use of the site by native mammals. Evidence of introduced species, such as the European rabbit (*Oryctolagus cuniculus*) was noted due to the presence of faeces. Some vegetation (such as the tree shown in Figure 6-11) would

provide occasional roosting and foraging resources for birds. The surrounding area would provide a minor degree of reptile habitat, particularly for snakes and lizards. Amphibian habitat is likely to be restricted to the most urban and disturbance adapted species only, such as striped marsh frog and common eastern froglet, if at all.

Fauna observed during the site inspection included:

- Noisy miner
- Rainbow lorikeet
- Australian magpie.

6.7.2 Potential impacts

Construction phase

The Proposal would require the trimming and removal of native and exotic shrubs, ground covers and trees. The majority of this clearing would be required around the proposed lift locations on both the eastern and western entrances to the station. A total of six trees would be required to be removed as part of the Proposal.

On the western side of the station (Culworth Avenue), impacts would be limited to one semi mature *Eucalyptus sideroxylon*, one semi-mature *Melaleuca sp.* and a small area of environmental weeds as shown in Figure 6-11.

On the eastern side of the station (Werona Avenue), affected vegetation would include planted landscaping species and common native species including *Melia azedarach*, *Pittosporum undulatum* and *Celtis sinensis*.

Figure 6-11 Vegetation to be removed to facilitate the lift installation on Culworth Avenue

Some minor trimming and or removal of vegetation would be required for installation of the ramp to the bus stop on Werona Avenue and the power supply upgrade which includes an upgrade of the existing transformer at the northern end of the station as shown in Figure 6-12. The vegetation in this location is comprised of bamboo and a small number of *Camellia oleifera*. The removal of this vegetation would not result in any significant impact.

Figure 6-12 Vegetation to be trimmed or removed around the existing transformer

The loss of vegetation over both the eastern and western sides of the station is expected to be up to 200 square metres. This would not represent a significant impact in the context of the broader vegetation present in the area and is likely to be readily replaced through landscaping efforts associated with the Proposal. Any vegetation to be removed as part of the Proposal would be managed in accordance with Transport for NSW's *Vegetation Management (Protection and Removal) Guideline* (2019e).

The proposed resurfacing of the Werona Avenue footpath to the existing bus stop has the potential to impact the roots of adjacent trees within the adjacent rail corridor and road verge. No excavation is required in this area and therefore no encroachment into the tree protection zone of these trees would occur. Therefore, these trees are able to be retained.

Despite the Proposal area's urban context, it is likely to be used by both native and exotic fauna. The degree of usage is likely to be low given the highly urbanised surrounding environment. Overall, the Proposal is considered unlikely to result in a significant impact on individual fauna species or the habitat of threatened or migratory fauna.

Construction of the Proposal has the potential to aid the spread of weeds into and out of the site during construction (both within the rail corridor and adjacent areas). The degree of this impact would be readily managed via the application of suitable hygiene protocols outlined in Section 7.2 and as such is considered to be minor.

Operational phase

The operation of the Proposal would not result in any ongoing impacts to vegetation within or around the station. Lighting at the station is proposed to be upgraded as part of the Proposal. Provided that lighting is sympathetically designed to avoid spill into surrounding areas, this is not expected to result in any substantial impacts upon native fauna.

The operation of the Proposal is intended to facilitate additional use of the station by a range of customers. While this may result in a minor increase in the level of human activity, this is not expected to affect native fauna in the area.

6.7.3 Mitigation measures

A number of mitigation measures are proposed to minimise the biodiversity impact of the Proposal including:

- disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be trimmed or removed in the arboricultural assessment (Birds Tree Consultancy, 2021) would be clearly demarcated onsite prior to construction. Trees to be retained would be protected through temporary protection measures
- Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the arboricultural assessment (Birds Tree Consultancy, 2021). Tree protection would be undertaken in line with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of TPZs
- resurfacing of the Werona Avenue footpath would be undertaken via tree sensitive construction measures, such as using a pier and beam, where works occur within TPZs
- lighting would be designed to minimise spill into surrounding areas as far as practical to avoid impacts upon native fauna.
- trees nominated for potential removal would be offset as per the requirements of Transport for NSW Vegetation Offset Guide DMS-SD-087.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.8 Contamination, landform, geology and soils

6.8.1 Existing environment

Geology and soils

The *1:100,000 Geological Map of Sydney* indicates that Killara Station is underlain by Ashfield Shale of the Wianamatta group which is comprised of black to dark-grey shale and laminate. The station and surrounding area is classified as part of the Hydrosols group, with the primary soils identified as yellow podzolic soils with regular occurrences of earthy sands and siliceous sands in the surrounding area.

The 1:100,000 Soil Landscape Series Sheet viewed through the NSW Government Sharing and Enabling Environmental Data (SEED) portal reveals that Killara Station is underlain by the Glenorie Soil Landscape. The Glenorie landscape is described as extensively cleared, with undulating to rolling low hills, high soil erosion hazard and localised impermeable surfaces with highly plastic soil.

A search of relevant datasets within the SEED portal was performed to establish the existing soil salinity level for the Proposal area. No salinity results were mapped within or near the Proposal area.

A review of the Atlas of Australian Acid Sulfate Soils indicated that there is a low probability of occurrence of ASS within one kilometre of the Proposal area. The area is mapped as class 5, where ASS are not typically found. ASS contain iron sulfides which when disturbed or exposed to air can release sulfuric acid. These soils are common along the coast of NSW and are also found inland around waterways, wetlands and drainage channels. The NSW Government Acid

Sulfate Soils Risk Maps indicate that the area surrounding Killara is classified as having no known occurrence of ASS.

The platform is elevated relative to the rail track bed and land surrounding the rail corridor. The topography of the site is undulating to the west of the station and slopes east to the east side of the station.

Contamination

The NSW EPA list of contaminated sites and record of notices in Killara and surrounding suburbs (as at 22 April 2021) indicates that there are two recorded sites with current contamination notices, and two other sites with former notices within one kilometre of Killara Station. Sites with current notices are:

- the 7-Eleven service station (Former Mobil) located at 496 Pacific Highway approximately 600 metres to the south west of Killara Station
- the former BP service station in Lindfield at 478 Pacific Highway approximately 700 metres away to the south west of Killara Station.

Former notices in the area are:

- the former Caltex service station at 692B-694 Pacific Highway approximately 650 metres to the north west of Killara Station
- the land adjacent to the former service station site at 684-684a, 960, 692, and 969 Pacific Highway approximately 620 metres to the north west of Killara Station.

Other potentially contaminating sites in the Proposal area include:

- other petrol stations along the Pacific Highway (BP Petrol Station at 544 Pacific Highway around 500 metres away)
- car repair shops and garages (such as Killara Garage at 544 Pacific Highway located approximately 450 metres away)

As the station precinct has operated since 1899, there is a risk of typical rail-related contaminants within the Proposal area relating to:

- fuel and oil spills, and engine emissions from historical rail activities
- pesticides and herbicides from weed and vegetation control
- potential asbestos containing materials within historical cabling and pipework ducting
- former site structures and brake linings
- various contaminants associated with the fabric of old rolling stock and structures and associated with imported fill and ballast.

AS 4482.1-2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds* lists chemicals used by specific industries, and includes chemicals commonly associated with railway yards which may be present at Killara Station, including:

- hydrocarbons
- arsenic
- phenolics
- heavy metals

- nitrates and ammonia.

The Proposal would include modifications to the existing toilet facilities in the station building and minor station building modifications. Asbestos and lead paint are likely to occur within these items and have been identified in station buildings at nearby stations (Waitara) built in the 1890s.

6.8.2 Potential impacts

Construction phase

The Proposal would require excavation work for the installation of foundations and footings for new lift shafts and lifts, platform modifications and resurfacing. Other earthworks may be required for footpath work, relocation of services, drainage connection work and ground levelling work.

Soil disturbance, erosion and sedimentation

Excavation and other earthworks, if not adequately managed, could result in the following impacts:

- erosion of exposed soil
- dust generation from excavation and vehicle movements over exposed soil
- increase in sediment loads entering the stormwater systems and/or local runoff.

Such impacts can potentially lead to adverse environmental impacts on biodiversity, for example through the introduction of sediment downstream into waterways that connect to Rocky Creek near Harry Seidler Reserve (approximately 700 metres north-east) or Gordon Creek (approximately 1.5 kilometres south-east). These impacts would be minor given the scale of the work, limited amount of ground disturbance required, and the relatively flat surrounding topography and stability of the Proposal area. Notwithstanding, appropriate erosion and sediment control measures would be implemented to manage potential impacts (refer to Table 7-1 for further detail).

As there is a low probability of ASS occurring in the Proposal area, there are not expected to be any impacts associated with ASS.

Contamination

Excavation and other earthworks have the potential to expose contaminants, which, if not appropriately managed, can present a health risk to construction workers and the community. Contaminants can also pose an environmental risk if they are released to soils or nearby waterways.

As there is potential for existing soil contamination onsite, chemical testing and visual characterisation in accordance with the *Waste Classification Guideline* (EPA, 2014) would be undertaken to confirm the composition and nature of excavated material. Potential contamination at the Proposal area is unlikely to be at a level that would preclude the proposed work, especially as there is no change to the existing land use. Where spoil is classified as unsuitable for reuse, it would be transported to an appropriately licensed offsite facility.

Construction work to the station building also has the potential to disturb asbestos containing material and other hazardous substances (such as lead paint), posing a potential health risk to both construction workers and passengers. Potential contamination impacts may also arise from accidental spills of fuels, lubricants and chemicals used for construction plant and equipment. Accidental spills have potential to contaminate soils and waterways. The risk of

impacts from contamination from construction activities is considered to be low if the mitigation measures identified in Table 7-1 are implemented.

Operational phase

There would be no lasting risks to geology, soils or contamination as a result of the operational phase of the Proposal.

6.8.3 Mitigation measures

As part of the CEMP, a site-specific Erosion and Sediment Control Plan/s would be prepared and implemented in accordance with the '*Blue Book*' – *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). The Erosion and Sediment Control Plan would be established prior to the commencement of construction and be updated and managed throughout according to the activities occurring during construction.

An environmental risk assessment would be undertaken prior to construction and would include a section on contamination as per the Transport for NSW Standard Requirements. Measures to mitigate potential impacts from contaminated soil/materials would include an unexpected contamination finds procedure and Waste Management Plan, as part of the CEMP. All waste would be managed in accordance with relevant legislation.

Appropriate mitigation measures would be implemented to manage hazardous substances during demolition work. This would include the removal of hazardous materials from the structure by appropriately licensed asbestos/hazardous waste removalists and in accordance with relevant legislation and guidelines (refer to Section 7.2 for further detail of waste-related impacts).

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface Water

The site is mostly impervious, with the rail corridor and station area runoff generally discharges through local council-maintained infrastructure. Stormwater from the site would be expected to ultimately discharge into Rocky Creek near Harry Seidler Reserve (approximately 700 metres north-east) or Gordon Creek (approximately 1.5 kilometres south-east).

Rocky Creek and Gordon Creek flow in an easterly direction with both joining Middle Harbour in East Killara. Middle Harbour runs south, with an outlet at Middle Head and North Head into Sydney Harbour. The Proposal area is located within the Middle Harbour catchment and is not located within a flood planning area.

Flooding

The Proposal area is not mapped within Ku-ring-gai Council's records as being flood prone.

Flood studies are currently being undertaken for the Middle Harbour northern catchment and Middle Harbour southern catchments which includes Rocky Creek in Gordon and Killara and Gordon Creek in Lindfield and East Killara respectively. These flood studies commenced in 2020 and are now seeking feedback from the community (Ku-ring-gai Council, 2020b; Ku-ring-gai Council, 2020c).

On the western side of the station the topography is undulating which may result in localised flooding and pooling of water nearby. On the eastern side of the station the topography gradually slopes east. Therefore, it is likely that during rainfall events, runoff discharges downhill and is unlikely to flood at or immediately surrounding the east side of the station.

Groundwater

The Australian Government Bureau of Meteorology Groundwater Explorer mapping system was used to identify all bores in the vicinity of the Proposal area. Within a one kilometre radius five bores were identified, one at approximately 500 metres east, three at approximately 600 metres west, and one located at approximately 650 metres south. Given the distance of the Proposal from the bores and depth of excavation proposed, it is unlikely that any contamination associated with the station would impact the bores.

Given the nature of the surrounding locality as a highly developed urban area approximately 10 kilometres from the Sydney CBD, it is considered unlikely that the groundwater in the area would be used for any sensitive purposes such as a source for drinking water. There is a reticulated drinking supply in this area.

According to the DPIE geological maps, soils at and surrounding Killara are Ashfield Shale which has low permeability, high salinity and acts as an aquitard restricting the flow of groundwater between aquifers. According to a recent study of the Beaches Link and Gore Hill Freeway Connection (Arcadis & Jacobs, 2017) located approximately six kilometres south of Killara, groundwater levels in the Ashfield Shale were observed to occur approximately nine metres below ground level.

A similar report prepared by WSP in 2011 for a property in Waitara approximately eight kilometres north of Killara also confirmed groundwater soils to have low permeability, and a depth of approximately nine metres (WSP Environmental Pty Ltd, 2011). Based on these sources, it is considered likely that similar conditions exist within the vicinity of the Proposal area.

6.9.2 Potential impacts

Construction phase

The construction phase of the Proposal has the potential to impact on hydrology and water quality.

The Proposal has the potential to increase pollutant loads within local waterways through the release of sediment and debris from excavation during construction. This would be somewhat naturally mitigated by the substantial separation between the Proposal area and nearby waterways. Rocky Creek and Gordon Creek are the closest recognised waterways and are located approximately one kilometre and 1.5 kilometres away respectively from the Proposal. Despite this, it is recommended that suitable sediment control measures are implemented and maintained during construction. Should these be implemented, it is expected that the overall impact upon local waterways and their water quality would be negligible to minor.

It is estimated that the maximum depth of excavation required for the lift installations would be approximately six metres, which is approximately two metres above the groundwater level identified in the reports for the sites closest to the station which were approximately six to eight kilometres away. As such, it is not expected that groundwater would be intercepted and the potential for impacting groundwater is low.

Direct impacts to the underground stormwater network may occur from construction activities. Appropriate controls would be detailed in the CEMP to ensure the drainage points are adequately protected during construction activities.

Operational phase

The Proposal does not change the elevation of the area in a way that would modify the current storage capacity and as such, it is unlikely that the Proposal would pose any risk of changing flood patterns. Slight elevation changes would be limited to regrading a section of the existing pedestrian footpath along Werona Avenue to provide a level access ramp to the existing bus stop, upgrading the existing footpath along Culworth Avenue and regrading the station

platform. These activities would likely improve any localised flooding issues associated with these areas.

New drainage outlets installed near the new lift areas would connect to existing stormwater pits. Runoff from the reconfigured pathways would continue to drain to the existing street stormwater system.

6.9.3 Mitigation measures

An Erosion and Sediment Control Plan would be prepared and implemented for the Proposal in accordance with the requirements of the Blue Book (Landcom, 2004) to manage risks to water quality. This would include specific controls to protect the stormwater network around Killara Station.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.10 Air quality

6.10.1 Existing environment

The existing air quality of the surrounding environment is considered to be characteristic of a suburban environment. Sensitive receivers in the vicinity of the Proposal include staff and customers at Killara Station, residential properties along Werona Avenue and Culworth Avenue and the users of the Killara neighbourhood centre's facilities on Marian Street.

A search of the National Pollutant Inventory undertaken on 21 April 2021 for the 2018/2019 reporting period identified no polluting sources within three kilometres of the Proposal.

Other contributors to air quality within the local area would include emissions from motor vehicles on the surrounding road network, particularly from heavy vehicles along the Pacific Highway.

6.10.2 Potential impacts

Construction phase

Temporary air quality impacts that have the potential to occur during construction include minor increases in dust and emissions of carbon monoxide, sulfur dioxide, particulate matter, nitrous oxides, volatile organic compounds and other substances associated with excavation and the combustion of diesel fuel and petrol from construction plant and equipment.

Anticipated sources of dust and dust-generating activities include:

- removal of the retail kiosk on the existing footbridge
- excavation for the lift shafts
- demolition work within the station building for the proposed toilet modifications
- movements in the construction compound areas
- trenching and excavation for the footpath work and relocation of services
- loading and transfer of material from trucks
- other general construction activities.

The Proposal would have a minimal impact on air quality as it would not involve extensive excavation or other land disturbance with the potential to generate significant quantities of dust. Standard management measures would be established to manage dust emissions from construction work.

The operation of plant, machinery and trucks would also contribute to exhaust emissions in the local area, however, these impacts would be short-term and minor due to the limited number of plant, machinery and vehicles required.

Operational phase

Overall impacts on air quality during operation would be negligible as the Proposal would not result in a change in land use or introduce activities that impact upon air quality. As the Proposal would increase access to public transport, the use of public transport would be expected to lead to a small reduction in private vehicle emissions in the long-term, which may contribute to an improvement in local air quality.

6.10.3 Mitigation measures

Mitigation measures to manage air quality include measures regarding maintenance and efficient operation of plant and equipment and for dust suppression including watering, covering loads and appropriate management of any tracked dirt/mud on vehicles.

Refer to Table 7-1 for a full list of proposed mitigation measures.

6.11 Waste

During construction of the Proposal, the following waste materials would be generated:

- excavated spoil
- asphalt and concrete
- surplus building materials and building waste (metal, timber, plastics, etc.)
- electrical wiring and conduit waste
- hazardous waste (chemicals and potentially asbestos)
- green waste
- general waste, including food scraps generated by construction workers.

Waste management would be undertaken in accordance with the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act). A Waste Management Plan would be prepared to identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities along with other onsite management practices such as keeping the area tidy and free of rubbish.

The handling, storage, transport and disposal of asbestos and hazardous waste (including any lead waste) would be in accordance with the requirements of relevant EPA and Safe Work NSW guidelines. Waste management targets in consideration of the ISCA Infrastructure Sustainability Rating Scheme (v1.2) (ISCA, 2018) or the Transport for NSW Sustainable Design Guide v4 would be developed for the Proposal and would include reuse and recycling.

6.12 Sustainability

The design of the Proposal would be based on the principles of sustainability, including aiming for an excellent rating as a program under the ISCA Infrastructure Sustainability Rating Scheme (v1.2) or equivalent under the Transport for NSW Sustainable Design Guide v4 and the Transport for NSW Environmental Management System (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.3 for more information regarding the application of these guidelines.

Further positive impacts in relation to climate change and sustainability associated with the Proposal include encouraging a reduction in private vehicle use and increasing the accessibility of public transport services.

6.13 Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate and understand the limitation of adaptation. The effects of climate on the Sydney region can be assessed in terms of weather changes, storm intensity, flooding and increased risk of fire.

Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall expected to occur in a 100-year average recurrence interval flood event would occur more frequently. The Proposal would be designed to withstand the effects of flooding and rainfall, for example through adequate drainage.

Climate change could lead to an increase in frequency and severity in bushfires. The Proposal is not situated on land mapped as bush fire prone, but would be designed with appropriate fire protection measures.

The climate projections for Metropolitan Sydney in 2030 include an increase in mean temperature of 0.7°C which is expected to rise 1.9°C by 2070. Projections also include an increase in the number of hot days with a maximum temperature of over 35°C and increased annual rainfall.

Climate change risks to the Proposal is based on projected weather conditions, the Proposal's scope items, and feedback on similar proposals. It is based on the following considerations:

- the Proposal is not situated on land mapped as bushfire prone land
- the Proposal is not situated on flood prone land
- lifts and other station infrastructure could be subject to an increased frequency of extreme heat days which:
  - may pose a threat to human health on power outages due to extreme heat
  - may make it uncomfortable for passengers waiting to alight the train.

The detailed design would consider the impacts of climate change on the Proposal through:

- selection of materials for durability in extreme conditions and that minimise heat retention
- incorporate fire resistant/retarding materials wherever practicable
- incorporate engineering and design features to ensure structures are constructed to minimise direct impacts from severe storms and strong winds.

6.14 Greenhouse gas emissions

An increase in greenhouse gas emissions, primarily carbon dioxide, would be expected during construction of the Proposal due to exhaust emissions from construction machinery and vehicles transporting materials and personnel to and from site.

The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (Transport for NSW, 2019b) or other approved modelling tools. The carbon footprint would be used to inform decision making in design and construction. Greenhouse gas emissions would also be assessed in accordance with ISCA Infrastructure Sustainability Rating Scheme (v1.2) or the Transport for NSW Sustainable Design Guide v4.

Due to the small scale of the Proposal and the short term temporary nature of the individual construction work, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 7-1.

It is anticipated that, once operational, the Proposal may result in an increase in use of public transport and a relative decrease in use of private motor vehicles by commuters who travel to and from Killara. A modal shift in transport usage may reduce the amount of fuel consumed by private motor vehicles with a corresponding relative reduction in associated greenhouse gas emissions in the local area.

6.15 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in close proximity to one another. The impacts may be caused by both construction and operational activities and can result in a greater impact to the surrounding area than would be expected if each project was undertaken in isolation. Multiple projects undertaken at a similar time/similar location may also lead to construction fatigue, particularly around noise, traffic and air quality impacts, if not appropriately managed.

A search of the DPIE Major Projects Register, Transport for NSW's Projects Register, Sydney North Planning Panel Development and Planning Register, and Ku-ring-gai Council Development Application Register was carried out on 11 May 2021 within a one kilometre radius from Killara Station. A summary of developments relative to the Proposal are provided in Table 6-23. Most developments are of relatively minor scale and therefore unlikely to result in cumulative impacts.

Table 6-23 Proposed developments within one kilometre of the Proposal

Development proposals	Address	Status	Distance from Proposal
DA0050/21 Proposed storm and lightning shelter on Killara Golf Course	556 Pacific Highway, Killara	Approved	450 metres west
DA0408/20 Demolition of existing structures and construction of a residential flat building	1A Spencer Road, Killara	Unsatisfactory	450 metres west
DA0063/21 Significant alterations and additions	21A Lynwood Avenue, Killara	Referred to Officer	170 metres east
DA0044/21 Alterations and additions	19 Locksley Street, Killara	Approved	200 metres east
DA0144/20 Alterations and Additions to Marian Street Theatre	2 Marian Street, Killara	Under Assessment	150 metres away south-west
DA0176/21 Demolition of existing structures and construction of 10 three-storey multi-dwelling townhouses	10 Culworth Avenue Killara	Referred to Officer	150 metres west

During construction, the work would be coordinated with other construction activities in the area, including the Marian Street Theatre alterations, the multi-unit developments at 10 Culworth Avenue and at 1A Spencer Road, Killara. Consultation and liaison would occur with Ku-ring-gai Council, Sydney Trains, and other developers identified, to minimise cumulative construction impacts such as traffic and noise.

Coordination with other construction activities would ensure that traffic associated with the construction work would not have a significant impact on the surrounding road network. During operation of the Proposal, traffic and transport impacts would be limited and therefore are not anticipated to result in cumulative impacts to the performance of the surrounding road network.

Based on this assessment, it is anticipated that the cumulative impacts would be minor, provided that consultation with relevant stakeholders and mitigation measures are followed. Refer to Table 7-1 for a full list of proposed mitigation measures.

The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed and implemented as appropriate.

The Proposal forms part of the Transport Access Program which is designed to drive a stronger customer experience outcome to deliver seamless travel to and between modes, encourage greater public transport use and better integrate station interchanges with the role and function of town centres within the metropolitan area and developing urban centres in regional areas of NSW. The cumulative impact of accessible station upgrades in Sydney is more equitable access to infrastructure for people with disability or limited mobility, parents/carers with prams and customers with luggage. The station upgrades also provide a greater incentive for those requiring this access to use public transport.

7 Environmental management

This chapter of the REF identifies how the environmental impacts of the Proposal would be managed through environmental management plans and mitigation measures. Section 7.2 lists the proposed mitigation measures for the Proposal to minimise the impacts of the Proposal identified in Chapter 6.

7.1 Environmental management plans

A CEMP for the construction phase of the Proposal would be prepared in accordance with the requirements of Transport for NSW's EMS. The CEMP would provide a centralised mechanism through which all potential environmental impacts relevant to the Proposal would be managed, and outline a framework of procedures and controls for managing environmental impacts during construction.

The CEMP would incorporate as a minimum all environmental mitigation measures identified below in Section 7.2, any conditions from licences or approvals required by legislation, and a process for demonstrating compliance with such mitigation measures and conditions.

7.2 Mitigation measures

Mitigation measures for the Proposal are listed below in Table 7-1. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 7-1 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of *Environmental Management Plan Guideline – Guideline for Infrastructure Projects*, NSW Department of Planning, Industry and Environment, 2020) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with Transport for NSW's *Guide to Environmental Controls Map* (Transport for NSW, 2019c) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
6.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.

No.	Mitigation measure
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
	Traffic and site access
8.	Prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP and would include at a minimum: • ensuring adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised • maximising safety and accessibility for pedestrians and cyclists • ensuring adequate sight lines to allow for safe entry and exit from the site • ensuring access to railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) • managing impacts and changes to on and off street parking and requirements for any temporary replacement provision • parking locations for construction workers away from stations and busy residential areas and details of how this will be monitored for compliance • routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses • details for relocating kiss and ride and rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus operators. Particular provisions would also be considered for the accessibility impaired • measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP. Consultation with the relevant roads authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.
9.	Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.
10.	Road Occupancy Licences for temporary road closures would be obtained, where required.
11.	Pedestrian access would be maintained throughout construction to ensure that pedestrian connectivity is not impacted as a part of the work and that suitable and safe paths are provided.
12.	Qualified traffic controllers would be used when required during construction work to ensure safe and efficient movement of vehicle and pedestrian traffic on the external road as well as in and out of the construction site.
13.	Fencing and barriers would be installed between the construction site and outside the construction zone to ensure safe and easy navigation of pedestrians and cyclists.
14.	Opportunities to minimise impacts to parking and pedestrian movements through scheduling of construction activities would be investigated.

No.	Mitigation measure
	Urban design, landscape and visual amenity

15.	An Urban and Landscape Design Plan (ULDP) would be prepared by the Contractor, in consultation with the Ku-ring-gai Council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The UDP, at a minimum, would address the following:
	• the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to:
	  ○ site analysis
	  ○ vision and objectives for the infrastructure
	  ○ strategies that apply to ISCA approved guidelines in accordance with Urb-1 (ISCA V 1.2) or the Transport for NSW Sustainable Design Guide v4
	• connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles would be shown
	• integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements would be shown
	• integration with surrounding streetscape including street trees, entries, vehicle cross overs etc
	• integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use
	• design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal.

16.	A Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with the relevant council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The PDP, at a minimum, would address the following: • materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences • location and design of pedestrian and bicycle pathways, street furniture including relocated bus and taxi facilities, bicycle storage (where relevant), telephones and lighting equipment • landscape treatments and street tree planting to integrate with surrounding streetscape • opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal • total water management principles to be integrated into the design where considered appropriate • design measures included to meet to meet ISCA v1 2 or the Transport for NSW Sustainable Design Guide v4 • identification of design and landscaping aspects that will be open for stakeholder input, as required.
17.	All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to *AS 1158 Road Lighting* and *AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting*.
18.	The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.

No.	Mitigation measure
19.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
20.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
21.	During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.
22.	Landscaping within the road verges and along the rail corridor edges (including potential planting of street trees or shrubs, if possible) would be considered along Werona Avenue
23.	Design elements would be considered to reference the heritage character of the station and surrounding landscape while maintaining the visual quality of a 'new' piece of infrastructure rather than replicating heritage items
24.	the heritage gardens on the eastern side of the station would be protected to preserve the character of the suburban station within its heritage setting
25.	Light spill from the construction area into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
26.	Finishes and materials for the station would be complementary to the existing locality and landscape and reflective surfaces would be minimised with a preferred use of muted colours.
27.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the proposal
28.	Implement measures to ensure no tracking of dirt and mud into public roads and other public spaces from construction activities and vehicle movements
	Noise and vibration
29.	Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (Transport for NSW, 2019a) and the Noise and Vibration Impact Assessment for the Proposal (AECOM, 2021b). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.

No.	Mitigation measure
30.	The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise • avoiding any unnecessary noise when carrying out manual operations and when operating plant • ensuring spoil is placed and not dropped into awaiting trucks • avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable • switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded • avoiding deliveries at night/evenings wherever practicable • no idling of delivery trucks • keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site • minimising talking loudly, no swearing or unnecessary shouting, or loud stereos/radios onsite, no dropping of materials from height where practicable, no throwing of metal items and slamming of doors.
31.	The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include: • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction work at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours work • use of quieter and less vibration emitting construction methods where feasible and reasonable.
32.	The CNVMP would include, as a minimum, the following: • identification of nearby residences and other sensitive land uses • description of approved hours of work • description and identification of all construction activities, including work areas, equipment and duration • description of what work practices (generic and specific) would be applied to minimise noise and vibration • a complaints handling process • noise and vibration monitoring procedures, including for heritage structures • overview of community consultation required for identified high impact work.

No.	Mitigation measure
33.	Work would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday, 8.00 am to 1.00 pm Saturdays). Any work outside these hours may be undertaken if approved by Transport for NSW or authorised under the *Environmental Planning and Assessment (COVID-19 Development – Infrastructure Construction Work Days No. 2) Order 2020* (whilst the Order is in effect), and the community is notified prior to these work commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the Transport for NSW Environment and Planning Manager for any work outside normal hours
34.	As per the *Construction Noise and Vibration Strategy* (Transport for NSW, 2019a), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am, and to continuous blocks not exceeding three hours each with a minimum respite from those activities and work of not less than one hour between each block, unless otherwise approved by Transport for NSW.
35.	Blasting, where required, would be limited to between 9am and 5pm Monday to Friday and 9am and 1pm Saturday. There would be no blasting on Sundays or public holidays
36.	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.
37.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed work would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (AECOM, 2021b) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
38.	Vibration (other than from blasting) resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage vibration –British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings Part 2 and German Standard DIN 4150:Part 3 – 1999: Structural Vibration in Buildings: Effects on Structures • For human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS 6472-2:1992 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)*
39.	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory work including jack hammering and compaction for all buildings/structures/roads with a plan distance of 50 metres from the work and all heritage listed buildings and other sensitive structures within 150 metres of the work (unless otherwise determined following additional assessment they are not likely to be adversely affected)
	Aboriginal heritage
40.	All construction staff would undergo an induction in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.

No.	Mitigation measure
41.	If unforeseen Indigenous objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019d) would be followed, and work within the vicinity of the find would cease immediately The Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in coordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and Heritage NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.
	Non-Aboriginal heritage
42.	A heritage induction would be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction.
43.	In accordance with Section 170a of the Heritage Act, Sydney Trains would provide notification of the work to Heritage Division 14 days prior to the commencement of the work.
44.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019d) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Heritage NSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to work recommencing at the location.
45.	A suitably qualified and experienced heritage architect who is independent of the design and construction team's personnel would be engaged to provide ongoing heritage, design and conservation advice throughout detailed design and any subsequent relevant design modifications. The nominated heritage advisor would provide specialist advice throughout the detailed design phase to ensure that the final design adheres to the relevant strategies and the design recommendations in the SoHI (AECOM, 2021c).
46.	Transport for NSW would continue to consult with Sydney Trains Heritage throughout the design process to address preliminary feedback on subjects including the form and materials of the lift and generally, landscaping and works associated with new and existing services.
47.	During the detailed design phase of the Proposal, a landscape plan would be provided either by, or with the input of, a qualified heritage landscape specialist which would include mitigation measures for any necessary tree removal and include species for replanting that are appropriate to the heritage landscape.
48.	Related to the proposed lifts and widened footbridge, detailed design would investigate: • options to minimise impacts to the railway garden • retention of the original fabric of the footbridge, in particular the star newels at the bottom the stairs, hand rails and balustrades • re-use of the original balustrade on the footbridge at the areas of footbridge widening. Where supplementary balustrades and handrails are required, these would be designed to be compatible with the retained elements in terms of form, placement and materiality • options to minimise impacts to the brickwork associated with the platform, including the edge coping walls.

No.	Mitigation measure
49.	Related to the station building upgrade: • care would be taken when undertaking all demolition works so as not to damage significant fabric • any new brickwork would match the original and new interior tiling would consider the Sydney Trains *Draft – NSW Heritage Station Passenger Tile Finishes* (2020) • new services, outlets, wall units and brackets would be located internally in areas already modified and/or consolidated in one location • impacts to the detailed architraves around the current toilet entry door and transom window would be minimised
50.	As close as possible, the height of the eaves associated with the two new boarding assistance zone canopies would match the height of the eaves associated with the existing station building. The proposed canopies would aim to reduce impact to significant fabric and the visual impact of the Proposal through recessive materials and sympathetic design
51.	Platform regrading would not cover any existing wall vents that have been installed along the lower course of the brickwork to the station building. If cast iron gratings are removed, these would be stored for future reuse
52.	A heritage interpretation plan would be prepared and implemented for the station in accordance with *Interpreting Heritage Places and Items and the Sydney Trains Heritage Interpretation Guideline* and would investigate methods of reinstating of the original footbridge lighting as a primary interpretation element. The Proposal is considered a medium/major project in terms of evaluating interpretation options and therefore a nominal score of 70 in accordance with the guidelines should be achieved
53.	Prior to any construction, a photographic recording would be undertaken of the station, including (but not limited to) the station building, platform, footbridge and garden in accordance with *Photographic Recording of Heritage Items using Film or Digital Capture* (Heritage Council of NSW, 2006).
54.	All ancillary works (CCTV, PA, communications, air-conditioning etc) would be undertaken in accordance with the relevant Sydney Trains heritage guidelines. Alternative solutions would be explored where any impacts to significant fabric are identified. Works would avoid fixing new services to the façade of the exterior building and would be contained/ concealed in new development areas. A complete services plan is to be reviewed and assessed by a qualified heritage architect identifying alternative solutions, and submitted to the Associate Director Environmental Impact Assessment (AEDIA) (or delegate) for endorsement prior to works commencing.
	Socio-economic
55.	Sustainability criteria for the Proposal would be established to encourage the Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal
56.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
57.	A Community Liaison Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
58.	Contact details for a 24-hour construction response line, Project Infoline and email address would be provided for ongoing stakeholder contact throughout the construction phase.

No.	Mitigation measure
59.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction.
	Biodiversity
60.	Construction of the Proposal must be undertaken in accordance with Transport for NSW's *Vegetation Management (Protection and Removal) Guideline* (Transport for NSW, 2019e) and Transport for NSW's *Fauna Management Guideline* (Transport for NSW, 2019f)
61.	All workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity.
62.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Arborist Assessment (Bird Tree Consultancy, 2021) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures.
63.	Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Arborist Assessment (Bird Tree Consultancy, 2021). Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs.
64.	Resurfacing of the Werona Avenue footpath would be undertaken via tree sensitive construction measures, such as using a pier and beam, where works occur within TPZs.
65.	Trees nominated for potential removal would be offset as per the requirements of Transport for NSW Vegetation Offset Guide DMS-SD-087.
66.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
67.	Should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete Transport for NSW's Tree Removal Application Form and submit it to Transport for NSW for approval.
68.	For new landscaping work, mulching and watering would be undertaken until plants are established.
69.	Weed control measures, consistent with Transport for NSW's *Weed Management and Disposal Guideline* (Transport for NSW, 2019g), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015*.
	Soils and water
70.	Prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of work and maintained throughout construction.

No.	Mitigation measure
71.	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the work is complete and areas are stabilised.
72.	Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area.
73.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport for NSW's *Chemical Storage and Spill Response Guidelines* (Transport for NSW, 2019h).
74.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport for NSW *Chemical Storage and Spill Response Guidelines* (Transport for NSW, 2019h) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill.
75.	In the event of a pollution incident, work would cease in the immediate vicinity and the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.
76.	The existing drainage systems would remain operational throughout the construction phase.
77.	Should groundwater be encountered during excavation work, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport for NSW's *Water Discharge and Reuse Guideline* (Transport for NSW, 2019i).
	Air quality
78.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (Transport for NSW, 2019j).
79.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
80.	Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling.
81.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.

No.	Mitigation measure
82.	To minimise the generation of dust from construction activities, the following measures would be implemented: • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.
	Waste and contamination
83.	The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum: • identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.
84.	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with SafeWork NSW requirements.
85.	All excavated spoil suitable for reuse would be reused on site and distributed as agreed with Transport for NSW and the Contractor. Excess spoil that cannot be reused and distributed on site would be transported to another Transport for NSW Project site. The reuse of excavated material would be further reviewed and confirmed during construction.
86.	All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility.
87.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste* (EPA, 2014) prior to disposal.
88.	Any concrete washout would be established and maintained in accordance with Transport for NSW's *Concrete Washout Guideline* – draft (Transport for NSW, 2019k) with details included in the CEMP and location marked on the ECM.
	Sustainability, climate change and greenhouse gases
89.	Detailed design and construction of the Proposal is to be undertaken in accordance with the ISCA Infrastructure Sustainability Rating Scheme (v1.2) or the Transport for NSW Sustainable Design Guide v4.
90.	The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (Transport for NSW, 2019b) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction.

No.	Mitigation measure
	Cumulative impacts
91.	The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed in the CEMP, and implemented as appropriate.

8 Conclusion

This REF has been prepared in accordance with the provisions of Section 5.5 of the EP&A Act, taking into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The Proposal would provide the following benefits:

- improved and equitable access to Killara Station for customers resulting from the installation of lifts, accessible parking, upgraded accessible paths and boarding assistance zones
- improved station amenity and safety for customers at the station resulting from the installation of the family accessible toilet, unisex ambulant toilet, new lighting and CCTV
- improved safety of the existing platform stairs by installing new tactiles, new nosings and handrails.

The likely key impacts of the Proposal are as follows:

- temporary changes to vehicle and pedestrian movements in and around the station during construction including temporary footpath diversions
- temporary changes to parking arrangements (including kiss and ride) around the station precinct during construction
- visual changes due to the introduction and removal of elements into the existing environment including three new lifts, removal of the retail kiosk (currently not leased) located on the footbridge and removal of vegetation on both sides of the station
- temporary visual changes during construction due to the introduction of construction compounds and work areas
- temporary noise and vibration impacts during construction
- impacts to the heritage fabric of the station through the installation of the new lifts, modifications to the station entrance and station platform.

This REF has considered and assessed these impacts in accordance with clause 228 of the EP&A Regulation and the requirements of the EPBC Act (refer to Chapter 6, Appendix A and Appendix B). Based on the assessment contained in this REF, it is considered that the Proposal is not likely to have a significant impact upon the environment or any threatened species, populations or communities. Accordingly an EIS is not required, nor is the approval of the Minister for Planning and Public Spaces.

The Proposal would also take into account the principles of ESD and sustainability (refer to Section 3.3.3 and Section 4.3). These would be considered during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

References

AECOM, 2015, Killara Station Precinct – Accessibility and Commuter Car Park: Concept Plan Project, Sydney

AECOM, 2021a, *Landscape Character and Visual Impact Assessment* – Killara Station Upgrade, Sydney

AECOM, 2021b, *Noise and Vibration Impact Assessment* - Killara Station Upgrade, Sydney

AECOM, 2021c, *Statement of Heritage Impact* - Killara Station Upgrade, Sydney

AGIC, 2011, *Guidelines for Climate Change Adaptation,* Australian Green Infrastructure Council (now Infrastructure Sustainability Council of Australia), Sydney

Arcadis & Jacobs, 2017, *Beaches Link and Gore Hill Freeway Connection Scoping Report,* Sydney

Australian Bureau of Statistics (ABS), 2006, *2006 Census Community Profiles: Killara*, Sydney

Australian Bureau of Statistics (ABS), 2016, *2016 Census QuickStats: Greater Sydney*, Sydney

Bird Tree Consultancy, 2021, *Arboricultural development impact assessment report – Killara Station Upgrade,* Sydney

Department of Environment and Climate Change, 2009, *Interim Construction Noise Guideline*, Sydney

Department of Environment, Climate Change and Water, 2011, *NSW Road Noise Policy*, Sydney

Department of Environment and Conservation, 2006, *Assessing Vibration: A Technical Guideline*, Sydney

Department of the Environment and Heritage, 2006, *Climate Change Impacts and Risk Management; A Guide for Business and Government,* Australian Greenhouse Office, Canberra

Department of Planning and Environment, 2014, *A Plan for Growing Sydney*, Sydney

Department of Planning, Industry and Environment, 2020, *Environmental Management Plan Guideline – Guideline for Infrastructure Projects*, Sydney

EPA, 2014, *Waste Classification Guidelines*, Sydney

EPA, 2017, *Noise Policy for Industry,* Sydney

GHD, 2018, Ku-ring-gai Council: Blackbutt Creek Floodplain Risk Management Study and Plan

Infrastructure NSW, 2018, *Building Momentum -State Infrastructure Strategy 2018-2038,* Sydney

Ku-ring-gai Council, 2014, *Access and Disability Inclusion Plan*, Sydney

Ku-ring-gai Council, 2012a, *Ku-ring-gai Cycleways Map*, Sydney

Ku-ring-gai Council, 2012b, *Ku-ring-gai Bike Plan*, Sydney

Ku-ring-gai Council 2015, *Ku-ring-gai Local Environment Plan,* Sydney

Ku-ring-gai Council, 2020a, *Ku-ring-gai Local Strategic Planning Statement*, Sydney

Ku-ring-gai council, 2020b, Middle Harbour – Northern Catchments Flood Study

Ku-ring-gai council, 2020c, Middle Harbour – Southern Catchments Flood Study

Landcom, 2004, *Managing Urban Stormwater: Soils and Construction, Volume - 4th Edition*, Sydney

Ministry of Transport, 2008, *Guidelines for the Development of Public Transport Interchange Facilities*, Sydney

NSW Government, 2015, *State Priorities – NSW: Making It Happen*, Sydney

NSW Heritage Office, 1998, *How to Prepare Archival Records of Heritage Item*, Sydney

NSW Heritage Office, 2001, *Assessing Significance for Historical Archaeological Sites and 'Relics'*, Department of Planning, Sydney

NSW Heritage Office, 2002, *Conservation Management Documents – Guidelines on Conservation Management Plans and Other Management Documents*, Sydney

NSW Heritage Office & Department of Urban Affairs & Planning, 2002, *Statements of Heritage Impact* (Issue 2)

OEH, 2010, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW South Wales,* Sydney

OEH, 2011, *Guidelines for Consultants Reporting on Contaminated Sites*, Sydney

OEH, 2016, *NSW Guide to Surveying Threatened Plants*

Transport for NSW, 2017, *Disability Action Plan 2018-2022*, Sydney

Transport for NSW (former RMS), 2018, *Guideline for Landscape Character and Visual Impact Assessment Practice Note,* Sydney.

Transport for NSW, 2018, *Future Transport 2056*, Sydney

Transport for NSW, 2019a, *Construction Noise and Vibration Strategy*, Sydney

Transport for NSW, 2019b *Carbon Estimate and Reporting Tool Manual*, Sydney

Transport for NSW, 2019c, *Guide to Environmental Controls Map*, Sydney

Transport for NSW, 2019d, *Unexpected Heritage Finds Guideline*, Sydney

Transport for NSW, 2019e, *Vegetation Management (Protection and Removal) Guideline*, Sydney

Transport for NSW, 2019f, *Fauna Management Guideline*, Sydney

Transport for NSW, 2019g, *Weed Management and Disposal Guide*, Sydney

Transport for NSW, 2019h, *Chemical Storage and Spill Response Guidelines*, Sydney

Transport for NSW, 2019i, *Water Discharge and Reuse Guideline*, Sydney

Transport for NSW, 2019j, *Air Quality Management Guideline*, Sydney

Transport for NSW, 2019k, *Concrete Washout Guideline - draft*, Sydney

WSP Environmental Pty Ltd, 2011, *Detailed Site Investigation 4a Romsey Street, Waitara, NSW.*

Appendix A Consideration of matters of National Environmental Significance

The table below demonstrates Transport for NSW's consideration of the matters of NES under the EPBC Act to be considered in order to determine whether the Proposal should be referred to Commonwealth Department of the Environment.

Matters of NES	Impacts
Any impact on a World Heritage property? There are no World Heritage properties in the vicinity of the Proposal.	Nil
Any impact on a National Heritage place? There are no National Heritage places in the vicinity of the Proposal.	Nil
Any impact on a wetland of international importance? There are no wetlands of international importance in the vicinity of the Proposal.	Nil
Any impact on a listed threatened species or communities? It is unlikely that the development of the Proposal would significantly affect any threatened species or communities.	Nil
Any impacts on listed migratory species? It is unlikely that the development of the Proposal would significantly affect any migratory species.	Nil
Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.	Nil
Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal.	Nil
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal does not involve development of coal seam gas or coal mining, nor is it likely to impact on water resources.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near Commonwealth land.	Nil

Appendix B Consideration of clause 228

The table below demonstrates Transport for NSW's consideration of the specific factors of clause 228 of the EP&A Regulation in determining whether the Proposal would have a significant impact on the environment.

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community resulting from increased traffic, noise and reduced visual amenity. Mitigation measures, as outlined in Section 7.2, would be implemented to manage and minimise adverse impacts.	Minor
(b) Any transformation of a locality? The Proposal would introduce new visible elements (three lifts) into the existing landscape. These new elements however would be consistent with the existing use of the station and considered to be common features at railway stations. The Proposal would likely have a positive contribution to the locality as it would deliver an accessible path of travel to and from the station and facilitate better access to the station.	Minor
(c) Any environmental impact on the ecosystem of the locality? Environmental impacts are anticipated to be minor and temporary in nature and would not be expected to result in adverse impacts to the ecosystem of the locality.	Minor
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The Proposal would result in a short-term reduction of the aesthetic of Killara Station due to the presence of construction materials and equipment, and a longer-term impact to the heritage aesthetics of Killara Station through the introduction of modern lifts. This would be mitigated through the design of the lifts. Construction of the Proposal would also result in a reduction to environmental quality through noise and traffic impacts. Most of these impacts would be temporary in nature, and all are considered to be minor.	Minor

Factor	Impacts
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? Aesthetically, the garden contributes strongly to the significance of the station group, providing a setting that evokes a past practice of station garden design. The Killara Station precinct has aesthetic significance for its contribution to the characteristic nature of the North Shore line - one of homogenous station design and landscaping. The station has historic significance as the construction of the railway remains as a model example of an early 20th century station. The railway encouraged rapid subdivision and the development of the town in the late nineteenth century. It is one of a number of stations that demonstrate the significant impact of the railway in facilitating settlement in the northern suburbs of Sydney and is an important station on the first purely suburban line in NSW. Killara Station is considered to have social significance at a local level. Killara Station possesses a largely intact railway/municipal ornamental garden on its eastern side and is one of the most important railway station gardens within the metropolitan network. The proposed work would have little or no impact to the historical significance of the station and to the aesthetic significance attributed to the station gardens. There would be some impact to the aesthetic significance of the rest of the station, due to the addition of three lifts and other works. There would be a minor negative socio-economic impact due to the permanent removal of the retail kiosk located on the station's footbridge. The Proposal is likely to have a positive contribution to the locality by creating equitable access to the station.	Moderate
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The Proposal is unlikely to impact on the habitat of protected fauna.	Nil
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely to endanger any species of animal, plant or other form of life living on land, in water or in the air.	Nil
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment.	Nil
(i) Any degradation of the quality of the environment? The Proposal is unlikely to result in the degradation of the quality of the environment. During construction there would be minor impacts to the environment, primarily from noise and dust emissions and reduction in visual amenity.	Nil
(j) Any risk to the safety of the environment? The Proposal could result in pollution or safety risks to the environment during construction. Provided the recommended management and mitigation measures are implemented, this risk is considered unlikely.	Nil

Factor	Impacts
(k) Any reduction in the range of beneficial uses of the environment? The Proposal would not result in any reduction in the range of beneficial uses of the environment.	Nil
(l) Any pollution of the environment? Construction of the Proposal could result in pollution of the environment (e.g. noise and dust emissions), however provided the recommended management and mitigation measures are implemented, this risk is expected to be minor.	Minor
(m) Any environmental problems associated with the disposal of waste? The Proposal in unlikely to result in environmental problems associated with the disposal of waste. Hazardous waste (including asbestos, if found) may be generated by the Proposal. Contamination identification would occur prior to construction to confirm the presence of hazardous materials. All waste would be managed and disposed of with a site-specific WMP prepared as part of the CEMP. Measures would be implemented to ensure waste is reduced, reused or recycled where practicable.	Minor
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely to increase the demand on resources (natural or otherwise) that are, or are likely to become, in short supply.	Nil
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative environmental effects with other activities are discussed in Section 6.15. Based on the surrounding existing and proposed developments, cumulative effects are expected to be minor and be primarily related to traffic, noise and visual amenity.	Minor
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? As the Proposal is not located within a coastal area, it would not impact on coastal process and/or coastal hazards, including those under projected climate change conditions.	Nil

AECOM

Killara Station Upgrade
Transport for New South Wales

Transport Access Program 3 Killara Station

Statement of Heritage Impact

Statement of Heritage Impact

Transport Access Program 3: Killara Station

Client: Transport for New South Wales

ABN: 18 804 239 602

Prepared by

AECOM Australia Pty Ltd
Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia
T +61 2 8934 0000 F +61 2 8934 0001 www.aecom.com
ABN 20 093 846 925

Job No.: 60643261

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

25-Jun-2021
Prepared for – Transport for New South Wales – ABN: 18 804 239 602

Quality Information

Document	Transport Access Program 3: Killara Station
Ref	60643261
Date	25 June 2021
Prepared by	Deborah Farina and Chris Lewczak
Reviewed by	Alice Thurgood and Catherine Brady

Revision History

Revision	Revision Date	Details	Authorised Name/Position	Signature
0	07.05.2021	Draft for Transport for NSW review	Chris Lewczak	
1	26.05.2021	Second draft for Transport for NSW review	Alice Thurgood	
2	25.06.2021	Final	Alice Thurgood	

Table of Contents

Executive summary iv
1.0 Introduction 1
1.1 Background 1
1.2 Site identification 1
1.3 Killara Station upgrade 2
1.4 Methodology 2
1.5 Report limitations 3
2.0 Statutory context 4
2.1 Commonwealth legislation 4
2.1.1 Environment Protection and Biodiversity Conservation Act 1999 4
2.1.2 Disability Discrimination Act 1992 4
2.2 State legislation 4
2.2.1 Environmental Planning and Assessment Act 1979 4
2.2.2 State Environmental Planning Policy (Infrastructure) 2007 4
2.2.3 Heritage Act 1977 5
2.3 Local government 5
2.3.1 Ku-ring-Gai Local Environmental Plan 2015 5
2.4 Summary of statutory controls 6
3.0 Historical context 10
3.1 Early European settlement 10
3.2 A 'United Australia': Railway Developments 12
3.2.1 Sydney to the Hawkesbury River then Killara 12
3.2.2 Development of Killara 12
3.3 Literature review 16
3.4 Development of Killara Station 17
4.0 Physical evidence 18
4.1 Killara Station – major group elements 18
5.0 Significance assessment 28
5.1 Introduction 28
5.2 Killara Railway Station Group 29
5.2.1 Section 170 register listings 29
5.2.2 Discussion 31
5.3 Grading of significant elements 32
6.0 Proposal description and impacts 33
6.1 Options assessment 33
6.2 Alternative options considered 33
6.2.1 The 'do-nothing' option 34
6.2.2 Assessment of identified options 34
6.3 Justification for the preferred option 34
6.4 The Proposal 35
6.5 Proposal impacts 38
6.5.1 New lifts and footbridge widening 38
6.5.2 Station building modifications 38
6.5.3 Upgrade to boarding assistance zones 39
6.5.4 Station platform upgrade 40
6.5.5 Materials and finishes 41
6.5.6 Visual impacts 41
6.6 Impacts to heritage significance 42
6.6.1 Summary of archaeological potential and impacts 52
7.0 Statement of heritage impact 56
7.1 Introduction 56
7.2 Process questions 56
7.2.1 Minor partial demolition (relating to station building upgrade) 56
7.2.2 Major additions (relating to the new lifts, platform widening and boarding assistance zone modifications) 57

7.3 Statement of heritage impact 58
8.0 Recommendations 60
9.0 References 63

List of Tables

Table 2-1 Summary of listed heritage items within and adjacent to the Proposal area 7
Table 2-2 Heritage Conservation Areas 8
Table 3-1 Chronology of Killara Railway Station Group 17
Table 5-1 Significance assessment criteria 28
Table 5-2 Significance assessment – Killara Railway Station Group 29
Table 5-3 Grading of significance criteria (from NSW Heritage Office, 2001:11) 32
Table 5-4 Killara Station grading of fabric (Heritage NSW, 2009) 32
Table 6-1 Viewpoints chosen to assess visual impacts (AECOM, 2021) 42
Table 6-2 Assessment of impacts to heritage significance of the Killara Railway Station Group (Heritage NSW, 2009) 43
Table 7-1 Summary of the nature of the direct and indirect impacts 59

List of figures

Figure 1-1 Killara Station location context 1
Figure 1-2 Killara Railway Station Group s170 Heritage Curtilage Plan (NSW Heritage Division, 2009) 2
Figure 2-1 Location of nearby heritage items and heritage conservation areas 9
Figure 3-1 Detail of map showing land grants around Killara Railway Station, c. 1926 (State Library of NSW, Item No. Z/M2 811.1441/1926/1) 11
Figure 3-2 Detail of subdivision plan for "The Maples" estate, c. 1935 (State Library of NSW) 11
Figure 3-3 Station layout, c. 1906 (Sydney Trains Virtual Plan Room) 12
Figure 3-4 Killara Railway Station prior to duplication, looking south. Note paling fence at left (State Library of Victoria) 13
Figure 3-5 Killara Railway Station following duplication and construction of footbridge, c.1910 (National Library of Australia) 13
Figure 3-6 Killara Station layout, 1925 (Sydney Trains Virtual Plan Room) 14
Figure 3-7 Plan of Killara Station building as constructed and completed in 1909 (Sydney Trains Virtual Plan Room) 14
Figure 3-8 Killara Station, c 1960s (Australian Railway Historical Society) 15
Figure 3-9 Colour photograph of gardens, looking south, in 1964 (Australian Railway Historical Society) 15
Figure 3-10 NSW Railways Suburban Timetable from November 1962 featuring Killara Railway Station gardens on its cover (National Library of Australia) 16
Figure 4-1 Existing entrance to Killara Station from Werona Avenue (AECOM, 2021) 18
Figure 4-2 Existing entrance to Killara Station from Culworth Avenue (AECOM, 2021) 19
Figure 4-3 Part of the ornamental garden, looking north from the footbridge (AECOM, 2021) 19
Figure 4-4 Ornamental garden, looking south from the footbridge (AECOM, 2021) 20
Figure 4-5 Original star patterned newel posts, balustrades and handrails at the Werona Avenue (eastern) access to footbridge. These are also present on the Culworth Avenue side of the footbridge (AECOM, 2021) 20
Figure 4-6 Stairs from footbridge to Werona Avenue. Note original tapered end of handrail (AECOM, 2021) 21
Figure 4-7 View towards commuter car park (construction compound area) on Culworth Avenue (AECOM, 2021) 21
Figure 4-8 Deck of footbridge, looking east. Cantilevered kiosk is at right (AECOM, 2021) 22
Figure 4-9 Footbridge, looking south toward Culworth Avenue from platform (AECOM, 2021) 22
Figure 4-10 Steel substructure of footbridge and cantilevered kiosk. Note modern steel substructure of the footbridge deck (at left) (AECOM, 2021) 23

Figure 4-11	Killara Station looking south, with "up" line (Platform 1) in foreground (AECOM, 2021)	23
Figure 4-12	Station building on "down" line (Platform 2), looking north (AECOM, 2021)	24
Figure 4-13	Modified roofline of main station building and contemporary canopy addition in foreground, looking north from footbridge (AECOM, 2021)	24
Figure 4-14	Northern end of station building modified to include toilets (AECOM, 2021)	25
Figure 4-15	Internal layout of men's toilet, Killara Station (AECOM, 2021)	25
Figure 4-16	Internal layout of communications/store room, Killara Station, looking north (AECOM, 2021)	26
Figure 4-17	Western internal wall of communications/store room indicating original and updated features (AECOM, 2021)	26
Figure 4-18	Windows in station building (AECOM, 2021)	27
Figure 6-1	Key features of the Proposal (indicative only, subject to detailed design)	37
Figure 6-2	Existing layout and demolition plan for existing toilets (Aurecon, 2021, provided by Transport for NSW)	38
Figure 6-3	Proposed layout of toilets (Aurecon, 2021, provided by Transport for NSW)	39
Figure 6-4	Example of an artist impression of how the boarding assistance zones would look at a similar station to Killara	40
Figure 6-5	Location of transformer at the northern end of the garden; to be upgraded as part of the station power supply upgrade (AECOM, 2021)	41
Figure 6-6	Gardens from Footbridge, c. 1956 (Australian Railway Historical Society)	48
Figure 6-7	Gardens from the footbridge, looking south undated (Australian Railway Historical Society)	48
Figure 6-8	Gardens from the footbridge, looking north (AECOM, 2021)	49
Figure 6-9	Gardens from the footbridge looking south (AECOM, 2021)	49
Figure 6-10	Example of dimensions of "Out-of" sheds, this example from Scone (Sydney Trains Virtual Plan Room)	52
Figure 6-11	Detail of Figure 3-5 showing "out-of" shed (red arrow), c.1910 (National Library of Australia)	53
Figure 6-12	Plan for removal of out-of shed for a new bookstall, c. 1934 (Sydney Trains Virtual Plan Room)	53
Figure 6-13	Detail of Figure 3-3 above, showing modification of 1899 platform for duplication, c. 1906 (Sydney Trains Virtual Plan Room)	54
Figure 6-14	Killara Station looking south, undated (Australian Railway Historical Society NSW, Image 008774)	55
Figure 7-1	Photomontage of the new lift on Werona Avenue (AECOM, 2021)	58

Executive summary

Transport for NSW (Transport for NSW) has proposed the upgrade of Killara Station (the Proposal). The Proposal forms part of the Transport Access Program, a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure across NSW.

Transport for NSW has developed accessibility upgrade plans and undertook options development and assessment for Killara Station. Two options were developed to address deficiencies at the station to meet its accessibility obligations in an efficient and cost-effective manner.

The preferred option (Option 1) has since been refined and is subject to an environmental impact assessment. As part of the Review of Environmental Factors (REF), AECOM has been commissioned by Transport for NSW to undertake a Statement of Heritage Impact assessment for the construction and operation of the Proposal.

Killara Station is located approximately 14 kilometres north of Central Station, within the Ku-ring-gai Council local government area and is listed on the Transport Asset Holding Entity (TAHE) Section 170 Heritage and Conservation Register.

The key features of the Proposal considered in this assessment include:

- the installation of three new lifts and lift landings connecting to the existing footbridge to provide access to the station platform
- widening of the existing footbridge to accommodate the lifts
- platform works including regrading and providing new seating and canopies for the two existing boarding assistance zones
- provision of two kiss and ride bays on Culworth Avenue (including one to be accessible), footpath upgrades and other new access path modifications. The existing station building toilets would also be upgraded with provision of a new unisex ambulant toilet and a new family accessible toilet.

In summary, the potential heritage impacts of the Proposal are as follows:

Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	None.
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	The construction of the new lift to access the footbridge at the southern (Werona Avenue) side of the station would have a moderate negative impact to significant heritage fabric. The widening of the footbridge and associated canopy would have a moderate negative impact to significant heritage fabric. The modification of the two boarding assistance zones to provide seating, wheelchair spaces and canopies on the platform would have a low to moderate negative impact to the aesthetic significance associated with the station.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	The visual impact from the construction of the new lifts on either side of the footbridge is assessed as minor and can be mitigated to minimise the visual impact.

Impact Type	Impact
Negligible or no impacts (does not affect heritage values either negatively or positively)	The reconfiguration of the existing toilets into the new ambulant toilet, and creation of a family accessible toilet is considered to have a neutral heritage impact. The existing two doors in the northern elevation were constructed c.1993 and are therefore not original fabric. The internal works would be contained within the existing toilets, which were also upgraded in 1993. All current fixtures and fittings, including tiles, are non-original. The regrading of the station platform surface and installation of the Tactile Ground Surface Indicators would have a negligible impact to the heritage significance associated with the station.
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	The Proposal would improve safety and accessibility and the station would be enhanced following its reconfiguration. The construction of the new lift structures would enable access to and appreciation of the station by a wider demographic.

Mitigation measures and recommendations to minimise impacts to the heritage listed Killara Station Group are as follows.

Recommendation 1 – Heritage advice

A heritage architect must be engaged to provide ongoing heritage and conservation advice throughout the detailed design process. In addition to ongoing heritage advice, the nominated heritage architect shall:

- confirm and document options analysis around impacts to significant elements and design mitigation to avoid or reduce adverse impacts
- ensure that the final design adheres to the relevant policies, including but not limited to the *Heritage Platforms Conservation Management Strategy*, *Railway Footbridges Heritage Conservation Strategy*, *Canopies and Shelters: Design Guide for Heritage Stations* and the *Station Access Heritage Conservation Guide*
- provide input to detailed development and supervise works to significant fabric within the scope of works, including works to the handrails, balustrades and newel posts of the footbridge, connection of widened footbridge elements, and all original fabric of the station building, the platform and in the vicinity of the garden.

The nominated heritage architect may be required to update this assessment when impacts are defined during the detailed design phase and record the above additional analysis in an updated report.

Recommendation 2 – Consultation with Sydney Trains Heritage

It is recommended that Transport for NSW continue to consult with Sydney Trains Heritage throughout the design process to address preliminary feedback on subjects including the form and materials of the lift, landscaping and works associated with new and existing services.

Recommendation 3 – Heritage landscape plan

To offset anticipated impacts to the heritage gardens it is recommended that during the detailed design phase of the Proposal a landscape plan would be provided either by, or with the input of, a qualified heritage landscape specialist. This plan would include mitigation measures for any necessary tree removal and species for replanting that are appropriate to the heritage landscape. New landscaping must complement the existing landscaping. New gardens should be horticulturally and stylistically sympathetic to the period of the station gardens (i.e. early twentieth-century rockery garden). The use of similar materials such as stone and brick is encouraged, as is the use of a variety of plant species to avoid monocultural plantings along Werona Avenue.

Appropriate treatment of the landscape will facilitate interpretation of the station gardens as a socially significant asset to the local community.

Recommendation 4 – Lifts and footbridge

The following recommendations are made in relation to the platform lifts and associated walkway construction:

- detailed design would further investigate options to minimise impacts to the railway garden
- the original fabric of the footbridge, in particular the star newels at the bottom of the stairs on both sides of the footbridge and platform, hand rails and balustrades should be investigated to be retained
- re-use of the original balustrade on the footbridge at the areas of the footbridge widening is recommended. Where supplementary balustrades and handrails are required, these would be designed to be compatible with the retained elements in terms of form, placement and materiality
- detailed design would minimise the impact to the brickwork associated with the platform, including the edge coping walls.

Recommendation 5 – Station building upgrade

The following recommendations are made with relation to the station building reconfiguration:

- care would be taken when undertaking all demolition works so as not to damage significant fabric
- new services, outlets, wall units and brackets (etc.) would be located internally in areas already modified and/or consolidated in one location. Existing openings in ceilings are the preferred location for the installation of new services. New services and fittings would use existing fixing points or be located at mortar joints. These works would be undertaken in accordance with the Sydney Trains technical notes, *Installation of New Electrical and Data Services at Heritage Sites* (2017) and *Fixing Methods at Heritage Sites*
- new services would be installed as per Recommendation 10 below
- impacts to the detailed architraves around the current toilet entry door and transom window would be minimised
- new interior tiling would consider the Sydney Trains *Draft – NSW Heritage Station Passenger Tile Finishes (2020).*

Recommendation 6 – Boarding assistance zones

The height of the eaves associated with the two new boarding assistance zone canopies would match, as close as possible, the height of the eaves associated with the existing station building. The heights would match to create a continuity between the existing station building and the two new structures.

The proposed canopies should aim to reduce impact to significant fabric and the visual impact of the Proposal through recessive materials and sympathetic design.

Recommendation 7 – Station platform upgrade

The following recommendation is made with regard to works that would be undertaken on, and to, the current platform. This includes the regrading and resurfacing of the platform surface.

- re-grading of the station platform would not cover any existing wall vents that have been installed along the lower course of the brickwork to the station building. If cast iron gratings are removed, these would be stored for future reuse.

Recommendation – Interpretation

A heritage interpretation plan must be prepared and implemented for the station in accordance with NSW Heritage Office (former) publication *Interpreting Heritage Places and Items and the Sydney Trains Heritage Interpretation Guideline*. The Proposal is considered a medium/major project in terms of evaluating interpretation options and therefore a nominal score of 70 in accordance with the guidelines should be achieved.

The interpretation plan would investigate methods of reinstating the footbridge lighting as a primary interpretation element.

Recommendation 9 – Recording

Prior to any construction, a photographic recording would be undertaken of the station, including (but not limited to) the station building, platform, footbridge and garden. This recording would be undertaken in accordance with the Heritage Council of NSW publication, *Photographic Recording of Heritage Items using Film or Digital Capture* (Heritage Council of NSW, 2006).

Recommendation 10 – Installation of services

All ancillary works (CCTV, PA, communications, air-conditioning etc) would be undertaken in accordance with the relevant Sydney Trains heritage guidelines. Alternative solutions must be explored where any impacts to significant fabric are identified. Works would proceed with the principle of avoiding fixing new services to the façade of the exterior building and would be contained/ concealed in new development areas. A complete services plan is to be reviewed and assessed by a qualified heritage architect identifying alternative solutions, and submitted to the Associate Director Environmental Impact Assessment (AEDIA) (or delegate) for endorsement prior to works commencing.

Recommendation 11 – Heritage induction

A heritage induction would be provided to all on-site staff and contractors involved in the Proposal. The induction would clearly describe the heritage constraints of the site.

Recommendation 12 – Unexpected finds and stop work procedure

The Construction Environmental Management Plan (CEMP) for the Proposal would include stop work procedures in accordance with Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019) to manage activities in the unlikely event that intact archaeological relics or deposits are encountered.

1.0 Introduction

1.1 Background

Transport for New South Wales (Transport for NSW) is proposing to upgrade Killara Station (the Proposal). The Proposal forms part of the Transport Access Program, a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure across NSW.

Options for improving access to Killara Station were developed following preparation of a scoping report and a series of workshops with Transport for NSW and the project design team. Two options were developed to address deficiencies at Killara Station and to meet the accessibility obligations in an efficient and cost-effective manner, while being easy to maintain. These options are discussed in detail in Section 6.1. Through the multi criteria analysis process, the preferred option (Option 1) was selected, further refined and is subject to environmental impact assessment. As part of the Review of Environmental Factors (REF), AECOM has been commissioned by Transport for NSW to undertake a Statement of Heritage Impact (SoHI) assessment of the construction and operation of the Proposal.

1.2 Site identification

Killara Station is located approximately 14 kilometres north of Central Station, within the Ku-ring-gai Council local government area (LGA). The station is located on the T1 North Shore line and services local trains (Figure 1-1).

The Proposal encompasses Killara Station, which is listed on the Transport Asset Holding Entity (TAHE) Section 170 Heritage and Conservation Register (Figure 1-2).

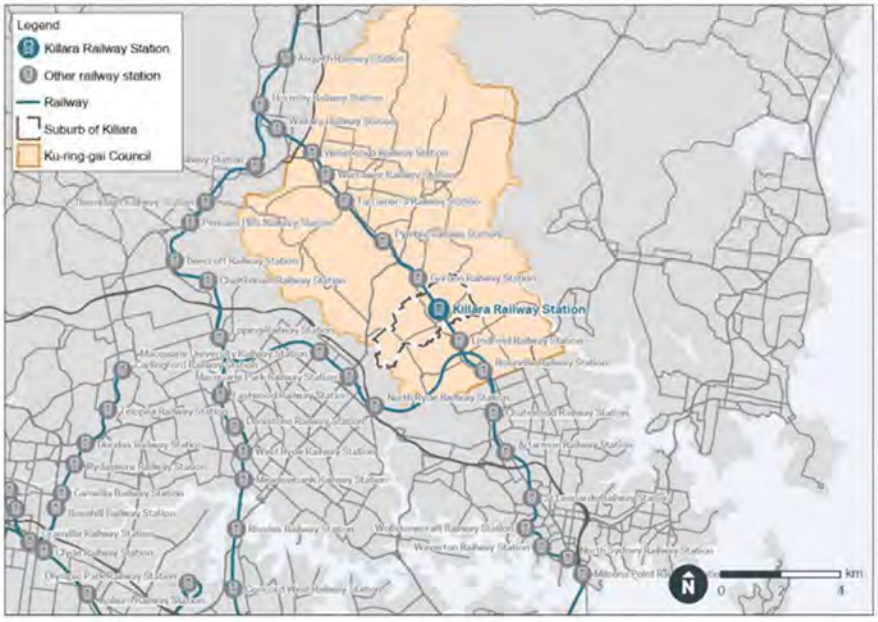


Figure 1-1 Killara Station location context

Figure 1-2 Killara Railway Station Group s170 Heritage Curtilage Plan (NSW Heritage Division, 2009)

1.3 Killara Station upgrade

The proposed upgrade to Killara Station includes the installation of three new lifts and lift landings connecting to the existing footbridge to provide access to the station platform, widening of the existing footbridge to accommodate the lifts, platform works including regrading and providing new seating and canopies for the two existing boarding assistance zones, provision of kiss and ride bays on Culworth Avenue (with one to be accessible), footpath upgrades and other new access path modifications. The existing station building toilets would also be upgraded with provision of a new unisex ambulant toilet and a new family accessible toilet.

A full description of the Proposal is provided in Section 6.4.

1.4 Methodology

This heritage assessment has been undertaken in accordance with *Assessing Heritage Significance* (NSW Heritage Office, 2001) and *Statements of Heritage Impact* (NSW Heritage Office & Department of Urban Affairs & Planning, 2002. It includes:

- desktop searches of relevant heritage registers
- review of Proposal drawings and scoping design reports
- review of the following key documents:
  - heritage register listings for the station
  - historic plans for the station held by the Sydney Trains Plan Room
  - previous reports and other relevant documentation provided by Transport for NSW

- background research into the historical development of the station using the historic plans, historical photographs, newspapers and other primary and secondary historical sources as relevant and referenced in Section 3.0
- site inspection on 6 April 2021 by AECOM staff assessing the existing station (both internal and external) along with the existing character of the Proposal area and surrounding land uses. Note: all photographs within this report were taken during the site inspection unless otherwise stated.

1.5 Report limitations

The purpose of this report is to identify and assess historic heritage and archaeological potential that might be impacted by the Proposal. Predictions have been made within this report about the probability of subsurface archaeological materials occurring within the site, based on surface indications and environmental contexts. However, it is possible that materials may occur in areas without surface indications and in any environmental context. Should subsurface archaeological materials be uncovered during construction, these would be addressed in accordance with the *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019).

This report is based on the scoping design and is subject to detailed design. It is noted that during detailed design, details of the Proposal may change or be refined. Further heritage assessment would be required to assess the potential additional impacts to the heritage value of Killara Station during detailed design as outlined in Section 8.0.

A summary of the statutory requirements regarding historical heritage is provided in Section 2.0. The summary is provided based on the experience of the authors with the heritage system in Australia and does not purport to be legal advice. It should be noted that legislation, regulations and guidelines change over time and users of the report should satisfy themselves that the statutory requirements have not changed since the report was written.

2.0 Statutory context

A number of planning and legislative documents govern how heritage is managed in NSW and Australia. The following section provides an overview of the requirements under each as they apply to the Proposal.

2.1 Commonwealth legislation

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) defines 'environment' as both natural and cultural environments and therefore includes Aboriginal and non-Aboriginal historic cultural heritage items. Under the EPBC Act, protected heritage items are listed on the National Heritage List (NHL) (items of significance to the nation) or the Commonwealth Heritage List (CHL) (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE). The RNE has been suspended and is no longer a statutory list; however, it remains as an archive.

Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a matter of National Environmental Significance (known as a controlled action under the EPBC Act), may only progress with approval of the Commonwealth Minister for Agriculture, Water and the Environment. An action is defined as a project, development, undertaking, activity (or series of activities), or alteration. An action would also require approval if:

- it is undertaken on Commonwealth land and would have or is likely to have a significant impact on the environment on Commonwealth land
- it is undertaken by the Commonwealth and would have or is likely to have a significant impact.

Killara Station has not been identified on the NHL, CHL or RNE and therefore the Proposal would not require a referral under the EPBC Act with respect to heritage.

2.1.2 Disability Discrimination Act 1992

The Commonwealth *Disability Discrimination Act 1992* (DDA) aims to reduce discrimination against people with a disability. The DDA requires that people are given equal opportunity to access public transport and buildings, including those with heritage significance. The Proposal is being undertaken, in part, to comply with the requirements of the DDA.

2.2 State legislation

2.2.1 Environmental Planning and Assessment Act 1979

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) allows for the preparation of planning instruments to direct development within NSW. This includes Local Environmental Plans (LEP), which are administered by local government and contain provisions to guide land use and the process for development applications. LEPs usually include clauses requiring that heritage be considered during development applications and a schedule of identified heritage items be provided. The EP&A Act also allows for the gazettal of State Environmental Planning Policies (SEPP).

2.2.2 State Environmental Planning Policy (Infrastructure) 2007

SEPPs are environmental planning instruments which address planning issues within the State. SEPPs can make the Planning Minister the consent authority for the types of development they relate to. The *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP 2007) is of relevance to this Proposal.

Clause 14 of ISEPP 2007 applies to infrastructure developments carried out by, or on behalf of, a public authority, if the development is likely to impact a local heritage item or heritage conservation area (other than a heritage item that is also a State heritage item). Under ISEPP 2007, a public authority, or person/s acting on behalf of a public authority, must not carry out a development to which clause 14 applies, unless an assessment of the proposed impact has been prepared and forwarded to

the local government of the area for comment. Comments received within 21 days must be taken into consideration.

2.2.3 Heritage Act 1977

The NSW *Heritage Act 1977* (as amended) was enacted to conserve the environmental heritage of NSW. Under Section 32, places, buildings, works, relics, movable objects or precincts of heritage significance are protected by means of either Interim Heritage Orders (IHO) or by listing on the NSW State Heritage Register (SHR). Items that are assessed as having State heritage significance can be listed on the SHR by the Minister on the recommendation of the NSW Heritage Council. Killara Station is not listed on the SHR.

Under Section 170 of the *Heritage Act 1977*, NSW Government agencies are required to maintain a register of heritage assets. The register places obligations on the agencies, but not on non-government proponents, beyond their responsibility to assess the impact on surrounding heritage items.

The Killara Railway Station Group has been identified on the TAHE Section 170 Heritage and Conservation Register under the State Heritage Inventory (SHI) database (SHI # 4801066). Under Section 170A(1)(c) Sydney Trains must provide the Heritage Division with written notice prior to demolition of any place, building or work entered in its register.

Archaeological features and deposits are afforded statutory protection by the 'relics provision'. Section 4(1) of the *Heritage Act 1977* (as amended 2009) defines 'relic' as follows:

> *any deposit, artefact, object or material evidence that:*
>
> *(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
>
> *(b) is of State or local heritage significance.*

The 'relics provision' requires that no archaeological relics be disturbed or destroyed without prior consent from the Heritage Council of NSW. Therefore, no ground disturbance works may proceed in areas identified as having archaeological potential without first obtaining an Excavation Permit pursuant to Section 140 of the *Heritage Act 1977*, or an Archaeological Exception under Section 139 of the *Heritage Act 1977*.

The Heritage Council must be notified of the discovery of a relic under Section 146 of the *Heritage Act 1977*.

2.3 Local government

Killara Station is located within Ku-ring-gai Council local government area. The relevant LEP applying to the site is Ku-ring-gai LEP 2015 and its application is outlined below.

2.3.1 Ku-ring-Gai Local Environmental Plan 2015

Part 5, Section 5.10 of the Ku-ring-gai LEP 2015 deals with heritage conservation within the area covered by this LEP. All heritage items listed in the LEP are included in Schedule 5. The Ku-ring-gai LEP 2015 states:

> *(1) The objectives of this clause are as follows:*
>
> *a. to conserve the environmental heritage of Ku-ring-gai,*
>
> *b. to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,*
>
> *c. to conserve archaeological sites,*
>
> *d. to conserve Aboriginal objects and Aboriginal places of heritage significance.*
>
> *(2) Development consent is required for any of the following:*
>
> *a. demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):*

i. *a heritage item,*

ii. *an Aboriginal object,*

iii. *a building, work, relic or tree within a heritage conservation area,*

b. *altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,*

c. *disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,*

d. *disturbing or excavating an Aboriginal place of heritage significance,*

e. *erecting a building on land:*

i. *on which a heritage item is located or that is within a heritage conservation area, or*

ii. *on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,*

f. *subdividing land:*

i. *on which a heritage item is located or that is within a heritage conservation area, or*

ii. *on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.*

Killara Station is listed as an item of environmental heritage on Schedule 5 of the Ku-ring-gai Council LEP 2015 (Item I1106) and partially within the Springdale Heritage Conservation Area (C21).

2.4 Summary of statutory controls

Killara Station has been identified by Sydney Trains as holding local significance and is listed on the TAHE Section 170 Heritage and Conservation Register. The register search was extended to 100 metres from the curtilage of Killara Station to establish if there were surrounding registered items or conservation areas that may be affected by the Proposal. Table 2-1 summarises the heritage listings identified as a result of this search.

There are 11 local heritage items located within 100 metres of Killara Station. Most are dwellings or shops located to the immediate east and west of the station.

The southern portion of the station curtilage is within the Springdale Heritage Conservation Area. Two conservation areas are located within approximately 20 metres to the east (Lynwood Avenue Heritage Conservation Area – C23) and west (Marian Street Heritage Conservation Area – C24) of the station. All locally significant heritage items listed in Table 2-1 are within these heritage conservation areas. Table 2-2 sets out the features of the heritage conservation areas and Figure 2-1 shows the location of these heritage items and heritage conservation areas in relation to Killara Station.

Table 2-1 Summary of listed heritage items within and adjacent to the Proposal area

Heritage list	Items within the Proposal area	Level of significance	Items adjacent to the Proposal area	Level of significance	Distance to Proposal area
World Heritage List	Nil	n/a	Nil	n/a	n/a
National Heritage List	Nil	n/a	Nil	n/a	n/a
Commonwealth Heritage List	Nil	n/a	Nil	n/a	n/a
Register of the National Estate (non-statutory)	Nil	n/a	Nil	n/a	n/a
State Heritage Register	Nil	n/a	Nil	n/a	n/a
TAHE Section 170 Heritage and Conservation Register	Killara Railway Station Group (SHI #4801066)	Local	Nil	n/a	n/a
Ku-ring-gai LEP 2015	Killara Railway Station Group (I1106)	Local	Dorchester Flats 1 Marian St Killara (I320)	Local	46 metres south west
			Newsagent, chemist 11-15 Marian St Killara (I328)	Local	90 metres south west
			Dwelling House 6 Lorne St Killara (I302)	Local	90 metres west
			Lynwood Cottage 4 Lynwood Ave Killara (I308)	Local	75 metres north east
			"Lynwood" dwelling house 10 Lynwood Ave Killara (I310)	Local	100 metres north east
			"Morningside" dwelling house 1 Maples Ave Killara (I319)	Local	25 metres east
			Dwelling house 25A Werona Ave Killara (I408)	Local	20 metres east
			"Maple House" 25 Werona Ave Killara (I406)	Local	20 metres east
			Killara Post Office 23A Werona Avenue Killara (I407)	Local	20 metres east

Heritage list	Items within the Proposal area	Level of significance	Items adjacent to the Proposal area	Level of significance	Distance to Proposal area
			Dwelling House 5 Locksley St Killara (I298)	Local	80 metres east
			Dwelling House 7 Locksley St Killara (I299)	Local	95 metres east
	Springdale Heritage Conservation Area	Local	Lynwood Avenue Heritage Conservation Area (C23)	Local	20 metres east
			Marian Street Heritage Conservation Area (C24)	Local	20 metres west

Table 2-2 Heritage Conservation Areas

Heritage Conservation Area (HCA)	Features
Lynwood Avenue HCA (C23)	This area has aesthetic significance from the highly intact and cohesive late Nineteenth Century to early Twentieth Century Federation and Inter-War development
Marian Street HCA (C24)	Contains examples of single detached houses from the Federation, Interwar and Post war periods. The built context is enhanced by large garden settings, wide street proportions, street plantings and remnant and planted native trees, element synonymous with the Ku-ring-gai area and retains an emphasis on residential, recreational and cultural development
Springdale HCA (C21)	Medium to large lots with well-established gardens. The houses are almost exclusively detached residences, with architectural styles including Federation Queen Anne, Arts and Craft, Inter-war Old English, Spanish Mission, Mediterranean and Californian Bungalow. Many houses retain period landscape features including sweeping drives, borders of mixed shrubberies and planted out beds

Figure 2-1 Location of nearby heritage items and heritage conservation areas

3.0 Historical context

In order to appreciate the heritage significance of an item, it is important to understand the historical context in which it was constructed and the subsequent factors that have influenced its development.

A detailed analysis of Aboriginal cultural heritage is beyond the scope of this report; however, it is important to recognise the Darug and Guringai people who occupied and thrived in the Ku-ring-gai area prior to European occupation.

The following sections outline the development of Killara Station.

3.1 Early European settlement

The Hawkesbury River was known to Europeans from the onset of colonial history, when in 1788, Governor Phillip voyaged west, exploring its islands and riverbanks (Hornsby Shire, 2017). Over time, settlements grew along the river, attracted by the richness of available resources (Higginbotham, 1993).

Settlement was concentrated along the river sections before the search for more farming land led to surveyors being sent out to map greater areas between Sydney and the Hawkesbury areas. By 1816 Timber getters were sent to the Ku-ring-gai area to fill the need for supplies back at the main settlement areas in Sydney. By the 1829 the Great North Road from Parramatta to Wisemans Ferry has been constructed, and specific areas and allotments were granted along the road for agricultural purposes, predominately used for orchards.

One of the earliest non-Aboriginal visitors to the Killara area were timber getters. These were itinerant workers, who lived in temporary dwellings whilst working in a given area. The area was known for its large trees, with diameters of 1.2 to 2.2 metres. Bullock drays would carry the cut timber to the Lane Cove River, from where it would be floated to Sydney (Edwards, 1926:119).

The earliest land grants were made in the vicinity of Killara from the early 19th century. The land comprising Killara Station was part of two such land grants, the northern portion being a parcel of 80 acres granted to Edwin Booker in 1821 and the southern portion being part of a 160 acre grant to Jane McGillivray made in 1839 (Figure 3-1).

Both land grants covered both sides of the rail line and were occupied by the grantees. Booker sold his grant to J W Fish, a sea captain, in 1822. Fish's wife lived in a cottage near the modern-day railway bridge crossing of Powell Street, approximately 220 metres north of Killara Station (Edwards, 1926:114). The McGillivray Grant was made to John Dunmore Lang and Jane McGillivray's father, James Bradley, in trust for Jane McGillivray. She lived in a house called "Springdale" and much of the grant is now part of the Springdale Heritage Conservation Area. Jane McGillivray, an accomplished woman, operated a Ladies' College at Parramatta from the 1830s, until several family tragedies saw her move to her grant at Killara in 1856. She lived in a weatherboard cottage until her death in 1861 (Edwards, 1926:120).

The first subdivisions in the Killara area commenced in the 1890s, shortly after the announcement of the North Shore Line. The timing of these subdivisions is undoubtedly connected with the construction of the railway, and in particular the subdivision of the Springdale estate. Other large estates, such as The Maples were broken up into smaller, suburban residential lots (Figure 3-2). The railway station name of "Killara" was apparently suggested by historian, author and local alderman James Edwards, which in an unspecified Aboriginal language means "permanent" or "always there" (Architectural Projects Pty Ltd, 2010:69). This name was soon adopted as the suburb name.

Figure 3-1 Detail of map showing land grants around Killara Railway Station, c. 1926 (State Library of NSW, Item No. Z/M2 811.1441/1926/1)

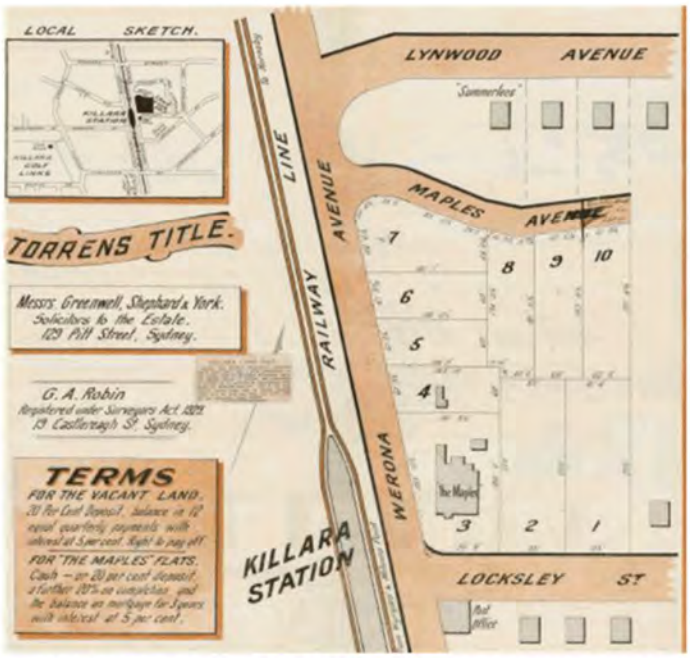


Figure 3-2 Detail of subdivision plan for "The Maples" estate, c. 1935 (State Library of NSW)

3.2 A 'United Australia': Railway Developments

The first railway in the Colony connected Sydney to Parramatta Junction in 1855. Following this, proposals for further lines were numerous, as the benefits of transporting goods from inland centres were immediately recognised by "landed interests" (RailCorp, 2009)

In the lead up to Federation, development focus shifted to uniting railways between the eastern colonies, and a continuous rail line was envisaged that would facilitate communication and transport from Charlestown, Queensland right through to Port Augusta, South Australia (Hornsby Shire, 2017) The Hawkesbury River formed a major challenge in this pursuit as its steep river banks necessitated the funding and construction of "the largest iron bridge in the southern hemisphere", which would allow the railway to continue uninterrupted (Davison, 1978) (The Australian Town and Country, 1889).

3.2.1 Sydney to the Hawkesbury River then Killara

With plans for the railway bridge already set in motion, railway lines in the north and south were extended towards Hornsby and then further to the Hawkesbury River, and camps were established along the routes to house railway construction workers (NSW Heritage Division, 2009). A station to present day Hornsby was not opened until September 1886. The creation of the line out to Hornsby became the focal point for construction of the line further to the north toward and eventually crossing, the Hawkesbury River. Branch lines were then added from Hornsby back towards the south to connect with the then single-track North Shore line. As these lines were constructed, the surrounding areas to the stations began to transform and become populated with both industries and suburban transformation.

3.2.2 Development of Killara

Killara Station was not conceived until the early 1890s, when land for subdivisions to the south of Hornsby were called for. The original Killara Station (c.1899) consisted of a single platform that was converted to an island platform following duplication. Both platforms appear to have been constructed, however a paling fence was erected to separate them (Figure 3-3, Figure 3-4).

Duplication of the North Shore line between Hornsby and Lindfield allowed for the construction of a standard island platform between the two tracks. Duplication resulted in the existing track becoming the up main and the new line to be placed on the western side to become the new down track. A footbridge was constructed to link Werona Avenue and Culworth Avenue (Figure 3-5)

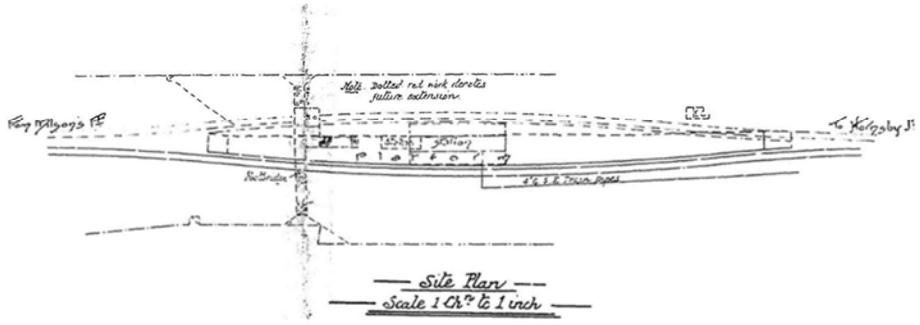


Figure 3-3 Station layout, c. 1906 (Sydney Trains Virtual Plan Room)

Figure 3-4 Killara Railway Station prior to duplication, looking south. Note paling fence at left (State Library of Victoria)

Figure 3-5 Killara Railway Station following duplication and construction of footbridge, c.1910 (National Library of Australia)

Once constructed in 1910, the station consisted of the brick island platform, brick standard station building and the footbridge (Figure 3-6). The original station building was a typical A8 design, that included a booking office building at one end, a waiting room and ladies rest room in the centre, and separate waiting room and men's restroom at the other end (Figure 3-7).

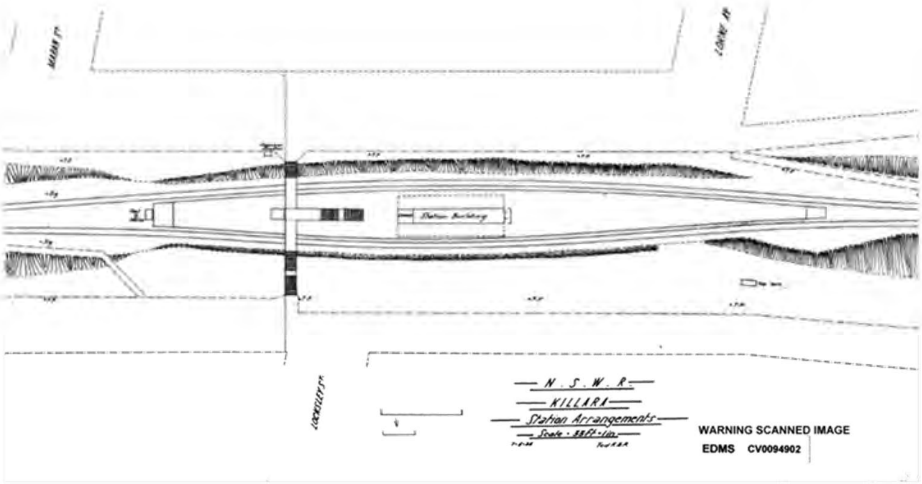


Figure 3-6 Killara Station layout, 1925 (Sydney Trains Virtual Plan Room)

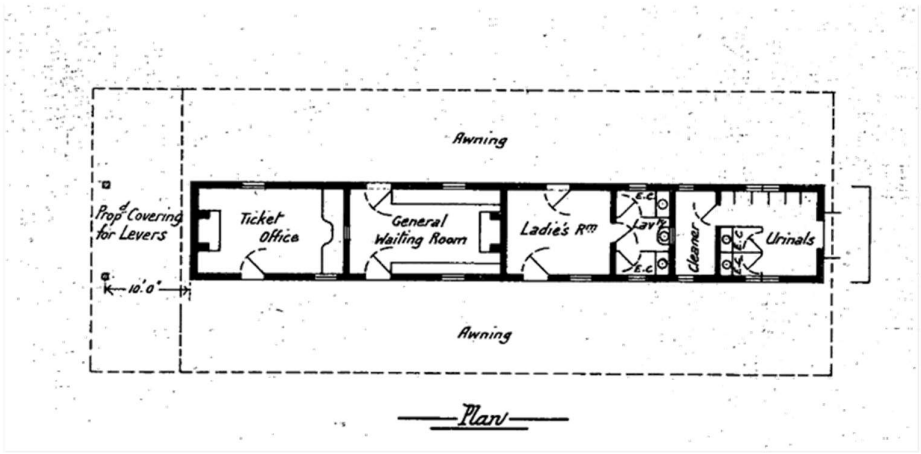


Figure 3-7 Plan of Killara Station building as constructed and completed in 1909 (Sydney Trains Virtual Plan Room)

3.2.2.1 Station garden

In an effort to beautify railway stations, in the late 19th century, station masters were encouraged by the Railway and Transport Institute to plant gardens in and around railway stations. In 1899 a Railway and Tramway Horticultural Society was formed, to encourage skills in horticulture among rail staff (Buckley (ed.), 2017:14).

In 1905, the local progress association provided a garden to Killara Station, measuring approximately 120 metres by 13 metres adjacent to and parallel with the rail corridor on Culworth Street. A newspaper article at the time noted that at the time of donation the garden had been:

> *...thoroughly trenched, worked and planted with ornamental trees and shrubs obtained from government departments or supplied by private donors. One of the latter gave five dozen picked rose trees, in addition to a quantity of camelias, azaleas and hibiscus. Creepers will before long trail over the stone wall that borders the bed. Residents are taking great interest in the undertaking, and some of them have sent their gardeners to work in the area. Expert skill,*

therefore, as well as energy, has been brought to bear, and there is every prospect of a successful result (Daily Telegraph, 1905:6).

Two years later, it was reported that the garden at Killara Station was flourishing, particularly with roses. Commendation was given to the station master, who "took a lively interest" in the garden (Daily Telegraph, 1907:11).

In November of that same year, Killara took first prize in the Railway Stations Garden competition for its area, awarded by the (Daily Telegraph, 1907:15), and again the following year (Sydney Morning Herald, 1908:10).

By the 1950s, the local council took over the maintenance of the railway gardens within its boundaries, including at Killara Station. The park superintendent for that council, Mr R D Bruce, was in charge having been a landscape gardener and formerly director of the State Gardens in Perth. Seedlings were grown at the council's nursery at Gordon. Plants on the island platforms were still maintained by station staff (Sunday Herald, 1953:19).

Throughout the second half of the 20th century, the gardens continued to be maintained however the importance of railway gardens gradually declined (Figure 3-8 and Figure 3-9). Nevertheless, for many years the railway garden at Killara Station featured on the cover of railway timetables (Figure 3-10).

Figure 3-8 Killara Station, c 1960s (Australian Railway Historical Society)

Figure 3-9 Colour photograph of gardens, looking south, in 1964 (Australian Railway Historical Society)

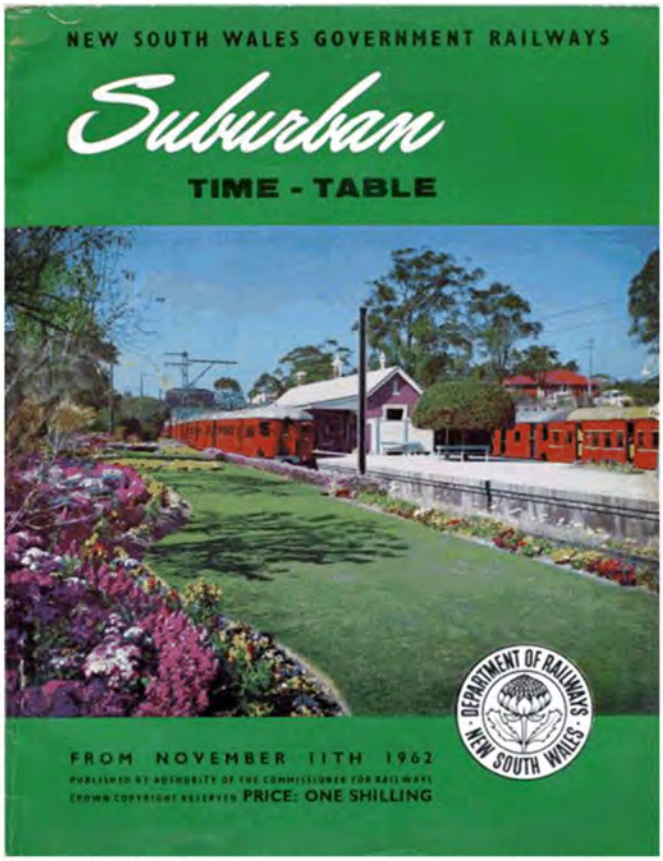


Figure 3-10 NSW Railways Suburban Timetable from November 1962 featuring Killara Railway Station gardens on its cover (National Library of Australia)

3.3 Literature review

There have been several recent heritage assessments undertaken for Killara Station for previous upgrade works. Each report recognises the historic and aesthetic heritage values of Killara Railway Station Group, and the high heritage significance of the gardens. In 2014, OCP Architects provided a Heritage Impact Report on Killara Station ahead of the proposed removal of hazardous materials at the station. These works were largely confined to the station building and included the removal of lead paint, asbestos cement sheeting, fluorescent light fittings and synthetic mineral fibres insulation. Overall, balanced against the safety aspects of the removal of hazardous materials, OCP concluded that those works had a neutral impact on the heritage significance of the station building.

AECOM provided preliminary heritage advice for works proposed for the station precinct and a commuter car park upgrade in 2015. There was a wide program of works proposed in 2015 that included the installation of accessibility compliant ramps and lifts; compliant access paths between each street, associated interchange facilities and the station; canopy coverage for the lifts and interchange facilities; provision for future canopies; Tactile Ground Surface Indicators to stairs, platforms, lifts and interchange facilities; an accessible ticket window, and a review of CCTV design. In acknowledging the Killara Railway Station Group's heritage significance and the particular significance of the gardens, AECOM recommended several guiding principles in the concept design for the works,

including the retention of original fabric of the station building where possible, the avoidance of impact to the gardens where possible, retention and/or modification of the original fabric of the footbridge rather than demolition, a shallow pitch to the footbridge roof to align with rooflines of the station building, a recessive colour palette to reduce any visual dominance and avoidance of new openings to the station buildings, with doors widened only where necessary.

In 2017, PTW Architects provided a SoHI as part of a Statement of Environmental Effects (SEE) for a package of upgrade works including repairs to the external face brick walls of the station building with an undercover waiting area added, repainting elements of the station building, new bathroom fittings and fixtures in the station building and potential reconstruction of the original roof profile and decorative gable end details removed in the 1980s. The SoHI found that the changes were acceptable from a heritage point of view. In addition to the station building works, general maintenance works to the garden was also proposed. PTW Architects recommended the retention of the garden layout, but that weed removal and top up mulch to be undertaken as per the Sydney Trains Garden Bed technical specification.

3.4 Development of Killara Station

Killara Station has been subject to a number of modifications since its opening in 1889. The original fabric and known upgrades are summarised in Table 3-1.

Table 3-1 Chronology of Killara Railway Station Group

Original 1989 station	
1889	Single line – Station building
1905	Garden commenced
1906	Single line – Brick station building constructed
1909 station	
1909	Island platform is built
1909	Duplication of the train line from Hornsby to North Sydney
1909	Type A8 station design used on the Northern Line
1910	Overhead footbridge constructed
1928	Electrification and installation of automatic signalling; signal frame removed; extension of awning
1976	Station building badly burned when station left unattended
1984-1993	Construction of footbridge kiosk
1993	Modifications to canopies and stairs
2014	HAZMAT removal/maintenance
2018	Station refresh
2019	Platform resurfacing

4.0 Physical evidence

This section provides a physical description of Killara Station to provide an understanding of the physical elements that contribute to the station's heritage significance. The descriptions are based on those contained in the SHI listing for Killara Railway Station Group.

4.1 Killara Station – major group elements

Killara Station has a single island platform, accessed by an overhead footbridge from Werona Avenue on the eastern side (Figure 4-1) and Culworth Avenue from the west (Figure 4-2). An ornamental garden is located on Werona Avenue adjacent to the steps of the footbridge and within the rail corridor (Figure 4-3 and Figure 4-4). This garden is within the curtilage of the Killara Railway Station Group.

Figure 4-1 Existing entrance to Killara Station from Werona Avenue (AECOM, 2021)

Figure 4-2 Existing entrance to Killara Station from Culworth Avenue (AECOM, 2021)

Figure 4-3 Part of the ornamental garden, looking north from the footbridge (AECOM, 2021)

Figure 4-4 Ornamental garden, looking south from the footbridge (AECOM, 2021)

The footbridge is uncovered and supported by original star-type metal newel posts at the base of each stair, with original metal balustrades and handrails (Figure 4-5 and Figure 4-6). The flooring, however, is modern poured concrete (Figure 4-8, Figure 4-8). Original Frodingham steel remains on the stairs, with modern Glengarnock steel on the upper deck (Figure 4-9 and Figure 4-10). A timber and metal-framed kiosk is cantilevered from the footbridge but appears to be of modern construction (c.1984-1993) and is no longer in use (Figure 4-8 and Figure 4-10).

Figure 4-5 Original star patterned newel posts, balustrades and handrails at the Werona Avenue (eastern) access to footbridge. These are also present on the Culworth Avenue side of the footbridge (AECOM, 2021)

Figure 4-6 Stairs from footbridge to Werona Avenue. Note original tapered end of handrail (AECOM, 2021)

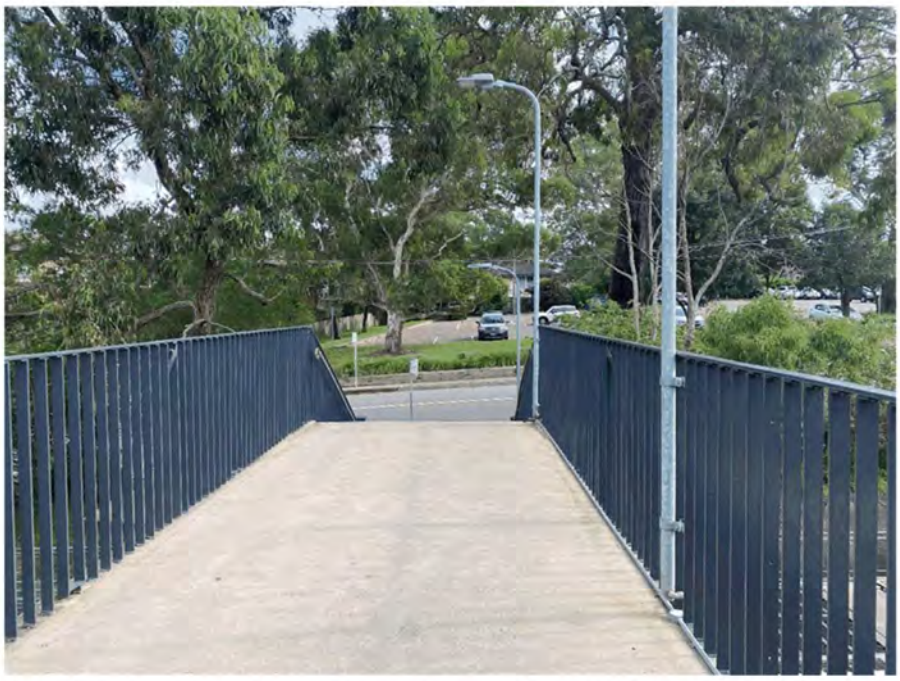


Figure 4-7 View towards commuter car park (construction compound area) on Culworth Avenue (AECOM, 2021)

Figure 4-8 Deck of footbridge, looking east. Cantilevered kiosk is at right (AECOM, 2021)

Figure 4-9 Footbridge, looking south toward Culworth Avenue from platform (AECOM, 2021)

Figure 4-10 Steel substructure of footbridge and cantilevered kiosk. Note modern steel substructure of the footbridge deck (at left) (AECOM, 2021)

The station consists of an island platform with a single brick station building (Figure 4-11). The platform itself is occupied by the station building and associated station platform furniture and lighting. Previous investigations indicate the location of gas chambers (since removed) beneath the modern platform surface, to the south of the footbridge. Some subsurface, remnant archaeological deposits may remain in that location, however these are unlikely to be disturbed by the proposed works.

Figure 4-11 Killara Station looking south, with "up" line (Platform 1) in foreground (AECOM, 2021)

The station building is of red face brick, tuck-pointed, with moulded render string course, architraves and sills (Figure 4-12). The roof has been extensively modified, with the original gable form being removed to create a gable of a much lower pitch that is a continuation of the awning. The roofing material is a modern steel profile (Figure 4-13). Curved, cast-iron, cantilevered brackets support the timber-framed awning (Figure 4-12). The building does not retain the original gable ends, bargeboards, valances or chimneys. The northern end of the building has been modified to include two doors for passenger toilets (Figure 4-14).

Figure 4-12 Station building on "down" line (Platform 2), looking north (AECOM, 2021)

Figure 4-13 Modified roofline of main station building and contemporary canopy addition in foreground, looking north from footbridge (AECOM, 2021)

Figure 4-14 Northern end of station building modified to include toilets (AECOM, 2021)

The interiors of the station building, whilst retaining most of its original plan, have been extensively modified (Figure 4-15, Figure 4-16). Walls are rendered and have no dado (lower part of a wall, between a dado rail/chair rail and the skirting board). Fireplaces have been infilled and ceilings replaced. Some original features remain, including original window joinery of double-hung sash windows with 16-pane coloured glass (Figure 4-17, Figure 4-18). A secret lockable safe remains in operation (similar examples are in operation at Denistone and Normanhurst) (Heritage NSW, 2009).

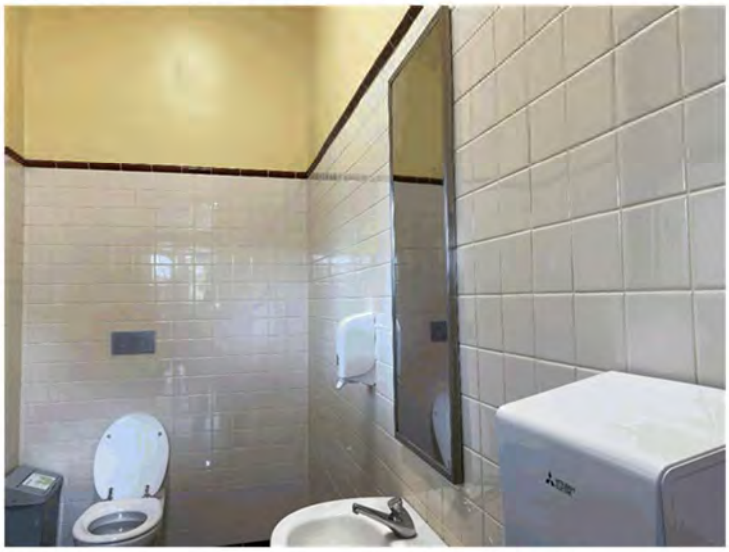


Figure 4-15 Internal layout of men's toilet, Killara Station (AECOM, 2021)

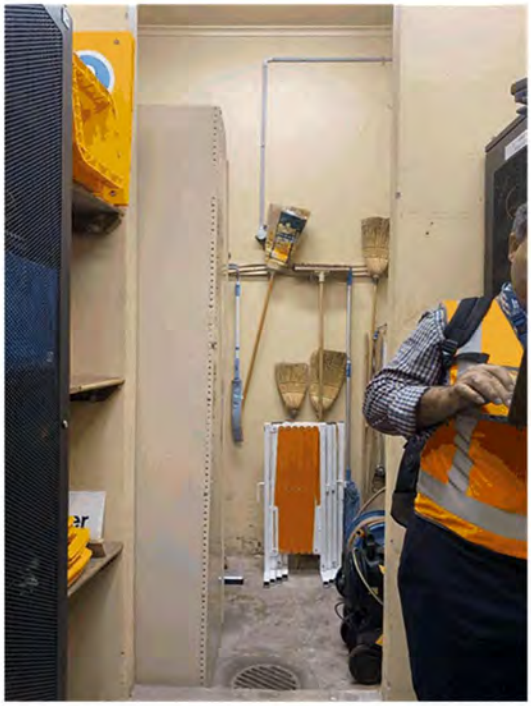


Figure 4-16 Internal layout of communications/store room, Killara Station, looking north (AECOM, 2021)

Figure 4-17 Western internal wall of communications/store room indicating original and updated features (AECOM, 2021)

Figure 4-18 Windows in station building (AECOM, 2021)

5.0 Significance assessment

5.1 Introduction

In order to understand how a development would impact on a heritage item, it is essential to understand why an item is significant. An assessment of significance is undertaken to explain why a particular item is important and to enable the appropriate site management and curtilage to be determined. Cultural significance is defined in *The Australia ICOMOS Charter for Places of Cultural Significance 2013* (ICOMOS (Australia), 2013) as meaning "aesthetic, historic, scientific, social or spiritual value for past, present or future generations" (Article 1.2). Cultural significance may be derived from a place's fabric, association with a person or event, or for its research potential. The significance of a place is not fixed for all time, and what is of significance to us now may change as similar items are located, more historical research is undertaken, and community tastes change.

The process of linking this assessment with an item's historical context has been developed through the NSW Heritage Management System and is outlined in the guideline *Assessing Heritage Significance* (NSW Heritage Office, 2001), part of the NSW Heritage Manual (Heritage Branch, Department of Planning). The *Assessing Heritage Significance* guidelines establish seven evaluation criteria (which reflect four categories of significance and whether a place is rare or representative) under which a place can be evaluated in the context of State or local historical themes. Similarly, a heritage item can be significant at a local level (i.e. to the people living in the vicinity of the site), at a State level (i.e. to all people living within NSW) or be significant to the country as a whole and be of National or Commonwealth significance.

In accordance with the guideline *Assessing Heritage Significance*, an item would be considered to be of State significance if it meets two or more criteria at a State level, or of local heritage significance if it meets one or more of the criteria outlined in Table 5-1. The Heritage Council requires the summation of the significance assessment into a succinct paragraph, known as a Statement of Significance. The Statement of Significance is the foundation for future management and impact assessment.

Table 5-1 Significance assessment criteria

Criterion	Inclusions/Exclusions
Criterion (a) *– an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).*	The site must show evidence of significant human activity or maintains or shows the continuity of historical process or activity. An item is excluded if it has been so altered that it can no longer provide evidence of association.
Criterion (b) *– an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local to area).*	The site must show evidence of significant human occupation. An item is excluded if it has been so altered that it can no longer provide evidence of association.
Criterion (c) *– an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).*	An item can be excluded on the grounds that it has lost its design or technical integrity or its landmark qualities have been more than temporarily degraded.
Criterion (d) *– an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.*	This criterion does not cover importance for reasons of amenity or retention in preference to proposed alternative.

Criterion	Inclusions/Exclusions
Criterion (e) *– an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area). Significance under this criterion must have the potential to yield new or further substantial information.*	Under the guideline, an item can be excluded if the information would be irrelevant or only contains information available in other sources.
Criterion (f) *– an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).*	An item is excluded if it is not rare or if it is numerous, but under threat. The item must demonstrate a process, custom or other human activity that is in danger of being lost, is the only example of its type or demonstrates designs or techniques of interest.
Criterion (g) *– an item is important in demonstrating the principal characteristics of a class of NSW's (or local area's):* • *cultural or natural places cultural or natural environments.*	An item is excluded under this criterion if it is a poor example or has lost the range of characteristics of a type.

5.2 Killara Railway Station Group

5.2.1 Section 170 register listings

Killara Railway Station Group has been assessed against the heritage criteria in the Section 170 Heritage and Conservation Register listing to determine the level of significance and related statutory protection as outlined in Table 5-2.

Table 5-2 Significance assessment – Killara Railway Station Group

Significance Criteria	Application of Criteria (Existing Assessment)
Historical significance SHR criteria (a)	*Killara Railway Station has historical significance at a local level. The station was a later addition to the North Shore line. It was opened in 1899 and is one of a number of stations that demonstrate the significant impact of the railway in facilitating settlement in the northern suburbs of Sydney. The garden, in association with the grouping of the station, footbridge and platform evokes a former era of travel and civic pride in railways that no longer exists.* *Killara Station has local significance in terms of its association with the formerly prestigious Railway Stations Gardens Competition. The gardens at Killara station have long been a key feature of the station and were featured on the cover of Sydney metropolitan railway timetables for many years.*

Significance Criteria	Application of Criteria (Existing Assessment)
Historical association significance SHR criteria (b)	*The item does not meet this criterion.*
Aesthetic significance SHR criteria (c)	*The garden is a largely intact typical railway/municipal ornamental garden, one of the most important railway station gardens in the region. It has significance due to its rich collection of historic exotic plantings and is held in high regard by the local community. The garden contributes strongly to the significance of the station group, providing a setting that evokes a past practice of station garden design. The station building has aesthetic qualities as an example of early twentieth century railway station design with fabric and details typical of this period and similar to other rail buildings of the late nineteenth and early twentieth century in Sydney and on the North Shore line in particular. The aesthetic significance of the station building has been compromised however, by major changes to the roof structure and later changes internally.* *The Killara Station precinct has aesthetic significance for its contribution to the characteristic nature of the North Shore line - one of homogenous station design and landscaping. With the former Killara Post Office and the treed setting, Killara Station contributes to a small but significant suburban heritage precinct.*
Social significance SHR criteria (d)	*Killara Station is considered to have social significance at a local level. Killara Station possesses a largely intact railway/municipal ornamental garden on its eastern side and is one of the most important railway station gardens within the metropolitan network. The garden is a strong source of pride in the local community and has a strong association with the once famous Railway Stations Garden Competition. The garden also featured on the cover of Sydney metropolitan railway timetables for many years. The location of the former Killara Post Office at the corner of Locksley St and Werona Ave opposite the garden reinforces the civic nature of this precinct.*
Technical/Research significance SHR criteria (e)	*The item does not meet this criterion.*
Rarity SHR criteria (f)	*Killara Station is considered to be rare at a local level. The station possesses a largely intact garden on its eastern side, which is one of the most impressive in the region with the exception of the Wahroonga Station garden. The civic pride which was once associated with the coming of the railways and the station as a major landscape and social element within the community is evident in the garden at Killara Station, one of very few on the metropolitan network to remain. The station contributes to the overall character of the Northern line* (T1 North Line).
Representativeness SHR criteria (g)	*Killara Station has representative significance at a local level. The garden represents the practice of railway station gardening that was once common throughout the network. It is an excellent example of its type due to its integrity and grouping with the original station building, platforms and footbridge.* *The footbridge was identified as an item of moderate heritage significance in the comparative analysis from the 2016 'Railway Footbridges Heritage Conservation Strategy'* (NSW Government Architect's Office Heritage Group, 2016).

Significance Criteria	Application of Criteria (Existing Assessment)
Integrity/Intactness	*Killara Station has a largely intact garden setting which adds greatly to the heritage significance of the place. The station building and footbridge, however, have undergone a number of changes that have resulted in a significant loss of both integrity and intactness. The removal of the original roof on the station building has had the most detrimental effect on the site and results in the station being a poor example of its type along the North Shore line.*

The existing Statement of Significance reads as follows:

> *Killara Railway Station Group has heritage significance at a local level. It is a typical suburban station with associated ornamental gardens, and one of the few stations in the region where there has been relatively little change to the appearance of the overall setting. It is one of a number of stations that demonstrate the significant impact of the railway in facilitating settlement in the northern suburbs of Sydney and is an important station on the first purely suburban line in NSW. The station has local significance in terms of its association with the formerly prestigious Railway Stations Gardens Competition. It is one of the most important and intact railway gardens in the region. The grouping of the station building, platform and footbridge in their landscape setting, contribute to the characteristic nature of the North Shore line, with its homogenous early twentieth century station designs and garden settings. The replacement of the original roof form of the station building with a poorly designed substitute structure detracts from the overall setting and significance.*

This Statement of Significance was last updated 11 May 2009.

5.2.2 Discussion

The heritage significance associated with Killara Station relates to the station's historical, social and aesthetic significance, with particular reference to the garden on the Werona Avenue side of the station and its connection with the former Railway Stations Gardens Competition. Historically, the construction of the station allowed for the development of the surrounding area, both for industrial and residential purposes. That growth also led to the expansion of the railway line itself, leading to the duplication of the line in 1909 and construction of the new station.

The station platform and building are recognised as good examples of early twentieth century design, with the exterior of the station building still reflective of the original design. Areas of reduced integrity to the station and the station building relate to the internal modifications and to the replacement of the station building's roof and modification/simplification of its form.

In 2016 a heritage conservation strategy was undertaken for Sydney Trains' railway footbridges (Government Architect's Office, 2016). This strategy included an assessment of the heritage significance of these railway footbridges. The Killara Station footbridge was assessed as being of moderate significance due to the number of modifications to the steps and decking (Government Architect's Office, 2016:71). However, the star-type newel posts, original steel balustrades and handrails are the only original elements left of the 1910 footbridge, and given the extensive modifications to the footbridge, these few original elements are now of increased rarity. However, despite its loss of integrity and intactness, the footbridge is recognised for its contribution to the historical and aesthetic significance of this and other stations on the North Shore line (Government Architect's Office, 2016:143).

5.3 Grading of significant elements

As different elements of an item can have a different contribution to its heritage significance, it is sometimes useful to define which elements are of significance and which may detract from its significance. The NSW Heritage Division (NSW Heritage Office, 2001:11) use the grading criteria provided in Table 5-3. The grading of significant elements associated with Killara Station are outlined in Table 5-4.

Table 5-3 Grading of significance criteria (from NSW Heritage Office, 2001:11)

Grading	Justification	Status
Exceptional	Rare or outstanding element directly contributing to an item's local and State significance	Fulfils criteria for local or State listing
High	High degree of original fabric. Demonstrates a key element of the item's significance. Alterations do not detract from significance	Fulfils criteria for local or State listing
Moderate	Altered or modified elements. Elements with little heritage value, but which contribute to the overall significance of the item	Fulfils criteria for local or State listing
Little	Alterations detract from significance. Difficult to interpret	Does not fulfil criteria for local or State listing
Intrusive	Damaging to the item's heritage significance	Does not fulfil criteria for local or State listing

Table 5-4 Killara Station grading of fabric (Heritage NSW, 2009)

Grading	Element meeting criteria
Exceptional	Form and character of the station gardens and their interaction with the local suburban setting
High	General form and character of the station building noting the modified roof form is intrusive (see below)
Moderate	• fabric of the footbridge within the rail corridor • proximity and association with the Killara Post Office on Werona Avenue
Little	Nil
Intrusive	• replacement roof on the station building • cantilevered kiosk on footbridge

6.0 Proposal description and impacts

The following section provides a description of the Proposal and is followed by a detailed assessment of the potential impacts to identified heritage significance.

6.1 Options assessment

In 2015, options for improving access to Killara Station were developed following a series of workshops with Transport for NSW and the project design team.

In 2021, Option 1 was further refined giving consideration to accessibility, customer experience and minimising impacts to heritage elements including the heritage gardens and footbridge.

These options are outlined further in Section 6.2.

6.2 Alternative options considered

Option	Key features
2015 options	
Option 1	• retention of a portion of the existing footbridge and platform stairs • provision of a new lift to provide access from the existing footbridge to the platform, including removal of the existing kiosk to accommodate lift installation and lift landing • provision of a new lift and stairs at Werona Avenue to provide access to the station footbridge from the east • provision of new ramp and stairs at Culworth Avenue to provide access to the station footbridge from the west • provision of canopy cover from the new lifts to the station building as well as existing footbridge • reconfiguration of the existing station building to provide an ambulant staff toilet and family accessible toilet.
Option 2	• demolition of the existing footbridge, ramps and stairs and construction of new footbridge north of the existing footbridge • provision of a new lift and stairs at Werona Avenue to provide access to the station footbridge from the east • provision of a new ramp and stairs at Culworth Avenue to provide access to the station footbridge from the west • provision of a new lift to access the platform from the new footbridge • provision of canopy cover from the new lifts to the existing station building as well as new footbridge • reconfiguration of the existing station building to provide an ambulant staff toilet and family accessible toilet.

Option	Key features
2021 option	
Option 1b (preferred option)	• retention of the existing footbridge and platform stairs • provision of a new lift to provide access from the existing footbridge to the platform, including removal of the existing kiosk to accommodate lift installation and lift landing • provision of a new lift at Werona Avenue to provide access to the station footbridge from the east • provision of a new lift at Culworth Avenue to provide access to the station footbridge from the west • widening of the existing footbridge to accommodate the new lift landing areas • reconfiguration of the existing toilet facilities in the station building to provide a family accessible toilet and a unisex ambulant toilet • provision of seating and canopies at existing boarding assistance zones on the platform.

6.2.1 The 'do-nothing' option

Under a 'do-nothing' option, access to the platform would remain the same and there would be no changes to the way the station currently operates.

The NSW Government has identified the need for improving the accessibility of transport interchanges, train stations and commuter carparks across NSW as a priority under the Transport Access Program.

The 'do nothing' option was not considered a feasible alternative as it is inconsistent with NSW Government objectives and would not encourage the use of public transport or meet the needs of the Killara community.

6.2.2 Assessment of identified options

The options were quantitatively and qualitatively assessed against a range of criteria using Transport for NSW's multi criteria assessment (MCA) framework by Transport for NSW and key stakeholders.

Weightings were applied to each criterion to better evaluate each option against Transport for NSW's key objectives and drivers. Qualitative criteria that were used to evaluate the options included:

- accessibility
- infrastructure requirements
- facility operations and maintenance
- deliverability
- cost
- customer experience
- transport integration
- urban design and precinct planning
- environment, sustainability and heritage.

6.3 Justification for the preferred option

In 2015, Option 1 was identified to best meet the specific objectives of the Proposal (as outlined in Section 6.1) and the wider Transport Access Program. The MCA showed that Option 1 scored the highest in customer experience, urban built form and land use integration, engineering constraints, facility operation and maintenance, and heritage and environment categories.

Option 1 was also the preferred option for the retention of the heritage significance and character of the Killara Railway Station Group (AECOM, 2015). It was concluded in that assessment that the proposed alterations to the interior of the station building as described in Option 1 would not impact fabric of heritage significance, however, the following recommendations were made to ensure the external significance is not impacted by the Proposal:

- the door to the male toilet should be locked and/or bolted to prevent access, but should remain intact to preserve the symmetry of the northern elevation
- the window adjacent to the staff ambulatory toilet should have a privacy treatment applied to the interior of the glass, so as to maintain the appearance externally
- impact on all ornamental gardens should be minimised where possible.

Since the identification of Option 1 as the preferred option, ongoing design development and consultation has been undertaken to refine the scope of the Proposal and Option 1b was developed. In response an additional lift is proposed at the Culworth Avenue station entrance and the existing footbridge retained and widened to improve accessibility and customer experience. The revised layout retains the significant heritage footbridge, including stairs, and minimises impact on the heritage gardens.

6.4 The Proposal

The Proposal involves an accessibility upgrade of Killara Station as part of the Transport Access Program which would improve accessibility and amenities for customers.

The Proposal would include the following key features:

- construction of three new lifts to provide access to the station platforms and existing footbridge, including associated lift landings, canopies, throw screens and support structures
- widening of the existing footbridge to accommodate the new lift landing areas
- provision of seating, wheelchair spaces and canopies at existing boarding assistance zones on the platform
- provision of a new pedestrian crossing, a kiss and ride bay with two spaces (including one accessible space), two new accessible parking spaces and new bicycle hoops on Culworth Avenue
- upgrade of the existing shelter on Culworth Avenue to provide accessible seating and wheelchair waiting area
- upgrade of existing footpath along Culworth Avenue to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces
- regrading a section of the existing pedestrian footpath along Werona Avenue to provide a level access ramp to the existing bus stop
- relocation of existing bicycle hoops and provision of new bicycle hoops on Werona Avenue
- reconfiguration of the existing toilet facilities in the station building to provide a family accessible toilet and a unisex ambulant toilet
- ancillary work including platform regrading, minor station building modifications, station power supply upgrade, protection and relocation of services and utilities, new or reinstatement of Tactile Ground Surface Indicators where required, upgrades to stairs, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

Figure 6-1 shows the general layout of key features for the Proposal.

Associated with the Proposal, the following works are outside the boundary of the station and therefore outside the heritage curtilage:

- new pedestrian crossing, kiss and ride bays, accessible parking spaces and bicycle hoops on Culworth Avenue
- upgrade of existing shelter on Culworth Avenue
- upgrade of existing footpath along Culworth Avenue
- regrading of existing pedestrian footpath along Werona Avenue
- provision of additional bicycle hoops on Werona Avenue.

Although outside the heritage curtilage, the s170 heritage inventory listing notes that any development in the vicinity of the station needs to consider the historical relationship between the station and its surrounding area (Heritage NSW, 2009). The proposed work outside the heritage curtilage is not expected to cause a direct impact to the station or its elements and therefore unlikely to result in an adverse visual impact to the station, either individually or collectively.

The impacts of the key features of the proposal are considered in Table 6-2 and Table 7-1.

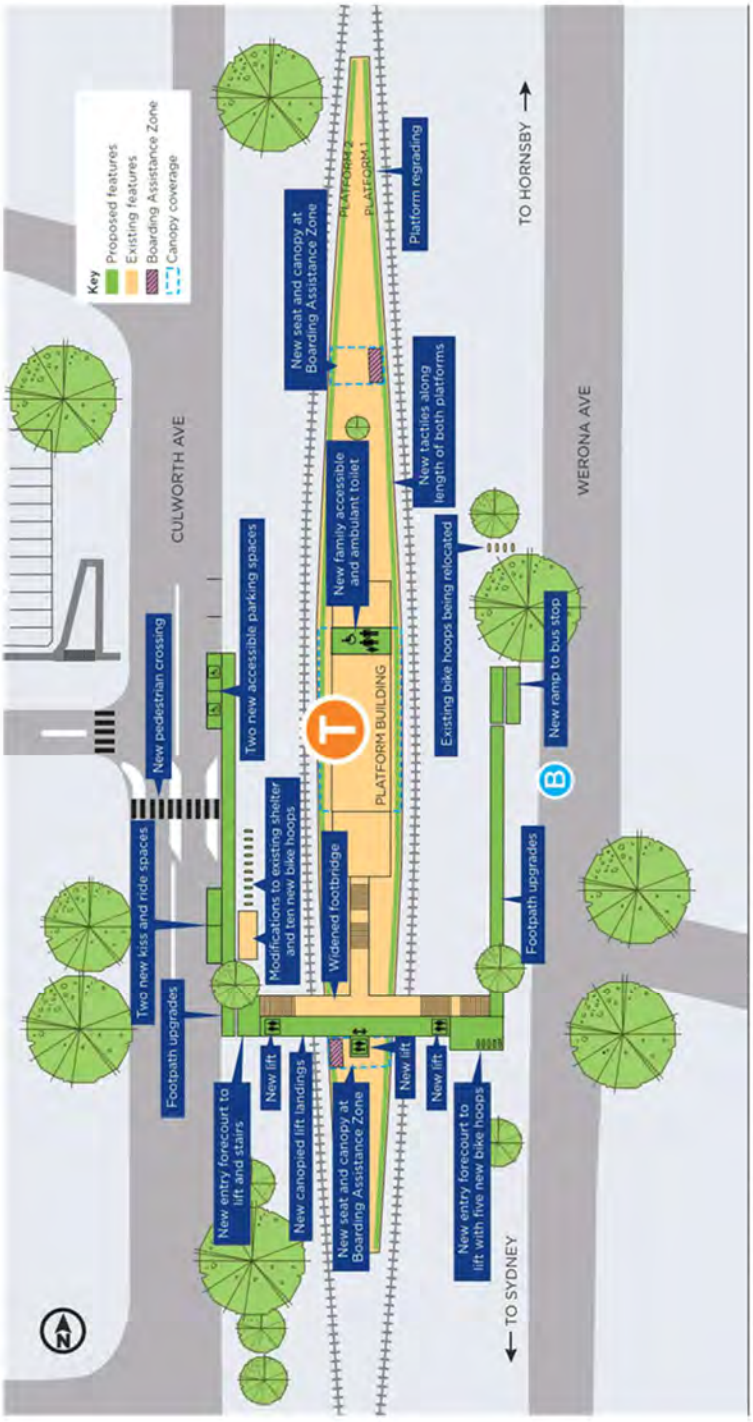


Figure 6-1 Key features of the Proposal (indicative only, subject to detailed design)

6.5 Proposal impacts

6.5.1 New lifts and footbridge widening

The Proposal includes the installation of three new lifts at the station. The first of the three lifts would be placed on the western end of the existing footbridge (Culworth Avenue side), accessed by a new entry forecourt. Another of the lifts is proposed to be in the approximate location of the existing footbridge kiosk which would be demolished (opposite the stairs leading from the footbridge to the station platform). The third lift would be placed on the eastern end of the existing footbridge (Werona Avenue side), also accessed by a new entry forecourt. The existing stairs to the footbridge would be retained (Figure 6-1). The pedestrian footpath on Werona Avenue leading to the new lift would be regraded and a new ramp would be installed to the existing bus stop.

The footbridge is proposed to be widened to accommodate the new lift landing areas on the southern side of the footbridge, and a canopy erected over the new, widened section of the footbridge.

6.5.2 Station building modifications

The Proposal includes demolition of existing toilets and upgrade to the interior of the station building's male and female toilets to create a family accessible toilet, and modification of the other toilet to create a unisex ambulant toilet. The Proposal would alter non-significant fabric as the male and female toilets have been recently upgraded. The toilet reconfiguration works are not expected to have a heritage impact (see Figure 6-2, Figure 6-3).

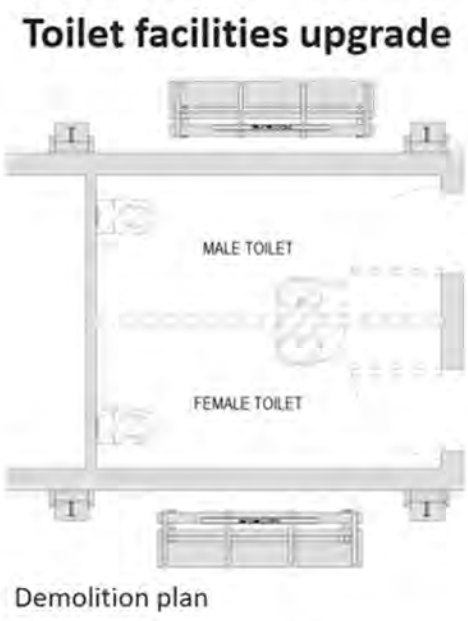
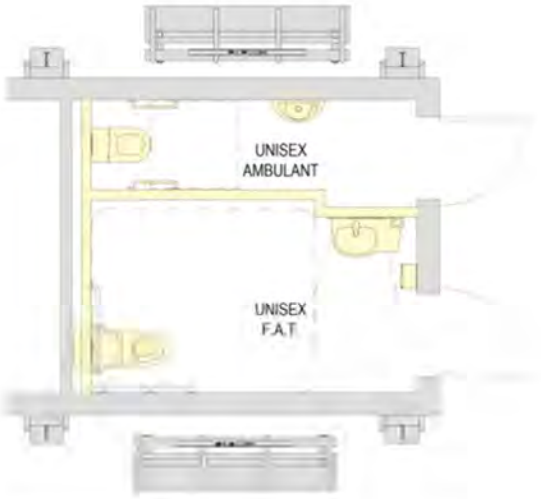


Figure 6-2 Existing layout and demolition plan for existing toilets (Aurecon, 2021, provided by Transport for NSW)



Proposed plan

Figure 6-3 Proposed layout of toilets (Aurecon, 2021, provided by Transport for NSW)

Minor work would also be required to convert the existing store room into a communications room, however this would not include structural works and therefore would have no heritage impact on the station building.

6.5.3 Upgrade to boarding assistance zones

New seating, wheelchair spaces and canopies would be provided at the two existing boarding assistance zones on the platform either side of the existing station building. Each structure consists of four engineered steel posts that support the outriggers for the canopy roof design. The roof of the canopies would be a metal cladding, with a parallel flange channel eave. The height of the eave from the finished platform surface would be approximately 2.8 metres. An example of what the boarding assistance zones would look at a similar station to Killara is provided in Figure 6-4.

Figure 6-4 Example of an artist impression of how the boarding assistance zones would look at a similar station to Killara

6.5.4 Station platform upgrade

The platform works would include:

- station power supply upgrade (Figure 6-5)
- protection and relocation of services and utilities
- new or reinstatement of Tactile Ground Surface Indicators where required
- upgrades to stairs, handrails and fencing. In relation to handrails, the original star-type newel posts, handrails and balustrades on the access stairs from Werona Avenue and Culworth Avenue will be retained and a supplementary compliant handrail provided
- new ticketing facilities including additional Opal card readers
- improvement to station communication systems (including CCTV cameras)
- wayfinding signage.

Figure 6-5 Location of transformer at the northern end of the garden; to be upgraded as part of the station power supply upgrade (AECOM, 2021)

6.5.5 Materials and finishes

Materials and finishes for the Proposal have been selected based on the criteria of durability, low maintenance, cost effectiveness, to accord with heritage requirements, to minimise visual impacts, and to be aesthetically pleasing.

Availability and constructability are also important criteria to ensure that materials are readily available and the structure can be built with ease and efficiently. Materials are also selected for their application based on their suitability for meeting design requirements.

Each of the upgraded or new facilities would be constructed from a range of different materials, with a different palette for each architectural element. Subject to detailed design, the Proposal would include the following:

- lift shafts – concrete lift shaft base and steel frame
- lift doors – stainless steel
- lift glass – clear
- lift roof and canopies – consistent or complimentary with the existing station roofing
- platform – asphalt
- footpath – concrete.

Material selection would be further developed and confirmed through detailed design to respond to the existing heritage context of the station. The design would be presented to the Transport for NSW Design Review Panel for comment before being accepted. An Urban Design Plan would also be prepared by the Contractor, prior to finalisation of detailed design for endorsement by Transport for NSW.

6.5.6 Visual impacts

A Landscape and Visual Impact Assessment (LVIA) was undertaken for the Proposal (AECOM, 2021). Five representative viewpoints were assessed in relation to the Proposal, with the overall ratings of impact outlined in Table 6-1.

Table 6-1 Viewpoints chosen to assess visual impacts (AECOM, 2021)

Viewpoint	Viewpoint rationale	Distance from the Proposal	Overall rating
Viewpoint 1: Culworth Avenue and Lorne Avenue	Assesses the view from the intersection of Culworth and Lorne Avenues with visual receptors including passers-by and local residents.	120 metres	Low (neutral)
Viewpoint 2: Culworth Avenue Council Car Park	Assesses the view from the pedestrian entry point of the council car park on Culworth Avenue with visual receptors including commuters and passers-by.	25 metres	Moderate to low (neutral)
Viewpoint 3: 18 Culworth Avenue	Assesses the view from the apartment block at 18 Culworth Avenue with visual receptors including passers-by and local residents.	35 metres	Moderate (neutral)
Viewpoint 4: Werona Avenue and Locksley Street	Assesses the view from the intersection of Werona Avenue and Locksley Street with visual receptors including passers-by and local residents. This viewpoint lies adjacent to two heritage items on Werona Avenue.	15 metres	Moderate (adverse)
Viewpoint 5: 25 Werona Avenue	Assesses the view from 25 Werona Avenue with visual receptors including passers-by and local residents.	50 metres	Moderate to low (neutral)

As noted in Table 6-1, only viewpoint 4 is assessed as having an adverse visual impact. The basis for this moderate - adverse rating relates to the impacts on the heritage character of the station, in particular the garden. These visual impacts are discussed further in Table 6-2 below.

6.6 Impacts to heritage significance

Potential impacts to the heritage significance of Killara Station as a result of the Proposal are summarised in Table 6-2.

Table 6-2 Assessment of impacts to heritage significance of the Killara Railway Station Group (Heritage NSW, 2009)

Criterion	Significance	Action
Historical significance SHR criteria (a)	**Killara Railway Station has historical significance as one of a number stations that demonstrate the significant impact of the railway in facilitating settlement in the northern suburbs of Sydney. The gardens at Killara Station also have a long been a key feature of the station and were featured on the cover of Sydney metropolitan railway timetables for many years.**	***New lifts and footbridge widening*** The addition of three new lifts is not expected to impact on the historical significance of the station. Its historicity relies on its importance in facilitating settlement on the northern suburbs of Sydney. The addition of lifts would not alter that importance. Similarly, the widening of the footbridge and canopy addition is also not expected to alter the historical significance of the station overall. The footbridge postdates the station platform by a year and allowed access to the station. The footbridge is considered to be of moderate historical significance; it would be of a higher grading but for the modification of its original fabric. The *Railway Footbridges Heritage Conservation Strategy* (NSW Government Architect, 2016:71) states the following regarding the Killara Station footbridge: *Killara Station footbridge… is one of few such structures on the North Shore line that have not had an awning installed. Star type newel posts are located at the base of each stair. Original steel balustrades and handrails remain, although steps and decking are modern concrete poured on metal sheet construction.* Most of the remaining original fabric would be retained, and the balustrading to be removed in the widening should be reinstated, thereby maintaining its historical significance. The canopy addition would be to the new section of the footbridge only, leaving the original section of the footbridge without a canopy/awning. The configuration of the station and its key elements that contribute to the station's historical significance (station building and gardens) would remain largely intact, however the installation of the lifts on the eastern (Werona Avenue) side occupy a small footprint within the existing garden. This garden is a rare example of a formal railway garden and as recommended during the concept design phase works within the garden should be avoided.

Criterion	Significance	Action
		Station building modifications The Proposal includes the reconfiguration of the existing male and female toilets to a family accessible toilet and a unisex ambulant toilet. Both existing toilets appear to have been upgraded in 1993, with all interior walls, floor, ceiling and door being upgraded. The internal fixings are also modern. Given the extensive remodelling of the toilets in 1993, it is unlikely that the reconfiguration of the internal areas would impact on historically significant fabric. Minor works are also proposed for the existing communications room, however none of these are structural and therefore will not impact on the station building's heritage significance. The proposed alterations to the station building would not have an impact on the historical significance of the station as the item would continue to act as a tangible link to the development of the railway network and to the surrounding area. The proposed modifications would still allow the contributory elements of the station building to be interpreted as the earliest and key phase of the historical development of the station.
		Boarding assistance zones The configuration of the station and its key elements that contribute to the station's historical significance would remain intact. The proposed works would have little or no impact to the historical significance of the station. The provision of seating, wheelchair spaces and canopies at the two existing boarding assistance zones would provide additional shelter, improve customer experience and enable the continued use of the station.
		Station platform upgrade Other ancillary works, including station power upgrade, platform regrading, Tactile Ground Surface Indicators, handrails, new ticketing facilities and CCTV upgrades would have a negligible impact to the station's historic heritage significance. In relation to the station power upgrade, a transformer at the northern end of the garden would be modified and connected with the power supply on the station platform. This connection would be made via horizontal directional drilling. Given its proximity to the garden and the garden's high heritage significance, it is recommended that no longitudinal galvanised service trough (GST) is to pass through heritage garden.

Criterion	Significance	Action
Aesthetic significance SHR criteria (c)	**The garden is a largely intact typical railway/municipal ornamental garden, one of the most important railway station gardens in the region. It has significance due to its rich collection of historic exotic plantings and is held in high regard by the local community. The garden contributes strongly to the significance of the station group, providing a setting that evokes a past practice of station garden design. The railway station building has aesthetic qualities as an example of early 20th century railway station design with fabric and details typical of this period and similar to other rail buildings of the late 19th /early 20th century in Sydney and on the North Shore line in particular. The aesthetic significance of the station building has been compromised, however, by major changes to the roof structure and later changes internally. The Killara Station precinct has aesthetic significance for its contribution to the characteristic nature of the North Shore line – one of homogenous station design and landscaping. With the former Killara Post Office and treed setting, Killara**	***New lifts and footbridge widening*** The construction of the proposed lifts would have a moderate adverse impact on the aesthetic significance of the station. The placement of the two new lifts on either side of the footbridge would create new elevated elements that would be visible. The central lift from the footbridge to the station platform would have an adverse impact on the station platform, however it would be separated from the station building by the footbridge supports and platform access stairs. The design has minimised impacts to the overall character of the North Shore line as the exterior of the station building would not be impacted by the construction of this lift Siting the lifts to the city side of the footbridge helps maintain the integrity of the historic station arrangement. As noted in the LCVIA, the eastern side of the station (Werona Avenue) has moderate visual sensitivity owing in part to the presence of heritage items, in particular the garden and to a lesser extent the two heritage items adjacent to the station ("The Maples" and the former Post Office). The proposed lifts are larger than other structures within the Killara Railway Station Group and therefore visually dominant. Materials and finishes proposed to be used for the upgrade works would continue the evolution use of materials for station upgrades. Originally constructed out of timber, the station evolved to be rebuilt using brick, the modern and acceptable building material of the time. Subsequent works from the 1940s through to the 1980s used similar design materials specific to the time, being brick and corrugated iron. Material selection would be further developed and confirmed through detailed design to respond to the existing heritage context of the station.
		Station building modifications The reconfiguration of the internal male and female toilets would not have an impact to the aesthetic significance associated with the station. Both toilets were recently renovated, and there are no original fixtures remaining in either toilet.

Criterion	Significance	Action
Social significance SHR criteria (d)	railway station contributes to a small but significant heritage precinct.	***Boarding assistance zones*** The construction of the canopies, seating and wheelchair spaces at the two existing boarding assistance zones would have a little adverse impact on the aesthetic significance of the station. The station is lower than the surrounding landscape and is screened from the adjacent streetscape by mature vegetation. The introduction of new canopies at the two existing boarding assist zones are located at a reasonable distance from the key elements of Killara Station, would not be connected to the station building and would easily be recognisable as a new structure. In addition, the boarding assist zone structures would be designed to be as lightweight and visually recessive as possible
		Station platform upgrade The ancillary works, including platform regrading, tactile surface ground indicators, handrails, new ticketing facilities and CCTV upgrades are not expected to have an impact to the station's aesthetic heritage significance.
	Killara station is considered to have social significance at a local level. Killara railway station possesses a largely intact railway/municipal ornamental garden on its eastern side and is one of the most important railway station gardens within the metropolitan network. The garden is a strong source of pride in the local community and has a strong association with the once famous Railway Stations Garden Competition. The garden also	***New lifts and footbridge widening*** The construction of lifts would provide equitable access to the platform, which would allow a wider range of the community to appreciate the heritage significance of the station. The installation of the new lifts would allow for the continued use of the station, and would retain the connection between the local community, the railway station and the wider rail network.
		Station building modifications The proposed removal of the current male and female toilet fittings and fixtures and reconfiguration to a family accessible toilet and unisex ambulant toilet are unlikely to have a negative adverse impact on the social significance associated with this station as the proposed alterations would make the toilets more user friendly. It is anticipated that the construction of the family accessible toilet would have a positive impact on the local community by providing essential amenities for equitable access.

Criterion	Significance	Action
	featured on the cover of Sydney metropolitan railway timetables for many years. The location of the former Killara Post Office at the corner of Locksley St and Werona Avenue opposite the garden reinforces the civic nature of this precinct.	***Boarding assistance zones*** The provision of seating, wheelchair spaces and [illegible] at the two existing boarding assistance zones would provide additional shelter, improve customer experience and enable the continued use of the station. This would not have an impact to the social significance associated with the station. ***Station platform upgrade*** The proposed ancillary works would have no impact on the social significance associated with the station.

Rarity **SHR criteria (f)**	**Killara Station is considered to be rare at a local level. The station possesses a largely intact garden on its eastern side, which is one of the most impressive in the region with the exception of the Wahroonga Station garden. The civic pride which was once associated with the coming of the railways and the station as a major landscape and social element within the community is evident in the garden at Killara station, one of the very few on the metropolitan network to remain. The station contributes to the overall character of the Northern line.**	***New lifts and footbridge widening*** Overall, the construction of the lifts and widening of the footbridge would have a minor impact on the rarity of the garden. The lift on the southern (Werona Avenue) side of the footbridge is proposed to be placed within the garden area of the station, a rare example of a largely intact railway garden. As no images or plans of the gardens to the south of the footbridge have been located, the original layout of this section of the garden is uncertain, however the majority of formal elements of the garden, including all known photographs, are to the footbridge's north. It should also be noted that while the gardens are still well-cared for and maintained, they no longer have the same level of formality and complexity as displayed in the 1950s and 1960s (see Figure 6-6 and Figure 6-7), indicating that the layout and form of the gardens has changed throughout the years. Design elements such as garden bed edging and plants were altered over time and their provenance is uncertain.  **Figure 6-6 Gardens from Footbridge, c. 1956 (Australian Railway Historical Society)**  **Figure 6-7 Gardens from the footbridge, looking south undated (Australian Railway Historical Society)**

Figure 6-8 Gardens from the footbridge, looking north (AECOM, 2021)

Figure 6-9 Gardens from the footbridge looking south (AECOM, 2021)

The Conservation Guide for Railway Gardens notes the following general principles for conservation of railway gardens (Office of Rail Heritage, 2012:8-9):

- maintain the existing significant aspects of the garden and the overall form and layout
- minimise new plantings and landscape elements
- do as much as necessary and as little as possible (ICOMOS Burra Charter, 2013)
- where most edging is extant and sound, this should be retained
- where edging is missing or unsound, the edging could be replaced with new materials to match the original style, materials, form, texture, surface characteristics, sizes, jointing and surface treatments
- before commencing construction works, photograph and document the existing gardens to ensure a dated record is available of what was there and what is being constructed.

The approximate location for the proposed lift at Werona Avenue is in an overgrown garden bed adjacent and to the south of the existing footbridge. This southern section of the garden is visually separate from the larger part of the garden by the footbridge and was not featured in photographs or promotional material. The section of the garden to the north of the footbridge was the section that has been more fully recorded.

		While the lift installation would cause an adverse impact to the garden, this can be partially mitigated by the redesign of the garden. Given that the section of garden to the south of the footbridge is different in character to the section to the north of the footbridge (comprising only trees, no formal beds), the installation of the lift could represent an opportunity to redesign both sections of the garden as a whole.
		Station building modifications There are no rarity values attached to the toilets. The reconfiguration works are not expected to have an impact to the rarity values associated with the station.
		Boarding assistance zones The provision of canopies, seating and wheelchair spaces for the existing boarding assist zones would not have an impact to the rarity values associated with the station
		Station platform upgrade The ancillary works, including station power upgrade, platform regrading, Tactile Ground Surface Indicators, handrails, new ticketing facilities and CCTV upgrades are not expected to have an impact to the station's rarity values.
Representativeness **SHR criteria (g)**	**Killara Railway Station has representative significance at a local level. The garden represents the practice of railway station gardening that was once common throughout the network. It is an excellent example of its type due to its integrity and grouping with the original station building, platforms and footbridge. The footbridge has identified as an**	***New lifts and footbridge widening*** Overall, the construction of the lifts and widening of the footbridge is not expected to have an impact to the representativeness associated with the station. The installation of the southern (Werona Avenue side) lift to the south of the footbridge would be away from the principal garden beds and would have a minimal impact on the garden. The footbridge would also be retained in an altered form, with the existing original fabric – an important component of the moderate heritage significance grading in the *Railway Footbridges Conservation Management Strategy* (2016), retained. The balustrading should be removed during the widening and reused on the widened footbridge, thereby maintaining the original fabric of the footbridge and therefore the grading of significance.

item of moderate heritage significance in the comparative analysis from the 2016 'Railway Footbridges Heritage Conservation Strategy'.	***Station building modifications*** Both the current male and female toilets have recently been refurbished, including with new internal fixtures. Internally there is no remaining original fabric associated with these toilets. As such, the internal refitting of both toilets as a family accessible toilet and unisex ambulant toilet would not have a negative impact to the significance under this criterion, as the works would be contained to areas that have already been modified.
	Boarding assistance zones The provision of canopies, seating and wheelchair spaces for the two existing boarding assist zones would not have a direct impact to the representative significance associated with Killara Station. These improvements would not have a physical impact to the station building or its other key elements. The provision of additional features at the existing structures would create a new visible structure; however, they would be easily recognisable as being modern, and would be reversable without impacting the significant fabric associated with the station.
	Station platform upgrade The ancillary works, including station power upgrade, platform regrading, Tactile Ground Surface Indicators, handrails, new ticketing facilities and CCTV upgrades are not expected to have an impact to the station's representativeness heritage significance.

6.6.1 Summary of archaeological potential and impacts

The potential for the presence of archaeological relics in particular places is significantly affected by activities which may have caused ground disturbance. These processes include the physical development of the site and the activities that occurred there. The likelihood for the presence of these relics (i.e. their archaeological potential) is distinct from the archaeological/heritage significance of these remains, should any exist. For example, there may be 'low potential' for certain relics to survive, but if they do, they may be assessed as being of 'high significance'.

The archaeological potential at Killara Station is considered low. There are known subsurface features, such as

- the previous out-of shed structure
- the original platform alignment on Platform 2
- some garden and landscape structures.

These items are described further below.

Out-of shed

An out-of shed was a small lock-up structure for the use of rail staff while the station master was not in attendance. These sheds could be used by train drivers to deliver goods and store them safely out of regular rail hours. They were usually small structures with a lockable door located near the ends of platforms (see Figure 6-10).

The out-of shed at Killara Station was located adjacent to and south of the existing footbridge, directly beneath the footbridge kiosk. It was constructed of weatherboard, with a metal roof and guttering.

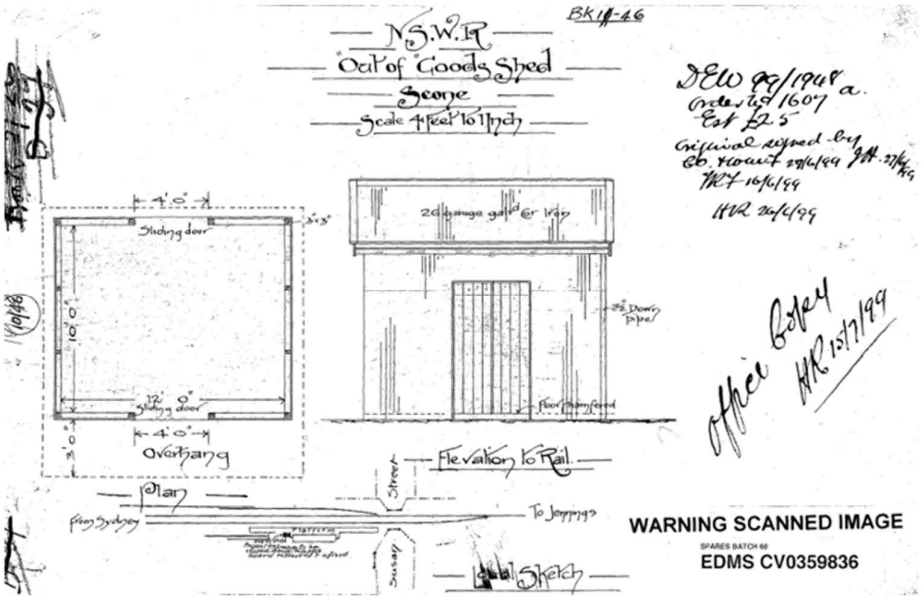


Figure 6-10 Example of dimensions of "Out-of" sheds, this example from Scone (Sydney Trains Virtual Plan Room)

Figure 6-11 **Detail of Figure 3-5 showing "out-of" shed (red arrow), c.1910 (National Library of Australia)**

According to a 1934 plan, the out-of shed was proposed to have been moved to allow for the construction of a new bookstall (Figure 6-12), however as photographs from the 1950s show a bookstall near the ticket office, it is unlikely that this bookstall was ever constructed. The date of the "out-of" shed's demolition, however, is unclear.

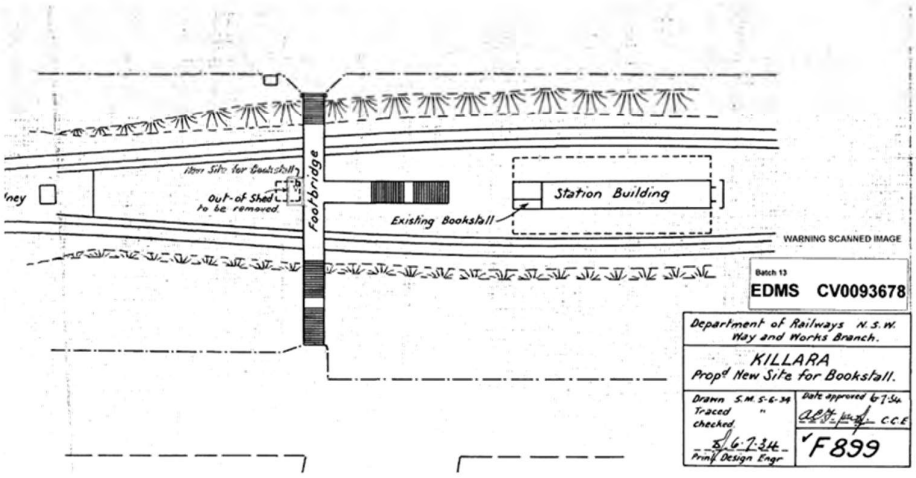


Figure 6-12 **Plan for removal of out-of shed for a new bookstall, c. 1934 (Sydney Trains Virtual Plan Room)**

Original platform alignment

As noted in Section 3.0, the original platform constructed in 1899 was a single platform that was designed to be converted to an island platform on duplication (Figure 6-13). The original platform included a paling fence along the length of the platform (see Figure 3-4).

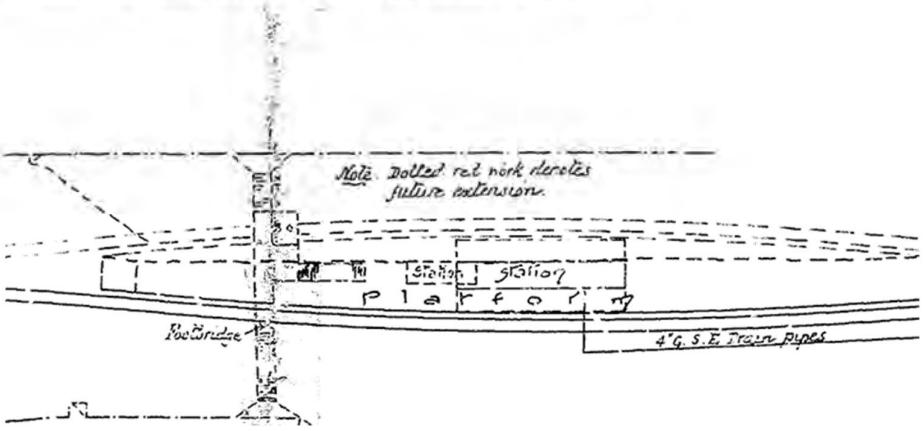


Figure 6-13 Detail of Figure 3-3 above, showing modification of 1899 platform for duplication, c. 1906 (Sydney Trains Virtual Plan Room)

Garden and landscaping structures

Historical photographs of the station show a number of plantings along the platform, as well as other landscaping elements such as lighting and seating as shown in Figure 6-14. While these elements contributed to the character of the station, their remains are likely to be ephemeral.

Figure 6-14 Killara Station looking south, undated (Australian Railway Historical Society NSW, Image 008774)

Works on the platform may uncover remains associated with the out-of shed, the original platform alignment and/or garden and landscape structures. However, as these remains are likely to be fragmentary and are unlikely to contribute further information regarding the shed, it is considered that these remains are not likely to be of archaeological significance. However, it is recommended that should these remains be encountered during works that the unexpected finds protocol be followed

7.0 Statement of heritage impact

7.1 Introduction

The objective of a SoHI is to evaluate and explain how the proposed development, rehabilitation or land use change would affect the heritage value of the site and/or place. A SoHI should also address how the heritage value of the site/place can be conserved or maintained, or preferably enhanced by the Proposal.

This report has been prepared in accordance with the NSW Heritage Office & Department of Urban Affairs and Planning *NSW Heritage Manual* (1996) and NSW Heritage Office *Statements of Heritage Impact* (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). The guidelines pose a series of questions as prompts to aid in the consideration of impacts based on the type of Proposal. The Proposal involves major additions to the station, being the proposed construction of the new lifts, widening of the footbridge, minor alterations to the station building toilets and platform regrading. The guideline suggests the following questions be used to direct discussion in relation to these two modification types:

Minor partial demolition (station building upgrade)

- is the demolition essential for the heritage item to function?
- are important features of the item affected by the demolition (e.g. fireplaces in buildings)?
- is the resolution to partially demolish sympathetic to the heritage significance of the item?
- if the partial demolition is a result of the condition of the fabric, is it certain that the fabric cannot be repaired?

Major additions (relating to the new lifts, footbridge widening and boarding assistance zone modifications)

- how is the impact of the addition on the heritage significance of the item to be minimised?
- can the additional area be located within an existing structure? If not, why not?
- would the additions visually dominate the heritage item?
- is the addition sited on any known, or potentially significant archaeological deposits? If so, have alternative positions for the additions been considered?
- are the additions sympathetic to the heritage item? In what way (e.g. form, proportions, design).

These questions are addressed below, based on the impacts to the heritage significance of the station, as outlined in Section 6.6.

7.2 Process questions

7.2.1 Minor partial demolition (relating to station building upgrade)

Is the demolition essential for the heritage item to function?

The reconfiguration of the existing male and female toilet is essential to provide DDA compliant facilities at the station. Both toilets were upgraded recently, and modifications to the internal layout are not expected to have an impact to the heritage significance associated with the station.

Are important features of the item affected by the demolition (e.g. fireplaces in buildings)?

There are no internal features associated with the current male and female toilets that are considered to be important. The current fixtures and fittings were installed recently and are all modern. Important original features such as windows would not be impacted.

Re-grading of the platform surface is not considered to impact on any important features.

Is the resolution to partially demolish sympathetic to the heritage significance of the item?

The proposed reconfiguration of the existing male and female toilets into a family accessible toilet and ambulant and staff toilet respectively, would be contained within the existing toilets. Both toilets were upgraded recently, with all current fixtures and fittings being modern and not original. As such, these works are considered to be undertaken sympathetically as they would be contained in areas already modified.

If the partial demolition is a result of the condition of the fabric, is it certain that the fabric cannot be repaired?

The demolition is not as a result of the condition of the fabric but to provide accessibility compliant facilities.

7.2.2 Major additions (relating to the new lifts, platform widening and boarding assistance zone modifications)

How is the impact of the addition on the heritage significance of the item to be minimised? Are the additions sympathetic to the heritage item? In what way?

The impact has been minimised through design. It is proposed that the lift shafts would be added to the existing footbridge entry and a central lift linking the footbridge and station platform approximately in the location of the existing footbridge kiosk. The placement of the lift shaft on the southern side (Werona Avenue) of the footbridge also minimises impact to the garden, the bulk of which is on the northern side of the footbridge.

The original fabric (i.e. newel posts, balustrades and handrails) on the existing original stairs from Werona Avenue and Culworth Avenue would be retained, however a compliant handrail would be added. This handrail would not be affixed to the existing structure, thereby eliminating impact.

The widening of the footbridge to accommodate the lifts minimises impact to the footbridge overall by retaining most of its significant original fabric, i.e. the handrails, balustrades and star-motif newel posts. As noted in Table 5-2, the deck and stair treads of the footbridge were modified during earlier works. The retention and re-use of the balustrade for the widened portion of the footbridge is recommended.

The proposed widened section of the footbridge would include a canopy, providing a covered corridor from the new lifts to and from Werona Avenue and Culworth Avenue and the platform. The canopy would be designed to be visually recessive, however the addition of the canopy would add bulk to the footbridge and therefore have a moderately negative visual impact on view corridors to and from the station. However, the extent of the visual impact of the canopy would depend on the materials/finishes and final design. A qualified heritage architect would be consulted during the detailed design phase to minimise any visual impact and consider the selection of appropriate materials.

The modification of two boarding assistance zones to provide seating, wheelchair spaces and canopies have been designed to be as visually recessive as possible. The location of the two structures would be either side of the existing station building and would not have a direct impact to any fabric associated with it. Also, the design has been minimised to include no internal walls or other elements that would obscure the view to the station building from on the platform. The eave and roof design would be flat, resulting in the design being as minimal as possible. Additional recommendations would be added for the height of the boarding assistance zone canopies to match, as close as possible, the height of the eaves associated with the station building.

The Proposal would contribute to demonstrating the capacity for this small railway station to evolve based on changing expectations and requirements of rail passengers. The proposed works can be considered as the next stage in the pattern of human use and adaptation. The station's historical purpose – to facilitate the movement of people – would continue into the future.

Figure 7-1 Photomontage of the new lift on Werona Avenue (AECOM, 2021)

Can the additional area be located within an existing structure? If not, why not?

The current access to the station is via a footbridge linking the station with both Werona Avenue and Culworth Avenue. The additional area consists of lift shafts, which cannot be located within the footprint of the existing footbridge.

The locations of the existing boarding assistance zones would not change. Canopy coverage will be maximised to provide shelter and not impede onto the track.

Will the additions visually dominate the heritage item? Are the additions sympathetic to the heritage item? In what way (e.g. form, proportions, design)?

The Proposal may result in the heritage item being somewhat visually dominated, although the extent of visual domination is dependent on detailed design. According to the LCVIA, the installation of the new lifts on Werona Avenue and Culworth Avenue would have a moderately adverse impact on the heritage character of the station owing to its size and scale, but would be ameliorated by the surrounding vegetation.

Is the addition sited on any known, or potentially significant archaeological deposits? If so, have alternative positions for the additions been considered?

There are no areas of significant archaeological potential that have been identified within the proposed construction area. As noted in Sections 4.1 and 6.6.1 above, there is the potential for subsurface remains relating to the out-of shed, the original platform alignment and garden and landscaping elements. These are not expected to have archaeological significance, however any archaeological remains discovered during construction works should follow the procedures set out in the Transport for NSW Unexpected Heritage Finds Guideline.

7.3 Statement of heritage impact

The potential impacts to the Killara Railway Station Group have been assessed against the criteria outlined in the NSW Heritage Division guidelines (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). The impacts of the Proposal have been graded against the significance of the site as outlined in Table 7-1.

Table 7-1 Summary of the nature of the direct and indirect impacts

Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	None.
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	The construction of the new lift to access the footbridge at the southern (Werona Avenue) side of the station would have a moderate negative impact to significant heritage fabric. The widening of the footbridge and associated canopy would have a moderate negative impact to significant heritage fabric. The modification of the two boarding assistance zones to provide seating, wheelchair spaces and canopies on the platform would have a low to moderate negative impact to the aesthetic significance associated with the station.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	The visual impact from the construction of the new lifts on either side of the footbridge is assessed as minor and can be mitigated to minimise the visual impact.
Negligible or no impacts (does not affect heritage values either negatively or positively)	The reconfiguration of the existing toilets into the new ambulant toilet, and creation of a family accessible toilet is considered to have a neutral heritage impact. The existing two doors in the northern elevation were constructed c.1993 and are therefore not original fabric. The internal works would be contained within the existing toilets, which were also upgraded in 1993. All current fixtures and fittings, including tiles, are non-original. The regrading of the station platform surface and installation of the Tactile Ground Surface Indicators would have a negligible impact to the heritage significance associated with the station.
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	The Proposal would improve safety and accessibility and the station would be enhanced following its reconfiguration. The construction of the new lift structures would enable access to and appreciation of the station by a wider demographic.

8.0 Recommendations

The following mitigation measures are recommended to minimise impacts to the heritage listed Killara Railway Station Group.

Recommendation 1 – Heritage advice

A heritage architect must be engaged to provide ongoing heritage and conservation advice throughout the detailed design process. In addition to ongoing heritage advice, the nominated heritage architect shall:

- confirm and document options analysis around impacts to significant elements and design mitigation to avoid or reduce adverse impacts
- ensure that the final design adheres to the relevant policies, including but not limited to the *Heritage Platforms Conservation Management Strategy*, *Railway Footbridges Heritage Conservation Strategy*, *Canopies and Shelters: Design Guide for Heritage Stations* and the *Station Access Heritage Conservation Guide*
- provide input to detailed development and supervise works to significant fabric within the scope of works, including works to the handrails, balustrades and newel posts of the footbridge, connection of widened footbridge elements, and all original fabric of the station building, the platform and in the vicinity of the garden.

The nominated heritage architect may be required to update this assessment when impacts are defined during the detailed design phase and record the above additional analysis in an updated report.

Recommendation 2 – Consultation with Sydney Trains Heritage

It is recommended that Transport for NSW continue to consult with Sydney Trains Heritage throughout the design process to address preliminary feedback on subjects including the form and materials of the lift, landscaping and works associated with new and existing services.

Recommendation 3 – Heritage landscape plan

To offset anticipated impacts to the heritage gardens it is recommended that during the detailed design phase of the Proposal a landscape plan would be provided either by, or with the input of, a qualified heritage landscape specialist. This plan would include mitigation measures for any necessary tree removal and species for replanting that are appropriate to the heritage landscape. New landscaping must complement the existing landscaping. New gardens should be horticulturally and stylistically sympathetic to the period of the station gardens (i.e. early twentieth-century rockery garden). The use of similar materials such as stone and brick is encouraged, as is the use of a variety of plant species to avoid monocultural plantings along Werona Avenue.

Appropriate treatment of the landscape will facilitate interpretation of the station gardens as a socially significant asset to the local community.

Recommendation 4 – Lifts and footbridge

The following recommendations are made in relation to the platform lifts and associated walkway construction:

- detailed design would further investigate options to minimise impacts to the railway garden
- the original fabric of the footbridge, in particular the star newels at the bottom of the stairs on both sides of the footbridge and platform, hand rails and balustrades should be investigated to be retained
- re-use of the original balustrade on the footbridge at the areas of the footbridge widening is recommended. Where supplementary balustrades and handrails are required, these would be

designed to be compatible with the retained elements in terms of form, placement and materiality

- detailed design would minimise the impact to the brickwork associated with the platform, including the edge coping walls.

Recommendation 5 – Station building upgrade

The following recommendations are made with relation to the station building reconfiguration:

- care would be taken when undertaking all demolition works so as not to damage significant fabric
- new services, outlets, wall units and brackets (etc.) would be located internally in areas already modified and/or consolidated in one location. Existing openings in ceilings are the preferred location for the installation of new services. New services and fittings would use existing fixing points or be located at mortar joints. These works would be undertaken in accordance with the Sydney Trains technical notes, *Installation of New Electrical and Data Services at Heritage Sites* (2017) and *Fixing Methods at Heritage Sites*
- new services would be installed as per Recommendation 10 below
- impacts to the detailed architraves around the current toilet entry door and transom window would be minimised
- new interior tiling would consider the Sydney Trains *Draft – NSW Heritage Station Passenger Tile Finishes (2020)*.

Recommendation 6 – Boarding assistance zones

The height of the eaves associated with the two new boarding assistance zone canopies would match, as close as possible, the height of the eaves associated with the existing station building. The heights would match to create a continuity between the existing station building and the two new structures. The proposed canopies should aim to reduce impact to significant fabric and the visual impact of the Proposal through recessive materials and sympathetic design.

Recommendation 7 – Station platform upgrade

The following recommendation is made with regard to works that would be undertaken on, and to, the current platform. This includes the regrading and resurfacing of the platform surface.

- re-grading of the station platform would not cover any existing wall vents that have been installed along the lower course of the brickwork to the station building. If cast iron gratings are removed, these would be stored for future reuse.

Recommendation 8 – Interpretation

A heritage interpretation plan must be prepared and implemented for the station in accordance with NSW Heritage Office (former) publication *Interpreting Heritage Places and Items and the Sydney Trains Heritage Interpretation Guideline*. The Proposal is considered a medium/major project in terms of evaluating interpretation options and therefore a nominal score of 70 in accordance with the guidelines should be achieved.

The interpretation plan would investigate methods of reinstating the footbridge lighting as a primary interpretation element.

Recommendation 9 – Recording

Prior to any construction, a photographic recording would be undertaken of the station, including (but not limited to) the station building, platform, footbridge and garden. This recording would be undertaken in accordance with the Heritage Council of NSW publication, *Photographic Recording of Heritage Items using Film or Digital Capture* (Heritage Council of NSW, 2006).

Recommendation 10 – Installation of services

All ancillary works (CCTV, PA, communications, air-conditioning etc) would be undertaken in accordance with the relevant Sydney Trains heritage guidelines. Alternative solutions must be explored where any impacts to significant fabric are identified. Works would proceed with the principle of avoiding fixing new services to the façade of the exterior building and would be contained/ concealed in new development areas. A complete services plan is to be reviewed and assessed by a qualified heritage architect identifying alternative solutions, and submitted to the Associate Director Environmental Impact Assessment (AEDIA) (or delegate) for endorsement prior to works commencing.

Recommendation 11 – Heritage induction

A heritage induction would be provided to all on-site staff and contractors involved in the Proposal. The induction would clearly describe the heritage constraints of the site.

Recommendation 12 – Unexpected finds and stop work procedure

The Construction Environmental Management Plan (CEMP) for the Proposal would include stop work procedures in accordance with Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019) to manage activities in the unlikely event that intact archaeological relics or deposits are encountered.

9.0 References

AECOM (2015). Killara Station Precinct Accessibility and Commuter Car Park Upgrade – Concept Plan Project, unpublished report to Transport for New South Wales.

AECOM (2021). Transport Access Program 3: Killara Station Upgrade - Landscape Character and Visual Impact Assessment (Draft). Unpublished report to Transport for New South Wales.

Architectural Projects Pty Ltd (2010). *1374- Ku-ring-gai South Conservation Areas Review*, Unpublished report to Ku-ring-gai Council.

Birds Tree Consultancy. (2021). Arbocultural Development Impact Assessment – Transport Access Program - Killara Station NSW. Unpublished report to Transport for New South Wales.

Buckley, P (ed.), (2017). 'NSW Railway Gardens', *NSW heritage Railway Station and Infrastructure News*, Issue No. 13, pp. 14-20.

Davison, G. (1978). 'Sydney and the Bush', *Historical Studies, 18*(71), 191-209.

Edwards, J G (1926). 'History of Killara, near Sydney', *Journal and Proceedings of the Royal Australian Historical Society*, Vol. 12 No. 2, pp. 112-136.

Edwards, Z and Rowland, J (2008). *Killara*, Dictionary of Sydney, accessed 30 March 2021 from https://dictionaryofsydney.org/entry/killara

Heritage Council of NSW (2006). *Photographic Recording of Heritage Items using Film or Digital Capture*. Photographic Recording of Heritage Items using Film or Digital Capture (nsw.gov.au)

Heritage NSW (2009). *Killara Railway Station Group*. https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4802058

Higginbotham, E (1993). *Hornsby Shire Heritage Study: Historical Archaeology Report*. Report for Perumal Murphy Wu Pty Ltd.

ICOMOS (Australia) (2013). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*. Australia ICOMOS. http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf

NSW Heritage Division (2009). *Hawkesbury River Railway Station group*. https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=5012051

NSW Heritage Office (2001). *Assessing Heritage Significance*. http://www.heritage.nsw.gov.au/docs/assessingheritagesignificance.pdf

NSW Heritage Office & Department of Urban Affairs & Planning (2002). *Statements of Heritage Impact* (Issue 2). Heritage Office & Department of Urban Affairs & Planning. https://www.environment.nsw.gov.au/Heritage/publications/index.htm#S-U

NSW Heritage Office, & NSW Department of Urban Affairs and Planning (1996). *NSW Heritage Manual*. Heritage Office & Department of Urban Affairs & Planning. http://www.heritage.nsw.gov.au/03_index.htm#M-O

Office of Rail Heritage (2012). *NSW Railway Conservation Guide: Railway Gardens*. Office of Rail Heritage, Sydney.

RailCorp (2009). *Victoria Street Railway Station (Railcorp S.170)*. http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801004

The Australian Town and Country (1889). The Australian Town and Country. *4 May*.

Transport for NSW (2019). *Unexpected Heritage Finds Guideline*. Transport for NSW.

Newspapers:
Daily Telegraph, 14 August 1905.
Daily Telegraph, 30 March 1907.
Daily Telegraph, 2 November 1907
Sunday Herald, 13 September 1953
Sydney Morning Herald, 3 November 1908