



Planning &
Environment

Cooks Cove

Planning Report

NOVEMBER 2016





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Printed October 2016

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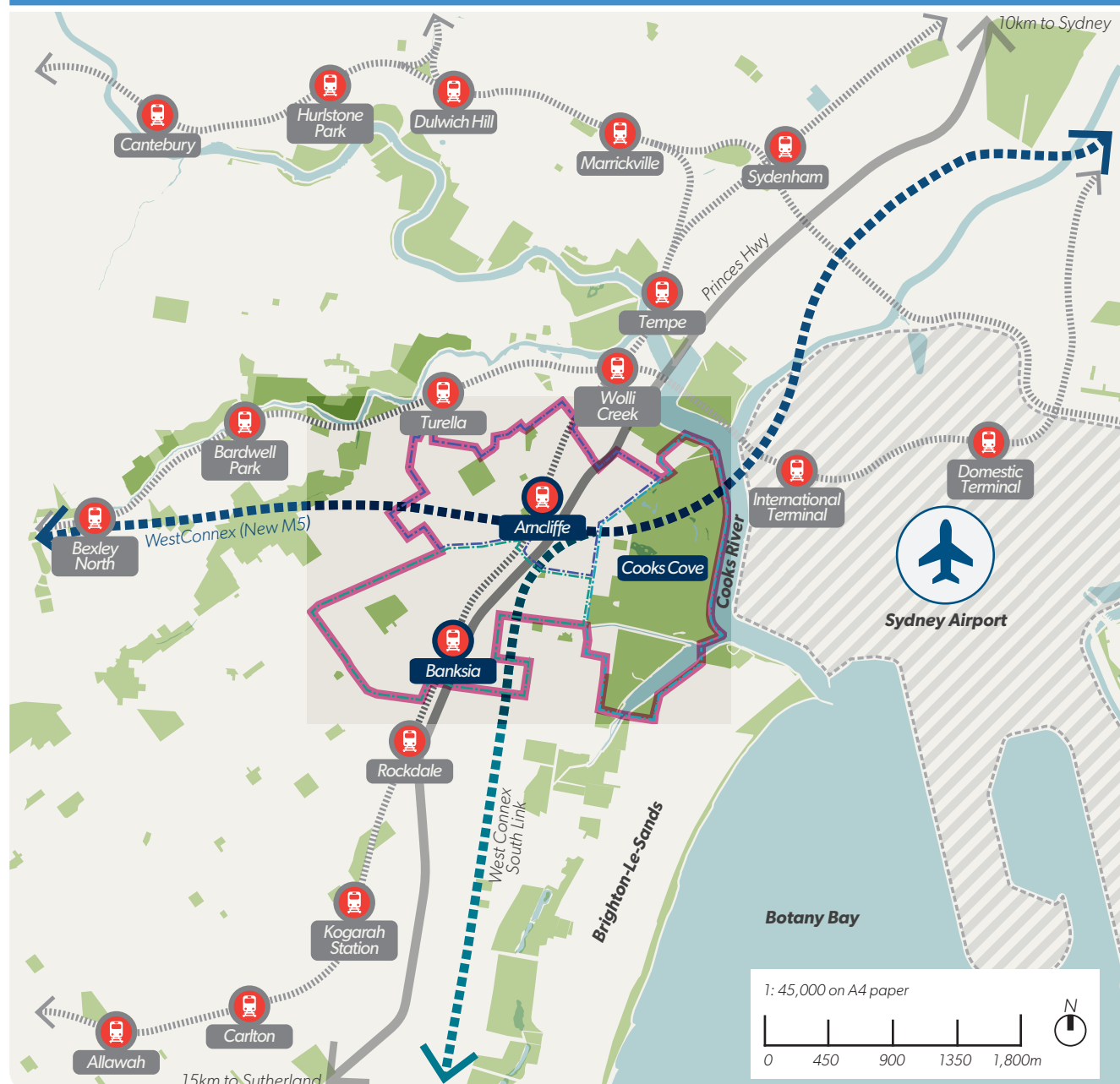
The Department of Planning and Environment has been working with Bayside Council (previously Rockdale City Council) to develop a Land Use and Infrastructure Strategy for the Bayside West Precincts including the Arncliffe Precinct, Banksia Precinct and the Cooks Cove Precinct. The purpose of the Strategy is to outline the vision for growth and to plan for the infrastructure needs to support this growth.

To inform the preparation of the Land Use and Infrastructure Strategy the Department engaged AECOM to undertake a preliminary review of opportunities and constraints to development within the Cooks Cove Precinct. This report details the outcome of these investigations.

The Cooks Cove Precinct is approximately 11km from the Sydney CBD and immediately to the west of Sydney Kingsford Smith Airport. An aerial of the Precinct is shown in Figure 2 overleaf.

The Precinct is located within the Bayside Local Government Area (formerly the Rockdale City Council) and covers an area of approximately 135 hectares. It is bound by Marsh Street to the north and north west, Cooks River and Sydney Kingsford Smith Airport to the east, West Botany Street to the west, and Bestic Street to the south. The Precinct is centrally traversed by the M5 Motorway, separating the northern and southern parts of the site.

FIGURE 1: REGIONAL CONTEXT



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The Cooks Cove Precinct has been considered for redevelopment for recreational, employment and residential uses since 2004. The Precinct's close proximity to key transport nodes as well as areas flagged for redevelopment and uplift including the Botany and South Sydney industrial and mixed use / enterprise areas and the Arncliffe and Banksia Priority Precincts make it a desirable location for urban renewal.

The analysis of opportunities and constraints undertaken within the Cooks Cove Precinct has identified a number of critical areas for consideration in its redevelopment that will require further investigation as the planning process progresses to the next stage. These include:

- **Traffic and Transport:** A range of land use options were tested for traffic and transport implications. It was determined that whilst there is some existing capacity in transport infrastructure to service the sites redevelopment, there are also existing constraints and capacity issues that will need to be addressed. Rail services are currently at capacity, and viable future growth of the precinct will rely on proposed trunk road connections such as the WestConnex New M5 and the WestConnex South Link. Recommendations to help resolve this include creating better pedestrian and cycle linkages, bus feeder services to rail hubs and improving bus frequencies. Further traffic analysis and detailed modelling will be required to provide further understanding of the development impact on the surrounding road network. Potential refinement of land use scenarios may be required in response to the findings of this detailed assessment, such that an appropriate development yield and mix can be achieved that can be supported by a sustainable traffic and transport network.
- **Flooding:** As a result of the precincts' water frontage, flooding presents a significant constraint to its redevelopment. A variety of flood studies have been undertaken to date and a high level study drawing on the most recently developed flood model for the lower Cooks River was carried out for the purposes of this Study. The study found that the developable footprint that has been determined through an assessment of site constraints could be accommodated in a way that elevates proposed new habitable space above the relevant Flood Planning Level with only minor increases in off-site peak flood levels for events up to the 1% Annual Exceedance Probability flood. The development will also need to rely on use of the internal road network and open space areas for flood management purposes. It is noted that further studies will be required once redevelopment options have progressed to confirm these findings and address several other flood-related issues not specifically dealt with as part of this Study.
- **Contamination:** The investigation area's historical uses have led to a number of contamination hotspots. A 2013 review of a 2008 contamination assessment found that the northern part of the site could be made suitable for mixed use development including residential. A revised Environmental Site Assessment (ESA) and Remediation Action Plan (RAP) and a subsequent Site Management Plan will need to be developed and implemented.
- **Ecology:** A number of ecological studies have been undertaken and a management plan prepared for the Cooks Cove Precinct that have identified areas of significant vegetation, endangered species, and critical habitat. These include:
 - The Green and Gold Bell frog (listed as Endangered under the *Threatened Species Conservation Act 1995*);
 - Saltmarsh (identified as an endangered ecological community); and
 - Reedlands, wetland areas and mangroves (forming part of the "Freshwater Wetlands on Coastal Floodplains in the NSW North Coast Sydney Basin & South East Corner Bioregions", NSW Scientific Committee 2004b).

Redevelopment of the Precinct will need to consider these ecological sensitivities to ensure they are protected from impacts and that the amenity they provide is leveraged to benefit the community.
- **Aviation:** The Cooks Cove Precinct is immediately to the west of the Sydney Kingsford Smith Airport. This proximity means any development will need to be carried out in accordance with the various guidelines and planning controls that determine what development is appropriate and permissible to ensure safety and amenity are protected. Noise and height restrictions are the two most critical impacts in this regard.
- **Heritage:** There are two State significant heritage items located on the site, the Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) and a Chinese market garden. There are also two Local Heritage listed items included within the Precinct – the Former Hospital for Women and a Federation Cottage. These items are located within the small residential pocket that is not proposed for any change at this stage. Future redevelopment proposals will need to consider these heritage items.

2.1 Site Description

The Precinct is predominately characterised by open space and has a strong sporting and recreation history. The Kogarah Golf Club is located in the northern part of the site, occupying an area of approximately 35 hectares. Between Marsh Street and Levey Street is the Mercure Hotel, a rowing club, apartments of around eight storeys and single detached dwellings. The St George Stadium is located in the southern part of the site. The Rockdale Illinden Sports Centre was previously located in Barton Park in the southern part of the site, however has been relocated to Bicentennial Park, Rockdale, south of the site.

The Arncliffe Market Gardens are located within the western part of the Precinct. South of the market gardens and outside of the Precinct is a pocket of detached residential dwellings. There is also a residential pocket north of the market gardens, south of the M5 / Marsh St intersection. An overview of the different land uses within the Precinct is shown in Figure 3.

Vehicle access to the northern part of the Precinct is from Levey Street, accessing the Kogarah Golf Club. Vehicle access to the south is from Spring Street and the south is via Bestic Street. The Eve Street and Bestic Street Cycleways provide walking and cycle linkages through the Precinct, connecting from Marsh Street and around the M5 corridor central part heading south towards Muddy Creek

There are four wetland areas within the Precinct, which form part of the Rockdale Wetlands Corridor running from the Cooks River through to Sans Souci. There are two constructed frog habitat ponds located on RMS owned land adjacent to the south western corner of the northern part of the Precinct and adjacent to Marsh Street and the Southern and Western Suburbs Ocean Outfall Sewer. Muddy Creek, extending from the Cooks River, is located at the southern end of the Precinct and contains mangroves.

FIGURE 2: COOKS COVE PRECINCT



SECTION 2 : THE COOKS COVE PRECINCT

There are two major utility easements located on the eastern side of the Precinct in a north-south direction for the desalination pipeline and ethane gas pipeline. The heritage listed Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) is located above ground adjacent to the M5 corridor in the northern part of the Precinct. Whilst there are a number of landowners within the Precinct, large portions are within single ownership, offering significant brownfield redevelopment opportunities. An overview of the existing land ownership within the Precinct is shown in Figure 4.

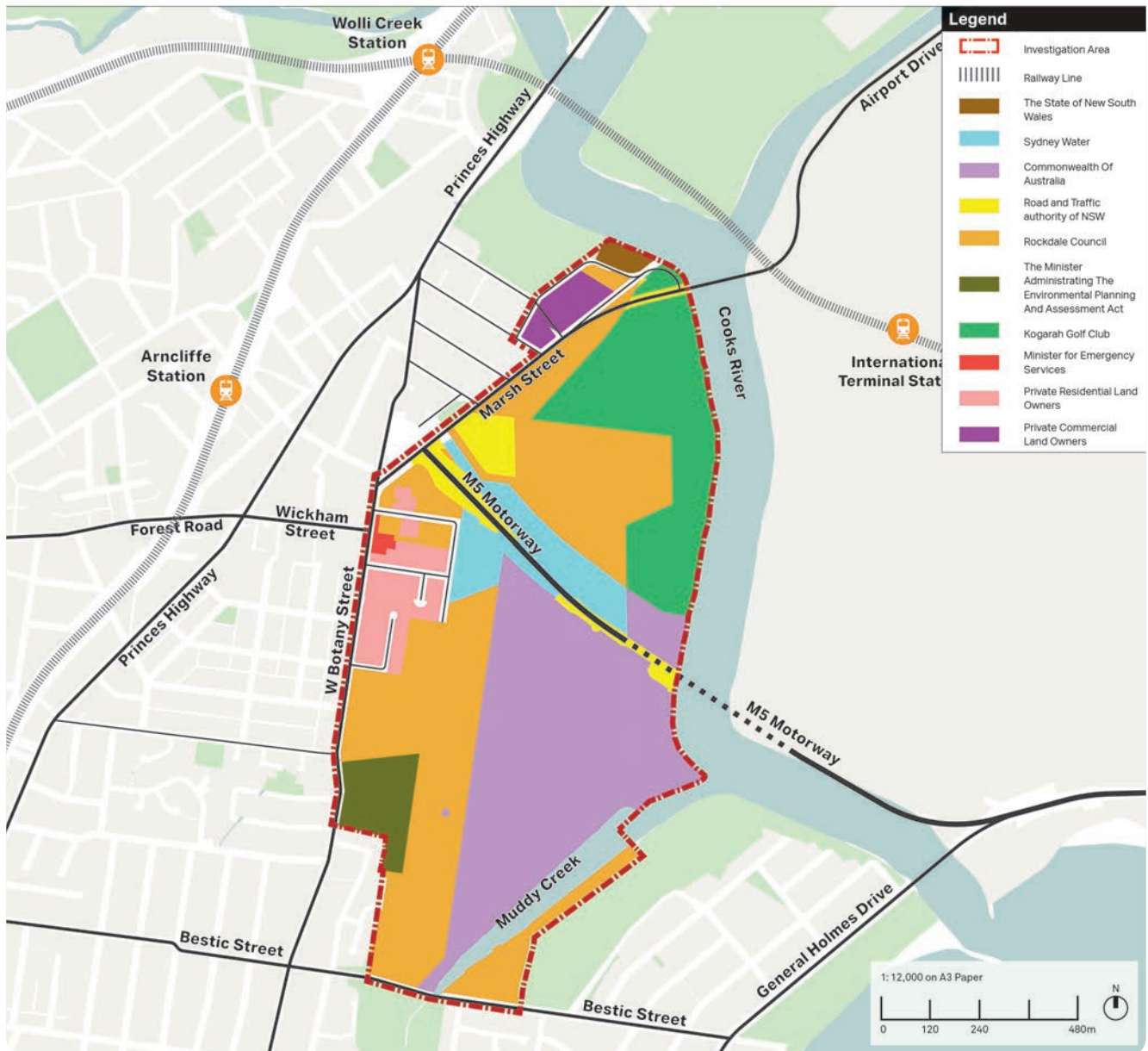
The Precinct is located in close proximity to a number of transport nodes and areas flagged for redevelopment. It is therefore considered strategically important as it is:

- Approximately 600m from Arncliffe Station, and approximately 1km from Wolli Creek Station;
- Approximately 1km from Sydney Airport International Terminal and 3.5kms from the Domestic Terminal. Sydney Airport employs around 30,000 people on-airport, and indirectly employs an estimated 280,000 people directly and indirectly (Sydney Airport Coportate Limited, 2014);
- Within close proximity to the Botany and South Sydney Industrial and mixed use/ enterprise areas which provide tens of thousands of jobs and augments the employment within the Airport;
- Less than 1km from the Arncliffe and Banksia Precincts, which are also being reviewed for further regeneration and development uplift; and
- Well located in relation to frequent train and bus services making it an appropriate area for further dense, mixed use development.

FIGURE 3: LAND USES WITHIN THE COOKS COVE PRECINCT



FIGURE 4: LAND OWNERSHIP



2.2 Site history

Since the 1880s the Cooks Cove Precinct has supported a variety of functions. The following is an overview of the Precinct's historic uses:

- 1880's – Southern and northern portions served as Arncliffe Sewage Farm (night soil depot). Original termination of Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS).
- Early 1900s – Agriculture and market gardens established, continued use for night soil depot.
- 1930s – Bonnie Doon Golf Course established, night soil depot significantly reduced in area, extension of SWSOOS towards the east.
- 1940s – Army and Air Force radio school occupied Bonnie Doon Golf Course site, once the school vacate, the site was left derelict until Kogarah Golf Club formed in mid 1950s.
- Post war Sydney Airport expansion led to significant modifications to Cooks River and Muddy Creek, further reshaping through the 1960s; current alignment formed in early 1970s.
- 1960s – Central portion of the site (now Barton Park) used as a municipal landfill for putrescible waste, Spring Street Wetland system began to establish.
- 1970s – Golf course underwent landscaping and earthworks and St George Soccer Football Association Stadium was constructed, accompanied by other soccer fields in southern portion of site.
- Apart from minor rearrangements of sporting fields and construction of M5 Motorway through the site in the late 1990s, the Precinct's land uses have remained largely consistent since.

2.3 Current Planning Context

A Plan for Growing Sydney (2014)

In December 2014 the NSW Government released its new metropolitan plan for Sydney *A Plan for Growing Sydney*. The Plan has been drafted to guide land use planning decisions for Metropolitan Sydney for the next 20 years and spells out the vision is to make Sydney a strong global city that is a great place to live and work.

Within the Plan, the Cooks Cove Precinct is identified as being located at the southern end of the 'Global Economic Corridor'. This is defined as a corridor of concentrated jobs and activities in strategic centres, transport gateways and industrial lands extending from Port Botany and Sydney Airport through Global Sydney, Chatswood to Parramatta and Norwest. The planned growth in these locations is focussed on sustaining and expanding the economy and on providing more jobs closer to where people live. The corridor includes high-value road, rail, health, arts, cultural, educational and other public investments; high-amenity areas; and high land values.

A planning priority set out in *A Plan for Growing Sydney* is to protect Sydney Airport and Port Botany's functions through supporting airport related land uses and infrastructure around the Airport. A key action related to this planning priority is for the Government to work with local councils and the airport and port authorities to safeguard sites that support the freight network beginning with areas most affected by aircraft noise.

Another relevant key priority identified in the Plan is the Arncliffe and Banksia Priority Precincts. The Government is seeking to match population growth with investment in infrastructure, providing new schools and recreation facilities along with road and public service improvements.

The Plan also has a focus on the provision of new housing in well located areas that are close to jobs and key transport nodes.

Rockdale Community Strategic Plan 2013 – 2025 (2013)

The Rockdale Community Strategic Plan 2013-2025 is the Council's long term community plan. It identifies the aspirations of the community and sets up a framework for shaping the City and delivering community outcomes.

The Plan identifies that the LGA (former Rockdale) is expected to accommodate approximately 5,900 additional dwellings and 410,000 square metres of additional commercial floor space within the next 10-15 years. The Cooks Cove Precinct together with existing centres and industrial areas are identified in the Plan as the areas within which the majority of new jobs are expected to occur.

The Plan identifies two major projects that are of relevance to the Cooks Cove Precinct in terms of social infrastructure. The recently completed upgrade to the Rockdale City Library is identified. It is located approximately 1.2km from the Cooks Cove Precinct and will provide:

- A modern library facing on to the Princes Highway;
- Function rooms such as conference rooms/meeting rooms available for use by Council and the community; and

- Reception spaces to provide dual function of customer service for Council business with the library and the community.

The Plan also identifies the Arncliffe Youth Centre as the next Major Project to be undertaken by Council. Council stated in 2014 that the Youth Centre, which is proposed to be located at 4 Wardell Street, Arncliffe (approximately 600m west of the Precinct), will accommodate a wide range of recreational activities and youth services including sporting activities, learning, study, homework space, musical and artistic pursuits as well as support and counselling services. Council also stated it will feature two indoor multi-purpose courts, one with grandstand seating for up to 440 spectators.

Princes Highway Corridor Strategy 2013

Council prepared the Princes Highway Corridor Strategy in September 2013. It identifies the area between Rockdale and Wolli Creek along the Princes Highway as a highly attractive location for people wishing to live, work and locate business in proximity of the CBD. The Strategy further identifies that although it is well situated, the area lacks coherency as a recognisable 'place'. The Strategic Vision set out in the Corridor Strategy provides a framework for revitalisation, change and renewal for the area and provides a structure for new development opportunities.

The strategic vision comprises two core elements:

- Grow Arncliffe as a Residential Precinct; and
- Revitalise the Highway Enterprise Corridor for Employment Uses.

Sydney Airport Master Plan

The Sydney Airport Master Plan released on the 17th February 2014 outlines Sydney Airport's plan for the operation and development of the Sydney Kingsford Smith Airport for the period to 2033.

The Development Plan for the airport outlined in the Master Plan includes the following key features:

- Both Terminal 1 (T1) and Terminal 2/Terminal 3 (T2/T3) precincts will be expanded, with the largest expansion to the north of T3 and east of T2;
- Both T1 and T2/T3 precincts will become integrated terminals for international, domestic and regional airlines;
- T2 and T3 will be integrated by linking the two terminals;
- Both precincts will include swing gates which can be used for either international or domestic/regional operations at different times of the day;
- Existing aviation fuel facility locations can be retained for the period of the Master Plan;
- The existing T1 freight precinct can be retained for the period of the Master Plan;
- The South East and North East Sectors of the airport will be developed to accommodate additional apron parking and engineering facilities; and

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- Taxiway extensions and significant airfield developments, including the extension of Taxiway B to the east of the main runway.

The following ground transport improvements are proposed to support this Development Plan:

- A new one-way roadway configuration for the T2/T3 precinct by 2018, providing a dedicated entrance and exit roadway to the precinct, significantly improving traffic flows for all vehicles including taxis, limousines and coaches.
- Upgrades to traffic flow within the T1 precinct by separating parking traffic and creating a dedicated and specially configured public pick-up area.
- Consideration of the WestConnex motorway project and its interface with the airport.
- Sydney Airport has been in discussions with local councils to link Sydney Airport land to the current and planned cycleways. This includes eventual links to the Princes Highway, as well as improved access from Marsh Street to the Alexandra Canal Cycleway.

The indicative airport layout plan is set out at Figure 5.

Land use zonings and development controls applicable to the site are detailed in the Cooks Cove SREP No. 33 and the Rockdale LEP 2011. Figure 6 and Figure 7 show the parts of the Precinct which are subject to SREP 33 and Rockdale LEP 2011 respectively.

The statutory framework applicable to the Cooks Cove Precinct will need to be updated to address future uses that depart from its current zoning.

Sydney Regional Environmental Plan No. 33

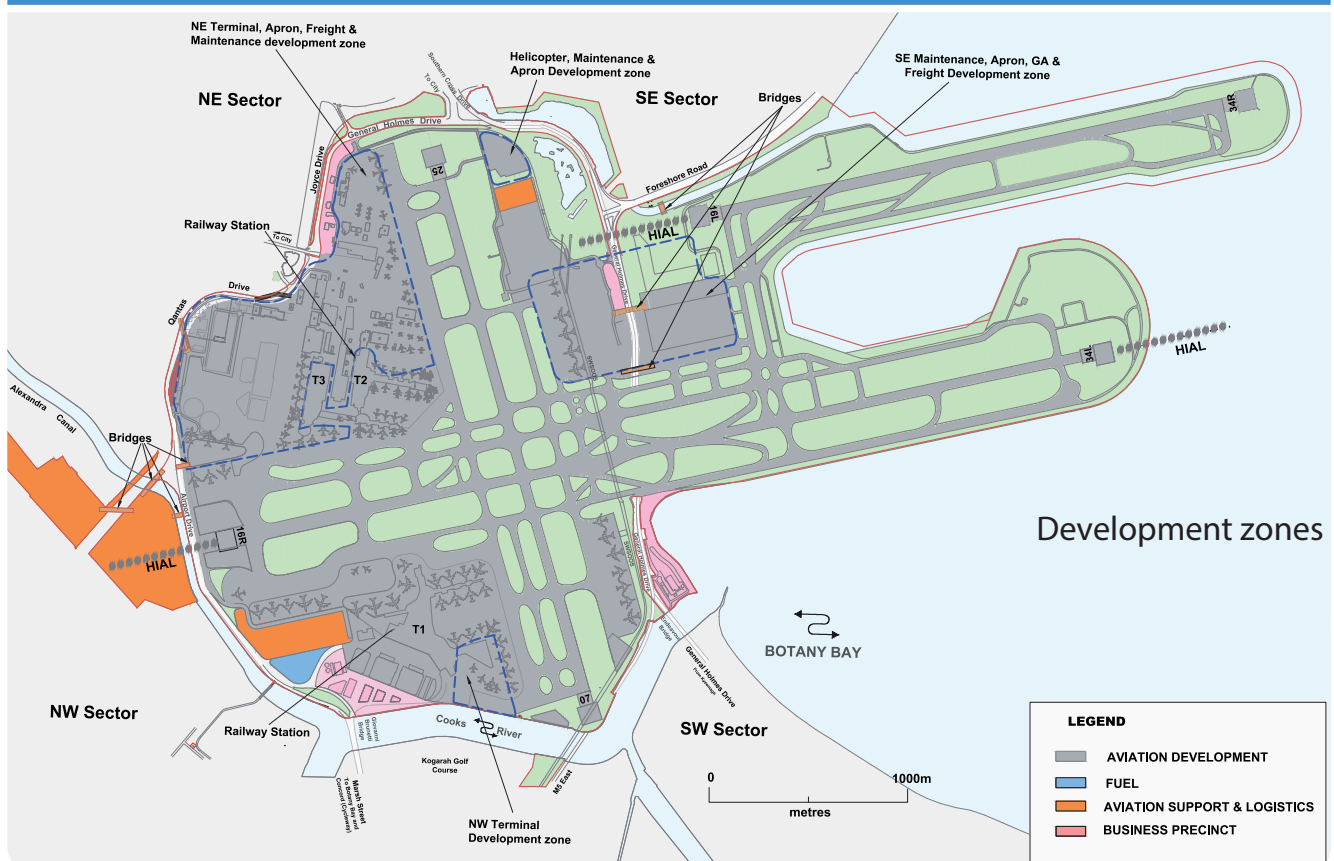
The Sydney Regional Environment Plan No. 33 (SREP 33) is a deemed State Environmental Planning Policy. The aims set out in SREP 33 are targeted towards the development of the site for trade and technology uses, leveraging from the Precinct's proximity to the Sydney International Airport at Botany. The aims also seek to protect the environmentally sensitive areas and to provide for public open space and recreational uses.

As shown in Figure 6, under SREP 33 the majority of the Precinct is split into three zones:

- **Trade and Technology:** to encourage economic activity and trade-focussed businesses as defined in the SEPP.
- **Special Uses:** to accommodate existing special uses, including the South West Sydney Ocean Outfall Sewer, the M5 corridor and the future F6 extension.
- **Open Space:** to provide for open space and recreational uses and environmental protection areas.

The types of development permitted under the Trade and Technology Zone are outlined following.

FIGURE 5: DEVELOPMENT PLAN



Source: Sydney Airport Master Plan 2033 (2014)

FIGURE 6: SREP NO. 33



Source: Sydney Airport Master Plan 2033 (2014)

Advanced technology businesses; aids to navigation; car parks and car parking stations (if their only use is ordinarily incidental to other uses allowed within the zone); child care centres; clubs; commercial support premises; community facilities; drainage; educational establishments; hotels; light industries; medical centres; motels; offices ancillary to trade-related enterprises; open space; passenger transport terminals; public transport infrastructure (not including car parks or car parking stations); recreation areas; recreation facilities; remediation of land; restaurants; roads; service stations; serviced apartments; shops; tourist facilities; trade-related enterprises; vehicle rental centres; warehouses.¹

All other development is prohibited.

Clause 10 of the SREP 33 provides planning principles which a consent authority needs to consider in assessing any proposed development for the Cooks Cove Precinct:

- **Role and land use activities:** Encourage advanced technology and trade-focussed businesses; optimise public transport. Active frontages along main streets and pedestrian routes are encouraged.
- **Built form:** Height, form and orientation of buildings are to take into account visual impact from both land and water, as well as view sharing within the Precinct, solar access, ventilation, wind impact, the amenity and privacy of hotel occupants; need to conserve the habitat of threatened fauna. Design should promote high quality of amenity and follow design practices that encourage energy conservation and the promotion of public transport.
- **Public Domain:** The foreshore is to be publicly accessible, and linked to public areas within and adjoining the Precinct. Coordinated pedestrian and cycling networks and public transport services, which link into the regional Bay-to-Bay cycleway are to be provided throughout the Precinct. Networks are to link with the railway stations, areas adjoining the Precinct and the foreshore.

¹ All land uses are defined under SREP 33 – Cooks Cove

- **Accessibility, movement and parking:** Transport and traffic should be managed in accordance with a comprehensive plan for the coordinated public transport services and its staging.
- **Ecology and heritage:** Water and energy-efficient design criteria are to be promoted; soil erosion and sedimentation control measures implemented during remediation and construction. Riparian areas with estuarine and native vegetation are to be established and maintained for the protection and enhancement of the Cooks River estuary and remaining natural areas. Development should not have adverse impacts on the water quality of the Cooks River, Muddy Creek or wetlands. Wetlands within the site and along the foreshores are to be conserved.

In accordance with SREP 33 the maximum permitted amount of floor space for the within the Trade and Technology Zone is 270,000m² GFA. Of this not more than 5,000m² can be used for the purpose of commercial support premises, shops and restaurants.

In addition, the maximum height of buildings is not to exceed 6 storeys, unless it is within 120m of the Cooks River, where the maximum building height is 5 storeys. The only exception to this is that one building within the Trade and Technology Zone is permitted to be a maximum of 11 storeys, provided it is no closer than 10 metres from the zone boundary.

The statutory framework applicable to the Cooks Cove Precinct will need to be updated to reflect the future uses and future scale and bulk of development.

Rockdale Local Environmental Plan (LEP) 2011

The Rockdale LEP 2011 is the applicable local environmental planning instrument for the three sections of the Precinct that are located outside of the SREP33 boundaries. The aims set out in the Plan focus on:

- Providing a vibrant area in which Rockdale residents can live, work and play;
- Conserving the environmental heritage of Rockdale;
- Maintaining and improve residential amenity and encourage a diversity of housing to meet the needs of Rockdale residents;
- Promoting economic activity within Rockdale through the facilitation of commercial, employment-generating and tourism opportunities;
- Providing high quality open space and a range of recreational facilities to meet the demands of Rockdale and its visitors,
- Promoting and enhance Rockdale's foreshores;
- Encouraging residential and employment densities around transport nodes in order to provide sustainable transport options; and
- Minimising impacts on land subject to environmental hazards, particularly flooding.

The areas of the Precinct that are included under the Rockdale LEP 2011 are outlined in Figure 7 and are zoned a combination of Public Recreation, Mixed Use, Low Density Residential and Infrastructure.

Height of Buildings

As shown in Figure 8, the section of the Precinct north of Marsh Street that is zoned for B4 Mixed Use has a building height provision of 46m. The Public Recreation zoned area in this northern section is not subject to a building height restriction under the LEP.

Floor Space Ratio

As shown in Figure 9, the section of the Precinct north of Marsh Street zoned B4 Mixed Use has a Floor Space Ratio (FSR) of 3:1. There is no FSR provision for the RE1 Public Recreation or SP2 Infrastructure zoned land.

The Low Density area of the Precinct along its western edge has an FSR provision of 0.5:1 and again there is no provision for FSR for the land in this southern section of the Precinct zoned for Public Recreation.

Active Street Frontages

The area of land between Marsh Street and Levey Street that has been identified for acquisition for a new road is also identified in the Plan for active street frontage. This means that any premises on the ground floor of the building facing the street must be used for the purposes of business or retail. The area extends some way along both Marsh Street and Levey Street.

Heritage

There are two sites within the Precinct that are identified under the Rockdale LEP 2011 as having Local Heritage significance that will need to be considered in any future redevelopment. These are the Former Hospital for Women located at 112 West Botany Street and a Federation Cottage located at 9 Brennans Road.

There are two further sites that are identified in the LEP as having State Heritage significance. These are the Arncliffe Market Gardens located at 212 West Botany Street and the Southern and 'Western Suburbs Ocean Outfall Sewer (WSOOS)—Western Main Carrier' located along the northern side of the Hume Highway.

Acid Sulfate Soils

The LEP identifies that the land areas north of Marsh street, south of Muddy Creek and along the eastern edge of the residential pocket between West Botany Street and Eve street all contain Class 3 Acid Sulfate soils.

This class of acid sulfate soils requires development consent for any works more than 1 metre below the natural ground surface or works that will likely lower the watertable by more than 1 metre below the natural ground surface.

The land within the residential pocket between West Botany Street and Eve Street to its western side is classified Class 5 acid sulfate soils. This class of acid sulfate soils requires development consent for any works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum where the water table is likely to be lowered below 1 metre Australian Height Datum on the adjacent Class 1, 2, 3 or 4 land.

Flooding

Clause 6.6 of the LEP identifies the area north of Marsh Street, south of Muddy Creek and a small section between Eve Street, Brennans Road and Marsh Street as flood prone land.

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Development consent would be required for any development located in these parts of the Precinct.

Biodiversity

A small section of the eastern edge of Eve Street and a small area of land south of Muddy Creek are identified under clause 6.8 of the LEP as 'environmentally sensitive' areas.²

Development consent is required for any development located in these parts of the Precinct.

Natural Resources – Wetlands

A small area of land south of Muddy Creek close to the Cooks River is identified under clause 6.10 of the LEP as environmentally sensitive wetlands. There is also an additional small area of land along Eve Street that is identified as wetlands.

Development consent is required any development located in these areas of the Precinct.

2.4 Significant Development Applications and Planning Proposals

The following section provides an overview of the State Significant Developments and key Planning Proposals relevant to the Cooks Cove Precinct.

State Significant Development

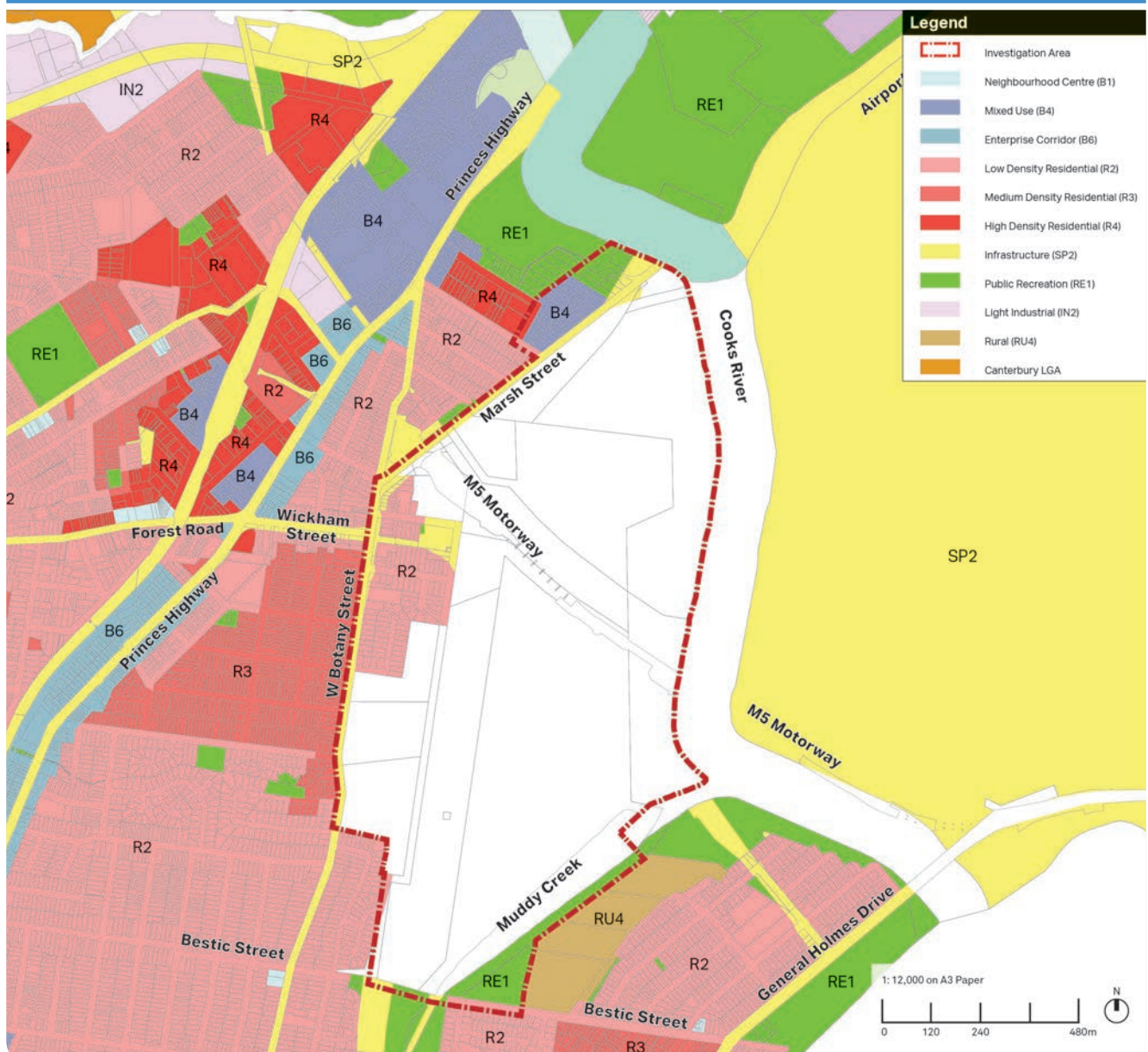
State Significant Developments are determined based on their size, economic value or the potential impacts they may have. Development that is State Significant Development (SSD) is identified in the State and Regional Development State Environmental Planning Policy.

The NSW Major Projects Register indicates two State Significant Developments in the vicinity of the Cooks Cove Precinct. These are outlined below.

M5 East WestConnex New M5

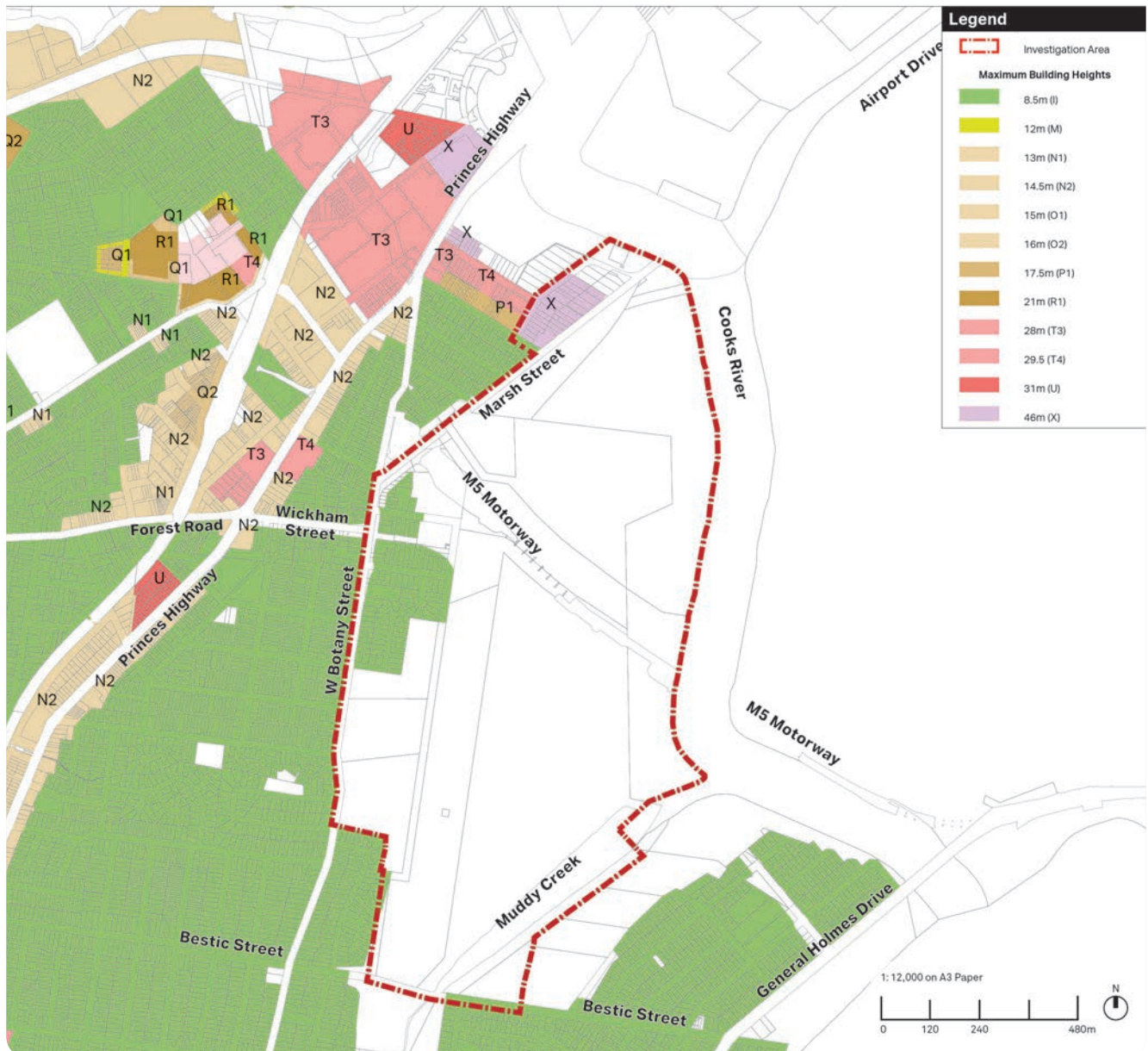
WestConnex Delivery Authority (now Sydney Motorway

FIGURE 7: ROCKDALE LEP 2011 LAND ZONING



² Environmentally sensitive areas are defined under clause 3.3 of Rockdale LEP 2011

FIGURE 8: ROCKDALE LEP 2011 HEIGHT OF BUILDINGS



Company) submitted a proposal for a new multi lane twin motorway tunnels between the M5 East Motorway (east of King Georges Road, Beverly Hills and Bexley Road, Bexley) and St Peters, and a new road interchange and upgrade of local roads at St Peters to connect to Campbell Road and Euston Road, St Peters and Gardeners Road, Mascot. The application was approved on 20 April 2016. See more detail at Section 3.2 of this chapter.

Discovery Point

On 22 February 20011 Discovery Point Pty Ltd obtain development approval for a mixed use development including land uses; building envelopes for 14 new buildings ranging in height from 2 storeys to 21 storeys; street layouts; maximum total gross floor area; minimum gross floor area for non-residential uses; car parking rates; open space and indicative landscape concepts. The project is located approximately 1.5 kilometres to the north west of the Precinct.

Previous Schemes for the Cooks Cove Precinct

Since 2004, a number of masterplans and investigations have been undertaken for the Cooks Cove Precinct. This includes a Master Plan prepared in 2004, a Stage 1 DA submitted in 2006 and an unsolicited proposal put forward to the NSW Government by Boyd Properties in 2013.

Cooks Cove Master Plan (2004)

The Cooks Cove Master Plan 2004 was prepared on behalf of the former Sydney Harbour Foreshore Authority (SHFA) to identify a land use strategy for future development of Cooks Cove. It was developed alongside the SREP33. Key aspects of the master plan are summarised below.

- Estimated maximum floor space 270,000m².
- Advanced technology businesses, commerce and trade related business uses, and hotel and retail uses, with a projected employment population of 11,000 workers.
- Accommodation and enhancement of existing key community sporting facilities and provision of new passive

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open space opportunities.

- 18 hole golf course relocated to the south of the M5.
- Pocket parks and foreshore pedestrian/ bicycle pathway extending along the southern edge of the Cooks River.
- Establishment of permeable network of streets, public open space, networks for pedestrian and cycle access and a system of habitat zones including foreshore remediation.
- Provision of dedicated public transport linkages.

Cooks Cove Stage 1 DA (2006)

The Stage 1 DA submitted by Boyd Cook Cove Pty Ltd was approved by Rockdale Council in December 2006 for a large part of the Precinct land. The DA principally sought concept approval for the following:

- Layout of the golf course to the south of the M5 and associated facilities;
- Layout for all public domain areas including parks, cycleways and pedestrian routes;

- Layout for the reconfigured St George Soccer Football Association playing fields and car parking areas; and
- Proposed improvements and management regime of the open space and wetlands in the Precinct.

An overview of the previous scheme is shown in Figure 10.

Within the Trade and Technology Zone, approval was granted for;

- Access and internal street network arrangements;
- Street block envelopes (ie heights and setbacks);
- A maximum of 270,000m² of GFA; and
- A maximum of 4,755 tenant and on street car parking spaces.

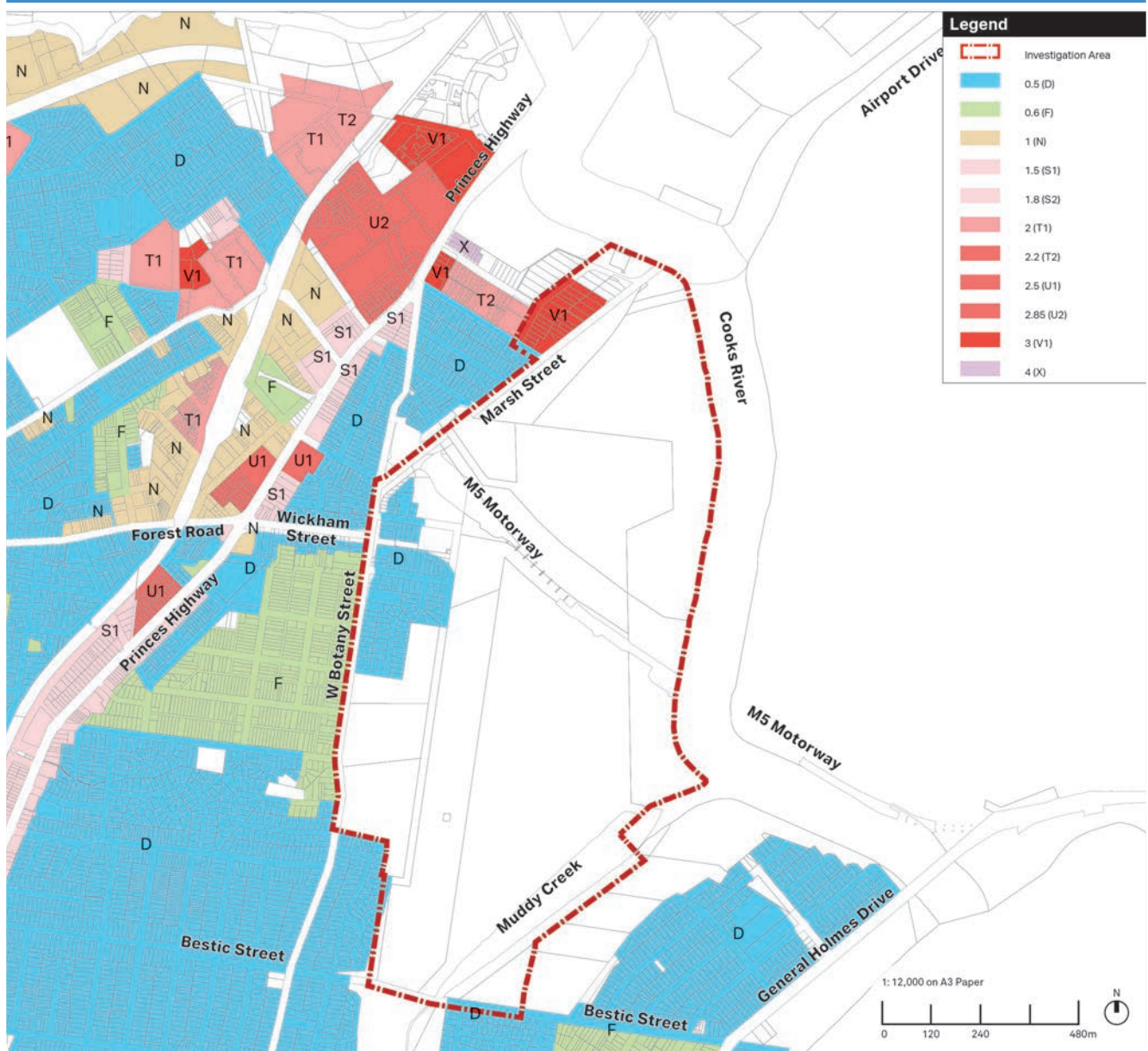
The project did not progress.

Unsolicited Proposal 2013

A Stage 1 Unsolicited Proposal was submitted in November 2013 by Boyd Properties to NSW Premier and Cabinet.

Endorsed by Rockdale City Council, it proposed a \$3.1 billion state significant redevelopment of the Precinct. Key aspects included (source JBA, 2015):

FIGURE 9: LEP 2011 FLOOR SPACE RATIO



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FIGURE 10: PREVIOUS SCHEMES – STAGE 1 DA (2006)



SECTION 2 : THE COOKS COVE PRECINCT

- Land swap arrangement allowing 18.4ha of freehold land to be developed for mixed-use purposes.
- 82ha balance of land to remain under public ownership by NSW State Government or Rockdale City Council.
- Decontamination and remediation of land within the Precinct.
- Project delivered at no cost to NSW Government and Rockdale City Council.
- Creation of 5,000 new homes.
- Development of significant supporting facilities including commercial offices, trade and airport related uses, health and aged care facilities, retail, hotel and serviced apartments, and student accommodation.
- 5,000 new jobs through the above uses.
- Relocated 18-hole golf course.
- Extensive community and recreational facilities - public parklands, a multi-purpose sporting complex, foreshore activities including cycle and pedestrian paths, wharves and a public marina.

An overview of the proposal is shown in Figure 11.

The Proposal did not progress past the Stage 1 of the unsolicited proposal assessment phase and was discontinued in late 2014.

FIGURE 11: PREVIOUS SCHEMES – UNSOLICITED PROPOSAL (2006)



3

This section of the report provides an analysis of the Cooks Cove Precinct, establishing the key planning issues, opportunities and constraints that are to be addressed in the future planning for the precinct.

Opportunities

The key attributes that provide key opportunities for the Precinct's further planning and development are that it:

- Has a suitable and sizeable area of land that has the capacity to accommodate development and new open space;
- Is flat to mildly undulating topography;
- Includes an abundance of open space and through cycle links which provides amenity both north and south of the M5;
- Has been heavily disturbed through past site activities and comprises mainly grassland;
- Is in close proximity to the airport, providing opportunities for other complementary airport uses and/or housing opportunities for employees of the airport;
- Is well serviced in terms of social infrastructure with a large number of schools and other public and private services in close proximity;
- Is located in good proximity to key local transport nodes including Sydney Airport, Arncliffe station and Wolli Creek Station;
- Provides opportunities to incorporate improvements for access to services and facilities that will benefit the broader community;
- Is surrounded and has access to a number of roads that are the subject of planned improvements;
- Contains remnant and regrowth native vegetation and wetlands that, where appropriate, can be retained and incorporated into future public domain areas; and
- Has direct water frontage that both provides an attractive outlook and a buffer to the Sydney Airport site.

Constraints

The key constraints for the Precinct's further planning and development are that it:

- Currently experiences peak period transport capacity issues, that present constraints in terms of access into and out of the Precinct;
- Has limited access connection opportunities along the Precinct's boundaries due to the Cooks River, Sydney Airport land and the M5 Motorway;
- Will retain elements of the WestConnex New M5 operations that may impact staging of Precinct redevelopment and could generate noise and operational impacts for any future adjoining or nearby development in the Precinct;

- Is limited to prescriptive building height and land use parameters set by the Sydney Airport's operational constraints mapping;
- Incorporates a desalination pipeline, an ethane gas pipeline and the Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) that either preclude or restrict development in affected portions of the Precinct;
- Includes State and locally listed European Heritage Items will require careful consideration so to not impact upon the heritage significance of these items;
- Comprises sensitive habitats and threatened species located that not only potentially limit development but may be sensitive to impacts from adjoining development;
- Is largely affected by the 1:100 year ARI flood line and Probable Maximum Flood (PMF) level; and
- Is likely to contain some contamination that will need to be addressed prior to development.

3.1 Proximity to the Sydney Airport

The Cooks Cove Precinct's proximity to the Sydney Kingsford Smith airport means there are some specific aviation considerations that need to be taken into account in relation to its future development. Specifically, there are a number of guidelines and planning controls that will determine what development is appropriate and permissible within the Precinct. These guidelines and controls are outlined in this section.

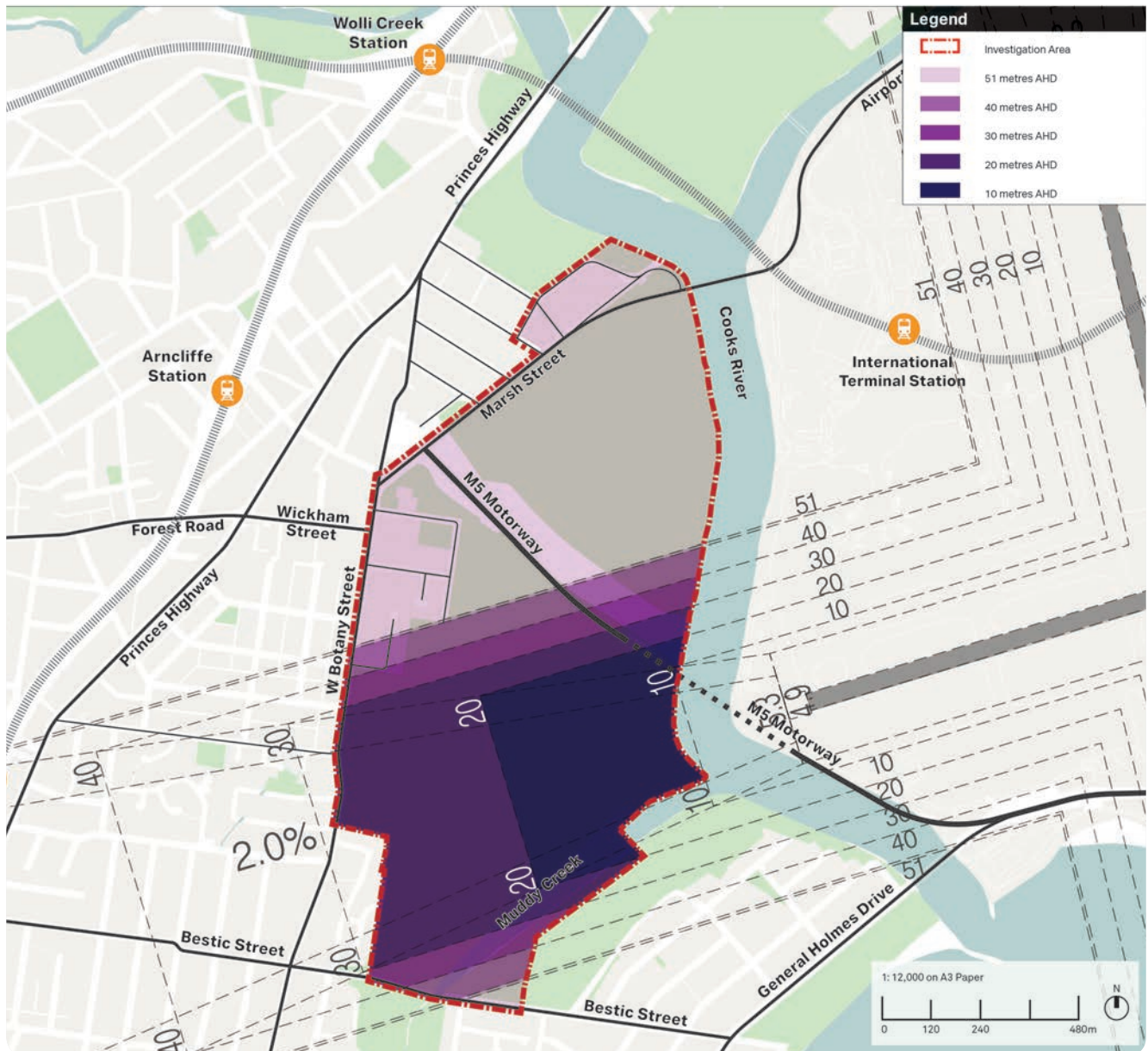
Obstacle Limitation Surface (OLS)

The Obstacle Limitation Surface (OLS) is a series of surfaces in the airspace surrounding an airport. The OLS defines the airspace to be protected for aircraft operating during the initial and final stages of flight, or manoeuvring in the vicinity of the airport.

As shown in Figure 12, the majority of the northern part of the Precinct, currently occupied by Kogarah Golf Course, has a maximum OLS height limit of 51m AHD. It is understood that the elevation of the Precinct ranges from approximately 1.5m to 2.3m AHD. Therefore the maximum building height (without requiring approval from the Civil Aviation Services Authority (CASA) would be in the order of 49.5m-48.7m. The middle part of the Precinct, in line with the Sydney Airport east-west runway, has a maximum height of 10m AHD, increasing to around 20m AHD with distance from the airport.

It is noted that previous master plans have proposed a taller building zone that exceeds the OLS (ie 20 – 25 storeys) adjacent to Marsh Street and suggested that an aeronautical impact assessment be undertaken. CASA approval would be required to build above the OLS.

FIGURE 12: OLS



Procedures for air navigation services – aircraft operations (PANS- OPS) surfaces

Radio-navigation aids and satellite navigation enable aircraft to operate safely in poor weather conditions. PANS-OPS guidelines are established to protect those stages of take-off, landing or manoeuvring when aircraft are operating in non-visual (instrument) mode. Pilots must be assured of obstacle clearance in these circumstances, although transition from or to visual conditions will generally occur at some point in the flight (Sydney Airport, 2014).

A preliminary review of the PANS-OPS Charts shows that maximum height limits in the northern part of the Precinct are around 80m AHD, extending to 90m AHD in some areas around Marsh Street.

Further assessment of any master plan designs should be undertaken by an aviation specialist to address the OLS and PANS-OPS implications.

Australian Noise Exposure Forecast

Australian Noise Exposure Forecast (ANEF) charts are contour maps that show a forecast of aircraft noise levels. As shown in Figure 12, the majority of the northern part of the Precinct is between the 20 and 25 ANEF noise contour.

Following is an overview of suitable types of development within the Precinct in accordance with the ANEF provisions:

- Residential development with suitable noise mitigation measures is permitted within the 20-25 ANEF zone, but unacceptable in areas above 25 ANEF.
- For the areas that are in the ANEF contours 25 and above, open space, recreation facilities, commercial buildings and hotels could be accommodated; however noise amelioration through design would be required for some of these uses.

There is no specific noise criteria applicable to the assessment of airport ground operations, however for previous applications a noise assessment was undertaken against the requirements of *State Environmental Planning Policy (Infrastructure) 2007*

SECTION : 3.0 OPPORTUNITIES AND CONSTRAINTS ANALYSIS

(ISEPP) in relation to noise sensitive developments near busy roads and rail infrastructure. Mitigation measures may need to be considered in the masterplan layout and development controls. The aircraft noise assessment undertaken in 2013 (Renzo Tonin and Associates) found that the impacts of noise from ground transportation could be mitigated through design measures to comply with Australian Standards for buildings affected by aircraft noise (AS2021-2000) and the ISEPP criteria.

It is noted that since the aircraft noise assessment was undertaken in 2013, AS2021 has been updated (released March 2015). Therefore, the recommendations regarding noise attenuation, particularly for residential development, would need to be updated.

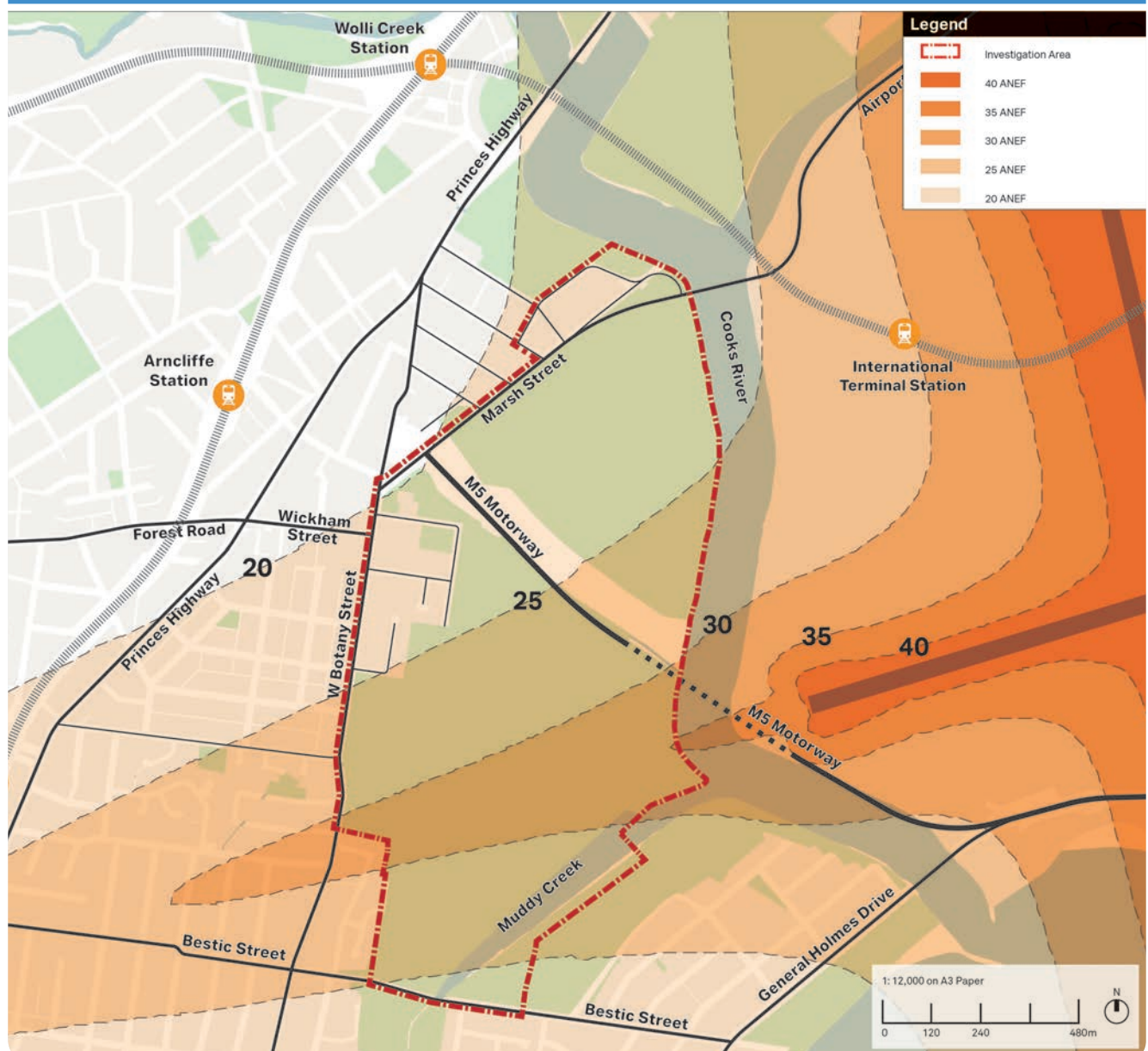
AS2021-2015 Acoustics Aircraft Noise Intrusion – Building Siting and Construction indicates residential development is ‘conditionally acceptable’. AS2021-2015 however anticipates that other noise metrics (aside from ANEF) may be used when making land use planning decisions (ref AS2021 PG. 140).

National Airports Safeguarding Framework (NASF)

The National Airports Safeguarding Framework (NASF) is a national land use planning framework that sets out a purpose of enhancing the current and future safety, viability and growth of aviation operations at Australian airports. The following NASF guidelines are relevant to the proposed development in the Precinct:

- NASF Guideline B: Managing the risk of building generated windshear Turbulence at Airports. The height and bulk of buildings would need to consider this guideline.
- NASF Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports. The management of wildlife in the wetlands and waste management within the Precinct would need to consider this guideline.
- NASF Guideline E: Managing the Risk of Distraction to Pilots from Lighting in the Vicinity of Airports. The location of any floodlights for playing fields etc within the Precinct would need to consider this guideline.

FIGURE 13: ANEF CONTOURS



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It is understood that the National Airports Safeguarding Advisory Group is in the process developing a further NASF guideline that would relate to communication, navigation and surveillance facilities and equipment operated by Airservices Australia at airports which may also need to be considered in the future.

Other Surfaces

A number of other surfaces are defined to ensure off-airport obstacles don't obscure airport safety lights or interfere with signals from ground-based air navigation equipment. These surfaces include Navigational Aids Protection Surfaces (NAPS), Precision Approach Path Indicator (PAPI) system protection surfaces and High Intensity Light Protected Surfaces (HIAL). The PANS-OPS and OLS directions take the requirements for these surface requirements into consideration and are therefore the prevailing instrument for determining development

requirements. Further investigation into all aviation related requirements will need to occur at the next stage of the Cooks Cove Precinct's development to ensure there are no conflicts with the airport's safe operation.

Engine out emergency procedures

The various airlines that operate through the airport may have developed what is known as engine out (emergency) procedures that could be relevant to the development of the Precinct. Under Civil Aviation Order 20.7.1B operators of aircraft having an all-up weight in excess of 5700kg are required to consider obstacle clearance requirements in the event of an engine failure. The specific procedures put in place for meeting these requirements are a matter for the individual aircraft operators/airlines and so consultation will need to occur prior to any future development to determine what procedures exist.

FIGURE 14: ROAD NETWORK CONTEXT



3.2 Transport Network

Current Travel Patterns

An assessment of current travel patterns in the area surrounding the Cooks Cove Precinct identified the following key destinations for local residents:

- Sydney Inner City;
- Kogarah-Rockdale (local);
- Botany & the Eastern Suburbs; and
- Northern CBDs.

Transport mode share for existing residents in the area is currently weighted towards private vehicles (61%) followed by train (34%), bus (3%) and walking (2%).

A further assessment of current travel patterns in the area highlighted the following key origins for local employees:

- Kogarah-Rockdale (local);
- Sutherland Shire; and
- Hurstville.

Mode share for local employees is weighted significantly more towards private vehicles (82%) followed by train (11%), walking (3%) and then bus (1%).

Road connections and access points

Figure 13 illustrates the road network context for the Precinct and the average daily volumes experienced in 2015 for some key roads. The key roads that service the Precinct include:

- M5 Motorway;
- Princes Highway;
- Marsh Street – Wickham Street – Forest Road (Arterial Road); and
- West Botany Street (Sub-arterial Road).

The Cooks River, Sydney Airport land and the M5 Motorway all present constraints to expanding the road network around the Precinct. Peak period capacity issues also present constraints in terms of access into and out of the Precinct. The following network locations represent critical pinch points in peak periods:

- The Princes Highway corridor, with the key pinch point being at its intersections with Railway Parade and Forest Road;
- The signalised intersections of Marsh Street with the West Botany Street and the M5 interchange, with resultant minor queuing to the west along West Botany Street and Wickham Street;
- The M5 interchange at Marsh Street (PM peak only), with queues extending from the westbound on-ramp back up to Marsh Street – both to the east towards the airport as well as to the west along West Botany Street; and
- Airport Drive and the International Airport access roads also experience congestion in the morning and evening peaks.

The current road network is at capacity in some key locations of the road network, particularly on the Princes Highway. It is considered regional (through) traffic and the Sydney Airport are the major contributors to current congestion in the local road network.

A number of road projects that will affect transport conditions in the local area are currently either under investigation, proposed, planned or under construction. They range from minor to major infrastructure projects and are driven by a combination of policy and long-term network planning, or in support of more localised development (i.e. Wolli Creek). These are shown in Figure 14 overleaf and include:

Gertrude Street extensions

As identified in the Rockdale DCP 2011 a new link road is proposed from Levey Street (opposite Gertrude Street) to Marsh Street. Gertrude Street extension would extend the existing Gertrude Street to connect to Marsh Street and would potentially provide vehicle access for the precinct. It is proposed that Gertrude Street would have limit direct vehicular access from abutting property. It has also been suggested that this link may not be made accessible for private vehicles, but only for pedestrians, cyclists and buses.

Marsh Street widening

As part of WestConnex enabling works, the construction of the widening of Marsh Street has commenced which includes widening the carriageway to three lanes in each direction between the Cooks River and the M5 Motorway interchange. The project allows for two right turn lanes into the proposed Gertrude Street extension. The widening works fulfil an important role in providing access to the motorway network. Any delays that may be introduced with new access intersections on Marsh Street to the Cooks Cove Precinct could have an impact on the reliability and operation of the motorway network.

WestConnex, South Link

WestConnex is a 33 kilometre motorway that is intended to link Sydney's west with the Sydney Airport and the Port Botany precinct. Stage 1 of WestConnex (the M4 Widening and M4 East) is currently under construction. Stage 2 of WestConnex, the New M5, received approval from the Commonwealth on 11 July 2016, this follows State Planning approval received on 21 April 2016. Locally, the New M5 is anticipated to reduce traffic flows on the existing M5, which will likely have traffic operation benefits at the currently congested M5 interchange at Marsh Street.

Stage 3 of WestConnex, the Haberfield to St Peters M4-M5 Link is currently in the very early stages of planning and design with completion expected by 2023.

The proposed South Link from Arncliffe to Kogarah is currently being investigated by the NSW Government, and would connect the New M5 to the southern and bayside suburbs of Sydney, and the proposed F6 Motorway. It is the southern extension to WestConnex that would yield the most benefit to traffic conditions in the Cooks Cove area. With reduced through-traffic along key corridors including the Princes Highway, more road network capacity would be made available for urban uplift and improved State Road accessibility. WestConnex South Link is expected to form the first part of the F6 (discussed following) that currently has a reservation over the Precinct.

In 2014 the NSW Government allocated \$11 million to commence investigations to deliver the F6 Motorway. Last year, Transport for NSW and RMS prepared a final business case for the motorway and has now progressed to Final Business Case stage. For the purposes of traffic assessment as part of the New M5 EIS it was assumed that the WestConnex South Link would be operational by 2031, along with the 'full' three stages of WestConnex. This assumption has also been applied for the purposes of this traffic assessment.

However, it should be noted that no funding has been committed by the Government to construct the F6 Motorway. Therefore Princes Highway will continue to carry significant amount of through traffic and may further constrain the ability of local traffic to access the regional road network including traffic generation by the Cooks Cove Precinct and other urban development along the Princes Highway corridor.

Public Transport

Bus

The main role the bus mode plays in most of Sydney's south is as a trunk feeder to rail, with a low overall mode share to bus in the area (as the main mode of travel). The other role of buses is to service centres not serviced by rail - to the east towards the Airport and Randwick, west towards Bexley and Campsie and south towards the bayside areas and Taren Point. Figure 16 illustrates the existing bus network and bus stops in the vicinity of the Precinct.

Due to the existing land uses within the Cooks Cove Precinct, the existing bus routes only service the western and northern boundaries along West Botany Street and to a lesser extent Wickham Street.

The 400/410 is a major regional route that connects Burwood and Rockdale to Sydney Airport, Randwick, UNSW and Bondi Junction. It operates along Wickham Street and Marsh Street (there are no bus stops on Marsh Street).

FIGURE 15: PROPOSED ROAD UPGRADES



FIGURE 16: EXISTING BUS NETWORK



The actual operating frequency of the 400/410 service is approximately seven minutes during peak periods; however the limited stops nature of the service results in a service frequency in the vicinity of Cooks Cove Precinct of only around 20 minutes. The reliability of bus services is also impacted by the congestion on the road network in the vicinity of the Precinct.

The 422 bus route provides connections from Rockdale to Sydney CBD via Sydney University, running along West Botany Street. Both of these routes have relatively low frequency in the area, with higher frequency in other areas. This contributes to the existing low mode share seen for buses in the study area (3%).

The 422 operates more frequently between Tempe and the City, with approximately half those services extending south past the Precinct to Rockdale.

Data from JTW as well as Opal data provided by Transport for NSW (TfNSW) indicates that the Sydney Kingsford Smith Airport is the largest attractor of local bus trips, with most originating from the Banksia Station and Wickham Street bus stops.

Rail

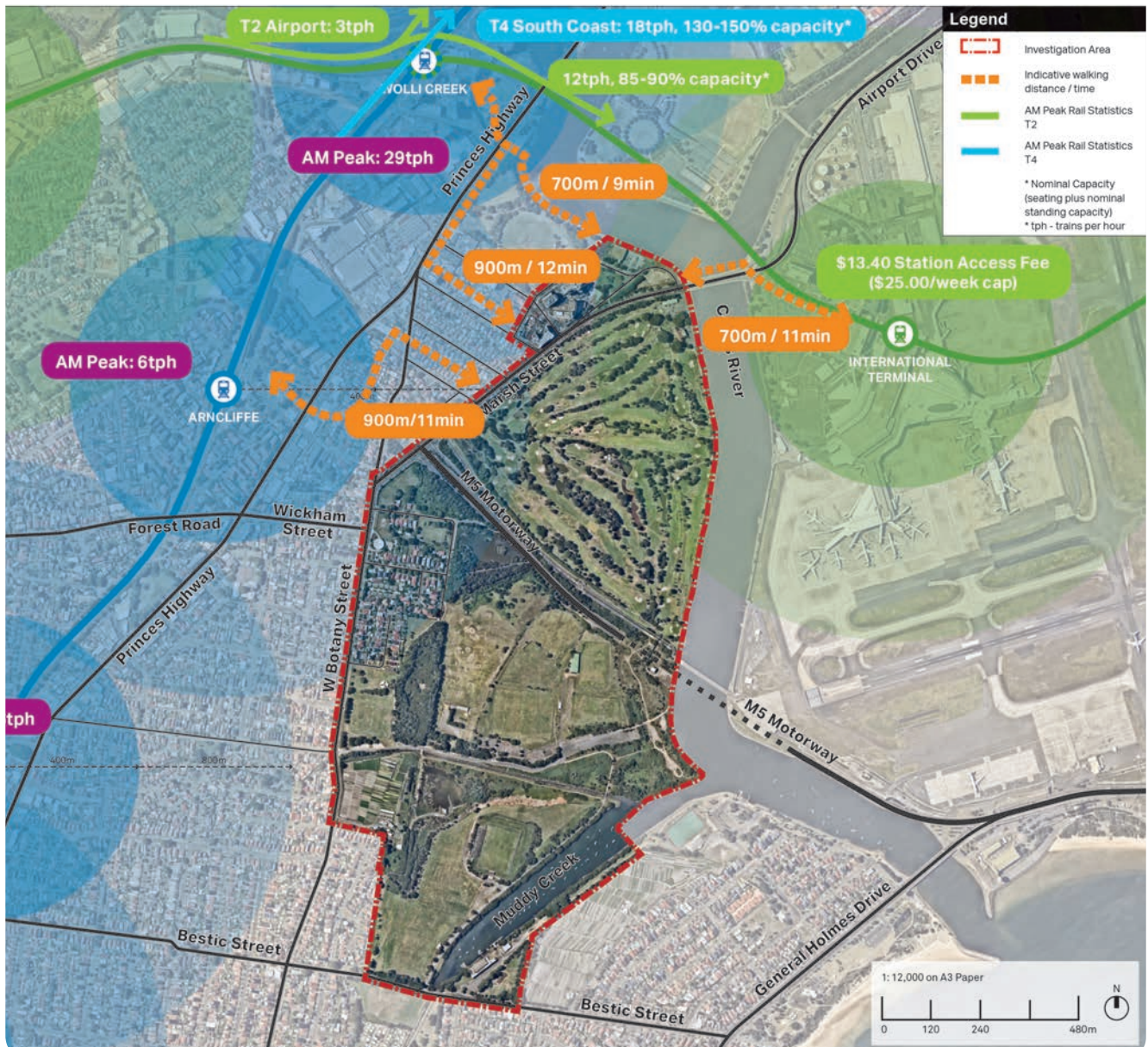
Rail is the trunk public transport mode of the south making up around 30% of local mode share according to JTW data. Figure 17 illustrates the existing rail network in the vicinity of the Precinct.

Wolli Creek is the key station for the Cooks Cove Precinct in terms of station facilities/capacity as well as train serviceability and catchment. The area is also supported by Arncliffe and Banksia Stations, though these stations have a lower standard of facilities and serviceability. Walking distances and times to each surrounding station are generally quite long (over 800 metres and 10 minutes). There is also a lack of connectivity and safe access from the Precinct to these stations.

Wolli Creek Station is serviced by both the T2 Airport Line and the T4 Illawarra and South Coast Line, hence with more frequent train services and capacity. Arncliffe and Banksia Stations are located on the T4 Illawarra Line.

The T2 Line provides access between Wolli Creek and the Sydney CBD via Airport, Green Square, Mascot and areas to the

FIGURE 17: EXISTING RAIL NETWORK



south west. The nearest station to the east of the Precinct is the International Terminal along the T2 Line. However, ridership of this line is hindered by a station access fee and current access from the Precinct is restricted by the river.

Some services on this line have more available capacity when they arrive at Wolli Creek, however there are upstream capacity constraints around Green Square which would be exacerbated by additional growth in and around the Precinct.

The T4 Line provides rail access to the Sydney CBD, Bondi Junction and each of the centres within the Kogarah, Rockdale and Sutherland Shire areas to the south.

The T4 Line is currently at full capacity during the AM peak hour operating at around 135% of the seated load capacity when the trains arrive at Wolli Creek Station. Transport for NSW have identified the need to provide additional capacity on the T4 Line, however a commitment is yet to be made to delivering new infrastructure. This finding presents a constraint not just to the Cooks Cove Precinct, but to urban growth along the T4 corridor on the whole.

Walking and Cycling

The Cooks Cove Precinct forms an important link in the Botany Bay to Homebush Bay regional cycle network, however the existing links through the Precinct are convoluted (refer Figure 18). The Precinct's redevelopment presents an opportunity to further extend cycle network linkages to the Alexandra Canal Cycleway as well as improve the Botany Bay to Homebush Bay route.

Pedestrian access into and out of the Precinct is limited and often without prioritisation when attempting to cross major roads, such as Marsh Street, the M5 and West Botany Street.

A lack of east-west connectivity is an issue for both pedestrians and cyclists. Additionally, the Princes Highway and Cooks River are barriers to walking and cycling movement.

A number of walking and cycling connectivity needs have been determined for the Precinct; these are highlighted on Figure 19 overleaf and include:

Regional (as shown by the red dotted line):

- Homebush Bay regional cycle facility;
- Alexandra Canal Cycleway;
- The Grand Parade; and
- East-west connectivity to areas such as Banksia and beyond (currently poor).

Localised (as shown by the green dotted line):

- Public transport nodes
 - Local centres and shops; and
 - Sydney Airport.

FIGURE 18: WALKING AND CYCLING CONNECTIVITY NEEDS



FIGURE 19: WALKING AND CYCLING CONNECTIVITY NEEDS



Scenarios

Four land use scenarios have been considered for the purposes of strategic transport study. Broadly speaking this includes two residential-based scenarios and two employment-based scenarios. All scenarios have the same assumed developable area, which has been estimated by the broader investigation team based on various constraints such as flooding, potential road reserve requirements and airport noise restrictions (e.g. flight paths).

The Precinct will also accommodate other land uses such as recreational facilities; however these have not specifically been incorporated. These elements are not considered to be large trip generators during peak periods, are likely to be located in other parts of the development outside the developable area and have separate access arrangements.

- **Option 1** represents a conservative residential and mixed use option that acknowledges known capacity constraints to local key transport links.
- **Option 2** is a commercially driven version of Option 1, in which residential dwellings are traded for office space. This option was a sensitivity test partially driven by the opportunity to utilise potential counter-peak direction transport capacity.
- **Option 3** forms a variation of Option 1, which is based on the 5,000 dwellings proposed by previous proposals for the Precinct.
- **Option 4** represents land uses that are allowed under the current zoning and assumes a mix of high traffic generating uses including retail and commercial offices. The retail component represents a shopping centre approximately the scale of Bondi Junction Shopping Centre.

SECTION : 3.0 OPPORTUNITIES AND CONSTRAINTS ANALYSIS

Options 1, 2 and 3 have a mix of land uses including residential, hotel, commercial, retail and educational uses. From a travel demand generation perspective, the options cover a spectrum of travel demand generation and also travel directionality.

The 'shopping centre' component of the retail in these three options is generally envisaged as slow trade retail – small business retail and services rather than a destination retail centre in itself. The supermarket is envisaged to be a more mid-tier supermarket tenant (e.g. Harris Farm Market) rather than a major chain (e.g. Coles, Woolworths). For Option 4 the retail component would be envisaged as a major retail centre.

Analysis and Recommendations

Road Connections and Access Points

The high level analysis that was undertaken to assess road connections and access points for the Precinct against the four different scenarios outlined in the previous section, considers two main access locations at Marsh Street as well as access at Levey Street as shown on Figure 20. The analysis draws on

traffic forecasts for Marsh Street, as published by the NSW Government in the WestConnex New M5 Environmental Impact Statement (EIS).

The preliminary traffic assessment indicates that only one scenario may be accommodated by the two proposed access intersections, provided that additional investment is placed into nearby intersections. Any additional development would require secondary access locations such as Levey Street or investing in more significant upgrades at Marsh Street.

RMS has been engaged regarding access locations for the Precinct and will continue to be consulted to determine the requirements for access points to the Precinct through the next stages of the planning process.

This preliminary analysis indicates a widened **Marsh Street** still has limitations in accommodating development traffic in the long term. It also indicates that the F6 has a strong influence on availability of local road capacity. Ongoing engagement with RMS and TfNSW going forward will be required to manage the road network planning process and outcomes.

FIGURE 20: ROAD ACCESS AND IMPACT



The **Princes Highway** has been identified as the main singular 'destination' for traffic leaving the Precinct and further assessment would be required at this corridor to determine impacts and any required upgrades. The need for upgrades along this corridor would be heavily driven by anticipated timing of both Cooks Cove development and the completion of WestConnex South Link.

Notwithstanding the above, the main traffic movements are forecast to be towards the south and the **M5 Motorway** Interchange. The impacts on this intersection and at West Botany Street would require impact assessment along with the broader State road network in the area as part of any future development proposal.

Airport Drive has been shown to represent a relatively low desire line for traffic accessing the development, however any future assessment would still need to be cognisant of interaction with access roads to the International Airport.

Public Transport

A conceptual public transport network has been developed to respond to identified issues and future needs, highlighted in Figure 21 it includes:

- Enhanced pedestrian crossing facilities at Princes Highway and Marsh Street, RMS have identified grade separation as preferred at both locations.
- Bus feeder services to mitigate walking distance / time issues. This could include consideration to connecting to Sydenham – where more passenger capacity exists – instead of local stations. However, potential congestion on Princes Highway could affect reliability of bus feeder services to Sydenham.
- More frequent local bus 422 services.
- New bus stops at Marsh Street to accommodate access to new and improved suburban bus routes.
- Increased rail capacity through improvements to infrastructure and services.

FIGURE 21: PUBLIC TRANSPORT RESPONSE



FIGURE 22: WALKING AND CYCLING RESPONSE



3.2.6.1 Walking and Cycling

A conceptual walking and cycling network has been developed to respond to identified issues and future needs, highlighted in Figure 22 it includes:

- A direct foreshore bicycle path along the Cooks River with improved connectivity across Muddy Creek.
- Connection to Giovanni Brunetti Bridge.
- Potential new walking and cycling connections across the Cooks River, to enhance complementary land uses with Sydney Airport, and as a potential alternate crossing opportunity to improving the Giovanni Brunetti Bridge crossing.
- Treatments that manage key conflicts points at Marsh Street, Princes Highway and West Botany Street through pedestrian enhancements - either by overpasses or improved crossings.
- Potential walking and cycling connections into Banksia Priority Precinct via Spring Street.
- Opportunities to improve pedestrian amenity and safety within the Precinct and along connections to areas surrounding the Precinct including transport interchanges such as rail stations and bus stops. This could be achieved through treatments including footpath upgrades, connecting missing links (if practical without the need for property acquisition), as well as improvements to landscape and lighting.

3.3 Open Space and Recreation

The Cooks Cove Precinct features an abundance of both private and public open space and is also in close proximity to a variety of surrounding open space. Existing public recreation areas and infrastructure currently within the Precinct include St George Rowing Club, Kogarah Golf Club, St George Soccer Stadium, Barton Park, Banksia Field, Riverine Park and Lance Studdert Reserve.

Public recreation areas and infrastructure located around the Precinct include:

- Cahill Park immediately to the north of the Precinct, across Marsh Street, sport facilities include a large sports field used for cricket and rugby and 4 tennis courts;
- Tempe Recreational Reserve north of the Precinct, across the Cooks River, sports facilities include an Indoor Sports Centre, Jets Sports Club, Cooks River Motor Boat Club, 6 sports grounds (soccer and cricket), 11 netball courts and cricket nets;
- Arncliffe Park on Wollongong Road, to the north west of the Precinct, sport facilities include a cricket pitch and a soccer field;
- St George Randwick Hockey Club to the south of the Precinct, sports facilities include one hockey field;
- Rockdale Women's Sports field to the south west of the Precinct, sports facilities include 15 netball courts and 3 sports fields;
- Kyeemagh Reserve, Rockdale Park, McCarthy Reserve, Redmond Field, Muddy Creek and White Oak Reserves immediately to the south of the Precinct, around Muddy Creek;
- Rockdale Bicentennial Park, sports facilities include south of Muddy Creek; and
- Several other smaller parks within one kilometre of the Precinct.

FIGURE 23: OPEN SPACE AND RECREATION FACILITIES



3.4 Topography and Flooding

The Precinct has a generally flat topography on the area to the north of the M5 with some mild undulation associated with golf course landscaping.

The area south of the M5 has large flat areas associated with the sporting fields however also undulates in some parts (to a greater degree than the northern section). This undulation is largely a result of the former land filling operations and slightly raised banked edges on the perimeter of a number of the sports fields.

The residential area located along West Botany Street is slightly raised from the open space it adjoins, with the land sloping moderately away towards Eve Street.

Flooding is a significant constraint to development on the Cooks Cove Precinct, with the majority of the Precinct north of the existing M5 East affected by the 100 year Average Recurrence Interval (ARI) flood event. One dimensional flood modelling was carried out in 2006 (Patterson Britton and Partners) and 2008 (Worley Parsons) to support previous development applications for the Precinct, however these proposals did not involve residential development. Since these studies were undertaken there have been significant changes in flood policies and guidelines in relation to Flood Planning Levels, Climate Change and Sea Level Rise.

A number of previous flood studies and floodplain risk management studies have been prepared for the lower Cooks River. Specifically, in 2009 Sydney Water commissioned the Cooks River Flood Study (MWH+PB Joint Venture, 2009) to understand flooding impact and the potential to naturalise some concrete channels to improve aesthetic and environmental values. This study is the presently adopted flood study for the lower Cooks River.

The flood modelling that was undertaken for the Cooks River Flood Study (MWH+PB Joint Venture, 2009) study shows the northern part of the Precinct, currently occupied by the golf course, to be fully inundated at during an extreme event such as the PMF, and substantially inundated during events such as the 100 year ARI. To the south of the M5 East flooding on the Precinct from Muddy Creek or one of its tributaries is noted in Muddy Creek Reserve, Lance Stoddert Reserve and Barton Park during the 100 year ARI flood. During an extreme event such as the PMF, this flooding has a higher elevation, and extends into the surrounding residential areas in Arncliffe, Banksia, Kyeemagh and Brighton Le Sands.

Flood mapping undertaken as part of this study, which was based on modelling prepared for the Cooks River Flood Study (MWH+PB Joint Venture, 2009), shows a flood depths for the 100 year ARI of generally between 0.0 and 0.5 m on the Precinct. Greater depths of water are noted in the Eve Street, Riverine Park and Barton Park Wetlands, as well as in some of the existing waterways. Refer to Figure 24 for the 100 Year ARI and levels on the Precinct.

As part of this study, a high level flood impact assessment was undertaken based on a scenario for the Precinct that included residential, employment and open space uses. This exercise determined that the adopted development scenario does not have broader impacts on Cooks River Flooding. In both the 100 and 200 year ARI flood events there no significant changes in the flood level in the Cooks River both upstream and downstream of

the Precinct. The flood impact assessment included sensitivity testing that considered the joint effect of Cooks River flooding and elevated water levels in Botany Bay, and showed that flood impacts as a result of the proposed development were not affected. In all tested cases the majority of the flood conveyance past the Precinct was found to take place within the confines of the Cooks River, with the overbank conveyance having been blocked by previous developments.

However, a small flow is able to enter the Precinct from the north by flowing across Marsh Street, and there is the potential that if this is blocked then there will be residual impacts to the north of Marsh Street. These residual impacts were determined could be managed in the 100 year ARI Cooks River flood with the construction of a flood conveyance channel and flood storage area. These features will require integration with the final urban design once this is determined.

For the events that incorporate the 100 year ARI elevated water levels in Botany Bay, flood level increases of up to 90 mm have been identified north of Marsh Street. Further work that identifies the storm duration that results in the maximum flood level on the Precinct should be undertaken for both the existing and proposed conditions, and should consider the effect of local catchment runoff and drainage, as well as the stability of the existing embankment on the Kogarah Golf Course site. When 100 year ARI water levels in Botany Bay are included in the model, peak flood levels in the Cooks River are greater than assumed in the Cooks River Flood Study (PB-MWH Joint Venture, 2009), the Cook Cove – Stage 2 Open Space DA Flood impact Assessment (WorleyParsons 2010), or the Bonnie Doon Flood Study (WMAWater, 2016). As such, the impacts shown in the 100 year ARI which include the effects of elevated tidal levels in Botany Bay, may be more conservative than adopted as part of other studies.

Evacuation of the Precinct during events up to and including the PMF will likely need to be managed with a shelter in place strategy. As the critical duration of the Cooks River is relatively short at two hours, and the area surrounding the development, including Wolli Creek, relatively densely populated, it is unlikely that alternative response approaches are viable. This will require further consideration once the final form of the development has been determined.

Due to the complexity of the flooding constraint, future flood modelling is recommended, once the precinct masterplan is adopted, to an appropriate level of detail in order to demonstrate the following:

- Upstream flood impacts in the Cooks River can be managed.
- Site drainage and local overland flows can be managed on the Precinct.
- The proposed flood mitigation strategy can be incorporated into the masterplan layout.
- Safety and evacuation procedures have been assessed and planned for.
- That there is no increase in flood impact on surrounding areas, such as to the north of Marsh Street.

It is also recommended that any future flood study (including model inputs and approach) be independently peer reviewed.

3.5 Views

No view analysis study has been undertaken to date for the Precinct, the following summary is based on general observations.

The entire eastern edge of the Precinct currently has unobscured views to the Cooks River and beyond. As the land is reasonably flat across the Precinct, this view does not extend at ground level to the western parts of the Precinct however would be achieved by upper levels of any newly developed buildings.

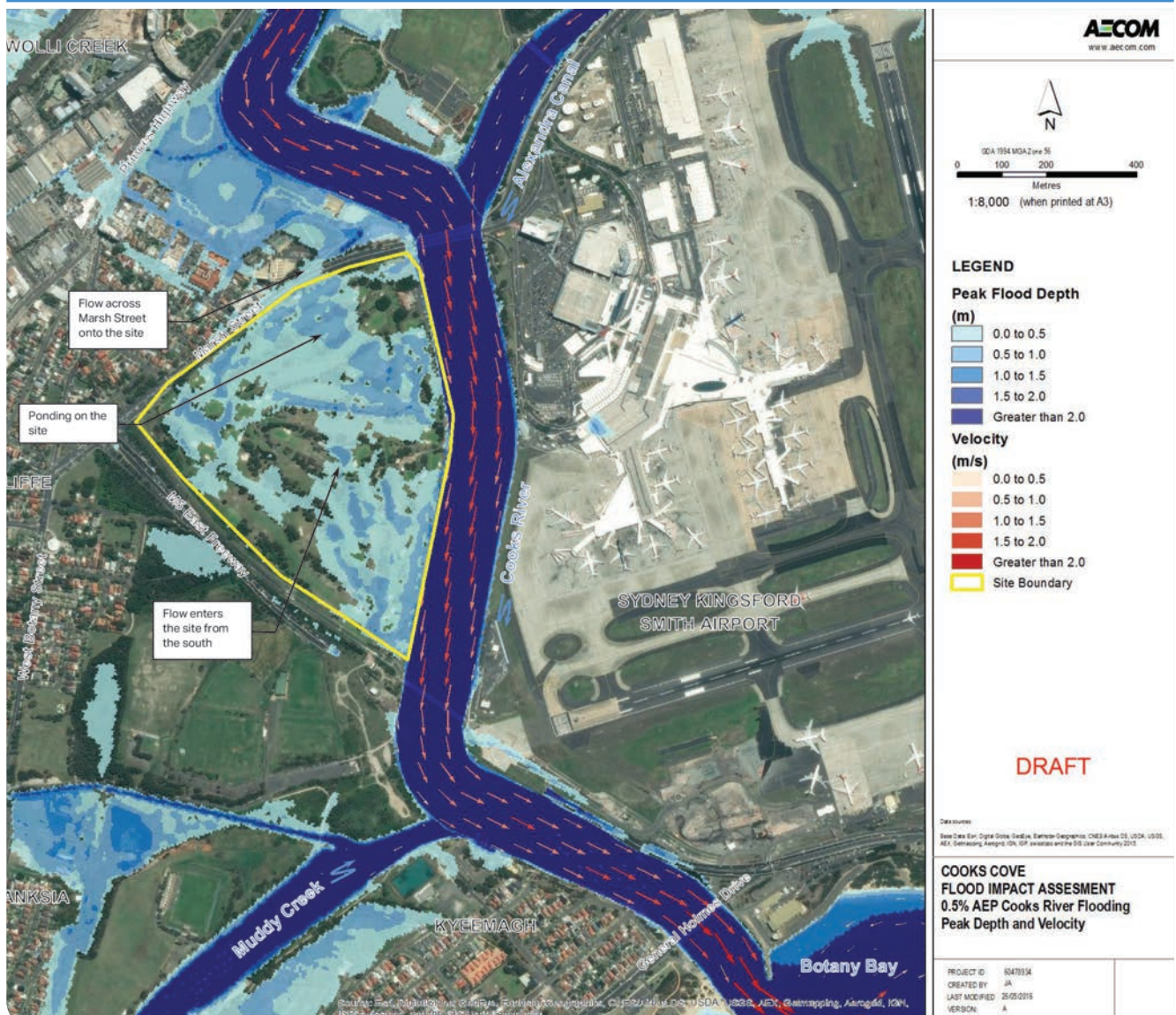
The land located to the south of Muddy Creek around the boat yards provides views to the Creek and the bordering mangroves. Further east along Muddy Creek towards the Cooks River, the views are predominantly to vegetation from the ground level but would extend to Muddy Creek and the Cooks River at higher building levels. The land to the north of Muddy Creek has glimpses of the Creek at ground level and is predominately characterised by views of vegetation however again at upper levels would provide views to the creek and further to the Cooks River.

The M5 Motorway is largely obscured by the dense vegetation which surrounds it at ground level on both its northern and southern sides however would potentially be viewed from any newly developed nearby multi storey developments.

The land to the north of Marsh St slopes towards the Cooks River providing views to the water and across to Tempe Recreational Reserve for the upper storeys of the buildings along Gertrude Street and Levey Street.

It is recommended that a view analysis study be conducted for the Precinct. It is also recommended that subsequent consideration be given to the development of additional controls in the Rockdale DCP for the Precinct, particularly in relation to views of the Cooks River.

FIGURE 24: 100 YEAR ARI FLOOD LEVEL



3.6 Vegetation and Ecology

A number of ecological studies have been undertaken and a management plan prepared for the Cooks Cove Precinct. The studies have identified areas of significant vegetation, endangered species, and critical habitat. A summary of the key considerations is provided below:

- The Spring Street Canal intersects the Precinct, east to west, and contains small areas of scattered mangrove and saltmarsh species (Hassell, 2010).
 - There are four wetland areas within the study Precinct, which form part of the Rockdale Wetlands Corridor running from the Cooks River through to Sans Souci. These are the Spring Street Wetland, dominated by a central mangrove community, Landing Lights Wetland, dominated by the endangered ecological community (EEC) 'coastal saltmarsh' community, and the Marsh Street and Eve Street Wetlands. Marsh/Eve Street Wetlands is known habitat for the threatened Green and Golden Bell Frog. The wetlands contain threatened estuarine and freshwater vegetation and coastal saltmarsh (Rockdale Biodiversity Strategy, 2010).
 - There are two constructed frog habitat ponds located on RMS land adjacent to the south western corner of the Precinct, adjacent to Marsh Street and the SWOOS (Hassell, 2010). These are dominated by reedland, which are considered to form part of the "Freshwater Wetlands on Coastal Floodplains in the NSW North Coast Sydney Basin & South East Corner Bioregions", NSW Scientific Committee 2004b. A new frog habitat is proposed to be constructed as part of the WestConnex New M5 project. Roads and Maritime owns land at Marsh Street directly adjacent to the existing M5 Motorway and in proximity to the existing RTA Ponds on the Kogarah Golf Course. Opportunities to create new Green and Golden Bell Frog habitat at this location is being pursued as part of the management plan for the species.
- The Marsh Street land provides a potential opportunity to both expand and secure the Arncliffe Green and Golden Bell Frog population and is the first priority for supplementary measures. In addition, a BioBanking agreement (supported by the annual payments from the BioBanking Trust Fund) could provide the basis to secure long term funding for the management of any recreated habitat.
- The Green and Golden Bell Frog has been detected on Precinct, and is listed as Endangered under the Threatened Species Conservation Act 1995. A Green and Golden Bell Frog Plan of Management was developed as part of the WestConnex New M5 project to mitigate the impacts of the project on the population and its associated habitat. The plan of management includes measures to create additional habitat adjacent to the Arncliffe surface works area and to increase the amount of tussocky grasses and swales around the RTA Ponds to increase the quality of habitat. Studies have also indicated that a number of threatened migratory birds are using the Landing Lights wetland. These include the Terek Sandpiper, Broad-billed Sandpiper, Great Knot, Sanderling, Black-tailed Godwit and the Lesser Sand Plover.
 - Studies have indicated that a number of threatened migratory birds are using the Landing Lights wetland. These include the Terek Sandpiper, Broad-billed Sandpiper, Great Knot, Sanderling, Black-tailed Godwit and the Lesser Sand Plover.
 - The Muddy Creek Plan of Management (POM) 2011 relates to Barton Park, Lance Studdert Reserve, Kyeemagh Boat Ramp Reserve and Muddy Creek. The POM identifies that there is significant mangrove vegetation adjacent to the banks of Muddy Creek. Any activity in this region with the potential to harm the mangroves will require appropriate assessment, approvals and permits.

FIGURE 25: ENDANGERED ECOLOGICAL COMMUNITIES (EECs), WETLANDS, FROG HABITAT AND OTHER THREATENED SPECIES



FIGURE 26: LOCATION OF HERITAGE ITEMS



3.7 Heritage

The Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) is located adjacent to the M5 corridor in the northern part of the Precinct and is listed as an item of State Significance under the NSW Heritage Act 1977.

The primary significance of the SWOOS is in the function it serves the community of the Southern and Western areas of Sydney by channelling and managing its effluent, and in the careful and precise engineering methods employed to achieve it. It represents a historically important step in the implementation of the largest sewer system in Sydney and thereby NSW.

A Heritage Impact Statement prepared by City Plan Heritage was prepared as part of 2006 Stage 1 DA and the later 2008 Stage 2 open space and golf course DA.

The market gardens, located at 212 West Botany Street, Banksia is also identified as an item of high heritage significance and is

listed on the State Heritage Register and S.170 register under the NSW Heritage Act 1977.

Known as the Arncliffe Chinese Market Gardens, their significance lies in their association with the Chinese community and their demonstration of a continuous pattern of land usage since the late nineteenth century. They are one of only three such surviving market gardens in the Inner Sydney region and one of few similar surviving examples in the Sydney Metropolitan Region.

There are also two sites within the Precinct that are identified as having Local Heritage significance that will need to be considered in any future redevelopment. These are the Former Hospital for Women located at 112 West Botany Street and a Federation Cottage located at 9 Brennans Road'.

These local heritage items are located within the small residential pocket that is not proposed for any change at this stage.

3.8 Existing Community Facilities

Existing community facilities in the vicinity of the Cooks Cove Precinct are outlined in Figure 27 and include:

Community Spaces

- Arncliffe Community Centre to the west of the Precinct;
- Coronation Hall to the west of the Precinct;
- Arncliffe YMCA to the west of the Precinct;
- A new Youth Centre with a range of facilities has been proposed for a location to the west of the Precinct but the status of this project is currently not known;
- Arncliffe Scots Sports and Social Club to the west of the Precinct; and
- Kyeemagh RSL and Community Club, immediately south east of the Precinct.

Religious Facilities

Wolli Creek Islamic Mosque to the west of the Precinct; and
St David's Anglican Church to the west of the Precinct.

Libraries

- Arncliffe library to the west of the Precinct; and
- The new Rockdale City library (opened 30 July 2016) is located to the west of the Precinct along the Princes Highway.

Schools and Childcare Facilities

- St Francis Xavier's Catholic Primary School to the west of the Precinct;
- Arncliffe Public School to the west of the Precinct;
- Heritage listed Kyeemagh Market Gardens, immediately to the south of the Precinct;
- Sydney Airport, across the Cooks River to the east of the Precinct;
- Arncliffe West Infants School located north west of the Precinct;
- Cairnsfoot Special School located north west of the Precinct;
- Athelstand Public School (primary) located west of the Precinct;
- Tempe High School located north of the Precinct; and
- There are approximately 10 childcare facilities within a 1km radius of the Precinct.

FIGURE 27: COMMUNITY FACILITIES



Seniors Facilities

- Rockdale Senior Citizens Centre to the west of the Precinct; and
- Rockdale Community Services Inc (providing aged and disability care and support) to the west of the Precinct.

The capacity of these facilities to support development of the Precinct will need to be investigated as plans progress and the land use mix is determined.

If residential development is pursued, it is likely that redevelopment of the Precinct will require the inclusion of education facilities however this would be dependent on the number of dwellings.

3.9 Infrastructure and Utilities

Two utility easements are located on the eastern side of the Precinct in a north-south direction for the desalination pipeline and ethane gas pipeline, as follows:

- Desalination pipeline: 1.8m diameter within an easement of approximately 6m. Development is not inhibited over and around the desalination pipeline, however must comply with development controls as defined by the infrastructure operator (Icon Project Management, 2015). If buildings cannot be developed within the easement there may be opportunities for pavement (roads) or open space.
- Ethane gas pipeline: a high pressure gas pipeline runs along the eastern (Cooks River) boundary. The easement is generally 5m wide. The pipeline located at a depth of 1.2m-2.3m (Worley Parsons, 2008). There are restrictions for building over this pipeline however it may be incorporated within open space, the river foreshore, or road reserves.

FIGURE 28: INFRASTRUCTURE AND EASEMENTS



- The Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) is located above ground adjacent to the M5 corridor in the northern part of the Precinct.

Further investigation will be required to determine the specific locations and development constraints related to this infrastructure, including consultation with the owners and operators to determine specific safety requirements. Any planned augmentation of existing civil and utility infrastructure will need to maintain minimum clearance between the desalination and ethane pipelines.

All utility services are available to the development Precinct. Augmentation (as required) will need to be undertaken as part of the next stage of the planning process (JBA 2015).

3.10 Contamination

A number of contamination studies and remediation plans have been undertaken for the Precinct between 2005 and 2013. The most recent Environmental Site Assessment (ESA) was undertaken by Consulting Earth Services (CES) in 2008.

The findings from this assessment are summarised below:

- The area of the Precinct which is zoned Trade and Technology (TTZ) under SREP 33 was identified as having soil contamination hotspots. These areas were found to contain fill material that is affected by Total Petroleum Hydrocarbon (TPH C6-C36), benzene, toluene, ethylbenzene and total xylene (BTEX), and fragments of asbestos cement sheeting. Particular areas of concern were the bowlers and USTs located within the Kogarah Golf Course Club House car park.
- The remaining portion of the area north the M5 and south of Marsh Street was identified to include lead, Total Petroleum Hydrocarbon (TPH C15-C36) and Pure Benzo(a)pyrene (BaP). Asbestos fibres were not found in near-surface soils but fragments of fibrous cement sheeting were observed at the surface around one sample area.
- From the groundwater samples taken for this northern part of the investigations area, arsenic, chromium, copper, lead, zinc and ammonia were detected at concentrations that exceed acceptable levels. CES considered that the elevated metal concentrations and ammonia in groundwater to have low potential to adversely impact the receiving waters.

A review of the 2008 and an accompanying Remediation Action Plan (RAP) was undertaken by CES in 2013. This review recommended that this northern part of the Precinct can be made suitable for mixed use development, including residential, subject to preparation and implementation of a revised ESA and RAP, and a subsequent Site Management Plan for acid sulfate soils.

It is notable that the 2008 assessment did not include parts of the Precinct, including:

- Land to the north of Marsh Street, including the residential areas and Cahill Park;
- Residential areas to the east of West Botany Street (west of Eve Street wetland);
- Market garden;
- Part of Banksia Field;
- Residential land located to the east of West Banksia Street and west of Bestic street parkland;
- The area currently occupied by the Muddy Creek Boating and Amateur Fishing Association; and
- The area surrounding the Saint George Soccer Stadium.

It is considered that the existing residential areas within the study boundary that have not be subject to an environmental site assessment may be contaminated, however further investigation would be required for the areas of existing open space and the Muddy Creek Boating and Amateur Fishing Association site.

The WestConnex New M5 EIS also identified the following environmental management measures would take place as part of their project:

- Potentially contaminated areas directly affected by the New M5 project would be investigated and managed in accordance with the requirements of guidance endorsed under section 105 of the CLM Act. This includes further investigations in areas of potential contamination identified in the construction footprint.
- Appropriate mitigation measures including stockpiling and management of potentially contaminated material would be undertaken at construction compounds to prevent movement of material into receiving waters.
- Further in situ testing of soils in areas of known potential contamination to determine waste classification.

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There are a number of additional investigations that need to be carried out to refine a more prescribed development outcome for the precinct. These should be undertaken as part of the further planning and subsequent development of the precinct. Recommended study requirements include the following:

Community Consultation

- Continuing to consult with key stakeholders and the community to discuss, evaluate and confirm the desired built form character and uses for the precinct.

Aviation

- Investigating the potential to strengthen the precinct's relationship with the airport.
- Undertaking an aeronautical impact assessment in consultation with Sydney Airport, CASA and Air Services Australia.

Transport

- Further investigating the viability of potential walking and cycling improvements including:
 - Creating two signalised intersections into the precinct on Marsh Street at Flora Street and Gertrude Street with pedestrian connectivity across Marsh Street at these two intersections;
 - Access into and out of the precinct at Spring Street and Bestic Street;
 - Public promenade along the Cooks River waterfront;
 - Pedestrian and bicycle link across the Cooks River to the airport;
 - Pedestrian and bicycle link across the M5 Motorway providing more direct access to Arncliffe station;
 - Pedestrian and bicycle link across Muddy Creek to provide efficient and continuous access along the Cooks River;
 - Connections to existing bike paths, such as Eve Street Cycleway and Bestic Street Cycleway;
 - Connected and continuous footpaths throughout the precinct;
 - Walkable block dimensions for all future development; and
 - Creation of a wetland walk with interpretive signage.
- Investigating further possible public transport improvements including enhancing bus connections and/or frequency to local train stations and other common origins and destinations.
- Undertaking further traffic modelling for the more defined development scheme/s for the Precinct.

Open Space and Social Infrastructure

- Investigating and understanding the specific social infrastructure and open space needs of the future community in the precinct, and considering the colocation of these to maximise the efficiency of use while also allowing for shared maintenance costs.

Land Use

- Undertaking a market assessment to determine a viable mix of land uses in the short, medium and long term.
- Considering appropriate development densities to ensure amenity while matching market suitability.
- Further investigating the location and orientation of the sports and recreation facilities adjacent to the Cooks River to provide a high degree of amenity and to take advantage of this direct interface.

Heritage

- Creating a heritage strategy that is then employed and integrated into the planning and development within the precinct.

Vegetation and Ecology

- Creating a wetland management and interpretation plan that is used to inform further planning and development within the precinct.
- Undertaking detailed ecology studies to determine an accurate understanding of these values across the precinct to then inform future development and conservation opportunities.
- Reviewing and updating existing Environmental Site Assessment and Remediation Action Plan and undertake additional assessment (where required) to determine the extent of contamination and required remediation needed to make the precinct suitable for future development and land uses.

Infrastructure and Utilities

- Determining augmentation requirements for utilities and infrastructure services to further define the capacity for precinct's development.

Flooding

- Undertaking further flood modelling and continue to test flood mitigation requirements as planning for the precinct continues and to test further schemes for the precinct.

Urban Design

- Establishing a public domain strategy which focuses on solidifying road networks across the precinct and effectively integrating the open space and public domain elements with future development schemes.

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The following tables provide an overview of the infrastructure projects that have been identified to support any future development at Cooks Cove.

TABLE 1: REGIONAL INFRASTRUCTURE UPGRADES IDENTIFIED

Measure		Delivery	Timing and delivery	Assumptions
Public transport				
B1	New bus stops on Marsh Street.	Cooks Cove developer & TfNSW/ Council	Bus stops to be provided prior to construction certificate for first dwelling at Cooks Cove. To be partly funded by Special Infrastructure Contribution or satisfactory arrangements.	New bus stops are required on Marsh Street to accommodate access from Cooks Cove to bus network (AECOM, 2016)
Regional/State road network				
R1	New major intersections on Marsh Street to provide access to Cooks Cove.	Cooks Cove developer & RMS/ TfNSW	Intersections to be completed prior to construction certificate for first dwelling at Cooks Cove.	New intersections are required at two points along Marsh St to provide access to the Cooks Cove Precinct (AECOM, 2016).
R2	Improvements to Marsh Street and Airport Drive. Including improved pedestrian connections to the Giovanni Bridge and upgraded pedestrian crossing of Marsh Street (potential pedestrian over pass).	RMS/ TfNSW/ Cooks Cove developer	Upgrades to be completed prior to construction certificate for first dwelling at Cooks Cove. To be partly funded by Special Infrastructure Contribution or satisfactory arrangements.	Improvements to Marsh Street and Airport Drive will be required to support the growth in traffic volumes from Cooks Cove precinct (AECOM, 2016).
Improvements for Pedestrians and Cyclists				
P1	Investigate provision of a new walking and cycling bridge over the Cooks River to the Sydney Airport.	Developer/ Council	Investigations into new crossing to be incorporated into any planning proposal for Cooks Cove.	Opportunities exist to provide new walking and cycling connections across the Cooks River, to enhance complementary land uses with Sydney Airport (AECOM 2016).
P2	A direct foreshore bicycle/ pedestrian path along the Cooks River.	Cooks Cove Developer/ Council	Construction of path to commence prior to construction certificate for first dwelling at Cooks Cove. To be partly funded by Special Infrastructure Contribution or satisfactory arrangements.	A direct foreshore bicycle path along Cooks River with improved connectivity across Muddy Creek should be provided (AECOM 2016).
P3	New and improved cycle and pedestrian crossing of the Princes Highway from Cahill Park to Brodie Spark Drive. Consider pedestrian over pass.	Cooks Cove developer & RMS/ TfNSW	Improved crossing to be completed prior to construction certificate for first dwelling at Cooks Cove. To be partly funded by Special Infrastructure Contribution or satisfactory arrangements.	An upgrade to the pedestrian crossing of Princes Highway from Cahill Park is required to provide a better connection from Wolli Creek Station to Cooks Cove (AECOM 2016)
Education				
E1	New school located at Cooks Cove.	Department of Education	Provision for a school is to be allowed for, as agreed to by Department of Education, into any rezoning of Cooks Cove. Contribution to land costs to be partly funded by Special Infrastructure Contribution or satisfactory arrangements.	School Assets Strategic Plan to be released in 2016 and updated every five years.

TABLE 2: LOCAL INFRASTRUCTURE UPGRADES

Measure	Delivery	Timing and delivery	Assumptions
Drainage and flooding			
D1	Upgrade trunk drainage across the catchment and upgrade existing drainage network, including: Drainage network along Wollongong Road from Dowling Street to Bonar Street, and under the railway line; Additional inlets and drainage works at Valda Avenue; Pipe upgrades at Eve Street Brick arch openings under sewer carrier; Modifications to Bonnie Doon Channel; Dedicated overland flow paths.	Council/ developers	Preliminary design and costings of upgrades to be undertaken by Council with support from the Department for inclusion in the Development Control Plan (Strategy Action 1) and review of the Section 94 Plan (Strategy Action 3).
D2	New flood storage and detention basins to mitigate future flooding.		Arndcliffe and Banksia subject to some areas of flooding following significant rainfall events and require upgrades to the existing drainage infrastructure (Mott MacDonald, 2015).
D3	New levee to provide additional drainage capacity and reduce inundation from the Cooks River.		
Community infrastructure			
C7	Provision of new active recreation facilities at Cooks Cove.	Construction of recreation areas to commence prior to construction certificate for first dwelling at Cooks Cove.	Opportunities exist to provide new walking and cycling connections across the Cooks River, to enhance complementary land uses with Sydney Airport (AECOM 2016).