Mirvac

Aus Tech Park

Precinct Pedestrian Planning

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Contents

1 Introduction

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning and Environment pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Mirvac Projects Pty Ltd (Mirvac) is seeking to secure approval for the urban regeneration of the Australian Technology Park (ATP), including the redevelopment of three car parking lots within ATP for the purposes of commercial, retail and community purposes, along with an extensive upgrade to the existing public domain within ATP. Building heights of 4, 7 and 9 storeys are proposed across the 3 development lots.

Australian Technology Park (ATP) has been continuously developed since its establishment in 1996, but has been underutilised as a technology and business precinct for quite some time. UrbanGrowth NSW Development Corporation (UGDC) has actively encouraged new development and employment opportunities at the Park for the past 15 years, and Mirvac intends to continue upon this and deliver upon the precinct's full potential, with the development of circa 107,400sqm for employment uses, which will facilitate the employment homes of an extra 10,000 staff everyday within ATP by development completion.

1.1 Background

Mirvac has been announced by UrbanGrowth NSW as the successful party in securing ownership and redevelopment rights for the ATP precinct, following an Expression of Interest (EOI) and an Invitation to Tender (ITT) process which commenced in 2014. Mirvac has also secured the Commonwealth Bank of Australia (CBA) as an anchor tenant for the development and intends to immediately commence the urban regeneration of this precinct through the lodgement of this SSDA. CBA's commitment to the precinct is in the form of one of the largest commercial leasing pre-commitments in Australian history, occupying circa 95,000 square metres of commercial, retail, community and childcare NLA, which will house circa 10,000 technology focused staff by 2019 and 2020. Mirvac's redevelopment goes well beyond the development on the 3 development lots, as it includes the regeneration of the public domain within ATP, the addition of retail to activate the precinct and also the provision of community facilities such as a community centre, a gym and 2 x 90 child childcare facilities.

1.2 Site Description

The ATP site is strategically located approximately 5km south of the Sydney CBD, 8km north of Sydney airport and within 200m of Redfern Railway Station. The site, with an overall area of some 13.2 hectares, is located within the City of Sydney local government area (LGA). Refer to Figure 1 below for a graphic representation of the site location and context.

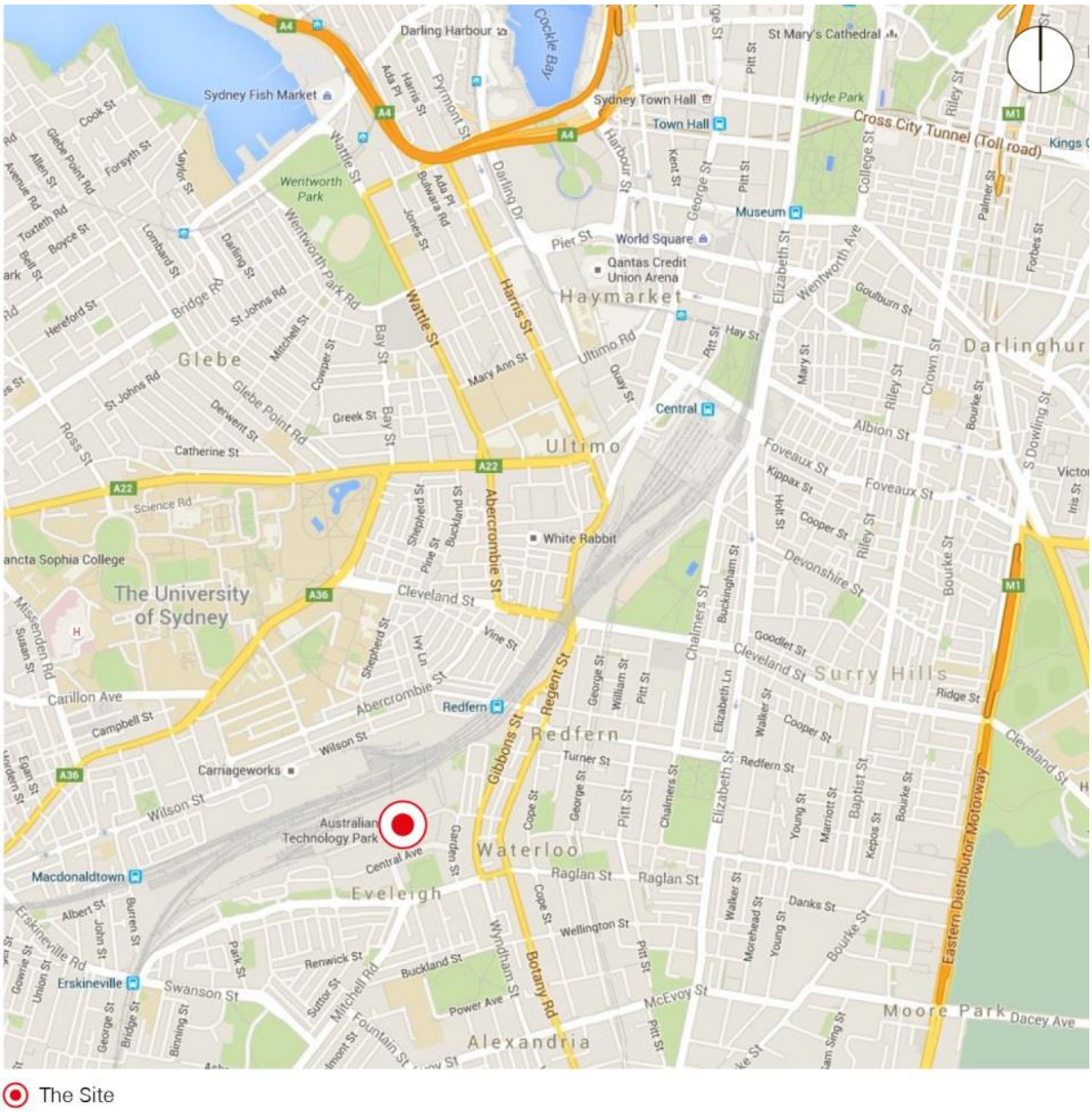

Figure 1 - Site Location

Three key sites remain undeveloped within the ATP site and are presently used for at-grade worker and special event car parking. These sites are:

- Lot 8 in DP 1136859 – site area circa 1,937m^2;
- Lot 9 in DP 1136859 – site area circa 8,299m^2; and
- Lot 12 in DP 1136859 – site area circa 11,850m^2.

Figure 2 provides an aerial image of the ATP site along with identifying the three development sites.

The SSDA works boundary excludes the Locomotive Workshop. Future development associated with the adaptive re-use of the Locomotive Workshop will be the subject of separate future applications.

Figure 2 - Site Context

1.3 Overview of Proposed Development

The development application seeks approval for the following components of the development:

- Site preparation works, including demolition and clearance of the existing car parking areas/ancillary facilities and excavation;
- Construction and use of a 9 storey building within Lot 9 (Building 1), comprising of parking, retail, commercial and childcare uses;
- Construction and use of a 7 storey building within Lot 12 (Building 2) comprising of parking, retail and commercial uses;

- Construction and use of a 4 storey community building within Lot 8 (Community Building) comprising of gym, retail, community, commercial and childcare uses;
- Extensive landscaping and public domain improvements throughout the precinct for the benefit of the local community; and
- Extension and augmentation of physical infrastructure/utilities as required.

A more detailed and comprehensive description of the proposal is contained in the Environmental Impact Statement (EIS) prepared by JBA.

1.4 Planning Framework

State Environmental Planning Policy (SEPP) Major Development 2005 is the principal environmental planning instrument applying to the ATP. Schedule 3, Part 5 of the Major Development SEPP sets out the zoning, land use and development controls that apply to development on the Site.

As the development has a capital investment value of more than $10 million it is identified as State Significant Development under the *State Environmental Planning Policy (State and Regional Development) 2011*, with the Minister for Planning the consent authority for the project.

1.5 Objective

The purpose of this report is to describe the findings of the precinct level pedestrian analysis for the ATP. Figure 3 shows the draft precinct plan.

As defined by Mirvac, the objectives are to:

- Identify and analyse key pedestrian desire lines to the surrounding areas and links to Redfern Railway Station;
- Determine the adequacy of pedestrian and cycle facilities to meet the likely future demand of the proposed development and give considerations of measures to be implemented;
- Demonstrate the pedestrian circulation, accessibility and connections on site and to surrounding streets in a schematic form;

Figure 3 - Precinct Plan, December 2015

2 Pedestrian Desire Lines

Identify and analyse key pedestrian desire lines to the surrounding areas and links to Redfern Railway Station.

2.1 Peak Hour Demand

The total office population across the three buildings is 12,600 people. This is based on an assumed density of $8m^2$ per person as directed by Mirvac. The demand has been attributed to a peak hour by applying percentage arrivals from similar types of offices. Using data derived from a major bank in Sydney's CBD, a factor of 55% has been applied to derive the AM peak 1-hour flow. Applying this percentage, it is therefore assumed that 6,930 people arrive at either Building 1, 2 or 3 in the ATP during the peak hour. It has been assumed that the demand for the gym, retail, child care and community building will be outside the AM peak hour and will therefore not impact the peak demand.

2.2 Mode Share

Staff and visitors will arrive to the site from a number of locations based on their primary transport mode. The following modes are considered:

- Private Car (including as passenger)
- Train
- Bus
- Ferry/Tram/Other
- Bicycle
- Walk

Those arriving by private car and bicycle are assumed to use one of the spaces within the building that they are working, everyone else will arrive to the area on foot. The mode share has been used to estimate the origins of those arriving on foot. Table 1 shows the estimated mode share based on the following assumptions.

Private Car

It is assumed that only staff that have access to an on-site car space will drive to site. It is also assumed that all car spaces are occupied. Based on BTS journey to work data for the ATP travel zone, there is an assumed vehicle occupancy of 1.1 people per vehicle. Given that there are a total of 706 car parking spaces, there will be a total of 777 people who get to the site by private car, representing 6% of the buildings population. It is recognized that this is low compared to traditional private vehicle mode share, however there is very limited on-street and off street parking available within 1km of the site.

Bicycle

It is assumed that all of the 606 bicycle spaces (in the end of trip facilities) are utilised, representing 5% of the buildings population.

Walk

'Journey to work' (JTW) data prepared by BTS has been analysed for Travel Zone 222, which encompasses the entire ATP precinct. The data shows that 8% of people working in Travel Zone 222 completed their trip from home entirely by walking. This rate is adopted for the two CBA buildings.

Public Transport

Public transport makes up the remainder of the mode share after the private car and active transport modes are estimated, equating to 81%. The JTW data has been used to identify the breakdown in public transport modes for trips made to the subject site. Of the three public transport modes, train comprised 64% of trips, bus 27% and ferry/tram made up the last 8%. These proportions have been scaled down pro rata so that they sum to 81%.

Table 1 shows the assumed mode share for Buildings 1, 2 and 3, and the peak 1-hour demand.

Mode	Proportion	Peak 1-hour demand (ppl)
Private Car (including as passenger)	6%	430
Train	52%	3,600
Bus	22%	1,500
Ferry/Tram/Other	7%	450
Bicycle	5%	330
Walk	8%	550

Table 1 Assumed mode share

2.3 Distribution and Desire Lines

The desire lines for the staff and visitors arriving by foot have been developed based on the point at which they join the surrounding street network, and the shortest path to their destination. The desire lines of users to Building 3 are very similar to Building 1 due to the close proximity of the two building entry locations. All Building 3 demand is included in the Building 1 desire lines.

All of the people arriving by train are assumed to use Redfern Station to the north. Access between the station and ATP is via the south end of Platform 10, near the corner of Cornwallis Street and Marian Street.

It is understood that the future Sydney Metro project includes a station at Waterloo. This would have an impact on the distribution, and is discussed in Section 3.2. In summary, the scenario without Waterloo station is the worst case for pedestrian flows into the ATP site, and is the basis of the following analysis.

All of the people arriving by bus are assumed to be on one the services travelling north-south along Wyndham St and Botany Rd. For building 1, bus users are assumed to get off at the Henderson Road stops. For building 2, bus users are assumed to get off at the Boundary St stops.

The Ferry/Tram/Other users are assumed to have arrived from the north near Central Station. These people could either walk south towards Redfern Station/ATP or catch a train one stop from Central to Redfern, either way they are assumed to arrive via Redfern Station.

Pedestrians travelling entirely on foot from their household are distributed to the surrounding neighbourhoods. The BTS 'Travel Zone Explorer' has been used to assess the future workforce population in the areas surrounding the ATP site. The assessment considered the proportion of people living north, east, south and west of the site, and then distributed the population pro rata.

It is understood that consideration is being given to providing a pedestrian crossing of the rail lines adjacent to the ATP site. The location of the bridge is yet to be confirmed, but the design of the site allows flexibility to accommodate this potential new desire line wherever it is positioned. The worst case scenario would be at a location near Redfern Station, thus maximising the pedestrian on the desire line from the north east of the site. Alternatively if the bridge is located west of the Locomotive Workshops, the upgrade of Village Square as per Aspect's public Design Report provided with the SSDA shows an increased level of provision. This is considered to be appropriate to cater for the north-south pedestrian movement.

Figure 4 shows the desire lines from each of the modes that arrive on foot to Buildings 1 and 2. It also shows the 1-hour AM peak volume from each mode. The desire lines have been created assuming pedestrians choose the shortest route possible.

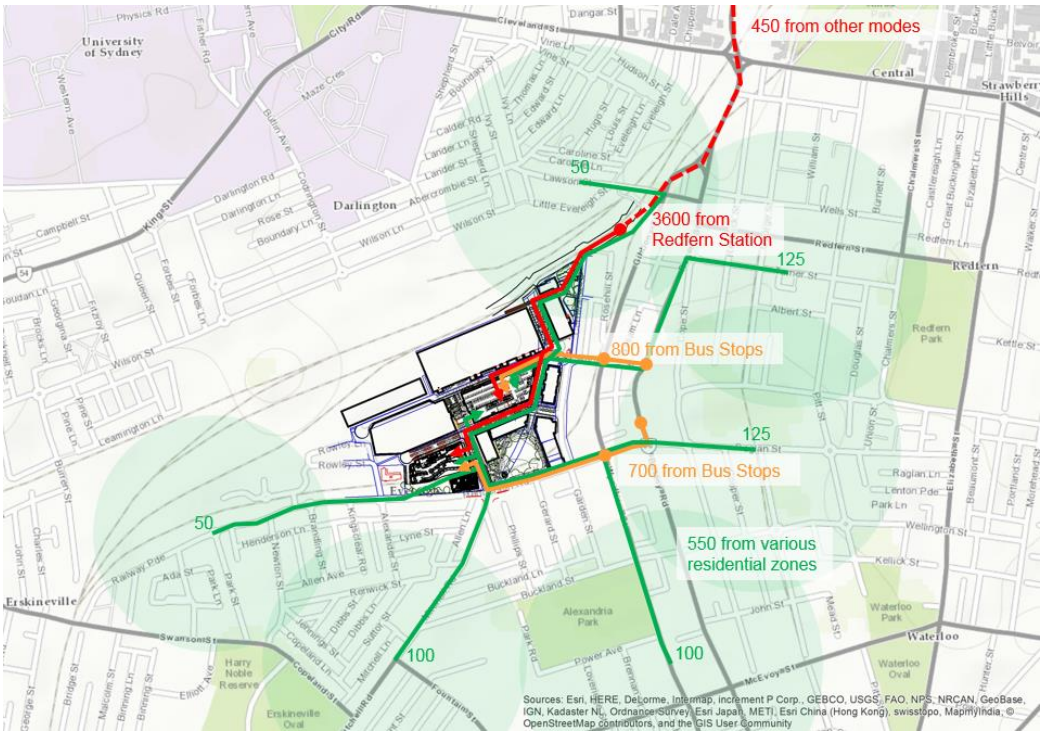

Figure 4 - Pedestrian Desire Lines - AM peak 1-hour demand

Figure 5 consolidates the desire line information for each mode provided in Figure 4 and shows the total estimated pedestrian demand on the various links within ATP. These demand values represent the demand generated by Buildings 1, 2 and 3 only, and do not consider demand generated by other building such as the Media City, NICTA, etc. The next stages of the pedestrian planning assessment will include a review of the existing pedestrian demand on these links, and consider how the total future demand will be accommodated by the footpath infrastructure. The figure shows that the busiest links are those that connect to Redfern Station as this is the primary transport mode.

It is noted that the pedestrian links are being upgraded as part of a strategic review within the public domain.

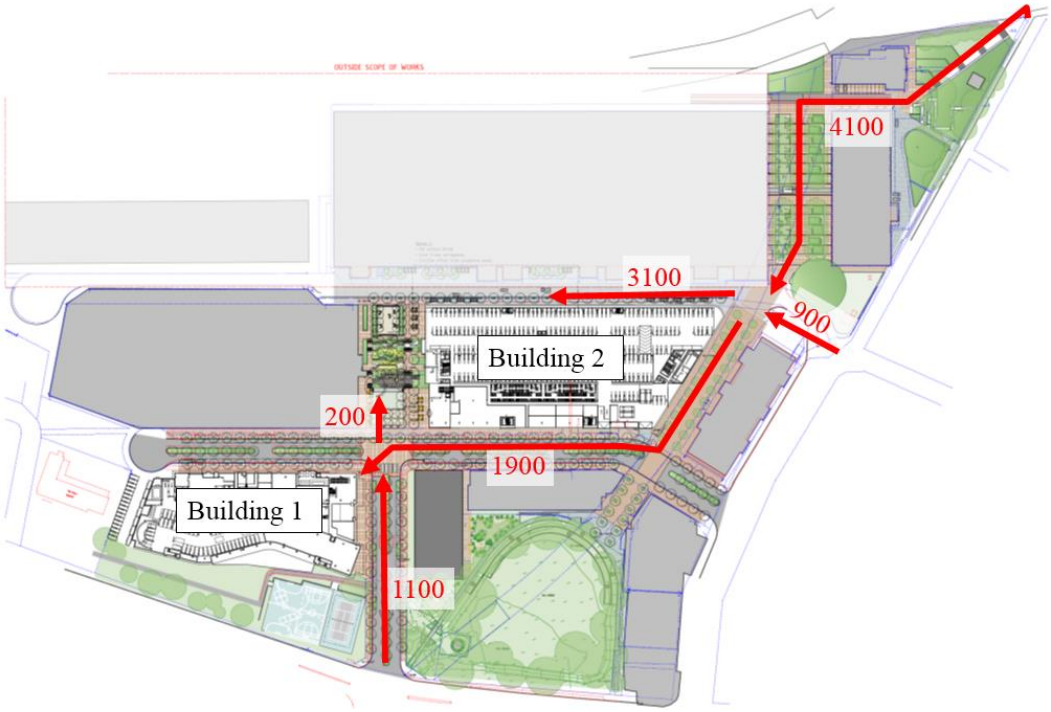

Figure 5 – Building 1 and 2 Pedestrian Flows on Precinct Streets, AM Peak 1-hour

3 Pedestrian Facilities

Determine the adequacy of pedestrian and cycle facilities to meet the likely future demand of the proposed development and give considerations of measures to be implemented.

3.1 Pedestrian Links

The pedestrian assessment is based on the Fruin Level of Service (LOS) principles (Fruin, 1971), which are internationally used and recognised. The principles are based on research into how much space is required per person to allow a certain level of comfort. This can be summarised as LoS A, which represents a comfortable LoS where free movement is possible and pedestrians do not interrupt each other's movement, through to LoS F where a breakdown of flow may occur.

Level of Service criteria for pedestrians are described in Figure 6 below. The target LOS for public realm spaces such as those within ATP is LOS A/B, which is defined as having pedestrian flows up to 23 people per minute per metre. Levels of Service B and C will operate with minimal delays but will be more congested and a lower amenity for pedestrians. LOS D will begin to see difficulties manoeuvring, while LOS E and F will be severely congested with delays and queuing expected.

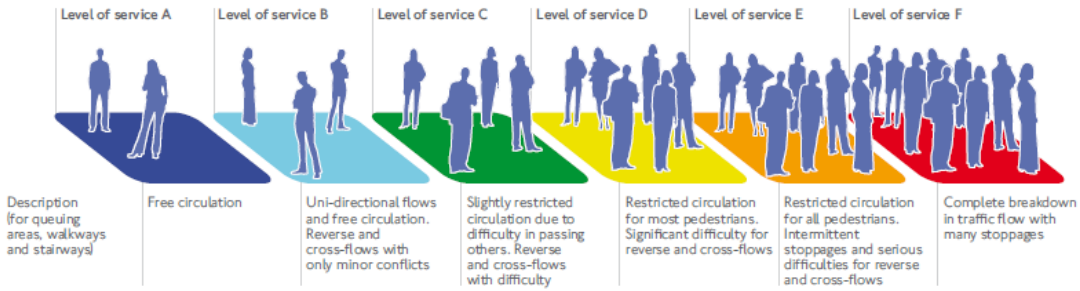

Figure 6: Fruin Level of Service Criteria (Walkways)

The peak 1-minute flow on the footpath network has been estimated by factoring the peak 1-hour demand. It is assumed that the peak 15-minute flow equals 30% of the peak hour, which is based on historical data and gives practical guidelines for transit behaviour. The peak minute is assumed to equal 10% of the peak 15 minutes. This represents surges in arrivals as a result of trains and buses schedules, and the pulsing of arrivals from signalised crossings. The surge factor equates to an uplift of 50% compared to a scenario without surges. The peak 1-minute flows are shown in Figure 7. As can be seen from the figure, all of the pedestrian flows associated with buildings 1 and 2 are unidirectional. This will minimise pedestrian conflicts and improve the level of service.

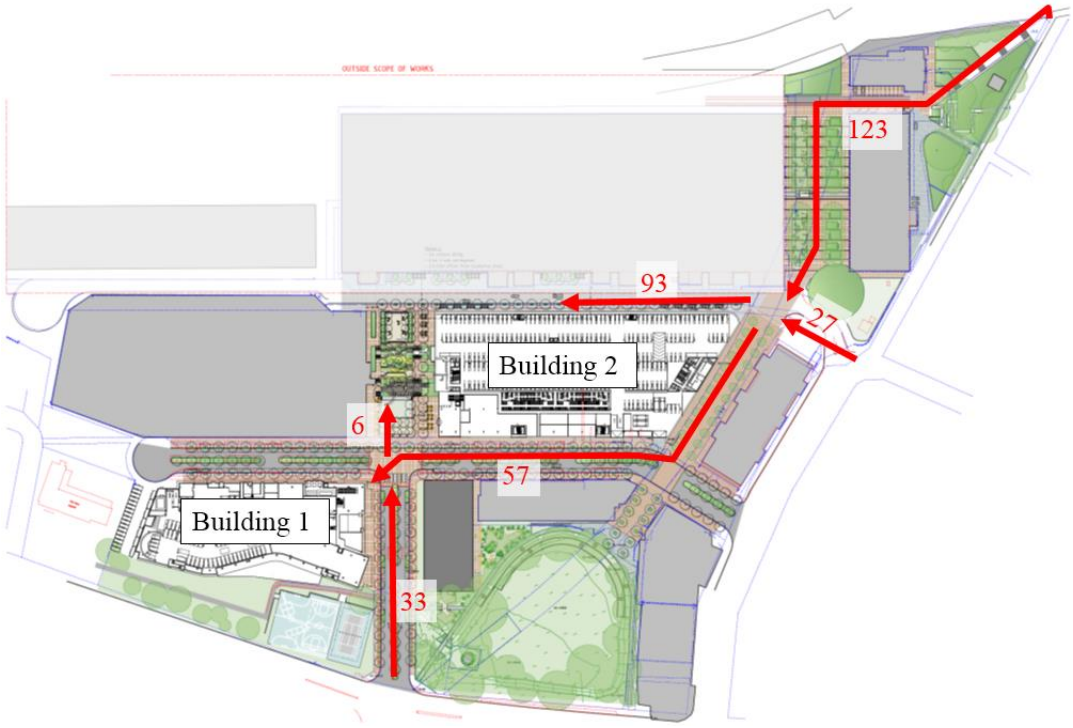

Figure 7 - Building 1 and 2 Pedestrian Flows, 1-minute peak flow

Figure 8 shows the LOS on each pedestrian link in the ATP precinct, under the demand from Buildings 1 and 2. Other than Locomotive Street, at links with footpaths on both sides of the road, it is assumed that each footpath carries 50% of the demand. It is assumed that all pedestrians on Locomotive Street will use the south side of the road as they will be accessing Building 2. The width of the southern footpath on Locomotive Street is assumed to be 3m, which takes into account the proposed on-path tables and chairs associated with the Building 2 retail.

The results show that the majority of the pedestrian links will operate within LOS A.

The link in the north east corner of the site that leads to Redfern station is shown to operate at LOS B. Given that it is adjacent to the station, there is an expectation that it may be busier than an open environment, and LOS B would be acceptable in this location. In addition, the public realm access to Redfern Station is being upgraded, see Aspect's Public Domain Report provided with the SSDA. This will enhance the entrance experience and access to the Station.

Locomotive Street, north of Building 2 is shown to operate at LOS B. LOS B is marginally busier than desired but given the unidirectional nature of the flow it is expected to be satisfactory. In addition, the performance is based on the width of the footpath at its narrowest point, which is 3m. LOS A will be achieved along any stretches of the footpath that are at least 4.1m wide. The clear footpath width on the south side of Locomotive Street varies from 3m to 7m, and will therefore operate at LOS A and B, at various locations.

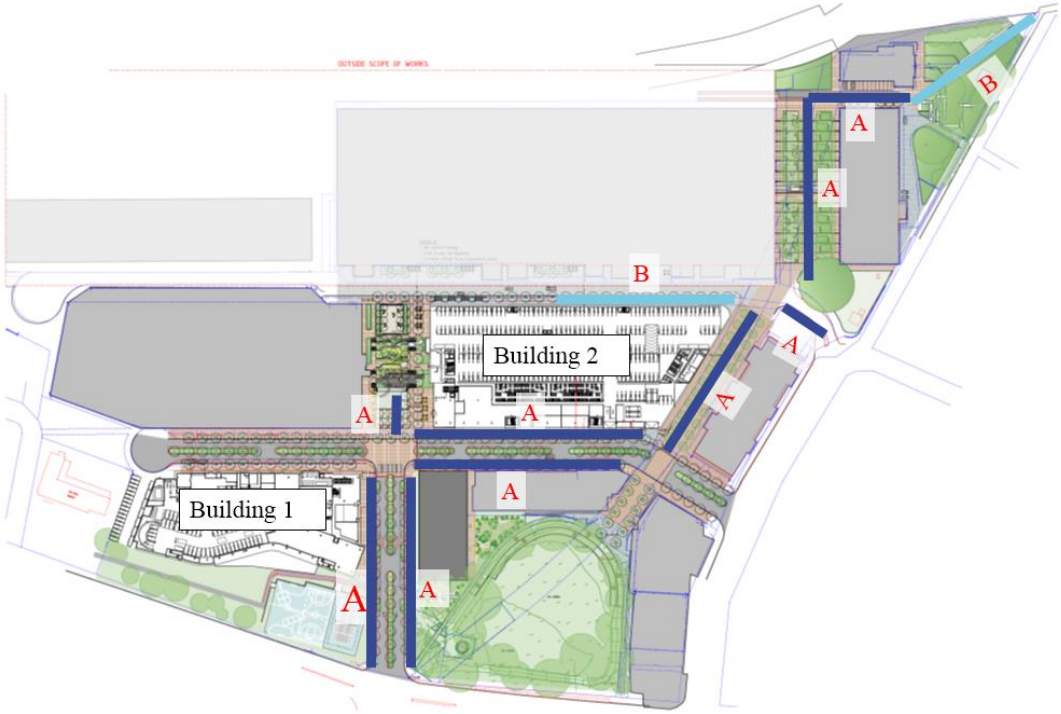

Figure 8 - LOS on links based on Building 1 and 2 demand, AM Peak

3.2 Pedestrian interaction with bicycles

Bicycle access to Buildings 1and 2 is provided via Central Avenue as shown in Figure 9. The desire lines to these car parks is also shown in the Figure. These desire lines show that all bicycles travelling to the bicycle facilities are expected to travel on the roads, and therefore ride within the carriageway. This results in negligible amount of interaction between pedestrians and bicycles on shared paths. The primary interactions will occur at the intersections, in these instances bicycles operate similarly to cars and must give way to pedestrians where required. Therefore the interaction of pedestrians and bicycles is not expected to impact the design requirement of the footpaths and shared paths.

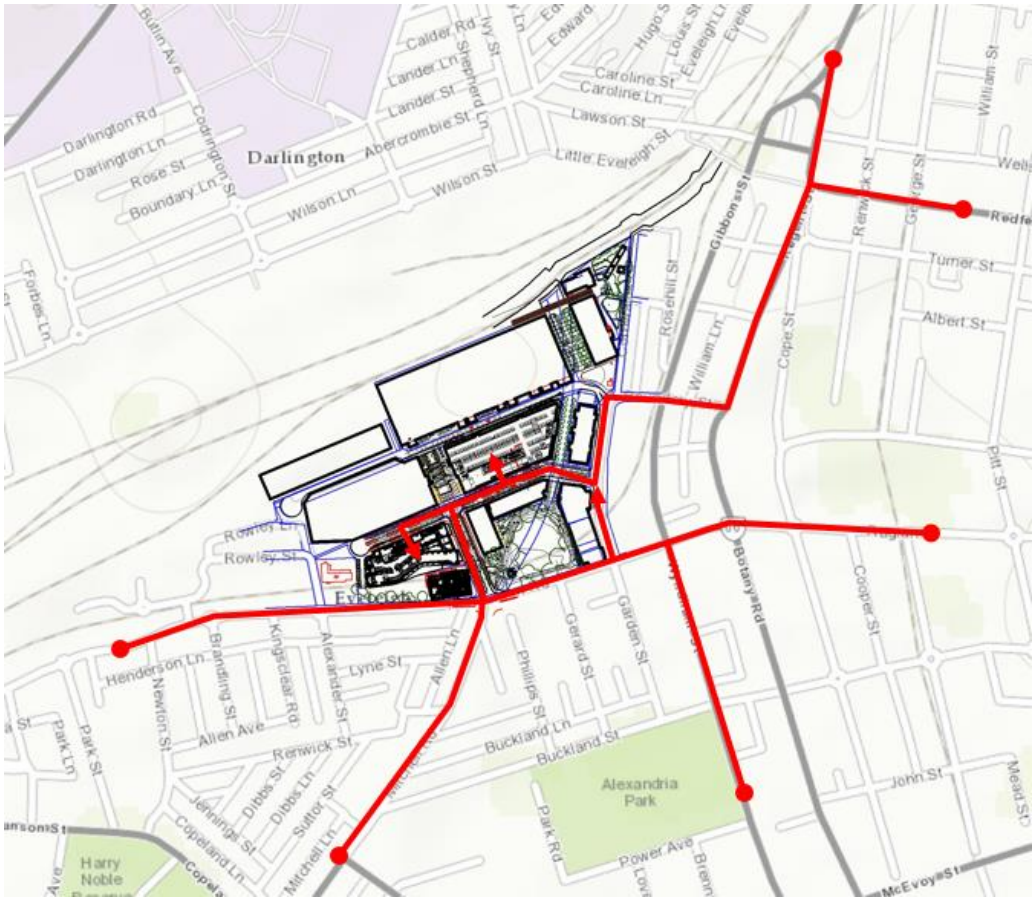

Figure 9 - Bicycle access to Buildings 1 and 2

3.3 Impact of Sydney Metro

The Sydney Metro project includes a station at Waterloo. A station at Waterloo would alter the travel patterns of a number of the train users to ATP. Figure 10 shows the desire lines from Waterloo Station, assuming pedestrians use the streets with minimal gradient. A shift in train demand from Redfern Station to Waterloo station will take pressure off the link from Redfern Station, and transfer that to Davy Street. The combined footpath width on Davy Street is 5.7m, which provides enough width to cater for 90% of the train demand transferring to Waterloo station, while maintaining LOS A. The transfer of train passengers to Waterloo Station would also take pressure off Locomotive Street, Mitchell Way and Central Avenue. Therefore it is considered that the scenario without Sydney Metro Waterloo Station is the worst case, and has been used for the assessment. However the current proposal for Sydney Metro will have an improvement on the ATP network by distributing the train arrivals to alternative footpaths.

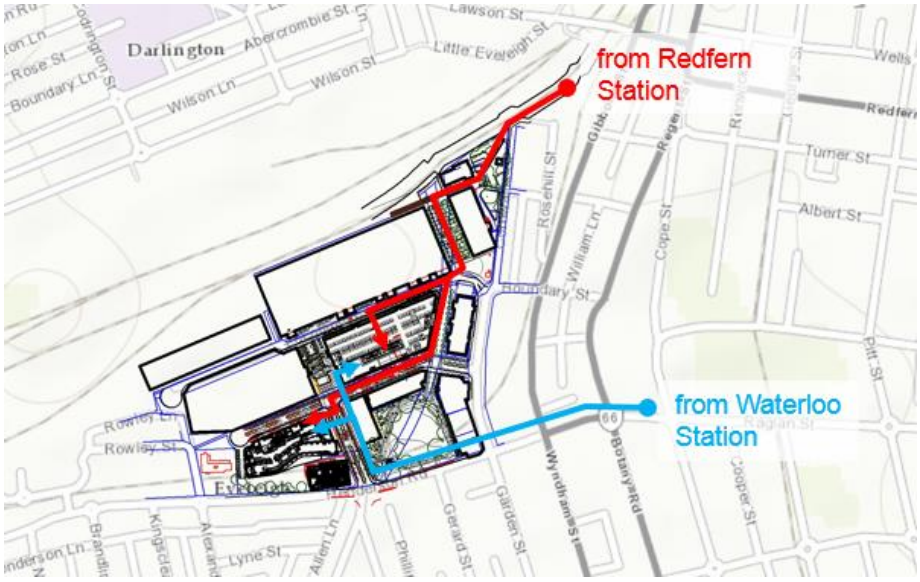

Figure 10 - Desire lines from Waterloo Station

3.4 Intersection Treatments

Three intersections within the ATP precinct are proposed to be modified as part of the public realm works. In each case the architect has proposed that the intersections include raised pavement that is flush with the footpath. Zebra crossing markings are provided at all locations.

Figure 11 shows the proposed treatment at the intersection of Locomotive Street and Mitchell Way. The key desire line is from Innovation Plaza (from Redfern Station). Pedestrians on the desire line have priority over vehicles. The crossing is delineated by bollards and the zebra crossing markings.

A traffic engineering assessment of the impact of providing pedestrian priority should be undertaken to ensure that the high number of pedestrians do not cause excessive queuing for vehicles on Locomotive Street towards Garden Street.

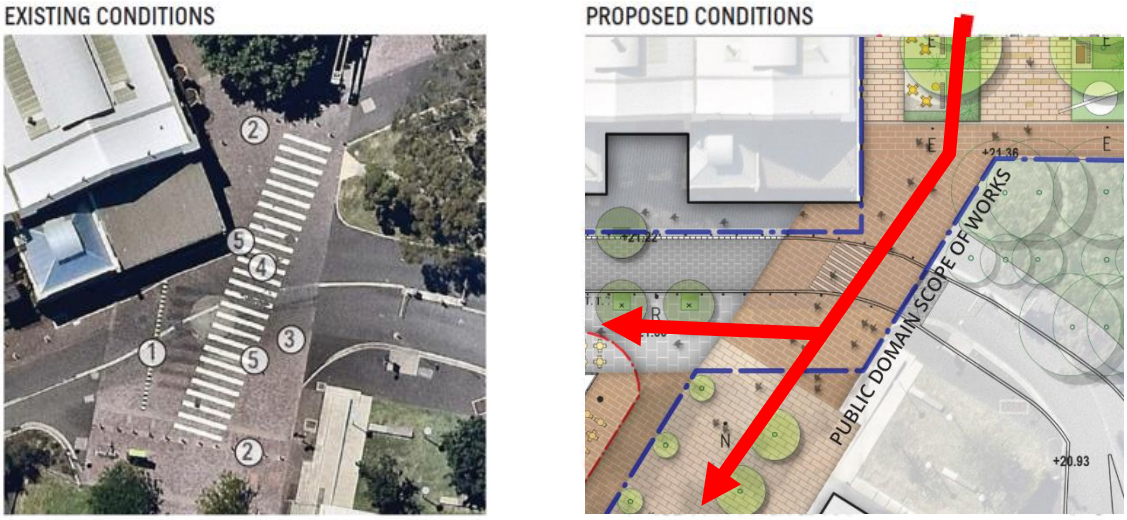

Figure 11 - Locomotive St/Mitchell Way Intersection treatment

Figure 12 shows the proposed treatment at the intersection of Central Avenue and Mitchell Way. The key desire line is from Mitchell Way (from Redfern Station). Pedestrians on the desire line have priority over vehicles. The crossing is delineated by the kerbs and zebra crossing markings.

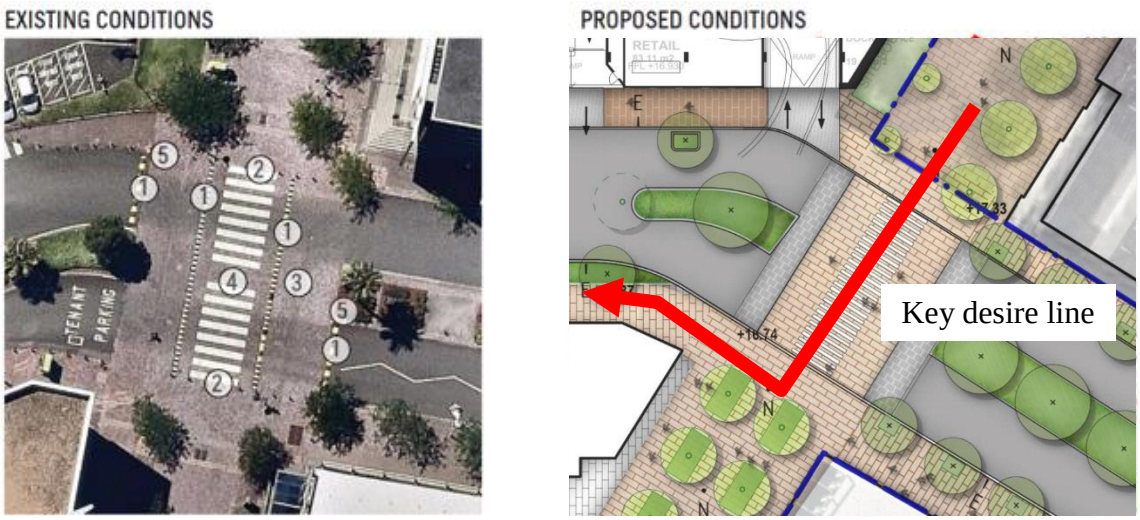

Figure 12 - Central Ave/Mitchell Way Intersection treatment

Figure 13 shows the proposed treatment at the intersection of Davy Road and Central Avenue. The key desire line is from either side of Central Avenue to Building 1, including a diagonal movement across the intersection. Pedestrians on the desire lines have priority over vehicles. Pedestrians on the diagonal desire line are likely to use the western crossing of Central Avenue to avoid having to cross Davy Street. The crossing is delineated by kerbs and the zebra crossing markings.

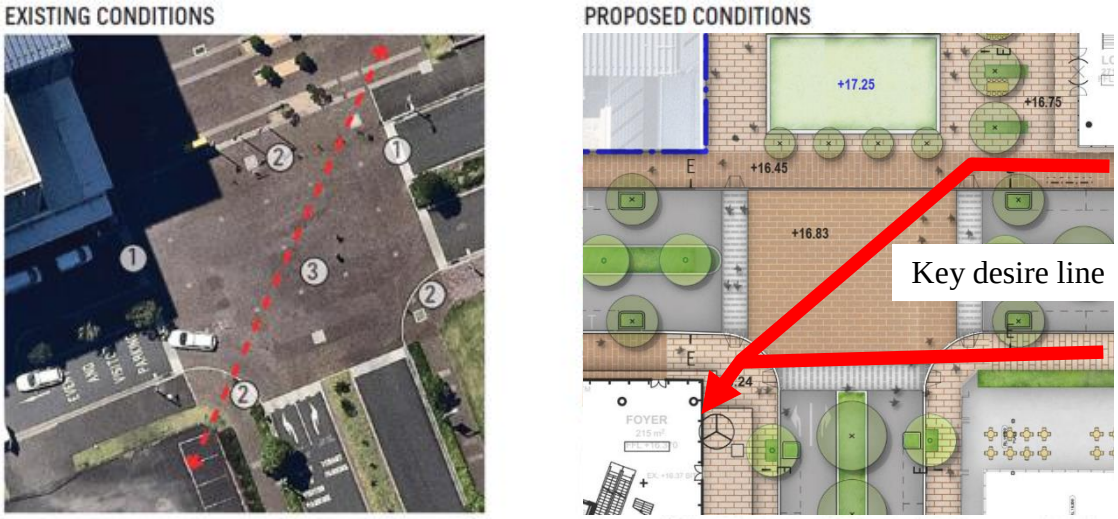

Figure 13 - Davy Rd/Central Ave Intersection treatment

4 Pedestrian Circulation and Accessibility

Demonstrate the pedestrian circulation, accessibility and connections on site and to surrounding streets in a schematic form.

The accessibility and circulation within the site and to the external street network has been assessed with consideration to grades and crossing priority. Figure 14 shows the accessibility and circulation assessment. This assessment highlights the accessibility of the site for people with a mobility impairment and also shows the paths with higher degrees of pedestrian priority.

The topography of the site leads to a number of the north-south paths having a gradient between 1:17 and 1:25. The key desire line from Redfern Station follows a path that includes steps at the north east corner of the site. To avoid these steps, people with a mobility impairment will be able to use a new ramp system that provides a DDA compliant series of ramps between Innovation Plaza and Cornwallis Street.

Village Square to the west of Building 2 includes terraced levels, and does not include any ramp access between the levels. However, there is an existing public lift that provides outdoor access between the levels.

For staff/visitors in Building 1 and 3 who want to get to Locomotive Street and avoid the streets with gradients above 1:25, they could use the vertical transport within Building 2, or the public lift in Village Square.

In summary, all three buildings are accessible from all external locations.

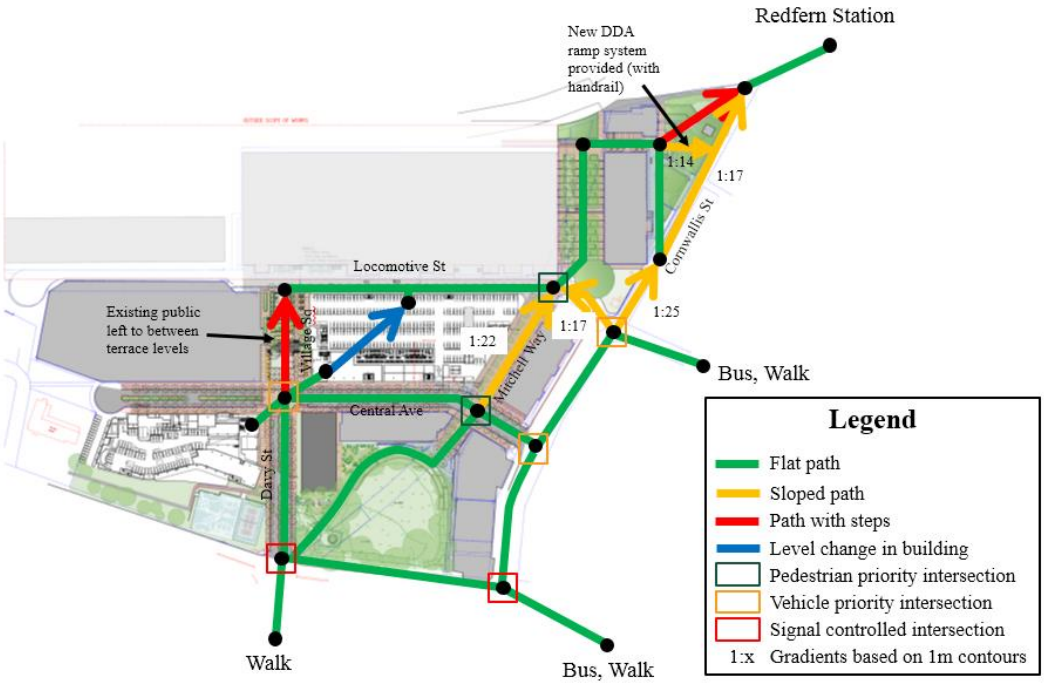

Figure 14 - Pedestrian connectivity and accessibility within site and to external streets

5 Conclusions and Recommendations

The following conclusions and recommendations are made:

- The key desire line into the site is from Redfern Station, with approximately 4,100 people arriving the AM peak hour;
- With the exception of Locomotive Street, the pedestrian links operate at LOS A during the AM peak under the Building 1, 2 and 3 demand. Locomotive Street operates at LOS B at its narrowest section, and at LOS A for the majority of its length, which is considered acceptable;
- The stepped path from Redfern Station will operate at LOS B during the AM peak, which is acceptable;
- Pedestrian priority should be maintained at the two intersections with Mitchell Way, via a zebra crossing;
- Site circulation and accessibility is satisfactory.