Attachment A9

Transport and Traffic Report – Botany Road Precinct

Botany Road Corridor - Transport and Traffic

FINAL

April 2021

Client: City of Sydney
Project: Botany Road Corridor – Transport and Traffic

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Cattell Cooper
PO Box 159
Spit Junction, NSW, 2088
ABN: 44 609 258 527

Project contact:
Bryony Cooper
0400 551199

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1 Introduction

Much of South Sydney including the Botany Road Corridor, is going through tremendous change. The residential population is increasing rapidly as formerly industrial and commercial sites are redeveloped into residential accommodation. People living in the Waterloo-Zetland local area has increased from 14,475 in 2011 to 31,553 in 20191; more than doubling in less than 10 years. Just to the south, Green Square is undergoing similar transformation. This level of population growth is set to continue with the redevelopment of public housing estates; Waterloo, Redfern and North and South Eveleigh.

Planned growth is being driven by local urban renewal and the construction of the Waterloo Metro Quarter on the Sydney Metro City and South West Line. The station will open in 2024 and provide direct connections to Central Station, Sydney CBD, North Sydney, Chatswood, Macquarie Park and Norwest.

The transport and traffic study is one of a number of studies along with urban design, Indigenous and built heritage, noise and air quality studies, that will be used to inform the review of the planning controls for the Botany Road corridor and contribute to the employment growth targets in the Eastern City District Plan. This study will also inform the City's ongoing work on delivering the vision of a green, global and connected City of Sydney through the Community Strategic Plan and Economic Strategy and the productivity priorities of the NSW Government.

1.1 Botany Road

Botany Road as a movement corridor and the suburbs it passes through have a long history predating European invasion and colonisation.[2]

Aboriginal and Torres Strait Islander people have a long connection with the inner Sydney suburbs of Redfern, Waterloo and Alexandria, and the place defined as the 'Botany Road Corridor' (the Study Area). The area is part of Gadigal Country, within the Eora Nation. The Gadigal clan is one of the 29 Aboriginal clans of the Sydney basin which make up the Eora nation. As the City of Sydney's Barani website reports: "The territory of the Gadi(gal) people stretched along the southern side of Port Jackson (Sydney Harbour) from South Head to around what is now known as Petersham."

Aboriginal people used the heath and wetlands in this area to camp, hunt, fish, construct tools, keep and share knowledge, create art, and harvest plant foods and medicine. They maintained pathways through the dune heath that connected coastal and inland clans. When the British invaded, Aboriginal people sought refuge here.

During the twentieth century, Aboriginal and Torres Strait Islander people from across Australia, and NSW in particular, came together to work, reconnect with family, and build communities in Redfern, Waterloo, Alexandria, Eveleigh and Darlington. The area became known as 'Aboriginal Redfern', the most recognised and significant urban Aboriginal place in Australia.

Europeans utilised Aboriginal pathways and established industries on what they considered marginal land. These industries included the Federal Match Factory, Henry Jones & Co IXL Jam Factory, Francis Chocolates and the Australian Glass Manufacturers. These were also important workplace for Aboriginal people coming to Sydney to find work. By 1945 there were around 158 factories in Redfern and Waterloo.

Today, the Botany Road corridor, much like other areas of South Sydney the corridor, is going through tremendous change. The number of people living in the local area is increasing rapidly as formerly industrial and commercial sites are redeveloped into residential accommodation. The residential population in the Waterloo-Zetland local area has increased from 14,475 in 2011 to 31,553 in 2019[3]; more than doubling in less than 10 years. Just to the south, Green Square is undergoing similar transformation. This level of population growth is set to continue with the redevelopment of public housing estates; Waterloo, Redfern and North and South Eveleigh.

The development of the Metro Quarter focused on the Waterloo Station, on the City and South West Metro (to commence operation in 2024) and the redevelopment of the Waterloo housing estate will accelerate urban renewal. Local development and the location of major transport hubs will increase pedestrian activity.

[1] https://profile.id.com.au/sydney/population?WebID=320&BMID=10 (accessed 22 April 2020)
[2] Cox Inall Ridgeway (2020) Brief Aboriginal History of the Botany Road Corridor and Surrounds (for City of Sydney)
[3] https://profile.id.com.au/sydney/population?WebID=320&BMID=10 (accessed 22 April 2020)

Urban renewal and changes to the wider road network challenge the role of the Botany Road corridor as a connector linking the industrial lands and airport to the south with the Sydney CBD to the north. The completion of the WestConnex orbital motorway will further augment the strategic road network, providing alternative north-south traffic routes to the east and west.

There is an opportunity to challenge the recent focus of Botany Road as a traffic corridor, particularly for heavy vehicles, instead recognising the importance of local places, responding to the needs of local residents and workers, improving safety and amenity. The rationale for the establishment of one-way traffic operation in the northern part of the corridor has fallen away and increased residential density, an emphasis on place over movement and the need to improve safety for all road users support the establishment of a traffic network that meets a broad range of objectives.

1.2 The Botany Road Corridor Transport and Traffic Study

This study has employed a 'movement and place' approach to understand the study area and solutions that focus on:

- Improving accessibility and connectivity by addressing and delivering a legible street network to encourage low car dependency and enable safe pedestrian, cycle, and vehicular interactions.
- Providing the right type of infrastructure that encourages walking and cycling, improving permeability through people-focused street connections that link recreation spaces, community facilities, and other areas of interest within the precinct and its surrounding locality.
- Ensuring that street design enables equitable access for people of all ages and abilities and provides opportunities for social interaction.

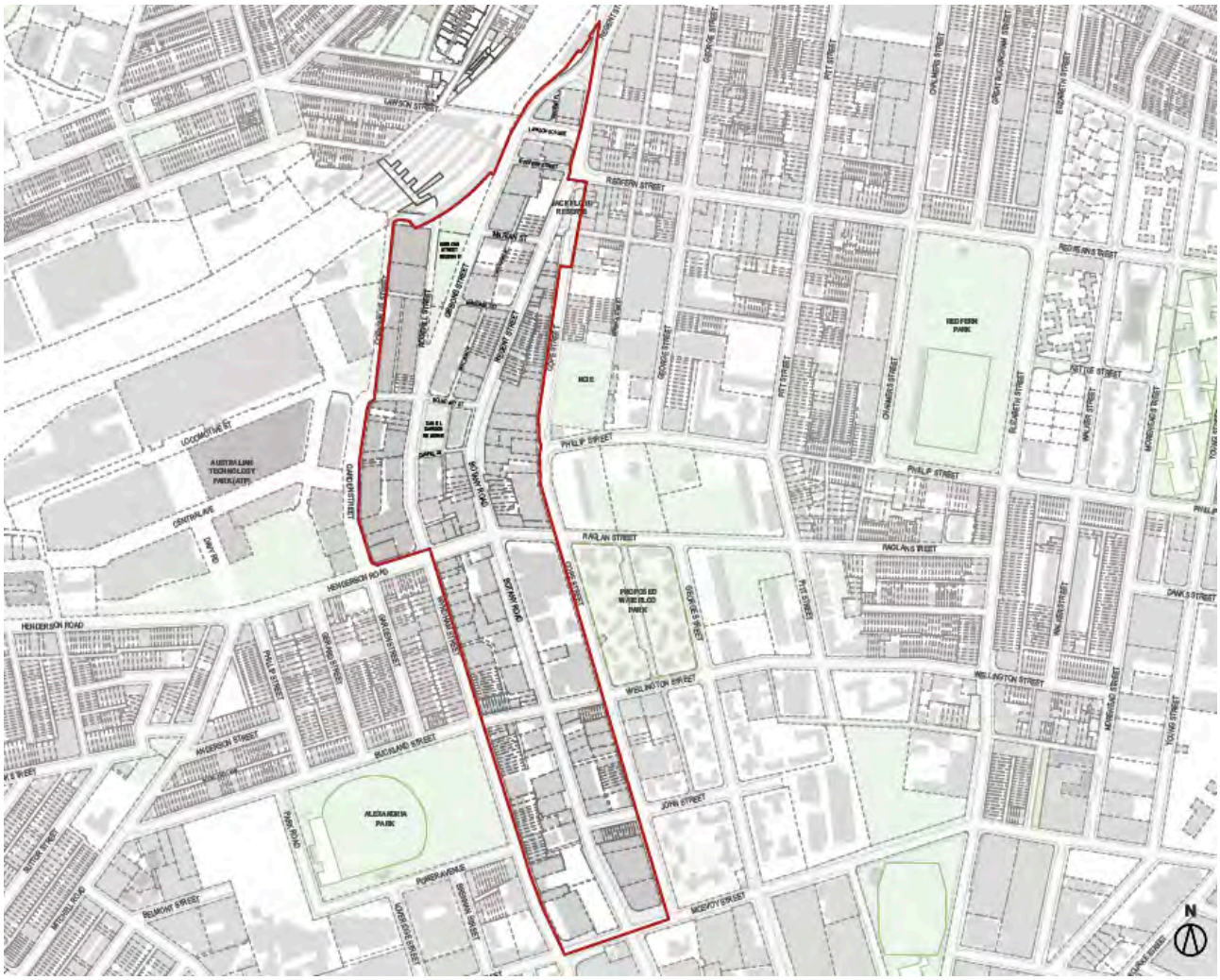
This study is one of a number of studies that include urban design, Indigenous and built heritage, noise and air quality. Together this body of work will be used to inform the review of the planning controls for the Botany Road corridor and contribute to the employment growth targets in the Eastern City District Plan.

This study will also inform the City's ongoing work on delivering the vision of a green, global and connected City of Sydney through the Community Strategic Plan and Economic Strategy and the productivity priorities of the NSW Government.

1.2.1 Study area

The Botany Road Corridor study area is shown in Figure 1-1. Gibbons Street and Regent Street operate as a 'one-way pair' with traffic on Gibbons Street travelling northbound and southbound movement on Regent Street. Botany Road between Henderson Road and McEvoy Street has two-way traffic operation.

Figure 1-1 – Study area (TZG Architects)



Planned growth is being driven by the construction of the Waterloo metro station on the Sydney Metro City and South West Line and the Waterloo Metro Quarter redevelopment. The station will open in 2024 and provide direct connections to other centres within the Eastern Economic Corridor; Sydney CBD, North Sydney, Chatswood, Macquarie Park and Norwest. Waterloo Station will significantly improve local accessibility and provide relief to Redfern and Green Square Stations, along with proposals to increase capacity on the Airport Line and significantly upgrade Redfern Station.

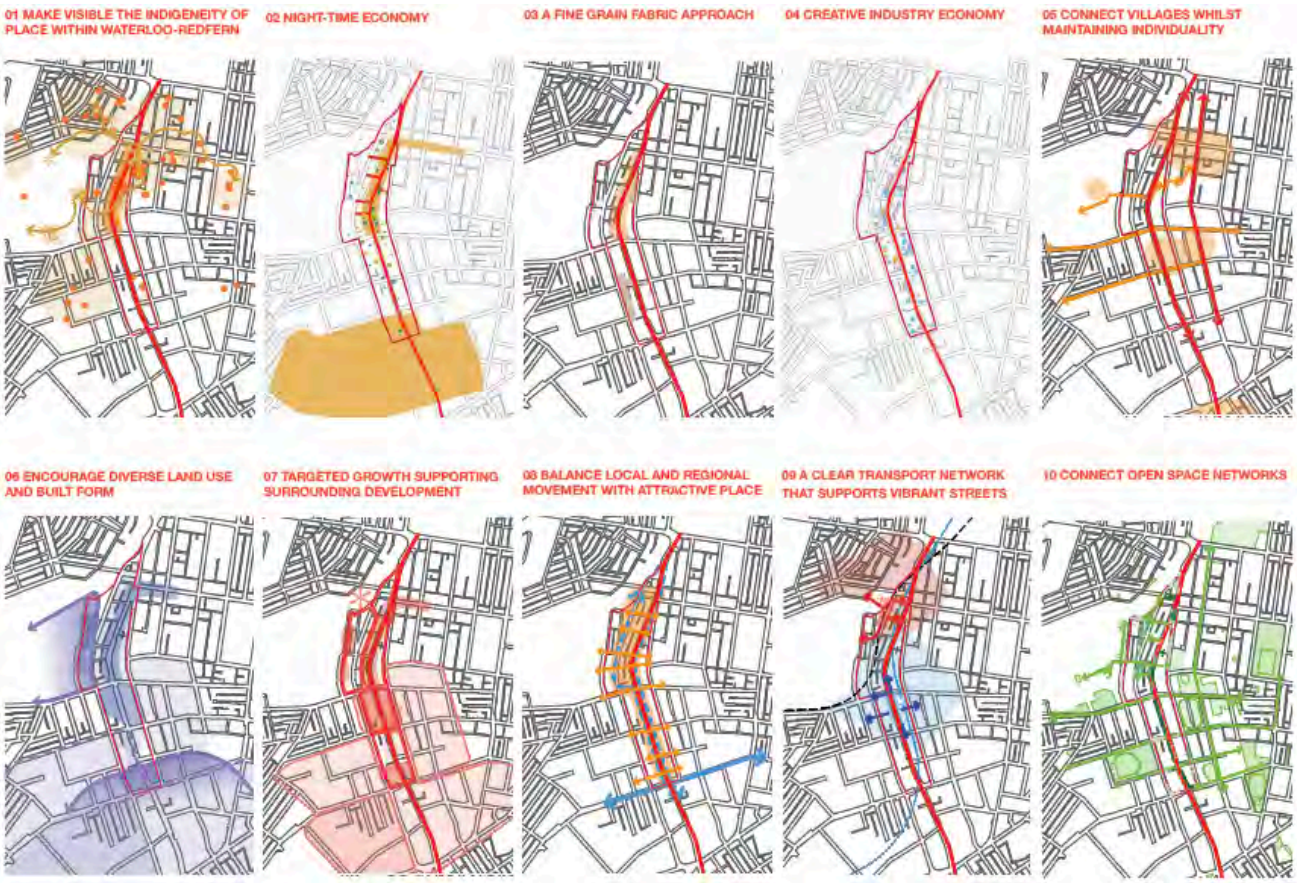
Botany Road, Gibbons Street and Regent Street form a bus corridor, providing direct north-south routes connecting Green Square and Rosebery to the south with Redfern and the Sydney CBD to the north. Botany Road also provides opportunities for easy and legible interchange with Green Square, Redfern and the new Waterloo stations. This corridor is a heavy vehicle route, connecting Port Botany, Sydney Airport and the Southern Enterprise Area with local customers, the Sydney CBD and areas to the north via the Sydney Harbour Bridge. This includes trucks carrying dangerous goods and which are excluded from Sydney's motorway tunnels under current policies.

The road network through southern areas of the City of Sydney is typically congested as commercial and private traffic mix on key corridors. Road congestion impacts bus reliability and travel times, making service planning challenging and buses unattractive to users. Bus services are at capacity in the morning peak period, leaving people waiting at stops or looking for alternatives. This situation has seen a significant uptake in cycling within these areas in recent years and a review of plans and policies demonstrates continued support for active transport.

1.3 Botany Road Corridor vision

The individual studies have been coordinated and the findings brought together within the urban design report. This report identifies a vision for the Botany Road Corridor underpinned by a series of key moves with associated design principles, that unify competing priorities, structure approaches for the public realm and intertwine past, present and future histories into a rich, characterful approach for the growth of the area.[4]

Figure 1-2 - Botany Road Corridor Key Moves[5]



The relevant (to this component study) design principles, are:

- Provide a safe, engaging and comfortable environment that merges daytime and night-time uses seamlessly. (Key Move 2: Night-time economy)
- Strengthen the high street and encourage conversion back to active frontages. (Key Move 3: Fine grain fabric approach)
- Ensure the high street is vibrant, walkable, small scale and local. (Key Move 3: Fine grain fabric approach)
- Provide legible, safe pedestrian connections between villages to enhance community well-being, culture and liveability. (Key Move 5: Connect villages whist maintaining individuality)
- Work with the Indigenous community to strengthen Aboriginal and Torres Strait Islander visibility and understanding and accessibility within village areas. (Key Move 5: Connect villages whist maintaining individuality)
- Design public places to support Botany Road as a thriving main street connector between the villages. (Key Move 5: Connect villages whist maintaining individuality)
- Support transit-oriented growth with a commercial and retail hub at Waterloo metro station. (Key Move 6: Encourage diverse land use and built form)
- Take on a holistic approach - Achieve movement and place balance for the whole street condition, for all users of space and all kinds of transport. (Key Move 8: Balance local and regional movement with attractive place)

[4] TZG (October 2020) Botany Road Corridor Urban Design Study – Urban Design Options Report
[5] TZG (December 2020) Urban Design Framework

- Consider the removal of one way traffic pairs on Regent Street, Botany Road and Gibbons Street. (Key Move 8: Balance local and regional movement with attractive place)
- Design for lower Botany Road as a transport and movement corridors. (Key Move 8: Balance local and regional movement with attractive place)
- Support Regent Street as a place of pedestrian and retail activity. (Key Move 8: Balance local and regional movement with attractive place)
- Improve walkability, pedestrian amenity and attractiveness of active transport between transport modes and activity centres. (Key Move 8: Balance local and regional movement with attractive place).
- Enable retail and employment growth opportunities within close proximity to transport connections. (Key Move 8: Balance local and regional movement with attractive place)
- Make attractive places within high use transport nodes to address modal deficiencies in the short term. (Key Move 8: Balance local and regional movement with attractive place)
- Encourage choice, equitable access to reliable transport by improving attractiveness, legibility, interchange and connection amenity between inter-modal transport. (Key Move 9: A clear transport network that supports vibrant streets)
- Increase safety by considering relationships between speed, traffic volume and well designed pedestrian / cyclist / vehicle interfaces. (Key Move 9: A clear transport network that supports vibrant streets)
- Ensure that Regent Street and Botany Road serve people first, that the village centres and activity streets becoming better places, not simply movement corridors. (Key Move 9: A clear transport network that supports vibrant streets)
- Provide upgrades for ease of access for less mobile transport users, including ease of walking, access to transport and movement north-south and east-west along the corridor. (Key Move 9: A clear transport network that supports vibrant streets)
- Support City of Sydney's Sustainable 2030 goal for a city for walking and cycling, particularly through east-west links. (Key Move 10: Connect open space networks)
- Support existing active recreation spaces within upgraded active connections and cycle linkages. (Key Move 10: Connect open space networks)
- Provide legible, green links through the Corridor to existing adjacent open space. (Key Move 10: Connect open space networks)
- Provide for green infrastructure within the corridor as meeting places, plazas or street amenity. Design these places for active recreation. (Key Move 10: Connect open space networks)
- Improve liveability of busy main streets through increased urban tree canopy and street planting. (Key Move 10: Connect open space networks)

These design principles guide the approach to the transport and traffic network and consideration of options.

1.4 Structure of the transport and traffic report

This report brings together:

- Local policy and planning review summary
- Descriptions of the transport networks
- Botany Road corridor themes
- Development of future network options street by street.

2 Policy and planning context

2.1 Emerging principles

The strategic background document review (Appendix A) found that there is a consistent identification of issues, primarily focused around the tension between providing for improved place outcomes driven by urban renewal and the needs of maintaining traffic flow and efficiency along an economically important movement corridor. A summary of the issues identified include:

- Poor amenity for people walking through the area, with noise, high traffic flows and insufficient crossing opportunities.
- Poor road safety outcomes, particularly for vulnerable road users.
- Low public transport speeds and poor reliability.

While there is a need to retain the movement corridor which is supported through the documents, there is a recognition that there is a need to find a better balance with the needs of other users of the corridor. This need for a balanced approach is increased by the location of the Waterloo metro station and development of the Metro Quarter and Waterloo housing estate.

Increased activity and pedestrian movements will demand improved place outcomes and a much greater level of amenity than is currently experienced. This will support the expected increase in street based activity and also encourage the use of public and active transport, which is critical to meeting the mode share targets and limiting impacts on the economically important traffic on the corridor. Recent studies considering the movement and place functions of the corridor identify an increase in place function, supporting a 'vibrant street' environment.

Improved safety outcomes, particularly for vulnerable road users, are fundamental to supporting place outcomes and the realisation of the Government's 'Towards Zero' policy. All proposed interventions must maximise user safety.

The emerging principles relevant to the Botany Road Corridor study include:

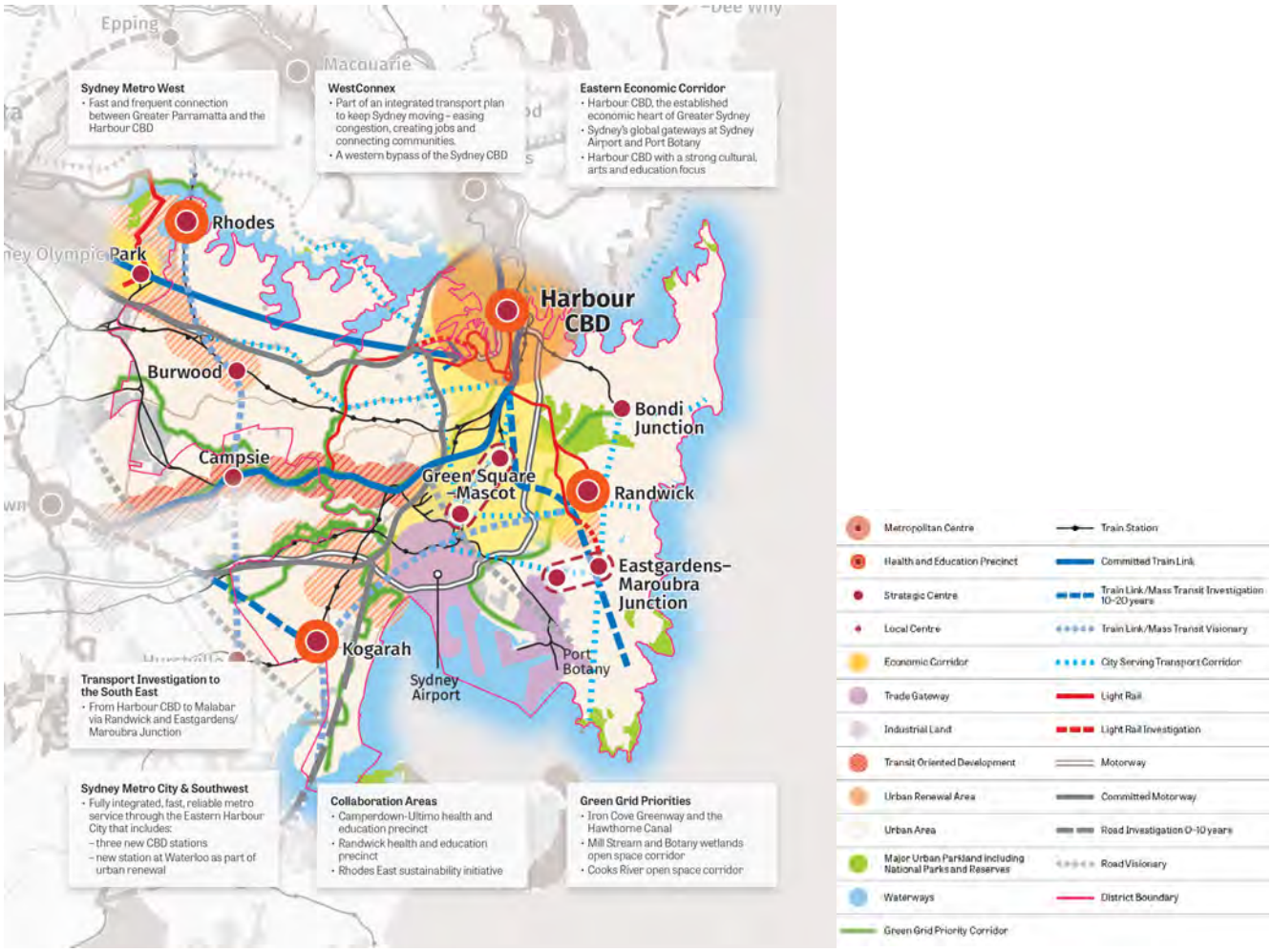
- Maintain the Botany Road movement corridor, with the prioritisation of strategic and economically significant transport, including buses and freight.
- Improve the urban amenity for people walking, including increased crossing opportunities (particularly in an east-west direction) and enhanced footpaths to achieve a vibrant street environment.
- Provide for a more legible and coherent street environment that supports an improved place outcome
- Provide clear and safe connections to the adjoining east-west and north-south cycleway network and ensure cycle parking is provided in convenient locations.
- Minimise traffic generation from new development along the corridor by taking advantage of the highly accessible nature of the corridor - particularly following the introduction of the Waterloo metro station.
- Improve the safety of all road users with a particular focus on vulnerable road users.
- Improve bus infrastructure, including access to and from bus stops, given the future role of Botany Road as a key bus corridor.
- Protect local residential streets (e.g. Wyndham Street) from increased traffic movements

These emerging principles align with the 10 key moves and the highlighted relevant design principles.

2.2 Strategic policy and plans

The NSW Government's strategic planning documents (Greater Sydney Regional Plan, Future Transport 2056 and the Eastern City District Plan) recognise the significance of the Botany Road corridor within the Eastern Economic Corridor which stretches from Macquarie Park, Chatswood, St Leonards, the Harbour CBD and Randwick to Green Square, Mascot and the international gateways of Sydney Airport and Port Botany.

Figure 2-1 Eastern City District Plan[6]



A focus for the Eastern City District is to become more innovative and globally competitive, carving out a greater portion of knowledge intensive jobs in the Asia Pacific Region. Accordingly, a focus is on the international competitiveness of the Harbour CBD, the innovation corridor which includes the Australian Technology Park, and the District's strategic centres, aligning growth with infrastructure, and improving the liveability of public places at a human scale.

The District is set to grow by about 157,000 dwellings over the next 20 years and the focus of this growth will be on well-connected and walkable places that build on local strengths and deliver quality places. The integrated approach to the green infrastructure of the district will improve sustainability.

The Plan identifies a mass transit / train corridor for investigation from the Harbour CBD to the south eastern suburbs indicatively via Green Square, Randwick and south to Eastgardens-Maroubra Junction. This vision has more recently been articulated through the South East Sydney Transport Strategy (2020).

These documents recognise the need to create vibrant safe places with quality public realm and balancing the efficient movement of people and goods with supporting the liveability of places on the road network while also protecting employment lands including the Southern Enterprise Area to the south of the study area.

Rail network planning (NSW and Australian Governments' joint *Western Sydney Rail Study*) addresses the growing needs of Western Sydney and recommends a preferred future network. The network includes upgrades to the T8 Airport and South Line to increase capacity from the south-west and provide more frequent services to Sydney (Kingsford Smith) Airport and the growing areas of Green Square and Mascot. This has the potential

[6] Greater Sydney Commission (2018) Eastern City District Plan

to increase the attractiveness of Green Square station for access to rail services for people living and working in the study area.

As noted the South East Sydney Transport Strategy (2020) identifies a preferred future scenario which includes a mass transit line extending from the Sydney CBD to the south-east via Zetland and Randwick, a mass transit line connecting Randwick to the west via Eastlakes and Sydney Airport, a network of rapid buses including two services operating on the Botany Road corridor: a Mascot to North Sydney service and a Coogee to the Bays Precinct via UNSW and University of Sydney service. The strategy includes the realisation of the principal bicycle network, delivering active transport networks focused on local centres and increasing road safety; both identified as important outcomes of the strategy. Overall the strategy assumes a high degree of mode shift supported by the enhancement of public transport and active transport networks and services, recognising that the predicted increase in transport demand cannot be supported otherwise.

The strategy envisages the Botany Road corridor as continuing to be a significant movement corridor but with a high place function. This will see the corridor identified as a vibrant street from Redfern south to Green Square town centre.

As an area transitioning from industrial land uses to high density residential, located just to the north of the Southern Enterprise Area and between the Airport, Port and Sydney CBD, the Green Square-Waterloo precinct faces a number of challenges. The strategy looks to the delivery of new public transport infrastructure and services, complemented by active transport links to deliver a mode shift and reduced traffic volumes, maintaining road capacity for freight and other essential vehicles.

In the context of the Botany Road corridor the strategy identifies the initial focus being, *improving bus service capacity and performance, cycle network enhancements, traffic speed reductions and supporting demand management and planning policies, delivering greater amenity throughout the [Green Square-Waterloo] precinct*.[7]

City of Sydney's Sustainable Sydney 2030 sets out the vision for the City. It identifies five big moves, including: integrated transport, the liveable green network and sustainable renewal. To realise these big moves there are 10 strategic directions:

- Integrated transport for a connected City
- A City for pedestrians and cyclists
- Vibrant local communities and economies
- Sustainable development, renewal and design.

Within Direction 3 (integrated transport for a connected City), Sustainable City sets out the objective to manage regional roads to support increased public transport use and reduced car traffic on City streets. It recognises the impact of heavily trafficked and congested roads on the economy and local communities and identifies the need to ensure opportunities to improve amenity are provided as part of future regional road management.

2.3 Local policy and plans

The Central to Eveleigh Urban Transformation Strategy (Jacobs, 2018) consisted of three discrete project packages: Redfern to Eveleigh, Waterloo and Central Station. Within the Central to Eveleigh Corridor, five precincts focused on government land were identified: Redfern Station, North Eveleigh, South Eveleigh, Waterloo and Central Station.

[7] South East Sydney Transport Strategy (August 2020) Transport for NSW (page 52)

Figure 2-2 Redfern to Eveleigh Corridor[8]

The Central to Eveleigh Urban Transformation Strategy, identified and agreed 10 key moves to underpin the overall vision for the corridor:

- Renew Redfern Station and connect Redfern to Wilson Street
- Create a green network
- Create walking and cycling connections across the railway corridor
- Connect the city with surrounding places
- Create centres of activity around stations
- Create a centre for Sydney's growing economies
- Strengthen arts, culture, and heritage
- Integrate new high-density mixed use buildings with existing neighbourhoods and places
- Deliver a diversity of housing choice, tenure and price points

The work identified five guiding principles closely linked to the outcomes described in Future Transport 2056:

1. Provide multiple transport options
2. Encourage the use of sustainable modes of transport
3. Support liveable communities and successful places
4. Provide safe and accessible services
5. Protect productive transport corridors that support a strong economy

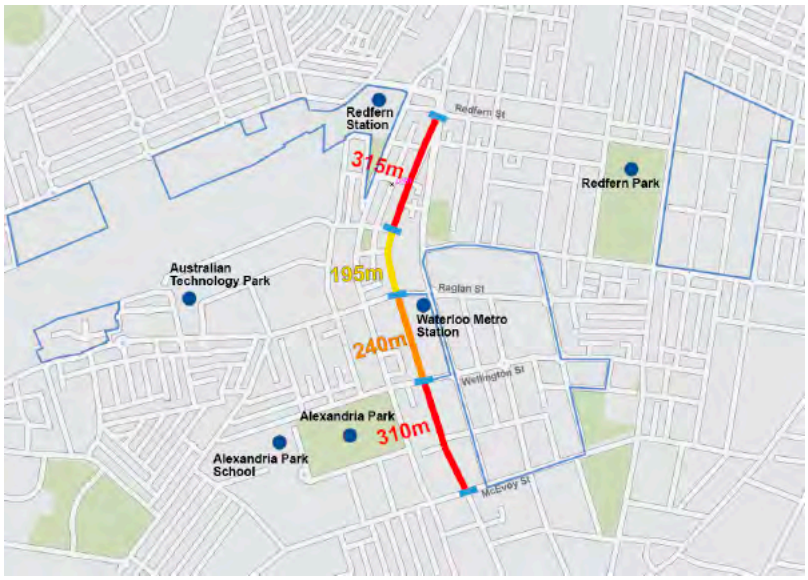
The principles are intended to ensure the future residents, workers and visitors have a range of travel choices suited to their preferences and trip purpose, supported through land use change. Through the application of the principles planned urban renewal projects support, and are supported by, a multi-modal transport network that enhances the accessibility of key locations and achieves environmental, social and economic objectives.

The report recognises the changing urban environment with new development increasing levels of activity and supporting new commercial, retail and hospitality enterprises. The existing street level and pedestrian

[8] Jacobs (2018) R2E Land Use and Infrastructure Implementation Plan – Traffic and Transport Context

environment is poor with limited crossing opportunities and heavy traffic. As the place function increases in the future there will be a need to consider balancing the needs of people, buses and vehicular traffic.

Figure 2-3 Existing distances between Botany Road pedestrian crossings[9]



This document considers options regarding the one-way pair arrangement of Regent and Gibbons streets: but these are limited to the extension of the one-way pair or its removal focused on Regent Street as the primary north and south connection.

Figure 2-4 Botany Road / Wyndham Street existing[10]

[9] Jacobs (2018) R2E Land Use and Infrastructure Implementation Plan Traffic and Transport Context (p30)
[10] Jacobs (2018) R2E Land Use and Infrastructure Implementation Plan Traffic and Transport Context (p31)

Two options for the reconfiguration of the corridor exist: the removal of the one-way pair or the extension of the one-way pair.

Figure 2-5 Possible Botany Road / Wyndham Street reconfiguration[11]

The advantages and disadvantages of the existing operation and the two possible alternatives are discussed at a high level in the report and this discussion is summarised in the following table.

Table 2-1 Botany Road corridor configuration options, advantages and disadvantages

Configuration	Advantages	Disadvantages
Existing	Simplified phasing at intersections	• Increased turning movements and operational impacts at the closely spaced Botany Road/Henderson Road/Raglan Street and Henderson Road/Wyndham Street intersections. • Indirect northbound route resulting in traffic volumes and congestion on Wyndham Street of a level that is not appropriate to the character of the street and land uses. • The splitting of traffic across Gibbons Street and Regent Street leads to significant delays for pedestrians due to the need to cross two busy road corridors to travel between the station and Redfern town centre.

[11] Jacobs (2018) R2E Land Use and Infrastructure Implementation Plan Traffic and Transport Context (p32)

Configuration	Advantages	Disadvantages
Removal of one-way pairs (two-way operation)	• Solidify corridor as principal movement corridor. • Simplified movements at Botany Road / Henderson Road / Raglan Street intersection. • Reduced impacts on traffic flow resulting from significant pedestrian demands generated by Waterloo metro station. • Local area traffic management on Wyndham and Gibbons streets required to maintain local access and discourage through traffic, enhancing safety and amenity.	[none identified in report]
One-way pair extension	• Simplified movements at Botany Road / Henderson Road / Raglan Street intersection. • Possible opportunities for additional mid-block crossing opportunities.	• Significant vehicle movements along northern section of Wyndham Street would continue.

The Mascot to Eveleigh Road Network Plan (Roads and Maritime Services, June 2018) (RNP) sets out a plan for the development of the Mascot to Eveleigh corridor. The RNP seek to balance the current and future need for movement of people and freight along the corridor. It connects the strategic aspirations of Future Transport 2056 with the practical requirements of road network users, identifying opportunities that deliver on the six customer outcomes in Future Transport. The Botany Road corridor which is the subject of the City of Sydney study is wholly contained in Segment 1 of the RNP. The RNP makes the following observations for this part of the corridor:

- Recognition of the place function due to the significance of the Redfern / Waterloo local centre and the Australian Technology Park.
- This is the least busy section, in terms of traffic volumes.
- This section forms part of the tertiary freight network and is approved for B-Double combination vehicles with general, concessional and higher mass limits.
- There are 17 bus routes operating along this part of the corridor and with segment 2, experiences the highest number of passengers boarding and alighting at stops.
- Despite the number of bus routes and high number of passengers, there are no bus lanes in this part of the corridor.
- This part of the corridor has the highest number of people walking, aligning with land use and the activity centre of Redfern / Waterloo.
- This section exhibits the highest casualty crash rate along the corridor, and the number of Fatal and Serious Injury (FSI) crashes is greater than the Sydney Metropolitan Area average and had the highest incidence of crashes involving vulnerable road users (36% of crashes).

The RNP recognises the significant movement function of the Mascot to Eveleigh corridor and also the location of local centres where the place function is higher. Considering the 'Movement and Place' classification, the RNP identifies segment 1 as a movement corridor status 4c:

A movement corridor for general traffic, heavy vehicles and buses linking the Sydney CBD, southern suburbs, Sydney Airport and Port Botany. Dominant land uses along the segment include residential, commercial and entertainment. Key destinations in the area include Redfern Station, Redfern / Waterloo local centre, Alexandria Park, Australian Technology Park and Green Square mixed-use centre.[12]

The RNP rates current place and movement performance, the following are noted for this part of the corridor:

- Place performance -
    - On-street parking and loading is well utilised during off-peak times

[12] RMS (2018) Mascot to Eveleigh Road Network Plan (p13)

    - The quality of bus stop facilities is poor with most bus stops lacking shelters and basic passenger facilities
    - Relatively good cycle parking opportunities with 83 cycle parking spaces in the segment
    - Traffic speeds and ambient noise levels impact the pedestrian environment, there are limited mid-block crossing opportunities
- Movement performance –
    - Bus speeds are low, 20 km/h or less in the peak periods and in both directions, and unreliability is high
    - Pedestrian movement performance is rated as relatively good, with footpaths on both sides of the roads in the segment

In the future the RNP assumes the corridor will continue to accommodate a high and increasing demand for movement in part due to the significant planned urban regeneration along the Mascot to Eveleigh corridor. This will bring future challenges to improve conditions for pedestrians and cyclists, provide bus priority and facilities and meet the needs of freight.

In segment 1 the expected changes in land use and increasing place function will see a change in the Movement and Place classification from 'Movement Corridor' to 'Vibrant Street'.

The RNP identifies the following opportunities, relevant to the Botany Road corridor:

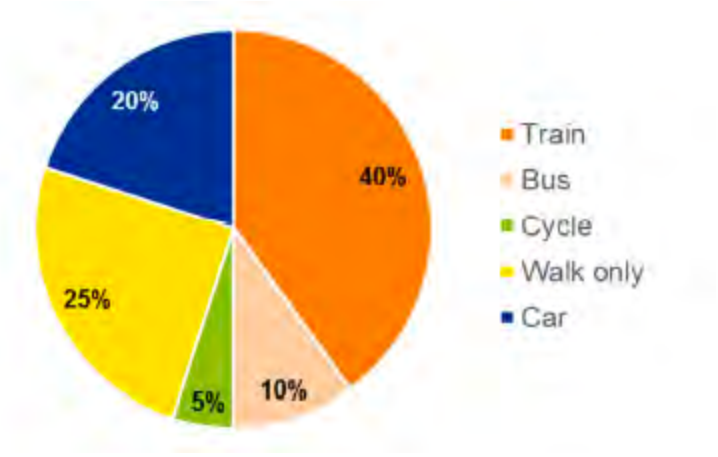
- Investigate reasons for and potential to address crashes involving vulnerable road users
- Investigate PM peak traffic congestion
- Consider the opportunity for an extension of the one-way pair
- Consider safer car parking arrangements
- Investigate options for accommodating increased bus services and pedestrian movements
- Consider opportunities to improve low bus travel speeds and reliability
- Consider place-based needs
- Review pedestrian connectivity to / from public transport hubs and activity centres
- Consider the need for improved cycling infrastructure and connectivity

The subsequent Waterloo Metro Quarter State Significant Precinct Transport Study (Jacobs, 18 October 2018) sets out the transport context for the Waterloo Metro Quarter State Significant Precinct. UrbanGrowth NSW (now part of Infrastructure NSW) and Land and Housing Corporation's (now part of Stronger Communities) objectives for renewal of the Precinct are identified as:

- Housing: A fully integrated urban village of social, private and affordable housing
- Services and amenities: New and improved services, facilities and amenities to support a diverse community
- Culture and design: A safe and welcoming place to live and visit
- Open Space and environment: High quality public spaces and a sustainable urban environment
- Transport and connectivity: A well connected inner city location

While the future development outcomes of the Metro Quarter have been revised and are discussed further below (section 4), the future mode share demonstrates a considerable increase in walking through the local area as a result of development and increased activity.

Figure 2-6 – Metro Quarter future mode share[13]



The Transport Study developed this future mode share target based on consideration of:

- *Proximity to Sydney Metro Waterloo Station, which will provide access to high quality mass transit services on Sydney Metro City & Southwest*
- *Densely located land uses, activities and attractors as well as proximity to Sydney CBD and Green Square, enabling shorter trip lengths more conducive to walking and cycling*
- *Low existing traffic generation rates in recent high density developments in Waterloo and Redfern, and high (81 per cent) AM peak non-car mode share observed at the Redfern traffic generation survey site*
- *Enhancements to the bus network to strengthen east-west routes, enabled by Sydney Metro City & Southwest, and improved cycling connections with key surrounding destinations.*
- *Consideration of Category A rates outlined in City of Sydney's DCP requirements to represent best practice in the provision of transport facilities appropriate for the Metro Quarter.*

The study sets out the future assumptions in terms of Waterloo metro station. The City and South West metro service will be operational from 2024. By 2036 forecasts indicate 3,700 people will enter the station in the morning peak hour and 2,350 will exit. In total over 5,000 people will walk to or from the metro station in the morning peak hour.

Table 2-2 Waterloo metro station forecasts morning peak entries and exits 2036[14]

Morning peak entries/exits	Mode	Percentage	Number
Entries	Walk	76%	2,812
	Cycle	1%	37
	Bus	19%	703
	Kiss and ride / drop off	4%	148
Exits			2,350

The transport study presents an assessment of the Metro Quarter proposal, including a quantification and assessment of the impacts of the development on transport networks and services.

It identifies six guiding transport principles:[15]

1. Support the development of transport networks that provide 24 hour / 7 days a week access - Ensure that residents and workers are provided with multiple high quality transport options to reach a variety of

[13] Jacobs (2018) Waterloo Metro Quarter State Significant Precinct Transport Study (p 6)
[14] Derived from Jacobs (2018) Waterloo Metro Quarter State Significant Precinct Transport Study (p 33-34)
[15] Jacobs (2018) Waterloo Metro Quarter State Significant Precinct Transport Study (p 47)

destination/s for live, work and play activities in a 24 hour/7 day a week economy and to support connections to the metro system.

2. Encourage access by public transport, walking and cycling to reduce car dependence - Provide high quality public and active transport linkages and sustainable approaches to parking provision that encourages residents to live car independent lifestyles if they choose to do so.
3. Support walkable urban environments - Ensure an integrated land use and transport outcome that supports walkable streets and high quality urban outcomes within the precinct, including active street frontages, fine-grained development pattern and a connected, permeable street network.
4. Strengthen east-west connections - Take advantage of the north-south connectivity provided by the metro by strengthening east-west connections, particularly for active transport and buses.
5. Minimise impacts on regional connections - Ensure that any impacts to regional connections for public transport and freight, such as Botany Road, are minimised where possible.
6. Support a hierarchy of access based on time of day - Develop and implement a hierarchy of access that prioritises access for people and goods based on time of day using the movement and place approach.

These principles support the need for travel behaviour change, with a much greater proportion of the future Metro Quarter population using public transport, walking and cycling in the future. The principles also underscore the importance of Botany Road as a regional connection for public transport and freight.

3 Existing networks

3.1 Traffic

Botany Road, south of Henderson Road operates as a two way, four lane corridor. To the north of Henderson Road the corridor is served by Gibbons Street (northbound traffic) and Regent Street (southbound traffic). Northbound traffic uses Henderson Road to make the dogleg movement to Gibbons Street. Wyndham Street is a local road that provides two-way vehicle access between McEvoy Street and Henderson Road, including kerbside parking lanes on both sides of the street.

Figure 3-1 – Existing traffic movements

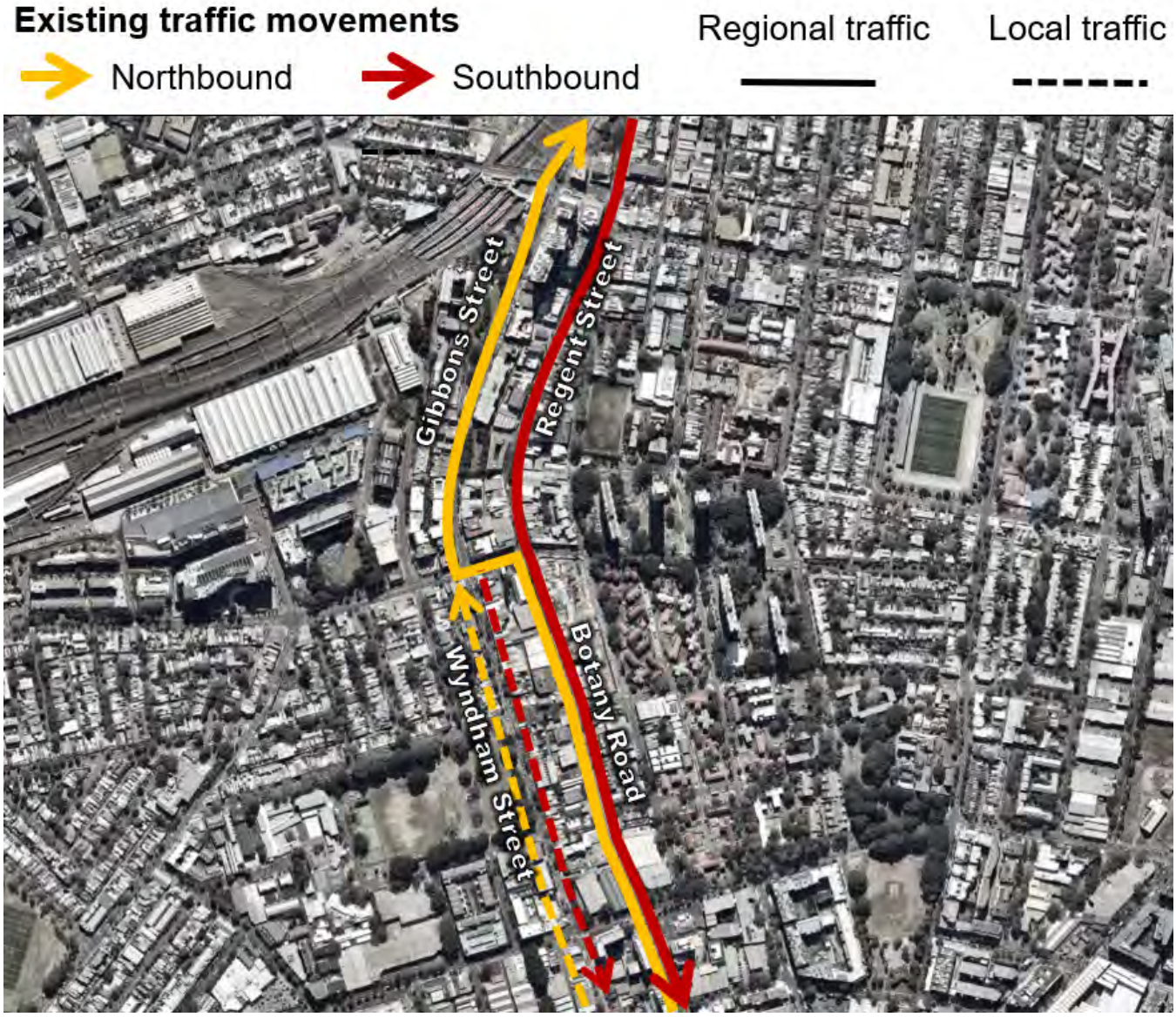
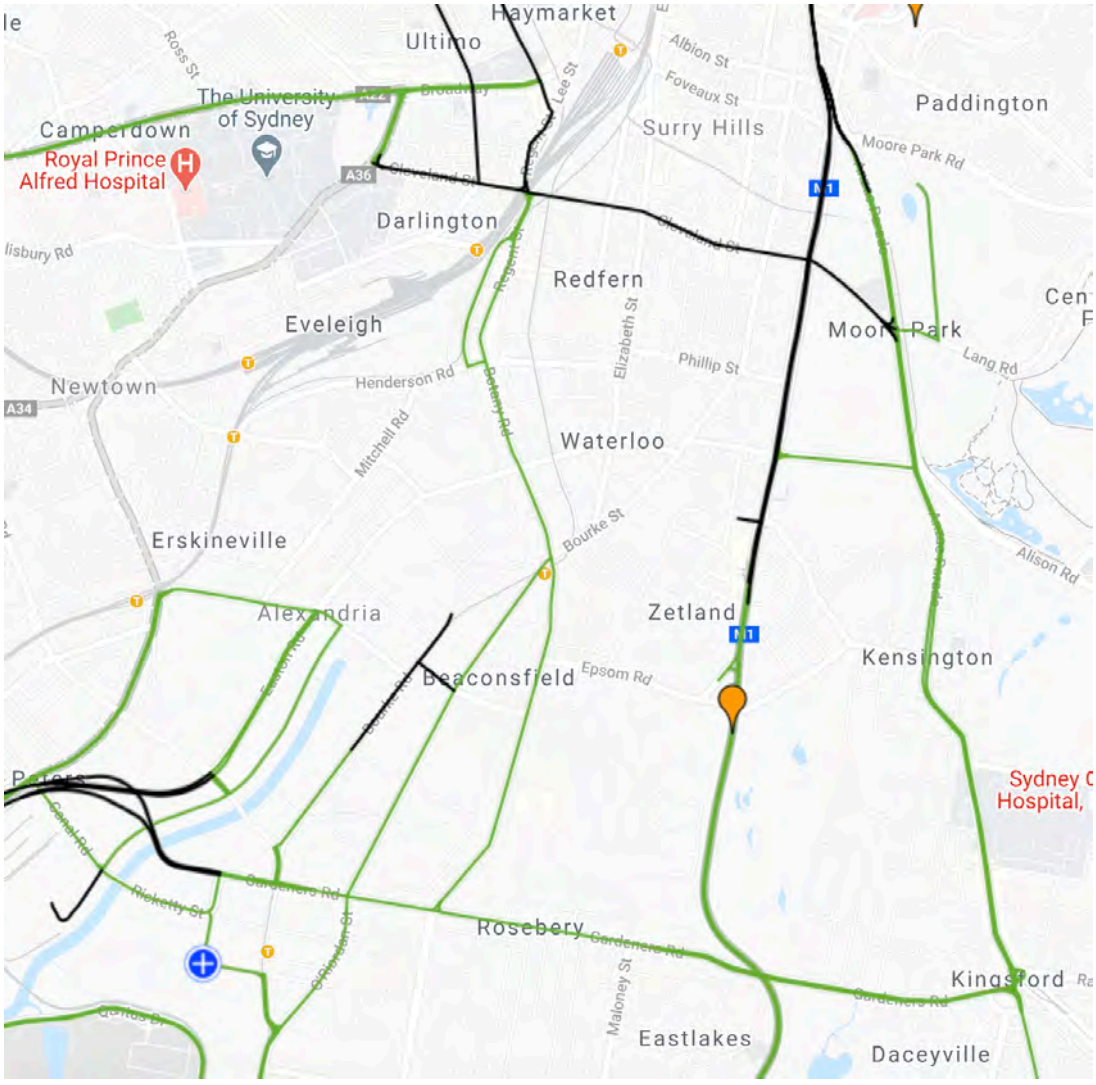


Table 3-1 – Existing traffic flows (City of Sydney, November 2016)

Scenario	Street	AM peak hour (8am-9am)			PM peak hour (5pm-6pm)		
		Northbound	Southbound	Total	Northbound	Southbound	Total
Existing	Botany Rd	707	1,053	1,760	779	946	1,725
	Regent St	-	1,712	1,712	-	1,837	1,837
	Gibbons St	1,668	-	1,668	1,427	-	1,427
	Henderson Rd	1,590 (west)	236 (east)	1,807	1,826 (west)	195 (east)	2,044

The approved B-double routes are shown in the following figure. Botany Road, Gibbons Street and Regent Street are approved B-double routes. This map also highlights the current importance of the Botany Road corridor as a route for dangerous vehicles as the Eastern Distributor to the east does not permit dangerous goods in the tunnels.

Figure 3-2 – B-double approved routes (black routes have travel conditions)[16]



[16] https://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html (accessed 18 November 2020)

3.2 Bus services and routes

Bus services operate along the corridor. Redfern and Redfern Station are both important destinations on the bus network and services operate north-south and east-west providing connections through the region.

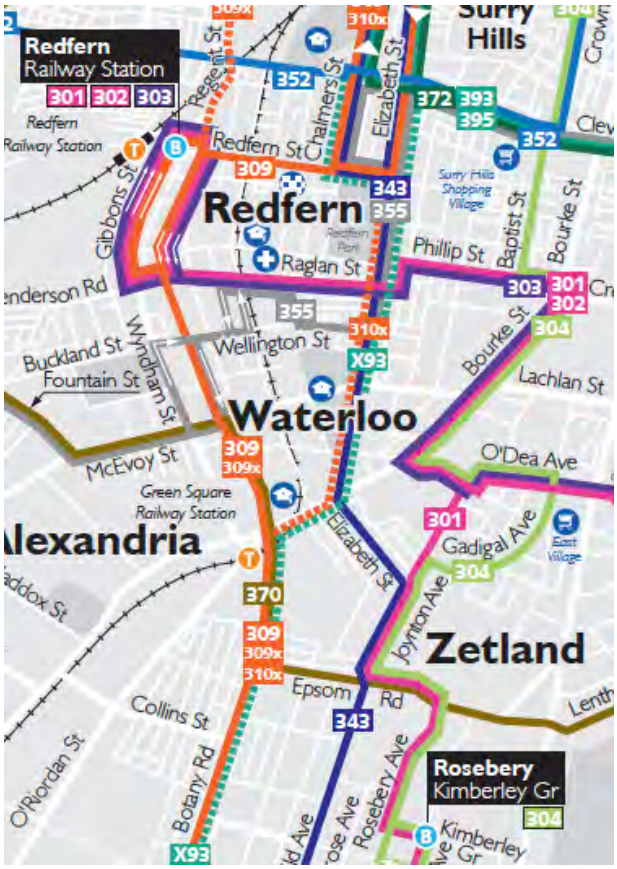
Table 3-2 - Botany Road Corridor – north / south bus routes [at 9 July 2020]

Service	Route	Weekday frequency
301 Redfern to Eastgardens via Mascot	Southbound: Regent Street/ Henderson Road Northbound: Henderson Road/ Gibbons Street	Every 30 minutes until 10pm, then every 60 minutes to 1am
302 Redfern to Eastgardens via Kingsford	Southbound: Regent Street/ Henderson Road Northbound: Henderson Road/ Gibbons Street	Interpeak only – every 60 minutes
303 Redfern to Sans Souci via Mascot	Southbound: Regent Street/ Henderson Road Northbound: Henderson Road/ Gibbons Street	Every 15 minutes in peaks Every 30 minutes in inter-peaks / evenings until 10pm, then every 60 minutes to midnight
305 Redfern / Mascot Stamford Plaza	Southbound: Regent Street/ Botany Road/ McEvoy Street Northbound: McEvoy Street /Wyndham Street/ Gibbons Street	Peak periods only Southbound - Every 30 minutes between 6:07 and 8:37 Northbound – Every 30 minutes between 14:40 and 17:43
308 Marrickville Metro to Central Eddy Avenue via Redfern (loop service)	Southbound: Regent Street/ / Henderson Road Northbound: Gibbons Street	Every 15 minutes in peaks Every 30-40 minutes in inter-peak / evenings
309 Central Station / Banksmeadow	Southbound: Regent Street/ Botany Road Northbound: Botany Road/ Gibbons Street	Every 9-10 minutes in peaks Every 12-15 minutes in inter-peak / evenings Every 20-30 minutes after 10pm and before 6am

These services are shown on the following network maps. Due to the one-way traffic operation, bus services operate north on Gibbons Street and south on Regent Street, impacting bus service legibility and interchange connectivity. While northbound services stop in close proximity to Redfern Station, southbound services stop in Regent Street, and passengers interchanging between rail and bus services must cross two major roads at signalised crossings.

Figure 3-3 Services 305 and 308

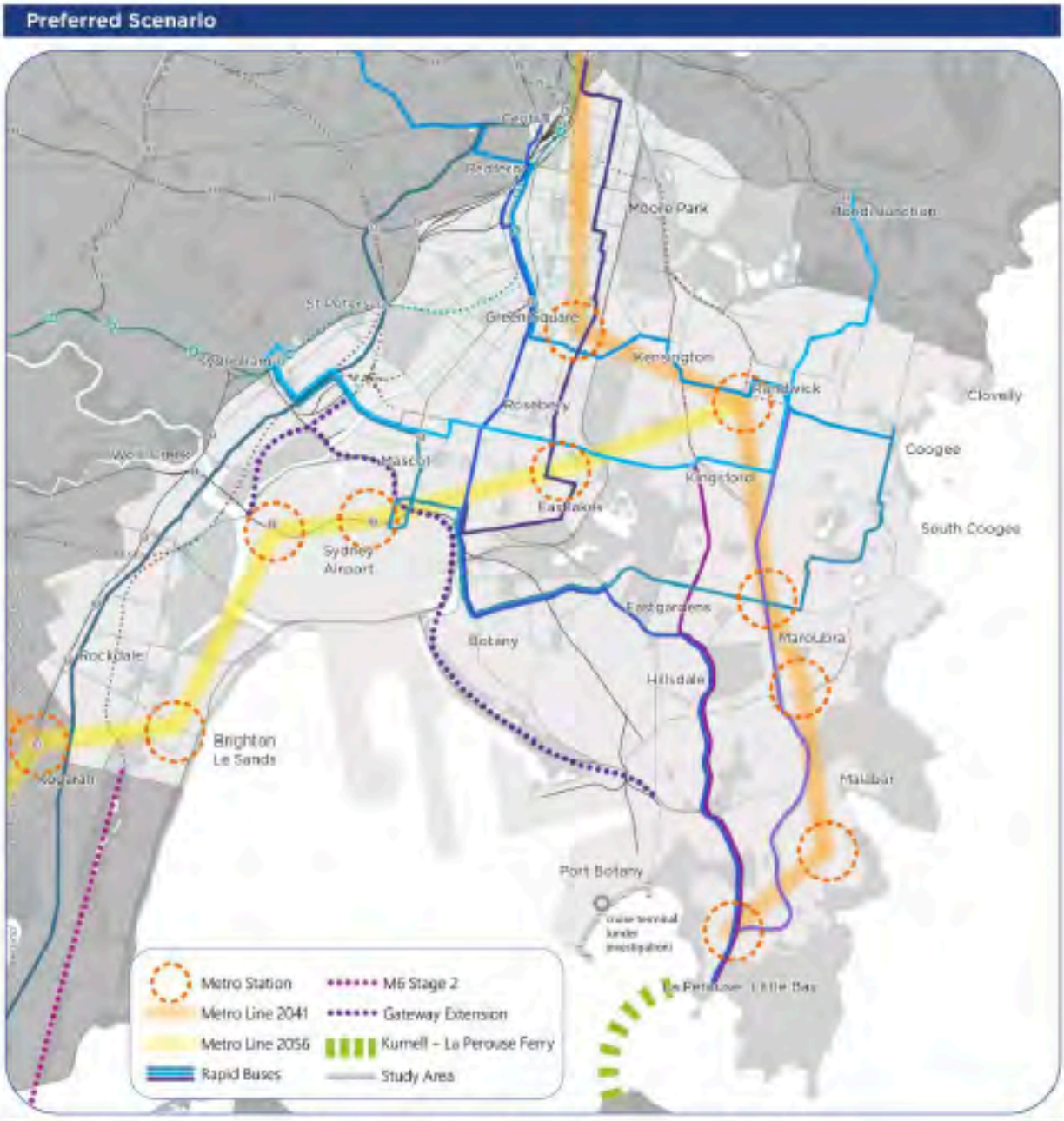
Figure 3-4 - Services 301,302, 303 and 309



The **South East Sydney Transport Strategy (August 2020)** envisages Botany Road corridor (Redfern to Green Square) as a Mass Transit Corridor, with two bus lines operating on this section. Of these bus lines one will provide a north-south service connecting Central Station with La Perouse via Eastgardens. The other will provide an east-west service connecting Randwick with Camperdown via Redfern.

Figure 3-5 - City-serving network at 2056, Future Transport 2056

Figure 3-6 – South East Sydney Transport Strategy preferred scenario



Initiatives for investigation – subject to business cases and investment decisions

- 8 Rapid Bus Routes
  - Railway Square to Sutherland Hospital (via Princes Highway)
  - Eastern Harbour City CBD to La Perouse (via Green Square and Eastgardens)
  - North Sydney to Mascot (via Green Square)
  - Bondi Junction to Sydenham (via Randwick and Mascot)
  - Randwick to La Perouse (via Anzac Parade)
  - Kingsford to La Perouse (via Bunnerong Road)
  - Coogee Beach to Bays Precinct (via UNSW and University of Sydney)
  - South Coogee to Sydenham (via Sydney Airport)
- Delivery of the Principal Bicycle Network
- Sydney Metro West extension to Malabar/La Perouse
- Sydney Gateway Extension to Port Botany
- Metro from Kogarah to Randwick

3.3 Active transport

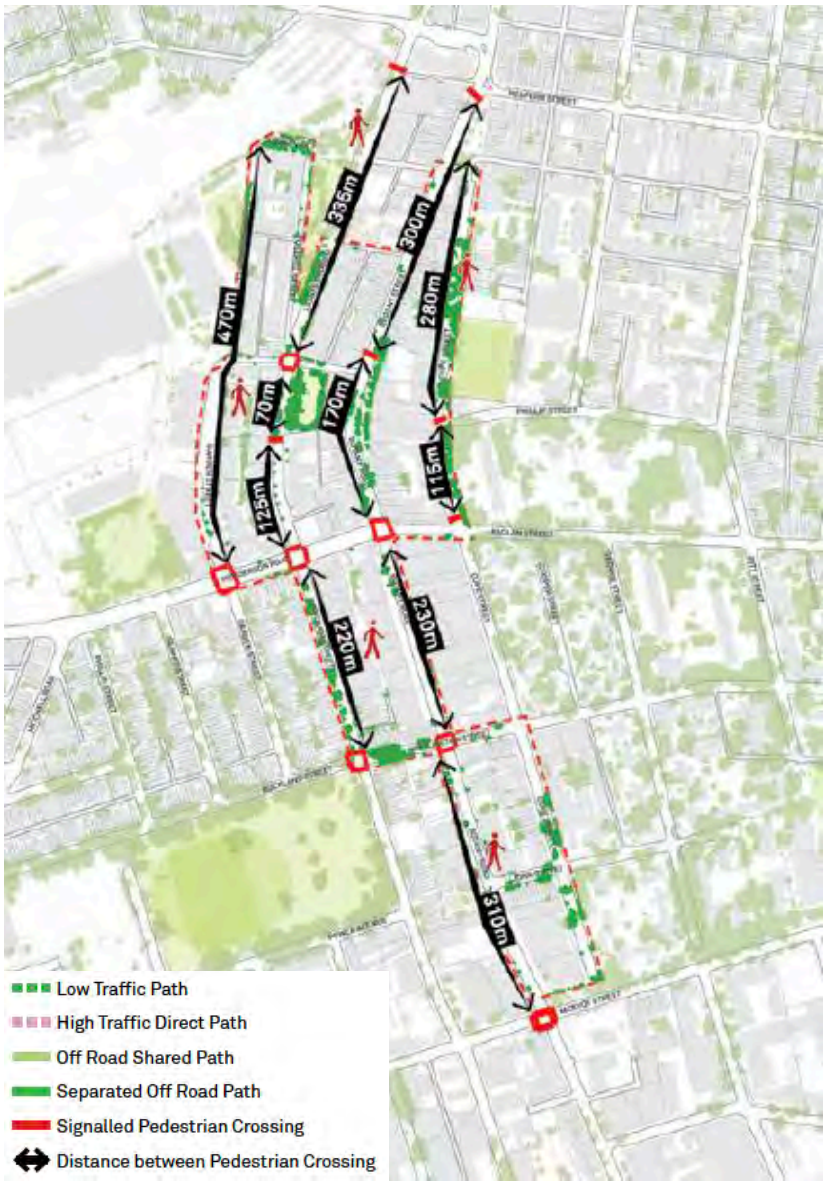
There are footpaths on both sides of the roads through the Botany Road corridor study area while the laneways tend to have no footpaths.

Pedestrians can cross at signalised intersections, although the spacing of the intersections does not support pedestrian connectivity and convenience. Along Regent Street there is a 300m distance between pedestrian crossings, despite the retail nature of the street. Along Botany Street, to the south, the distance between signalised intersections at Buckland Street and McEvoy Street is 310m with no mid-block crossings.

There are several laneways between Regent Street and Gibbons Street. These generally do not have footpaths but due to constrained widths are naturally slow speed environments. There is little passive surveillance in some lanes with limited opportunity for future activation.

Footpath widths vary across the study area but are typically 3.5m – 4m wide. Existing building setbacks have enabled footpath widening in Regent Street and Botany Road. Generally, the opportunity to increase footpath widths is limited to increasing building setbacks (at the time of redevelopment) and/or the reallocation of kerbside traffic lanes.

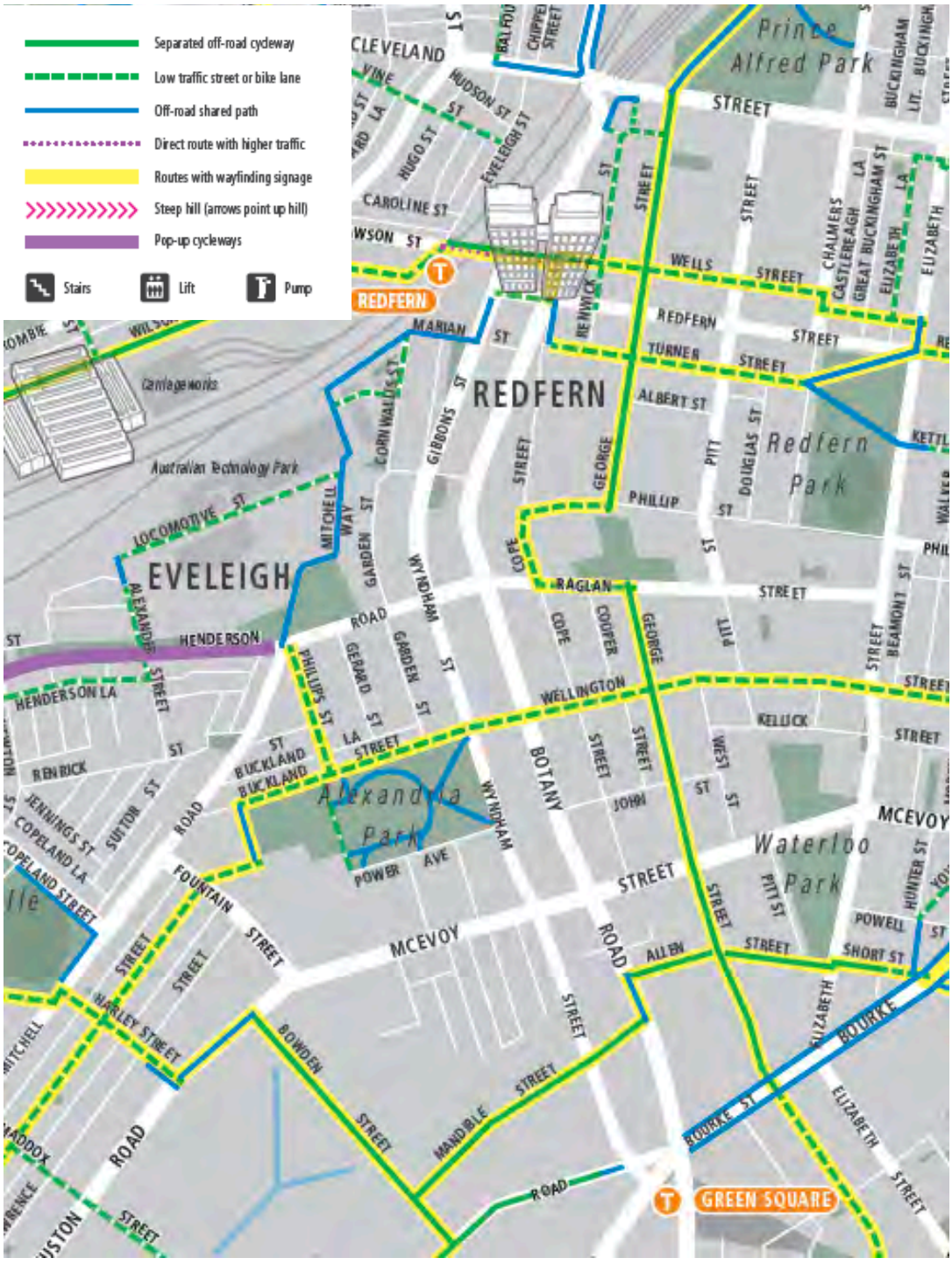
Figure 3-7 - Pedestrian crossings and distances[17]



[17] Central to Eveleigh Land Use and Infrastructure Implementation Plan (June 2018) Hassell

The cycle network is relatively well developed through the broader Botany Road corridor area. George Street, to the east of Botany Road, provides the main north-south connection, with Buckland Street / Wellington Street being the east-west connection. There is generally a lack of east-west connections and as noted, considerable distances between safe crossing locations particularly along Botany Road and Regent Street. As busy one-way streets Regent Street and Gibbons Street provide cyclists with limited access. Destinations along Regent Street can be accessed via Cope Street or Turner Street.

Figure 3-8 – Cycle network[18]



[18] City of Sydney cycle map (https://www.cityofsydney.nsw.gov.au/lists-maps-inventories/sydney-cycling-map)

4 Botany Road Corridor Themes

The 10 key moves and associated design principles set out a clear strategy for the Botany Road corridor. There is a recognised imbalance between movement and place. Place outcomes are impacted by vehicle volumes, speed and noise. Relatively high traffic speeds and volumes are detrimental to the liveability and place function of the area impacting the economic viability and vitality of businesses along Regent Street and are considerable issues for the local community.

This section discusses broad themes relevant to the whole study area. Improved road user safety, reduced speed limits and reduced traffic volumes, particularly heavy vehicle volumes, are important to realising the 10 key moves. These changes recognise the imbalance between movement and place outcomes, continuing urban renewal and increasing street based activity. While the current traffic arrangements in place with the one-way pair operation along Gibbons Street and Regent Street prioritise vehicle movements over place and other street users, significant improvements can be made within the context of the current traffic network.

4.1 Traffic and bus network

Bus route legibility through the northern part of the study area is relatively poor, particularly at Redfern Station. While northbound services stop close to the station in Gibbons Street, southbound services stop on the eastern side of Regent Street with passengers crossing both Gibbons Street and Regent Street at signalised crossings, incorporating both distance and delay into the interchange. This reduces the interchange functionality between Redfern Station and southbound buses and overall legibility.

For vehicles, legibility is provided through directional traffic signs, supported by prioritised turning movements at signalised intersections, for example, the northbound Botany Road/Henderson Road/Gibbons Street movement. Vehicles will circulate to gain access to local properties and parking adding to traffic volumes.

The current one-way operation of Gibbons Street (northbound) and Regent Street (southbound) (the one-way pair) impacts traffic and bus network legibility and promotes high travel speeds, with northbound and southbound movements separated in the northern part of the study area. The one-way pair limits the ability to provide safe and frequent pedestrian crossing opportunities and prioritises vehicular movement over pedestrian activity. Traffic volumes can increase as traffic circulates the one-way streets to access local properties and parking.

The potential removal of the one-way pair provides the opportunity to establish a legible network for both drivers and bus users and improved local access for residents, visitors, businesses and deliveries.

4.2 Road safety and speed limits

NSW has set out a clear road safety vision of zero fatalities and serious injuries on NSW roads by 2056. This ambitious but achievable target recognises the unacceptability of road trauma on our roads. The achievement of this and intermediate targets is focused on the internationally recognised safe system approach. There are four pillars to the safe system approach:

- Safe roads
- Safe speeds
- Safe people
- Safe vehicles

The adoption of a safe system approach is underpinned by three principles[19]:

- People are human and sometime make mistakes – a simple mistake shouldn't cost anyone their life.
- Roads, roadsides and vehicles need to be designed to minimise crashes or reduce forces if a crash happens.
- Road safety is a shared responsibility – everyone needs to make safe decisions on and around the road to prioritise safety.

Towards Zero recognises the contribution of speed to causing death or serious injury in a crash, particularly where vulnerable road users, such as pedestrians, cyclists, motorcyclists, children and older people, are involved. Lower speeds limits are used in built up areas where there are more people and vehicles around.

[19] https://towardszero.nsw.gov.au/safesystem (29 October 2020)

The Road Safety Plan identifies six priority areas including:

- Increase safety of vulnerable road users by providing pedestrian crossings, refuges and traffic calming devices, as well as expanding 40km/h zones in high pedestrian and local areas.

The Road Safety Plan 2021 recognises that most pedestrian and cyclist casualties occur on urban streets: Roads around busy areas such as shopping centres, entertainment and sporting precincts, hospitals, education facilities and transport interchanges must be safe for the movement of people, goods and services.20 Evidence supports improved pedestrian safety with reducing speed limits in high pedestrian activity areas, recognising the benefits for traffic efficiency and all road users.

The relationship between speed and road trauma in a crash is well established. Austroads has brought together evidence21 identifying speed as a predictor in both crash risk and injury severity if a crash occurs.

Further work focused on the safety of vulnerable road users notes; *It is increasingly accepted by road safety practitioners that, to be aligned with the Safe System philosophy for pedestrians and cyclists, 30 km/h impact speeds define the upper limit of an 'acceptable' collision. This 'Safe System boundary condition' coincides with an approximate 10% chance of the struck pedestrian being killed by the collision. Put another way, this corresponds to a 90% chance of survival.*[22] When serious injury is included the threshold drops to 20km/h: when a vehicle travelling at 20 km/h collides with a pedestrian, there is a 90% chance the pedestrian will escape a fatal or serious injury.[23] The NSW Road Safety Plan commits to an expansion of 40km/h in high pedestrian activity and local areas to reduce crashes and protect pedestrians. Evidence presented by Austroads supports a further reduction in vehicle speeds to align with safe system philosophy and the minimisation of risk and injury severity for vulnerable road users.

Austroads has identified safe system aligned measures for pedestrians and cyclists. The measures aligned to the Safe System philosophy include speed limits of 30km/h or less, and physical measures designed to prioritise vulnerable road users and at the same time maintain vehicle speeds within the 30km/h threshold.[24]

To realise the safety outcomes for all road users articulated through the 10 Key Moves and the associated design principles, it will be necessary to reduce the vehicle speeds in the corridor to 30 km/h, reducing road trauma in line with Towards Zero.

4.3 Importance of place

A well designed built environment is healthy, responsive, integrated, equitable and resilient. The transport network and how people move through and within the Botany Road corridor must contribute to these outcomes.

Better Placed is the NSW Government's policy[25] to enhance the design quality of the built environment, and create great places with design as central to finding solutions to the challenges facing communities. The policy sets out a framework for examining places and supporting effective design processes. It recognises the challenges of large-scale, complex urban renewal projects and the need for investment to benefit existing places.

Better Placed identifies seven objectives, two of which are particularly relevant to the intersection of place and movement:[26]

***Objective 3** - Better for the community (inclusive, connected, diverse) - The design of the built environment must seek to address growing economic and social disparity and inequity, by creating inclusive, welcoming and equitable environments. Incorporating diverse uses, housing types and economic frameworks will support engaging places and resilient communities.*

***Objective 4** - Better for people (safe, comfortable, liveable) - The built environment must be designed for people with a focus on safety, comfort and the basic requirement of using public space. The many aspects of human comfort which affect the usability of a place must be addressed to support good places for people.*

[20] Road Safety Plan 2021 (February 2018) Transport for NSW (page 14)
[21] Towards Safe System Infrastructure: A Compendium of Current Knowledge (2018) Austroads
[22] Integrating Safe System with Movement and Place for Vulnerable Road Users (2020) Austroads
[23] Towards Safe System Infrastructure: A Compendium of Current Knowledge (2018) Austroads (page 39)
[24] Integrating Safe System with Movement and Place for Vulnerable Road Users (2020) Austroads (page 17-18)
[25] Better Placed (2017) Government Architect
[26] Better Placed (2017) Government Architect (pages 40-41)

Through these objectives, Better Placed recognises the value of connectivity, safety and comfort, creating outcomes focused on vibrant streets and public places that are welcoming and accessible to everyone in the community. Safety and comfort reinforce each other encouraging more people on to the street which in turn makes places safer, interesting and enjoyable.

Utilising the Movement and Place classifications, the Mascot-Eveleigh Road Network Plan identifies the Regent Street, Gibbons Street, Henderson Road and Botany Road within the Botany Road Corridor study area as 'movement corridors'. The RNP recognises the conflict between the current movement function of these roads and the place function of the centre, identifying that these roads will move to be 'vibrant streets' in the future. Vibrant streets have both a movement and place function and it is generally recognised that these streets require careful management to meet the needs of all users, recognising that compromise may be required. The removal of the one-way pair offers opportunities for Regent Street that have the potential to increase its place function, moving it from a vibrant street to a 'place for people' and reducing the need for future compromise.

4.4 Heavy vehicles

The Botany Road corridor connects employment lands to the south with the Sydney CBD and areas to the north, providing a convenient connection for road freight. Historically, it has been an essential part of Sydney's road network, serving local industry, particularly tanneries and manufacturing. Over the last 20 to 30 years there have been significant changes to the arterial road network with the widening of Southern Cross Drive and the airport tunnel, the completion of the Eastern Distributor (1999) and M5 East (2001), and recently, the delivery of the M8, with future connections to the airport (via Sydney Gateway) and the orbital motorway network (via WestConnex).

These network changes have been accompanied by a shift in land use: a decline in industrial and manufacturing activities, and subsequent urban renewal. The significance of the Botany Road corridor within the network for heavy vehicles has reduced as alternative, more suitable routes have become available.

With the completion of the WestConnex network it is expected that heavy vehicle volumes will further decline with Botany Road being primarily used by vehicles with a local origin or destination and those carrying dangerous goods, which will be forced to continue using the Botany Road corridor. Realising the benefits of WestConnex and Sydney Gateway (the connection linking WestConnex to Sydney Airport and Port Botany) will be important to reducing heavy vehicle traffic on the Botany Road Corridor.

Northconnex provides an example of how heavy vehicles on the road network can be managed to reduce their impact on local communities and centres. Heavy vehicles without a local origin or destination are mandated to use the recently opened NorthConnex tunnel, reduced traffic volumes on Pennant Hills Road and environmental benefits including reduced pollution and noise. However, vehicles transporting dangerous goods are not be permitted to use NorthConnex and will continue using Pennant Hills Road. The project Environmental Impact Statement notes:

The transport of dangerous goods and hazardous substances would be prohibited through the main alignment tunnels and on and off-ramp tunnels, reducing the risk of very large fires or the release of toxic materials.[27]

Dangerous goods are generally prohibited from using road tunnels in Australia. Much of the motorway network and significantly the Eastern Distributor, M5 East and WestConnex is at least partially in tunnel resulting in the prohibition of dangerous, or placarded, loads and these remain on surface roads, including the Botany Road Corridor.

Austroads has recently considered the issue of dangerous goods in tunnels, including a literature review and consideration of risk assessment methodologies.[28] The accompanying literature review finds that in other jurisdictions, such as the European Union, a risk based approach is used to categorise tunnels with the determination of the dangerous goods permitted in the tunnel dependent on the tunnel category.

The M5 East tunnel was designed to permit use by vehicles carrying dangerous goods following the conclusions of a 1993 RMS (then RTA) study which found that; *the societal impact of a tunnel incident involving dangerous*

[27] NorthConnex Environmental Impact Assessment (Date?) Roads and Maritime Services (page 996) https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-6136%2120190227T054749.576%20GMT (accessed 30 October 2020)

[28] Dangerous Goods in Tunnels Literature Review (2019) Austroads and Dangerous Goods in Tunnels Application and Methodology (2019) Austroads

goods was preferable to a dangerous goods incident on the alternate route which ran past schools and hospitals.[29] Despite this, the road tunnel does not allow the passage of dangerous goods. As noted in Austroads, *the final decision on the passage of dangerous goods involved political considerations, policy issues, and community perception*.[30]

The recently opened M8 (New M5) was designed to meet or exceed recommended fire safety measures and standards but assumed the '*prohibition of vehicles carrying dangerous goods entering the tunnels*'[31] as one of several key fire and life safety project features.

The prohibition of dangerous goods in road tunnels is evident as a risk mitigation strategy, however, there appears to be limited comparative assessment of the risk of an incident on surface roads which may be congested, go through retail centres, and pass schools, hospitals and high-density residential development.

The literature indicates decisions are based on:

- Political considerations
- Policy issues
- Community perceptions
- Technical risk review

The National Road Transportation Association[32] has identified the current near total ban on dangerous goods in road tunnels in Australia as problematic. The Association calls for a risk-based approach that includes consideration of the risks of using an alternative surface route, traffic volumes, accident rates, tunnel design and the classes of dangerous goods being transported.

The problems with a lack of a risk-based approach is also recognised by Austroads: *The transport of DGs [dangerous goods] inherently carries some risk and banning their passage from tunnels can shift this risk from a route that includes a tunnel to other routes that may increase the overall risk profile, as well as have an economic impact. Consequently, the least risk option for the transport of DGs over the total route traversed should be identified and adopted.*[33]

Austroads puts forward a risk based methodology which can be applied transparently and in consultation with stakeholders. Austroads recommends, *risk assessments undertaken to determine the applicability, or otherwise, of DGs travelling through a tunnel are intended to be comparative risk assessments between alternate routes, or alternate design solutions*.[34]

In the context of the Botany Road Corridor there are examples (primarily, Northconnex) of mandating through vehicles use the motorway network. For those vehicles carrying dangerous goods it would be prudent to consider comparative risk, given the significant land use change and the potential impacts of an incident on high density residential development, schools, activity centres and rail transport infrastructure. There appear to be opportunities to take a more nuanced approach as other jurisdictions have, categorising road tunnels in line with classes of dangerous goods and the potential impacts of an incident.

It is, however, likely that the design and construction for existing tunnels and the role of the private sector in the ownership and operation of Sydney's motorway network will remain considerable barriers to change with respect to dangerous goods transport.

4.5 Noise and air quality

Noise and air quality in the study area has been analysed within the broader Botany Road Corridor planning work.[35] This study identified the key source of air pollution and noise in the study area as road traffic, and that a reduced traffic flow would see an improvement in the expected air quality and noise impacts.

[29] Dangerous Goods in Tunnels Literature Review (2019) Austroads
[30] Ibid.
[31] New M5 Environmental Impact Statement Chapter 6: Hazard and Risk (2015) Roads and Maritime Services https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-6788%2120190227T083244.031%20GMT (accessed 30 October 2020)
[32] https://www.natroad.com.au/news/transporting-dangerous-goods (accessed 2 November 2020)
[33] Dangerous Goods in Tunnels Application and Methodology (2019) Austroads (page 1)
[34] Dangerous Goods in Tunnels Application and Methodology (2019) Austroads (page 7)
[35] Draft Air Quality and Noise Study Botany Road Corridor (October 2020) Todoroski Air Sciences (for City of Sydney)

The analysis identifies heavy vehicles as a dominant contributor to the air pollution and noise generated by traffic. Reduced flows of heavy and commercial vehicles would reduce exposure to pollutants, including harmful particulates and Nitrous Oxide (NO_2).

The study finds that traffic generated air pollution increases as speeds reduce and that both pollution and noise can be exacerbated by vehicles idling, stopping at and accelerating away from traffic lights. Traffic conditions that enable vehicles to move through the area smoothly with minimal stops and at higher speeds would have positive benefits in reducing vehicle generated air pollution and noise. These conditions would not, however, support increased levels of walking and cycling and road safety outcomes. There is a need to achieve a balance where air pollution and noise can be reduced, and safety and amenity improved through lower traffic flows, including heavy vehicles, and streetscape design, including building setbacks, increased footpath widths and street planting.

4.6 Waterloo Metro Quarter

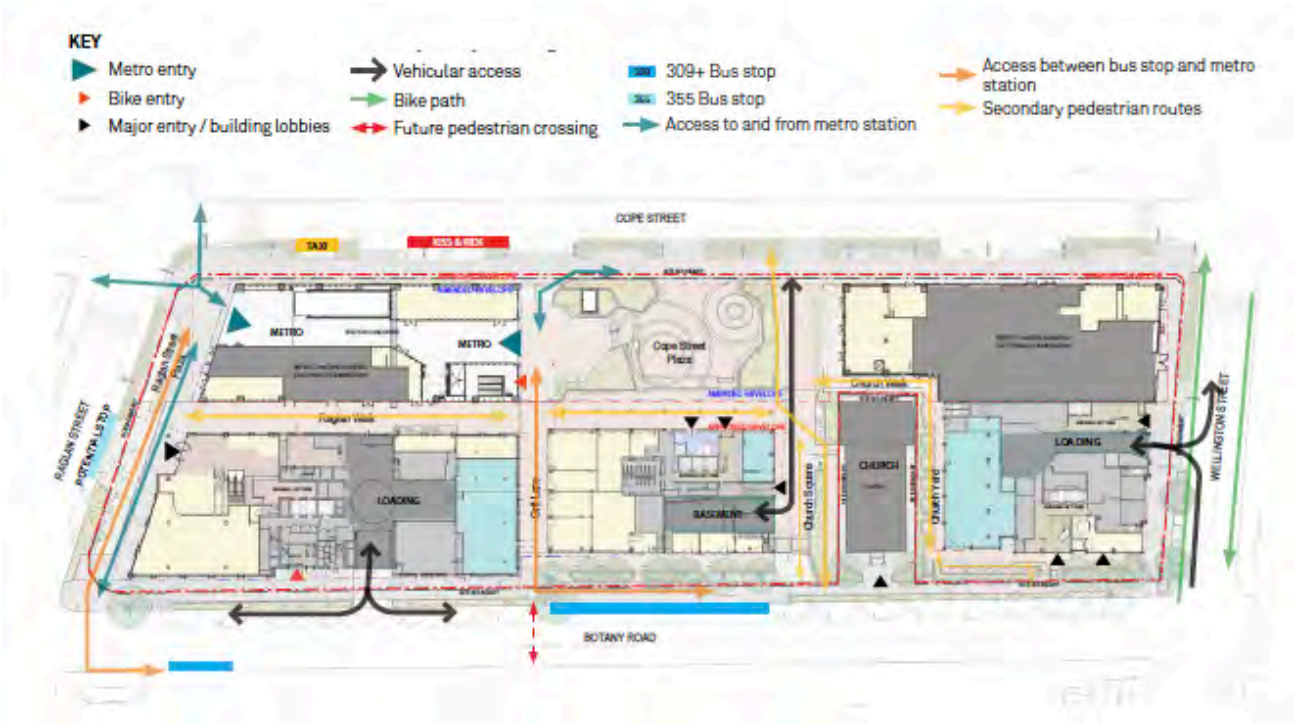
Sydney Metro City and South West will commence operations in 2024. Waterloo Station will be a major transport hub with commercial, community and residential redevelopment which is expected to extend to the west of Botany Road as sites are redeveloped.

The Waterloo Metro Quarter Environmental Impact Statement (November 2020) identifies:

- Three high-rise and two mid-rise buildings
- Residential units
- Commercial premises including retail and childcare
- Basement car park
- Public domain and landscaping

The WMQ will provide office space and community facilities to provide daytime activation and meet the needs of the local community. In offering offices, residential units and retail the WMQ will be both an origin and destination throughout the day and across the week. This considerable growth in pedestrian activity will demand a permeable street network to service pedestrians and cyclists to provide links to local residential areas, transport nodes, education and work locations, in particular the Australian Technology Park. Sydney Metro has identified a future pedestrian crossing of Botany Road to align with the northern through site link.

Figure 4-1 Waterloo Metro Quarter access and circulation[36]



[36] Waterloo Metro Quarter Environmental Impact Statement Overview (November, 2020) Sydney Metro

The station will be a focus for bus / metro interchange. Pedestrian numbers will increase considerably, demanding improved urban amenity, space and connectivity. The current traffic arrangements at the Botany Road / Henderson Road / Regent Street intersection, immediately adjacent to the future metro station, provide challenges in terms of pedestrian accessibility due to the long wait times experienced to accommodate traffic movements. Bus stops are already provided on Botany Road but will require upgrading to meet future demand generated by the opportunity to interchange with metro rail services and the general increase in development. Pedestrian pathways and road crossing locations through the broader area will require careful consideration.

Given the width constraints of many local roads which will limit the opportunity to widen footpaths, pedestrian space can be delivered through enhanced network permeability, providing multiple route options between the same two locations. This also provides interest and supports small local business throughout the locality. Generally, safety and security can be expected to be enhanced with increased passive surveillance.

Given Waterloo Station will be operational in 2024, there is some urgency to providing adequate supporting transport networks and services. Works prior to the station opening should include:

- Prioritising the provision of a permeable pedestrian network supported by frequent road crossings (at intersections and mid block)
- Removing footpath parking along Botany Road, to increase pedestrian space and minimise vehicle / pedestrian conflict
- Reducing the vehicle speed limit to 40km/hour, in line with the expected increase in pedestrian activity, in advance of this increase in activity
- Improving the bus stop facilities in Botany Road at Waterloo Station and implementing a mid-block crossing
- Extending the cycle network through the use of ‘pop-up’ and permanent infrastructure.

5 Option development

5.1 Transport and traffic outcomes

Informed by the broader Botany Road Corridor study findings and analysis of the current traffic and transport conditions, four outcomes focused on transport and traffic have been developed. These outcomes have guided the development of the transport and traffic options.

- Traffic volumes, including freight, will be managed appropriate to the existing land uses achieving a greater balance between the movement and place functions of the corridor.
    - Traffic will be maintained or reduced on Wyndham Street (between McEvoy Street and Henderson Road), appropriate to the predominantly terraced housing along this section of street.
    - Traffic volumes and speeds will be balanced with the surrounding land uses and activity, recognising that there is significant ongoing land use change which is increasing street-based activity. The local community values the place function of the corridor, particularly Regent Street.
    - Traffic volumes will be reduced and speeds calmed on Regent Street, appropriate to the retail activity and the predominance of fine grain retail frontages
    - An appropriate freight corridor will be maintained, with servicing for local businesses and residential development as necessary.
- Streets will be safe for all users with lower traffic speeds and greater levels of street based activity that provides for:
    - A traffic network and street design that encourages low vehicle speeds
    - Transport networks and flows that support street based activity
    - Kerbside uses (e.g. short term parking, loading) that support local businesses
    - Increased east-west crossing opportunities for pedestrians and cyclists, particularly along Regent Street
- Public transport will be attractive, with legible, high frequency and reliable services supported by user friendly infrastructure that:
    - Support the 30 minute city objective through bus priority and accessibility
    - Provide for legible bus networks (i.e. along a two-way street)
    - Provide high quality bus stops, with appropriate levels of shelter and seating
    - Support easy, convenient and legible interchange at stations (Waterloo and Redfern)
- Walking and cycling will be the travel options of choice for local trips, with convenient, safe and attractive walking and cycling routes that:
    - Increase crossing opportunities for pedestrians and cyclists (as above) and ensure they are located appropriate to the walking and cycling networks
    - Provide a safe, legible, permeable and attractive local network that connects to retail and services, stations and bus stops, parks and open space and residential developments, and is supported by infrastructure (e.g. cycle parking, weather protection)
    - Facilitate opportunities for east-west movement across key roads

5.2 Options

The development of the traffic network options was informed by the policy and planning review, work undertaken through the related Botany Road Corridor study projects, an understanding of the traffic network and the emerging transport objectives.

Broadly the options can be summarised as:

- Option 1 – Existing traffic operation and conditions.
- Option 2 – Existing traffic operation with reduced speed limits (40 km/h). In summary, option 2 offered no tangible benefits over the existing situation.
- Option 3 – Removal of the one way pair operation, with both Gibbons Street and Regent Street operating as two way streets. Option 3 is articulated through two alternative sub-options:
    - Option 3A – regional traffic continues to use both Gibbons Street and Regent Street north of Henderson Road, with northbound traffic primarily directed to Gibbons Street and south bound traffic primarily directed to Regent Street, allowing local traffic to move in both directions. Regional bus corridors would be focused on Gibbons Street, improving bus network legibility and the Redfern Station interchange.

- Option 3B – regional traffic movements (including regional bus corridors) in both the northbound southbound directions would be focused on Gibbons Street north of Henderson Road. Traffic flows would be considerably reduced on Regent Street and the two kerbside lanes would not be required for through traffic.

Recognising that the 10 key moves include the removal of the one-way pair operation and the reinstatement of two-way traffic operation on Gibbons Street and Regent Street, the transport and traffic analysis has focused on options 3A and 3B. These options are illustrated in the figures on the following pages and described in further detail in the following sections of the report. The possible outcomes of the broader network options have been developed for each street.

Figure 5-1 – Option 3A

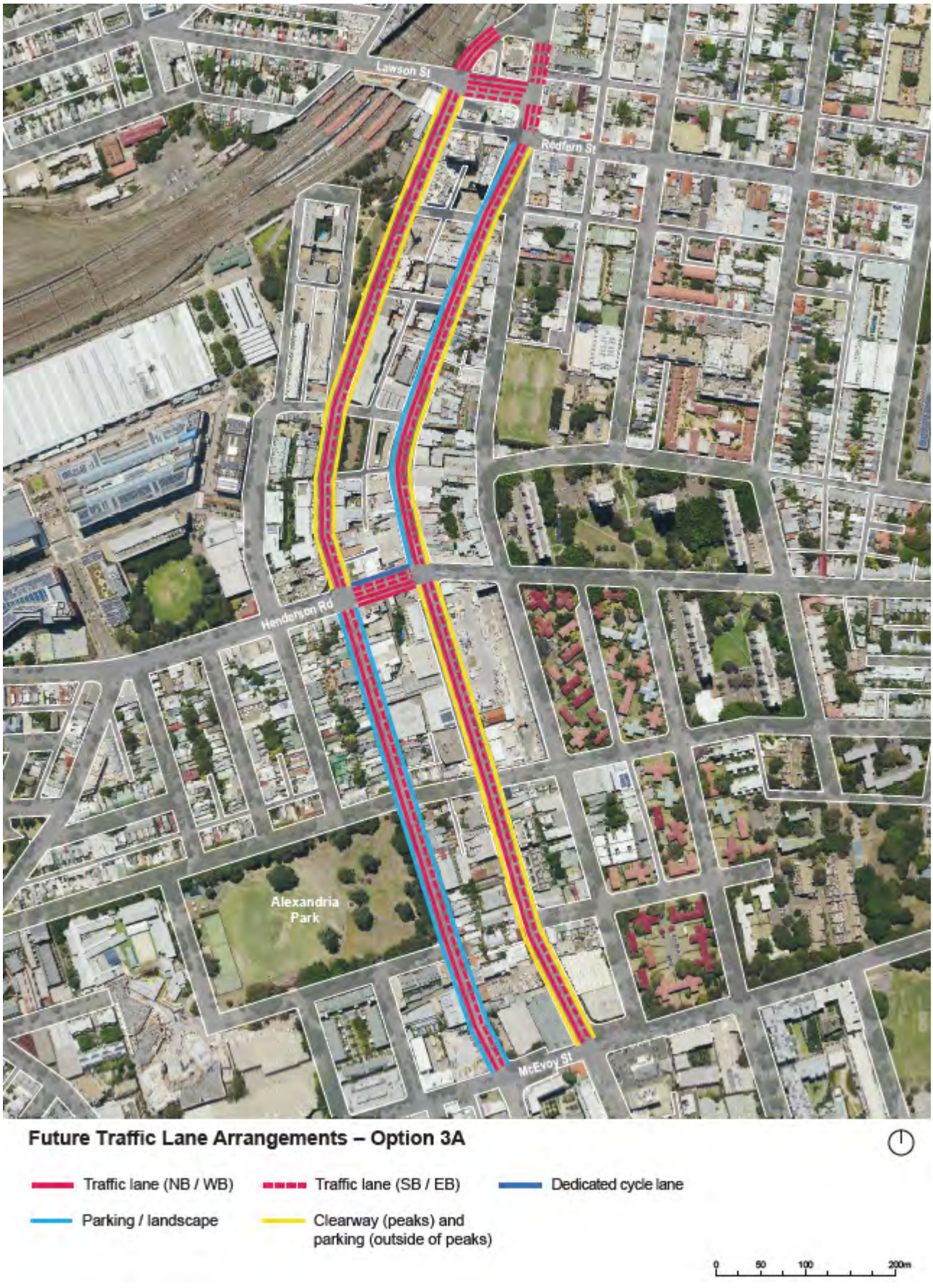


Figure 5-2 – Option 3B

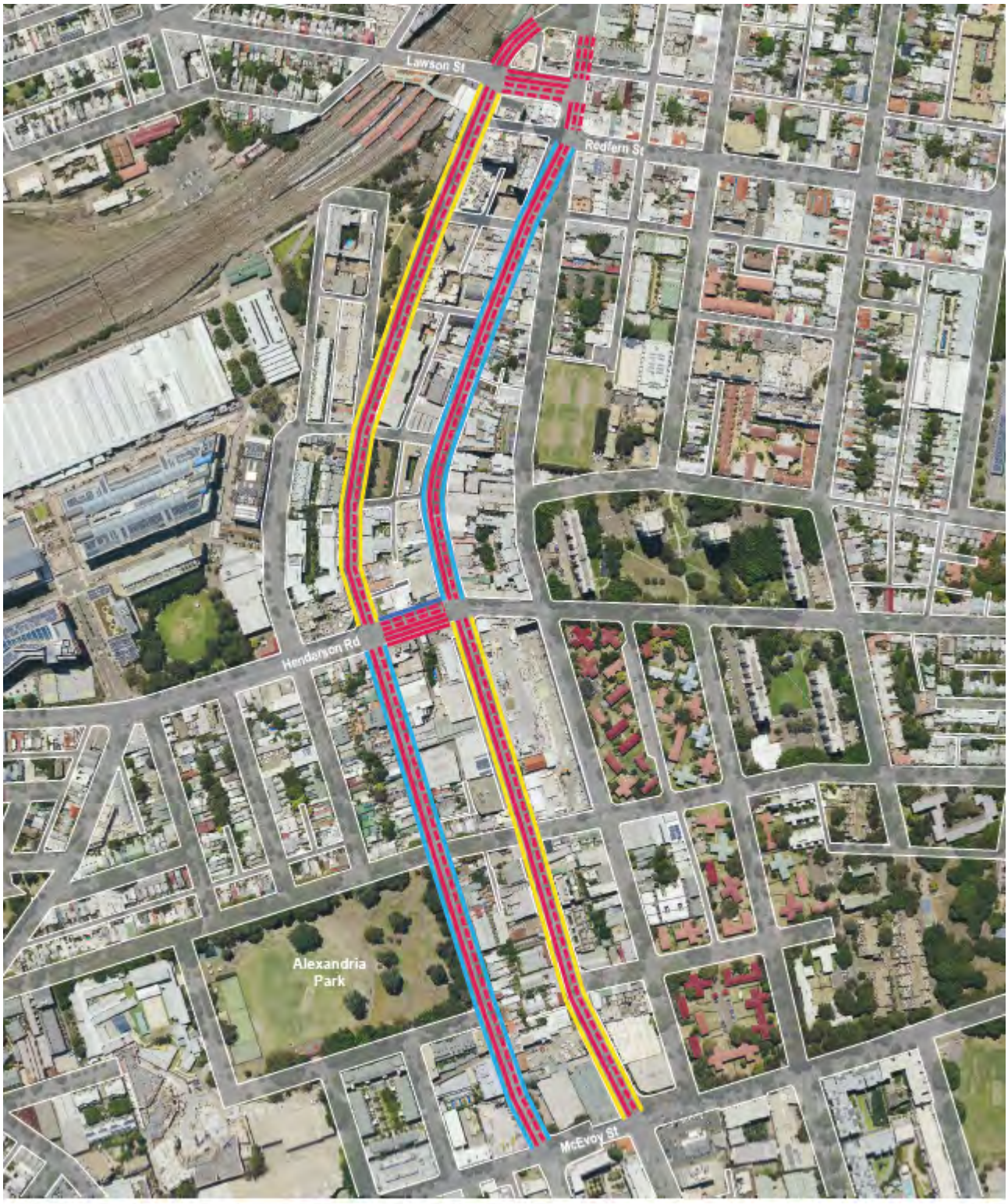


Table 5-1 - Traffic flows (Note: **Henderson Road – 'North' is westbound; 'South' is eastbound)**

Option	Street	AM peak hour (8am-9am)			PM peak hour (5pm-6pm)		
		Northbound	Southbound	Total	Northbound	Southbound	Total
1 / 2 (Existing)	Botany Rd	707	1,053	1,760	779	946	1,725
	Regent St	-	1,712	1,712	-	1,837	1,837
	Gibbons St	1,668	-	1,668	1,427	-	1,427
	Henderson Rd	1,590 (west)	236 (east)	1,807	1,826 (west)	195 (east)	2,044
3A	Botany Rd	707	1,053	1,760	779	946	1,725
	Regent St	389	980	1,369	393	906	1,299
	Gibbons St	1,279	732	2,011	1,034	931	1,965
	Henderson Rd	712 (west)	480 (east)	1,173	714 (west)	408 (east)	1,146
3B	Botany Rd	707	1,053	1,760	779	946	1,725
	Regent St	389	571	960	393	582	976
	Gibbons St	1,279	1,141	2,420	1,034	1,255	2,288
	Henderson Rd	712 (west)	869 (east)	1,582	714 (west)	755 (east)	1,469

5.2.1 Botany Road (McEvoy Street to Henderson Road)

Botany Road currently provides four traffic lanes, two southbound and two northbound. Clearways operate in both the morning and afternoon peak periods in both directions, preventing any kerbside parking when the clearways are in operation. Footpaths are provided on both sides of the street but crossing opportunities are limited to the signalised intersections at McEvoy Street, Buckland Street and Henderson Road.

Where buildings have been redeveloped, they have been subject to required setbacks, providing additional footpath width. Along the western side of Botany Road between Buckland Street and Henderson Road, the footpath increases to 9.7m wide but is utilised for car parking associated with local businesses, reducing local amenity and pedestrian safety.

Figure 5-3 Botany Road

Botany Road is a bus route and is will become more significant as a corridor for the rapid bus services identified in the South East Sydney Transport Strategy. Waterloo Metro station, located immediately east of Botany Road, between Buckland Street and Henderson Road, is under construction and services will commence operation in 2024. The station and new commercial and residential development on the site will form the Waterloo Metro Quarter. The Waterloo Housing Estate will also be redeveloped.

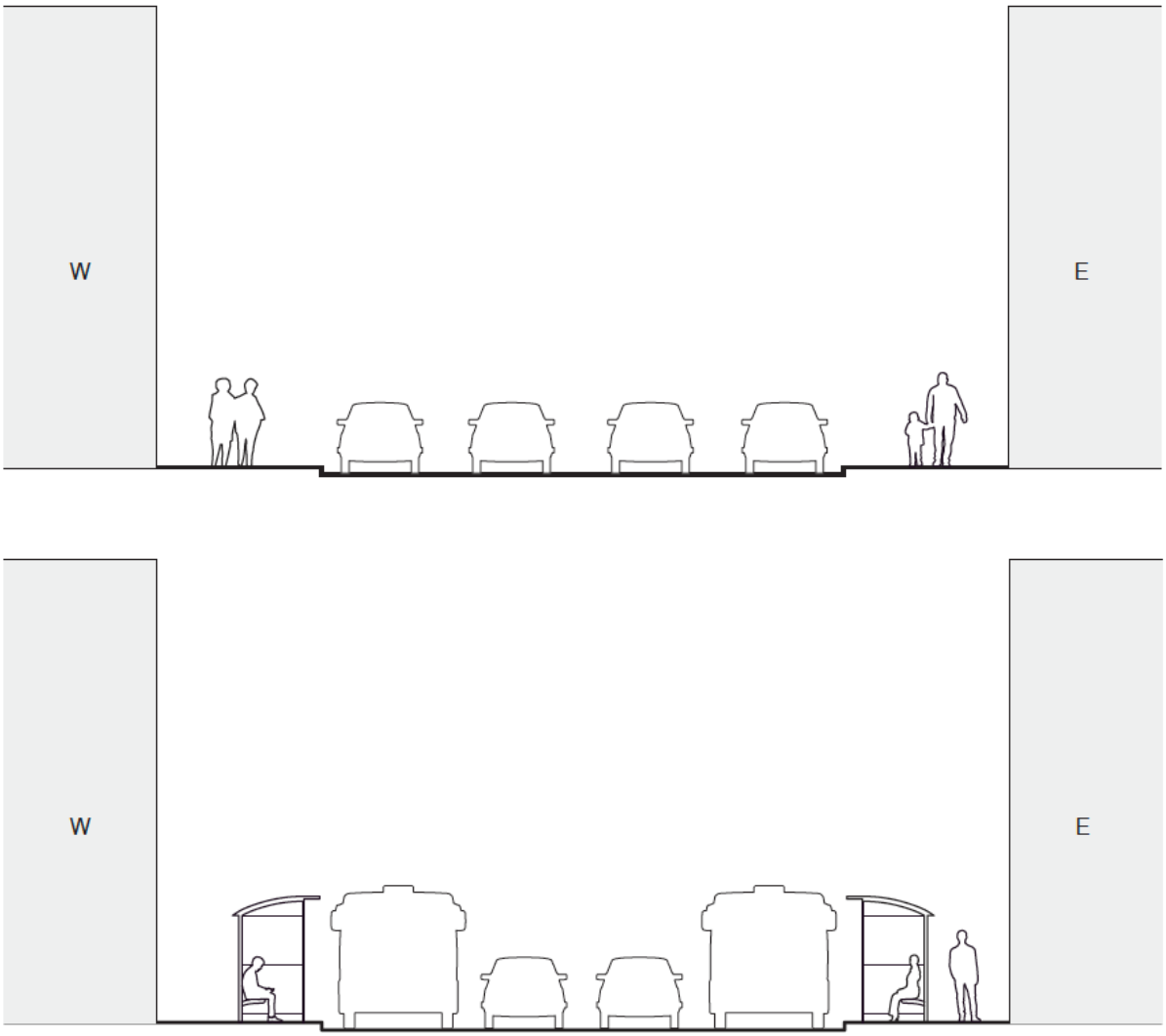
Botany Road will remain a traffic route into the future requiring four traffic lanes. Increased demand during peak periods can be provided through clearways and at other times the kerbside lanes can be utilised for

parking mid-block. As such there is minimal opportunity to change the lane configuration between the kerbs. Footpath widening can be achieved as buildings are redeveloped and setback provisions realised. Wider footpaths will be desirable to meet increased pedestrian demand, improve amenity and provide opportunities for street planting. Removal of existing footpath car parking should be explored in consultation with local businesses to provide for improved pedestrian amenity and reduce safety implications of vehicles reversing across the footpath into busy traffic lanes.

As buildings are redeveloped there is an opportunity to provide an east-west pedestrian connection through to Wyndham Street via Wyndham Lane (north). This will improve pedestrian network permeability and offer an alternative walk route between Botany Road and the Australian Technology Park. This potential future walking link will align with a possible future mid-block crossing of Botany Road (below) and Metro Quarter through site links.

With the commencement of metro services and the development of the Waterloo Metro Quarter there will be a demand for bus / rail interchange. This can be facilitated with the provision of high quality bus stops and associated facilities on both sides of Botany Road, and the location of a mid-block signalised crossing, aligned to the Metro Quarter through site links. It is noted that the signalised mid-block crossing can be linked to the signalised intersections at Henderson Road and Buckland Street negating any additional delay to vehicles and minimising vehicle stopping, acceleration and deceleration.

Figure 5-4 Botany Road indicative cross sections (as per existing)



5.2.2 Regent Street

Regent Street currently provides four traffic lanes in a southbound direction, being the southbound corridor of the one-way pair. Clearways operate along the western kerb. Outside of clearway operations and along the eastern kerb time limited parking is permitted. Footpaths are provided on both sides of the street. There is one signalised crossing just to the north of Boundary Street in addition to the signalised intersections at Henderson Road, Redfern Street and Lawson Square.

At the northern end of the corridor Regent Street provides connections to Redfern Street and Lawson Square. Signalised pedestrian crossings are not available on the northern approach of the Redfern Street intersection and southern approach of the Lawson Street intersection, meaning that pedestrians are unable to cross Regent Street in a single movement between these two intersections. Investigations should be undertaken, in consultation with Transport for NSW, to provide these missing pedestrian crossings to improve accessibility and safety for pedestrians.

Additional pedestrian space is provided on the eastern side of Regent Street (outside the IGA) and the footpath increases in width to 12m, offering increased amenity with street planting and seating.

Figure 5-5 Regent Street

East-west connections provide increase the permeability of the pedestrian network, including Chapel Lane, Boundary Street, Margaret Street and Redfern Street. There are signalised crossing that assist pedestrians in using Boundary Street and Redfern Street to access areas to the west of Gibbons Street, in particular the Australian Technology Park. The local network offers multiple pedestrian routes connecting to Redfern Station and the Australian Technology Park but is constrained by the relative lack of east-west crossings.

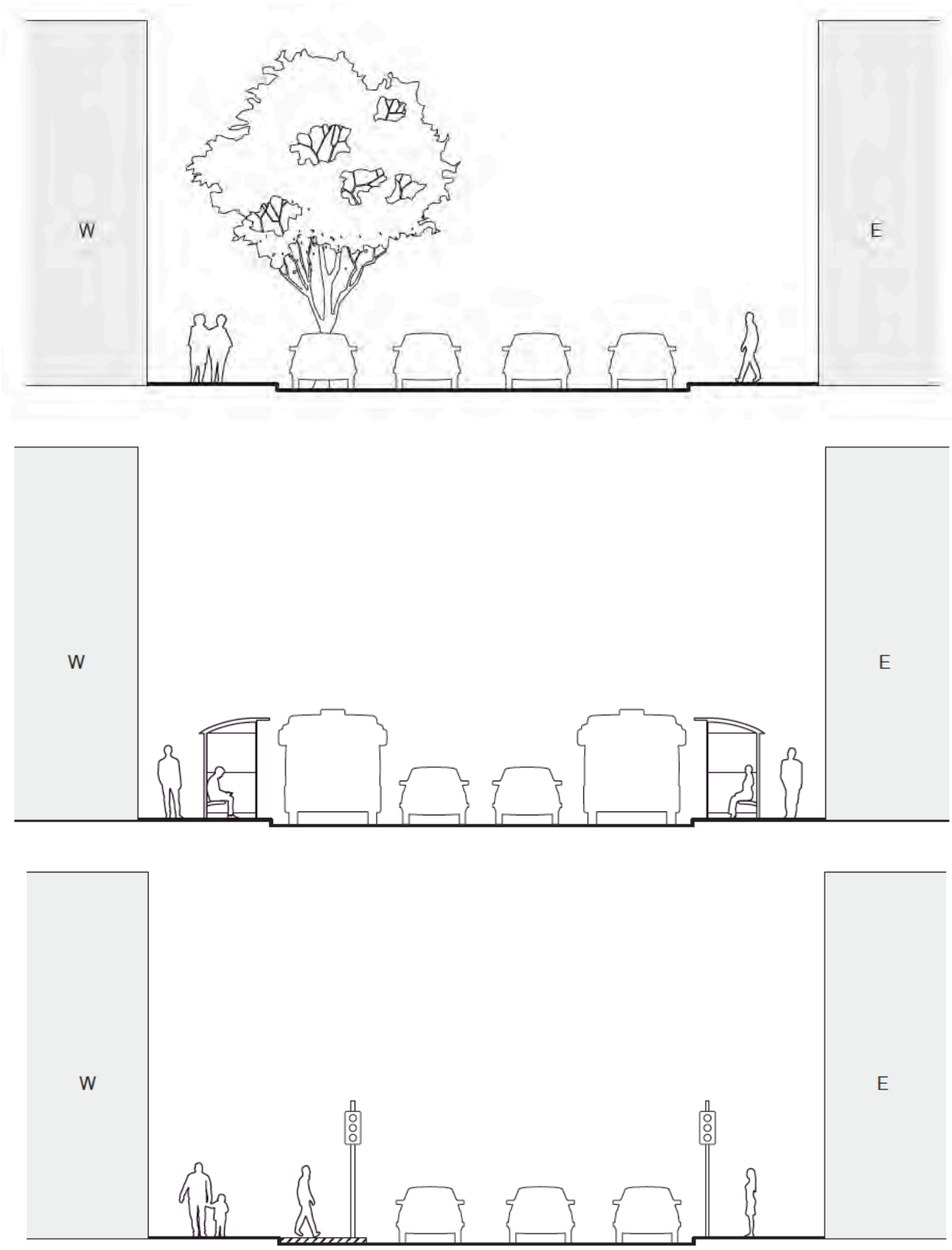
Removing the one-way pair and returning Regent Street to two-way traffic operation offers a number of advantages in part dependent on the configuration of the broader traffic network.

If Regent Street is retained as the strategic southbound traffic route, capacity is required meet peak period demand (option 3A). While one northbound traffic lane is sufficient, two southbound traffic lanes would be required in peak periods; the kerbside southbound lane could facilitate parking and loading through the interpeak period but would be a clearway during peak periods.

The kerbside northbound lane would no longer be required for through traffic and could be utilised for a mix of uses including parking, loading, street planning, kerb outstands and footpath widening. Kerb outstands can be used to reduce pedestrian crossing distances and facilitate bus boarding and alighting.

As three traffic lanes would need to be retained any additional pedestrian crossings would necessarily be signalised.

Figure 5-6 Regent Street Option 3A indicative cross sections (maintaining three through traffic lanes) general cross section, bus zone, pedestrian crossing



If Regent Street is identified as a local traffic route only (option 3B), with Gibbons Street the strategic north and southbound traffic route, sufficient traffic capacity to meet peak (and off-peak) period demand can be provided with one northbound and one southbound lane. This would allow both kerbside lanes to be effectively

repurposed and utilised for a mix of uses including parking, loading, street planning, kerb outstands and footpath widening. If only two traffic lanes are provided (one northbound and one southbound) unsignalised (zebra) pedestrian crossings could be installed to facilitate east-west movement. Kerb outstands could be effectively used to minimise the crossing distance at both unsignalised (zebra) crossings and informal crossing locations.

Figure 5-7 Regent Street Option 3B indicative cross sections (maintaining two through traffic lanes) general cross section, bus zone, pedestrian crossing

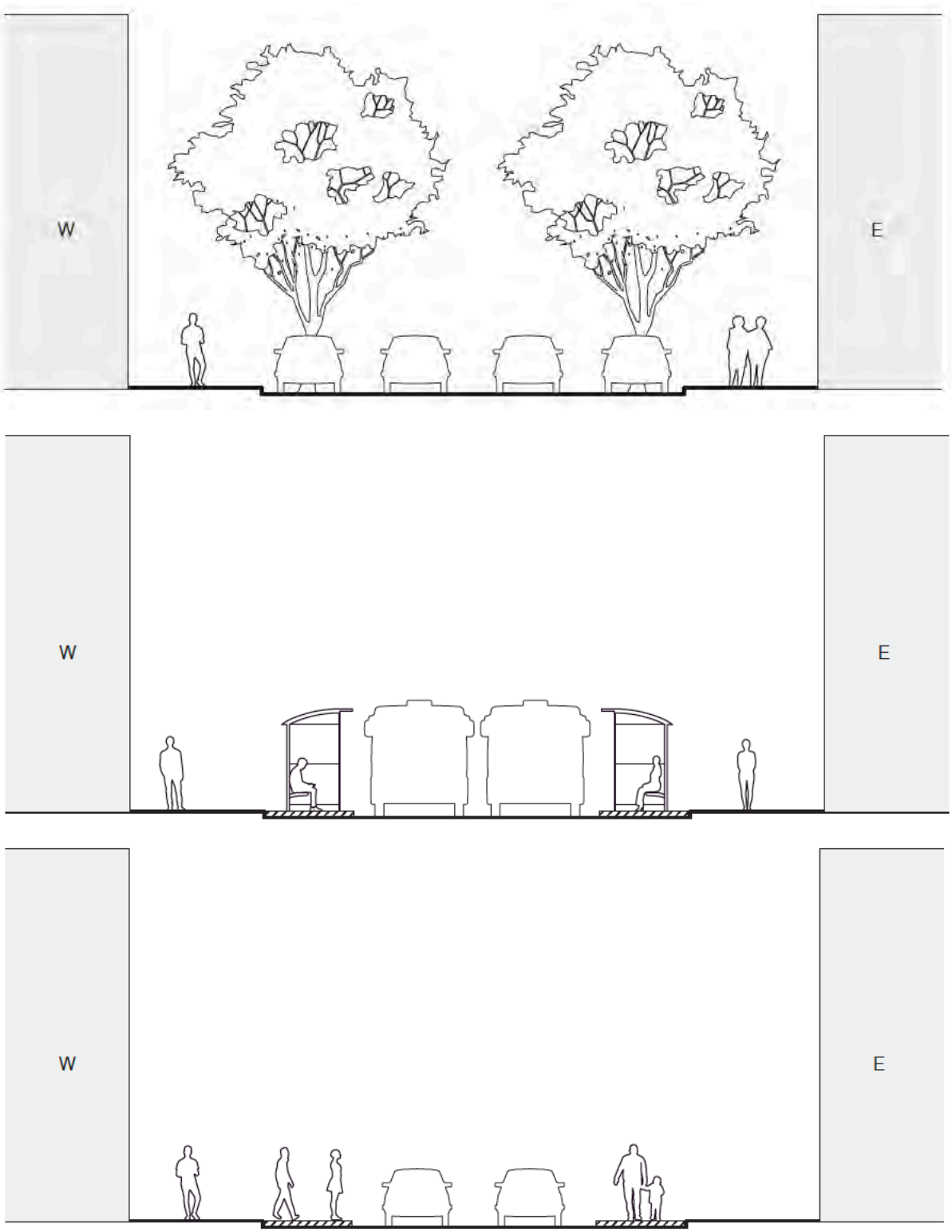


Table 5-2 Regent Street traffic outcomes

Option		AM peak hour (8am-9am)			PM peak hour (5pm-6pm)		
		Northbound	Southbound	Total	Northbound	Southbound	Total
1 / 2 (Existing)		-	1,712	1,712	-	1,837	1,837
3A	Vehicles	389	980	1,369	393	906	1,299
	% change on existing			-20%			-29%
3B	Vehicles	389	571	960	393	582	976
	% change on existing			-44%			-47%

5.2.3 Gibbons Street

Gibbons Street currently provides four traffic lanes in a northbound direction, being the northbound corridor of the one-way pair. Clearways operate along the eastern kerb. Outside of clearway operations and along the western kerb time limited parking is permitted. Footpaths are provided on both sides of the street and vary between 3.2m and 3.5m wide. There are signalised intersections at Henderson Road, Boundary Street, Redfern Street and Lawson Square.

On the west side of Gibbons Street, there is the Gibbons Street Reserve between Gibbons Street and Rosehill Street. While the reserve slopes relatively steeply from Gibbons Street up towards Rosehill Street, it provides alternative access through to Redfern Station and the Australian Technology Park. There is also Daniel Dawson Reserve to the east of Gibbons Street bounded by Chapel Lane, William Lane and Boundary Street.

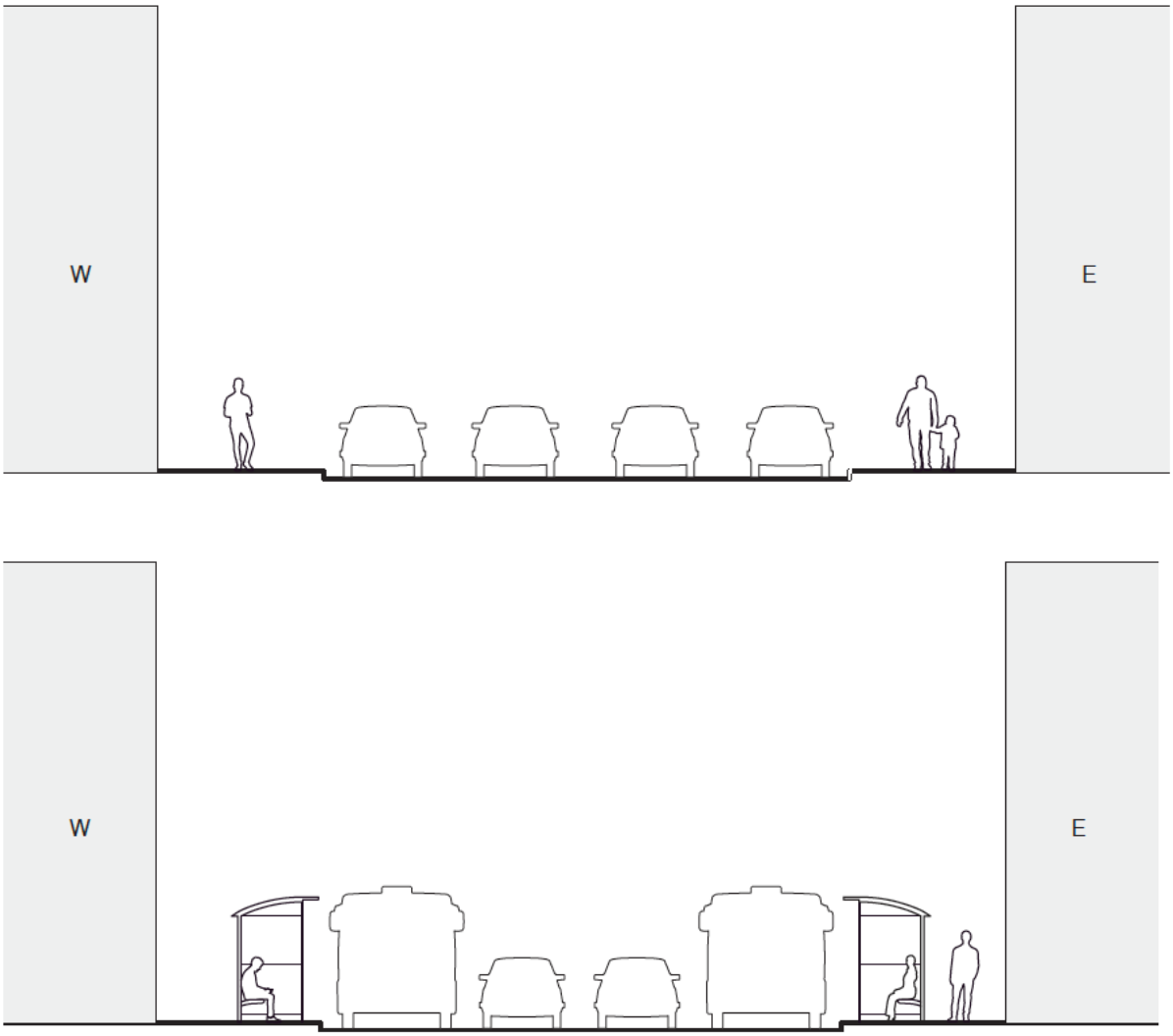
Figure 5-8 Gibbons Street

With the removal of the one-way pair, there are two alternative options for Gibbons Street:

- As the strategic northbound traffic route, with local southbound traffic (option 3A)
- As the strategic traffic route for both northbound and southbound traffic (option 3B)

Both of these options would see the need to retain four traffic lanes with peak period clearways. As the traffic conditions will remain similar into the future there is very limited potential for footpath widening. Traffic flows would increase as traffic volumes on Regent Street reduce.

Figure 5-9 Gibbons Street indicative cross sections Options 3A and 3B (general cross section, bus zone)



Traffic volumes in Gibbons Street would increase in both options.

Table 5-3 Gibbons Street traffic outcomes

Option		AM peak hour (8am-9am)			PM peak hour (5pm-6pm)		
		Northbound	Southbound	Total	Northbound	Southbound	Total
1 / 2 (Existing)		1,668	-	1,668	1,427	-	1,427
3A	Vehicles	1,279	732	2,011	1,034	931	1,965
	% change on existing			21%			38%
3B	Vehicles	1,279	1,141	2,420	1,034	1,255	2,288
	% change on existing			45%			60%

5.2.4 Henderson Road

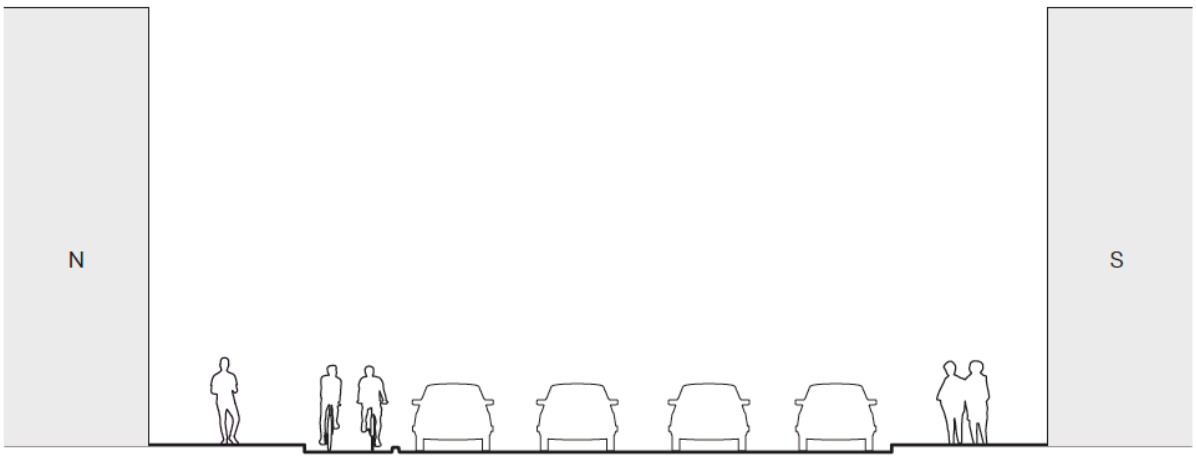
Henderson Road currently operates as a part of a dogleg to facilitate northbound traffic movements from Botany Road to Gibbons Street. Between Botany Road and Gibbons Street there are six traffic lanes, with four in the westbound direction to facilitate the heavy right-turning movement into Gibbons Street (northbound). A clearway operates in both peak periods along the southern kerb, while there is no stopping at any time along the northern kerb.

Figure 5-10 Henderson Road

The removal of the one-way pairs offers the opportunity to reconfigure and potentially reduce the traffic lanes on this section of Henderson Road. A reduction in traffic lanes then provides an opportunity to widen the footpaths, and/or provide a separated cycleway.

With the removal of the one-way pair and Regent Street retained as the strategic southbound route (option 3A), Henderson Road could potentially be reduced to four lanes, two westbound and two eastbound, with clearways / no stopping. The ability to reduce the capacity of Henderson Road is due to Regent Street being available for local northbound traffic and some assumed intersection changes to reduce turning movements. The removal of the kerbside lanes would facilitate the implementation widened footpaths and/or a separated cycleway, connecting to the broader cycle network.

Figure 5-11 Henderson Road Option 3A indicative cross section (four traffic lanes) general cross section



If Gibbons Street provides the strategic connection for both northbound and southbound traffic (option 3B) Henderson Road could potentially be reduced to five lanes, three westbound and two eastbound with clearways / no stopping. This option would allow the removal of one kerbside lane facilitating the implementation of widen footpaths and/or a separated cycleway.

Figure 5-12 Henderson Road Option 3B indicative cross section (five traffic lanes) general cross section

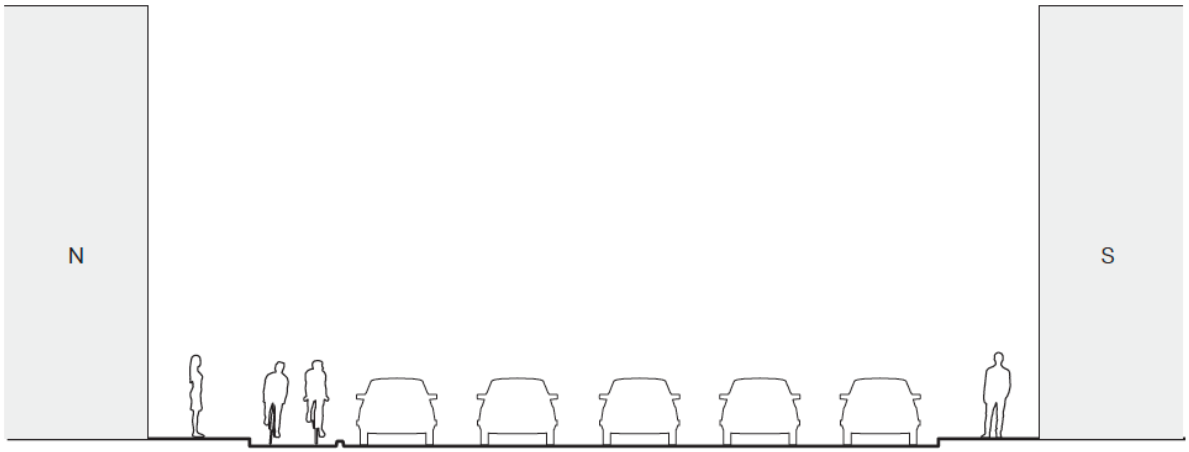


Table 5-4 Henderson Road traffic outcomes

Option		AM peak hour (8am-9am)			PM peak hour (5pm-6pm)		
		Westbound	Eastbound	Total	Westbound	Eastbound	Total
1 / 2 (Existing)		1,590	236	1,807	1,826	195	2,044
3A	Vehicles	712	480	1,173	714	408	1,146
	% change on existing			-35%			-44%
3B	Vehicles	712	869	1,582	714	755	1,469
	% change on existing			-12%			-28%

5.3 Intersections

The removal of the one-way pair to provide for two way traffic movements on Regent Street and Gibbons Street would require a reconfiguration of the intersections on Henderson Road at Botany Road and Gibbons Street. In line with the transport and traffic objectives, traffic movements at these intersections could be rationalised to support improved place outcomes and reduced pedestrian wait times – particularly adjacent to Waterloo Metro Quarter. Possible changes include:

- No right turn restriction from Regent Street into Henderson Road, with this movement relocated to Gibbons Street in line with the preferred traffic arrangements. This will allow the Botany Road / Henderson Road / Regent Street intersection to operate with fewer traffic phases and maintain an acceptable level of operation, while also providing added crossing time for pedestrians.
- No right turn restriction from Wyndham Street into Henderson Road to simply intersection movements and reduce points of conflict. This will also support the objective of reducing traffic flows on Wyndham Street in line with its current character.
- Not permitting southbound traffic movements from (the now two-way) Gibbons Street through to Wyndham Street to prevent this from becoming a 'rat run'. Instead vehicles would be directed to turn left towards Botany Road to ensure the Gibbons Street / Botany Road route remains the primary north-south movement corridor for regional traffic.

These intersection configurations would be subject to more detailed analysis and modelling in a subsequent stage of the project, to be undertaken in consultation with Transport for NSW.

Figure 5-13 – Existing and future potential intersection operation

Existing Traffic Movements at Intersections (north-south)

Future Potential Traffic Movements at Intersections (north-south)

Existing Traffic Movements at Intersections (east-west)

Future Potential Traffic Movements at Intersections (east-west)

Existing Traffic Movements at Intersections

Future Potential Traffic Movements at Intersections

In addition to the intersection changes required at Henderson Road, additional modifications will be required at the northern end of the corridor (Lawson Square) to facilitate the removal of the one-way pair. These changes will be the subject of discussions with Transport for NSW however may include:

- Right turn only restriction in place on Regent Street into Redfern Street so as to require all northbound regional traffic to use Gibbons Street. This measure would free up intersection capacity by reducing the number of required phases at the Regent Street / Redfern Street intersection
- Introduce a right turn or double right turn movement from Regent Street (southbound) into Lawson Square to then allow southbound traffic to turn left onto Gibbons Street
- Introduce a new signalised intersection on Gibbons Street and Regent Street to allow regional traffic to continue along Gibbons Street with local traffic to be focused on Regent Street. A concept of this intersection arrangement, prepared by Tonkin Zulaikha Greer Architects, is shown below. This arrangement is indicative only and would be subject to further testing and modelling, including consultation with Transport for NSW.

Figure 5-14 Potential intersection configuration at northern end of corridor

Source: Tonkin Zulaikha Greer Architects

6 Conclusion

Botany Road as a movement corridor and the suburbs it passes through have a long history predating European invasion and colonisation. Aboriginal people used the heath and wetlands in this area to camp, hunt, fish, construct tools, keep and share knowledge, create art, and harvest plant foods and medicine. They maintained pathways through the dune heath that connected coastal and inland clans.

Europeans utilised Aboriginal pathways and established industries on what they considered marginal land. The Botany Road corridor developed to provide a connection between these industrial areas and the Sydney city centre to the north, and more recently to Port Botany and Sydney Airport to the south.

Today, the Botany Road corridor, much like other areas of South Sydney the corridor, is going through tremendous change. The number of people living in the local area is increasing rapidly as formerly industrial and commercial sites are redeveloped into residential accommodation. Recent population growth is set to continue with the redevelopment of public housing estates; Waterloo, Redfern and North and South Eveleigh.

The development of the Metro Quarter focused on the Waterloo Station, on the City and South West Metro (to commence operation in 2024) and the redevelopment of the Waterloo housing estate will accelerate urban renewal.

Local residential and commercial development and the location of major transport hubs including Waterloo Metro Station and Redfern Station will increase pedestrian and cycle activity in the locality. Planned rapid bus services will serve local demand and provide for interchange with both Waterloo and Redfern stations. The completion of the WestConnex orbital motorway will further augment the strategic road network, providing alternative north-south traffic routes to the east and west.

There is an opportunity to challenge the recent focus of Botany Road as a traffic corridor, particularly for heavy vehicles, instead recognising the importance of local places, responding to the needs of local residents and workers, improving safety and amenity.

Given local growth, transport demand needs to be accommodated through public and active transport, facilitated by enhanced and new services and infrastructure. Local trips need to be supported through attractive walking and cycling networks offering convenient and safe access to local services, shops, employment, education and transport connections.

As the balance between the movement demands on the corridor and place requirements, evident with increasing activity along Botany Road and Regent Street north of Buckland Street, there is an opportunity to reconsider the operation of the Botany Road corridor through the Movement and Place framework. This will facilitate an increased emphasis on place outcomes, reduced traffic speeds, improved pedestrian network permeability and amenity. The corridor must be considered as multi-modal, prioritising the needs of vulnerable road users and public transport.

A key recommendation is the removal of the Gibbons Street / Regent Street one-way pair operation and the reinstatement of two-way traffic flow on both streets, improving network legibility for bus passengers and providing the opportunity for further active transport and amenity improvements. However, as discussed in this report, there are a number of opportunities to deliver improvements that will support growth, including increased activity at the Waterloo Metro Quarter, within the context of the current traffic operation. These improvements will deliver a safer pedestrian environment and should be pursued urgently.

The City of Sydney should continue to engage with Transport for NSW to explore the options and recommendations contained in this report and the broader Botany Road corridor studies, recognising that the recommended actions vary in terms of their delivery complexity but there is a need to realise improvements in the short term to support the operation of the Waterloo Metro Station.

Appendix A: Site visit, 23 June 2020

Botany Road Corridor Traffic and Transport
Site Visit 23 June 2020
Observations

Gibbons Street, green space between Rosehill Street and Gibbons Street



Henderson Street, east-west traffic



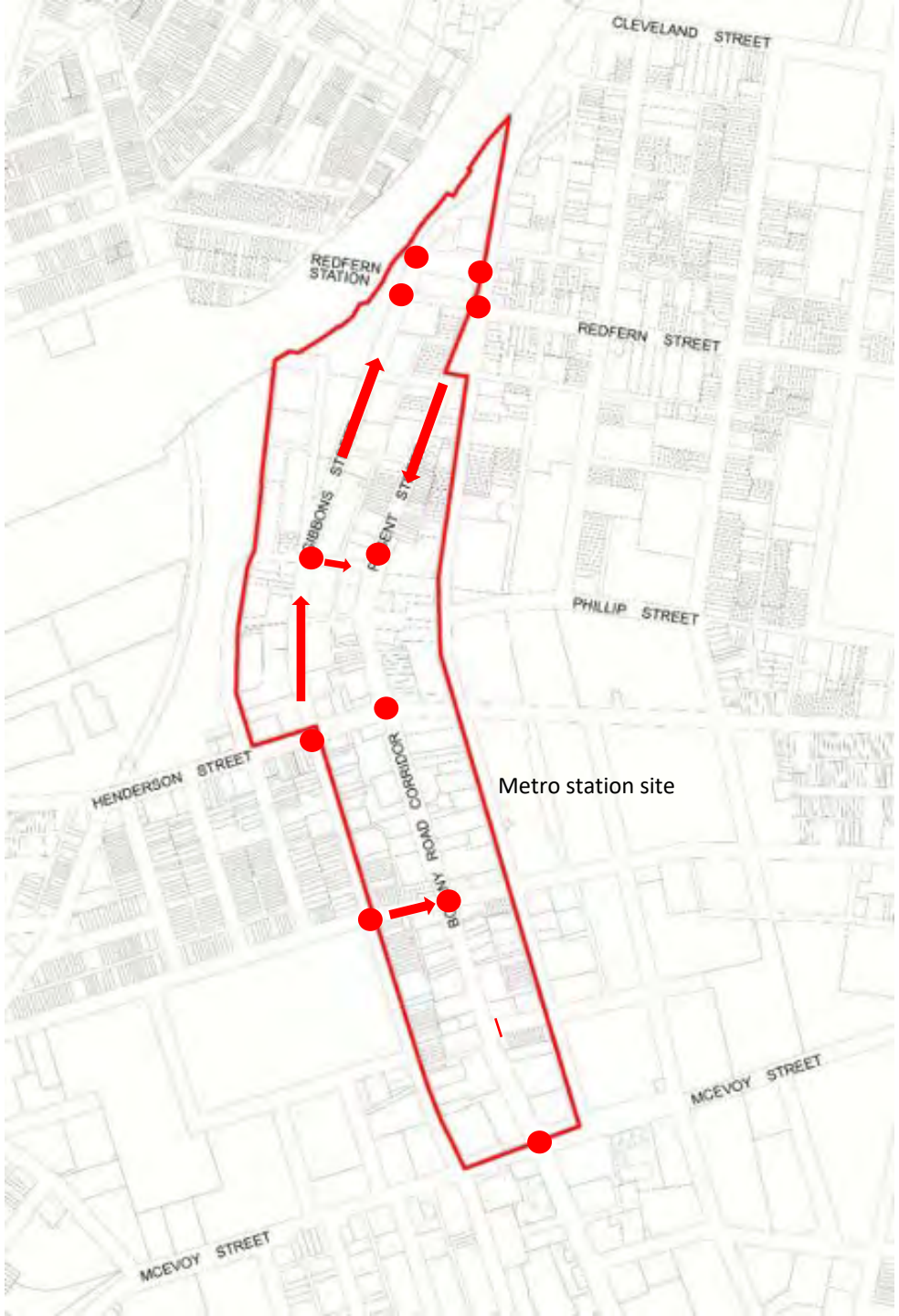
Intimidating pedestrian environment, buildings setback, warehouse retail, footpath parking



Wyndham Street north and Buckland Street, residential housing, terraces


Lanes with little / no activation





Connecting laneways, new residential development



Contrasting character of Cope Street, walkway connecting to Regent Street and Cope Street



Regent Street, landscaped area outside IGA, seating



Road closure at John Street, landscaping along Botany Road



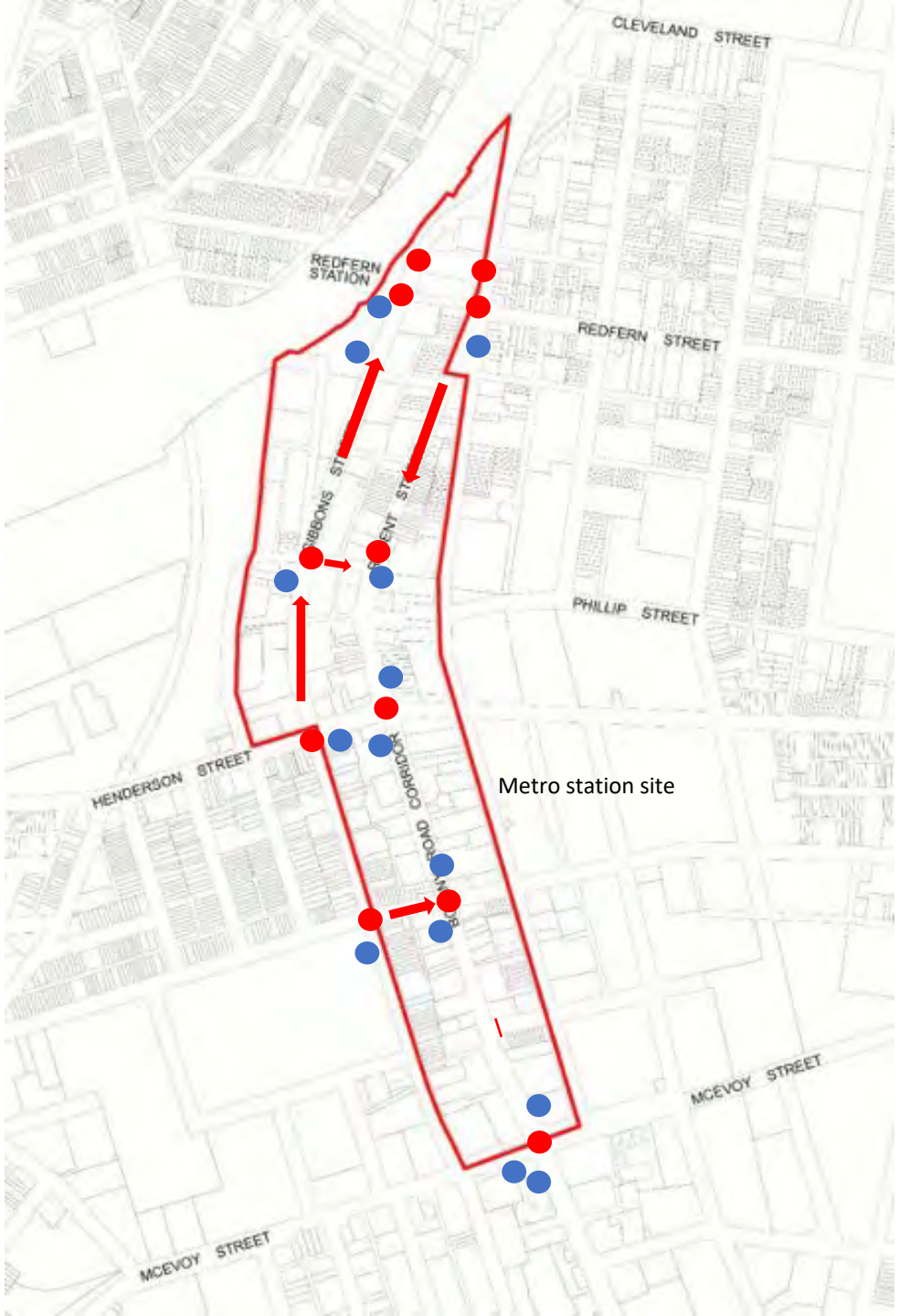
McEvoy Street / Botany Road, angle parking at back of footpath



Direction of traffic (where one-way)

Traffic signals

Botany Road Corridor Traffic and Transport
Site Visit 23 June 2020
Bus stop locations



Direction of traffic (where one-way)
Traffic signals
Bus stop

Appendix B: Options summary

The options are described in the following table. This table provides the operational detail for each option, including lane configurations and clearways.

Description of options

	Option		
Street configuration	**1 / 2 (Existing)**	**3A**	**3B**

Botany Street	• 4 lanes, 2 northbound, 2 southbound
	• Western kerb (northbound) – AM and PM clearway, 1P
	• Eastern kerb (southbound) – AM and PM clearway, no stopping, 1P
	• Lane configuration remains in both future scenarios, with
	  ○ Bus/metro interchange with bus stops on both sides of the road
	  ○ Potential for mid-block signalised crossing
	  ○ Opportunity to utilise western setback to provide pedestrian amenity		

Regent Street	• 4 traffic lanes, southbound (one way)
	• Western kerb – AM and PM clearway south of Boundary, otherwise, mix of 1P, no stopping, bus zones
	• Eastern kerb - Otherwise, mix of 1P, no stopping, bus zones
		• 4 traffic lanes, 2 northbound, 2 southbound
		• Peak period clearways
		  ○ AM eastern kerb (southbound)
		  ○ PM eastern kerb (southbound)
		• Opportunity for parking, planting, kerb outstands on western kerb (northbound)
		• Reduced traffic volumes (-20% in AM and -29% in PM peak hours)
			• 2 traffic lanes, 1 northbound, 1 southbound
			• Kerbside lanes provide opportunity for parking, planting, kerb buildouts
			• Reduced traffic volumes (-44% in AM and -47% in PM peak hours)
			• Opportunity for zebra crossings

Gibbons Street	• 4 traffic lanes, northbound (one way)
	• Eastern kerb – AM and PM peak clearway, otherwise mix of parking and no stopping
	• Western kerb – parking (1/2P, 2P and unrestricted), bus zones, no stopping
		• 4 traffic lanes, 2 northbound, 2 southbound
		• Peak period clearways
		  ○ AM Western kerb (northbound)
		  ○ PM northbound & southbound
		• Increased traffic volumes (21% in AM and 38% in PM peak hours)
			• 4 traffic lanes, 2 northbound, 2 southbound
			• Peak period clearways
			  ○ AM northbound & southbound
			  ○ PM northbound & southbound
			• Increased traffic volumes (45% in AM and 60% in PM peak hours)

Henderson Road	• 6 traffic lanes, 4 westbound, 2 eastbound • Southern kerb (westbound) – AM and PM clearway, no stopping • Northern kerb (eastbound) – no stopping	• Possible 4 traffic lanes, 2 westbound, 2 eastbound (requires testing through intersections) • Reduced traffic volumes (-35% in AM and -44% in PM peak hours) • Opportunity for separated cycleway and widened footpaths • Clearways / no stopping	• 5 traffic lanes, 3 westbound, 2 eastbound • Reduced traffic volumes (-12% in AM and -28% in PM peak hours) • Opportunity for separated cycleway or widened footpaths • Clearways / no stopping

The advantages, disadvantages and risks of options 3A and 3B are developed through the following tables, considering each street and each mode or user group.

Advantages, disadvantages and risks of options 3A and 3B, by street

	Options	
Street	**3A**	**3B**
Gibbons Street	**Advantages** • Two-way traffic • Reduced traffic speeds • Some opportunity for parking during AM peak period on eastern kerb **Disadvantages** • Increased traffic volumes • Increased truck volumes • Legibility of bus network is not improved with continued separation of northbound (Gibbons St) and southbound (Regent St) services • AM and PM clearways introduced • No opportunity for on-street parking during PM peak hour **Risks** • Increased traffic volumes impact mainly residential buildings • Further testing of Gibbons / Henderson / Wyndham intersection required to confirm traffic flows can be accommodated	**Advantages** • Two-way traffic • Reduced traffic speeds • Legibility of bus network improved with northbound and southbound services on Gibbons St • Gibbons St bus interchange at Redfern Station • Provides legible strategic traffic route **Disadvantages** • Increased traffic volume (further addition on 3A) • Increased truck volumes (similar to 3A) • AM and PM clearways introduced (further addition to 3A) • Opportunity to simplify Gibbons / Henderson / Wyndham intersection, allocating time to pedestrian crossings • No opportunity for on-street parking during both peak periods **Risks** • Increased traffic volumes impact mainly residential buildings • Further testing of Gibbons / Henderson / Wyndham intersection required to confirm traffic flows can be accommodated • Potential increase in Wyndham St traffic flows if intersection with Henderson Rd is not simplified
Regent Street	**Advantages** • Two-way traffic • Reduced traffic speeds • Reduced traffic volumes • One (probably western) kerbside lane not required for through traffic (parking, landscaping, trees) **Disadvantages** • Vibrant street (compromising movement and place functions) • Higher traffic flows on Gibbons St • Additional east-west pedestrian crossings would need to be via new	**Advantages** • Two-way traffic • Reduced traffic speeds • Reduced traffic volumes (further reduction on 3A) • Kerbside lanes not required for through traffic which presents opportunities for parking, loading, landscaping, trees etc • Zebra crossings can be provided, facilitating east-west pedestrian crossing • Reinforces Botany Rd / Regent St corridor as walking route

	Options	
Street	**3A**	**3B**
	traffic signals given a minimum three traffic lanes would be in operation during peak periods **Risks** • Vibrant street outcomes are not favoured due to poor safety outcomes • Further testing required to confirm right turn from Regent St into Henderson Rd can be relocated to Gibbons St	• Opportunity to simplify Regent St / Henderson Rd intersection, allocating time to pedestrian crossings **Disadvantages** • Higher traffic flows on Gibbons St (further addition to 3A) • 'dog leg' movements required for regional traffic at both Lawson St and Henderson Rd **Risks** • None identified
Henderson Road	**Advantages** • Two-way traffic (potentially four lanes total) • Reduced traffic speeds • Reduced traffic volumes • Reduce carriageway to five lanes with potential to reduce to four lanes • Reallocation of roadspace (equivalent of up to two lanes) to provide separated cycleway and/or increased footpath width **Disadvantages** • None identified **Risks** • Further testing required to confirm reduction down to four traffic lanes is achievable	**Advantages** • Two-way traffic • Reduced traffic speeds • Reduced traffic volumes (level of reduction less than in 3A) • Reduce carriageway to five lanes • Reallocation of roadspace (equivalent of one lane) to provide separated cycleway or increased footpath width **Disadvantages** • Increased traffic flows in the eastbound direction given 'dog leg' movement required for southbound traffic travelling between Gibbons St and Botany Rd • Concentration of all regional traffic movements at the Gibbons / Henderson / Wyndham intersection **Risks** • Further testing required to confirm reduction down to five traffic lanes is achievable

Advantages, disadvantages and risks of options 3A and 3B, by mode / user group

	Options	
Mode	**3A**	**3B**
Walking	**Advantages** • Reduced traffic speeds • Reduced traffic volumes in Regent St and Henderson Rd **Disadvantages** • Increased traffic volumes on Gibbons St **Risks** • None identified	**Advantages** • The Botany Rd / Regent St corridor is reinforced as a walking route • Zebra crossings in Regent St increase crossing opportunities and the general reduction in traffic and lanes increases ability to cross • Reduced traffic speeds • Reduced traffic volumes in Regent St and Henderson Rd **Disadvantages** • Increased traffic volumes on Gibbons St **Risks** • None identified
Cycling	**Advantages** • Separated cycleway provided on Henderson Rd **Disadvantages** • None identified **Risks** • None identified	**Advantages** • Separated cycleway provided on Henderson Rd • Regent St offers quiet north-south route and easy access to shops and services **Disadvantages** • None identified **Risks** • None identified
Public transport	**Advantages** • None identified (assuming no change to current network operation) **Disadvantages** • Does not support improved interchange legibility at Redfern Station • Does not support improved network legibility in line with identified city serving corridor **Risks** • None identified	**Advantages** • Legible interchanges at both Waterloo Metro and Redfern Station • Identified city serving corridor reinforced on Gibbons St supporting network legibility and service reliability • Bus priority can be delivered at intersections on Gibbons St **Disadvantages** • None identified **Risks**

	Options	
Mode	3A	3B
		• None identified
Freight (strategic)	**Advantages** • Legible north-south route **Disadvantages** • Strategic freight and strategic traffic routes use different local streets which may cause confusion **Risks** • Lack of common strategic traffic and freight route may not be acceptable	**Advantages** • Legible north-south route that corresponds to strategic traffic route **Disadvantages** • Southbound route uses Henderson Rd **Risks** • None identified
Freight (local)	**Advantages** • None identified **Disadvantages** • Clearway restrictions in Gibbons St and Regent St remain and will restrict deliveries during clearway hours **Risks** • None identified	**Advantages** • Deliveries can occur on Regent St 24/7 as required **Disadvantages** • Clearway restrictions in Gibbons St remain and will restrict deliveries during clearway hours **Risks** • None identified
Traffic	**Advantages** • Lower traffic speeds **Disadvantages** • Difference in route for northbound and southbound traffic does not support network legibility (legibility reduces on base case with removal of one way operation) **Risks** • Reduced network legibility	**Advantages** • Lower traffic speeds • Improved network legibility **Disadvantages** • Southbound traffic 'dog-legs' **Risks** • None identified

The overall advantages. disadvantages and risks are summarised in the following table.

Advantages, disadvantages and risks of options 3A and 3B

	Options	
Overall	**3A**	**3B**
Advantages	• Reduced traffic on Regent St will support some place outcomes • Reduced traffic on Henderson Rd – potentially two traffic lanes can be reallocated to active transport (footpaths and/or separated cycleway) • Can simplify intersections, reallocating time to pedestrian crossings	• Reduced traffic on Regent St supports vision and place outcomes – Regent St can become a high street similar to Crown St • Reduced traffic on Henderson Rd - one traffic lane can be reallocated to active transport (footpaths or separated cycleway) • Can simplify intersections, reallocating time to pedestrian crossings • Legible public transport interchanges at both Waterloo Metro and Redfern Station • Future Transport identified city serving corridor reinforced on Gibbons St supporting network legibility and service reliability
Disadvantages	• Lack of network legibility for buses, traffic, freight • Does not provide legible bus/rail interchange at Redfern Station • Increased traffic on Gibbons St (lower increase than in 3B) • Movement and place both remain important on Regent St which compromises outcomes for both	• Increased traffic on Gibbons St (higher increase compared to 3A)
Risks	• Regent St becomes a vibrant street which would generally not be favoured due to poor safety outcomes • Lack of network legibility (traffic and buses) • Increased traffic on Gibbons St impacting residents	• Increased traffic on Gibbons St impacting residents • Ability for Gibbons St to accommodate northbound and southbound regional traffic flows needs further testing

Appendix C: Policy review

Strategic plans

Future Transport Strategy 2056 (Transport for NSW, 2018)

Future Transport 2056[37] is NSW's long-term transport framework that provides the 40 year vision, directions and outcomes framework for customer mobility in NSW. It was developed in conjunction with the *Greater Sydney Region Plan* and the *State Infrastructure Strategy* (below).

Future Transport identifies six customer outcomes for transport: customer focus, successful places, a strong economy, safety and performance, accessible services, and sustainability and defines the 30-minute city: *The vision for Greater Sydney is one where people can access jobs and services in their nearest metropolitan city and strategic centre within 30 minutes by public transport, 7 days a week.*[38]

There are two components to the 30-minute city:

- Connecting people in each of the three cities to their nearest metropolitan centre. These are the largest employment and service centres in each of the three cities.
- Connecting residents in each of the five districts to their nearest strategic centre, noting Green Square-Mascot is a strategic centre, by public transport, walking and cycling, giving people 30-minute access to local jobs, goods and services.

These outcomes and the network requirements required to achieve the 30-minute city are further developed for Sydney in the *Greater Sydney Services and Infrastructure Plan.*[39]

A number of the Greater Sydney customer outcomes are particularly relevant for the future of the Botany Road corridor:

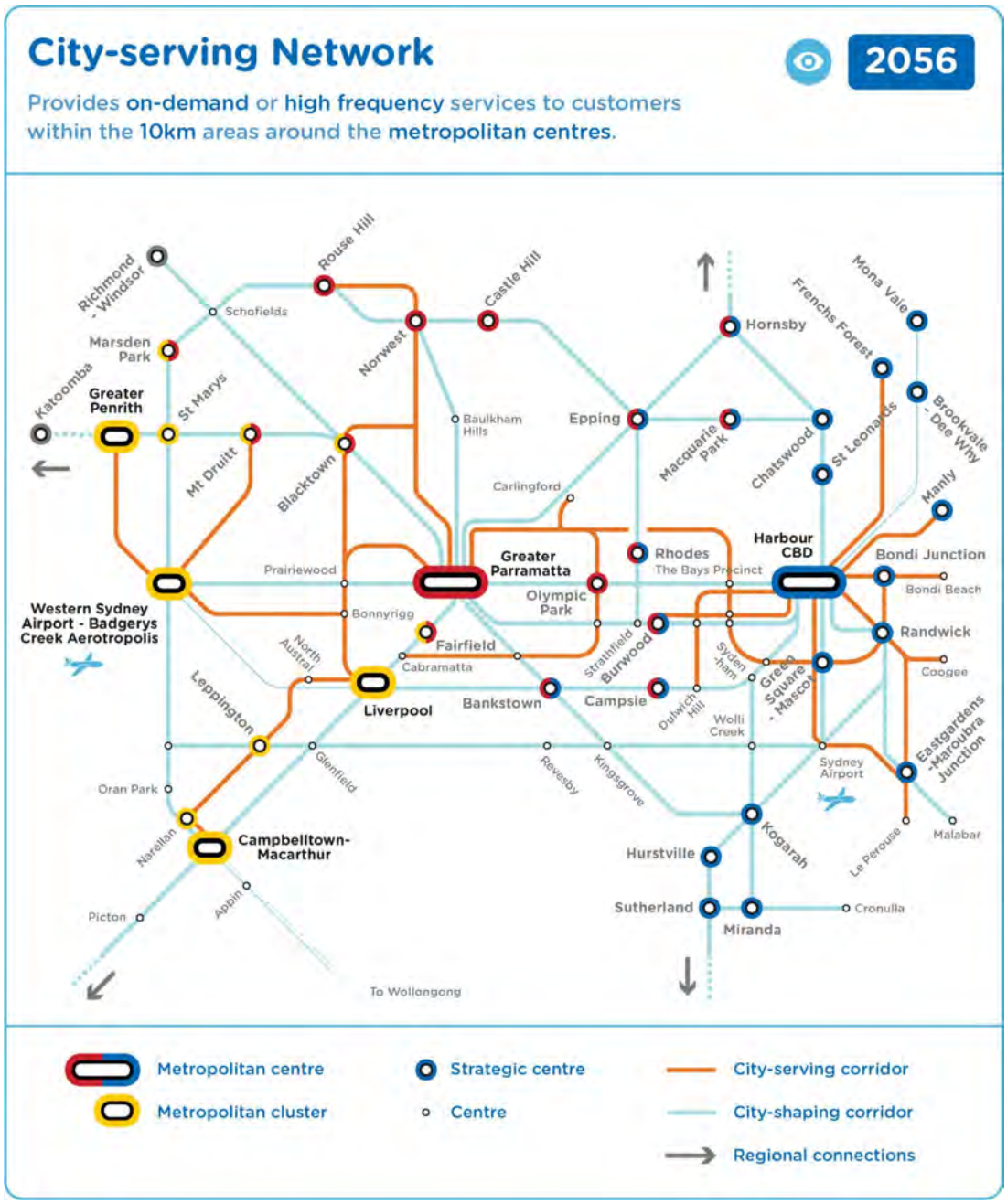
- Vibrant centres supported by streets that balance the need for short trips around centres and local areas, supported by a safe road environment and suitable pathways
- Vibrant centres supported by streets that balance the need for convenient access while enhancing the attractiveness of our places
- 30-minute access for customers to their nearest metropolitan centre and strategic centre by public transport seven days a week.

The network vision includes north-south and east-west mass transit in the longer-term (city shaping corridors) and with supporting services (city serving corridors) for investigation. The realisation of these corridor services would enhance the connectivity of the Botany Road corridor via mass transit, particularly to Randwick and the south-east.

In its overarching intent, *Future Transport* addresses how the transport of people, goods and services should occur in the future. Both working and studying from home are becoming more feasible for more people and these trends, strengthened through the COVID-19 experience, are likely to change travel behaviour and local activity.

[37] Future Transport Strategy 2056 (March 2018) Transport for NSW
[38] Future Transport Strategy 2056 (March 2018) Transport for NSW
[39] Greater Sydney Services and Infrastructure Plan (March 2018) Transport for NSW

Network vision 2056 – showing city serving and city shaping corridors (Future Transport)[40]



Road Safety Plan 2021[41] and Towards Zero

The *Road Safety Plan 2021* released in February 2018, features targeted initiatives to address key trends, trauma risks and the types of crashes occurring on NSW roads. Road safety is a critical and integral part of transport planning for all areas, and there are opportunities to implement road safety improvements for significant community benefit within the study area.

[40] https://future.transport.nsw.gov.au/plans/greater-sydney-services-and-infrastructure-plan/future-networks (accessed 25 September 2019)
[41] Road Safety Plan 2021 (February 2018) Transport for NSW

Building Momentum: State Infrastructure Strategy 2018-2038 (Infrastructure NSW, March 2018)

The *State Infrastructure Strategy 2018-2038 (SIS)*[42], released in March 2018, is a 20-year strategy that makes recommendations for each of NSW's key infrastructure sectors. It sets six key strategic directions:

- Continuously improving the integration of land and infrastructure planning – to meet the needs of population growth without eroding the character of towns and communities.
- Plan, prioritise and deliver an infrastructure program that represents the best possible investment and use of public funds – improved major project planning.
- Optimise the management, performance and use of the State's assets – making the most of the assets that NSW already owns.
- Ensure NSW's existing and future infrastructure is resilient to natural hazards and human-related threats – embed consideration of risk and resilience into all project businesses cases and capital asset planning.
- Improve state-wide connectivity and realise the benefits of technology – ensuring NSW becomes a leader in the adoption and use of digital technology.
- Dive high quality consumer-centric services and expand innovative service delivery models in infrastructure services – innovation in delivering new assets, and harnessing the skills of the public, private and not-for-profit sectors to get best value from public investment.

These themes are relevant to considering the future of the Botany Road corridor given the investment in metro and land use change. The SIS identifies the following relevant geographic directions within the Eastern Harbour City:

- *Improve access to international gateways.*
- *Improve mass transit connections to the CBD, especially from the west and south east.*
- *Improve active transport.*

Within the Eastern Harbour City, the SIS notes the opportunity for urban renewal in the Central-Eveleigh precinct, benefitting from the clustering of businesses in the emerging innovation precinct on the south-western edge of the CBD.

The criticality of the state's freight network in ensuring efficient access to international gateways is emphasised through the SIS and the role of the Botany Road corridor in connecting Sydney Airport and Port Botany to the Sydney CBD can be expected to be maintained into the future.

The SIS identifies the strategic objective for the transport sector as: *Ensure the transport system creates opportunities for people and businesses to access the services and support they need.* Key recommendations include:

- *Invest is transport infrastructure that is integrated with land use to create opportunities for agglomeration and enhance productivity, liveability and accessibility, in support of the policy goal of a '30-minute city'.*
- *Re-allocate road space in key commuter corridors to give priority to the most productive and sustainable transport modes, improve the integration of services across modes, remove network bottlenecks and upgrade operational systems and infrastructure.*
- *Overcome local constraints on the regional road and rail networks that limit the use of high productivity freight vehicles and rail freight.*
- *Develop extensive on-road rapid transit networks and active transport links to support the mass transit system.*

The following recommendation is also relevant:

- *…that the NSW Government increase investment in walking and cycling infrastructure and parks and open spaces as part of the ongoing integration of health into land use planning and transport strategies.*

Greater Sydney Region Plan (Greater Sydney Commission, 2018)

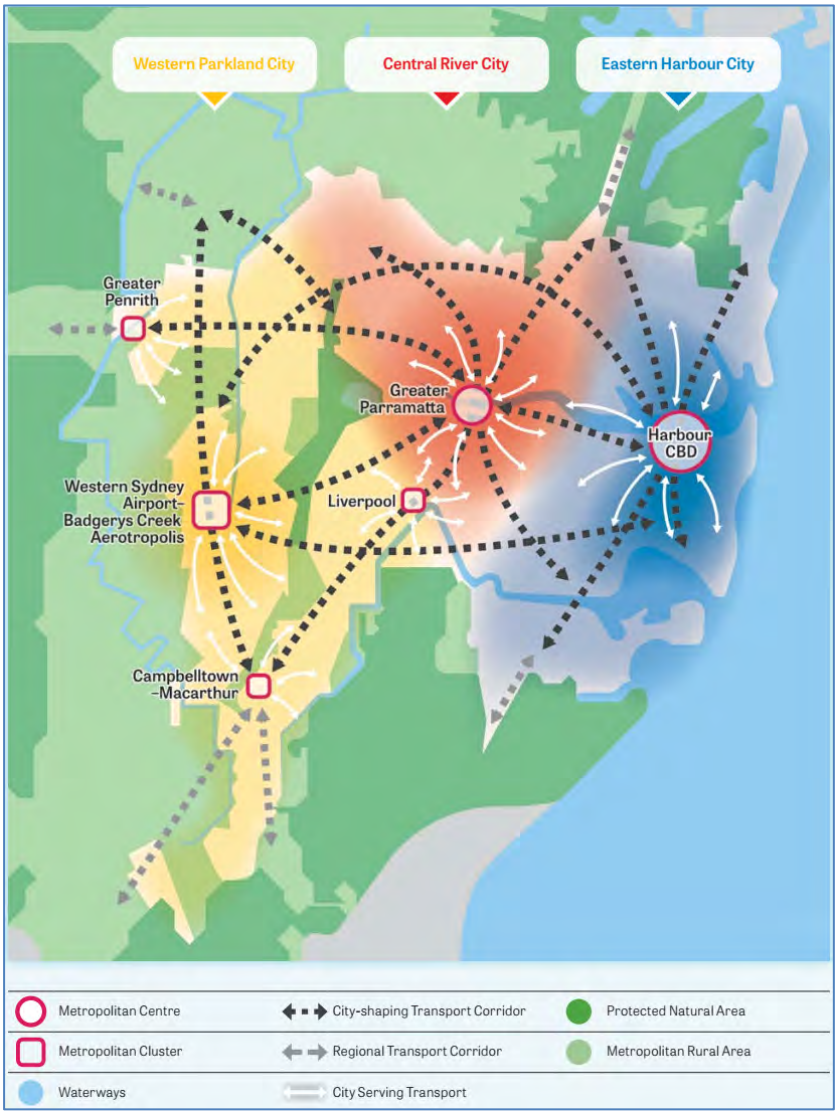
The Greater Sydney Commission (GSC) released the *Greater Sydney Region Plan – A Metropolis of Three Cities* in March 2018. The Botany Road corridor is part of the Harbour City, and the northern part of the study area lies within the Innovation Corridor which includes the Australian Technology Park.

[42] State Infrastructure Strategy (March 2018) Infrastructure NSW. http://www.infrastructure.nsw.gov.au/sis-2018 (accessed 25 September 2019)

The *Greater Sydney Region Plan, A Metropolis of Three Cities* is built on a vision of three cities where most residents live within 30 minutes by public transport of their jobs, education and health facilities, services and great places. The 30-minute city concept recognises the productivity, liveability and sustainability benefits of well integrated land use and transport planning supporting readily accessible services, jobs and recreational opportunities. Performance indicators proposed include the percentage of dwellings located within 30 minutes by public transport of a metropolitan centre/cluster, and within 30 minutes by public transport of a strategic centre.

A number of specific infrastructure investments linking with centres are included consistent with the concept. The plan prioritises infrastructure investments which enhance walkability within two kilometres of the metropolitan cluster or strategic centres or 10 minutes walking distance of a local centre. Similarly, investments will be prioritised that enhance cycling accessibility within five kilometres of such centres.

The three cities[43]



The plan includes an objective to create communities that are healthy, resilient and socially connected. The corresponding strategy is '*to deliver healthy, safe and inclusive places for people of all ages and abilities that support active, resilient and socially connected communities by:*

- *providing walkable places at a human scale with active street life*

[43] Greater Sydney Commission (2018) The Greater Sydney Region Plan - A Metropolis of Three Cities

- *prioritising opportunities for people to walk, cycle and use public transport…'*

The Greater Sydney Green Grid is another focus, to deliver walking, cycling and community access to open space, for social, economic and environmental benefits. It is a long-term vision for a network of high-quality green areas that connect centres, public transport and public spaces to green infrastructure and landscape features. It includes enhanced waterway corridors, transport routes, suburban streets, footpaths and cycleways.

The Green Grid will promote a healthier urban environment, improve community access to recreation and exercise, encourage social interaction, support walking and cycling and improve resilience.

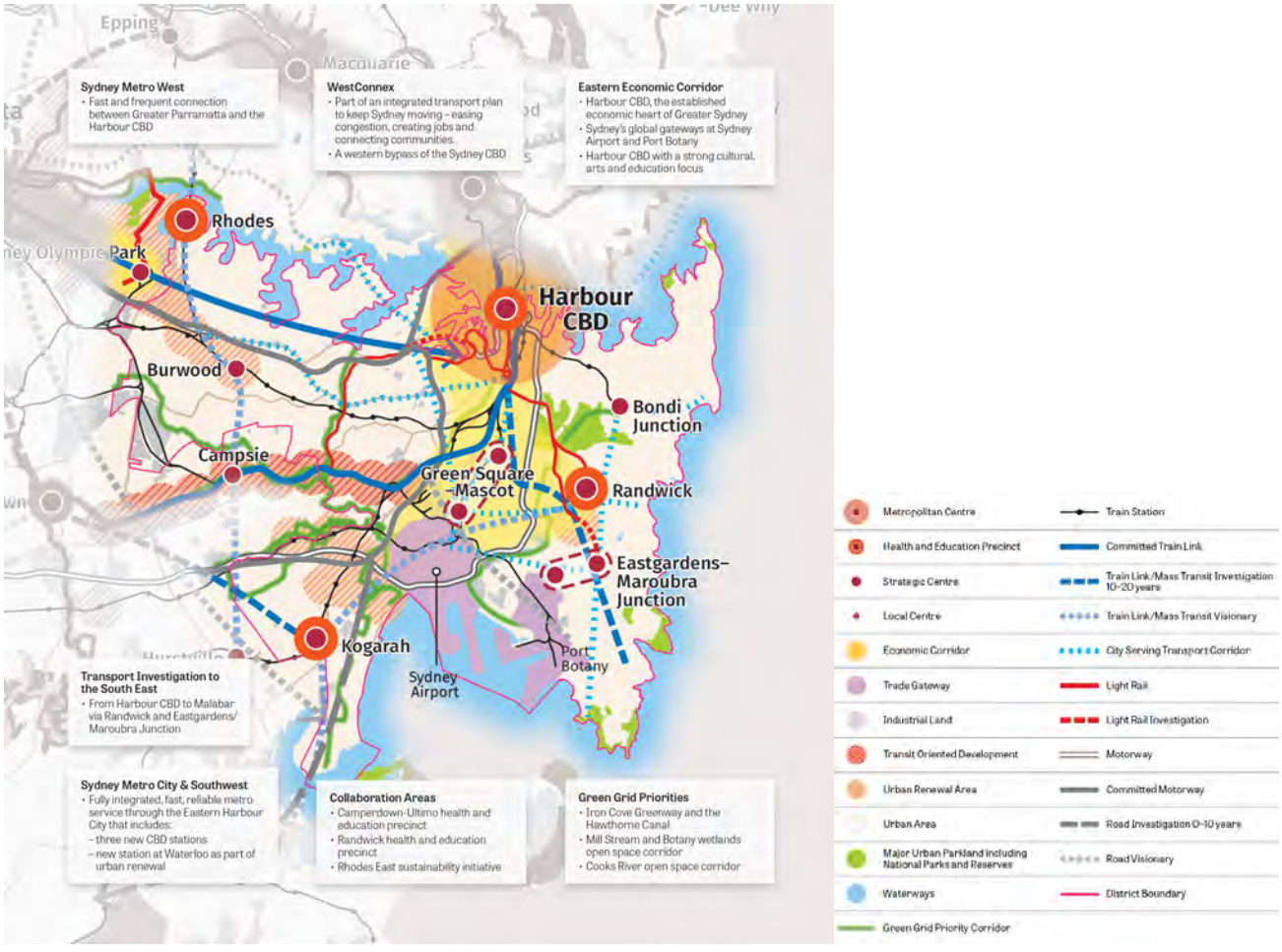
The plan identifies the economic importance of Sydney Airport and Port Botany the need to safeguard and support essential transport connections and corridors. It does emphasise the need for connections to and from WestConnex, facilitating use of the motorway by freight traffic. WestConnex has the potential to reduce the number of heavy freight vehicles using the Botany Road corridor.

Eastern City District Plan (Greater Sydney Commission, March 2018)

The GSC approaches its role on a district-by-district basis, and the Randwick Education and Health Precinct lies within the Eastern City District. The Eastern City District Plan provides a 20-year plan to manage growth and achieve the vision of a 40-year metropolis of three cities and 30-minute city.

Green Square-Mascot to the south of the study area is identified as a Strategic Centre and the Sydney CBD lies to the north. The Botany Road corridor study area lies within the Eastern Economic Corridor which stretches from Macquarie Park, Chatswood, St Leonards, the Harbour CBD and Randwick to Green Square, Mascot and the international gateways of Sydney Airport and Port Botany.

Eastern City District Plan[44]



[44] Greater Sydney Commission (2018) Eastern City District Plan

A focus for the Eastern City District is to become more innovative and globally competitive, carving out a greater portion of knowledge intensive jobs in the Asia Pacific Region. Accordingly, a focus is on the international competitiveness of the Harbour CBD, the innovation corridor which includes the Australian Technology Park, and the District's strategic centres, aligning growth with infrastructure, and improving the liveability of public places at a human scale.

The District is set to grow by about 157,000 dwellings over the next 20 years and the focus of this growth will be on well-connected and walkable places that build on local strengths and deliver quality places. The integrated approach to the green infrastructure of the district will improve sustainability.

The Eastern City District Plan lists a number of planning directions, priorities and indicators relevant to the study area.

Eastern City District Plan – Directions, Indicators and Planning Priorities

Direction	Indicator	Planning Priority
Infrastructure supporting new developments	Increased 30-minute access to a metropolitan centre / cluster.	E1 - Planning for a city supported by infrastructure
Celebrating diversity and putting people at the heart of planning	Increased walkable access to local centres.	E3 – Providing services and social infrastructure to meet people's changing needs. E4 – Fostering healthy, creative, culturally rich and socially connected communities.
Developing a more accessible and walkable city	Percentage of dwellings located within 30 minutes by public transport of a metropolitan centre / cluster. Percentage of dwellings located within 30 minutes by public transport of a strategic centre.	E10 – Delivering integrated land use and transport planning and a 30-minute city.
Creating conditions for a stronger economy	Increased jobs in metropolitan and strategic centres.	E8 – Growing and investing in health and education precincts and the Innovation Corridor.
Valuing green spaces and landscape	Increased urban tree canopy. Expanded Greater Sydney Green Grid.	E17 – Increasing urban tree canopy cover and delivering Green Grid connections.

The Plan identifies a mass transit / train corridor for investigation from the Harbour CBD to the south eastern suburbs indicatively via Green Square, Randwick and south to Eastgardens-Maroubra Junction.

The plan recognises the need to create vibrant safe places with quality public realm and balancing the efficient movement of people and goods with supporting the liveability of places on the road network. It also seeks to protect employment lands including the Southern Enterprise Area to the south of the study area.

Western Sydney Rail Outcomes report (Transport for NSW, 2018)

The NSW and Australian Governments' joint *Western Sydney Rail Study* addresses the growing needs of Western Sydney and recommends a preferred future network. The network includes upgrades to the T8 Airport and South Line to increase capacity from the south-west and provide more frequent services to Sydney (Kingsford Smith) Airport and the growing areas of Green Square and Mascot. This has the potential to increase the attractiveness of Green Square station for access to rail services for people living and working in the study area.

Western Sydney Rail Outcomes Report – Preferred Network for Western Sydney[45]

Resilient Sydney – A strategy for city resilience (2018)

Resilient Sydney sets out the directions that can be taken to strengthen the city's ability to survive, adapt and thrive in the face of global uncertainty and local shocks and stresses. Resilient Sydney sets out five directions. Direction 1 is a 'people centred city' which ensures equity, resilient growth and inclusion. The delivery of a cross-city active transport network will improve health, well-being and connections, and provide transport options during times of crisis.

Regional plans

South East Sydney Transport Strategy (Transport for NSW, 2020)

The South East Sydney Transport Strategy is a long term transport strategy for South East Sydney, developed in consultation with stakeholders through a codesign process. The strategy covers an area encompassing the

[45] Transport for NSW (2018) Western Sydney Rail Needs Outcomes Report

Randwick local government area, areas of Bayside including Port Botany and Sydney Airport and City of Sydney, extending west to the T4 Illawarra Line from Redfern to Rockdale.

The strategy takes into account local work by the GSC, the strategic needs of freight moving to and from Port Botany, land transport needs for Sydney Airport, strong residential, employment and service growth, land development opportunities and the transport challenges in the area. The strategy articulates the medium and long terms plans set out in Future Transport 2056, including the city-shaping corridors.

As a starting point the strategy identifies that the problems faced by the region: traffic congestion and poor public transport connectivity will worsen and limit growth, particularly in the southern parts of the region. These areas are largely reliant on bus services which are slow and unreliable. The broader objectives of the Greater Sydney Region Plan to deliver a 30-minute city will not be met. There will be insufficient capacity to meet the transport needs of the population into the future, and this will limit the growth potential of the region.

In response the strategy identifies a future scenario which includes a mass transit line extending from the Sydney CBD to the south-east via Zetland and Randwick, a mass transit line connecting Randwick to the west via Eastlakes and Sydney Airport, a network of rapid buses including two services operating on the Botany Road corridor: a Mascot to North Sydney service and a Coogee to the Bays Precinct via UNSW and University of Sydney service. The strategy includes the realisation of the principal bicycle network, delivering active transport networks focused on local centres and increasing road safety; both identified as important outcomes of the strategy. The strategy assumes a high degree of mode shift supported by the enhancement of public transport and active transport networks and services.

The strategy envisages the Botany Road corridor as continuing to be a significant movement corridor but with a high place function. This will see the corridor identified as a vibrant street from Redfern south to Green Square town centre.

As an area transitioning from industrial land uses to high density residential, located just to the north of the Southern Enterprise Area and between the Airport, Port and Sydney CBD, the Green Square-Waterloo precinct faces a number of challenges. The strategy looks to the delivery of new public transport infrastructure and services, complemented by active transport links to deliver a mode shift and reduced traffic volumes, maintaining road capacity for freight and other essential vehicles.

In the context of the Botany Road corridor the strategy identifies the initial focus being, *improving bus service capacity and performance, cycle network enhancements, traffic speed reductions and supporting demand management and planning policies, delivering greater amenity throughout the [Green Square-Waterloo] precinct*.[46]

Sustainable Sydney 2030 (City of Sydney, 2009)

City of Sydney's Sustainable Sydney 2030 sets out the vision for the City. It identifies five big moves, including: integrated transport, the liveable green network and sustainable renewal. To realise these big moves there are 10 strategic directions:

- Integrated transport for a connected City
- A City for pedestrians and cyclists
- Vibrant local communities and economies
- Sustainable development, renewal and design.

Within Direction 3 (integrated transport for a connected City), Sustainable City sets out the objective to manage regional roads to support increased public transport use and reduced car traffic on City streets. It recognises the impact of heavily trafficked and congested roads on the economy and local communities and identifies the need to ensure opportunities to improve amenity are provided as part of future regional road management.

[46] South East Sydney Transport Strategy (August 2020) Transport for NSW (page 52)