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Hawkesbury River Station Upgrade

Traffic, Transport and Access Impact Assessment

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Client: Transport for New South Wales

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Quality Information

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1.0 Introduction

1.1 Background

Transport for NSW (TfNSW) has proposed the upgrade of Hawkesbury River Station (the 'Proposal'). The Proposal forms part of the Transport Access Program (TAP), a NSW Government initiative to provide accessible, modern, secure and integrated transport infrastructure. TfNSW is the proponent for the Hawkesbury River Station Upgrade (the Proposal).

AECOM has been commissioned by TfNSW to undertake a Traffic, Transport and Access Impact Assessment of the construction and operation of the Proposal.

1.1.1 Key features of the Proposal

The Proposal would include the following key elements:

- construction of two new lifts to provide access to the existing footbridge and station platforms, including associated landings and support structures
- provision of a kiss and ride space and accessible parking space within the Dangar Road car park as well as an access path and pedestrian crossing from the car park to the station entrance
- regrading of the footpath at the access points to the station on the Dangar Road side of the station and extending approximately 50 metres (m) north east from the station entrance
- construction of a new family accessible toilet, a new unisex ambulant toilet, and a new staff toilet within the existing toilet facilities
- installation of a horizontal glass canopy over the entrance of the family accessible toilet
- installation of a new padmount transformer as well as ancillary electrical works to supply the station and new lifts with electricity
- ancillary works including adjustment to lighting, electrical upgrades, improvement to station communications systems (including CCTV cameras), hearing loops, wayfinding signage and installation of tactile ground surface indicators (TGSIs) as required.

A detailed description of the Proposal and its associated works are provided in Chapter 3 of the *Hawkesbury River Station Upgrade Review of Environmental Factors* (AECOM, 2019).

Subject to planning approval, construction is anticipated to commence in late 2019 and would take approximately 18 months to complete.

The construction methodology would be further developed during the detailed design of the Proposal by the nominated construction contractor, in consultation with TfNSW.

1.2 Study area

Hawkesbury River Station is located on the southern bank of Hawkesbury River in Brooklyn, a suburb in the Hornsby Shire Local Government Area (LGA) of New South Wales. The Hawkesbury River Station precinct includes the station, associated buildings, footbridge, pedestrian linkages to the adjacent streets, bus stops and car parking facilities.

The indicative boundary definition of Hawkesbury River Station precinct (i.e. the study area for this assessment) is shown in Figure 1.

Source: AECOM, 2019

Figure 1 Location map

1.3 Scope of the study

This Traffic, Transport and Access Impact Assessment provides a high level assessment of the potential impacts of the Proposal on transport, traffic, access and road safety. The purpose of this report is to:

- assess the existing traffic and transport conditions in and around Hawkesbury River Station precinct;
- evaluate the potential traffic generation caused by the Proposal;
- assess the impacts associated with construction and operation of the Proposal; and
- recommend mitigation measures to manage impacts, if required.

1.4 References

The following technical documents were reviewed to inform the assessment of Hawkesbury River Station, including:

- TAP3 Hawkesbury River Station – Scoping Design Report (Aurecon, Jan 2019)
- Hawkesbury River Station Transport and Access Report (Aurecon, Dec 2018)
- Hawkesbury River Station Pedestrian Flow Assessment Report (Aurecon, Dec 2018).

2.0 Existing conditions

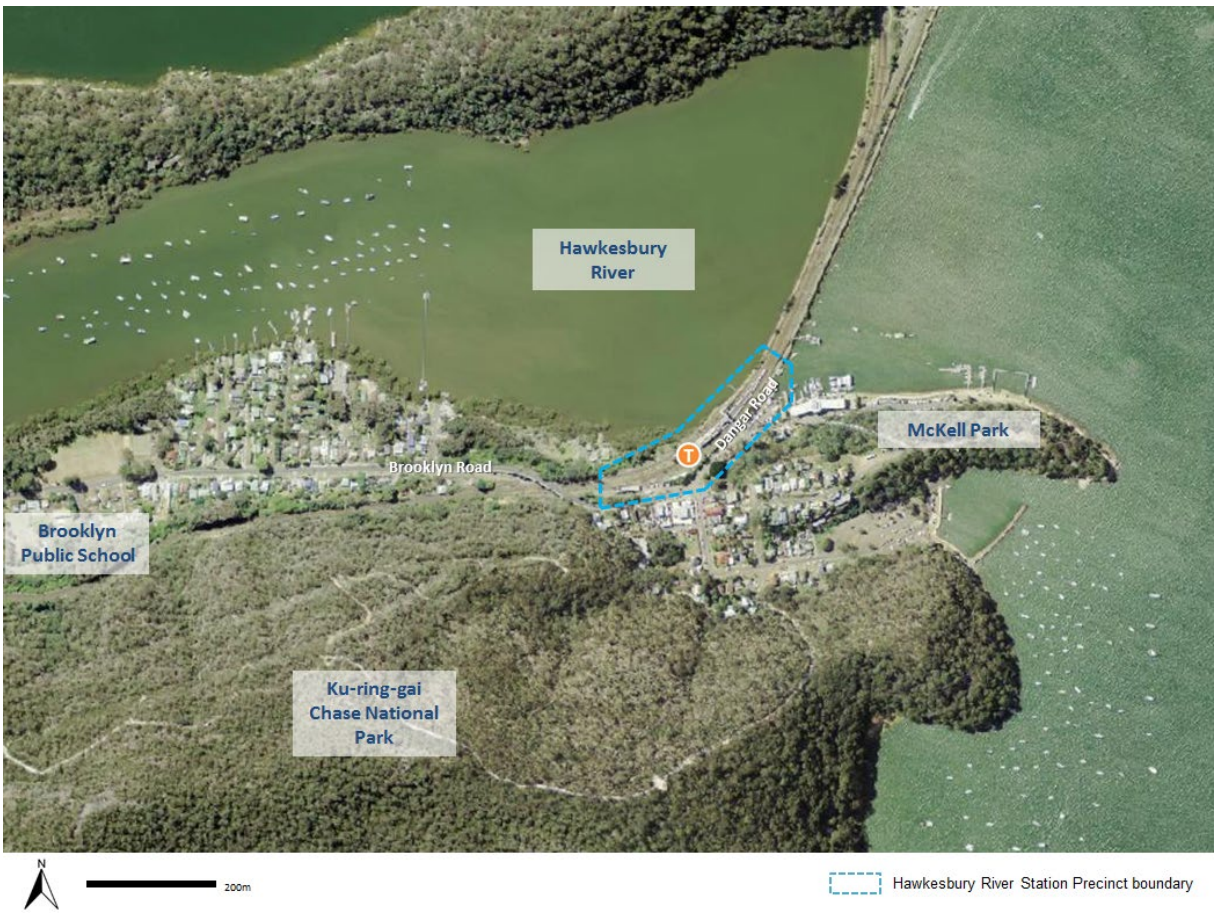
2.1 Brooklyn context

The suburb of Brooklyn is located approximately 28km north of Hornsby, within the Hornsby Shire LGA.

The suburb is served by the Central Coast & Newcastle Line on the Intercity Trains Network, providing connections to the Sydney Trains network (intercity and suburban). The adjacent stations to Hawkesbury River Station are Wondabyne Station (to the north) and Cowan Station (to the south).

The land use surrounding Hawkesbury River Station consists primarily of low density residential areas and the station is surrounded by the Ku-ring-gai Chase National Park and the Hawkesbury River.

Figure 2 illustrates some of the key roads and land use features in Brooklyn, including educational, parks, and environmental areas.



Source: AECOM, 2019

Figure 2 Brooklyn context

2.2 Hawkesbury River Station

Hawkesbury River Station is served by the Central Coast & Newcastle Line providing train services between Newcastle Interchange and Central Station in Sydney. Figure 3 shows Hawkesbury River Station on the Sydney Suburban Trains network.

Source: Sydney Trains, 2019 (modified by AECOM 2019)

Figure 3 Location of Hawkesbury River Station on the Sydney Trains network

The main station entrance is from Dangar Road to the east. The station is currently not accessible for people with mobility issues. The station is accessed by stairs on either side of a footbridge that crosses the railway. Stairs provide the only means of access from the footbridge to the island platform. The footbridge and stairs also provide a means for pedestrians and cyclists to cross the railway corridor. There are no canopies for weather protection above the footbridge and stairs.

The station has one island platform (Platform 1 and 2). Both platforms are currently used for through train services in each direction. The number of services at Hawkesbury River Station during the AM and PM two hour peak periods are shown in Table 1.

Table 1 Rail services at Hawkesbury River Station

Key Destination	AM Weekday Peak (6am-8am)	PM Weekday Peak (4pm-6pm)
Newcastle Interchange to Central	4 services	2 services
Central to Newcastle Interchange	2 services	4 services

Source: Sydney Trains, 2019

2.2.1 Current train passenger travel demand

Based on Opal data provided by TfNSW, Hawkesbury River Station recorded approximately 496 trips per weekday based on May 2017 averages. A breakdown of the Opal data is provided in Table 2.

Table 2 Hawkesbury River Station May 2017 Opal data

Station	Average weekday			
	Total	Peak 1 hour (8am-9am)	AM peak (6am-10am)	PM peak (3pm-7pm)
Hawkesbury River	496	33	173	143

Source: TfNSW, 2017

2.2.2 Station accessibility

The station is located between Dangar Road and Hawkesbury River, with access to the station provided via stairs and a footbridge over the railway. Access to Platforms 1 and 2 is via stairs from the footbridge.

The majority of the station facilities are located on the platform level and there are currently a number of interchange facilities provided at Hawkesbury River Station, as shown in Table 3.

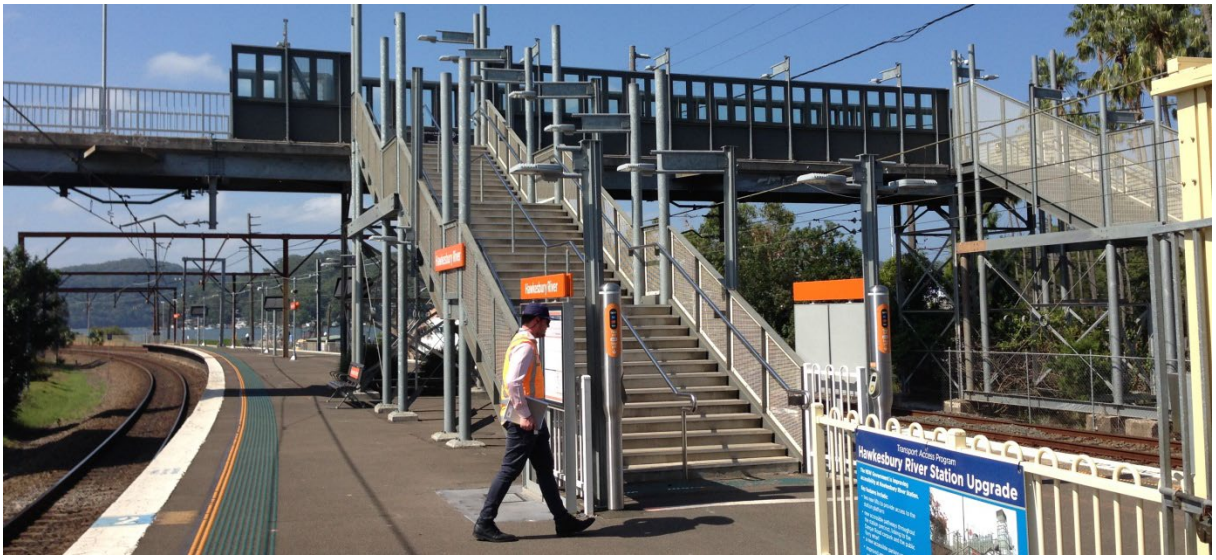
Table 3 Hawkesbury River Station facilities

Accessibility	General facilities	Transport interchange
• stairs • hearing loop • PA system for announcements • tactile surfaces	• toilets • emergency help point	• bus stops • ferry wharf • car parks

Source: Sydney Trains, 2019

2.2.3 Pedestrian facilities

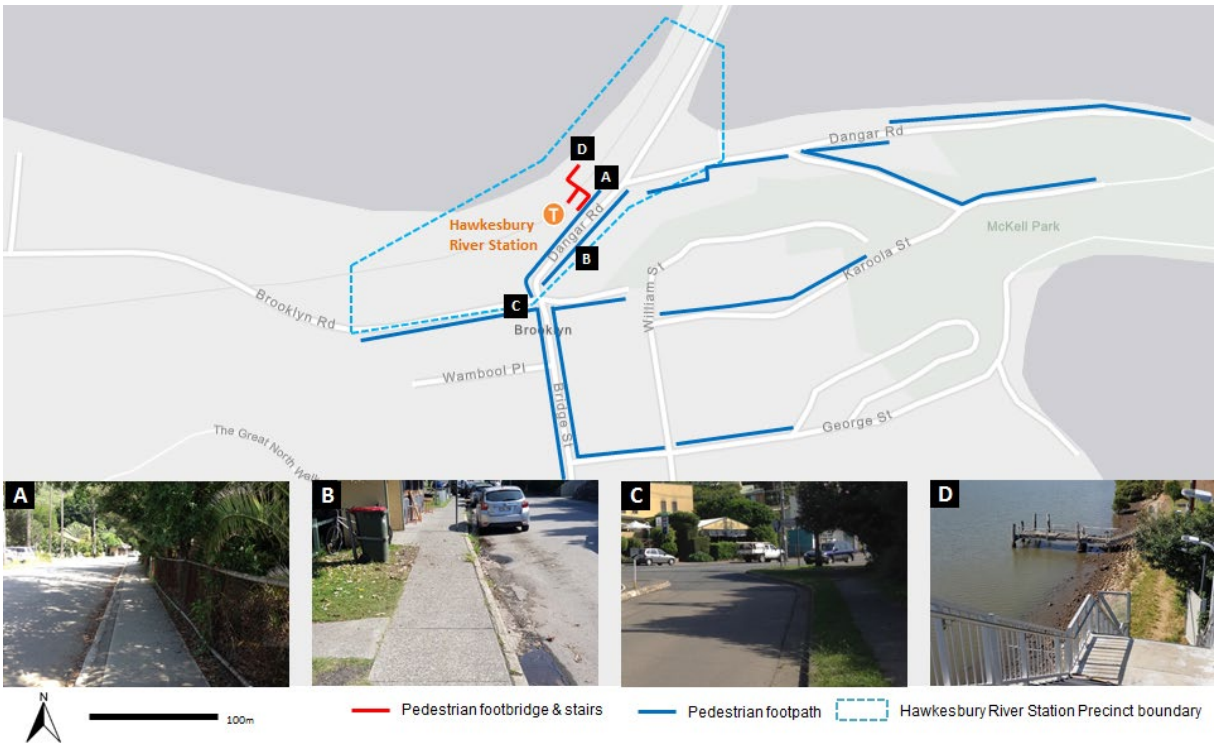
Figure 4 shows the stairs from the footbridge to the platform providing a barrier to accessible access to Platforms 1 and 2.



Source: AECOM, 2019

Figure 4 Pedestrian bridge and stairs

Figure 5 highlights some of the key pedestrian facilities in the vicinity of Hawkesbury River Station. Footpaths are present along both sides of Dangar Road. No formal pedestrian crossing is provided to connect the interchange facilities opposite the main station entrance, such as the bus stop and Dangar Road car park (McKell Park car park). The footpath on the western side of Dangar Road connects the commuter car park located along Brooklyn Road to the station. However, no formal crossings are provided at the intersection of Dangar Road / Brooklyn Road.

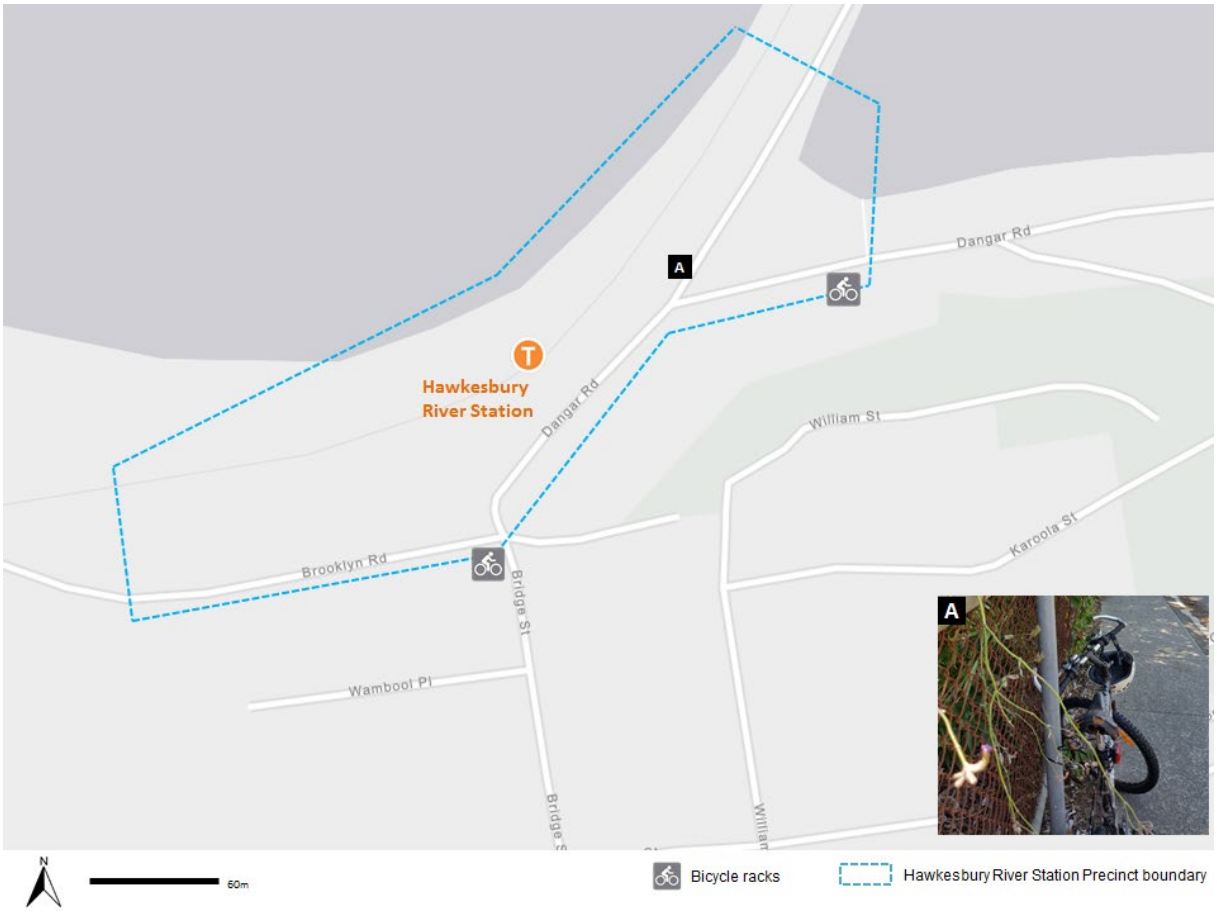


Source: AECOM, 2019

Figure 5 Pedestrian facilities

2.2.4 Cycling facilities

Cycle connectivity to Hawkesbury River Station is currently limited with no formal cycle routes in the vicinity of the station. There are currently no bicycle racks provided for the station. Bicycle racks are provided at nearby businesses as shown in Figure 6. Site observations showed there may be a demand for bicycle storage facilities at the station with cyclists informally securing their bikes to nearby poles (refer to item A in Figure 6 below).



Source: AECOM, 2019

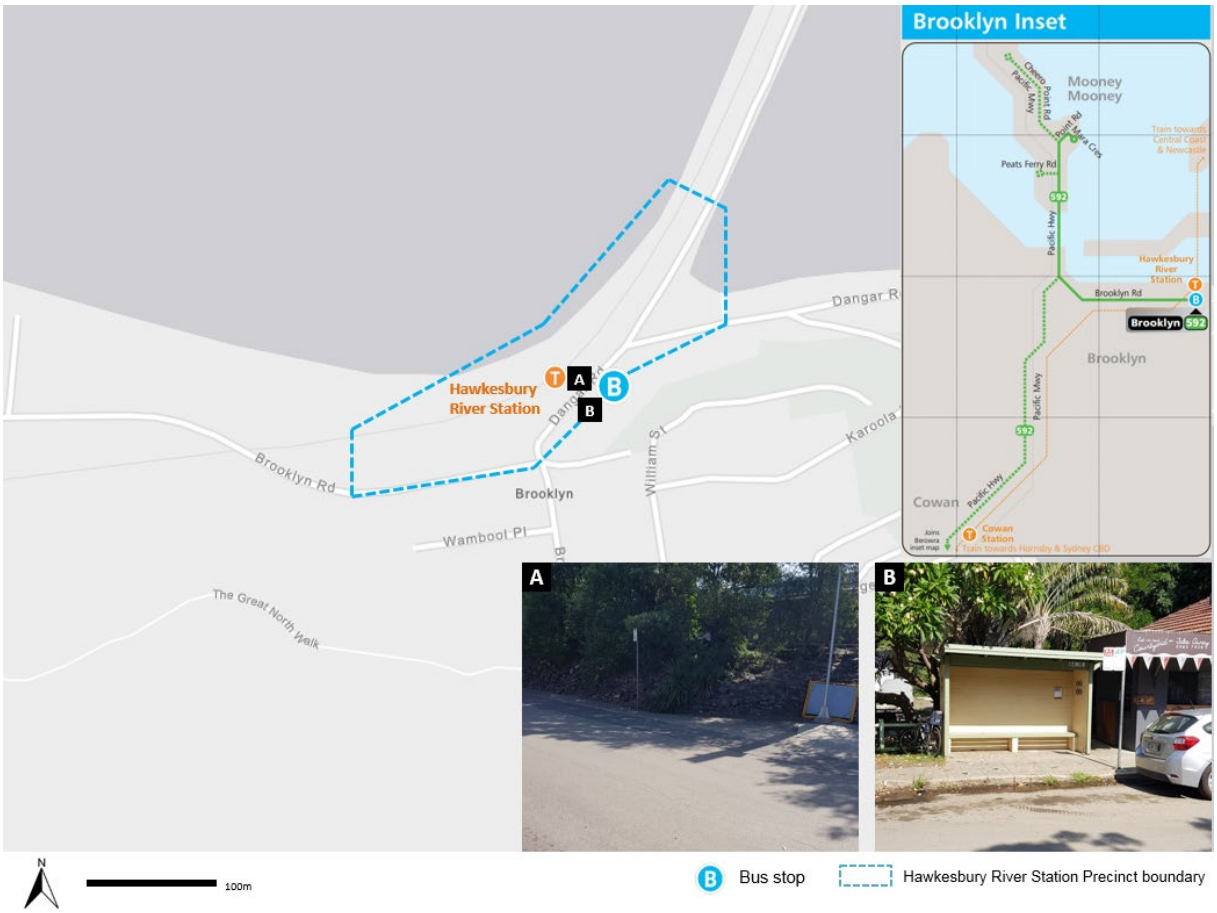
Figure 6 Nearest bicycle racks

2.2.5 Bus services and facilities

Figure 7 presents the bus stops that serve Hawkesbury River Station. There is a bus stop located along Dangar Road within walking distance to the station. Three bus routes serve the bus stop, which is operated by Transdev NSW. These routes include:

- Route 592: Loop service, Brooklyn to Mooney Mooney
- Route 8003: School buses, Hawkesbury River Station to Brooklyn Public School
- Route 8013: School buses, Brooklyn to Wideview Public School.

These bus routes connect residential areas to local transport interchanges, as well as employment and retail areas. The bus stop east of Dangar Road provides seating and shelter. However, no seating or shelter is provided at the bus stop west of Dangar Road. The bus stops also cater for temporary bus services during track work.



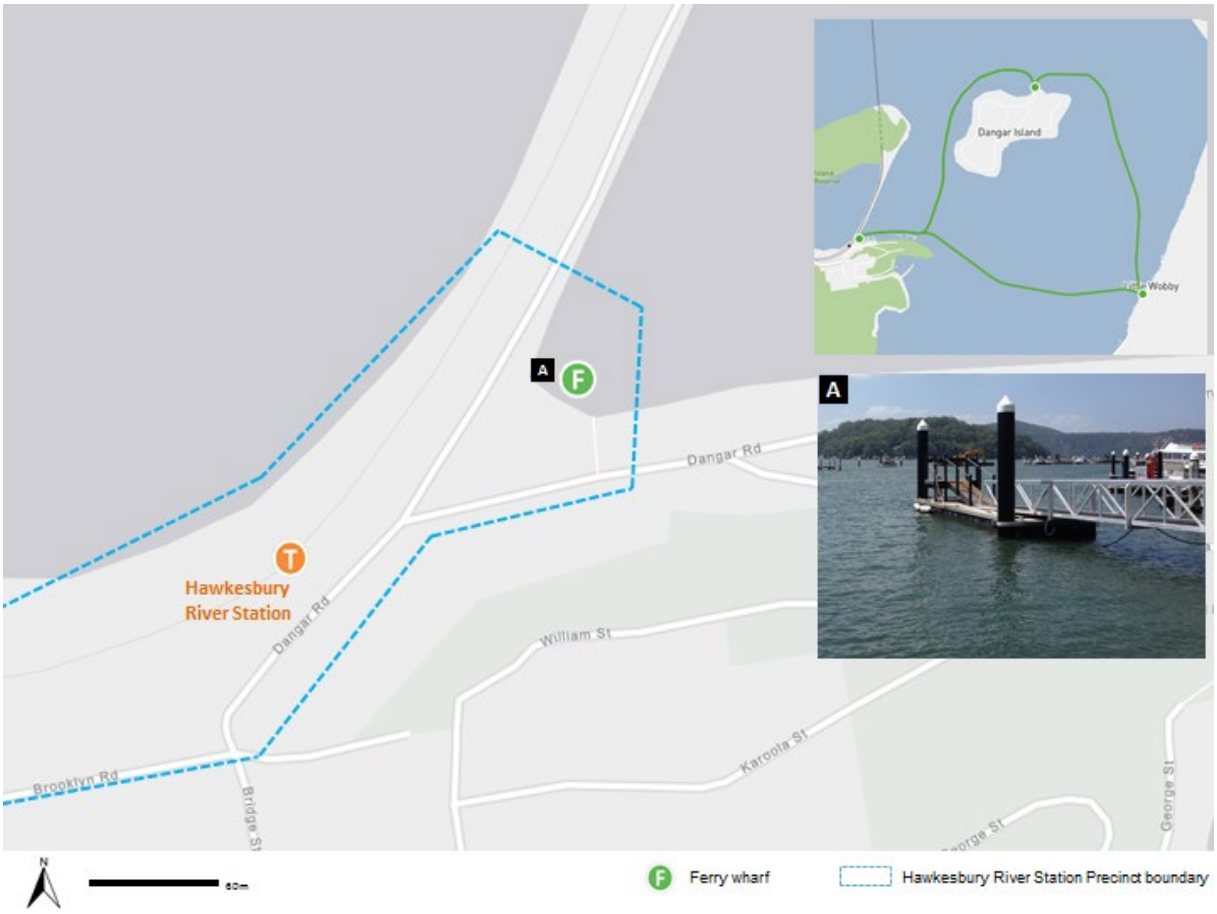
Source: AECOM, 2019

Figure 7 Bus stops and services

2.2.6 Ferry services

Brooklyn Wharf is located approximately 100m northeast of Hawkesbury River Station. It is serviced by the Brooklyn Ferry Service, a private ferry company operating a loop service on the Hawkesbury River. The western footpath on Dangar Road links to the ferry wharf. Figure 8 shows the Brooklyn Wharf which is located to the north east of the station.

During weekdays, there are three services departing the wharf in AM peak period (6am-8am) and three services in PM peak period (4pm-6pm).



Source: AECOM, 2019

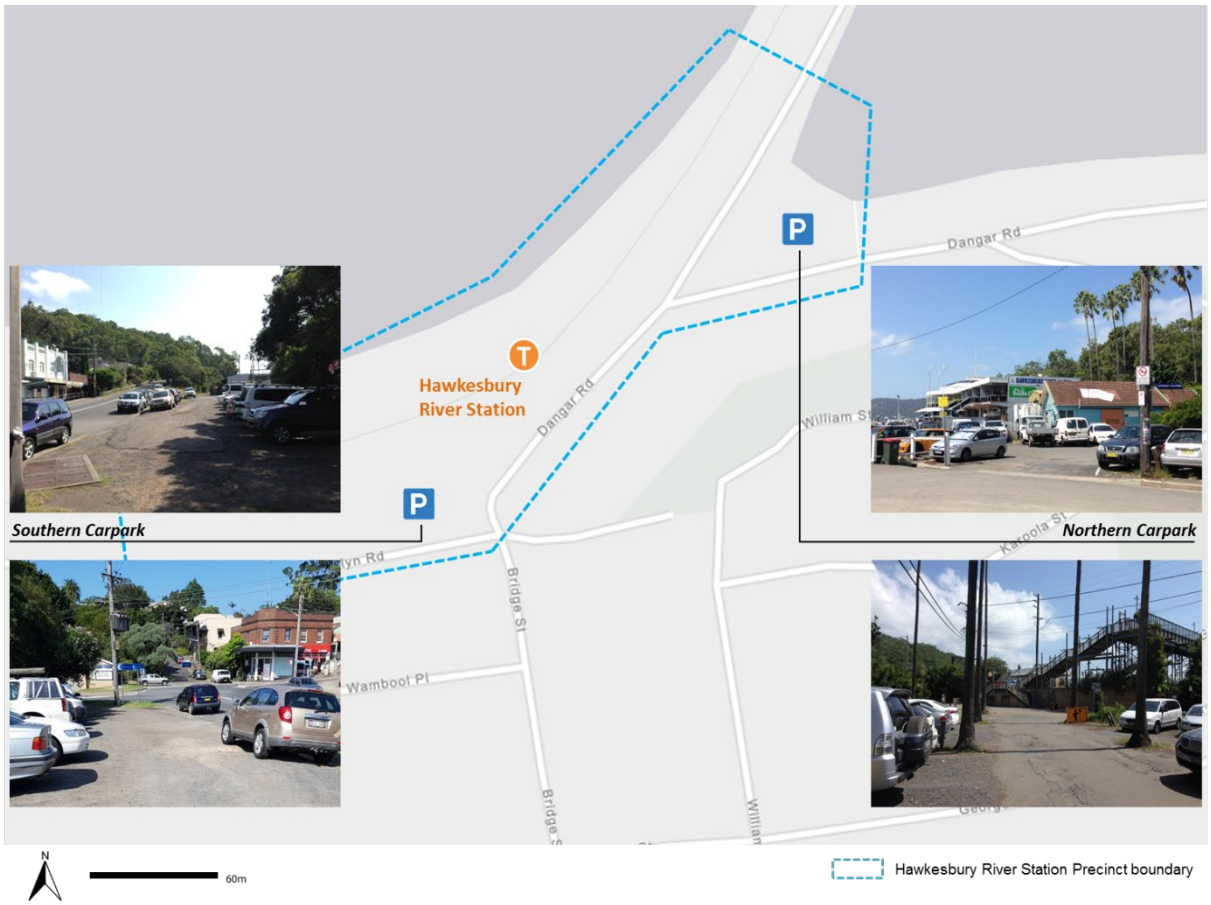
Figure 8 Ferry wharf and services

2.2.7 Parking facilities

Car parking facilities are currently provided near Hawkesbury River Station precinct, as shown in Figure 9.

A dedicated off-street commuter carpark is provided to the south of the station, along Brooklyn Road. However, the car parking spaces are unmarked and informal parking occurs in the car park, with capacity for up to 20 car parking spaces. Kerbside parking also occurs along the Brooklyn Road near the entrance of the car park. No clearly demarcated accessible parking spaces are provided within the commuter car park.

A Council car park is also provided on Dangar Road, adjacent to the ferry wharf. The car spaces within the off-street parking area are also unmarked with parking occurring informally. This parking area is used by locals living on Dangar Island, business owners/customers as well as commuters.



Source: AECOM, 2019

Figure 9 Parking facilities

2.2.8 Kiss and Ride facilities

There is currently no signposted kiss and ride zone for Hawkesbury River Station. Short-term parking and no parking zones along Dangar Road are likely to be used as drop off and pick up areas.

2.2.9 Taxi facilities

There is currently no taxi rank provided at Hawkesbury River Station precinct.

2.3 Roads

This section outlines the road network with respect to the Hawkesbury River Station precinct, providing a description of each key road. The key existing roads in the vicinity of the study area include Brooklyn Road and Dangar Road as shown in Figure 1.

2.3.1 Brooklyn Road

Brooklyn Road is a local road with one lane in each direction (as shown in Figure 10) linking to Dangar Road to the north and Bridge Street to the south. The three roads creates a four-way intersection, with entering traffic from Bridge Street and Dangar Road required to give way. The road provides connectivity to the state road network with a link to Pacific Highway, Cowan to the west. This road is the main road providing access to residential and commercial properties in Brooklyn. The sign-posted speed limit and associated road markings is 50km/h.

Source: AECOM, 2019

Figure 10 View of Brooklyn Road

2.3.2 Dangar Road

Dangar Road is a local road, which provides one traffic lane in each direction, as shown in Figure 11. The road links to Brooklyn Road and Bridge Street to the south and provides links to Hawkesbury River Station and Brooklyn Wharf. The default urban speed limit of 50km/h applies in the vicinity of the station as there is no posted speed limit sign.

Source: AECOM, 2019

Figure 11 View of Dangar Road

2.4 Travel mode choice

Travel data obtained from the Bureau of Transport Statistics provides an insight into the Journey to Work characteristics of residents in Brooklyn. The Bureau of Transport Statistics uses the Australian Bureau of Statistics (ABS) data collected during the 2011 Census, which includes method of travel to work at a Travel Zone (TZ) level. TZ 1613 includes the catchment area of Hawkesbury River Station, with the data from this TZ summarised in Table 4.

Table 4 Journey to work data (TZ 1613)

Mode of travel	TZ 1613 – Hawkesbury River Station[1] (Number of trips)	TZ 1613 – Hawkesbury River Station [1] (%)
Train	48	13%
Bus	0	0%
Car – as driver	199	53%
Car – as passenger	4	1%
Walked only	15	4%
Mode not stated	18	5%
Other	9	2%

Note [1]Excludes those who worked at home or did not go to work

Source: Bureau of Transport Statistics, 2011

The 2011 journey to work data shows that the majority of trips from Brooklyn were by car, with approximately 54 per cent of trips attributable to this mode (including car drivers and passengers), and 13 per cent of trips were made by train.

3.0 The Proposal

The Proposal retains the existing pedestrian bridge and stairs with the provision of two new lifts. Details of the proposed works to take place at the station to improve accessibility and customer experience include:

3.1.1 Station accessibility upgrade

Details of the Proposal to improve accessibility include:

- construction of two new lifts to provide access to the existing footbridge and station platforms, including associated landings and support structures
- provision of a kiss and ride space within the Dangar Road car park
- provision of a new accessible parking space within the Dangar Road car park
- provision of a new access path and pedestrian crossing from the new accessible parking / kiss and ride spaces in the Dangar Road car park to the station entrance
- re-grading of the footpath at the access points to the station on the Dangar Road side of the Station and extending to the end of Dangar Road
- construction of a new family accessible toilet, a new unisex ambulant toilet, and a new staff toilet within the existing toilet facilities and installation of false walls to accommodate toilet cisterns
- re-grading of the station platform surfaces to provide compliant access to station amenities
- installation of a resting zone along the Dangar Road pedestrian footpath adjacent to the rail corridor. The exact location of the resting zone would be confirmed during detailed design

3.1.2 Other works

- installation of mechanical ventilation systems for new toilets and lifts
- installation of signage and line-marking for the new accessible parking space, kiss and ride space and pedestrian crossing
- installation of Closed-Circuit Television (CCTV) cameras and Public Address (PA) systems to areas impacted by the construction contractor's activities
- relocation and/or repositioning station Help Points and telephone so that they are accessible to all customers
- relocation and provision of additional Opal card readers
- relocation of services as required by the construction contractor's activities
- installation of a glass canopy over the entrance to the proposed family accessible toilet.

3.1.3 Electrical work

Electrical work required to support the Proposal includes:

- installation of a new padmount transformer to supply electricity the Station and new lifts
- installation of all related cabling works connecting from Sydney Trains 11kV system to the distribution padmount transformer
- installation of a new service pole within the rail corridor, near the distribution padmount transformer to take the existing electricity supply to the new transformer
- provision of a new distribution board, including installation of circuit breakers and switches

- disconnect and remove the overhead 11kVA aerial lines between Sydney Trains Pole No. 11 and Ausgrid pole BR83732
- removal of Sydney Trains Pole No. 11 to facilitate the installation of the lift on Dangar Road.

3.1.4 Drainage

Drainage work required to support the Proposal includes the installation of lift downpipe systems to support the new lifts and sanitary drainage, potable water adjustments for the station toilets and a downpipe from the proposed canopy over the entrance to the proposed family accessible toilet. It is proposed that drainage is discharged to the existing stormwater drainage and not the track drainage system. The sanitary drainage for the upgraded toilets would be extended and connected to the existing sanitary drainage system.

The proposed upgrade to the Station and its surrounds are highlighted in Figure 12.

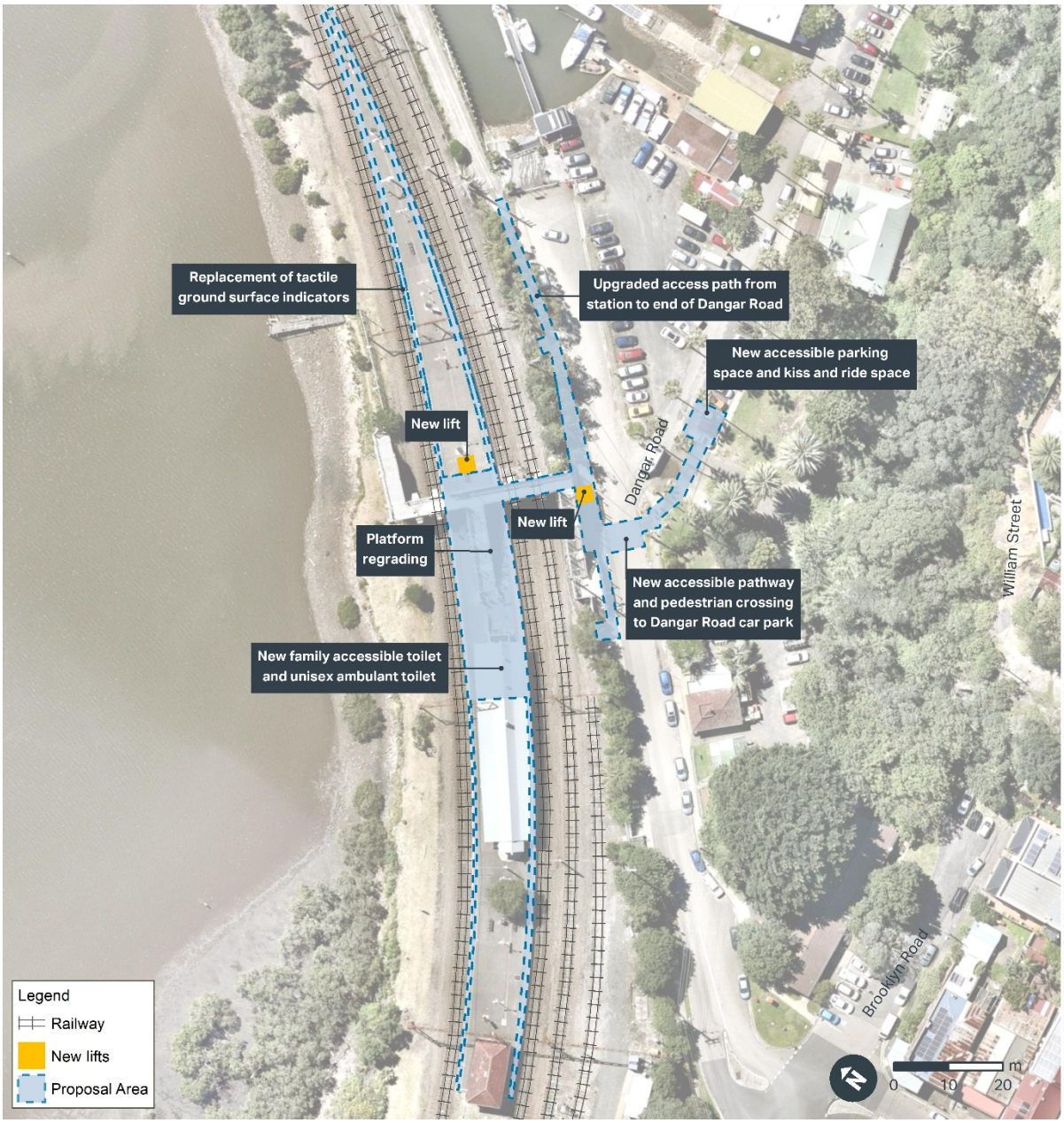


Figure 12 Proposed upgrades

4.0 Construction activities

4.1 Overview

The proposed construction activities for the Proposal are identified in Table 5.

Table 5 Construction activities

Stage	Activities
Site establishment and enabling works	• establishment of construction compound (i.e. erect hoardings and fences, tree protection zones (TPZs) (if necessary), site offices, amenities and plant/material storage areas) • establishment of temporary facilities as required (e.g. temporary toilets etc.).
Utility relocation	• identification of existing below ground utilities • relocation of utilities • disconnect overhead wires from Sydney Trains Pole No. 11 connecting to Ausgrid Pole BR83732 • remove Pole No. 11 • temporary diversion of low voltage line and other affected services • set up and install padmount transformer in the rail corridor adjacent to Dangar Road in preparation for power cutover • install new services pole inside the rail corridor to connect services to the padmount transformer.
Earthworks, piling works and initial lift installation works	• for both lift locations, commence site preparation. The crane for both lifts would be set up in the car park off Dangar Road • mobilisation of piling rigs to access lift locations • temporary earthworks and dismantling of fencing and barriers to allow piling rigs to reach desired location.
Lift installation works	• construction of foundation slab including excavation for lifts • removal of existing fencing and barriers • excavation of lift shaft well and establishment of foundations and formworks • insertion of piles at both locations for new lift foundation • construction of lift shafts • installation of lifts • installation of drainage systems • installation of cladding, fixtures, lighting, signage and CCTV cameras for the lift areas.
Station and toilet reconfiguration works	• reconfiguration of the existing male toilet to create a family accessible toilet and reconfiguration of the existing female toilet, to create a unisex toilet including a unisex ambulant toilet

Stage	Activities
	• installation of a horizontal glass canopy over the entrance to the existing male toilet • regrading the existing platform near to the Station building and to the proposed platform lift to match the level of the buildings and amenities • demolition of old and installation of new anti-throw screens on station footbridge near the locations of the proposed lifts • services and fit-out works and electrical works (including any re-directed services/utilities).
Station surrounds works	• line-marking of the accessible car space in the Dangar Road car park and one kiss and ride space • installation of signage, pedestrian crossings and tactiles as required • regrading of footpath at the Station entrance points on the Dangar Road side of the Station.
Demobilisation	• dismantling of construction compounds/hoarding areas.
Testing and commissioning	• testing electrical, communications and signalling components • commissioning of new lifts.

4.2 Construction vehicles

In facilitating these construction activities, various plant and equipment are likely to be required. These would include a combination of:

- trucks (semi-trailer and tipper)
- excavators and mini excavators
- piling rig
- concrete pump and concrete truck
- crane
- hydreama/hirail (type of truck that is able to travel on railway tracks).

Minor volumes of heavy vehicles are likely to be generated during the construction phase when transportation of concrete, equipment, preformed structures etc. is required. It is expected up to five heavy vehicles and up to 30 light vehicles would be generated per day during peak construction periods. It is expected there would be minimal impact on existing traffic conditions from these volumes of construction-related traffic.

The size of vehicles used for haulage would be consistent with the access route constraints, safety and any worksite constraints. Some construction activities (such as the delivery of precast sections) may require truck and trailer combinations or semi-trailers. Access arrangements for these vehicles would be defined in the Construction Traffic Management Plan (CTMP) prepared by the contractor during detailed design.

4.3 Working hours

Construction is expected to commence in late 2019 and take around 18 months to complete. The majority of construction work at Hawkesbury River Station would be limited to the standard construction hours as recommended by the Environmental Protection Authority (EPA):

- Monday – Friday: 7:00 am – 6:00 pm
- Saturday: 8:00 am – 1:00 pm
- Sunday / Public holidays: No work without prior approval from TfNSW.

Certain works may need to occur outside standard hours. These would include night works and works during routine rail shutdowns which are scheduled Sydney Train maintenance periods that would occur regardless of the Proposal when part of the rail network is temporarily closed, and trains are not operating. It is estimated that approximately five routine rail shutdowns would be required. Activities to be carried out during rail shutdown periods may include:

- modification and relocation of electrical cables
- installation of piles (using track-mounted piling rig) for the lifts
- foundation slab construction (concreting) delivery and craning in the new precast lift segments and lift car.

Out of hours works (OOHW) are required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway works and operational assets.

OOHW may also be scheduled outside rail shutdown periods for activities such as:

- delivery of oversized loads to the site such as construction plant and portable construction compound buildings, lift shaft components, steel beams and precast concrete elements.
- construction activities involving crane setups.

Approval from TfNSW would be required for any out of hours work and the affected community would be notified as outlined in the *TfNSW Construction Noise and Vibration Strategy* (TfNSW, 2018b).

4.4 Construction hoarding

Construction hoardings would be required at each of the proposed lift shafts. Construction hoardings would be carefully designed and installed, to take into account pedestrian activity that occurs during peak periods. All construction hoardings would:

- comply with relevant codes and standards
- have smooth surfaces particularly for areas adjacent to footpaths to allow pedestrians to brush past without snagging
- free of trip hazards at the base of the hoardings
- be clean and have a regular inspection of the surfaces
- have adequate lighting.

Construction hoardings would discourage entry without approval and minimise vandalism. All access points to fenced compounds would have lockable gates and appropriate information signs would be provided at the hoardings to identify the project, safety and communication protocols.

4.5 Ancillary facilities

Three temporary construction compound areas are proposed to accommodate a site office, amenities, laydown and storage area for materials. The locations of these compound areas are illustrated in Figure 13. The construction compound/storage areas and laydown areas would be located on land owned by RailCorp (managed by Sydney Trains) and Hornsby Shire Council.

A small area for temporary storage/laydown may also be required on the station platform around the proposed lift location.

Source: TfNSW, 2019

Figure 13 Construction compound locations

4.6 Construction vehicle routes

Figure 14 shows the potential access routes to the Hawkesbury River Station precinct, as well as TfNSW (former Roads and Maritime Services) approved B-double routes adjacent to the site.

The construction site is near M1 Pacific Motorway, which is an approved B-double route. This route provides high clearances and sufficient road widths to accommodate larger vehicles, making it ideal for the haulage routes. The construction vehicles will be subject to any local sign-posted restrictions, including temporary local restrictions.

Source: AECOM, 2019

Figure 14 Proposed haulage routes (indicative only, subject to detailed design)

4.7 Site security, site access and signage

Access to work areas would consider:

- safety of travelling public
- safety of construction workers and equipment
- impact on local communities in terms of safety, noise and road damage
- ease of access for emergency vehicles
- site security, particularly outside work hours.

4.8 Worker induction

All workers and sub-contractors engaged during the construction phase would be inducted prior to any commencement of works. The induction would identify the construction haulage routes, local speed zones, worksite protocols, staff parking facilities / public transport availability / carpooling opportunities and emergency / incident management strategies. Workers would be encouraged to park away from the station during the works and not near residences if possible.

4.9 Temporary diversions

A section of the road north of Dangar Road which leads to the ferry wharf may be temporarily closed during construction activities, with a lane closure expected to take place during construction works associated with the lifts. These works would likely be undertaken outside of peak periods, during a weekend rail possession.

Temporary traffic diversions would be implemented with appropriate signage to guide vehicles. Access to properties within the locations of road closures would be maintained where possible.

The potential locations of temporary diversions will need to be identified in the CTMP and Road Occupancy Licences would be sought if required.

5.0 Construction impacts

5.1 Public transport

Bus services in the vicinity of the Proposal would not be majorly affected during construction. Bus services along Dangar Road would continue to operate during construction activities, however may experience minor impacts, such as delays due to road works and temporary lane closures (e.g. use of a crane) or temporary relocations to enable construction activities.

Any changes to the location of the bus stop during construction would be undertaken in consultation with the bus operator and communicated to the public via signage or appropriate methods. Diversions or changes to bus services would be adequately sign-posted with appropriate community notification of any changes.

5.2 Pedestrians

During construction, works would be undertaken in a manner to ensure that public access routes to the station are maintained and pedestrian diversions are minimised. The Proposal is expected to cause temporary disruptions to the existing pedestrian facilities surrounding the station precinct, particularly when construction works for the lift and upgrade to the footpaths are being undertaken. This has the potential for increased safety risks for pedestrians, due to potential interactions with construction plant and vehicles. Construction works would be staged to ensure pedestrian access to the station is maintained.

Appropriate signs and/or traffic controllers would be positioned to notify pedestrians of the temporary arrangements. Any interaction between construction vehicles and pedestrians would be managed and controlled by traffic controllers. Impacts to pedestrians during construction would be managed through the development of a CTMP. Wherever possible, the community would be notified in advance of any planned works which would impact pedestrian movements through regular project notifications.

Pedestrian movement on the station platform would be temporarily impacted due to the reduced amount of space resulting from ancillary construction facilities or construction work. The reduced space on the platform may increase pedestrian congestion and reduce the amount of standing area for customers, however the likelihood of this occurring is low given the low patronage at Hawkesbury River Station. Appropriate signage would be provided to mitigate any potential impacts to pedestrian movement on the platform.

Mitigation measures would be subject to further consideration during detailed design and construction planning in consultation with the relevant authorities. Notification would be provided to the community on alternative transport arrangements, including changes to pedestrian access.

5.3 Cyclists

Since there are currently no dedicated bicycle storage facilities for the Hawkesbury River Station precinct, it is expected impacts to cyclists would be minimal during construction.

5.4 Kiss and Ride / Taxi

There is currently no signposted kiss and ride zones or taxi spaces provided near Hawkesbury River Station. Short-term parking and no parking zones along Dangar Road are more likely to be used as drop off and pick up areas. The construction of the proposed accessible carpark and path as well as the pedestrian crossing may affect some drop off and pick up areas. Alternative arrangements will be provided during construction.

5.5 Parking impacts

The operation of both car parking facilities within the Hawkesbury River Station precinct would be temporarily impacted during the construction of the Proposal. During construction, the following parking impacts are expected to occur:

- Dangar Road car park:

  - temporary closure of access points into the car park during lift works. Access along Dangar Road is to be retained throughout construction, if possible.
  - partial closure of the car park to allow certain construction activities to occur
- Brooklyn Road unsealed car park:
  - partial closure / reduced parking spaces may occur to accommodate the construction compound located within the car park.

These impacts at both off-street parking facilities would increase demand on surrounding roads. There is street parking available surrounding the station (to accommodate the parking spaces that would be unavailable at the Brooklyn Road car park for example), however this is limited and the public parking at the end of Dangar Road associated with the Hawkesbury Bay Marina may also be relied upon for commuters. This impact would be temporary and is not expected to be significant, however prior notice should be provided to commuters if a temporary loss to existing car parking is required during construction.

Parking provisions are not proposed for staff vehicles within or adjacent to the construction site, therefore construction workers would be encouraged to car-pool or use adjacent public transport services. However, it is expected that workers would travel via private vehicles which may also marginally increase the demand for parking surrounding the station in local roads. This impact may cause inconvenience to the public however is not expected to be significant in accordance with the low number of light vehicles expected (about 20 – 30 per shift). Workers would be encouraged to park away from the station where possible to alleviate this impact, and construction workers would not park within the commuter carpark. Provisions for parking management and community notification would be included in the CTMP.

5.6 Traffic

Traffic generated by construction vehicles, including staff vehicles, is likely to be low given the nature of the works proposed and would fluctuate dependent on the construction stage. Up to 30 light vehicles and five heavy vehicles per day during peak construction periods are expected to be generated during construction. It is expected there would be a minimal impact on existing traffic conditions.

Localised traffic control during construction would be essential to retaining functionality of the area which is subject to an influx of tourists at peak holiday periods and weekends when tourists visit the area.

Work zones to construct the proposed facilities along Danger Road may require temporary or partial lane closures and/or traffic diversions. Consultation with Hornsby Shire Council would be undertaken and a Road Occupancy Licence sought as required. Road works would be undertaken progressively and in the minimum area and timeframe required to undertake the particular phase of work. Signage would be displayed around work areas to inform the public.

5.7 Property access

Property access would be maintained, where possible, to minimise the impact to local residents and businesses. An accessway to a property is located adjacent to the proposed accessible car park and kiss and ride space. Should the Proposal proceed, the works to formalise these car parking spaces and the creation of an access path would likely temporarily disrupt access to this property via this accessway. The owner and/or occupier of the property would be appropriately consulted prior to works being carried out, and arrangements put in place to limit this disruption as far as practically possible.

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

5.8 Emergency vehicle access

Access for emergency vehicles would be maintained at the construction sites in accordance with emergency vehicle requirements. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes. Advice would include information about upcoming traffic disruptions, anticipated delays to traffic, extended times of work and locations of road closures.

6.0 Operational impacts

6.1 Future demand

Table 6 shows the 2036 patronage forecasts for Hawkesbury River Station obtained from TfNSW's Transport Performance and Analytics modelling.

Table 6 Patronage forecasts

Year	Weekday AM peak hour[2]	Weekday AM peak period[3]	Weekday PM peak period[4]	Average weekday
2036 (+15%)[1]	42	222	183	635

Notes:

1 - an additional 15% has been added to the forecast years for design assessment purposes.

2 – hour in the morning from 8am to 9am

3 – period of 4 hours in the morning from 6am to 10am

4 – period of 4 hours in the afternoon from 3pm to 7pm

Source: Aurecon, 2018

The Proposal has been designed to account for the predicted patronage forecasts. Detailed design would also consider future patronage demands.

It is unknown whether the patronage forecasts have taken into consideration the truncation of the Newcastle Line as part of the Newcastle Urban Renewal Strategy (2014), which removes the heavy rail line between Wickham and Newcastle Station for the provision of high frequency light rail services. However, in the event this has not been taken into consideration, it is unlikely to have a significant impact on patronage numbers at the station and design. Refer to Section 6.3 for the pedestrian modelling outcomes, which show the existing footbridge and staircases have the capacity to accommodate the forecast peak passenger demand.

6.2 Public transport

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

6.3 Pedestrians

The Proposal would improve facilities and offer significant benefits to pedestrians, including:

- installation of two new lifts to provide an accessible path of travel to the station platform
- provision a new pedestrian crossing from the Dangar Road car park to the station entrance
- regrading of the footpath on the Dangar Road (station side) and extending approximately 50 m north from the station entrance
- regrading of the station platform surfaces near the Station building to provide compliant accessible paths and ramps to station amenities

The Proposal would improve the user experience in the vicinity of the station with the potential to encourage more customers to walk to the station. The 2036 patronage forecasts show 57 per cent of rail passengers would be walking to the station. The pedestrian modelling undertaken for the Concept Design by Aurecon (*Hawkesbury River Pedestrian Flow Assessment Report*) indicates the footbridge, stairs and platform area achieves a level of service (LoS) A (where normal walking speed can be freely selected and slower pedestrians can be easily overtaken), as shown in Table 7. Therefore, no upgrades are proposed to the footbridge.

Table 7 Pedestrian modelling results – 2036 Concept Design

Structure	LoS
Island platform	A
Stairs – Hawkesbury River	A
Stairs – Island platform	A
Stairs – Dangar Road	A
Pedestrian bridge	A

Source: Aurecon, 2018

6.4 Cyclists

The Proposal does not propose to provide any bicycle storage facilities for the Hawkesbury River Station precinct. Hawkesbury River Station is classified as a Level C[1] interchange, which requires a minimum of 10 bicycle rack spaces.

Based on site observations, there is currently a need for bicycle storage facilities with cyclists securing their bikes onto nearly poles. Where possible consideration should be given to providing bicycle racks near the station entrance on Dangar Road during detailed design. This would meet the objectives of the NSW Government's Bike and Ride initiative, which encourages improved cycling facilities at transport interchanges.

6.5 Kiss and Ride / Taxi

The 2036 patronage forecasts show 15 per cent of rail passengers would be dropped off at the station. The Proposal would provide opportunity for kiss and ride and taxi activity to occur near Hawkesbury River Station.

The Proposal includes the provision of a formalised kiss and ride space within the Dangar Road car park, located close to the station entrance. The provision of the kiss and ride facility in the Dangar Road car park would provide a safe and formal area to pick-up and drop-off passengers. The proposed kiss and ride space would have a minor impact on parking availability within the car park however it is noted that the location is currently an informal parking area with no line-marking.

No formal taxi zone has been proposed as part of the Proposal. Taxi activity for the station precinct is likely to be limited. However, taxis are expected to use the kiss and ride zone or car parking area to pick up and drop off passengers.

6.6 Parking

The Proposal improves the provision of accessible parking surrounding Hawkesbury River Station by providing one additional accessible parking space within the Dangar Road car park. This results in the loss of two parking spaces within the Dangar Road car park, which would have a minor impact as there are a number of short term on-street and off-street parking spaces available in the area.

6.7 Traffic

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 the improved commuter experience and upgraded facilities are likely to result in a marginal increase in traffic, with a negligible impact on the surrounding road network. Minor impacts are anticipated to occur along Dangar Road due to the additional accessible parking space and kiss and ride space within the Dangar Road car park.

[1] Bike and Ride Program, Minimum Bicycle Parking Requirements, TfNSW 2015

6.8 Property access

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

7.0 Mitigation measures

Mitigation measures would be implemented to minimise traffic, transport and access impacts during construction and operation of the Proposal.

7.1 Construction Traffic Management Plan

Prior to the commencement of construction, a CTMP would be prepared as part of the Construction Environmental Management Plan and would include as 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 the station and residential properties is maintained (unless affected property owners have been consulted and appropriate alternative arrangements made)
- managing requirements around operating cranes in the airspace of adjacent properties (including any relevant permits or licences)
- managing impacts and changes to on- and off-street parking and requirements for any temporary replacement provision if a significant number of parking spaces are displaced during construction
- managing parking for construction workers - provide parking on-site on open land within the rail corridor and encouraging construction workers to carpool or use public transport. If not possible, parking locations should be located away from the station and residential areas
- considering routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses
- providing details of relocated bus stops, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired
- community notifications to inform local residents of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated impacts on the local road network relating to site works
- scheduling / staging construction works to minimise temporary loss of access facilities and available parking
- the owner and/or occupier of the property whose driveway is adjacent to the proposed accessible car park and kiss and ride space would be appropriately consulted prior to works being carried out, and arrangements put in place to limit this disruption as far as practically possible
- managing traffic flows around the area affected by the Proposal, including as required regulatory and directional signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the CTMP.

Consultation with the relevant roads authorities would be undertaken during preparation of the CTMP. The performance of all project traffic arrangements must be monitored during construction.

8.0 References

Aurecon, 2019, TAP3 Hawkesbury River Station – Scoping Design Report

Aurecon, 2019, Hawkesbury River TAP3 Architectural– Scoping Design Drawings

Aurecon, 2018, Hawkesbury River Station Transport and Access Report Rev 2

Aurecon, 2018, Hawkesbury River Station Pedestrian Flow Assessment Report Rev 2