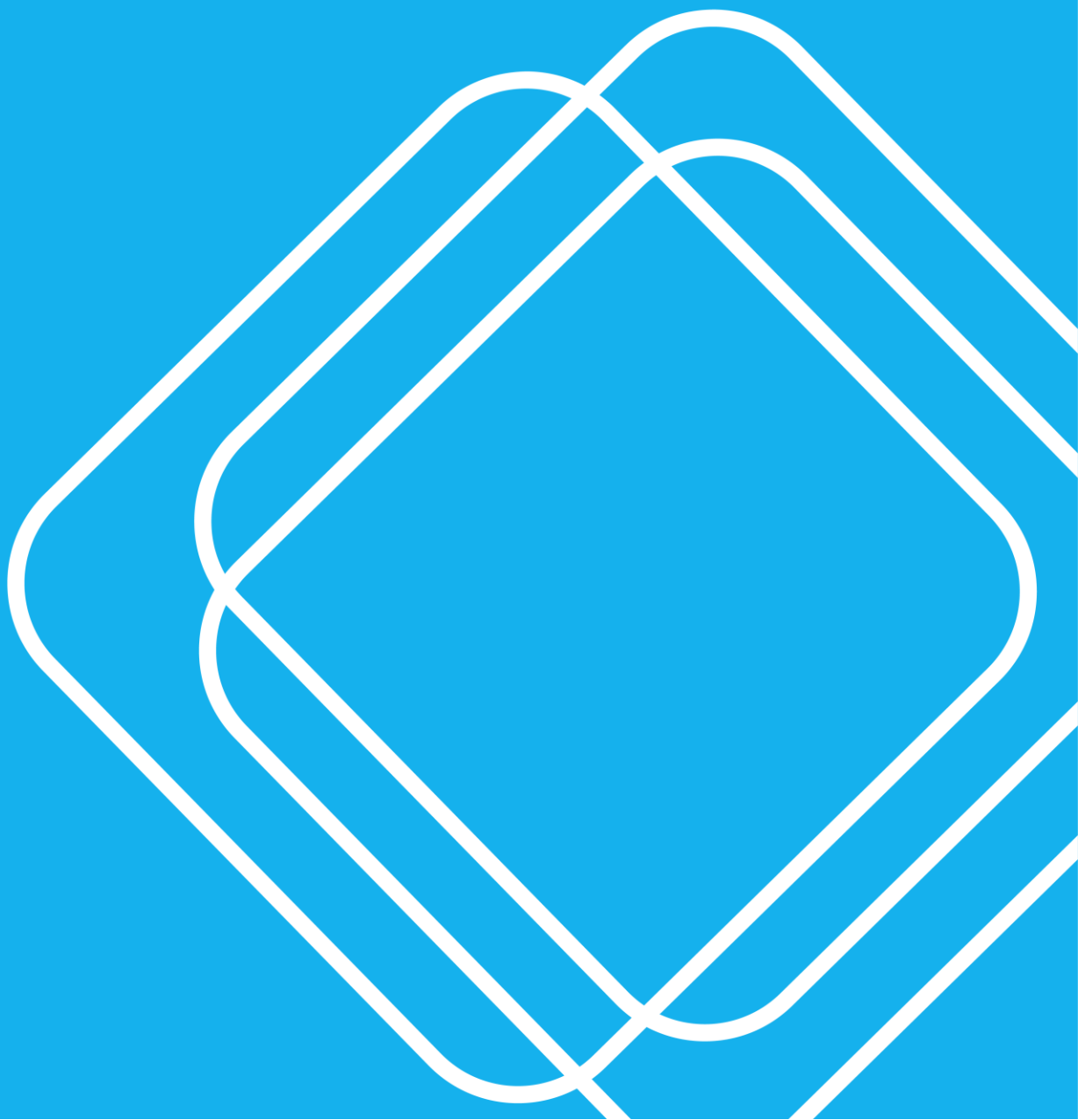
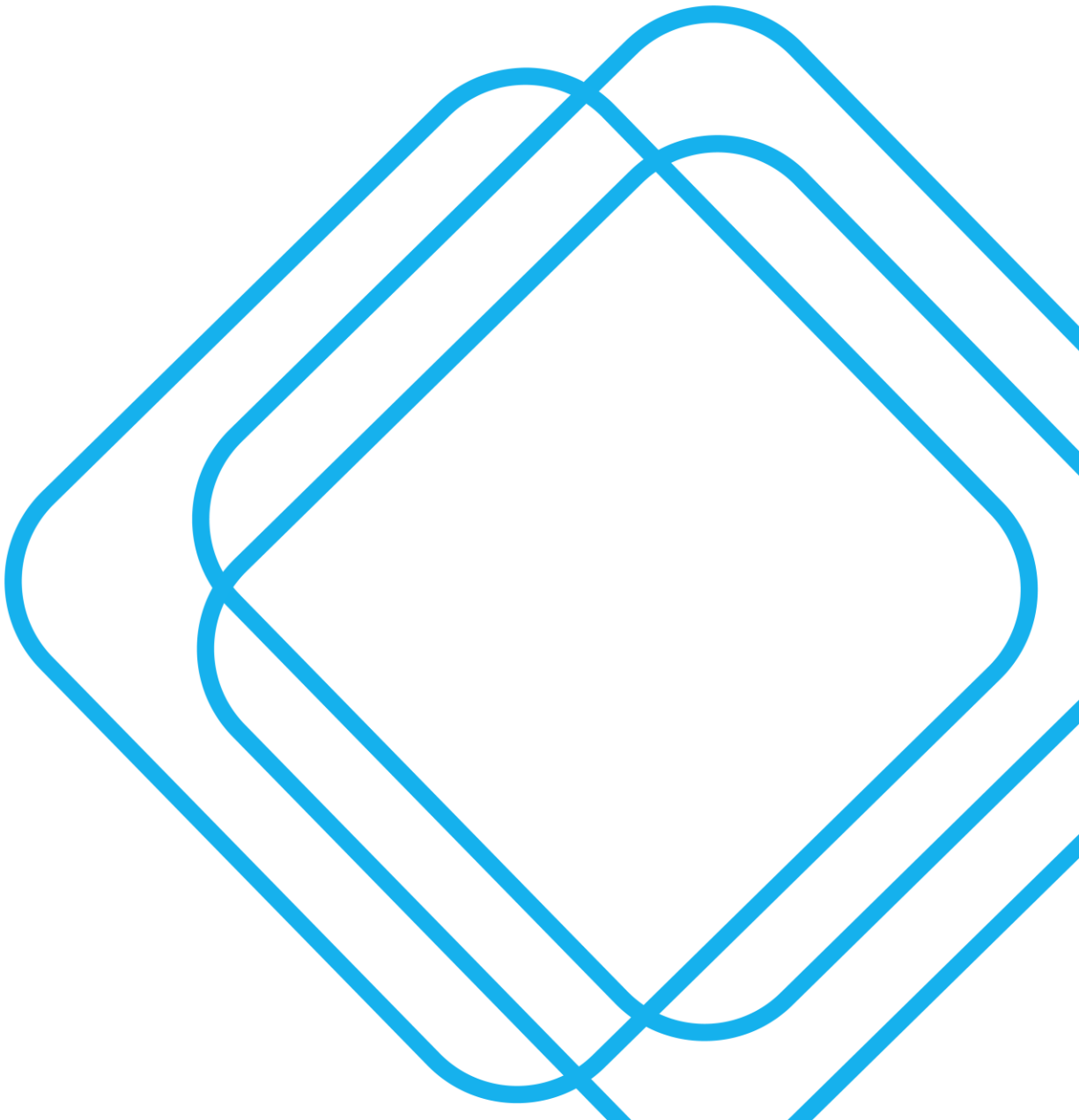
SCT Consulting

BRADFIELD CITY CENTRE FIRST BUILDING

Traffic and Transport Assessment

12 NOVEMBER 2021





Quality Assurance

Project:	Bradfield City Centre First Building		
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Client:	Western Parkland City Authority	**ABN:**	84 369 219 084
Prepared by:	SCT Consulting PTY. LTD. (SCT Consulting)	**ABN:**	53 612 624 058

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Quality Information	
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1.0	9 November 2021	Draft report
2.0	12 November 2021	Final

Contents

Appendices

Executive Summary

Purpose of this report

SCT Consulting was engaged by Western Parkland City Authority (WPCA) to undertake a Traffic and Transport Impact Assessment to support the State significant Development Application (SSDA) for the First Building in Bradfield City Centre, located within the Aerotropolis Core Precinct of the Western Sydney Aerotropolis.

The First Building will comprise applied research, proof of concept, prototype manufacturing and testing. A range of work settings shall be provided that addresses the need for environments to support collaborative and individual work.

The proposed development will have an approximate building footprint of approximately 2,500 m^2 and will include approximately 50 at-grade parking spaces.

The First Building will facilitate the earliest economic development activity within the Bradfield City Centre and will establish a precedent for future stages of development.

Future planning context

Western Parkland City has the largest supply of industrial lands with two planned intermodal terminals to support large-scale logistics growth – providing an ideal location for an Advanced Manufacturing Research facility.

The population of Western Parkland City is projected to grow from 740,000 in 2016 to 1.1 million by 2036 and to well over 1.5 million by 2056. The NSW Government is working to establish the Western Parkland City on the strength of the Western Sydney International Airport (WSIA) and the Western Sydney Aerotropolis. The new Western Sydney Aerotropolis will be built around the WSIA as Australia's next global gateway and is envisioned to be a polycentric city that capitalises on established centres of Liverpool, Penrith, and Campbelltown.

The Western Sydney Aerotropolis contains 10 precincts, and the Aerotropolis Core Precinct is one of the precincts that are the focus of the initial planning process. Aerotropolis Core is located immediately to the southeast of the WSIA and incorporates the Bradfield City Centre. The Bradfield City Centre is proposed to be delivered as part of the early stages within the Aerotropolis Core lands to facilitate economic activity and employment generation. Initial development activity by the Western Parkland City Authority (WPCA) focuses on the development of an Advanced Manufacturing Research Precinct. The Bradfield City Centre will be centred around a new Metro Station that is expected to be operational in 2026, in line with the opening of the new Airport. It is anticipated that several buildings within the Bradfield City Centre will be operational before the opening of Sydney Metro, including the First Building.

Existing conditions

The 2016 Method of Travel to Work data was analysed to determine current travel behaviour to and from the site during peak travel periods. The study area showed a high proportion of car use, which accounts for more than 70 per cent of the trips, in comparison to the 53 per cent of Greater Sydney. Given the limited public transport infrastructure servicing the area, public transport use only accounted for less than five per cent of the trips, in comparison to the 22 per cent total in Greater Sydney. Active transport use was also low due to limited employment opportunities in the vicinity and a gap in cycling or pedestrian infrastructure provision in the area.

The study area predominantly comprises rural lands with low-density developments. The Journey to Work statistics is not an accurate reflection or basis of future travel behaviour due to significant changes in land use and substantial future developments.

Future conditions

The surrounding context of the site is undergoing rapid transformation and will change drastically over future years. The Bradfield City Centre will be serviced by an integrated transport network that prioritises walking and cycling for short trips, and bus corridors and arterial roads to provide access both to/from and within the Aerotropolis.

The site will be serviced by three future rail lines on an expanded Sydney rail system: Sydney Metro Western Sydney Airport, the East-West Rail Link, and the South West Rail Link extension. Metro station will be within walking distance to the site, with rapid transit corridors connecting the site to Campbelltown-Macarthur, Liverpool, Parramatta, Penrith,

Blacktown, and the Western Sydney International Airport. The site will also have access to a well-placed network of frequent bus routes, particularly those using Fifteenth Avenue as the main transit corridor connecting the Aerotropolis Core with other major centres in Western Parkland City. In line with the vision of a 30-minute city, the rapid and local bus services will provide the site direct access through suburbs, centres, and transport interchanges within centres.

The site will be connected to the principal regional cycle path network via Badgerys Creek Road and Fifteenth Avenue, which will provide direct access within the city centre and to other precincts and will be integrated with the cycling infrastructure beyond the Western Sydney Aerotropolis. The site will also be connected to a local, permeable street network which connects pedestrian and cycling links to a variety of destination and transport nodes.

The future travel behaviour in the study area is benchmarked against Mascot for a more realistic representation of the future traffic and transport conditions of the site.

Planning is still underway for the broader land uses and transport network.

Proposed development

The Bradfield City Centre is located at 215 Badgerys Creek Road, Bringelly within the Liverpool Council local government area (LGA). The site is located within the Western Parkland City, and specifically within the Aerotropolis Core and Wianamatta-South Creek Precincts of the Western Sydney Aerotropolis. The First Building is located within the north-eastern corner of the Bradfield City Centre. The site has an indicative area of approximately 3 hectares and shares a common boundary along the site's western edge with properties located along Badgerys Creek Road.

Parking controls are still being developed will include approximately 50 at-grade parking spaces (18 permanent spaces, 32 temporary spaces). All proposed parking spaces will be on permeable surfaces and designed with the potential to transition to alternative uses over time. The site also is proposed to include 13 bicycle parking spaces and 4 end-of-trip facilities to support sustainable travel behaviour.

A 6m wide one-way vehicular access is proposed to be provided through the site for vehicles to enter from Innovation North and to exit onto Fifteenth Avenue. As Fifteenth Avenue will be delivered after the opening of the First Building, a one-lane carriageway will be constructed adjacent to Fifteenth Avenue to enable vehicle access.

The proposed at-grade loading bay is at the eastern extent of the building. The site will be serviced by a 19m semi-trailer once every two to three weeks. Waste collection will occur one to two times per week. A 12.5m heavy rigid vehicle was used to test swept paths for waste access. The vehicle access link allows a 19m articulated vehicle and a 12.5m heavy rigid vehicle (HRV) to traverse through the site and stop at the loading bay. This ensures no obstruction or conflict with other vehicles traversing through the site while a service vehicle or waste truck is parked at the loading bay.

Traffic and transport assessment

SIDRA modelling was undertaken for Badgerys Creek Road and Aerotropolis Access Road roundabout for two periods (weekday AM peak and weekday PM peak. The modelled scenarios are:

- 2023 peak metro construction – without development site
- 2023 peak metro construction – site construction
- 2023 peak metro construction – site operation (pre-metro trip generation)
- 2028 metro operation – without development site
- 2028 metro operation – site operation (short term trip generation).

The roundabout performs at a Level of Service (LoS) A and a Degree of Saturation (DoS) under 1.0 in all modelled scenarios. The roundabout performs better in 2028 scenarios due to the reduced car mode share after the opening of Sydney Metro. Modelling results suggest that the roundabout does not require any upgrades given the low car trip generation from the site.

In the short term, all site-generated trips are expected to be private vehicle trips due to the lack of public transport and active transport infrastructure. In the longer term, the site will be serviced by accessible rail and bus networks that provide wide coverage of destinations across the Sydney Greater Metropolitan Area. The public transport network is expected to accommodate the additional trips generated by the development given the low trip generation from the site. Site access will be integrated with the extensive walking and cycling network to accommodate active transport movements. The provision of on-site bicycle facilities and visitor bicycle parking would meet the needs of potential bicycle users.

The infrastructure proposed to be delivered is summarised as follows:

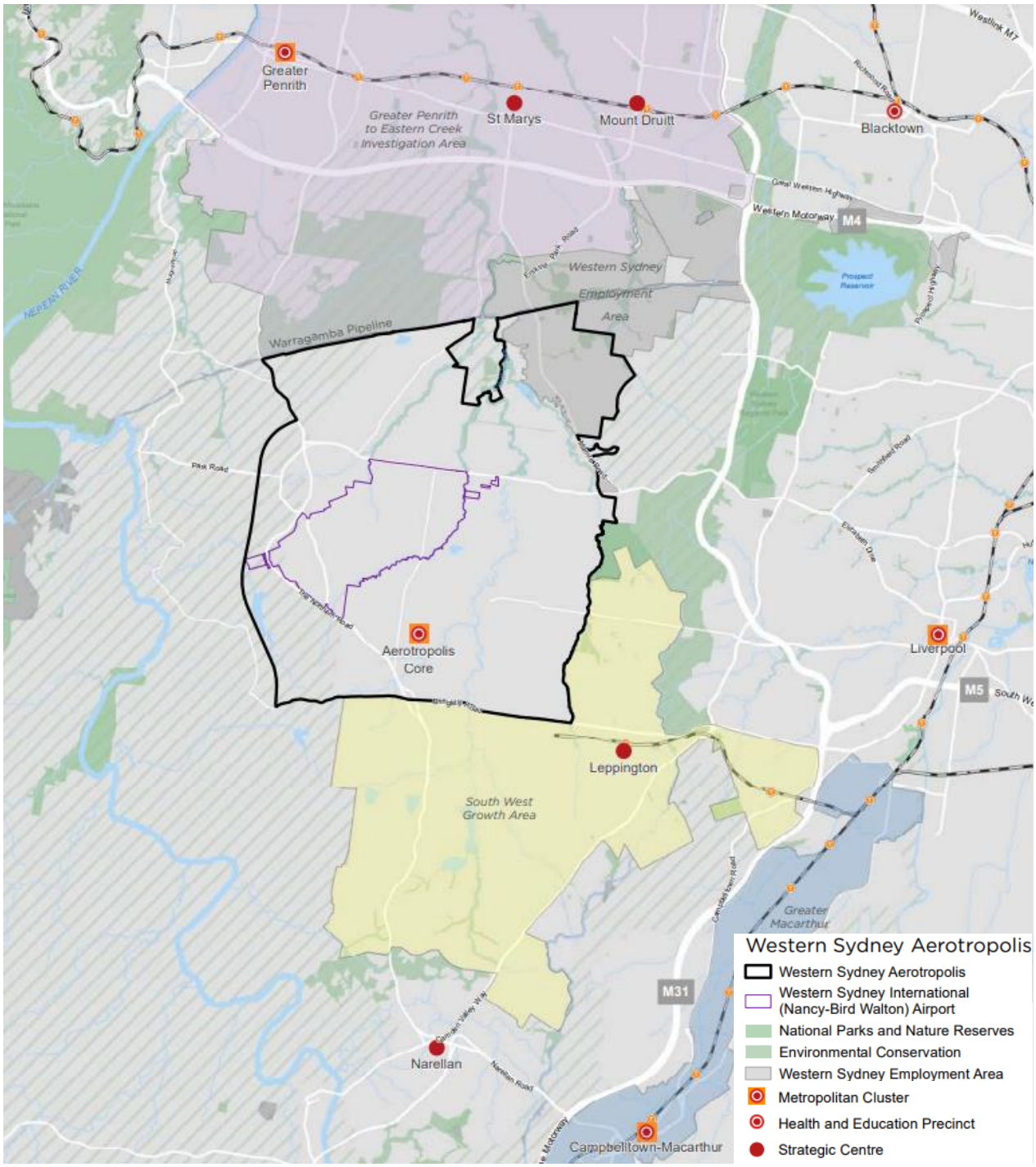
Infrastructure	Timing
Innovation North Street from Central Loop West to site access	Before crown completion certificate
Central Loop West from Innovation North Street to Aerotropolis Access Road (Sydney Metro's construction access connection to Badgerys Creek Road)	Before crown completion certificate
Southern general traffic carriageway of Fifteenth Avenue from Central Loop West to Metro Access Track	Before crown completion certificate
18 permanent car parking spaces and 32 temporary car parking spaces, 10% of which are electric charging	Before crown completion certificate
Removal of 32 temporary parking spaces	Within 12 months of the date from Sydney Metro Western Sydney Airport's first passenger service
13 bicycle parking spaces and 4 end of trip facilities	Before crown completion certificate

1.0 Introduction

1.1 Background

The NSW Government is working to establish the Western Parkland City on the strength of the Western Sydney International Airport (WSIA) and the Western Sydney Aerotropolis. The new Western Sydney Aerotropolis **(Figure 1–1**) will be built around the WSIA as Australia's next global gateway and is envisioned to be a polycentric city that capitalises on established centres of Liverpool, Penrith, and Campbelltown.

Figure 1–1 Western Sydney Aerotropolis

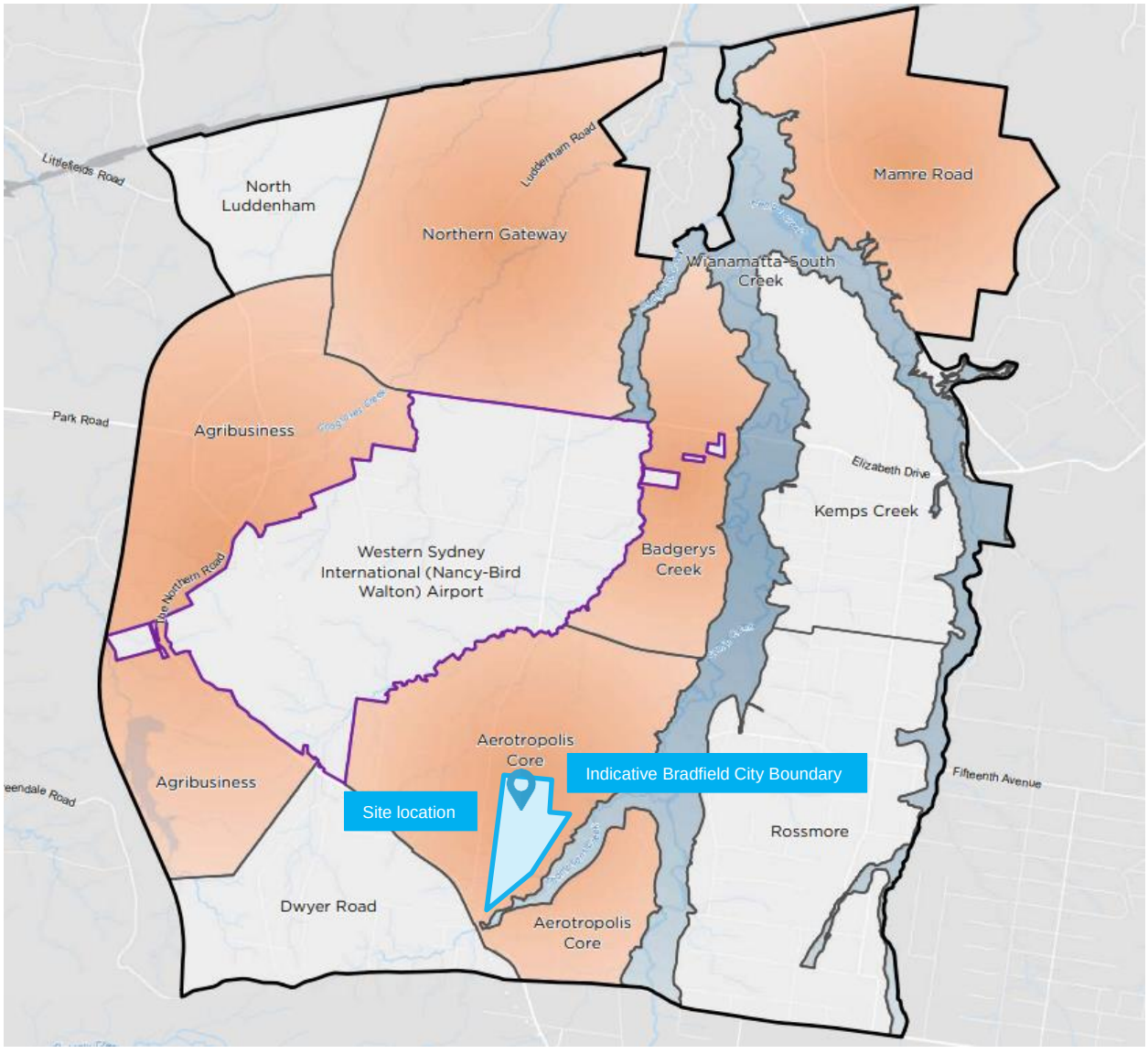


Source: Western Sydney Aerotropolis Plan 2020

The Western Sydney Aerotropolis contains 10 precincts, and the Aerotropolis Core Precinct is one of the initial precincts that are the focus of the initial planning process. Aerotropolis Core is located immediately to the southeast of the WSIA and incorporates the Bradfield City Centre (**Figure 1–2**).

The Bradfield City Centre is proposed to be delivered as part of the initial stages within the Aerotropolis Core lands to facilitate economic activity and employment generation. Initial development activity by the Western Parkland City Authority (WPCA) focuses on the development of an Advanced Manufacturing Research Precinct. The Bradfield City Centre will be centred around a new Metro Station that is expected to be operational in 2026, in line with the opening of the new Airport. It is anticipated that several buildings within the Bradfield City Centre will be operational before the opening of Sydney Metro, including the First Building. The First Building will facilitate the earliest economic development activity within the Bradfield City Centre and will establish a standard for future stages of development.

Figure 1–2 Bradfield City within Aerotropolis Core



Source: Western Sydney Aerotropolis Plan 2020

The First Building meets the threshold for State Significant Development (SSD) under Schedule 1 of State Environmental Planning Policy (State and Regional Development 2011) as a manufacturing research and development facility with a Capital Investment Value (CIV) of more than $30 million (including equipment).

SCT Consulting was engaged by WPCA to undertake a traffic, transport, and access assessment for the First Building, to support the SSDA. This Traffic and Transport Impact Assessment was conducted in advance of the finalisation of the Bradfield City Centre Masterplan.

1.2 Purpose and scope of the report

The purpose of this Traffic and Transport Impact Assessment is to support the SSDA of the proposed First Building in Bradfield City Centre. The scope of this document includes:

- A review of the strategic transport planning context for the study area including relevant state, regional and local planning policies
- A review of the existing and future traffic and transport conditions of the site and surrounding transport network
- A review of access strategy, car parking provision and end-of-trip facilities based on Western Sydney Aerotropolis Development Control Plan (DCP) requirements
- Estimate of future traffic generation and mode share of the site based on preliminary Bradfield City planning direction and surrounding transport network development
- Distribution of the trip generation to the surrounding road network based on anticipated access strategy and travel pattern
- Traffic modelling (SIDRA) of the two critical intersections for two peak periods (one weekday AM and one weekday PM) for the following scenarios:
  - 2023 peak metro construction – site construction
  - 2023 peak metro construction – site operation (pre-metro trip generation)
  - 2028 metro operation – site operation (short term trip generation)
- A review of the likely impact of the proposed development on the surrounding road network, public transport network, active transport network and parking provision
- A Green Travel Plan (GTP) outlining sustainable travel initiatives for the development

1.3 Compliance with SEARS requirements

Department of Planning, Industry and Environment (DPIE) has identified the requirements for the assessment in the Secretary's Environment Assessment Requirements (SEARs). **Table 1-1** shows where the specific SEARs requirements have been addressed. This report has fully responded to the SEARs requirements.

Table 1-1 Compliance with SEARS requirements

SEARS requirement	Location in report
Statutory and Strategic Context – including: – demonstration the proposal is consistent with all relevant planning strategies, environmental planning instruments, adopted precinct plans, draft district plan(s), and adopted management plans and justification for any inconsistencies. This includes, but is not limited to: • Greater Sydney Region Plan: A Metropolis of Three Cities • Western City District Plan • Future Transport Strategy 2056 and support plans • Western Sydney Aerotropolis Plan • Western Sydney Aerotropolis Development Control Plan – Phase 1 • Draft Aerotropolis Precinct Plan	**Section 2.0**
Infrastructure Requirements – in consultation with relevant service providers: – An assessment of the impacts of the development on existing utility infrastructure and service provider assets surrounding the site	**Section 6.0**
– Identification of any infrastructure upgrades required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained	**Section 5.2**

SEARS requirement	Location in report
– Development of an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be coordinated, funded, and delivered to facilitate the development	**Section 5.2**
A quantitative traffic impact assessment prepared in accordance with relevant Roads and Maritime Services and Austroads guidelines	**Section 6.0**
Details of all traffic types and volumes likely to be generated during all key stages of construction and operation, including a description of key access/haul routes, vehicle types and potential queueing impacts	**Section 5.0** **Section 6.0** **Section 7.0**
An assessment of the predicted impacts of this traffic on road safety (including pedestrian and cycling conflict) and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections (using SIDRA or similar traffic model at 5-year intervals)	**Section 6.0** **Section 7.0** **Appendix A**
Swept path diagrams depicting vehicles entering, exiting, and manoeuvring throughout the site	**Appendix B**
Details and plans of the proposed internal road network, loading dock servicing and provisions, on-site parking provisions, and sufficient pedestrian and cyclist facilities, in accordance with the relevant Australian Standards	**Section 5.2 - 5.3**
Review existing and future bus, rail networks and services planned to service the proposed site in line with Bradfield's strategic vision and objectives in temporary, short-term, and long-term scenarios	**Section 3.0** **Section 4.0**
Details of how the development will provide pedestrian connectivity (including through site linkages) to public transport including the proposed Sydney Metro station	**Section 4.1** **Section 5.2.3**
Details of road upgrades, infrastructure works or new roads or access points required for the development if necessary	**Section 5.2.1**
During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular, you must consult with: – Liverpool City Council – … – Transport for NSW – …	**Consultation was conducted with TfNSW and Liverpool City Council on 30 September 2021 minutes are attached.**

1.4 Report structure

This report has been structured into the following sections:

- **Section 2.0** provides a summary of the review of all relevant strategic documents
- **Section 3.0** describes the existing transport conditions for all modes of transport
- **Section 4.0** describe the future transport conditions for all modes of transport
- **Section 5.0** describes the proposed development, its access and parking strategy and the likely trip generation
- **Section 6.0** outlines the traffic and transport appraisal which describes the modelling that was undertaken and indicative impact as a result of the proposed development
- **Section 7.0** outlines the preliminary construction traffic and pedestrian management plan
- Section 8.0 summarises the report and presents the conclusions

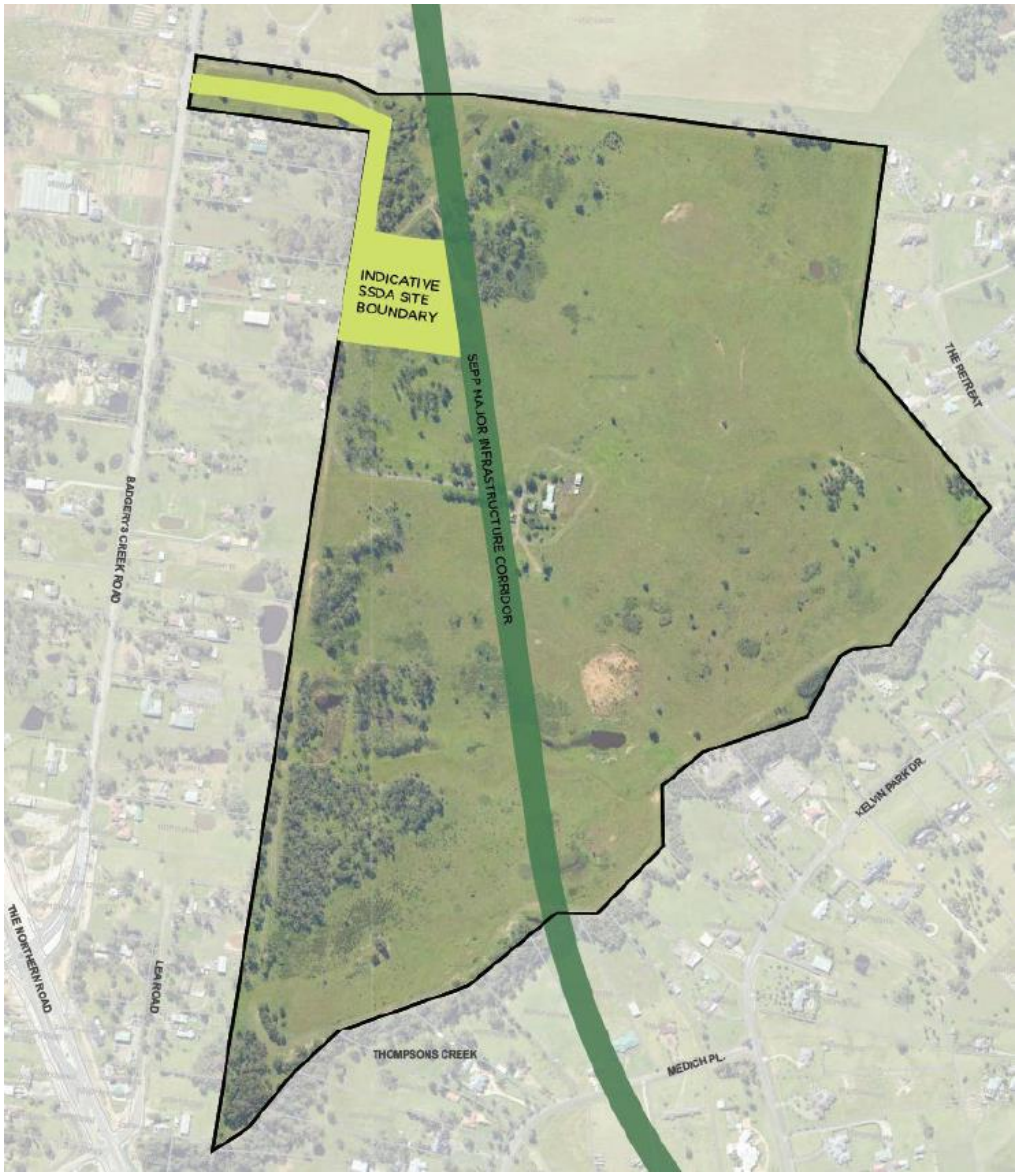
2.0 Strategic Context

2.1 Site context

The Bradfield City Centre is located at 215 Badgerys Creek Road, Bringelly within the Liverpool Council local government area (LGA). The site is located within the Western Parkland City, and specifically within the Aerotropolis Core and Wianamatta-South Creek Precincts of the Western Sydney Aerotropolis.

The First Building is located within the north-eastern corner of the Bradfield City Centre, as shown in **Figure 2–1** below. The Site has an indicative area of approximately 3 hectares and shares a common boundary along the site's western edge with properties located along Badgerys Creek Road.

Figure 2–1 Indicative site boundary



Source: The NSW Government Bradfield First Building Request for Secretary's Environmental Assessment Requirements 2021

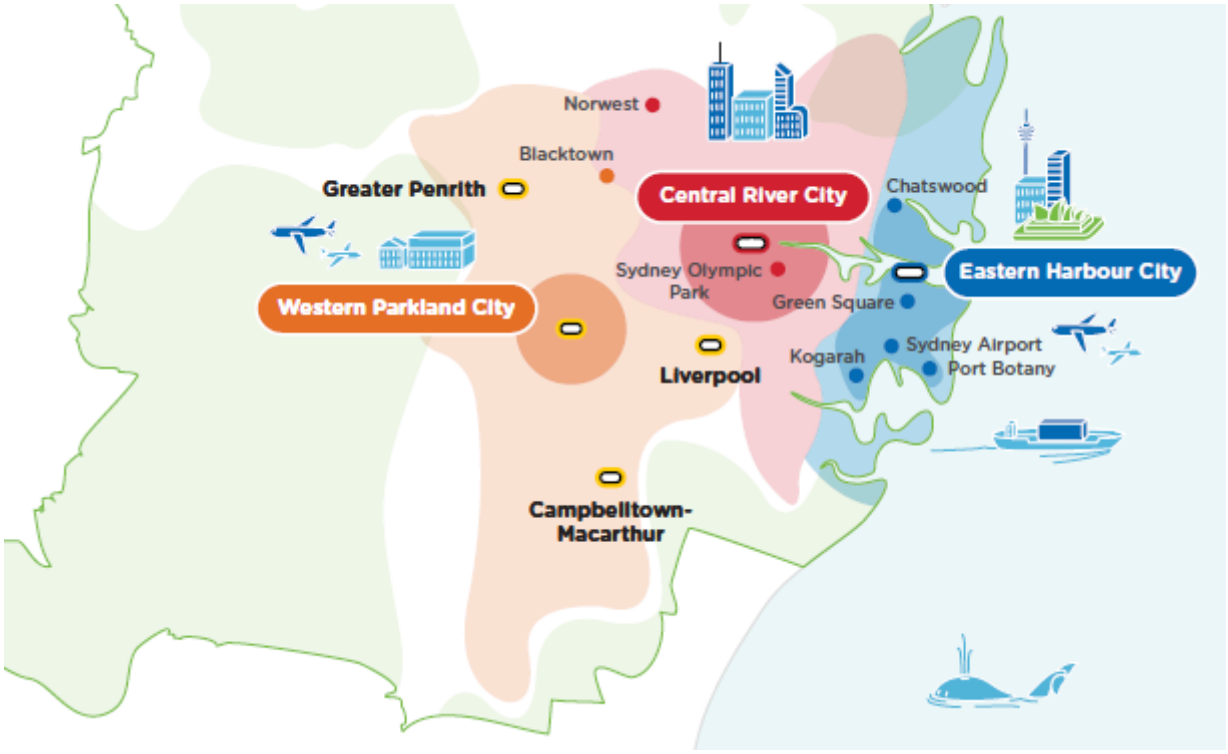
The First Building will be an advanced manufacturing research, development, and training facility to support the development of an advanced manufacturing sector and the requisite workforce skills within the Aerotropolis. The site will be a globally significant resource that attracts industry and researchers to the Bradfield City Centre through world-leading facilities, talent, and industry presence. In its initial phase, the First Building will serve as the public interface to the precinct and the Aerotropolis more broadly.

The First Building will play a critical economic development role with Bradfield, the Aerotropolis and the Western Parkland City, and will generate State-significant economic and social benefits for the entire NSW community. The First Building is expected to open and commence operation in 2023 to support early industry engagement, investment attraction, employment, and skills development.

2.2 Future Transport 2056

NSW Government's Future Transport Strategy 2056 sets the long-term vision for transport in NSW. The transport strategy builds on the Greater Sydney Region Plan, which identifies that Sydney will grow as a global metropolis with benefits distributed more evenly across the city. It sets out a vision of three cities: the Eastern Harbour City, the Central River City, and the Western Parkland City. This vision will guide many of the planning decisions that will deliver faster, convenient, and reliable travel times to major centres, as shown in **Figure 2–2**.

Figure 2–2 A future metropolis of three cities



Source: The NSW Government Future Transport 2056 Strategy, 2018

Sustainable passenger and freight transport are critical in supporting the development of Western Parkland City, the Aerotropolis and surrounding areas. Western Sydney corridors were identified across the Western Parkland City to connect regions of NSW to key economic and social opportunities.

Active and public transport networks in Western Parkland City will be progressively expanded and developed through a range of infrastructure investments, to support the vision of a '30-minute city':

- 30-minute access for customers to their nearest Centre by public transport 7-days a week
- Fast and convenient interchanging with walking times no longer than 5 minutes between services
- Walking or cycling as the most convenient option for short trips around centres and local areas, supported by a safe road environment and attractive paths
- Fully accessible transport for all customers.

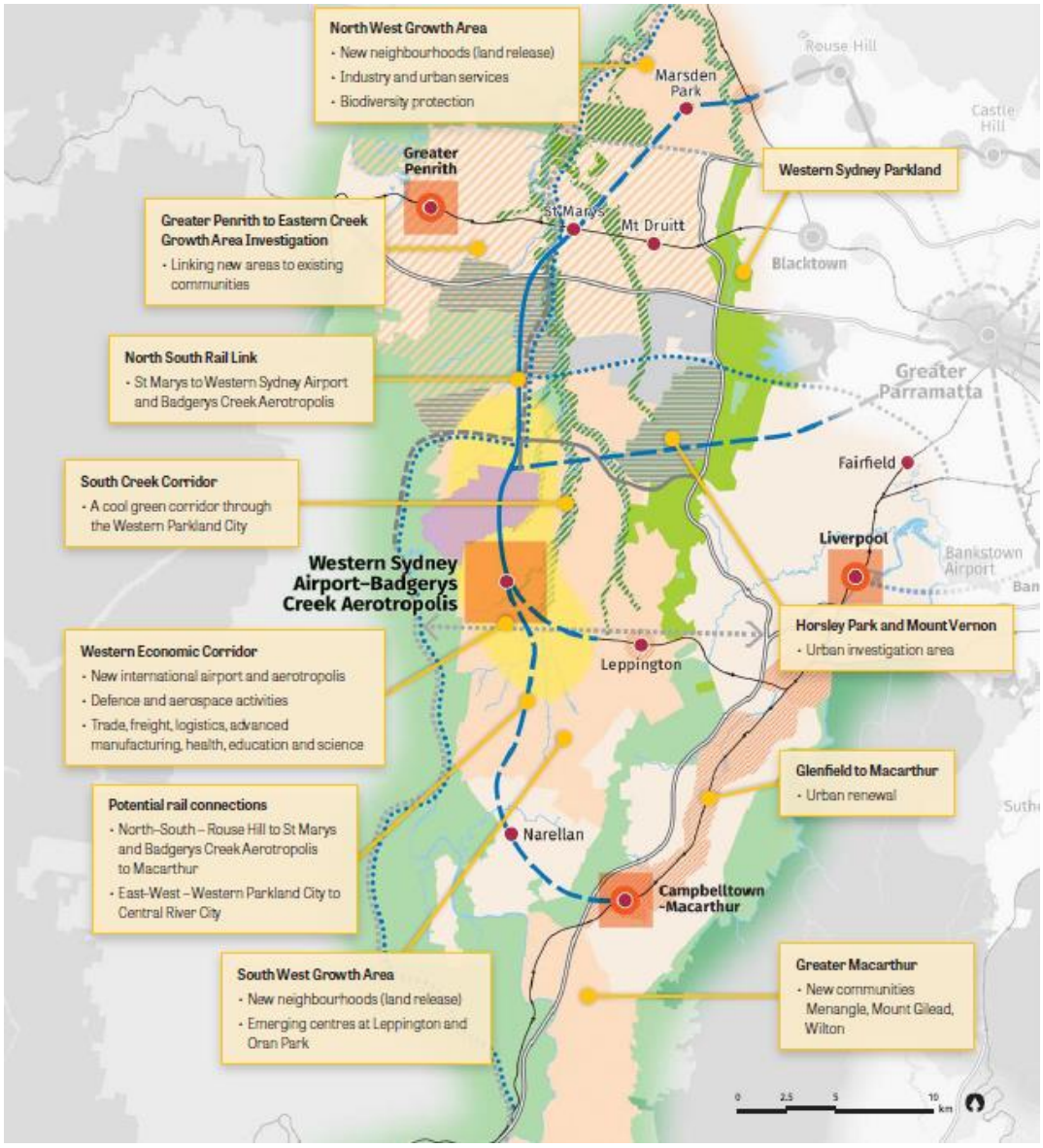
These infrastructure investments also include committed rail connections, corridor upgrades, and The Western Sydney City Deal to realise the vision for a connected city with integrated public transport, aviation, and digital infrastructure.

Implication for the site: The site should support the aspiration of 30-minute access by public transport and promote sustainable travel behaviour.

2.3 Greater Sydney Region Plan – A Metropolis of Three Cities (Greater Sydney Commission) 2018

The Greater Sydney Region Plan (the Plan) is in line with *Future Transport Strategy 2056* and *State Infrastructure Strategy 2018-2038* to integrate land use, transport, and infrastructure planning. The vision of Western Parkland City is shown in **Figure 2–3**.

Figure 2–3 Western Parkland City Vision



Source: Greater Sydney Region Plan – A Metropolis of Three Cities (Greater Sydney Commission) 2018

Western Parkland City has the largest supply of industrial lands with two planned intermodal terminals to support large-scale logistics growth. The population of Western Parkland City is projected to grow from 740,000 in 2016 to 1.1 million by 2036 and to well over 1.5 million by 2056. Currently, 49% of the Western Parkland City workers commute to other parts of Greater Sydney. The Plan highlights the particular focus on facilitating the growth of new metropolitan, strategic and local centres to provide more choices of local jobs and opportunities.

Western Sydney Airport and Western Sydney Aerotropolis will be an economic catalyst to transform Western Parkland City over the next 40 years. The Western Economic Corridor with north-south access will agglomerate the economic activities of the city and provide improved access to tertiary education and knowledge-intensive jobs.

Implication for the site: With the development of the Western Sydney Airport and Western Sydney Aerotropolis, it is critical to secure the access requirements for the airport and off-site industrial land for its 24/7 operation.

2.4 Western Sydney City Deal

The Western Sydney City Deal is a partnership between the Australian Government, NSW Government, and local governments of the Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith, and Wollondilly to deliver on *Smart Cities Plan* and the *Western City Sydney District Plan*, to achieve six core goals:

- **Connectivity**: Realising the 30-minute city by delivering the North South Rail Link
- **Jobs for the future**: Creating 200,00 jobs by supercharging the aerotropolis and agribusiness precinct as catalysts
- **Skills and education**: Skilling residents in the region and initiating an Aerospace Institute
- **Liveability and environment**: Respecting and building on local character through a $150 million Liveability Program
- **Planning and housing**: Coordinating and innovating through a Planning Partnership
- **Implementation and governance**: Delivering for the Western Parkland City with enduring tri-level government

2.4.1 Smart Cities Plan

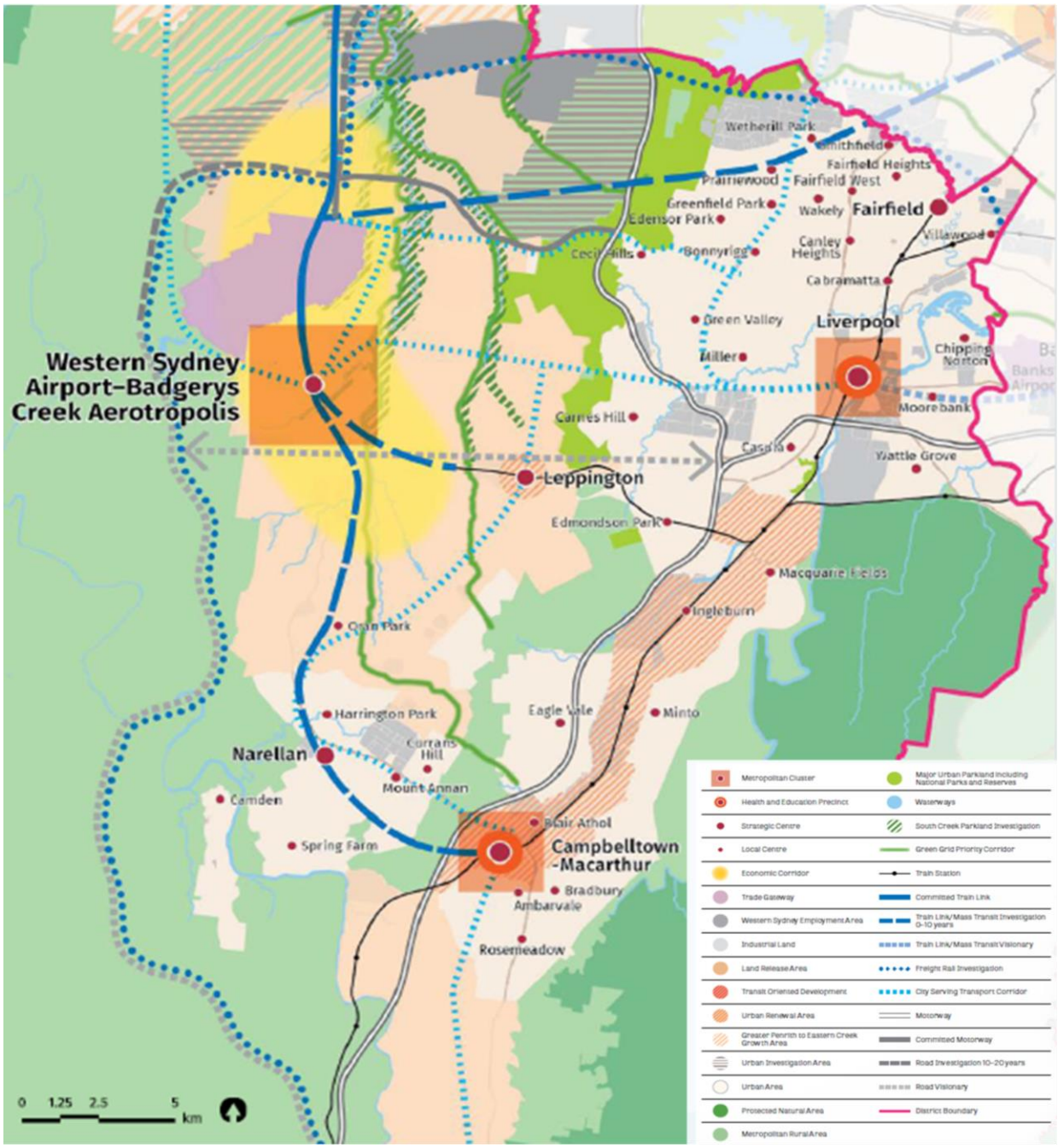
The Smart Cities Plan sets out a vision for productive and liveable cities that foster innovation, support growth, and create jobs. The plan is based on three key pillars:

- **Smart Investment**: prioritise projects that meet broad economic and city objectives such as accessibility, jobs, affordable housing, and healthy environments.
- **Smart Policy:** work across all levels of government to develop City Deals that unlock public and private investment in key economic centres.
- **Smart Technology**: embrace new technology with the potential to revolutionise how cities are planned, function, and how our economy grows.

2.4.2 Western City District Plan (Greater Sydney Commission) 2018

The Western City District Plan informs the coordination of land use and infrastructure in the Western Sydney Region over the next 20 to 40 years. The District will grow over the next 20 years with demand for an additional 184,500 dwellings. The plan implements the Greater Sydney Region Plan at a local level and assists councils to align their local planning strategies to place-based outcomes. It guides the decisions of State agencies and informs the private sector the wider community of approaches to manage growth and change. The Western City District structure plan is shown in **Figure 2–4**.

Figure 2–4 Western City District structure plan



Source: Western City District Plan (Greater Sydney Commission) 2018

The District will build on its economic strengths in advanced manufacturing, aerospace and defence industries, agricultural processing and export, construction and infrastructure, transport and warehousing, visitor economy and education and training to create a new Western Economic Corridor.

The plan implements the four key visions outlined in the Greater Sydney Region Plan:

- Infrastructure and collaboration:
  - Optimise infrastructure, investments, and employment opportunities for the District
  - Assess growth scenarios in collaboration areas (Liverpool, Greater Penrith, and Campbelltown-Macarthur) that best align land use, infrastructure, and community benefits
- Liveability:
  - Provide well-connected and walkable places

- Provide development in the land release areas and urban renewal close to existing centres

– Productivity:
  - Support knowledge-intensive jobs growth in the District
  - Include expansive industrial and urban services lands to the north and east of the Airport, supported by a freight link, to service Greater Sydney's long-term freight, logistics and industrial needs

– Sustainability:
  - Take on an integrated approach to green infrastructure to improve sustainability and amenity as the District changes
  - Support walking, cycling and community access to open space

2.4.3 Western Sydney Street Design Guidelines

The Western Sydney Street Design Guidelines has been developed as part of the commitments of the Western Sydney City Deal to develop uniform local government engineering design standards for the region. The guidelines focus on service provision to new greenfield development areas in Western Sydney, and it is complemented by the Engineering design Manual for Western Sydney, a document which provides the technical detail on the designing and building the streets introduced in the Street Design Guidelines.

The guidelines are structured around eight street design objectives:

– Streets encourage social activation through their design

– Streets are self-explaining slow environments that are safe and comfortable for all users

– Streets are inclusive with footpaths on both sides

– Streets are safe for cycling, with separated bicycle facilities on busy streets

– Continuous canopy cover is achieved on both sides of every street

– Water Sensitive Urban Design (WSUD) is integrated into every street

– Design carriageway widths to maximise space for alternative uses and users

– Ensure future transport solutions maximise place outcomes for streets

2.5 Western Sydney Aerotropolis Planning Package 2020

2.5.1 Draft Western Sydney Aerotropolis Plan (WSAP) 2020

As noted in **Section 2.5.3**, the Aerotropolis SEPP permits development to occur before the finalisation of the Precinct Plan. The proposed development demonstrates consistency with the draft Precinct Plan. The plan aims to support the delivery of the vision and objectives outlined in the *Western Sydney Aerotropolis Plan*.

The Precinct Plan framework echoes the overarching drivers of productivity, liveability, sustainability, and Infrastructure and Collaboration. A hierarchy of centres will be distributed throughout the Aerotropolis to create a place-based approach to support the residents, employees, tourists, and provide a focus to neighbourhoods.

The following principles apply to the planning of the Precinct transport network:

– Provide attractive and sustainable transport options and priorities public and active transport

– Optimise the movement of people and goods and minimise congestion

– Provide freight connections to support the Aerotropolis's productivity

– Provide good rail, freight, public transport, and active transport connections to, from and within the Aerotropolis precincts and beyond

– Ensure infrastructure corridors accommodate local connections

– Promote a behavioural shift towards public and active transport

– Design streets and public spaces to accommodate sufficient bicycle parking facilities

– Balance parking provision to promote the use of public and active transport

Implication for the site: The site needs to make provision for pedestrian and cyclist facilities also foster multimodality and promote sustainable mode share by providing a safe and comfortable environment for first-last mile journeys. The site also needs to support a reduction in car dependence in parking arrangements, public transport access and options to reduce or repurpose parking over the medium to long term.

2.5.2 State Environmental Planning Policy (Western Sydney Aerotropolis SEPP) 2020

The Aerotropolis SEPP is the principal environmental planning instrument that sets out land use zones and development controls for the Bradfield City Centre. The SEPP applies to the 11,200-hectare area surrounding the Airport. The SEPP aims to:

– Facilitate development in the Western Sydney Aerotropolis under the objectives and principles of the Western Sydney Aerotropolis Plan

– Promote sustainable, orderly, and transformational development in the Western Sydney Aerotropolis

– Ensure development is compatible with the long-term growth and development of the Western Sydney Airport (including the 24 hours a day Airport operation) and other critical transport infrastructure

– Promote employment and world-class innovation and provide for residential development in suitable locations

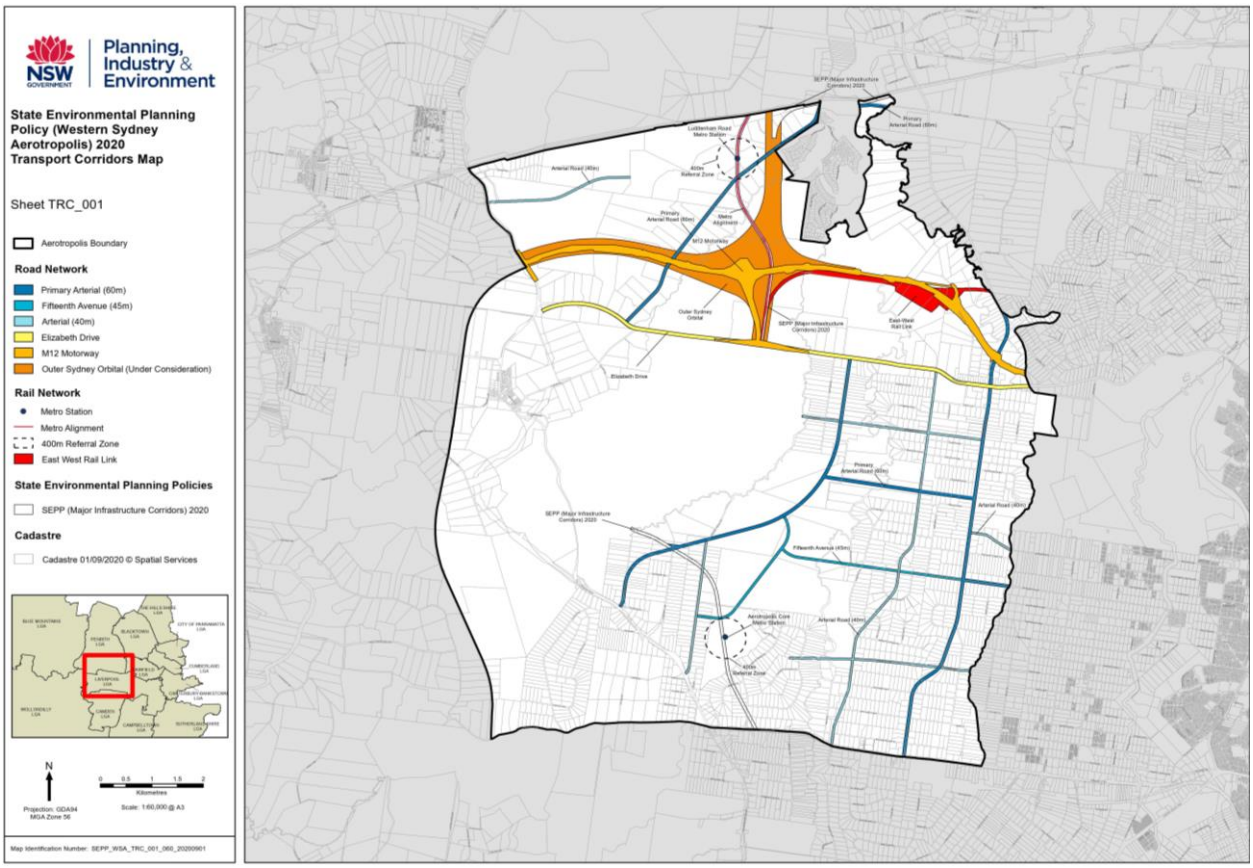
– Recognise the physical and cultural connection of the local Aboriginal community to the land and incorporate local Aboriginal knowledge, culture, and tradition into the development

– Preserve land for future infrastructure development

– Protect, maintain, and enhance, and minimise the impact of development on trees and vegetation, soil quality and the health of waterways and contribute to the conservation of biodiversity

– Recognise and protect the ecological and cultural value of Wianamatta-South Creek

Figure 2–5 SEPP (Western Sydney Aerotropolis) Transport Corridors Map



Source: State Environmental Planning Policy (Western Sydney Aerotropolis SEPP) 2020

Implication for the site: The following table provides an overview of the proposed development's consistency with the SEPP	
Transport Corridors	Penetration of ground to a depth of more than 2m below ground level is not expected. The transport corridors are depicted in **Figure 2–5**.
Development prior to Precinct Plan	The First Building: – Is consistent with the aims of the Aerotropolis SEPP – Will not result in land fragmentation – Will not hinder the orderly and coordinated provision of planned infrastructure – Is compatible with and will support long-term operations of the Airport – Takes into account development and infrastructure in the areas adjacent to the development – Will be adequately serviced by public utility infrastructure
Infrastructure	The Traffic and Transport Assessment will assess, confirm, and recommend infrastructure upgrades, service delivery, management initiatives and other measures to meet the transport targets, and address transport and traffic impacts associated with the proposed development.

2.5.3 Western Sydney Aerotropolis Development Control Plan 2021 (Phase 2 Draft)

The Western Sydney Aerotropolis Development Control Plan (DCP) 2021 supplements the Western Sydney Aerotropolis Plan 2020, the State Environmental Planning Policy, and the Western Sydney Aerotropolis Precinct Plan to inform the preparation and assessment of master plans and development applications. The DCP outlines the measures to achieving connectivity, liveability, productivity, and sustainability, including:

- Giving effect to the Greater Sydney Region Plan (Section 2.3) and Western District Plan (Section 2.4.2)
- Adopting the principles set in the Government Architect NSW's *Better Placed* design policy and *Greener Places* design framework
  - *Better Placed* design policy establishes the expectations and needs in designing NSW to enhance all aspects of the NSW urban environments.
  - *Greener Places* provides explanations to the need for green infrastructure and the vision and principles for its implementation.
- Encouraging development and building upon the objectives and principles under the WSAP (Section 2.5.1) and the Aerotropolis SEPP (Section 2.5.2)
- Supporting the implementation of the Precinct Plan (Section 2.5.4)

The DCP specifies the car parking, bicycle parking and end-of-trip facilities requirements. These requirements are summarised in Table 2-1 and Table 2-1.

Table 2-1 Western Sydney Aerotropolis DCP Phase 2 – Car parking requirements

Document	Requirement
Draft Western Sydney Aerotropolis DCP 2021 Phase 2 Draft	Minimum number of car parking spaces for light industry, greater than 800m walking distance of a metro station: – 1 space per 200sqm minimum – 1 space per 100sqm maximum Office or business premises: – 1 space per 100sqm GFA
	Minimum number of car parking spaces for light industry, within 800m walking distance of a metro station: – 1 space per 200sqm Office or business premises: – 1 space per 100sqm GFA

Document	Requirement
	Minimum number of car parking spaces for non-residential development, within 800m walking distance of a metro station: – 1 Motorcycle parking space per 10 car spaces – 1% of all provided spaces to be accessible parking For office, business, industrial or retail premises: – 1 car share space per 40 car spaces provided 1 electric vehicle parking space including charging station per 40 car spaces provided
	A minimum of 2% accessible car parking is provided for people with mobility impairment
	Car parking spaces and associated infrastructure are designed with the potential to transition to other uses

Source: Western Sydney Aerotropolis DCP Phase 2 Draft, 2021

Table 2-2 Western Sydney Aerotropolis DCP Phase 2 – Bicycle parking and end-of-trip facilities requirements

Document	Requirement
Draft Western Sydney Aerotropolis DCP 2021 Phase 2 Draft	Minimum number of car parking spaces for industry: – 1 space per 10 staff – 1 charging station for electric bicycles is provided for the first 5 bicycle spaces within a development, and for every 10 bicycle parking spaces thereafter Office or business premises: – 1 space per 150sqm GFA for staff – 1 space per 400sqm GFA for visitors
	Minimum provision for end-of-trip facilities for non-residential land uses: – 1 personal locker for each bicycle parking space 1 shower and change cubicle for the first 5 bicycle spaces or part thereof, plus an additional shower for every 10 bicycle parking spaces thereafter

Source: Western Sydney Aerotropolis DCP Phase 2 Draft, 2021

2.5.4 Draft Aerotropolis Precinct Plan

The Draft Aerotropolis Precinct Plan provides the policy context, vision, and objectives for the initial precincts: the Aerotropolis Core, Badgerys Creek, Wianamatta-South Creek, Northern Gateway, and Agribusiness precincts. The plan sets out the place-based performance criteria that inform the future development in each initial precinct and focuses on the coordination of land use, infrastructure, and transport infrastructure.

The Aerotropolis Core Precinct will be a dense urban precinct around a Metro station with connections to waterways and a new regional park system and will be home to between 50,000 and 60,000 workers. Residential communities and other noise-sensitive land uses will be within walking distance of the Metro station or other public transport. The Precinct Plan outlines the place-based approach to the performance criteria for the Aerotropolis Core Precinct and provides the framework for the infrastructure provision and preferred staging for development.

Implication for the site: The long-term access strategy for the site should consider the proposed nearby transport infrastructure and align with the future Western Sydney Aerotropolis transport network.

2.6 Western Sydney Aerotropolis Transport Planning and Modelling Stage 2 Report 2020

The Western Sydney Aerotropolis Transport Planning and Modelling Stage 2 Report 2020 was developed to support the delivery and validation of the vision for the Western Sydney Aerotropolis.

An assessment was undertaken to analyse the feasibility of the scenarios presented and identified the medium sustainable mode share as a realistic target for the five initial Western Sydney Aerotropolis precincts. The mode share target for walking and cycling is set at 6 per cent, public transport at 38 per cent and private vehicle at 56 per cent.

Implication for the site: The transport strategy for the development should assist in achieving the sustainable mode share target.

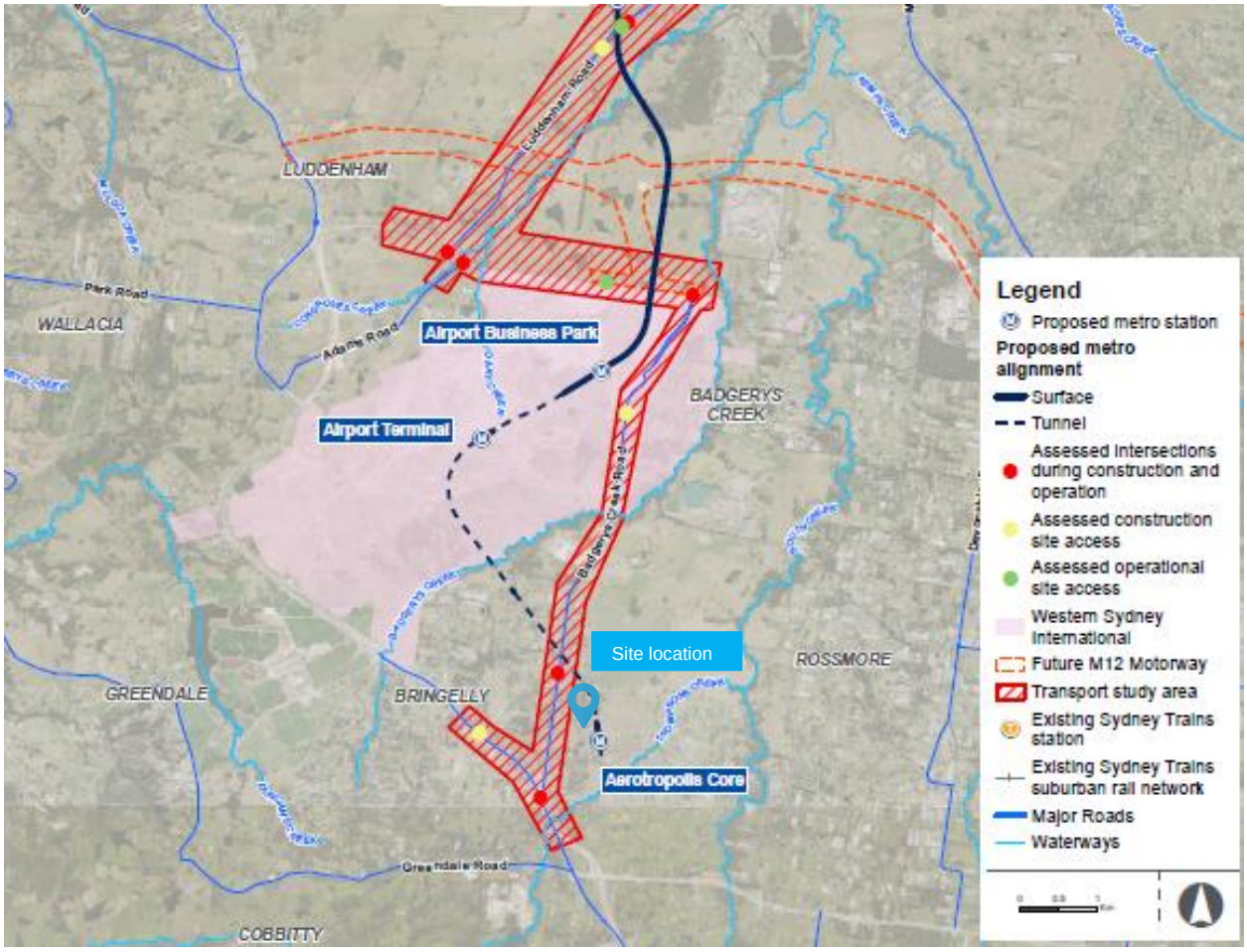
2.7 Sydney Metro – Western Sydney Airport EIS 2020

The Sydney Metro Western Sydney Airport line is a 23-kilometre new railway that will include new metro stations at St Marys, Orchard Hills, Luddenham, the Airport (two stations) and Bradfield City Centre.

The Sydney Metro EIS has assessed the potential impact on transport during the construction and operation of the project. The assessed area is shown in **Figure 2–6**. Key potential impacts on the transport network during construction would be primarily focused around the urban areas of St Marys, which may require the temporary partial closure of local streets, and temporary relocation of existing bus stops, interchanges, and routes.

There may be some potential temporary impacts to the road network due to the temporary addition of construction vehicles and temporary road closures during the construction phase. Cumulative temporary transport impacts may also be experienced where the same haul routes are concurrently used for the construction of the future M12 Motorway project and Western Sydney International Airport.

Figure 2–6 Sydney Metro Western Sydney Airport EIS study area near the site



Source: Sydney Metro – Western Sydney Airport EIS 2020

Implication for the site: The traffic assessment of the site should consider the impact of Metro construction.

2.8 Liverpool City Council Local Strategic Planning Statement (LSPS)

The Liverpool Local Strategic Planning Statement sets out the council's strategic planning vision for the next 20 years. The LSPS echoes the Greater Sydney Region Plan and the Western City District Plan, by aligning with the four key themes of connectivity, productivity, liveability, and sustainability.

Liverpool City Council advocates a modal shift to public transport and recognises the need for new or additional, better, and faster services to increase the appeal of public transport.

2.8.1 Fifteenth Avenue Smart Transit Corridor Design Framework

The Fifteenth Avenue Smart Transit (FAST) Corridor is a key initiative of the Liverpool City Council to deliver a high-quality public transport link between the Liverpool CBD and Western Sydney International Airport. The framework will provide a rapid transit connection between the Airport, the new Aerotropolis and Liverpool's CBD in time for the Airport's opening in 2026. The 19km corridor could accommodate fast and efficient transport services such as zero-emissions rapid buses, trackless trams, light rail, and alternative modes of transport such as carsharing. The high-speed transits will accommodate low speed urban 'super stops' at centres, and prioritise walking, cycling and micro-mobility with segregated shared paths and local landscaping.

Implication for the site: Fifteen Avenue is close to the site, and it may serve as a key access point to the site. The site should capitalise on the rapid transit services to promote sustainable travel behaviour.

2.9 Liverpool City Council Bike Plan 2018 - 2023

The Liverpool City Council Bike Plan 2018 – 2023 expands upon previous Bike Plans (1985, 1996, 2009), and aims to achieve a connected network of cycleways that services key destinations within the LGA. The plan explores various strategies to encourage bicycle usage in the area and helps to achieve the vision of liveability and sustainability under the Western Sydney City Deal.

Currently, the Liverpool City Council Bike Plan focuses on the precincts near Liverpool CBD on the eastern side of the LGA and has no proposed cycling infrastructure or strategic routes within the Western Sydney Aerotropolis.

Implication for the site: The site should propose active transport strategies that align with the vision and commitments of the Liverpool City Council.

3.0 Existing Conditions

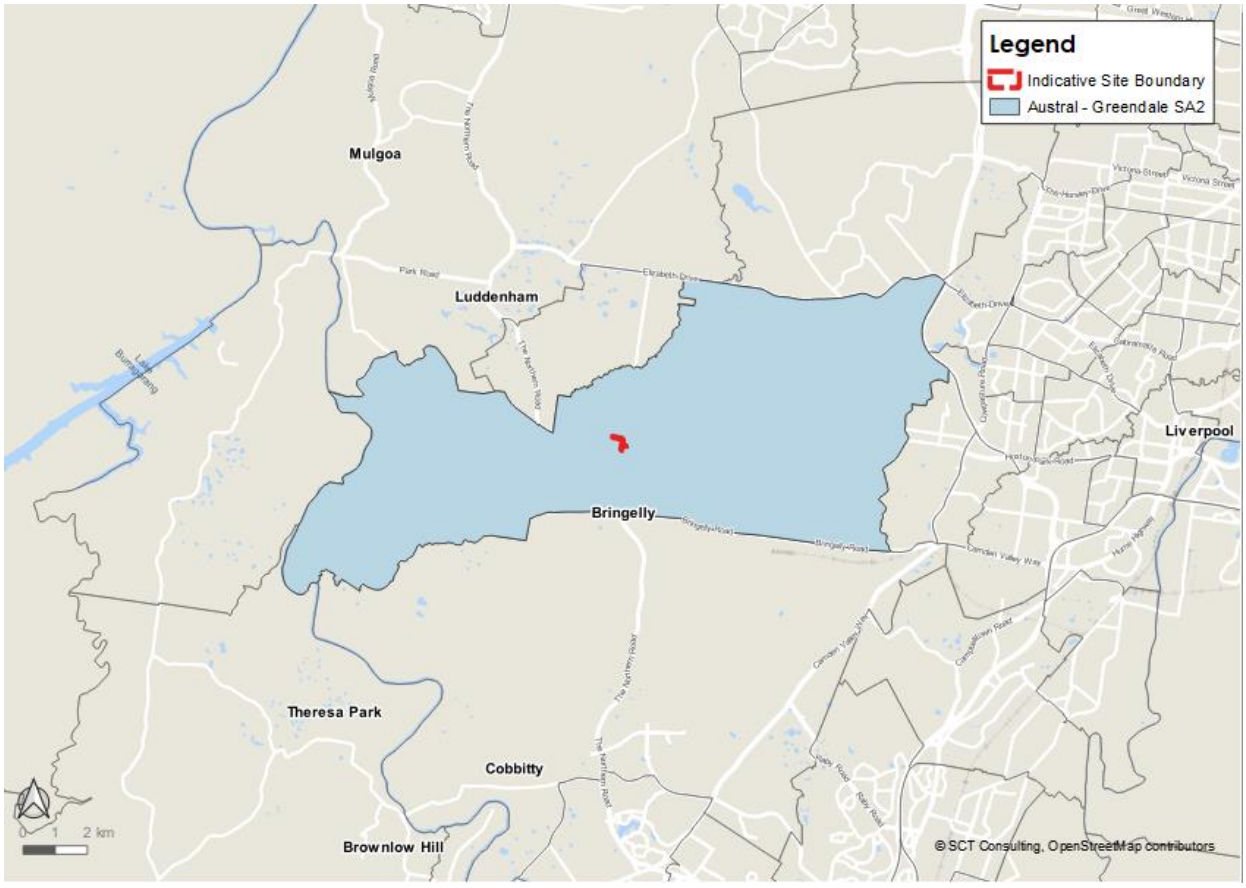
3.1 Land use

The site location was previously assigned the land use zoning type of SP2 Infrastructure by Liverpool LEP. This zoning has now been updated to ENZ Enterprise to align with future land uses by Aerotropolis SEPP.

3.2 Travel behaviour

2016 Census Journey to Work (JTW) data at Statistical Area Level 2 (SA2) was analysed to determine the current travel behaviour of the existing residents and employees in the vicinity of the site. The site is located in Austral – Greendale SA2 zone as shown in **Figure 3–1**.

Figure 3–1 Study area for JTW analysis (Austral – Greendale SA2)



It is noted that the study area predominantly comprises rural lands with low-density developments. The Journey to Work statistics is not an accurate reflection or basis of future travel behaviour due to significant changes in land use and substantial future developments. The future travel behaviour in the study area is benchmarked against Mascot in Section 4.3 below for a more realistic representation.

3.2.1 Journey to work

3.2.1.1 Worker's mode share

Private vehicles are the dominant mode for workers within the Austral – Greendale SA2 zone. The low public transport usage highlights the lack of existing public transport infrastructure and services in the study area.

The job origins show that despite the current nature of employment within the study area being highly localised, there's limited adoption of public transport or active transport, showing poor connectivity of the local public transport network and active transport facilities.

Table 3-1 Worker mode share (Austral – Greendale SA2)

Mode	Percentage of trips
Vehicle	75%
Public Transport	1%
Active Transport	4%
Work from home	18%

Source: Australian Bureau of Statistics, 2018

Table 3-2 Worker origin (Austral – Greendale SA2)

Worker Origin	Percentage of trips
Austral – Greendale	35%
Cobbitty – Leppington	3%
West Hoxton – Middleton Grange	3%
Elderslie – Harrington Park	2%
Mount Annan – Currans Hill	2%

Source: Australian Bureau of Statistics, 2018

3.2.1.2 Resident mode share

Private vehicles are the dominant mode for residents within the Austral – Greendale SA2 zone, with slightly higher public transport usage compared to workers within the area.

Consistent with the distribution of worker origins, the work destinations shows that many of the residents are still employed in and around the study area, and the nature of employment is highly localised. Similarly, there's limited connectivity in the local public transport and active transport network to promote sustainable travel behaviour.

Table 3-3 Resident mode share (Austral – Greendale SA2)

Mode	Percentage of trips
Vehicle	72%
Public Transport	5%
Active Transport	4%
Work from home	18%

Source: Australian Bureau of Statistics, 2018

Table 3-4 Resident destination (Austral – Greendale SA2)

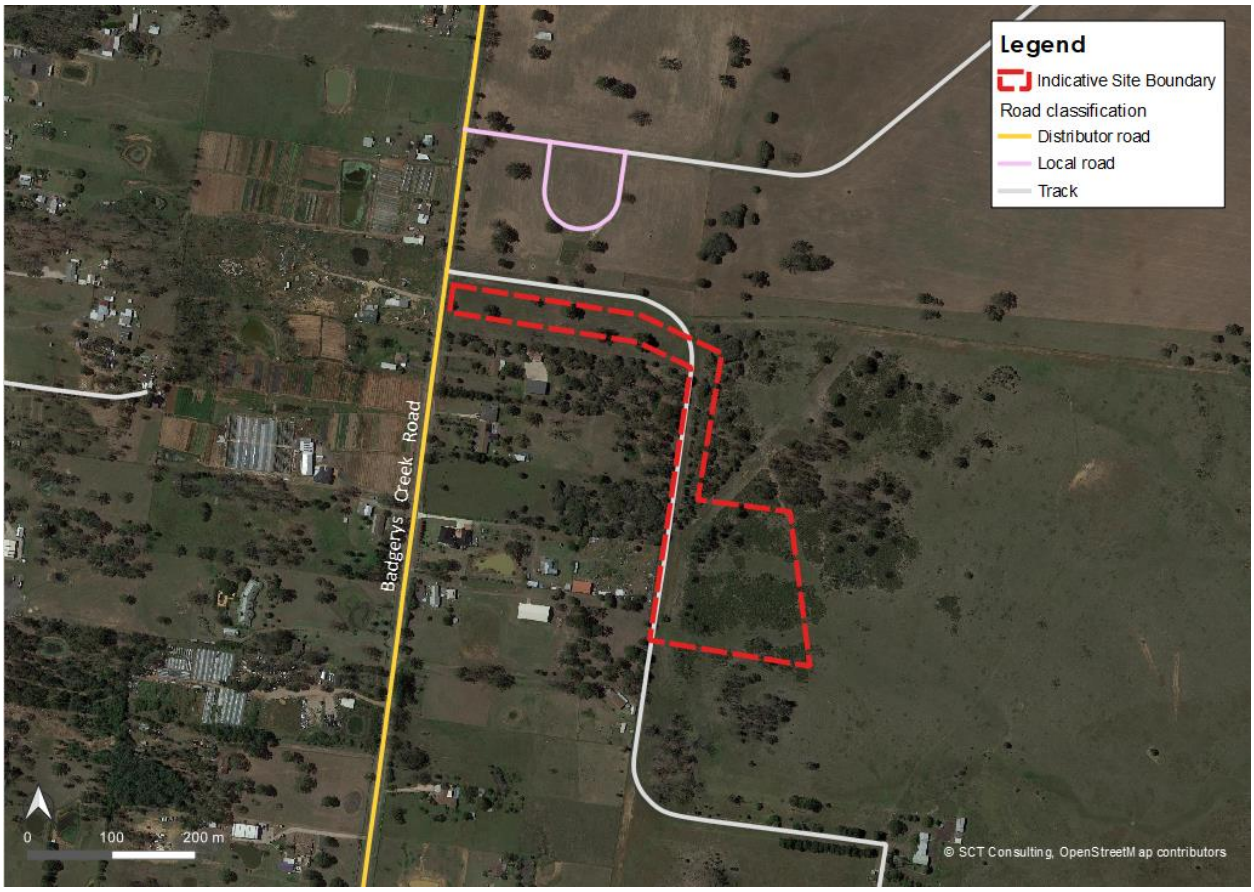
Resident destinations	Percentage of trips
Austral – Greendale	29%
Liverpool	4%
Prestons – Edmondson Park	4%
Sydney – Haymarket -The Rocks	3%
Chipping Norton – Moorebank	2%

Source: Australian Bureau of Statistics, 2018

3.3 Road network

The road network around the site is shown in **Figure 3–2**. Badgerys Creek Road is a distributor road running between Elizabeth Drive and the Northern Road. The road was realigned to allow for the new M12 Motorway and Sydney Metro Greater West, and it will be an entry point to the Western Sydney Airport upon its opening in 2026. The road is approximately 7 kilometres long with an undivided carriageway and unsealed shoulders. It has one lane in each direction with a posted speed limit of 80 km/h.

Figure 3–2 Road network around the site



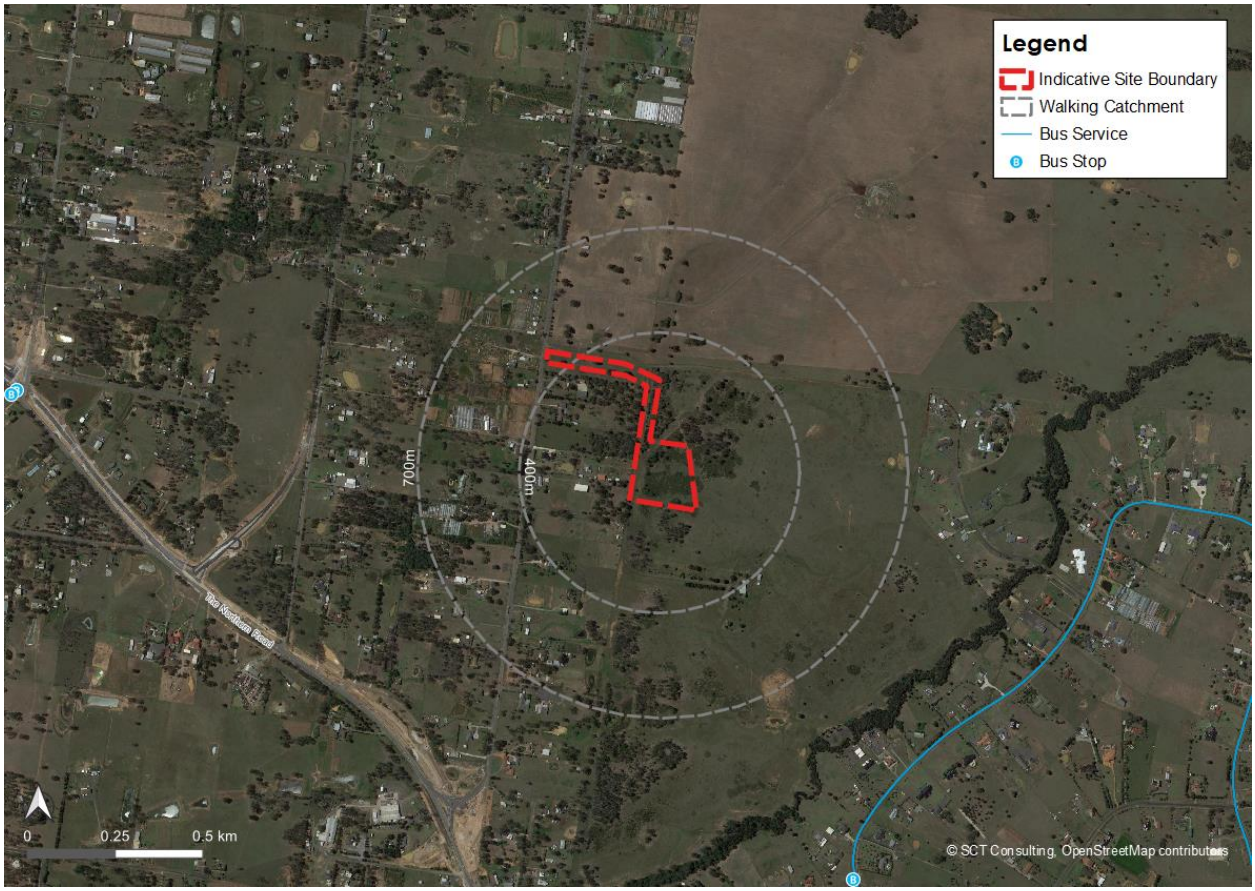
3.4 Public transport network

The maximum walking access distance for bus users is typically around 400m, and surveyed users in Australian capital cities are willing to walk between 226m and 302m further for more frequent service[1]. **Figure 3–3** shows the 400m and 700m walking catchment from the centre of the subject site, indicating no existing public transport coverage.

Currently, there's limited bus coverage on Badgerys Creek Road and The Northern Road due to construction. Route 801 starts at the Northern end of Badgerys Creek Road 3 times a day.

[1] Corinne Mulley, Chinh Ho, Loan Ho, David A Hensher and John Rose, "Will bus travellers walk further for a more frequent service? An international study using a stated preference approach", Transport policy (September 2017): 69.

Figure 3–3 Public transport network around the site



3.5 Active transport network

Given the rural nature and lack of urban development in the vicinity of the site, there is limited infrastructure to support pedestrian and cycling accessibility. As shown in **Figure 3–2** and **Figure 3–3**, there is no existing footpaths or shared paths around the site.

3.6 Current access arrangement

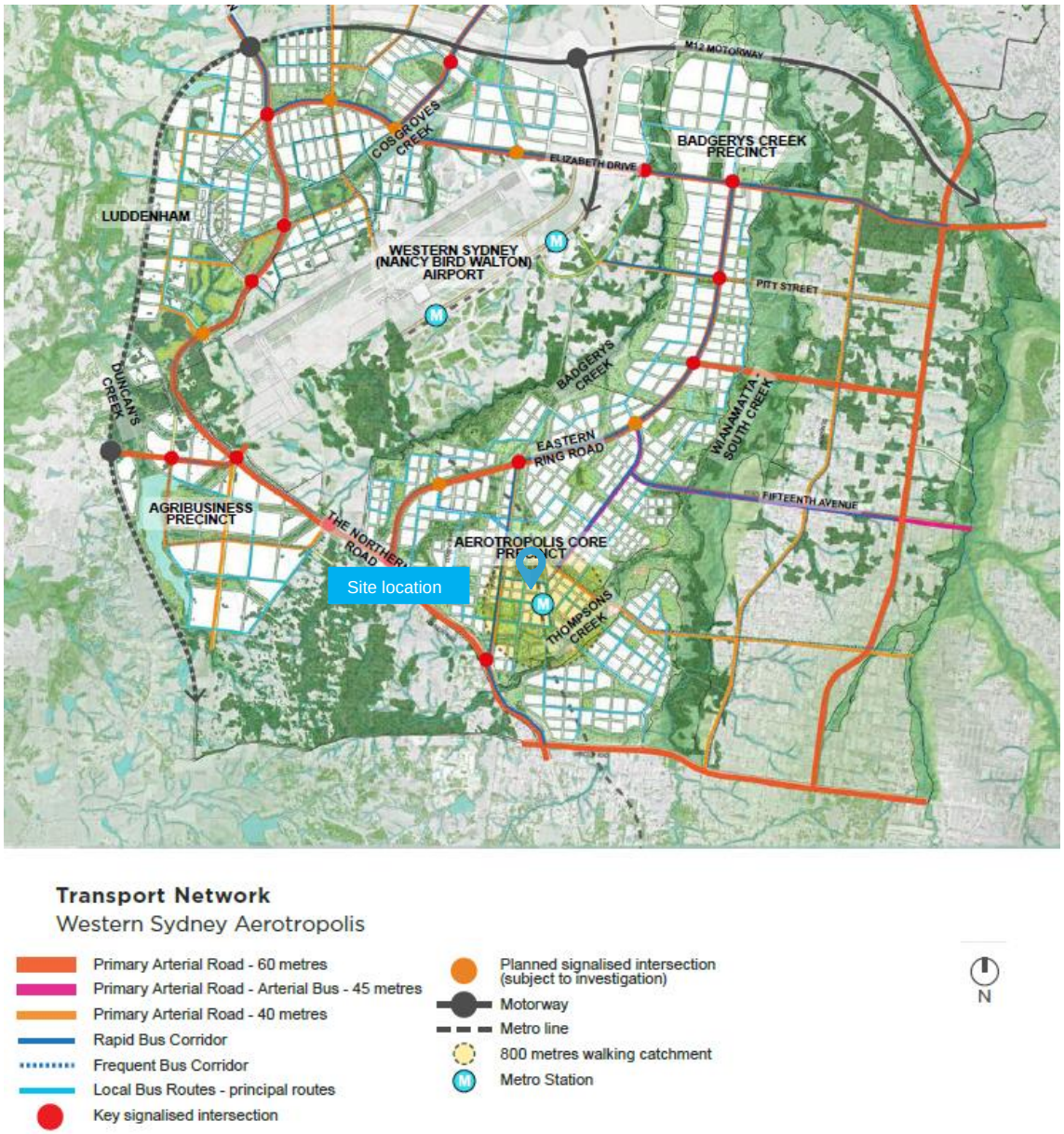
The site has an 80m wide access handle to Badgers Creek Road, traversing the western boundary, with some unformed internal vehicular tracks providing access to other parts of the site and long the site boundaries.

4.0 Future traffic and transport conditions

4.1 Future transport network

The surrounding context of the site is undergoing rapid transformation and will change drastically over future years. The Bradfield City Centre will be serviced by an integrated transport network that priorities walking and cycling for short trips, and bus corridors and arterial roads to provide access both to/from and within the Aerotropolis.

Figure 4–1 Future transport network in Western Sydney Aerotropolis



Source: Draft Aerotropolis Precinct Plan 2020

The future road network in Western Sydney Aerotropolis as shown in **Figure 4–1** will focus on local accessibility, and facilitate the efficient movement of private vehicles, freight, and all other modes. In line with the future vision to promote sustainable travel options, these arterial roads will also be bus-capable and will be equipped with dedicated cycling infrastructure and pedestrian footpaths to create a high amenity environment. There will be controlled intersections in public transport corridors and arterial roads to prioritise bus movements or freight movements. Transport connections such as the M12 Motorway, upgrades to Elizabeth Drive and The Northern Road, Eastern

Ring Road, Western Sydney Freight Line will provide critical initial access before the opening of Western Sydney Airport in 2026.

Badgerys Creek Road will be a critical north-south connection travelling through Bradfield City Centre, connecting Elizabeth Drive and The Northern Road, and providing efficient movement of person and freight. The arterial routes of Badgerys Creek Road and The Northern Road will facilitate Rapid Bus services access to and from Bradfield City Centre, Campbelltown, Penrith, Liverpool, and the Western Sydney Airport.

The Fifteenth Avenue which is to the north of the site will be a primary arterial bus corridor running east-west within Bradfield City Centre to provide rapid transit services between the Airport, the new Aerotropolis and Liverpool's CBD in time for the Airport's opening in 2026.

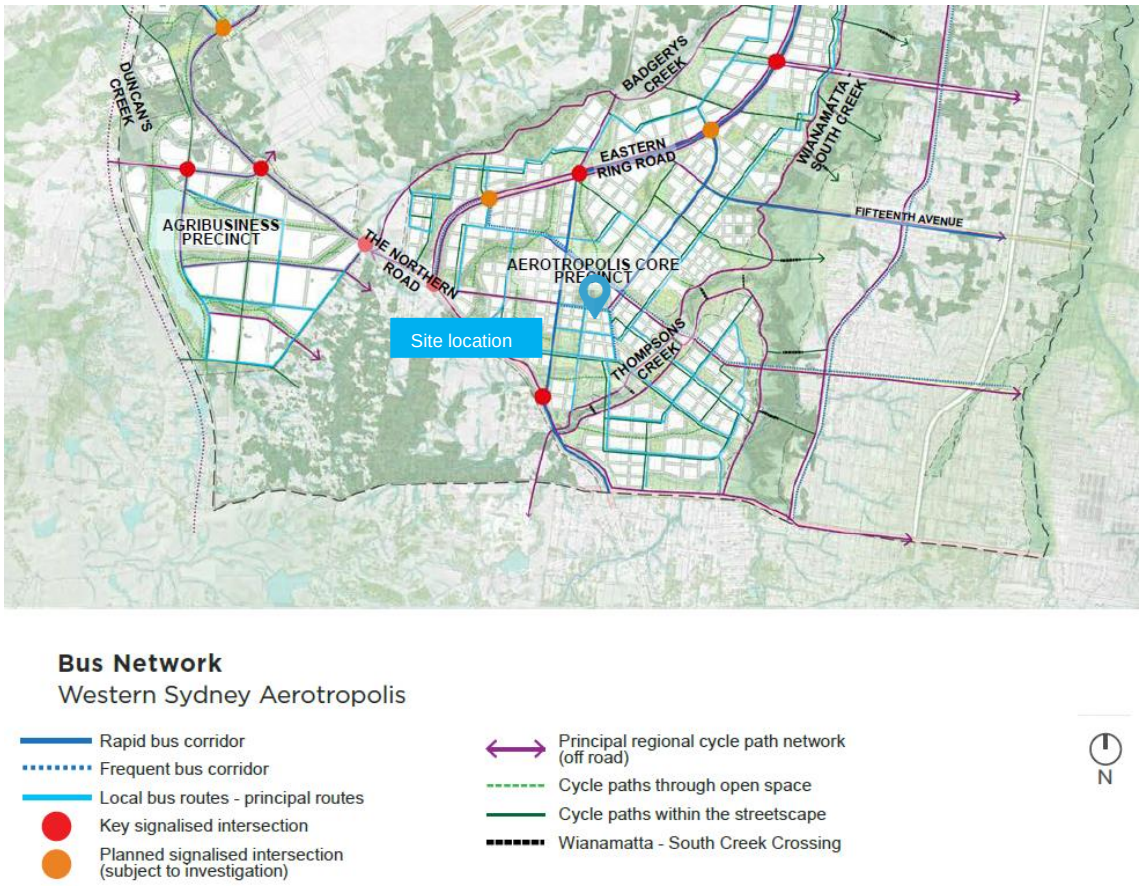
4.1.1 Public transport network

The site will be serviced by three future rail lines on an expanded Sydney rail system: Sydney Metro Western Sydney Airport, the East-West Rail Link, and the South West Rail Link extension. Metro station will be within walking distance to the site, with rapid transit corridors connecting the site to Campbelltown-Macarthur, Liverpool, Parramatta, Penrith, Blacktown, and the Western Sydney International Airport. The site will also have access to a well-placed network of frequent local bus routes. In line with the vision of a 30-minute city, the rapid and local bus services will provide the site direct access through suburbs, centres, and transport interchanges within centres.

Figure 4–2 shows the bus network plan with three types of bus services that are accessible to the site:

- Rapid bus routes: faster journey speeds, further-spaced stops
- Frequent bus routes: on average run every five minutes, connect centres and other public transport services to surrounding areas
- Local bus routes: connect residents and businesses with centres or other public transport connections

Figure 4–2 Future bus network in Western Sydney Aerotropolis



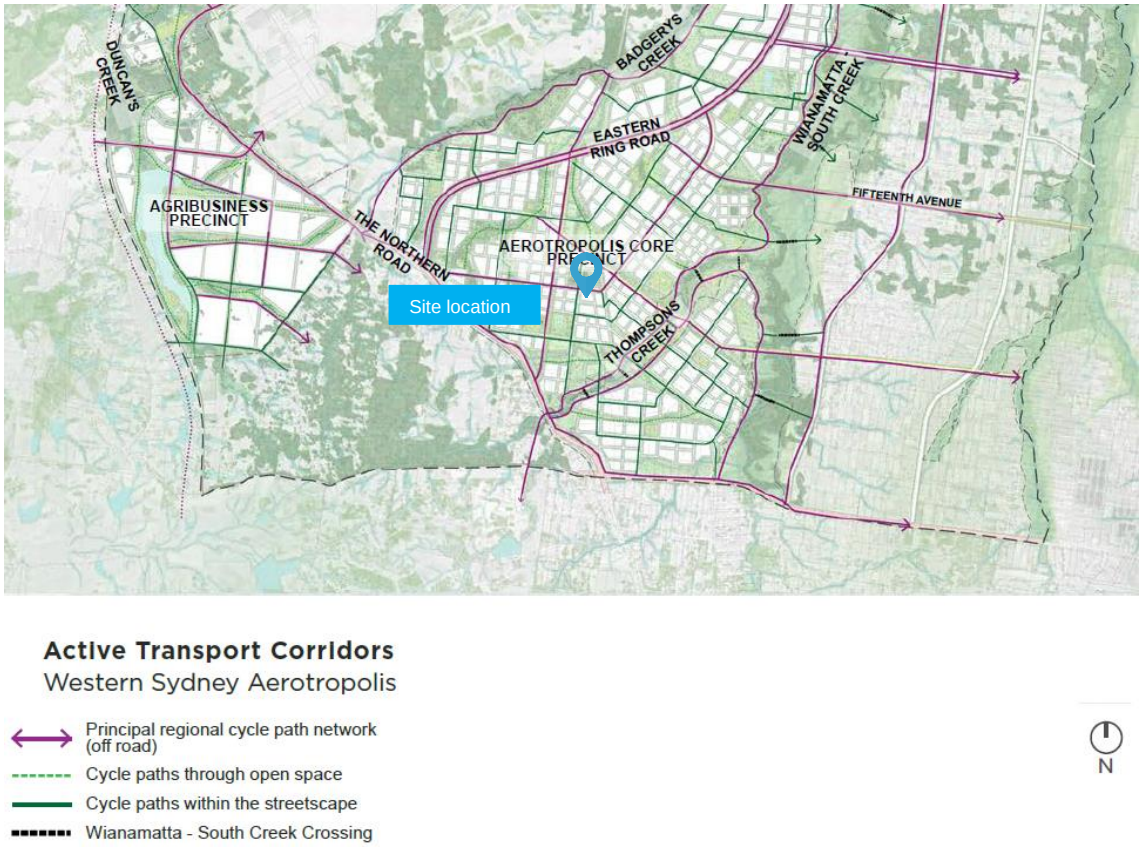
Source: Draft Aerotropolis Precinct Plan 2020

4.1.2 Active transport network

There will be an extensive walking and cycling network around the site to bridge gaps in the public transit network, as shown in **Figure 4–3**. The provision of a high-quality walking and cycling environment such as noise control, shaded spaces to stop and rest, accessible crossings, segregated cycleways and other well-planned facilities will encourage workers and residents to adopt active transport.

The site will be connected to the principal regional cycle path network via Badgerys Creek Road and Fifteenth Avenue, which will provide direct access within the city centre and to other precincts and will be integrated with the cycling infrastructure beyond the Western Sydney Aerotropolis. The site will also be connected to a local, permeable street network that interconnects pedestrian and cycling links to a variety of destination and transport nodes.

Figure 4–3 Future active transport network in Western Sydney Aerotropolis



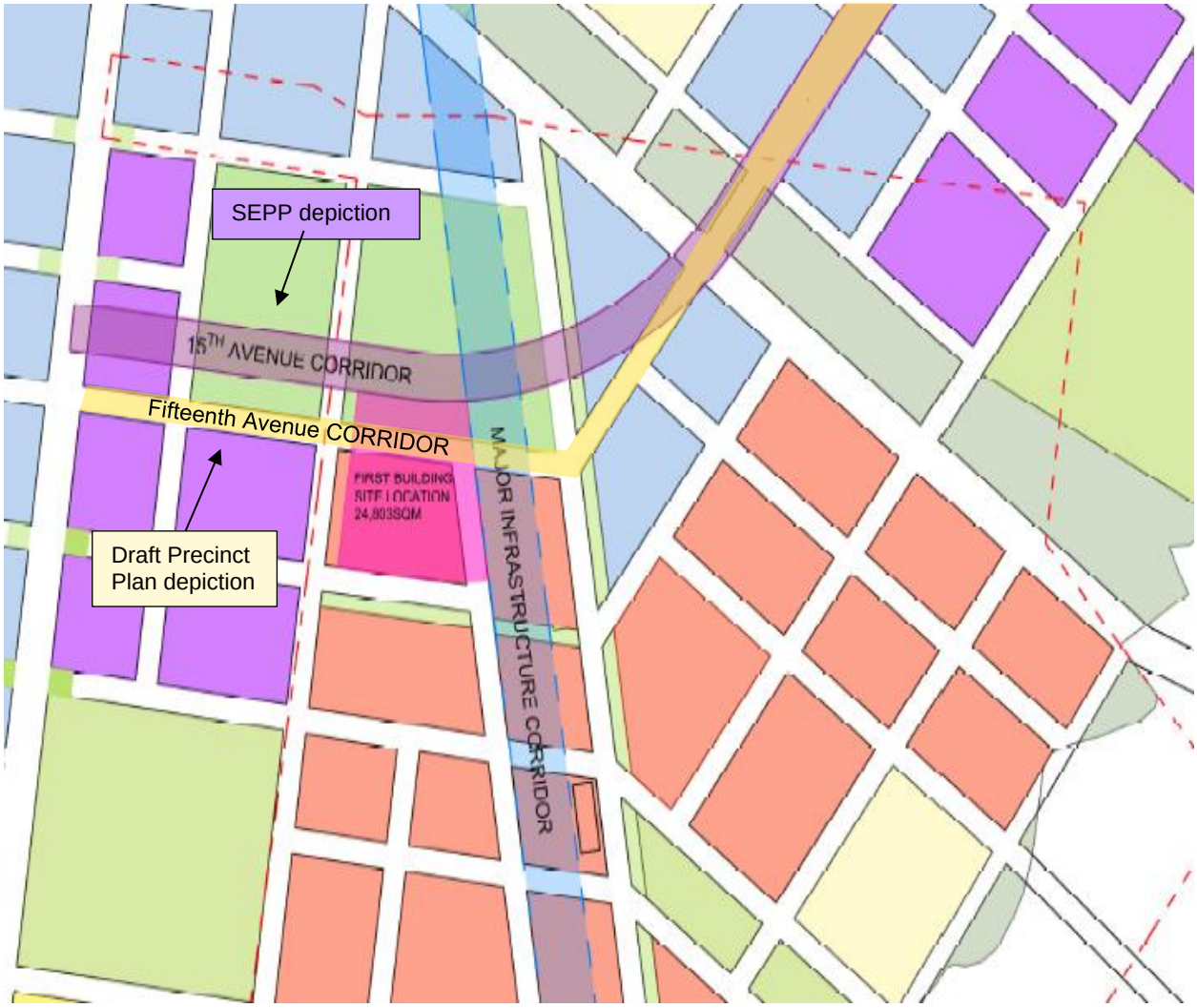
Source: Draft Aerotropolis Precinct Plan 2020

4.2 Fifteenth Avenue Corridor Reservation

As indicated in the State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 Transport Corridors Map, Fifteenth Avenue will be extended to the North of the site and will serve as a key access point for the site. However, there is an inconsistency between the depicted location of the Fifteenth Avenue Corridor in the SEPP and the Draft Western Aerotropolis Plan (WSAP) 2020. The mismatch in the proposed locations is shown in **Figure 4–4**.

It is understood that the Draft Western Aerotropolis Plan (WSAP) is still developing at the time of this SSDA submission. The inconsistency will be addressed before the finalisation of the precinct plans.

Figure 4–4 Proposed Fifteenth Avenue location (SEPP) shown on draft precinct plan



Source: WPCA, 2021

5.0 Proposed development

5.1 The First Building

The First Building will comprise applied research, proof of concept, prototype manufacturing and testing. A range of work settings shall be provided that addresses the need for environments to support collaborative and individual work.

The proposed development will have an approximate building footprint of approximately 2,500 m^2, a building height of approximately 18 metres above finished ground level and will include 50 at-grade parking spaces, as shown in **Figure 5–1**. The total Gross Floor Area (i.e. excluding the circulation, core, amenities and EOT) of 2,300m^2 GFA, comprising 1,000m^2 GFA manufacturing hall and 1,300 m^2 GFA of office uses.

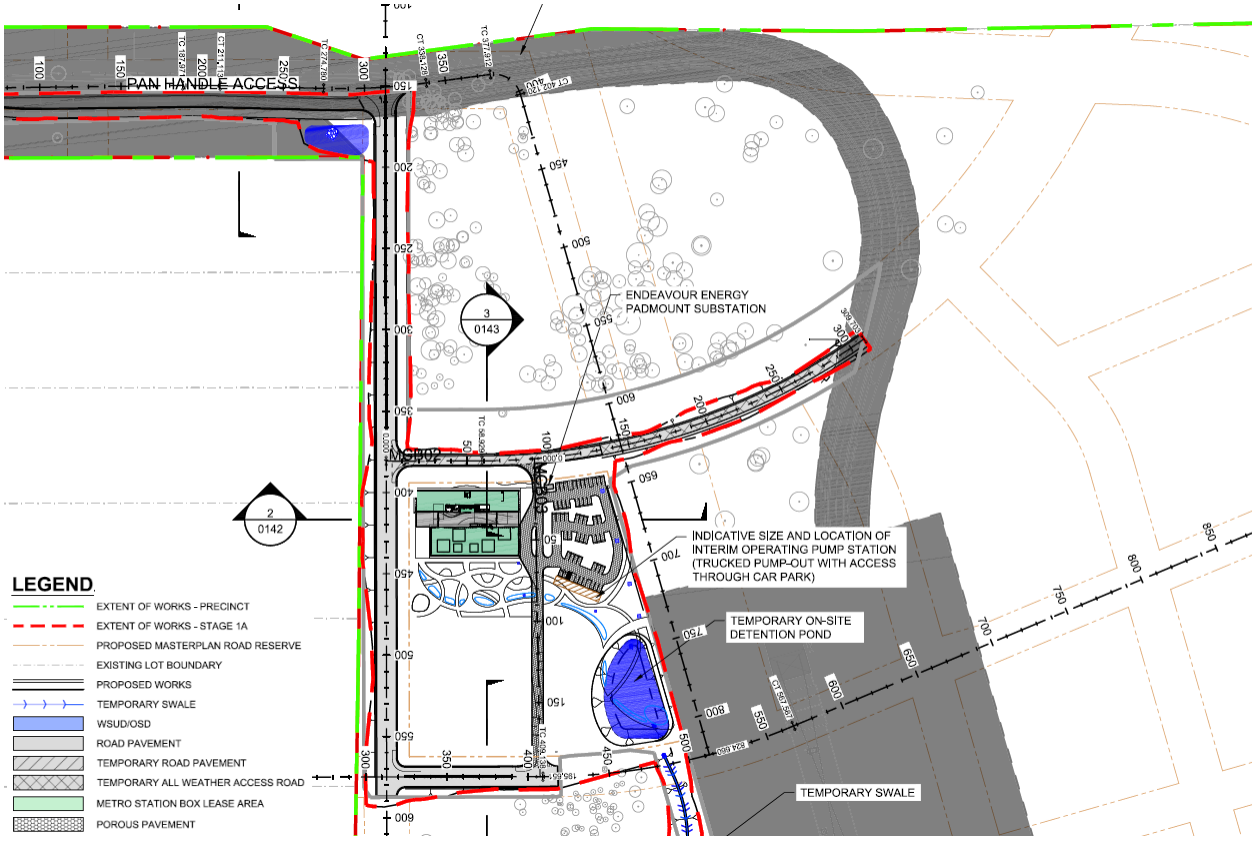
Figure 5–1 Site architectural plan

Source: Aerotropolis core precinct stage 1A – Package 01A 2021

5.2 Proposed access

The proposed transport access to and from the site is shown in **Figure 5–2**.

Figure 5–2 Site vehicle access



Source: Aerotropolis core precinct stage 1A – Package 01A 2021

The light grey areas indicate roadways that will be delivered as part of the development to connect development site with Aerotropolis Access Road (Pan Handle Access). These corridors will have longer term value for future development as the precinct is delivered.

5.2.1 Vehicle access

A 6m wide one-way vehicular access is provided through the site for vehicles to enter from Innovation North and to exit onto Fifteenth Avenue. As Fifteenth Avenue will be delivered after the opening of the First Building, a two-lane two-way temporary carriageway will be constructed adjacent to Fifteenth Avenue to enable vehicle access.

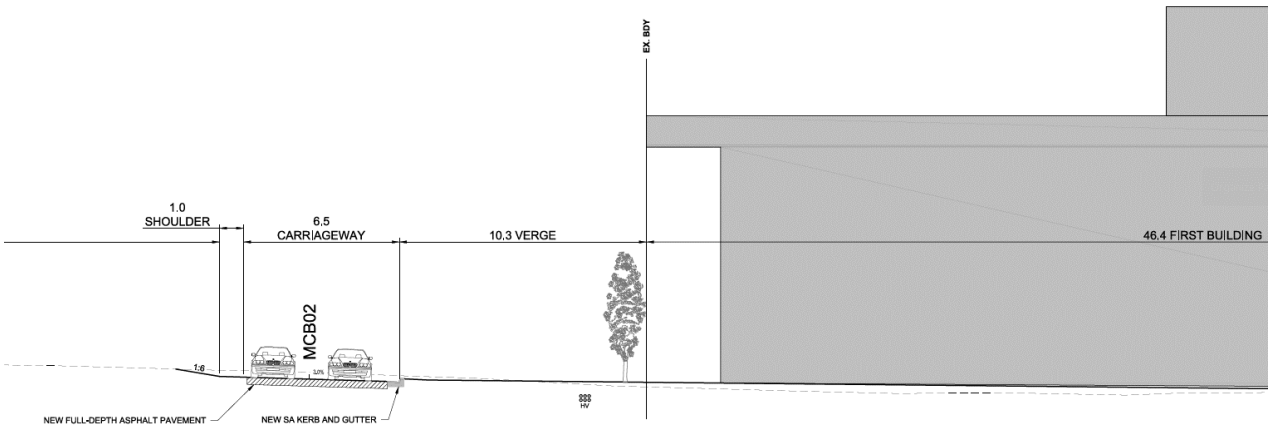
The access onto Fifteenth Avenue will be a low order service road, catering for traffic on the site only.

In the longer term, the intent is for the area designated car parking to be redeveloped, which would enable a reduction in the total parking spaces available to the site.

5.2.1.1 Proposed Fifteenth Avenue cross section

The proposed cross section of Fifteenth Avenue is provided in **Figure 5–3**.

Figure 5–3 Proposed Fifteenth Avenue (partial) cross section



Source: Aerotropolis core precinct stage 1A – Package 01A 2021

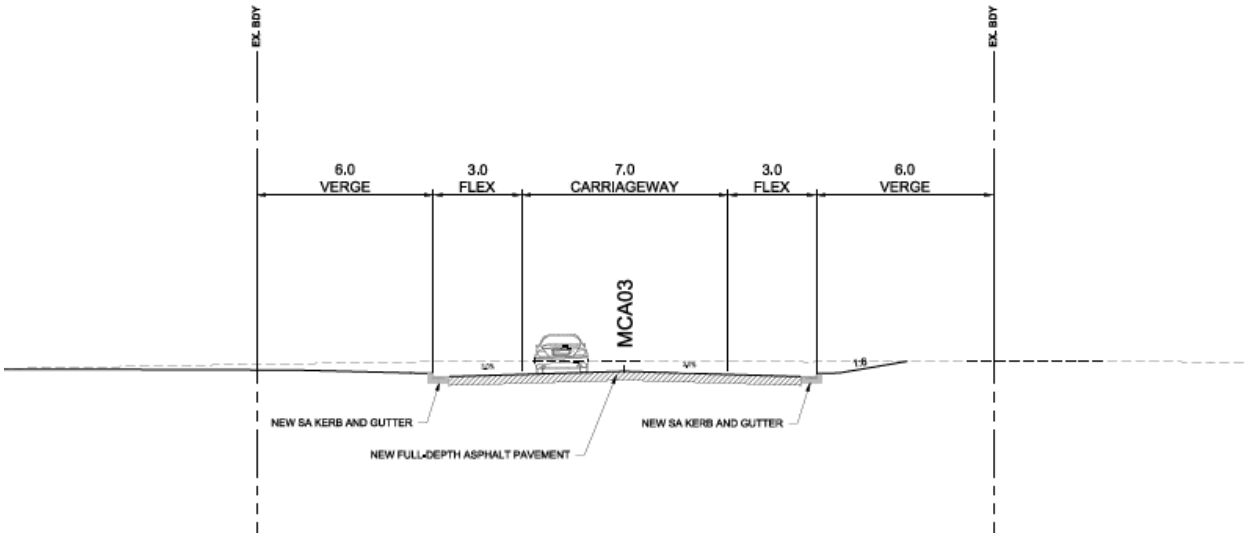
The propose cross section comprise two traffic lanes and a wide verge to accommodate future uses such as cycleways, footpaths or flex zone.

5.2.1.2 Proposed Innovation North cross section

The proposed cross section of Innovation North is provided in **Figure 5–4**.

A flex zone is proposed in this segment as a mitigation for the uncertainty on the surrounding street network. A flex zone of around 2.6m is normally proposed, which would allow for car parking. A zone of 3.0m could be used for a future general traffic lane or higher tier cycling facilities if desired within the cross section.

Figure 5–4 Proposed Innovation North cross section



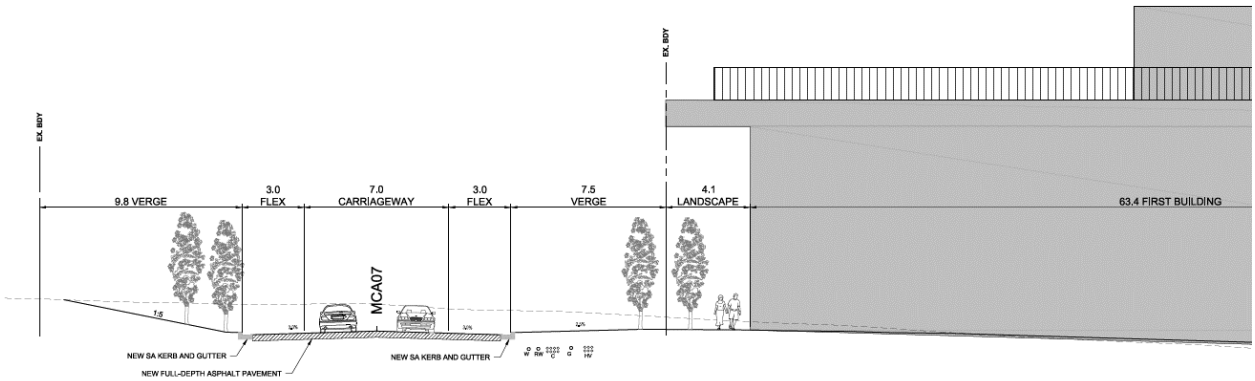
Source: Aerotropolis core precinct stage 1A – Package 01A 2021

5.2.1.3 Proposed Central Loop West cross section

The proposed cross section of Central Loop West is provided in **Figure 5–5**.

This section provides for a two-lane single carriageway with 3.0m flex zones on both sides. The verge may be used to accommodate future uses such as cycleways and footpaths.

Figure 5–5 Proposed Central Loop West cross section



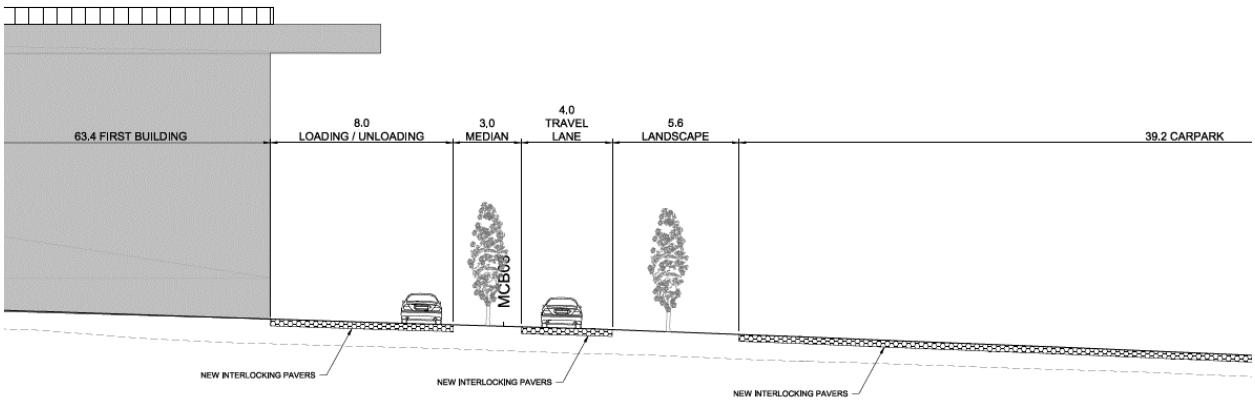
Source: Aerotropolis core precinct stage 1A – Package 01A 2021

5.2.2 Service access

The proposed at-grade loading bay is at the eastern extent of the building, adjacent to the north-south vehicle access link (see **Figure 5–6**). The site will be serviced by a 19m semi-trailer once every two to three weeks. Waste collection by a 12.5m heavy rigid vehicle (HRV) will occur one to two times per week.

The vehicle access link allows a 19m articulated vehicle and a 12.5m heavy rigid vehicle (HRV) to traverse through the site and stop at the loading bay (see **Appendix B** for swept paths analysis). This ensures no obstruction or conflict with other vehicles traversing through the site while a service vehicle or waste truck is parked at the loading bay.

Figure 5–6 Loading zone and shared zone typical cross section



Source: Aerotropolis core precinct stage 1A – Package 01A 2021

5.2.3 Active transport access

The vehicular access link is proposed to be a shared zone (see **Figure 5–6**), which allows cyclists and pedestrians to access the site via the same link.

5.3 Proposed parking provision

5.3.1 Car parking

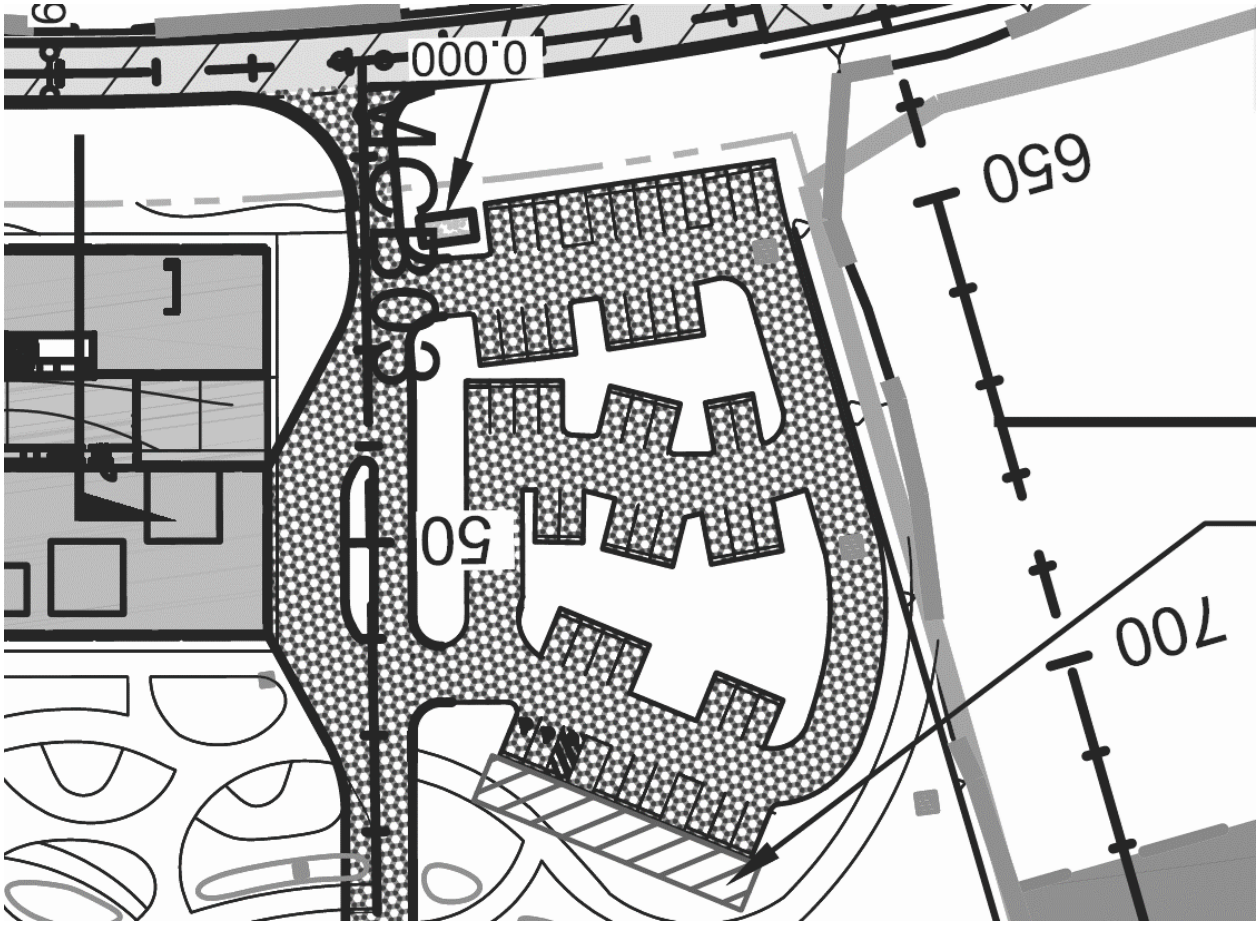
The proposed at-grade outdoor car park comprises 60 parking spaces (**Figure 5–7**). The proposed car parking provision is summarised in **Table 5-1**, and its consistency with the relevant requirements is outlined in **Table 5-2**.

Table 5-1 Proposed car parking spaces

Type	Quantity
Permanent car parking spaces (10% electric charging)	18
Temporary car parking spaces (10% electric charging)	32

Source: SCT Consulting, 2021

Figure 5–7 Proposed car park



Source: Aerotropolis core precinct stage 1A – Package 01A 2021

Table 5-2 Required onsite parking provision

Document	Requirement	Proposed onsite car parking
Draft Western Sydney Aerotropolis DCP 2021 Phase 2	Minimum number of car parking spaces for light industry, greater than 800m walking distance of a metro station: – 1 space per 200sqm minimum – 1 space per 100sqm maximum Office or business premises: – 1 space per 100sqm GFA	The proposed 50 parking spaces before the opening of Sydney Metro satisfies the maximum requirement of 23 car spaces

Document	Requirement	Proposed onsite car parking
	Minimum number of car parking spaces for light industry, within 800m walking distance of a metro station: – 1 space per 200sqm Office or business premises: – 1 space per 100sqm GFA	The proposed 18 permanent car spaces satisfy the maximum requirement of 17 car spaces after the opening of Sydney Metro
	Minimum number of car parking spaces for non-residential development, within 800m walking distance of a metro station: – 1 Motorcycle parking space per 10 car spaces – 1% of all provided spaces to be accessible parking For office, business, industrial or retail premises: – 1 car share space per 40 car spaces provided – 1 electric vehicle parking space including charging station per 40 car spaces provided	A total of two disabled parking spaces are proposed, which exceeds the requirements specified.
	A minimum of 2% accessible car parking is provided for people with mobility impairment	
	Car parking spaces and associated infrastructure are designed with the potential to transition to other uses	All proposed parking spaces on permeable surfaces and designed with the potential to transition to alternative uses over time Repurposing of parking spaces to be addressed in future DA
Preliminary Bradfield City Planning	– Office: 1 space per 175sqm GFA – Industry: 1 space per 100sqm GFA	The proposed 50 car parking spaces and the reduction to 18 car parking spaces satisfy the minimum requirement of 18 car parking spaces by the preliminary Bradfield city requirement.

Source: SCT Consulting, 2021

5.3.2 Bicycle parking and end-of-trip facilities

The proposed bicycle parking and end-of-trip facilities are summarised in **Table 5-3**. Its consistency with the relevant requirements is outlined in **Table 5-4**. A staged approach to the on-site provision of bicycle parking and end-of-trip facilities is intended to support active travel, along with anticipated improvements in the availability of public transport services.

Table 5-3 Proposed bicycle parking spaces and end-of-trip facilities

Type	Quantity
Bicycle parking spaces	13
End-of-trip facilities	2M, 2F

Source: SCT Consulting, 2021

Table 5-4 Required bicycle facilities

Document	Requirement	Proposed bicycle facilities
Draft Western Sydney Aerotropolis DCP 2021 Phase 2	Minimum number of car parking spaces for industry: – 1 space per 10 staff – 1 charging station for electric bicycles is provided for the first 5 bicycle spaces within a development, and for every 10 bicycle parking spaces thereafter Office or business premises: – 1 space per 150sqm GFA for staff – 1 space per 400sqm GFA for visitors	The proposed 13 bicycle parking spaces satisfies the minimum requirement of 8 staff bicycle spaces and 3 visitor bicycle spaces.
	Minimum provision for end-of-trip facilities for non-residential land uses: – 1 personal locker for each bicycle parking space – 1 shower and change cubicle for the first 5 bicycle spaces or part thereof, plus an additional shower for every 10 bicycle parking spaces thereafter	The proposed 4 end-of-trip facilities satisfy the minimum requirement of 3 end-of-trip facilities.

Source: SCT Consulting, 2021

5.4 Future mode share benchmarking and analysis

5.4.1 Comparison with Mascot – Eastlakes SA2 travel behaviour

2016 Census Journey to Work data for Mascot – Eastlakes SA2 was analysed to benchmark the travel behaviour at a metropolitan centre with an international airport, rail line and various committed road upgrades.

Table 5-5 Worker mode share (Mascot - Eastlakes SA2)

Mode	Percentage of trips
Vehicle	57%
Public Transport	25%
Active Transport	4%
Work from home	12%

Source: Australian Bureau of Statistics, 2018

Table 5-6 Worker origin (Mascot - Eastlakes SA2)

Worker Origin	Percentage of trips
Mascot – Eastlakes SA2 zone	8%
Waterloo - Beaconsfield	2%
Malabar – La Perouse - Chifley	1.5%
Rockdale - Banksia	1.5%
Arncliffe – Bardwell Valley	1.5%

Source: Australian Bureau of Statistics, 2018

The proportion of private vehicles trips was 10% lower for residents in Mascot – Eastlakes region than the workers who travel into the region for work. Public transport usage was also about 10% higher for the residents, indicating

better public transport access and connectivity. The higher use of active transport mode for residents also demonstrates better pedestrian and cyclist infrastructure within the region.

The findings show the potential to promote sustainable travel behaviour through well-developed public transport and active transport infrastructure. The vision for public transport and active transport mode share in Bradfield City Centre in the future is envisaged to be much higher than the Mascot – Eastlakes area in 2016, with sustainable transportation and the vision of '30-minute city' being key initiatives and priorities of the Bradfield City Masterplan and Western Sydney Aerotropolis Plan. The site will be serviced by Sydney Metro, a rapid transit corridor, well-connected walking and cycling infrastructure and end-of-trip facilities. The Western Sydney Aerotropolis will also become an economic centre that provides local education and employment opportunities, further reducing car dependency.

5.4.2 Target Mode Share

5.4.2.1 Bradfield city centre target mode share

Preliminary Bradfield City master planning investigated comparable city centres based on the mode share scenarios identified in the Draft Western Sydney Aerotropolis Plan 2020, to envisage an appropriate target mode share for future Bradfield City. The investigation concluded the following:

- Low sustainable mode share targets: most feasible in the short term (2026) as public transport infrastructure and services in Bradfield city centre begin to develop
- Medium sustainable mode share targets: most feasible in the medium term (2036) as public transport infrastructure and services in Bradfield city centre development start to mature
- Higher sustainable mode share targets: most feasible in the long term (2056 and beyond) with well-established public transport infrastructure and services in Bradfield city centre

The definition of sustainability targets, selected SA2 areas and geographic indicators to inform the vision are summarised in **Table 5-7**.

Table 5-7 Future Bradfield City target mode share

Mode	Low Sustainability Target (car trips >50%)		Medium Sustainability Target (car trips 33-50%)		High Sustainability Target (car trips 17-33%)		Highest Sustainability Target (car trips 0-16%)
	Liverpool	Parramatta - Rosehill	Chatswood East - Artarmon	Perth City	Melbourne CBD	North Sydney - Lavender Bay	Sydney - Haymarket - The Rocks
Vehicle	73.08%	49.03%	43.56%	42.18%	19.14%	26.46%	13.47%
Public Transport	11.53%	36.72%	36.72%	40.40%	62.59%	58.16%	70.91%
Active Transport	3.59%	4.13%	7.25%	5.61%	8.00%	6.22%	6.77%
WFH	10.51%	8.93%	11.33%	9.94%	9.17%	7.96%	7.73%
Indicators							
Employment	low		low to moderate		moderate to high		high
Population Density	low		low to moderate		moderate to high		high
Policies to influence travel behaviour	no/few		some		effective		very effective
Public Transport Infrastructure	limited access		reasonable access		good		excellent
Private vehicle usage	high		balanced use of public transport and private vehicles for medium/long trips		higher rate of PT use and cycling for long/medium trips		the highest rate of PT use and cycling for long/medium trips
Cycling Network	disconnected		developing		connected, good for short/medium trips		connected, good for short/medium trips
Attractiveness of walking as an option	low		good for short trips		good for short trips		good for short trips

5.4.2.2 First building target mode share

When the First building begins operations in 2023, private vehicles are expected to be the predominant travel mode for the workers due to the limited development of public transport infrastructure and services in the area. This assumption is consistent with the Bradfield city low sustainability target. It is assumed that the 60 car spaces will be fully utilised during peak hours.

As the public transport and active transport network develop, the Green Trave Plan will review the travel behaviour and the number of parking spaces annually to assist and promote the transition towards more sustainable travel behaviour. Provisions of end-of-trips facilities such as secure bike parking, changing rooms, showers and storage will also be reviewed to ensure availability and utility. By 2028, 30 of the 60 car spaces will be repurposed following the opening of Sydney Metro in 2026. The reduction of parking supply by half aligns with the Bradfield city medium sustainability target of less than 50% car trips. All the provided parking spaces are built on-grade with permeable surfaces to enable future repurposing of the spaces.

In the long term, the site will be fully serviced by the extensive and well-established public transport and active transport network. The increased accessibility is expected to significantly reduce car dependency, supporting the Bradfield city centre high sustainability target of less than 33% car trips.

It is assumed that 100% car mode share would apply before the opening of Sydney Metro. Short-term mode share and trip generation rates are anticipated following the opening of Sydney Metro. Medium and long term mode share would apply after the delivery of other public transport infrastructures such as Fifteenth Avenue Smart Transit Corridor and the overall establishment of the Aerotropolis transport network. This assumption is consistent with the Bradfield City sustainability target and is benchmarked against the 2016 mode share in Mascot. **Table 5-8** summarises the First building target mode share.

Table 5-8 First building target mode share

Horizon	Car Mode Share	
	AM peak	PM peak
Pre-metro	100%	100%
Short-term (post-Metro opening)	65%	65%
Medium-term	50%	49%
Long-term	34%	32%

Source: SCT Consulting, 2021

5.4.3 Surrounding Developments

5.4.3.1 Future roundabout upgrade

As part of Sydney Metro Western Sydney Airport enabling works, a roundabout is proposed at the intersection of Badgerys Creek Road and the current access handle to the site. The roundabout will be constructed to facilitate access to the Aerotropolis Station construction site during Sydney Metro construction. The roundabout will also be a key access point for vehicles to access the development site (**see Figure 5–8**). The alignment of the proposed roundabout is detailed in **Figure 5–9**. The roundabout will be operational in 2023 during peak Metro construction and will remain operational in 2028 shortly after the opening of Sydney Metro. The roundabout will be the only access point for First Building traffic in both target years.

The peak construction movements at Badgerys Creek Road and Aerotropolis Access Road roundabout in 2023 are shown in **Table 5-9**. The heavy vehicle distribution on Badgerys Creek Road is assumed to be 40 per cent from the north and 60 per cent from the south.

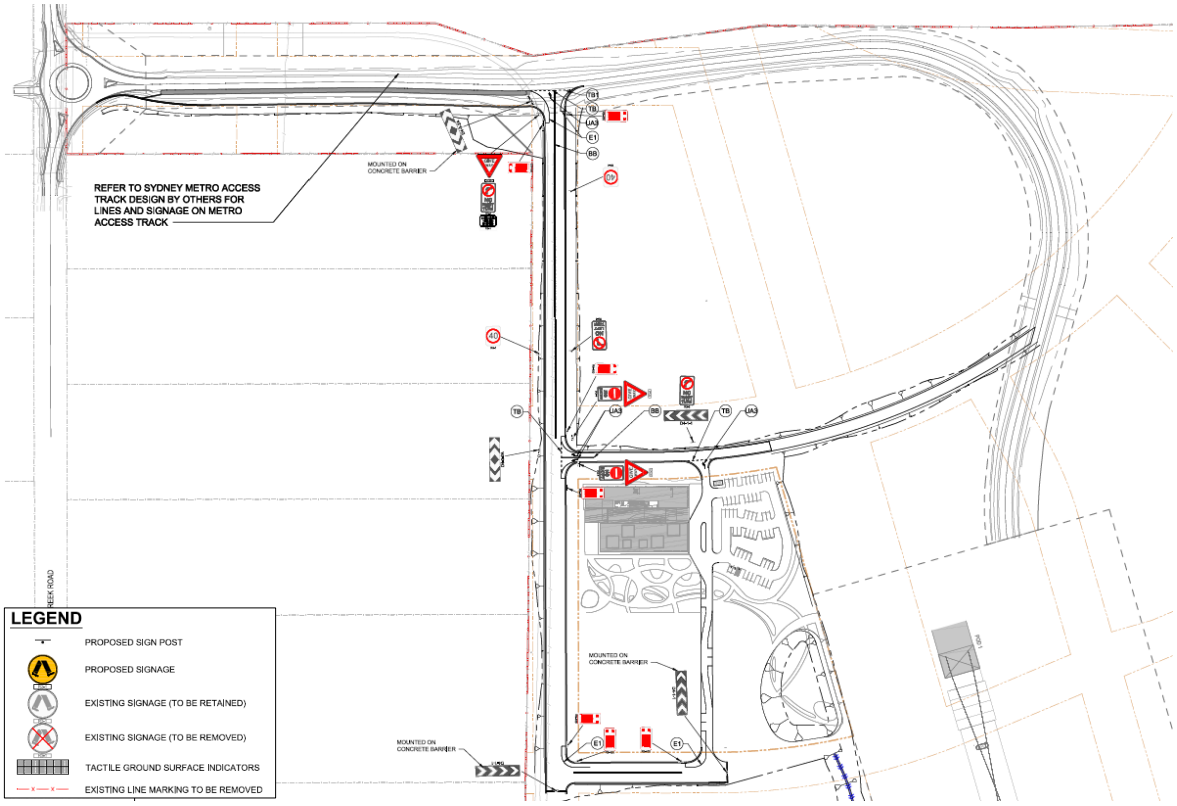
Table 5-9 Indicative peak construction vehicle movements at Badgerys Creek Road and Aerotropolis Access Road

Vehicle type	Peak construction movements during peak hour					
	AM peak			PM peak		
	IN	OUT	Total	IN	OUT	Total
LV	139	1	140	1	127	128

Vehicle type	Peak construction movements during peak hour					
	AM peak			PM peak		
	IN	OUT	Total	IN	OUT	Total
HV	16	16	32	15	15	30

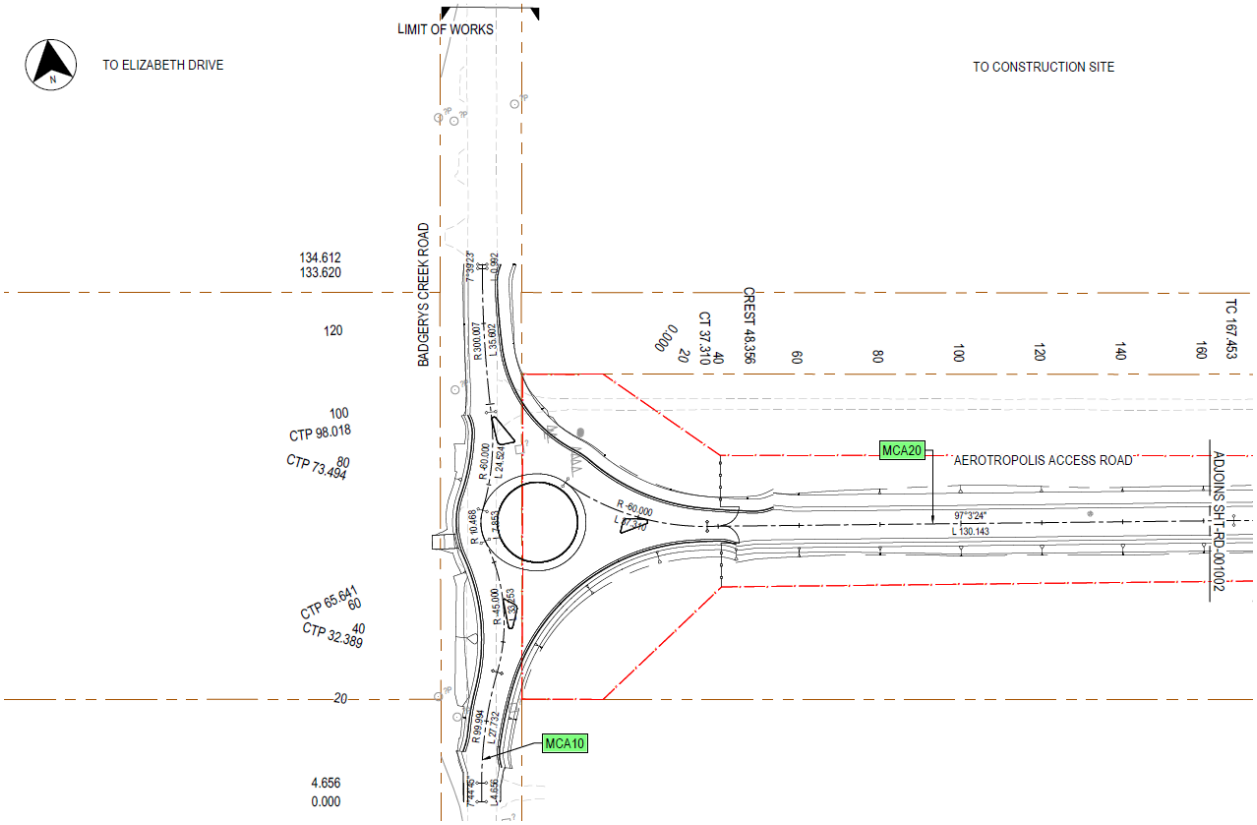
Source: SCT Consulting, adjusted construction traffic volumes based on Sydney Metro SIDRA Models (methodology outlined in Table 6-1), 2021

Figure 5–8 Access to and from the site via roundabout at Badgerys Creek Road and Aerotropolis Access Road



Source: Aerotropolis core precinct stage 1A – Package 01A 2021

Figure 5–9 Roundabout at Badgerys Creek Road and Aerotropolis Access Road



Source: Sydney Metro Western Sydney Airport Enabling Works Concept Design 2021

5.4.4 Bradfield City developments

Bradfield City Centre will be the Metropolitan Centre of Western Parkland City. Bradfield City Centre will comprise a range of land uses including commercial, residential, education, hotel and conference, advanced manufacturing, retail, entertainment, and recreational activities. Developments in Bradfield City will be delivered gradually over a period of at least 40 years, with the staging of development contingent on the delivery of supporting infrastructures, such as roads, footpaths, cycleways, bus stops and railway stations.

In the short term, there will be limited additional trips generated by developments in Bradfield City given the lack of supporting infrastructure. In the longer term, it is expected that the provision of active and public transport infrastructure will drive a sustainable transport more share for Bradfield City Centre and will be able to accommodate any future person trips generated by and attracted to Bradfield.

6.0 Traffic and Transport Impact Appraisal

6.1 Traffic modelling approach and assumptions

6.1.1 Modelling year

The future year of 2023 and 2028 was selected as the key target years based on the peak construction activities and operation of the development site and Sydney Metro. Five scenarios were selected for assessment:

- 2023 background traffic without project: Sydney Metro construction only
- **2023 background traffic with project construction**: Sydney Metro construction and First Building construction
- **2023 background traffic with project**: Sydney Metro construction and First Building in operation
- 2028 background traffic without project: Sydney Metro in operation only
- **2028 background traffic with project**: Sydney Metro and First Building both in operation

6.1.2 Traffic modelling approach and assumptions

As part of the Sydney Metro – Western Sydney Airport Environmental Impact Statement (EIS), Sydney Metro prepared a SIDRA model for the intersection of Badgerys Creek Road and Aerotropolis Access Road. The SIDRA model included:

- 2023 Sydney Metro Traffic
- 2023 Sydney Metro and WPCA (80) Traffic
- 2023 Sydney Metro and WPCA (240) Traffic

Three intersection control types were included in the model:

- Priority
- Signalised intersection
- Roundabout

Due to inconsistencies between the provided model and reported delay in Sydney Metro EIS, an alternative approach was adopted (**Table 6-1**) to maintain consistency with the Sydney Metro traffic forecast. The purpose of the traffic modelling is to understand the cumulative impact of the construction and operational traffic generated by the development site and Sydney Metro on the roundabout.

Table 6-1 Traffic modelling methodology

Step	Details
Audit Sydney Metro SIDRA models	– Replicate Sydney Metro models and update roundabout geometry based on Sydney Metro Western Sydney Airport Enabling Works Concept Design
Update 2023 Sydney Metro traffic volumes	– Scale 2023 Sydney Metro traffic volumes in the models to match the reported Badgerys Creek Road midblock volumes in Sydney Metro EIS for peak construction year with project – The updated models are used as the 2023 background traffic scenarios in this assessment
Calculate 2028 background traffic	– Interpolate between 2026 and 2036 midblock volumes on Badgerys Creek Road – Scale 2023 Sydney Metro traffic volumes in the models to match the interpolated 2028 Badgerys Creek Road midblock volumes
Model 2023 and 2028 scenarios	– Apply site-generated construction traffic and operation traffic to the model for assessment

Source: SCT Consulting, 2021

6.1.3 Comparison of roundabout movement volumes

Table 6-2 Comparison of Sydney Metro models (2023) and scaled background traffic models (2023 and 2028)

Origin	Destination	Vehicle Type	Movement volumes during peak hour					
			AM peak			PM peak		
			Sydney Metro	2023 Scaled	2028 Scaled	Sydney Metro	2023 Scaled	2028 Scaled
South	North	LV	853	1,065	436	346	396	359
		HV	129	161	66	29	33	30
South	East	LV	67	84	34	1	1	1
		HV	8	10	4	8	9	8
East	South	LV	1	1	1	67	77	36
		HV	8	10	9	8	9	4
East	North	LV	0	0	0	44	50	46
		HV	5	6	3	5	6	5
North	South	LV	270	337	289	1,034	1185	557
		HV	41	51	44	86	99	46
North	East	LV	44	55	47	0	0	0
		HV	5	6	5	5	6	3

Source: SCT Consulting, 2021

6.2 Trip generation and distribution of the proposal

6.2.1 Site construction

It is assumed that 30 construction light vehicless and 5 heave vehicles will be travelling to the site every day. All light vehicles are assumed to travel to site during AM peak and leave the site during PM peak. Heavy vehicle deliveries to and from site are assumed to occur outside of peak periods for the following reasons:

- Concrete deliveries usually have a maximum of 45 to 60 minutes travel time allowable between batching and pour. It is assumed that concrete pours will be coordinated to occur outside of peak periods to avoid road network unreliability.
- Similarly, deliveries of large building materials such as large steel members or reinforcements are generally coordinated in advance, and expected to occur outside of peak periods to avoid unnecessary delays.
- SIDRA analysis results indicate spare capacity at the roundabout. Given the small number of HVs on site, the impact of HVs on the intersection performance would be minimal.

The distribution of the construction vehicles is assumed to follow the HV distribution of Sydney Metro construction traffic.

A summary of the traffic distribution is shown in **Table 6-5**.

Table 6-3 Trip distribution for site construction

Origin	Destination	Vehicle Type	Movement volumes during peak hour (site in construction)	
			AM peak	PM peak
South	North	LV	0	0
South	East	LV	18	18

Origin	Destination	Vehicle Type	Movement volumes during peak hour (site in construction)	
			AM peak	PM peak
East	South	LV	0	0
East	North	LV	0	0
North	South	LV	0	0
North	East	LV	12	12

Source: SCT Consulting, 2021

6.2.2 Site operation

Pre-metro trip generation rates for the proposed development were derived from the *RMS Technical Direction (TDT 2013/04a)* and adjusted to reflect the limited public transport infrastructure servicing the site. The short, medium, and long-term trip generation rates were derived from the preliminary Bradfield City planning documents. The estimated trip generation are summarised in **Table 6-4**.

Pre-metro trip generation is adopted for 2023 scenarios, and short-term trip generation is adopted for 2028 scenarios.

Table 6-4 Trip generation for site operation

Horizon	Car Mode Share		Trip Generation Rate		Trip Generation (LV only)	
	AM peak	PM peak	AM peak	PM peak	AM peak	PM peak
Pre-metro (2023)	100%	100%	0.55 / 100sqm GFA	0.49 / 100sqm GFA	14 veh/hr	11 veh/hr
Short-term (2028)	65%	65%	0.36 / 100sqm GFA	0.32 / 100sqm GFA	9 veh/hr	7 veh/hr
Medium-term	50%	49%	0.28 / 100sqm GFA	0.24 / 100sqm GFA	6 veh/hr	6 veh/hr
Long-term	34%	32%	0.19 / 100sqm GFA	0.16 / 100sqm GFA	4 veh/hr	4 veh/hr

Source: SCT Consulting, 2021

The distribution of 2023 site-generated traffic is assumed to be consistent with the HV distribution of Sydney Metro construction traffic. The distribution of 2028 site-generated traffic is adopted from the ratio of northbound and southbound mid-block volumes on Badgerys Creek in 2028. Given the nature of the development, it is assumed that 90% of the AM trips will be inbound, and 90% of the PM trips will be outbound.

A summary of the traffic distribution is shown in **Table 6-5**.

Table 6-5 Distribution of site-generated traffic

Origin	Destination	Vehicle Type	Movement volumes during peak hour (site in operation)			
			AM peak		PM peak	
			2023	2028	2023	2028
South	North	LV	0	0	0	0
South	East	LV	7	5	1	0
East	South	LV	1	1	6	4
East	North	LV	1	0	4	3
North	South	LV	0	0	0	0
North	East	LV	5	3	0	0

Source: SCT Consulting, 2021

6.3 Performance metrics

The performance of the key roundabout providing access to First Building was assessed using the SIDRA Network software package. Intersection performance is measured in terms of the following:

– Degree of Saturation (DoS): The ratio of arrival (demand) flow rate to capacity during a given flow period. Acceptable intersection performance requires DoS < 1.0

– Level of Service (LoS): An index of the operational performance of traffic for a given intersection during a given flow period. Acceptable intersection performance normally requires a minimum of LoS D

– Queue length: A measure of the indicative length of the queue, based on the typical space occupied by vehicles

– Delay in seconds: the measure of the delay required to be reported per Traffic Modelling Guidelines – being the worst movement for all priority-controlled junctions (including roundabouts) and the average for all signalised intersections.

Table 6-6 provides a summary of the LoS performance bands.

Table 6-6 Level of Service index

Level of Service	Average delay per vehicle (sec)	Performance explanation
A	Less than 14.5	Good operation
B	14.5 to 28.4	Good with acceptable delays and spare capacity
C	28.5 to 42.4	Satisfactory
D	42.5 to 56.4	Operating near capacity
E	56.5 to 70.4	At capacity, at signals, incidents will cause excessive delays. Roundabouts require other control methods.
F	70.5 or greater	

Source: Guide to Traffic Generating Developments; RMS, 2002

6.4 Road network impacts

The performance of the roundabout under each modelling scenario is summarised in **Table 6-7**.

Table 6-7 Roundabout performance

Year	Background Traffic			With site construction			With site operation		
	Delay	LoS	DoS	Delay	LoS	DoS	Delay	LoS	DoS
Weekday AM Peak									
2023	7.1s	A	0.88	7.2s	A	0.887	7.1s	A	0.88
2028	6.8s	A	0.34				6.8s	A	0.36
Weekday PM Peak									
2023	10.2s	A	0.85	12.2s	A	0.850	10.8s	A	0.85
2028	7.0s	A	0.41				7.0s	A	0.41

Source: SCT Consulting, 2021

The roundabout performs at a Level of Service (LoS) A and a Degree of Saturation (DoS) under 1.0 in all modelled scenarios. The roundabout performs better in 2028 scenarios due to the reduced car mode share after the opening of Sydney Metro. Modelling results suggest that the roundabout does not require any upgrades given the low car trip generation from the site.

6.5 Public transport impacts

In the short term, all site-generated trips are expected to be private vehicle trips due to the lack of public transport infrastructure. Delivery of the planned Aerotropolis Core Metro Station is indicatively 300m southeast of the site. The opening of Sydney Metro and Fifteenth Avenue Rapid Transit Corridor is expected to significantly change travel behaviour in the area. The expected mode shift is reflected in the future trip generation rates.

In the longer term, the site will be serviced by accessible rail and bus networks (as described in **Section 4.1.1**) that provide wide coverage of destinations across the Sydney Greater Metropolitan Area. The public transport network is expected to accommodate the additional trips generated by the development given the low trip generation from the site.

6.6 Active transport impacts

In the short term, no pedestrian or cyclist movements are expected near the site due to the lack of active transport infrastructure. In the longer term, site access will be integrated with the extensive walking and cycling network (as described in **Section 4.1.2**) to accommodate active transport movements.

The provision of on-site bicycle facilities and visitor bicycle parking would meet the needs of potential bicycle users. Given the nature and the scale of development, the number of person trips during the peak periods are expected to be accommodated by the planned facilities and infrastructure.

6.7 Summary infrastructure schedule

In summary, the site can be accommodated within the current and future transport network. The site conforms to the relevant development control plan requirements where specified. Table 6-8 provides a summary of the proposed infrastructure to be provided.

Table 6-8 Infrastructure schedule

Infrastructure	Timing
Innovation North Street from Central Loop West to site access	Before crown completion certificate
Central Loop West from Innovation North Street to Aerotropolis Access Road (Sydney Metro's construction access connection to Badgerys Creek Road)	Before crown completion certificate
Southern general traffic carriageway of Fifteenth Avenue from Central Loop West to Metro Access Track	Before crown completion certificate
18 permanent car parking spaces and 32 temporary car parking spaces, 10% of which are electric charging	Before crown completion certificate
Removal of 32 temporary parking spaces	Within 12 months of the date from Sydney Metro Western Sydney Airport's first passenger service
13 bicycle parking spaces and 4 end of trip facilities	Before crown completion certificate

7.0 Preliminary construction traffic and pedestrian management plan

The preliminary construction traffic and pedestrian management approach is outlined below. The contractor responsible for delivery will prepare a detailed construction traffic management plan (CTMP), which may need to be approved by relevant authorities before construction commences. The CTMP would usually include Temporary Traffic Management Plans (TTMPs) and a Driver's Code of Conduct.

Badgerys Creek Road is expected to be the key haulage route to and from the site, with the Northern Road being the primary state access road. The peak construction traffic is estimated to be 30 light vehicles during peak periods. These haulage routes are consistent with what is being proposed for Sydney Metro Western Sydney Airport.

The addition of construction traffic generated by the development is unlikely to impact the overall network performance, given the low net increase in vehicle trips. Road network impacts by worker traffic to the site will be further mitigated by the construction workers generally starting earlier and finishing earlier than the commuter peak periods and would likely not coincide with the road network peak periods.

Aerotropolis Road and the roundabout of Badgerys Creek Road and Aerotropolis Access Road will only be used by construction vehicles in 2023, with minimal impact on general commuters. There will also be sufficient parking space on site to minimise the impact of construction vehicles on the availability of local parking availability.

Study area predominantly comprises rural lands with low-density developments, so construction activities will have minimal impact on surrounding land uses. Other mitigation measures would be adopted during the construction phase to reduce the impact of traffic movements on the community:

– Truckloads would be covered during transportation off-site
– Neighbouring properties would be notified of construction works and timing. Any comments would be recorded and taken into consideration when planning construction activities
– All activities, including the delivery of materials, would not impede traffic flow along local roads
– Materials would be delivered, and spoil removed during standard construction hours
– Avoidance of idling trucks alongside sensitive receivers
– Deliveries would be planned to ensure a consistent and minimal number of trucks arriving at the site at any one time.

To manage driver conduct the following measures are to be implemented:

– All truck movements will be scheduled
– Vehicles are to enter and exit the site in a forward direction along the travel path shown on delivery maps
– Drivers are to always give way to pedestrians and plants.

Traffic controllers will be used to stop traffic on the public street(s) to allow trucks to enter or leave the site. Where possible, vehicles must enter and exit the site in a forward direction. Traffic controllers will be nominated in future Road Occupancy License requests if required. They must wait until a suitable gap in traffic allows them to assist trucks to enter or exit the site. The Roads Act does not give any special treatment to trucks leaving a construction site, the vehicles already on the road have the right-of-way. Vehicles entering, exiting, and driving around the site will be required to always give way to pedestrians, although it is not expected that there will be pedestrian activities near the site during the construction phase.

The contractor responsible for delivery may coordinate with Sydney Metro to mitigate any impacts of concurrent construction on the local community and network. A further review of potential concurrent construction should occur as part of the construction traffic management plan to ensure traffic impact mitigations are proposed.

8.0 Summary and conclusions

An assessment of the traffic and pedestrian impacts for the proposed development was undertaken, and the results indicate that:

- Given the low level of expected construction traffic, the impact of construction activities and additional delays to the network is expected to be minor. The details of the construction impacts should be further considered in the Construction Traffic Management Plan (CTMP) prepared by the contractor responsible for the delivery.
- Operational traffic generated by the proposed development is unlikely to have any significant impact of traffic performance on the surrounding road network in both target future years (2023 and 2028), given the low number of generated trips.
- In the short term, all site-generated are expected to be private vehicle trips. In the longer term, the established public transport network, active transport network and on-site end-of-trips facilities will be able to accommodate the additional person trips generated by the development.
- Number of private vehicle trips will be reduced following the opening of Sydney Metro, and further reduced following the development of Fifteenth Avenue Rapid Transit Corridor and local public transit network. All parking spaces are proposed to be on permeable surfaces and designed with the potential to transition to alternative uses over time. Repurposing of parking spaces will be addressed in future DA.
- A 6m wide one-way vehicular access is provided through the site for vehicles to enter from Innovation North and to exit onto Fifteenth Avenue, which allows private vehicle and service vehicle movements. As Fifteenth Avenue will be delivered after the opening of the First Building, a two-lane single carriageway will be constructed adjacent to Fifteenth Avenue to enable vehicle access.

APPENDIX A

SIDRA Modelling Outputs

MOVEMENT SUMMARY

Site: 23_SM_AM [Badgerys Creek Rd | New Access Rd_AM (Site Folder: 2023 - SM Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	1226	161	1291	13.1	0.876	6.8	LOS A	29.5	229.7	0.33	0.44	0.33	62.0
3	R2	94	10	99	10.6	0.876	10.7	LOS A	29.5	229.7	0.33	0.44	0.33	59.0
Approach		1320	171	1389	13.0	0.876	7.0	LOS A	29.5	229.7	0.33	0.44	0.33	61.8
East: Aerotropolis Access														
4	L2	11	10	12	90.9	0.033	9.1	LOS A	0.2	1.9	0.58	0.67	0.58	39.2
6	R2	6	6	6	100.0	0.033	13.9	LOS A	0.2	1.9	0.58	0.67	0.58	37.1
Approach		17	16	18	94.1	0.033	10.8	LOS A	0.2	1.9	0.58	0.67	0.58	38.4
North: Badgerys Creek Rd (N)														
7	L2	61	6	64	9.8	0.381	6.6	LOS A	2.7	20.6	0.36	0.54	0.36	58.1
8	T1	388	51	408	13.1	0.381	7.2	LOS A	2.7	20.6	0.36	0.54	0.36	62.2
Approach		449	57	473	12.7	0.381	7.1	LOS A	2.7	20.6	0.36	0.54	0.36	61.6
All Vehicles		1786	244	1880	13.7	0.876	7.1	LOS A	29.5	229.7	0.34	0.47	0.34	61.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 23_SM_PM [Badgerys Creek Rd | New Access Rd_PM (Site Folder: 2023 - SM Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	429	33	452	7.7	0.347	6.8	LOS A	2.8	21.4	0.31	0.50	0.31	63.8
3	R2	10	9	11	90.0	0.347	12.6	LOS A	2.8	21.4	0.31	0.50	0.31	55.5
Approach		439	42	462	9.6	0.347	6.9	LOS A	2.8	21.4	0.31	0.50	0.31	63.6
East: New Access Rd														
4	L2	86	9	91	10.5	0.565	49.8	LOS D	5.4	41.4	1.00	1.23	1.62	33.2
6	R2	56	6	59	10.7	0.565	54.2	LOS D	5.4	41.4	1.00	1.23	1.62	33.4
Approach		142	15	149	10.6	0.565	51.5	LOS D	5.4	41.4	1.00	1.23	1.62	33.2
North: Badgerys Creek Rd (N)														
7	L2	6	6	6	100.0	0.850	7.9	LOS A	21.3	159.5	0.33	0.44	0.33	54.7
8	T1	1284	99	1352	7.7	0.850	6.7	LOS A	21.3	159.5	0.33	0.44	0.33	63.7
Approach		1290	105	1358	8.1	0.850	6.8	LOS A	21.3	159.5	0.33	0.44	0.33	63.6
All Vehicles		1871	162	1969	8.7	0.850	10.2	LOS A	21.3	159.5	0.38	0.51	0.42	59.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 23_CO_AM [Badgerys Creek Rd | New Access Rd_AM (Site Folder: 2023 - SM + CON Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	1226	161	1291	13.1	0.887	6.8	LOS A	32.6	253.4	0.36	0.43	0.36	61.8
3	R2	112	10	118	8.9	0.887	10.7	LOS A	32.6	253.4	0.36	0.43	0.36	58.9
Approach		1338	171	1408	12.8	0.887	7.1	LOS A	32.6	253.4	0.36	0.43	0.36	61.6
East: Aerotropolis Access														
4	L2	11	10	12	90.9	0.033	9.1	LOS A	0.2	1.9	0.58	0.67	0.58	39.2
6	R2	6	6	6	100.0	0.033	13.9	LOS A	0.2	1.9	0.58	0.67	0.58	37.1
Approach		17	16	18	94.1	0.033	10.8	LOS A	0.2	1.9	0.58	0.67	0.58	38.4
North: Badgerys Creek Rd (N)														
7	L2	73	6	77	8.2	0.401	6.7	LOS A	2.9	22.1	0.40	0.55	0.40	58.0
8	T1	388	51	408	13.1	0.401	7.4	LOS A	2.9	22.1	0.40	0.55	0.40	62.0
Approach		461	57	485	12.4	0.401	7.3	LOS A	2.9	22.1	0.40	0.55	0.40	61.3
All Vehicles		1816	244	1912	13.4	0.887	7.2	LOS A	32.6	253.4	0.37	0.47	0.37	61.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 23_CO_PM [Badgerys Creek Rd | New Access Rd_PM (Site Folder: 2023 - SM + CON Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	429	33	452	7.7	0.356	6.9	LOS A	2.9	21.9	0.34	0.51	0.34	63.6
3	R2	10	9	11	90.0	0.356	12.8	LOS A	2.9	21.9	0.34	0.51	0.34	55.3
Approach		439	42	462	9.6	0.356	7.0	LOS A	2.9	21.9	0.34	0.51	0.34	63.4
East: New Access Rd														
4	L2	104	9	109	8.7	0.675	64.1	LOS E	7.7	57.8	1.00	1.35	1.97	29.5
6	R2	68	6	72	8.8	0.675	68.5	LOS E	7.7	57.8	1.00	1.35	1.97	29.7
Approach		172	15	181	8.7	0.675	65.8	LOS E	7.7	57.8	1.00	1.35	1.97	29.6
North: Badgerys Creek Rd (N)														
7	L2	6	6	6	100.0	0.850	7.9	LOS A	21.6	161.5	0.34	0.44	0.34	54.7
8	T1	1284	99	1352	7.7	0.850	6.7	LOS A	21.6	161.5	0.34	0.44	0.34	63.6
Approach		1290	105	1358	8.1	0.850	6.8	LOS A	21.6	161.5	0.34	0.44	0.34	63.6
All Vehicles		1901	162	2001	8.5	0.850	12.2	LOS A	21.6	161.5	0.40	0.54	0.49	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 23_OP_AM [Badgerys Creek Rd | New Access Rd_AM (Site Folder: 2023 - SM + OP Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	1226	161	1291	13.1	0.883	6.8	LOS A	31.1	241.4	0.37	0.43	0.37	61.8
3	R2	101	10	106	9.9	0.883	10.7	LOS A	31.1	241.4	0.37	0.43	0.37	58.8
Approach		1327	171	1397	12.9	0.883	7.1	LOS A	31.1	241.4	0.37	0.43	0.37	61.5
East: Aerotropolis Access														
4	L2	12	10	13	83.3	0.035	8.8	LOS A	0.2	2.0	0.58	0.67	0.58	41.4
6	R2	7	6	7	85.7	0.035	13.3	LOS A	0.2	2.0	0.58	0.67	0.58	40.7
Approach		19	16	20	84.2	0.035	10.5	LOS A	0.2	2.0	0.58	0.67	0.58	41.1
North: Badgerys Creek Rd (N)														
7	L2	66	6	69	9.1	0.390	6.6	LOS A	2.8	21.4	0.38	0.54	0.38	58.1
8	T1	388	51	408	13.1	0.390	7.3	LOS A	2.8	21.4	0.38	0.54	0.38	62.1
Approach		454	57	478	12.6	0.390	7.2	LOS A	2.8	21.4	0.38	0.54	0.38	61.5
All Vehicles		1800	244	1895	13.6	0.883	7.2	LOS A	31.1	241.4	0.37	0.46	0.37	61.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 23_OP_PM [Badgerys Creek Rd | New Access Rd_PM (Site Folder: 2023 - SM + OP Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	429	33	452	7.7	0.351	6.8	LOS A	2.9	21.6	0.32	0.50	0.32	63.8
3	R2	11	9	12	81.8	0.351	12.5	LOS A	2.9	21.6	0.32	0.50	0.32	55.8
Approach		440	42	463	9.5	0.351	7.0	LOS A	2.9	21.6	0.32	0.50	0.32	63.5
East: New Access Rd														
4	L2	92	9	97	9.8	0.607	54.8	LOS D	6.2	46.9	1.00	1.27	1.74	31.8
6	R2	60	6	63	10.0	0.607	59.2	LOS E	6.2	46.9	1.00	1.27	1.74	32.0
Approach		152	15	160	9.9	0.607	56.5	LOS D	6.2	46.9	1.00	1.27	1.74	31.9
North: Badgerys Creek Rd (N)														
7	L2	6	6	6	100.0	0.852	8.0	LOS A	21.6	162.1	0.35	0.44	0.35	54.6
8	T1	1284	99	1352	7.7	0.852	6.8	LOS A	21.6	162.1	0.35	0.44	0.35	63.6
Approach		1290	105	1358	8.1	0.852	6.8	LOS A	21.6	162.1	0.35	0.44	0.35	63.5
All Vehicles		1882	162	1981	8.6	0.852	10.8	LOS A	21.6	162.1	0.40	0.52	0.46	58.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 28_SM_AM [Badgerys Creek Rd | New Access Rd_AM (Site Folder: 2028 - SM Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	502	66	528	13.1	0.358	6.5	LOS A	2.8	21.6	0.06	0.52	0.06	63.5
3	R2	38	4	40	10.5	0.358	10.5	LOS A	2.8	21.6	0.06	0.52	0.06	60.4
Approach		540	70	568	13.0	0.358	6.8	LOS A	2.8	21.6	0.06	0.52	0.06	63.3
East: Aerotropolis Access														
4	L2	10	9	11	90.0	0.023	8.4	LOS A	0.1	1.3	0.53	0.63	0.53	39.8
6	R2	3	3	3	100.0	0.023	13.2	LOS A	0.1	1.3	0.53	0.63	0.53	37.5
Approach		13	12	14	92.3	0.023	9.5	LOS A	0.1	1.3	0.53	0.63	0.53	39.2
North: Badgerys Creek Rd (N)														
7	L2	52	5	55	9.6	0.293	6.1	LOS A	1.8	13.6	0.18	0.51	0.18	59.0
8	T1	333	44	351	13.2	0.293	6.7	LOS A	1.8	13.6	0.18	0.51	0.18	63.2
Approach		385	49	405	12.7	0.293	6.7	LOS A	1.8	13.6	0.18	0.51	0.18	62.6
All Vehicles		938	131	987	14.0	0.358	6.8	LOS A	2.8	21.6	0.12	0.52	0.12	62.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 28_SM_PM [Badgerys Creek Rd | New Access Rd_PM (Site Folder: 2028 - SM Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	389	30	409	7.7	0.311	6.8	LOS A	2.2	16.9	0.26	0.50	0.26	64.1
3	R2	9	8	9	88.9	0.311	12.5	LOS A	2.2	16.9	0.26	0.50	0.26	55.8
Approach		398	38	419	9.5	0.311	6.9	LOS A	2.2	16.9	0.26	0.50	0.26	63.9
East: New Access Rd														
4	L2	40	4	42	10.0	0.126	8.4	LOS A	0.7	5.2	0.65	0.76	0.65	52.4
6	R2	51	5	54	9.8	0.126	12.8	LOS A	0.7	5.2	0.65	0.76	0.65	53.0
Approach		91	9	96	9.9	0.126	10.8	LOS A	0.7	5.2	0.65	0.76	0.65	52.8
North: Badgerys Creek Rd (N)														
7	L2	3	3	3	100.0	0.407	7.4	LOS A	3.0	22.8	0.11	0.50	0.11	55.8
8	T1	603	46	635	7.6	0.407	6.5	LOS A	3.0	22.8	0.11	0.50	0.11	65.1
Approach		606	49	638	8.1	0.407	6.5	LOS A	3.0	22.8	0.11	0.50	0.11	65.0
All Vehicles		1095	96	1153	8.8	0.407	7.0	LOS A	3.0	22.8	0.21	0.52	0.21	63.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 28_OP_AM [Badgerys Creek Rd | New Access Rd_AM (Site Folder: 2028 - SM + OP Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	502	66	528	13.1	0.361	6.5	LOS A	2.8	21.8	0.06	0.53	0.06	63.5
3	R2	43	4	45	9.3	0.361	10.5	LOS A	2.8	21.8	0.06	0.53	0.06	60.4
Approach		545	70	574	12.8	0.361	6.8	LOS A	2.8	21.8	0.06	0.53	0.06	63.2
East: Aerotropolis Access														
4	L2	11	9	12	81.8	0.024	8.1	LOS A	0.1	1.3	0.53	0.62	0.53	41.1
6	R2	3	3	3	100.0	0.024	13.2	LOS A	0.1	1.3	0.53	0.62	0.53	37.9
Approach		14	12	15	85.7	0.024	9.2	LOS A	0.1	1.3	0.53	0.62	0.53	40.4
North: Badgerys Creek Rd (N)														
7	L2	55	5	58	9.1	0.299	6.1	LOS A	1.8	13.9	0.20	0.51	0.20	59.0
8	T1	333	44	351	13.2	0.299	6.8	LOS A	1.8	13.9	0.20	0.51	0.20	63.1
Approach		388	49	408	12.6	0.299	6.7	LOS A	1.8	13.9	0.20	0.51	0.20	62.5
All Vehicles		947	131	997	13.8	0.361	6.8	LOS A	2.8	21.8	0.12	0.52	0.12	62.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 28_OP_PM [Badgerys Creek Rd | New Access Rd_PM (Site Folder: 2028 - SM + OP Traffic)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Badgerys Creek Rd (S)														
2	T1	389	30	409	7.7	0.312	6.8	LOS A	2.2	17.0	0.26	0.50	0.26	64.1
3	R2	9	8	9	88.9	0.312	12.5	LOS A	2.2	17.0	0.26	0.50	0.26	55.7
Approach		398	38	419	9.5	0.312	6.9	LOS A	2.2	17.0	0.26	0.50	0.26	63.9
East: New Access Rd														
4	L2	44	4	46	9.1	0.134	8.4	LOS A	0.7	5.5	0.65	0.76	0.65	52.7
6	R2	53	5	56	9.4	0.134	12.8	LOS A	0.7	5.5	0.65	0.76	0.65	53.2
Approach		97	9	102	9.3	0.134	10.8	LOS A	0.7	5.5	0.65	0.76	0.65	52.9
North: Badgerys Creek Rd (N)														
7	L2	3	3	3	100.0	0.407	7.4	LOS A	3.0	22.8	0.11	0.50	0.11	55.8
8	T1	603	46	635	7.6	0.407	6.5	LOS A	3.0	22.8	0.11	0.50	0.11	65.1
Approach		606	49	638	8.1	0.407	6.5	LOS A	3.0	22.8	0.11	0.50	0.11	65.0
All Vehicles		1101	96	1159	8.7	0.407	7.0	LOS A	3.0	22.8	0.21	0.52	0.21	63.4

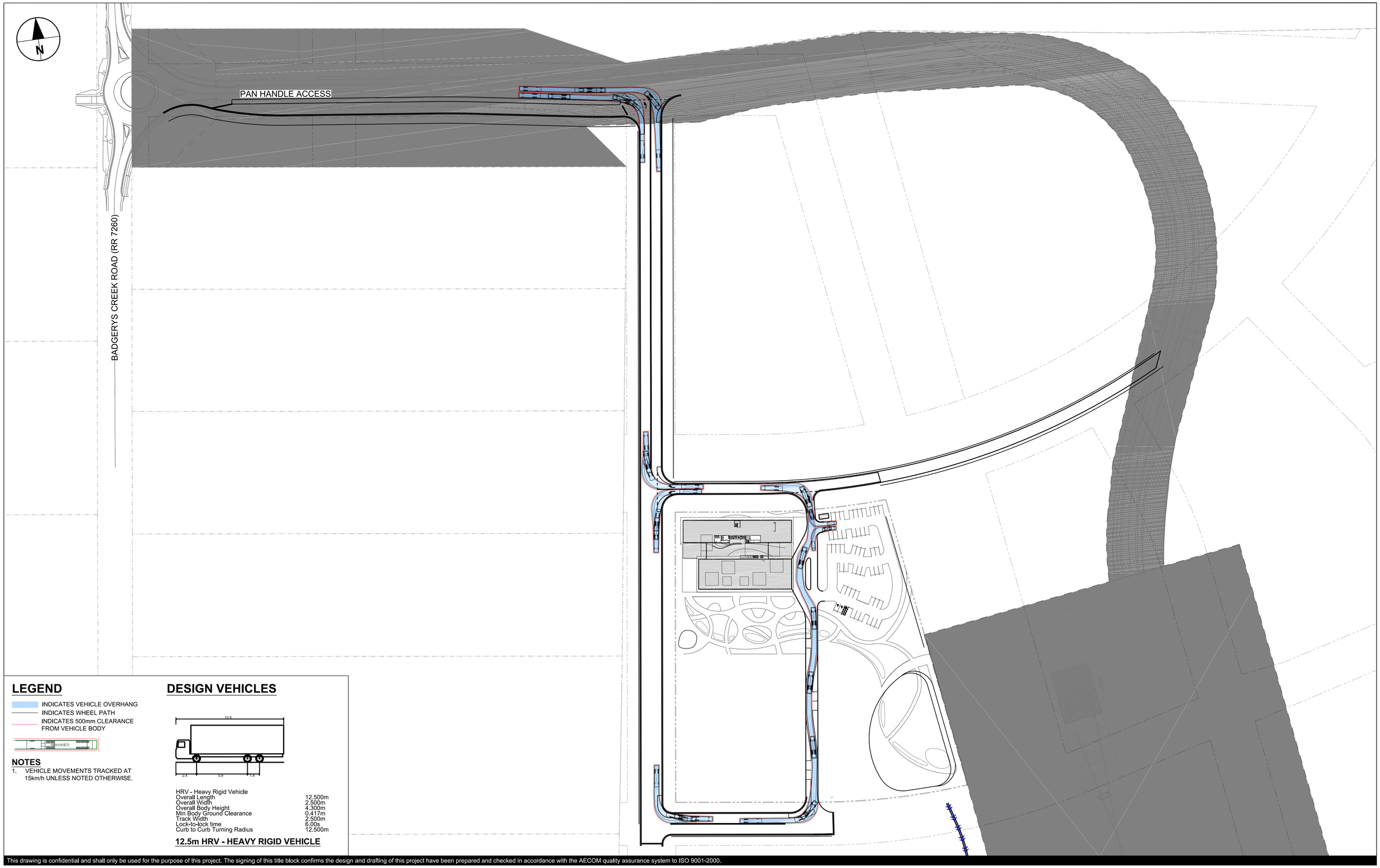
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX B

Swept path study

ISO A1 594mm x 841mm

Last saved by: JEFFLANG.YAN(2021-11-05) Last Plotted: 2021-11-05
Filename: C:\PWWORKING\AECOM_DS10_AU\JEFFLANG.YAN@AECOM.COM\D0312724\60646285-SHT-01-1000-CI-0971.DWG



LEGEND

- INDICATES VEHICLE OVERHANG
- INDICATES WHEEL PATH
- INDICATES 500mm CLEARANCE FROM VEHICLE BODY

NOTES

1. VEHICLE MOVEMENTS TRACKED AT 15km/h UNLESS NOTED OTHERWISE.

DESIGN VEHICLES

HRV - Heavy Rigid Vehicle	
Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

12.5m HRV - HEAVY RIGID VEHICLE

CONSULTANT

AECOM Australia Pty Ltd
A.B.N 20 093 846 925
www.aecom.com

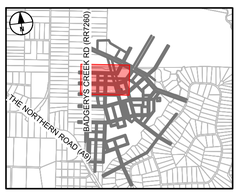
PROJECT

AEROTROPOLIS
CORE PRECINCT
BRINGELLY

CLIENT

NSW GOVERNMENT Western City & Aerotropolis Authority

KEY PLAN



SCALE BAR

0 25 50 m
1:1000

SAFETY IN DESIGN INFORMATION

ARE THERE ANY ADDITIONAL HAZARDS / RISKS NOT NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING?

☐ NO
☐ YES

PROJECT MANAGEMENT INITIALS

-	-	-
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM		SURVEY	

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PRELIMINARY

PROJECT NUMBER

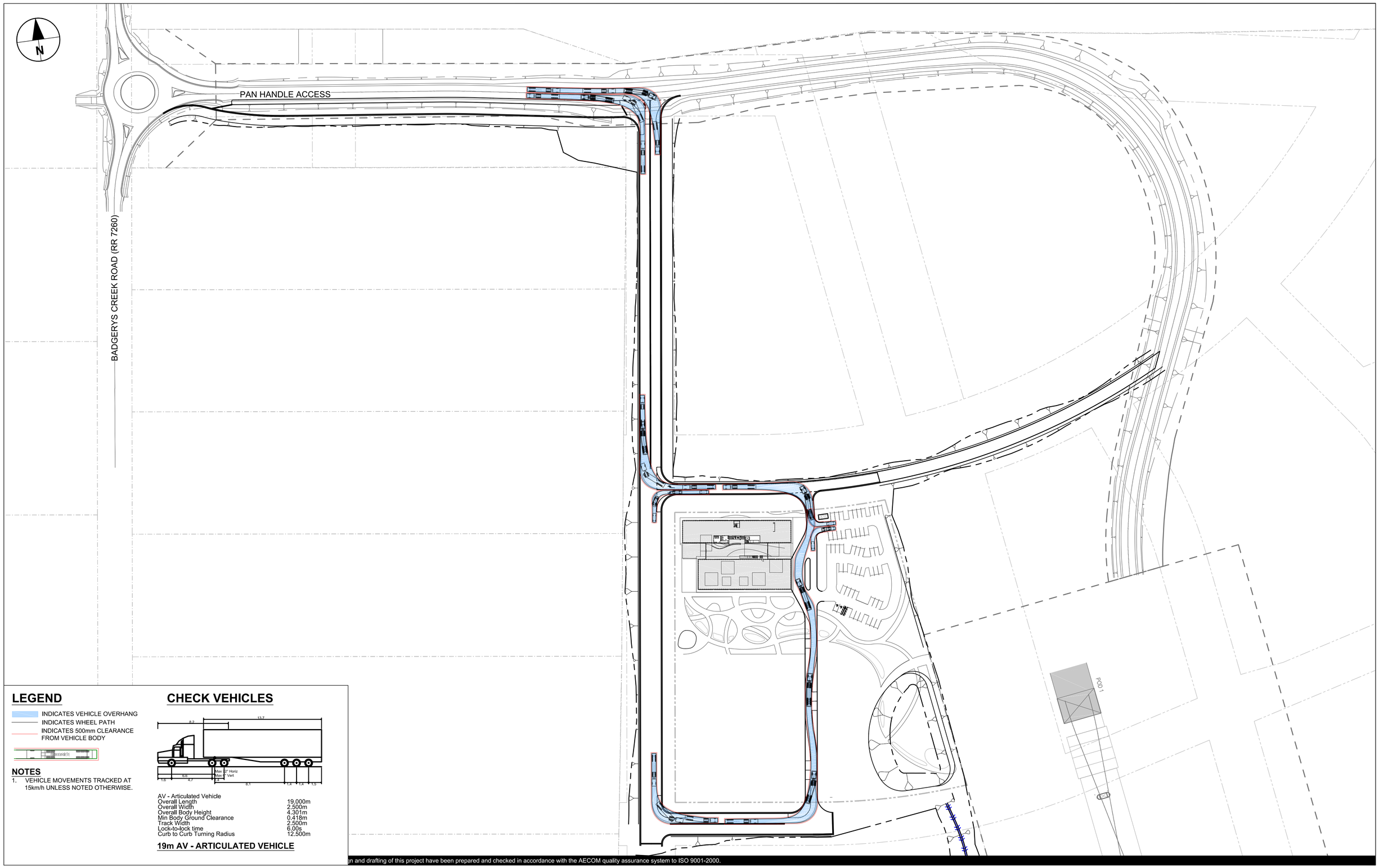
60646285

SHEET TITLE

TURNING PATH PLAN -
12.5m HRV

SHEET NUMBER

60646285-SHT-01-1000-CI-0971



LEGEND

- INDICATES VEHICLE OVERHANG
- INDICATES WHEEL PATH
- INDICATES 500mm CLEARANCE FROM VEHICLE BODY

NOTES

1. VEHICLE MOVEMENTS TRACKED AT 15km/h UNLESS NOTED OTHERWISE.

CHECK VEHICLES

AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

19m AV - ARTICULATED VEHICLE

AECOM

CONSULTANT

AECOM Australia Pty Ltd
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PROJECT

AEROTROPOLIS
CORE PRECINCT
BRINGELLY

CLIENT

NSW GOVERNMENT | Western City & Aerotropolis Authority

KEY PLAN

SCALE BAR

0 25 50 m
1:1000

SAFETY IN DESIGN INFORMATION

ARE THERE ANY ADDITIONAL HAZARDS / RISKS NOT NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING?

- ☐ NO
- ☐ YES

PROJECT MANAGEMENT INITIALS

-	-	-
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM		SURVEY	

ISSUE/REVISION

1		PRELIMINARY CONCEPT DESIGN
I/R	DATE	DESCRIPTION

PRELIMINARY

PROJECT NUMBER

60646285

SHEET TITLE

TURNING PATH PLAN
19m AV

SHEET NUMBER

60646285-SHT-01-1000-CI-0972

APPENDIX C

Consultation Minutes

Meeting minutes: First Building State Significant Development Application Agency Consultation

Project: First Building Traffic and Transport Assessment

Project Number: SCT_00270

Client: Western Parkland City Authority

Meeting Information	
Date and time	
30th September 2021 9:30AM to 10:30AM	
Location	
Microsoft Teams	
Attendees	
Andy Yung | SCT Consulting Jonathan Busch | SCT Consulting Esta Qiu | SCT Consulting Jeff Bannerman | Western Parkland City Authority Charles Wiafe | Liverpool City Council	Mark Ozinga | Transport for NSW Serena Li | Transport for NSW Pahee Rathan | Transport for NSW Zeliha Cansiz | Transport for NSW Nazia Pokar | Sydney Metro Hendrik Van Ieperen | Sydney Metro

Meeting minutes		
	Item	**Action**
1	**Introductions**	
2	- JB went through the draft Modelling Scoping Note. - A copy of the draft Modelling Scoping Note is provided to seek feedback from the stakeholder group for comment by next Thursday (7 October 2021).	All agencies
3	**Comments / feedback on modelling assumptions**	
	- Refer to RTA Guide to Traffic Generating Developments (2002) for pre-metro trip generation rate, more applicable for greenfields area - Include freight and heavy vehicles in modelling - Identify management strategies for potential congestion at Badgerys Creek Road roundabout (consider 10-year horizon)	SCT Consulting
	- Sydney Metro and Transport for NSW to source and provide SIDRA modelling files that were prepared for the Sydney Metro Aerotropolis EIS	Sydney Metro / TfNSW
4	**Comments / feedback on car parking**	
	- Adopt pre-metro and post-metro approach - Transition to reduced parking spaces for post-metro approach, in line with Aerotropolis DCP	SCT Consulting
	- Current proposed parking space adjacent to Metro corridor does not sit well with Metro corridor and station entrance. SCT to provide architectural plan of current concept design to Metro for comment.	SCT Consulting / WPCA

APPENDIX D

Green Travel Plan

First Building – Bradfield City Centre

Green Travel Plan

Prepared by: Adam Smith

Reviewed by: Jonathan Busch

12/11/2021 | version 2.0

What is a Green Travel Plan?

- A tool designed to address an organisation's travel needs and impacts and to provide measures and initiatives that encourages and supports sustainable travel alternatives for staff, students and their parents or guardians
- A **living document**, meaning it will change over time. This plan will requires ownership by stakeholders to be effectively implemented
- Green Travel Plans are commonly required for the granting of planning proposals across Australia. Their effectiveness can be dependent on communication, ambition, surrounding infrastructure and land-use zoning
- As the 'First Building' site is part of a greenfield development the listed initiatives will become more prevalent as the area grows in terms of people and buildings

The Green Travel Planning Process

- Establish relevant stakeholders to consult
- Set targets for the GTP and any limitations to be considered
- Appoint a green travel champion

- Review existing transport options available to the school
- Staff survey to determine current travel patterns

- Establish programs and initiatives based on data collection and background review
- Determine targeted audience, timeline and responsibility for each initiative

- Allocate responsible stakeholder / project teams to run individual initiative
- Establish program for the initiative
- Implement / run the initiative

- Ongoing monitoring of the program frequently during the first year
- Adjust / expand as necessary
- Once fully implemented, undertake annual reviews

Context

The First Building will experience significant changes as the Bradfield City Centre develops. As the first building, there may be a lag until there are other work places are up and running. The area surrounding the site will have construction activity, which will continue for many years.

The precinct will change significantly. The site currently has no access to public transport but will, by 2027, have a metro station within a short walk from the site. As the precinct is delivered, this site will be surrounded with some of the higher density parts of the aerotropolis.

With development will come new public transport as well as improved walking and cycling facilities.

It's important that as the surrounding land uses change, that travel behaviours do too. Importantly, around the time of the metro opening, this plan will need to be refreshed to take into account the new access available.

Organisational commitment

Organisational commitment is critical to the success of a green travel plan. Successful green travel plans tend to have:

- **Champions:** staff who are passionate and empowered to organise the activities in the plan
- **Funding:** sufficient budgets to achieve the agreed plan
- **Regular communication:** marketing for the initiatives in the plan helps to increase their profile to staff.
- **Supportive management:** when management regards sustainable travel as an organisational value and lead by example, staff are more likely to make changes.

The future occupant should make a commitment to the green travel plan.

Target setting

When the First Building is initially occupied, the surrounding land uses will be generally farmland and construction zones. During this phase, it is expected that staff will arrive to site by car. As Sydney Metro is delivered, staff will need to undergo a significant transition to more sustainable modes of transport, in line with the vision for the aerotropolis.

These targets are consistent with the planning process for the site.

Horizon	Car Mode Share	
	AM peak	PM peak
Pre-metro	100%	100%
Short-term (post-Metro opening)	65%	65%

Monitoring and Review

The occupant / building management will be responsible to implement a monitoring and review process for the success of green travel initiatives. This will comprise:

- **Annual staff travel survey:** NSW Government provides a template here for typical questions included in a survey.
- **Adjust targets based on historical performance:** not all plans work as intended. Adjust the targets so that they better align with the change that the organisation is seeing.
- **Adjust initiatives to improve effectiveness:** some initiatives are more successful than others at shifting behaviours. This can often differ from workplace to workplace – it's not a one size fits all. Updating plans on an annual basis helps ensure that the most effective policies are being implemented.

The green travel plan should be updated at least once per year to remain current.

Green Travel Planning Resources

- http://data.mysydney.nsw.gov.au/files/Travel+Plan+Toolkit.pdf
- http://data.mysydney.nsw.gov.au/files/Survey+methods+for+organisations.pdf
- https://www.cityofsydney.nsw.gov.au/development-guidelines-policies/travel-planning-guidelines (note that this is how the City of Sydney Council implements their policy – some elements are not required for First Building)
- https://www.connectmpid.com.au/ (inspiration – an example of transport management association)

Travel encouragement program opportunities

A suite of travel encouragement programs were evaluated to inform the final list of opportunities in the following pages:

Initiative	Yes/No	Reasons
Transport management associations	Yes (long term)	Effectiveness
Travel plan	Yes – this document	Effectiveness
Provision of bicycle parking and end of trip facilities	Yes (short term)	Effectiveness
Maximum parking provision	Yes (informed site planning)	Effectiveness
Traffic calming and speed reduction	Yes (informed site planning)	Effectiveness
Urban freight consolidation centres	No	Effectiveness
Provision of car share parking	Yes (short term)	Effectiveness
Alternative work schedules	No	Future occupants to evaluate if feasible
Active transport training and guides	No	No locations to walk to after building opens

Travel encouragement program opportunities

Initiative	Yes/No	Reasons
Carpooling program	Yes (short term)	Effectiveness
Combined travel behaviour programs	No	Future occupants to evaluate if feasible
Commuter financial incentives	No	Future occupants to evaluate if feasible
Education	No	Future occupants to evaluate if feasible
Journey planning tools	Yes (long term)	Effectiveness
Shuttle bus services	Yes (short term)	Effectiveness
Telework	No	Future occupants to evaluate if feasible
Wayfinding	No	No locations to walk to after building opens

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01

Initial opportunities

1. Carpooling

Overview:

- Staff living in similar areas could drive via a colleague's house to save on tolls and petrol.
- Staff could travel by train or bus to Liverpool and be picked up by a colleague who drives past on their way to work.
- Trips to off-site activities could be accommodated with staff sharing vehicles.

Investment:

- A comms channel (e.g. Teams chat channel) for staff to match with others in their area and plan trips
- Provide regular communications as management to encourage staff uptake.

Stakeholders:

- Staff
- Management

Evidence:

- A carpooling scheme implemented at a site in the UK reduced single occupancy trips by 28%*
- The introduction of carpooling at Macquarie Park saw a 20% reduction in commuting trips**

Photographer: David Emrich, unsplash.com

**Source: Making school travel plans work - Experience from English Case Studies (Carey Newson, Sally Cairns & Adrian Davis , 2010), carried out for the Department of Transport*

***Source: Cohop by Connect Transportation Management Association (2020)*

2. Car park management

Overview:

- Priority designated parking within the staff car park for carpooling or those with electric vehicles to encourage their uptake

Investment:

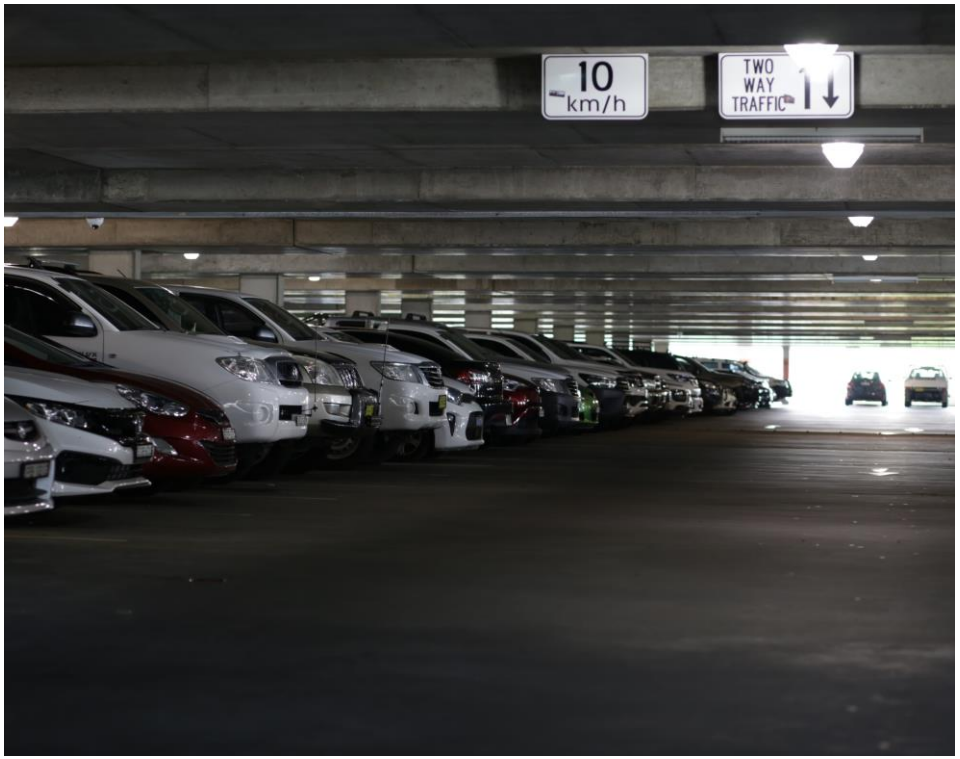
- Installation of electric charging points
- Signage for carpooling spaces

Stakeholders:

- Staff
- Management

Evidence:

- Active car park management maximises its efficiency and limits excess provision being provided



Photographer: David Emrich, unsplash.com

3. Provision of bicycle parking and end of trip facilities

Overview:

- The site has secure bicycle parking and end of trip facilities which enable staff to both cycle to site.
- The site is approximately a 10km cycle from Leppington Station. For some experienced cyclists, this journey could form part of their fitness regime.

Investment:

- Ongoing cleaning

Stakeholders:

- Staff
- Management

Evidence:

- A lack of secure bicycle parking is regarded a barrier to the uptake of cycling. Increasing the rate of cycling is linked to increased health, economic and environmental benefits*

Photographer: David Emrich, unsplash.com

**Source: Bauman, A., et al (2008) Cycling: getting Australia moving – barriers, facilitators and interventions to get more Australians physically active through cycling*

4. Precinct-wide shuttle

Overview:

- As the precinct develops, there's a potential for a shuttle service from Liverpool or Leppington Stations.
- By itself, First Building likely won't have enough staff to justify a shuttle service, but in connection with other future employers, there could be sufficient demands for a shuttle.
- The shuttle could also help with construction worker access for the metro and road projects in the area.

Investment:

- Contribution to shuttle service

Stakeholders:

- Management
- Other businesses

Evidence:

- Service coverage is an important predictor of public transport uptake. Without the option, employees will predominately travel by car.

Photographer: SCT Consulting

02

Opportunities after metro opens

5. Removal of temporary car parking spaces

Overview:

- As part of the planning process, within 12 months of the opening of Sydney Metro Western Sydney Airport, the car park needs to reduce to a total of 18 parking spaces. Other spaces should be made inaccessible (e.g., via fencing or bollards).
- Staff will need support for the transition. With the years of operating with more car parking supply, staff will have planned their lives around the ability to drive to site.

Investment:

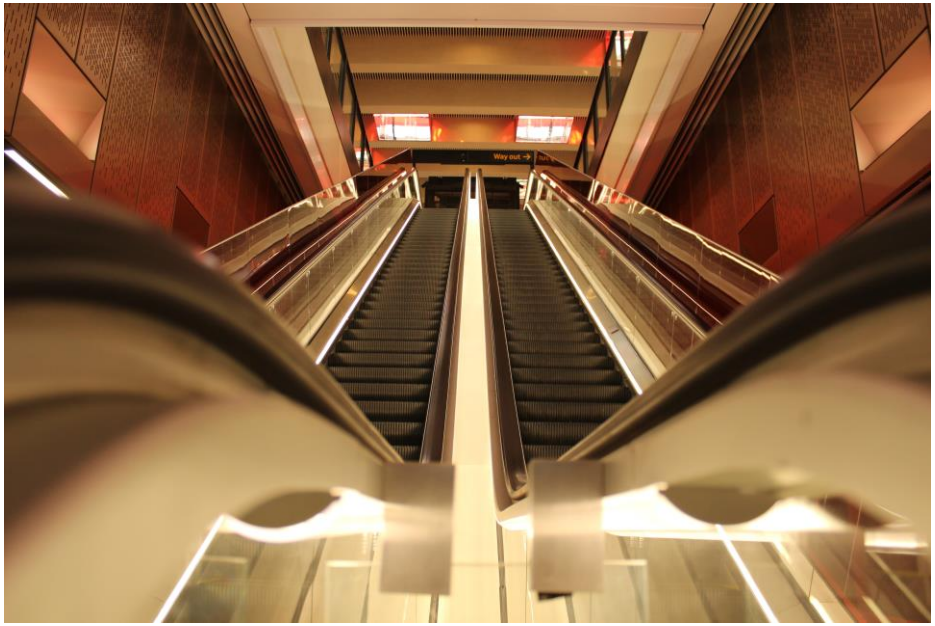
- Capital cost of making 33 parking spaces inaccessible.

Stakeholders:

- Staff
- Management
- Department of Planning, Industry & Environment

Evidence:

- This is expected to be required under the planning conditions, so isn't optional.
- Evidence shows that parking supply is one of the strongest predictors of car driving. This change will support transition to sustainable modes in line with the vision of the aerotropolis.



Source: SCT Consulting

6. Provision of a Travel Access Guide (TAG)

Overview:

- Prepare a Travel Access Guide (map with descriptive text) that provides information for staff with the most sustainable to access the site.
- It may be helpful to have maps of other parts of the network, not just around the site, so staff are aware of alternative access points to the public transport network.

Investment:

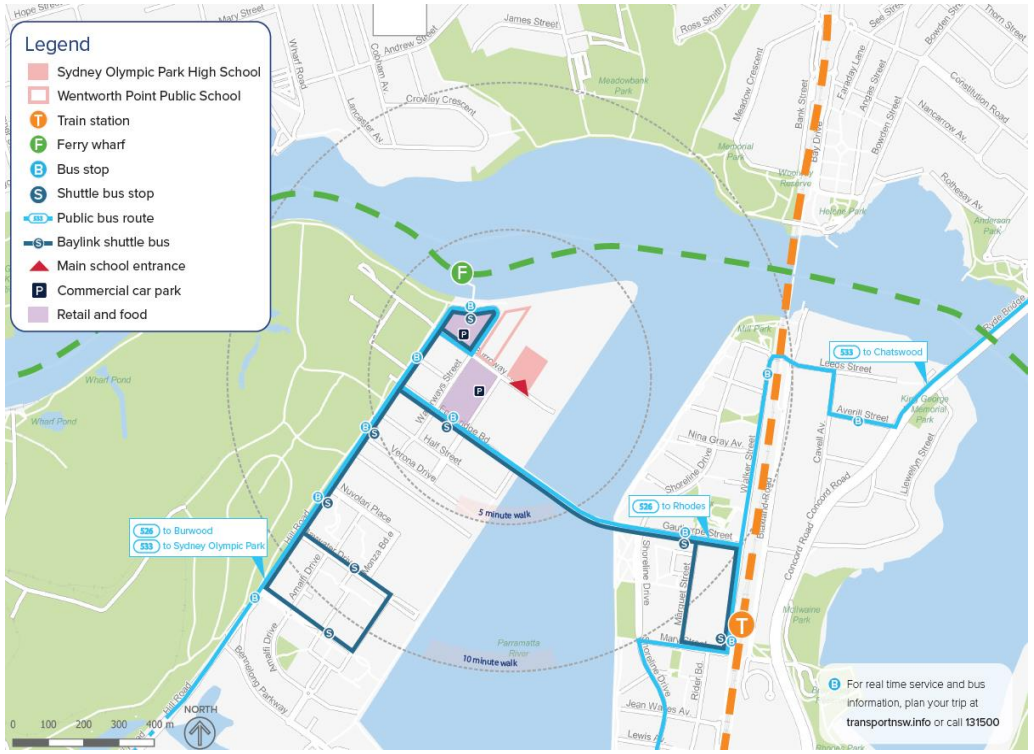
- Staff administration (1–2 days)
- Cost of printing (if required)

Stakeholders:

- Staff
- Management

Evidence:

- A TAG clearly communicates public transport services, walking distances and crossing points in a map format which is easy to interpret



Source: Department of Education / SCT Consulting

7. Travel Management Associations (TMA)

Overview:

- Transportation Management Associations are often public-private partnerships, formed by businesses with council and government support.
- A Transportation Management Association would work with its members to address transport issues through area-wide policy initiatives and pooling of resources

Investment:

- Staff administration to coordinate with other companies in the area – The role may be done by a dedicated Travel Management Association

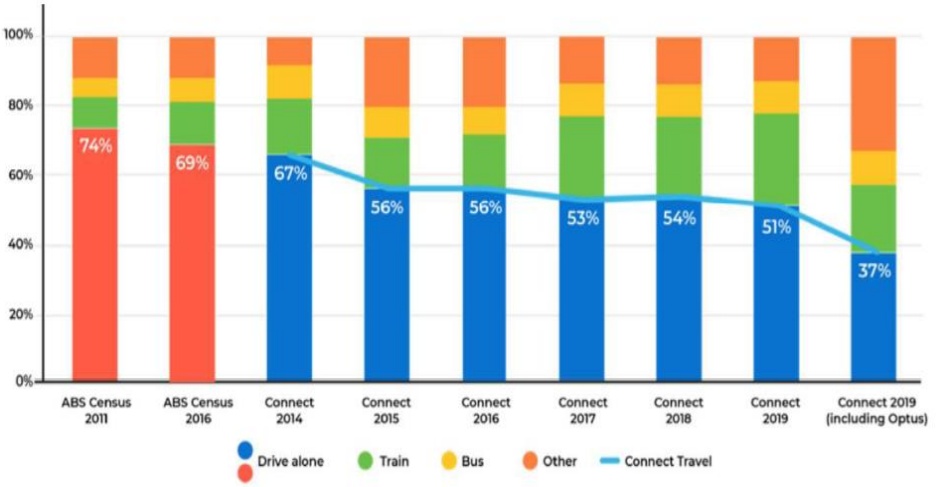
Stakeholders:

- Employers
- Staff
- Public sector organisations

Evidence:

- Has been successful in reducing congestion and parking need at Sydney Corporate Park and Macquarie park*

***Results of the introduced of Connect TMA at Macquarie Park**



Source: Cohop by Connect Transportation Management Association (2020)

Thank you

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