

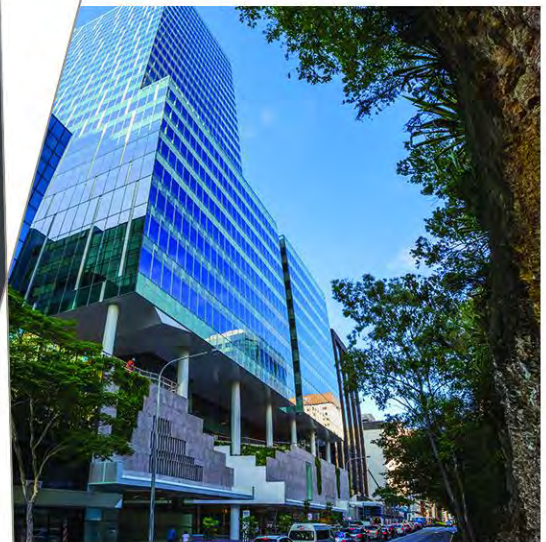
# Transport Plan context Report:– Camperdown, Leichhardt and Taverners Hill

Parramatta Road Corridor Urban  
Transformation Strategy

80018116

Prepared for  
Department of Planning, Industry &  
Environment and Inner West Council

10 March 2022



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# 1 Report structure

This report has been structured with key information in Part 1 which is supported by review and analytics documented in Part 2. The structure outline is shown in **Table 1-1**.

Table 1-1 Report structure

<b>Part 1: Introduction, summary of findings, issues, opportunities and considerations and options.</b>	
Introduction	Report purpose Background summary of the project and it need. Study precincts including mapping
Population	A review of the existing population and forecast in 2026 and 2036.
Summary of findings	This summarises the findings and transport implications of works documented in Part 2 of this report.
Summary of transport issues and opportunities	Tabulated issues and opportunities as identified in Part 2.
Considerations and options	Discussion of potential ways to manage the transport network to support access and movement for PRCUTS.
<b>Part 2: Background review analysis and case studies.</b>	
State government document summary	A summary of relevant documents from the Greater Sydney Commission, Urban Growth NSW, specifically the Parramatta Road Corridor Urban Transformation Strategy (PRCUTS) and Transport for NSW documents.
Local government document summary	Relevant Inner West Council documents which have implications for PRCUTS areas.
Emerging travel trends and technology	Desktop review of emerging transport technology which may have implications and benefits for the study area and are consideration for transport options and planning.
Land use – existing conditions	A high level summary of existing land uses in the PRCUTS areas of Camperdown, Leichhardt and Taverners Hill.
Travel demand	Findings of data analysis based on Transport for NSW Household Travel Survey and Australian Bureau of Statics Census, Journey to Work data.
Transport network – existing conditions	A review of the existing transport network infrastructure and services. This is categorised into the categories of connectivity and movement, active transport, public transport, road network, freight network, crash analysis, and parking.
Road space reallocation case studies	Selected example case studies where road space for general traffic has been reallocated as a result of either an alternative road being provided or broad reaching policy changes to improve place.

## 2 Introduction

### 2.1 Purpose

This transport context report is a supporting sub-report that documents the background review of documents, data and existing conditions to inform recommendations and actions for the Transport Plan.

It tables a summary of findings, issues, opportunities and initial considerations.

This study focuses on Parramatta Road precincts within the Inner West Council (IWC) Local Government Area (LGA).

### 2.2 Background

Opened in 1811, Parramatta Road is one of the oldest roads in New South Wales. Parramatta Road Corridor is a key east-west link between the Sydney CBD and Parramatta, spanning 20 kilometres from Granville to Camperdown.

Parramatta Road was formally a destination in itself, with people visiting for its adjacent businesses and shopping offerings.

Parramatta Road's function as a vehicle movement corridor has gradually taken priority over its place function from previous decades. This has had a reductive effect on its place value and attraction and it can no longer be described as a vibrant high street.

Parramatta Road serves an important function within regional Sydney for public transport and freight vehicles as well as general traffic.

The NSW government has recognised that Parramatta Road and surrounding land uses are not achieving their full potential, and a multitude of studies over the years have proposed various options and solutions to improve conditions.

The Parramatta Road Urban Transformation Strategy (PRCUTS) proposes approximately 27,000 new dwellings along the Parramatta Road corridor between Granville and Camperdown. There are also 50,000 new jobs planned along the corridor.

For IWC PRCUTS precincts, there is forecast to be an additional 10,000 residents and employees in the period 2016 – 2036.



The opening of WestConnex in 2023 will provide the option for some through-traffic to redistribute off Parramatta Road. This will open up opportunities to reimagine how people move along the corridor and the land uses it can support.

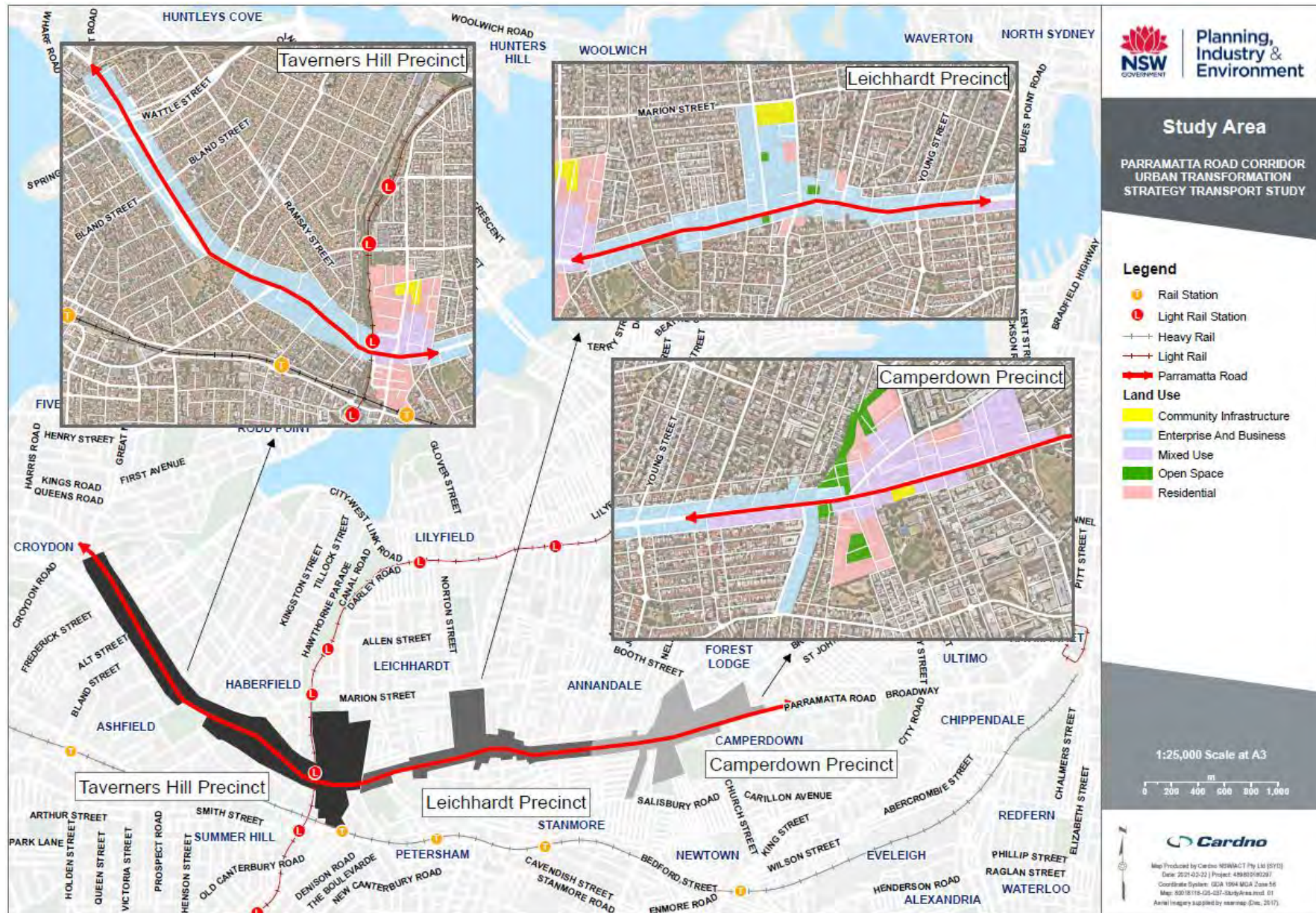
The Parramatta Road Urban Corridor Transformation Strategy (PRCUTS) brings together the elements of successful place making to provide a strategy to support population and employment growth, land use and place making and transport to improve the attractiveness and liveability of the corridor and surrounding areas.

### 2.3 Study precincts

This study has a primary focus on IWC precincts of Camperdown, Leichhardt and Taverners Hill shown in **Figure 2-1**.



Figure 2-1 PRCUTS IWC study precincts



### 3 Population

The key determinate of transport needs is the population it serves. The following section outlines the 2016 population and the forecast to 2036.

#### 3.1 Residents and employment

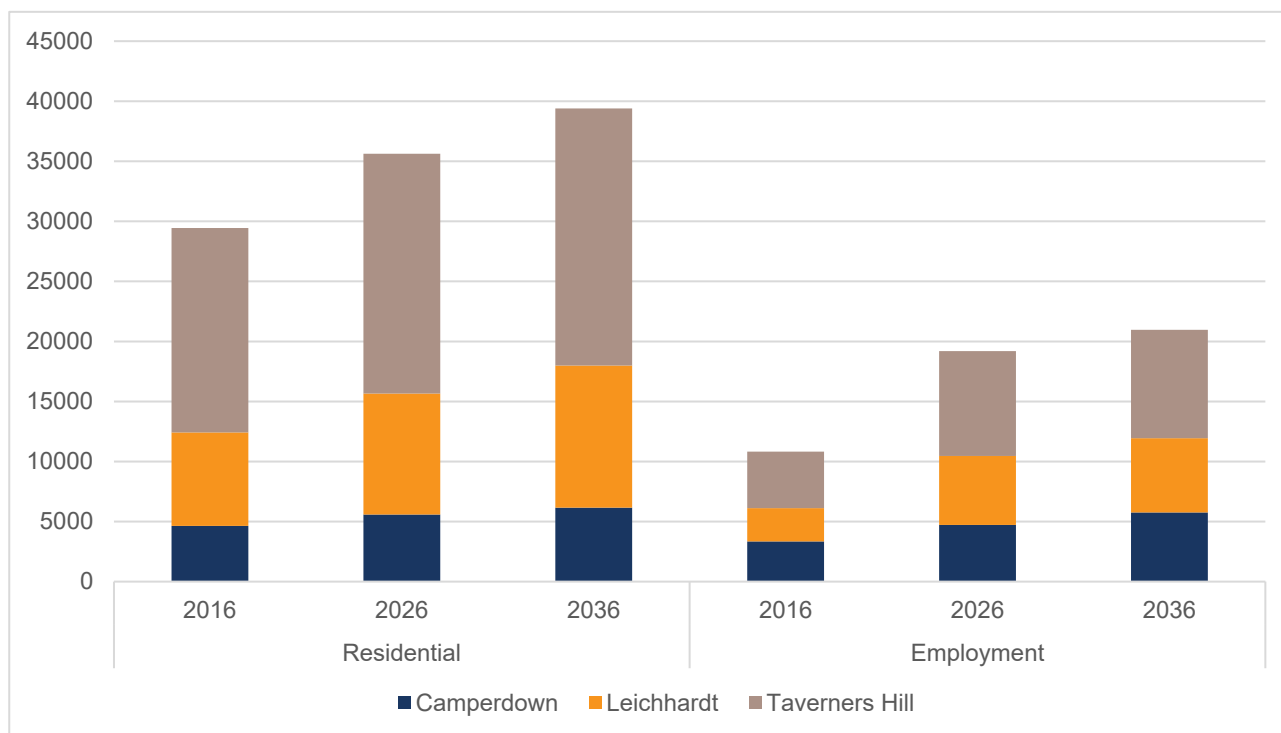
DPIE commissioned a PRCUTS land-use projections review in 2021 to assess the land use in IWC PRCUTS precincts more broadly for traffic modelling analysis. While this review assumed precinct boundaries slightly different to those shown in **Figure 2-1**, it provides a good indication of projected changes to residential and employment numbers. The population and employment forecast is as outlined in **Table 3-1** and graphed in **Figure 3-1**.

Table 3-1 PRCUTS IWC study area residential and employment population

Precinct	Population			Employment		
	2016	2026	2036	2016	2026	2036
Taverners Hill	17,018	19,964	21,409	4,705	8,732	9,025
Leichhardt	7,786	10,075	11,834	2,766	5,748	6,172
Camperdown	4,637	5,589	6,159	3,354	4,716	5,767
<b>Total</b>	<b>29,441</b>	<b>35,628</b>	<b>39,402</b>	<b>10,825</b>	<b>19,196</b>	<b>20,964</b>

Data source: PRCUTS land use review, SGS, 31/05/2021

Figure 3-1 Population – residential and employment forecasts



Data source: PRCUTS land use review, SGS, 31/05/2021

The data in **Table 3-1** and **Figure 3-1** shows that Taverners Hill will continue to house the most residents and employment.

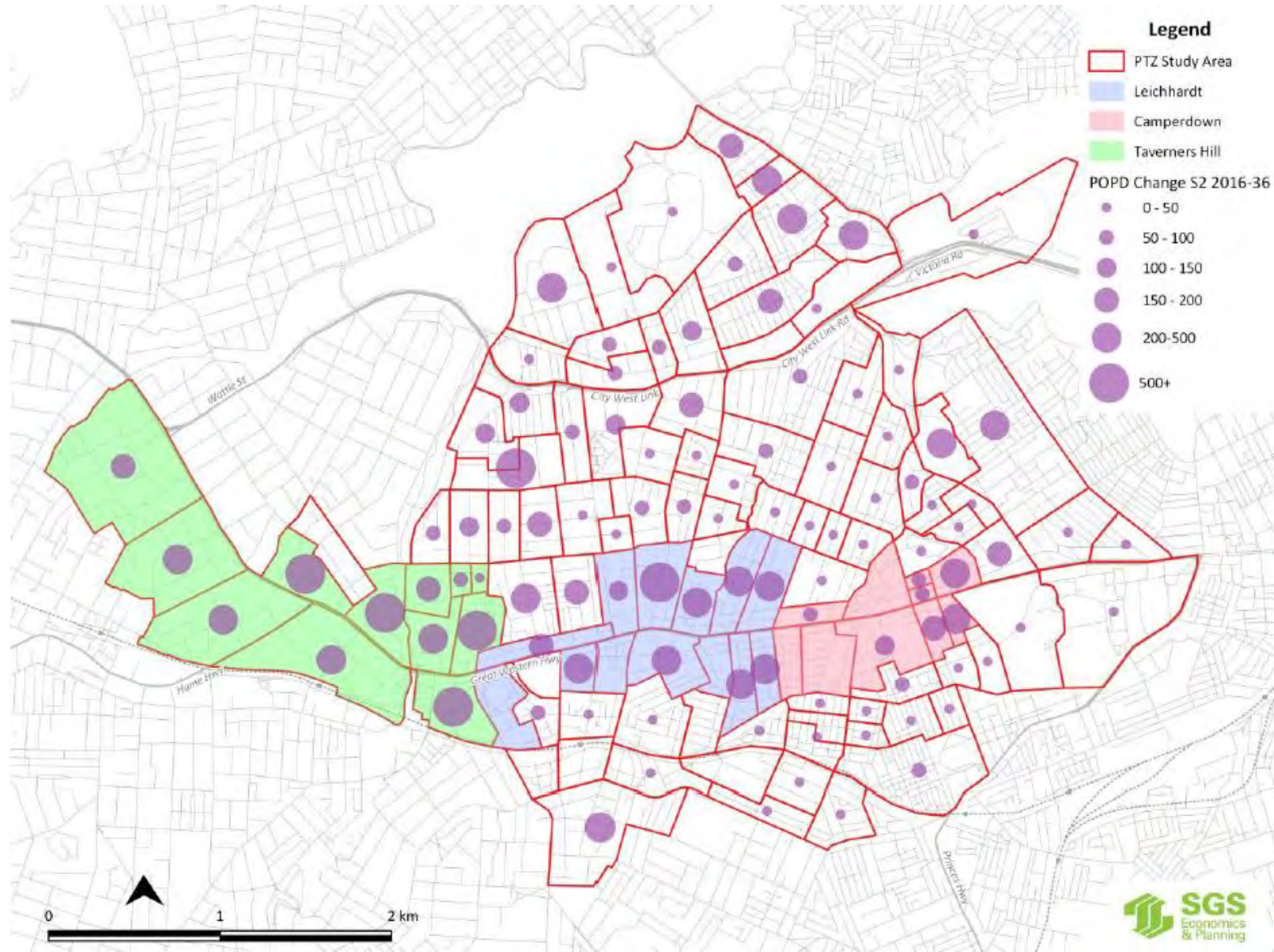
By 2036, it is anticipated the PRCUTS IWC areas will accommodate approximately 39,400 residents and 22,300 workers. Between 2016 and 2036, the transport network must facilitate the movements for an additional:

> 10,000 residents	> 10,000 employees (some of which will be residents)
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The population and employment analysis (*PRCUTS land use review, SGS, 31/05/2021*) and calculations is provided in **Appendix A**. This shows the difference between previous forecasts and the additional growth PRCUTS brings over previous land use forecasts.

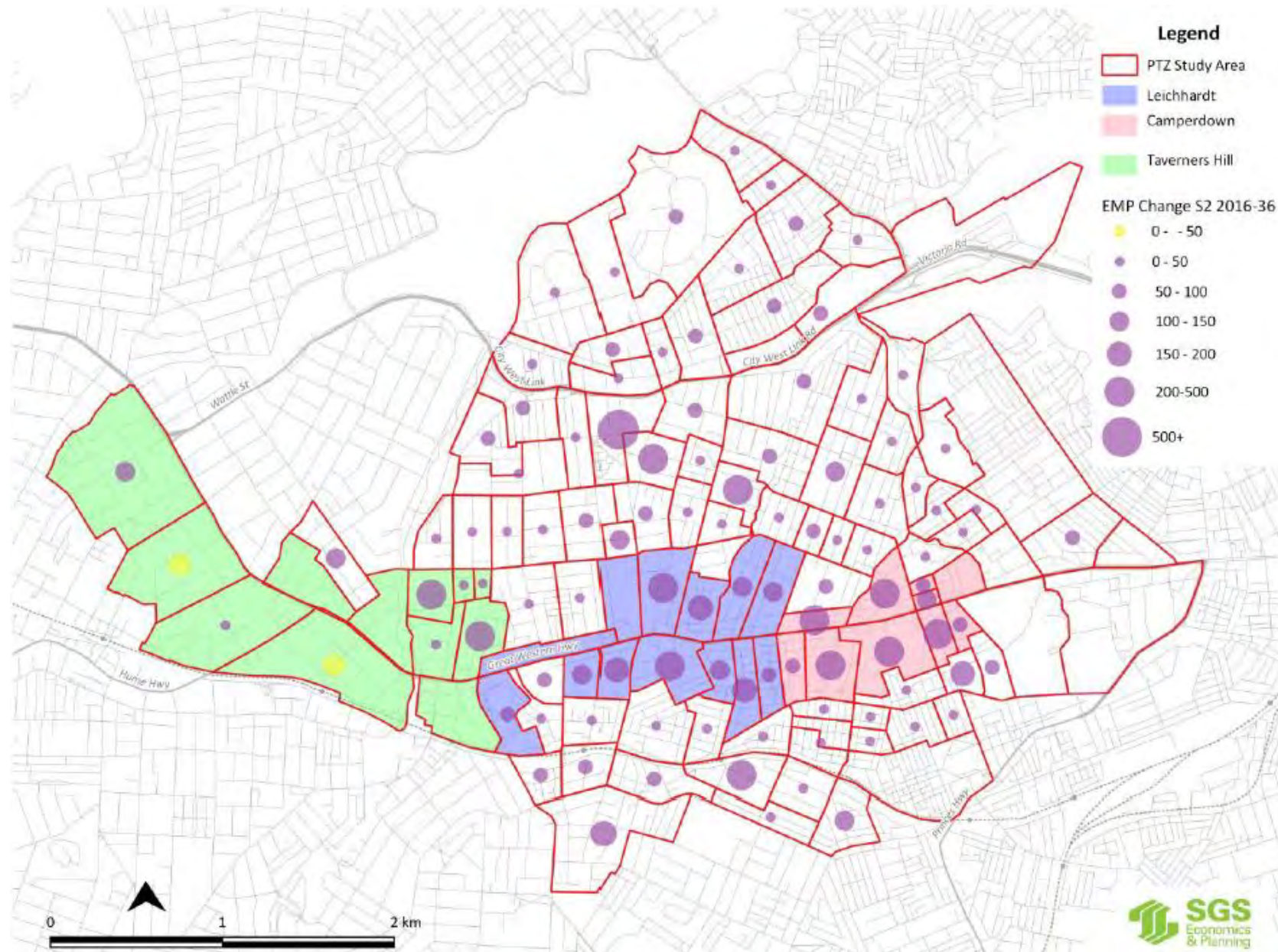
Residents and employment projects are shown in **Figure 3-2** and **Figure 3-3**.

Figure 3-2 Residential projection (2016 – 2036)



Source: PRCUTS land use review, SGS, 31/05/2021

Figure 3-3 Employment projection (2016 – 2036)



## 4 Summary of findings

### Vision and principles

#### Vision

*“Incremental renewal of the Corridor will occur over the long term to deliver a high quality, multi-use corridor with improved transport choices, better amenity, and balanced growth of housing and jobs.”*

The vision must continually be referred to for all recommendations to ensure that recommendations give effect to the vision and principles.

### Transport implications

- > Support increased travel demand through a changed mode split with increasing pedestrian, cycling, public transport share and reduce car mode share.
- > Increased sustainability and accessibility for all.
- > Contribute to affordable living conditions.
- > High and easy connectivity.
- > High frequency and serving north-south demands as well as east-west.
- > Leverage and enhance existing transport infrastructure and services
- > Support and improve desired place making outcomes.

### Land use

Intensification of land uses in IWC PRCUTS precincts are forecast to result in a change (from 2016 – 2036) of:

- > 10,000 more residents
- > 10,000 more employees.

These will generate additional trips across the transport network in addition to growth in population and employment from surrounding precincts.

### Travel demand

There will be higher travel demand.

Inner West residents make approximately 3.6 trips on a typical weekday, therefore an extra 10,000 people would result in approximately 36,000 trips across the transport network on a typical weekday.

Based on a general assumption that 80 per cent of employees may attend work on a typical day, an extra 16,000 trips would occur on typical working days travelling to/ from work plus any lunch time trips or other business generated trips throughout the day.

The volume of additional trips highlights the necessitates the need to shift trips away from private vehicles to walking, riding and public transport. Therefore, the conditions, issues and opportunities for pedestrians, cycling and public transport are key considerations for providing a functional and safe transport network for PRCUTS and surrounds.

### Pedestrians

- > There are limited crossing opportunities on Parramatta Road.
- > Footpath quality varies from good to poor (narrow/ uneven).

### Cycling

- > Variable standard bicycle network.
- > No safe opportunity along Parramatta Road and parallel routes have many turns.

### Roads

- > High crash rates are noted due to high vehicle volumes and congestion.

- > High traffic demand during peak periods resulting in traffic congestion.

### **Public transport**

- > Shared infrastructure with general traffic results in reduced reliability of road based public transport.
- > Some challenges with feeder bus routes to better service heavy and light rail stops.
- > Public transport frequency can limit the attractiveness of planning a multi-modal public transport trip.
- > The existing high frequency network needs to be promoted and identify opportunities for turn up and go routes (very high frequency routes).

### **Deliveries and Freight**

- > Increasing competition with general traffic on the road network kerbside space for small parcel/ package delivery.
- > Freight trips can be leveraged for a benefit of reduced private car trips.
- > Increasing residential and employment populations generate increased delivery demand.

### **Parking**

Car parking is examined in detail in a separate car parking note. In summary

- > Car parking takes up space and this needs to be considered against the opportunity cost for other uses of the space.
- > Car parking increases the cost of development. In multi-deck car parks, one car parking space can easily cost \$50,000 and this cost must be borne by the users a given site/ locality through the purchase price or lease costs.

### **Amenity**

The impact on amenity, streetscape and liveability will be considered particularly noting opportunities to improve:

- > Landscaping, tree planting and shading, with a strong preference given to WSUD;
- > Increased footpath widths and improved footpath surfaces/pavement treatments;
- > Buffering of pedestrians from traffic;
- > Provision of all-weather cover, ideally in the form of awnings which are sympathetic to the existing urban fabric;
- > Air quality and noise;
- > Public art and place-making.

## 5 Summary of transport issues and opportunities

Categorised transport-related issues and opportunities are outlined in the following tables. The location-specific issues and opportunities are shown in **Figure 5-1**.

### 5.1 Issues

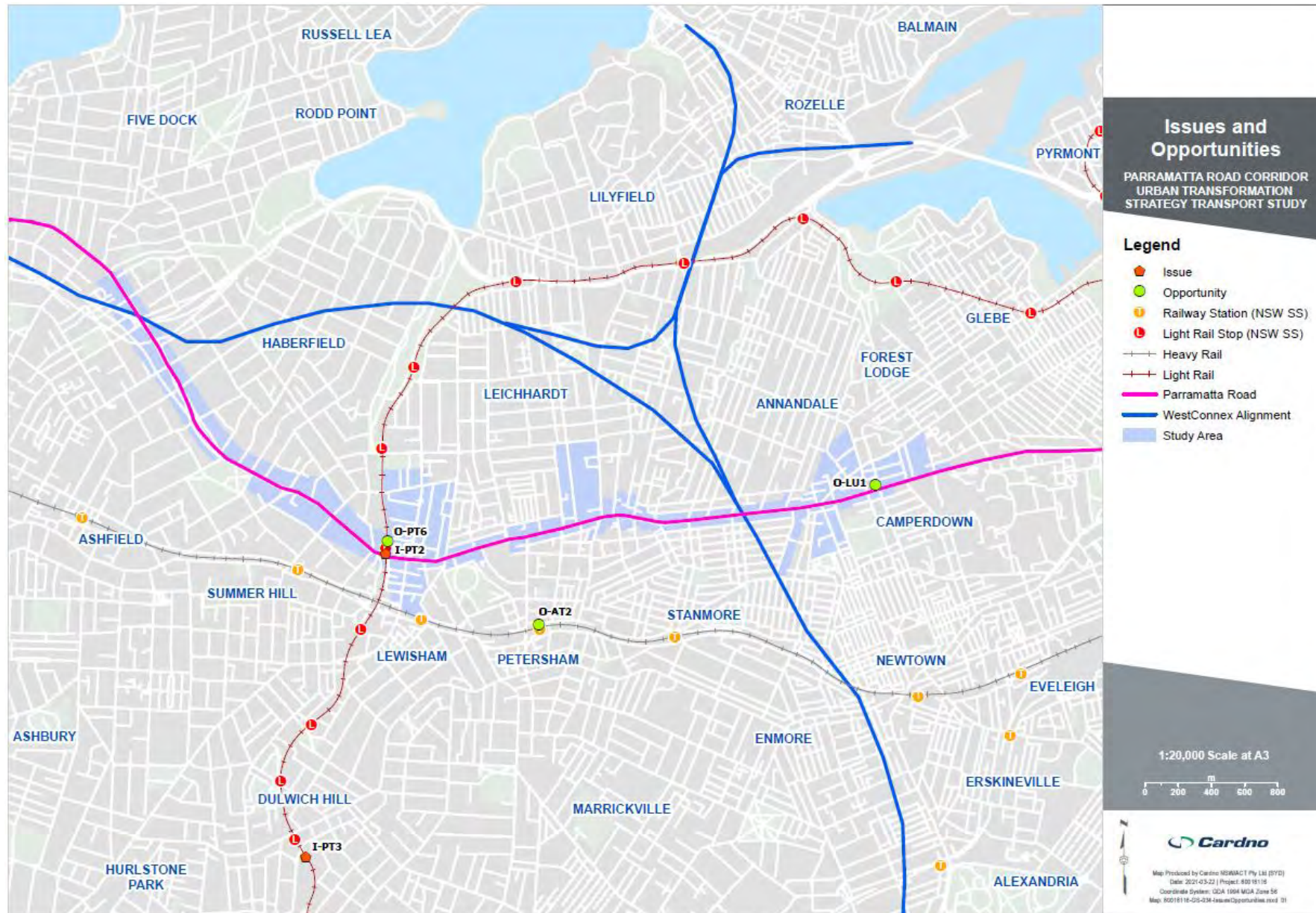
Category	#	Issue
People	I-P1	Growing population (20 per cent growth between 2017 and 2036) and aging population (52 per cent increase of population aged 65 years and over by 2036) generating demand for new and improved infrastructure.
Land use integration	I-LU1	Parramatta Road is a barrier for permeability, and poses a safety hazard, particularly for pedestrians and cyclists.
Active transport	I-AT1	Disconnected cycling infrastructure and high-speed roads such as Parramatta Road are a barrier for north-south active transport.
	I-AT2	Non-car modes of travel have low levels of connectivity to adjacent neighbourhoods and local centres.
	I-AT3	Kerbside bus lanes, traffic volumes and speeds discourage use of Parramatta Road as a cycling corridor and parallel routes have turns and are less legible.
Public transport	I-PT1	Mixed traffic lanes reduce bus reliability, speed and thus attractiveness and route capacity.
	I-PT2	Poor interchange between light rail and bus at Taverners Hill.
	I-PT3	Light rail infrastructure (single track in each direction) restricts the ability to increase frequency to and from Dulwich Hill.
	I-PT4	Legibility and complexity of existing bus routes.
	I-PT5	Missing north-south connectivity of public transport network, causing rail travel needing to pass through Redfern or Central before travelling along the north-south axis.
	I-PT6	Bus network is Sydney city centric, 11 out of 15 routes begin and end in there.
Roads and freight	I-R1	Congestion on roads, including Parramatta Road, particularly on weekday peak periods and weekends affecting travel times and reliability of buses.
	I-R1	Proximity with Port Botany and forecasted growth of freight activity increasing heavy vehicle pressure on road network.
Parking	I-Pa1	Publicly accessible parking demand is high in activity areas and residential streets.
	I-Pa2	There is an equity issue between land uses that service their own parking needs on-site as to sites that utilise on-street parking. I.e. the residential parking scheme subsidises users that forgo the cost of providing their own parking.
	I-Pa3	On-street parking limits opportunities to provide the space for other uses including trees, vegetation, runoff filtration, wider paths, separated cycleways.
	I-Pa4	Provision of car parking in new multi-level development cost in the order of \$50,000 per space, which results in increased development costs which is passed on to new residential and employment land uses.
	I-Pa5	There is a relationship between the high provision of car parking and increased traffic generation.



## 5.2 Opportunities

Category	#	Opportunity
Movement and Place	O-MP1	Identify greening opportunities in all transport network upgrades to achieve a “60% tree canopy cover over all pedestrian spaces (footpaths, trafficable pedestrian areas).”
	O-MP2	Enhance streetscapes through water-sensitive urban design (WSUD).
	O-MP3	Provide outdoor seating to encourage activation of street frontages and enhance the pedestrian environment.
	O-MP4	Consider gateway treatments at each precinct through the provision of space for murals by local artists on side streets at key intersections to local centres and to create a sense of neighbourhood identity.
Land use integration	O-LU1	Leverage on development of the Camperdown Triangle for creating more vibrant streets and stimulating local economy.
	O-LU2	Opportunity to enhance night time economy in the precincts through reliable night time public transport and welcoming streetscapes.
	O-LU3	Enhance permeability for all modes of travel across the precincts by introducing new north-south laneways south of Parramatta Road and east west laneways north of Parramatta Road.
	O-LU4	Consider temporal changes where regular road closures of low volume streets could be used for activation by outdoor dining, street markets and active travel.
	O-LU5	Consider use of existing at-grade off-street car parks as market places or community “nodes”.
Active transport	O-AT1	Improve connections across roads and side streets with initiatives such as continuous footpaths.
	O-AT2	Improve connectivity between Leichhardt Precinct and Petersham Station via existing active transport network particularly in the north-south alignment.
	O-AT3	Provide new cycle connections as planned under the Parramatta Road Urban Amenity Improvement Program.
Public transport	O-PT1	New public transport services providing critical north-south connectivity across Parramatta Road.
	O-PT2	Enhance integration between light rail, heavy rail and bus services.
	O-PT3	Ensure all bus stops are DDA compliant and provide shelter and seating.
	O-PT4	Provide on-demand or turn-up-and-go bus services to improve the public transport catchment to light and heavy rail services.
	O-PT5	Reallocate road space on Parramatta Road for high-frequency mass transport (such as GETS). Consider providing this along the centre of the road.
	O-PT6	Develop direct access to Taverners Hill LRS from Brown Street.
Roads and freight	O-R1	WestConnex to maximise diversion of heavy vehicle through-traffic (except dangerous goods vehicles) for improved freight efficiency and local safety.
	O-R2	WestConnex provides opportunities to transform Parramatta Road as a pedestrian friendly space, recognising “Traffic Evaporation” theory, where road space can be taken away to reduce traffic demand.
	O-R3	Reduce speed limits to support place making and improve safety for pedestrians and cyclists.
Parking	O-Pa1	Reduced provision of car parking provides positive enforcement of shift to sustainable modes.

Figure 5-1 Issues and opportunities



## 6 Considerations and options

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### 6.1 Parramatta Road

Parramatta Road can be described as in environmental, economic and urban decline. It is the major historical east-west artery of metropolitan Sydney and has been overwhelmed by heavy traffic, excessive noise and declining commercial spaces in recent years. Vacant buildings, pollution and large volumes of freight vehicles have contributed to the corridor becoming less pleasant and less attractive for all road users.

Parramatta Road currently accommodates:

- > A major bus corridor;
- > A high amount of vehicle traffic over a day, especially during peak periods;
- > High levels of congestion along the corridor during peak periods;
- > Limited north-south movement opportunities as signals are prioritised for east-west movement; and
- > Car parking during off-peak periods.

Redevelopment of the area through planning and infrastructure investment will assist in overcoming the challenges discussed above.

#### 6.1.1 Long list of considerations/ options

The long list of options is tabled to show a potential consideration for discussion only. Not all can be selected, as some options preclude or negate the need for other options.

The long list of opportunities and options to manage the PRC road space are outlined in **Table 6-1**. The treatments included in this table are generally applicable to all streets within the PRCUTS precincts, wherever practical. These are actions for IWC, DPIE and TfNSW to review and decide on.

Table 6-1 Parramatta road corridor long list of options

Initiative	Benefit	Impact	Consideration
<b>Place-making</b>			
Streetscape improvements: <ul style="list-style-type: none"> <li>▪ Landscaping</li> <li>▪ Public art</li> <li>▪ Street furniture</li> <li>▪ Pavement treatments</li> <li>▪ Lighting</li> <li>▪ Water sensitive urban design</li> </ul>	Improved place value and amenity, making the corridor attractive and comfortable for pedestrians. Street trees and landscaping provide shade, improve air quality and reduce the heat island effect.  Providing spaces for murals at key intersections will support local Inner West artists and function as gateways to local centres. This would create a sense of place and neighbourhood identity.	Reduction in footpath width due to landscaping and benches in the verge.	Benches, bins and pot plants are currently provided.  Footpath pavements are inconsistent and of varying quality and condition and can form components of urban realm improvement projects.
<b>Active transport</b>			
Continuous footpath treatment	Improved amenity and comfort for pedestrians who have increased priority. Attractiveness of active travel is increased.	Slower vehicle speeds (the intended effect) for vehicles turning off Parramatta Road which may cause traffic issues.	Continuous footpath treatments are raised, physical traffic management devices and are appropriate for intersecting streets with low traffic volumes.
Pedestrian countdown timer	Reduction in the risk of pedestrian and vehicle conflict. Pedestrians know exactly how much time they have to safely complete their crossing.	Cost and complexity to signalised intersection.	Pedestrian countdown timers work best at intersections where pedestrians are the only people on the road with a green light (no simultaneous turning movements for vehicles).
Separated cycleway	Provides a safer, dedicated space for cycling along Parramatta Road and throughout the corridor.  The corridor would form a major and direct east-west link for commuters, students, food delivery riders and recreational cycling linking with the GreenWay.  Provides a buffer/ calming effect between vehicle movements and the pedestrian realm on one or both sides.	Reduced space for: <ul style="list-style-type: none"> <li>▪ Motor vehicle traffic; and</li> <li>▪ Car parking.</li> </ul>	Unlikely to be supported by motorists or local businesses that perceive front of business parking opportunity as a key metric to support business viability. Sydney has a well-documented history of opposition of providing dedicated cycling space at the expense of motor vehicle space.  A separated cycleway for Pyrmont Bridge Road is to be delivered under the Parramatta Road Urban Amenity Improvement Program.
Signalised bicycle crossings	Introducing signalised bicycle crossings of Parramatta Road and key side streets (where possible) contributes to a safer and more attractive experience for cyclists, especially for less experienced / more vulnerable groups.	Vehicle delays at the intersection level due to the modified signal phasing.  Cost and complexity to signalised intersection.	Detailed analysis will be required at the intersection level to assess feasibility, quantify possible impacts and optimise signal phasing.
Introducing pedestrian phases on all legs of all intersections	Improved amenity and comfort for pedestrians who have more direct routes. Attractiveness of active travel is increased.	Vehicle delays at the intersection level due to the modified signal phasing.	Detailed analysis will be required at the intersection level to assess feasibility, quantify possible impacts and optimise signal phasing.

Initiative	Benefit	Impact	Consideration
Cost and complexity to signalised intersection.			
<b>Public transport</b>			
Full-time / turn up and go mass transit lane (i.e. Bus Rapid Transit, trackless trams)	Dedicated road space for mass transit improves journey reliability, capacity and efficiency of the mass transit vehicle. This can also make a difference to the number of vehicles and resourcing required. Mass transit is a highly effective method of carrying a high volume of people in a limited space. It is more efficient than private vehicle traffic while simultaneously having lower environmental and amenity impact.  GETS/ trackless trams are relatively quick and inexpensive to implement, have minimal disruption to the local economy during construction and have a higher speed, capacity and ride quality than Bus Rapid Transit (BRT).	Reduces road space for general traffic. Can limit on-street car parking opportunities.	A highly effective way of moving a high amount of people along the corridor. This requires planning to ensure it is an attractively positioned transport offering that people want to use.  Centre running (rather than kerbside running) design can help improve efficiency of public transport along the corridor by removing conflict with left turning vehicles and bicycles - thus enhancing public transport service time reliability. However, it introduces complexities for right turns and requires passengers to cross the road before/after using the public transport service.  Consideration can be given to investigate opportunities to introduce "turn-up-and-go" public transport services and/or introduce B-Signals to enhance public transport priority along the corridor.
Improved pedestrian/passenger storage on the footpaths adjacent to major public transport stops	Improved amenity and comfort for public transport passengers. Attractiveness of public transport and active travel is increased.	Could conflict with other uses of footpath width	Smart design can be incorporated to increase placemaking opportunities and improve amenity.
<b>Traffic management</b>			
Optimised signal timings / modified signal phasing to improve pedestrian and/or public transport	Reduction in delay for pedestrians crossing Parramatta Road and improve public transport travel times / reliability. Improve attractiveness of sustainable travel modes.	Longer travel times for vehicles.	Excessive pedestrian delay can result in severance of communities. Connectivity across Parramatta Road for pedestrians is currently weak.  Public transport priority contributes to increased attractiveness and improved travel times.
Examine opportunities for alternative heavy vehicle routes including reduced heavy vehicle tolls on WestConnex to encourage heavy vehicles to use WestConnex	WestConnex will provide a motorway bypass opportunity for some through-traffic. It is anticipated that the majority of freight traffic that currently passes along Parramatta Road between Port Botany and Western Sydney will re-divert trips to WestConnex.	Houses have been lost. Motorways have been documented to induce traffic demand. Entry and exit locations to WestConnex are likely to have high traffic demands.	WestConnex is likely to provide an initial benefit to the locality. Historic evidence of major road projects and bypasses indicate that traffic volumes can return to normal unless interventions are made to the bypassed road.

Initiative	Benefit	Impact	Consideration
	The WestConnex Strategic Business Case suggests traffic volumes along IWC portions of Parramatta Road will be similar to 2012 volumes in 2031.		
Co-ordinated traffic signals	Optimised traffic flow and capacity. Improved level of service.	Delays to side street traffic. Does little to reduce demand along Parramatta Road.	Signals are already co-ordinated and optimised for east-west flow. Parramatta Road has reached its capacity during peak periods and other interventions must be considered to maintain a functional corridor in the future.
Tidal flow lane management	Use lane management to increase the number of lanes in the peak movement direction, improving traffic flow and capacity. May provide the opportunity to select a dedicated mass transit lane. Often has a lower capital cost than alternative capacity increasing measures such as widening.	Increased resourcing to manage the road network. Removal of medians increases the chance of collisions of vehicles travelling in the opposite direction, unless a moveable median was selected. Effectiveness reduced where heavy right-turn movements must be accommodated.	This would require removal of all fixed central medians and installation of moveable barriers or overhead lane control signals with illuminated pavement markers. A directional split of traffic flow of at least 70/30 favouring the peak direction is generally necessary before tidal flow operation is justified.
No right turn movements at congestion points	More green time for through traffic. Signalised intersections have less phases.	Limits road network connectivity and accessibility. This can lead to vehicles first turning left and circulating in local streets to undertake an at-grade loop movement to position themselves at a signalised through point to get to the far side of Parramatta Road.	No right turns are already implemented at multiple intersections. Detailed analysis should be carried out to determine whether additional right term prohibitions will result in rat running through residential areas>
Right turn lanes at signalised intersections	Improved access to and from side-streets in more locations. This would distribute right turn movements along the corridor and reduce the through-movement function of the corridor. This would require increased signalisation which could be used to provide additional pedestrian crossings along the corridor.	Increased traffic demands on residential streets. This may reduce through capacity on Parramatta Road.	This could be done in conjunction with more signalised intersections. There are limitations associated with right turn lanes given how road widening is not supported from a place making perspective.
Reduced speed limit	Reduce the severity and potential occurrence of crashes for all road users and improve amenity adjacent to the carriageway.	Longer travel times which may reduce road capacity.	Dynamic speed management (variable speed limits) could vary the speed limit throughout the day/ week. While reduced speed limit is likely to result in longer travel time for vehicles it can help maintain or improve reliability and predictability of public transport travel times. This is aligned with the high level of pedestrian activity that will

Initiative	Benefit	Impact	Consideration
			materialise over time along the corridor due to increased residential population, employees and visitors combining with reactivated frontage uses.
Clearways	Additional road capacity through a parking lane and no delays from drivers undertaking parking movements.	No convenient on-street parking is available to support local businesses during clearway operation periods.	Initiative already implemented during peak periods in some areas. Clearways may be acceptable during peak periods however it is equally important to maintain kerbside parking outside peak periods.
Variable Message Signs (VMS)	Improved road efficiency and enhanced safety. Electronic signs assist with traffic and incident management.	Fully automated systems require the integration of incident detection systems with message selection and deployment for the management of incidents, congestion and impact of adverse weather conditions.	VMS are already implemented along the PRC: <ul style="list-style-type: none"> <li>▪ Before Dalhousie Street (westbound)</li> <li>▪ After Ross Street (eastbound)</li> </ul>
<b>Travel demand management</b>			
Tolls	Toll revenue could be used to fund transport initiatives along Parramatta Road and would likely reduce traffic demand.	Expensive to implement and requires on-going management.	Unpopular, unlikely to be supported by the majority of motorists unless there was a linked scheme to reduce WestConnex tolls for certain trips. Could be developed as a scheme where short trips are free and long trips are tolled.
<b>Kerbside Management</b>			
Improved kerbside management recognising the numerous competing elements in relation to land use, vehicle flow, freight and service delivery, pedestrian amenity, temporal demand and safety	Efficient kerbside management has the potential to achieve an effective balance of the competing demands by recognising the temporal changes in demand.	Use of the kerbside for purposes other than traffic flow has the potential to reduce traffic speeds in the through-lanes, however in the light of the numerous competing uses this may ultimately prove to be beneficial	In order to achieve a revitalization of the corridor it is essential that the placemaking benefits of efficient kerbside management be recognised. <ul style="list-style-type: none"> <li>- Use of the kerbside lane for parking has the ability to improve pedestrian amenity on the footpaths by buffering pedestrians from through traffic</li> <li>- Use of the kerbside lane for loading on deliveries has the potential to improve the built form of frontage uses</li> <li>- Use of the kerbside lane for through traffic may increase traffic speeds and so reduce safety and increase vehicle noise, in so doing reduce the overall amenity of the corridor.</li> </ul>

## Background review analysis and case studies

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The following sections of this report provide summaries of a range of state and local government documents, existing land use, existing transport network conditions and case studies of road space reallocation.

These were used to inform the:

- > Summary of findings.
- > Summary of transport issues and opportunities.
- > Considerations and options.



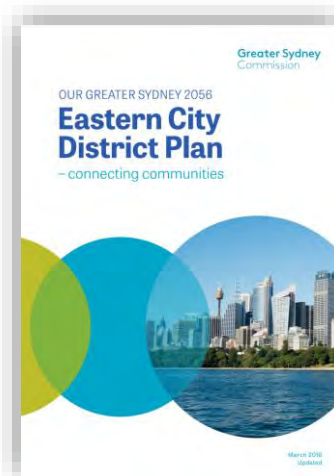
## 7 State government document summary

### 7.1 Eastern City District Plan, Greater Sydney Commission, 2018

The Greater Sydney Commission (GSC) is implementing The Greater Sydney Region Plan (the Regional Plan) through five district plans, which detail district-specific directions, place-based outcomes, and the actions to achieve these. The relevant district plan covering the Inner West is the *Eastern City District Plan* (the District Plan).

The District Plan describes how integrated land use and transport planning can help achieve the 30-minute city through increasing development density near transit corridors. It sets a housing supply increase for the Inner West of 5,900 new dwellings between 2016 and 2021, around 14,000 more people which is the third largest housing target for the District Plan.

The key infrastructure elements committed to in the District Plan that would impact the Parramatta Road Corridor (PRC) include Sydney Metro West and Parramatta Road public transport improvements.



### 7.2 Parramatta Road Corridor Urban Transformation Strategy, UrbanGrowth NSW, 2016

The *Parramatta Road Corridor Urban Transformation Strategy* (PRCUTS) represents the NSW Government’s 30-year plan to guide amplified land use functions and support urban revitalisation along the PRC. It presents the long-term infrastructure, commercial and housing delivery programs for the PRC, with an emphasis on place-based planning and liveability. It plans for an estimated 56,000 additional residents in 27,000 new homes and 50,000 new jobs focused within eight Precincts.

The Strategy is supported by a suite of technical documents prepared for UrbanGrowth NSW as part of the Parramatta Road Corridor Urban Transformation Program:

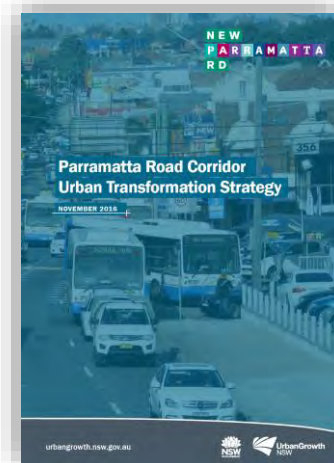


Table 7-1 PRCUTS supporting documents

Document	Description
Parramatta Road Urban Transformation Precinct Transport Report	The first step in developing transport plans for each of the eight Precincts to support urban transformation in the PRC over the short-, medium- and long-term.
Parramatta Road Corridor Implementation Plan 2016 – 2023	A prioritised set of actions to facilitate transformation of the Corridor in the short term.
Parramatta Road Corridor Planning and Design Guidelines	Suggested land use and built form controls to guide future development.
Parramatta Road Corridor Urban Amenity Improvement Plan	A program of urban amenity improvements attached to \$198 million of government funding to deliver tangible public domain improvements to the Corridor aligned with its staged redevelopment.
Parramatta Road Corridor Infrastructure Schedule	A prioritised and costed list of future infrastructure including open space, transport, traffic community, health and education facilities required to support the long-term growth in the Corridor.

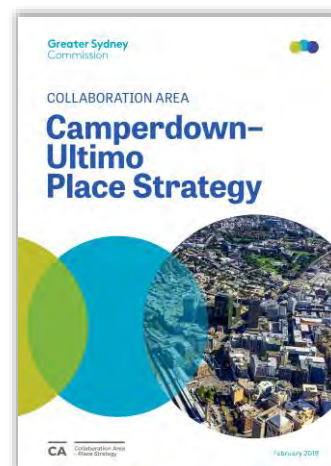
### 7.3 Camperdown Ultimo Collaboration Area Place Strategy, Greater Sydney Commission, 2019

The *Camperdown-Ultimo Collaboration Area Place Strategy* informs public and private policy and investment decisions through identification and recognition of complex, challenges and issues faced by the Collaboration Area and identification of growth priorities. The following priorities under the theme of “connectivity” are particularly relevant to this study:

1. Integrate and connect the Collaboration Area within and beyond its edges;
2. Improve local transport options and amenity within the Collaboration Area; and
3. Promote smart technology, drive innovation and connect locally globally.

The following action items under the three overarching priorities are relevant to this Transport Study:

- > **Action 1:** Develop a strategy for transport investigations and initiatives, underpinned by the principles of movement and place, to enhance safety, accessibility and permeability within and surrounding the Collaboration Area by prioritising pedestrian, safety and amenity, encouraging cycling, and planning for public transport, freight movements and parking.
- > **Action 2:** Advocate for better connections between Greater Sydney’s collaboration areas, innovation clusters and health and education precincts, including transport, technology, utility and digital networks, and information sharing.
- > **Action 3:** Advocate for a mass transit system that strengthens connections between the Collaboration Area and Greater Sydney’s economic corridors.
- > **Action 4:** Advocate for a Sydney Metro West station in Camperdown activity node.
- > **Action 7:** Improve public transport, pedestrian and cycling connectivity between the three activity nodes:
  - Haymarket to Camperdown along the Ultimo axis;
  - Camperdown to Eveleigh along the Darlington axis (particularly Redfern Station to University of Sydney); and
  - Haymarket to Eveleigh.
- > **Action 8:** Implement a pilot project along Broadway and Parramatta Road to reallocate road space and prioritise pedestrians between Central Station and key land uses on the Ultimo axis, while achieving an acceptable level of service for vehicles at the gateway to the Harbour CBD.
- > **Action 9:** Identify shared partnership transport solutions to optimise connectivity within the Collaboration Area.
- > **Action 11:** Consider piloting a Smart Places program in the Collaboration Area.



### 7.4 Camperdown Collaboration Area (Tech central) Place Based Transport Strategy, Transport for NSW, 2021

The Place-based Transport Strategy recognises the need to enhance Parramatta Road to be a safe, convenient, and connected movement corridor for all road users. The future of Parramatta Road requires a high-quality public transport solution to ensure accessible, frequent, and reliable services that enhance efficient movements along the corridor.

The implementation of a connected metropolitan cycling network will support access between the Tech Central node and surrounding areas. In addition, the Strategy recommends the creation of a better pedestrian environment along and across Parramatta Road with wider footpaths, increased dwell space and improved priority for walking at traffic signals, recognising its key role in connecting the Camperdown and Haymarket nodes.

## 7.5 Parramatta Road and Victoria Road Integrated Transport Strategic Business Cases, Transport for NSW 2021 (ongoing)

TfNSW are preparing Parramatta Road and Victoria Road Integrated Transport Strategic Business Cases with the aim to provide enhanced public transport, active transport and public domain opportunities along Parramatta Road.

The outcomes of this Strategic Business Case will be made available in 2022. TfNSW will continue to engage with DPIE and Council to ensure that the outcomes of Strategic Business Case are aligned with vision and recommendations of this Transport Study/Plan.

## 7.6 Future Transport Strategy 2056, Transport for NSW

*Future Transport 2056* (FT56) was released in early 2018, with the objective of ensuring that the Greater Sydney area is prepared for rapid changes in technology and innovation, in order to create and maintain a world class, safe, efficient, and reliable transport system over the next 40 years. It outlines a comprehensive strategy that focuses on how people and goods will be transported around the state, including details of the proposed infrastructure and initiatives.

The vision is built on six outcomes:

- > Customer Focused;
- > Successful Places;
- > A Strong Economy;
- > Safety and Performance;
- > Accessible Services; and
- > Sustainability.



With respect to tying land use and transport planning, Future Transport notes that *‘The best places take time and strong partnerships to develop and flourish. Integrated land use and transport planning can activate public spaces, corridors and networks, and positively impact the delivery of health, education and local government services. Transport can improve the liveability and character of places across the state, achieve wider benefits from investment and encourage more desirable patterns of development’* (p. 6).

This statement is particularly relevant to the PRC with respect to integrating transport infrastructure and land use planning to enable the desired transport mode splits.

Parramatta Road is identified as a ‘committed initiative’ being the beneficiary of a ‘major infrastructure upgrade’. The strategy notes that Parramatta Road is subject to public transport improvements in the 0 to 10-year timeframe.<sup>1</sup>

### 7.6.1 Greater Sydney Service and Infrastructure Plan

The *Greater Sydney Services and Infrastructure Plan* focuses on specific policy, service and infrastructure initiatives to support the strategic direction of Future Transport 2056.

The Plan discusses a number of specific Eastern City infrastructure initiatives. These include the following initiatives which are relevant to this study:

- > WestConnex;
- > Sydney Metro West;
- > Parramatta Road public transport improvements;
- > Priority Cycleway links in inner Sydney, including the Inner West GreenWay; and
- > Inner Sydney Regional Bike Network within 10km of the Harbour CBD.

<sup>1</sup> Future Transport 2056, p.103

## 8 Local government document summary

### 8.1 Inner West Community Strategic Plan, Inner West Council, 2018

The *Inner West Community Strategic Plan (CSP)* was produced by Council with active community input to identify a high-level vision of how the Inner West Council might best evolve socially to satisfy community needs over the next two decades. The Plan's implementation will involve collaboration with key stakeholders and Council has committed to reporting back to the community every four years on progress.

This transport study can help to give effect to the CSP. Relevant strategic directions, outcomes, strategies and indicators are reproduced in **Table 8-1**.

Table 8-1 Community Strategic Plan, strategic directions, outcomes and strategies

Strategic directions	No.	Outcome	Strategies	Indicators
1: An ecologically sustainable Inner West.	1.1	The people and infrastructure of Inner West contribute positively to the environment and tackling climate change.	Provide the support needed for people to live sustainably. Develop planning controls to protect and support a sustainable environment. Provide green infrastructure that supports increased ecosystem services.	Residential energy consumption.
	1.4	Inner West is a zero emissions community that generates and owns clean energy.	Develop a transport network that runs on clean renewable energy.	
	1.5	Inner West is a zero waste community with an active share economy.	Support people to avoid waste, and reuse, repair, recycle and share.	
2: Unique, liveable, networked neighbourhoods.	2.1	Development is designed for sustainability and makes life better.	Identify and pursue innovative and creative solutions to complex urban planning and transport issues. Develop planning controls that protect and support a sustainable environment and contribute to zero emissions and zero waste community.	Community satisfaction with managing development in the area. Community satisfaction with long-term planning for Council area. Satisfaction with safety of public spaces. Satisfaction with access to public transport. People who travel to work by public transport. Satisfaction with Cycleways. Satisfaction with maintaining footpaths. Community satisfaction with management of parking.
	2.3	Public spaces are high-quality, welcoming and enjoyable places, seamlessly connected with their surroundings.	Plan and deliver public spaces that fulfil and support diverse community needs and life Ensure private spaces and developments contribute positively to their surrounding public spaces Advocate for and develop planning controls that retain and protect existing public and open spaces	
	2.5	Public transport is reliable, accessible, connected and enjoyable.	Advocate for improved public transport services to, through and around Inner West. Advocate for, and provide, transport infrastructure that aligns to population growth.	
	2.6	People are walking, cycling and moving around Inner West with ease.	Deliver integrated networks and infrastructure for transport and active travel. Pursue innovation in planning and providing new transport options. Ensure transport infrastructure is safe, connected and well maintained.	

Strategic directions	No.	Outcome	Strategies	Indicators
3: Creative communities and a strong economy.	3.3	The local economy is thriving.	Strengthen economic viability and connections beyond Inner West. Promote Inner West as a great place to live, work, visit and invest in.	Satisfaction with Council support of local jobs and businesses.
	3.5	Urban hubs and main streets are distinct and enjoyable places to shop, eat, socialise and be entertained.	Pursue a high standard of planning, urban design and development that supports urban centres.	
4: Caring, happy, healthy communities.	4.1	Everyone feels welcome and connected to the community.	Foster inclusive communities where everyone can participate in community life. Empower and support vulnerable and disadvantaged community members to participate in community life.	Satisfaction with support for people with a disability. Walkable open space within 400 metres of all residents. Satisfaction with provision of services for older residents.
	4.3	The community is healthy and people have a sense of wellbeing.	Provide the facilities, spaces and programs that support wellbeing and active and healthy communities.	
	4.4	People have access to the services and facilities they need.	Plan and provide services and infrastructure for a changing and ageing population.	
5: Progressive local leadership.	5.2	Partnerships and collaboration are valued and recognised as vital for community leadership and making positive change.	Collaborate with partners to deliver positive outcomes for the community, economy and environment.	Satisfaction with Council's community engagement. Satisfaction with the community's ability to influence Council's decision making. Community satisfaction with long term planning for council area. Overall satisfaction with Council's performance.

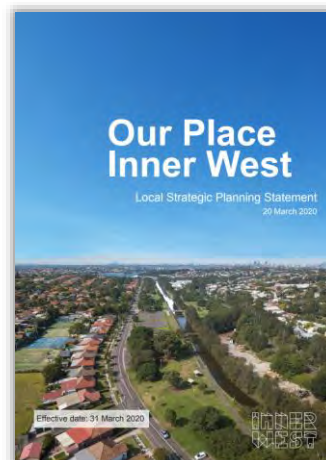
## 8.2 Inner West Local Strategic Planning Statement, Inner West Council, 2020

The *Inner West Local Strategic Planning Statement* (LSPS) outlines the vision:

***“A place of creative, connected, sustainable and productive neighbourhoods – as vibrant, innovative and diverse as our community”.***

This is supported by fourteen planning priorities. Key planning priorities that the transport study are most related to and can help give effect to include:

- > **Priority 1:** Adapt to climate change;
- > **Priority 2:** Inner West is a zero emissions community;
- > **Priority 6:** Plan for high quality, accessible and sustainable housing growth in appropriate locations integrated with infrastructure provision and with respect for place, local character and heritage significance.
- > **Priority 7:** Provide for a rich diversity of functional, safe and enjoyable urban spaces connect with and enhanced by their surroundings.
- > **Priority 8:** Provide improved and accessible sustainable transport infrastructure.
- > **Priority 9:** A thriving local economy; and
- > **Priority 11:** Provide accessible facilities and spaces that support active, health communities.

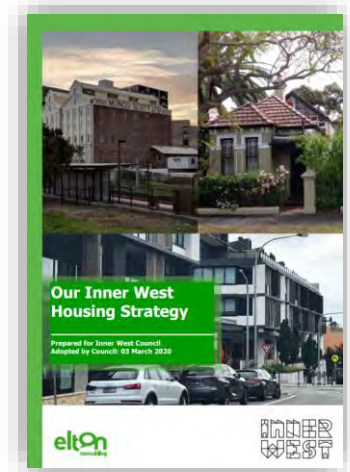


### 8.3 Inner West Local Housing Strategy, Inner West Council, 2020

The *Inner West Local Housing Strategy* is a high-level strategy providing direction for the provision for housing for communities within the LGA. It is an evidence-based study that informs the LSPS, LEP and DCP.

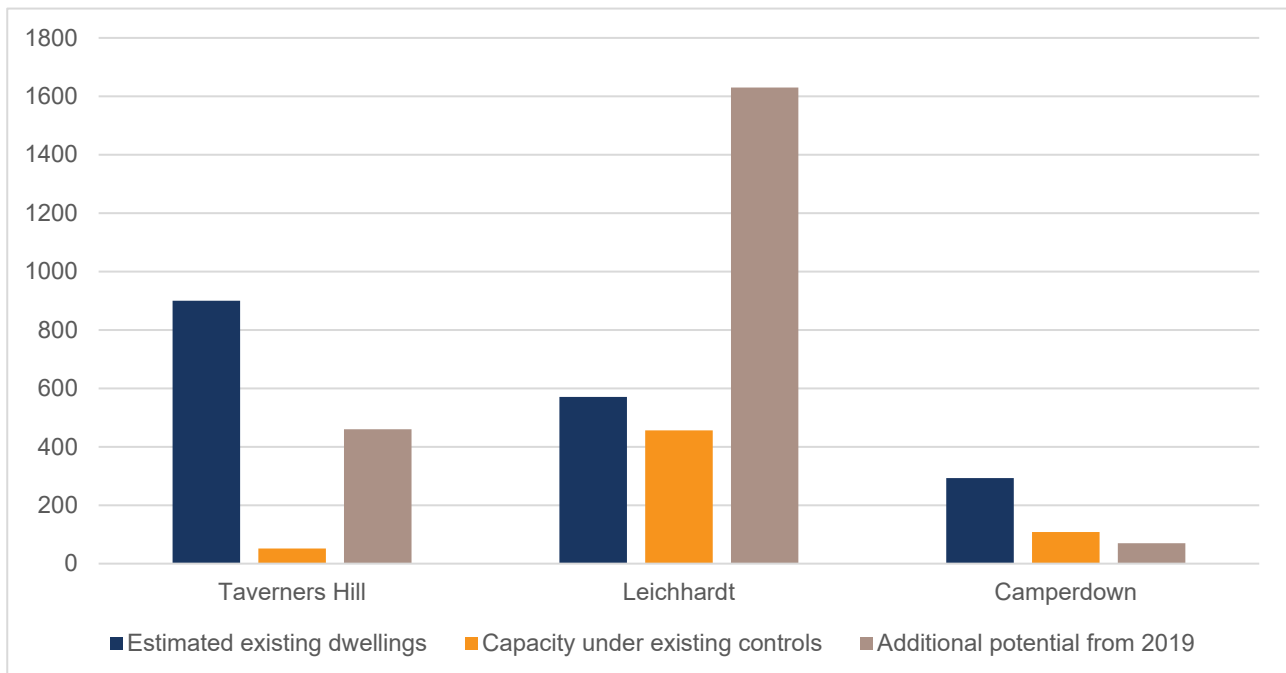
This Strategy aligns with Council’s and the community’s vision for housing and state government strategic plans and shows how Council will meet the requirements of the District Plan. It also:

- > Identifies the unique housing needs of Inner West’s current and future residents;
- > Develops an approach to boost housing supply, diversity and affordability responding to local needs while enhancing the character of local neighbourhoods;
- > Provides for population and housing growth;
- > Aligns growth and infrastructure; and
- > Supports the role of centres and informs Affordable Rental Housing mechanisms and strategies to increase affordable housing supply in the LGA.



The Strategy identifies significant potential development capacity from 2019 in Leichhardt, with some capacity for additional dwellings in Taverners Hill and Camperdown as shown in **Figure 8-1**. It is noted that this is dependent on rapid mass transit on Parramatta Road, within the existing road configuration. Additional development capacity has been identified in Leichhardt from 2026 due to the impacts of Sydney Metro West on the rail network.

Figure 8-1 Investigation areas from 2019 for additional housing in 2021-2026



Source: *Inner West Local Housing Strategy, Inner West Council, 2020*

## 8.4 Employment & Retail Land Study, Inner West Council, 2020

The *Employment & Retail Land Study* (EaRLS) provides a review of employment and retail land uses and their future potential in the IWC. It aims to facilitate the management of the Inner West employment lands and commercial centres, prioritising actions for productive commercial and industrial land uses to drive job growth and thriving economies.

The review and analysis of PRCUTS impacted land identifies inaccuracies in PRCUTS dwelling and employment numbers and that without details of the method and assumptions used in the PRCUTS projects, an independent critical review is difficult.

Council undertook an independent analysis of existing land use and floor space and has examined future land use scenarios based on strategic figures and what is likely to be feasible based on, existing planning controls, PRCUTS proposed planning controls and spatial analysis.

Key issues identified in the study relating to the PRC include:

- > Loss of industrial and urban services land as well as flexible and affordable employment floor space under PRCUTS in all three precincts; and
- > Greater Sydney Commission and Inner West Council policy positions have changed since the adoption of PRCUTS for the Camperdown precinct. Camperdown-Ultimo Collaboration Area Place Strategy (2019) recommends the following actions:
  - Safeguard business zoned lands from conversions which allow residential uses;
  - In support of establishing biotechnology hub in the triangles between Parramatta Road, Mallett Street and Pymont Bride Road; and
  - Safeguard existing and potential innovative and research activities from unrelated commercial activities until the master plan is produced for the precinct.



## 8.5 Inner West Integrated Transport Strategy, Cardno & Inner West Council, 2020

*Going Places: An Integrated Transport Strategy* for Inner West aims to address the transport challenges faced by the Inner West LGA and provides strategies and actions of integrated nature to support the Council in achieving its transport vision.

*Going Places* states the below vision for future transport which is focused on sustainable transport modes:

*“Growing numbers of Inner West residents, workers and visitors prefer to walk, cycle and use public transport because it is safe, convenient, enjoyable and healthy.*

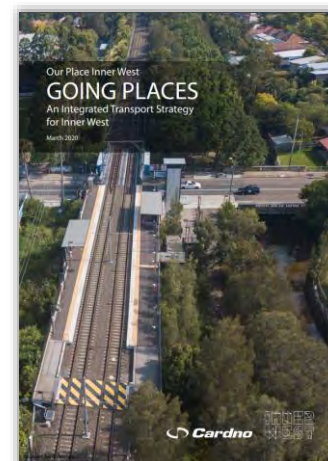
*Inner West transitions to environmentally sustainable transport.*

*Everyone is connected to their community and local services, and can access educational, retail, cultural and recreational districts, as well as jobs and services across local and regional areas.*

*The transport network enhances local economic vitality, with freight and goods movements are separated from people by space and/ or time.”*

The strategy is highly relevant to this study with future plans that would have direct implications on PRCUTS. It outlines several key projects including:

- > Parramatta Road Revitalisation;
- > Plan and Build Inner West Pedestrian Network;
- > Plan and Build Inner West Cycle Network;
- > The GreenWay and The Green Grid;
- > Grid Bus Network;
- > Increased support for efficient goods delivery;
- > Innovative Mass Transit for Parramatta Road;



### 8.5.1 Parramatta Road revitalisation

IWC previously commissioned the *Parramatta Road Transport Opportunity Study*. This study outlined an opportunity for a road-based mass transit system with dedicated road space to provide a high quality, frequency and capacity service along the Parramatta Road corridor as a means to support a high capacity movement function for people instead of vehicles. The Inner West Integrated Transport Study provides further recommendations including:

- > 24-hour dedicated mass transit lane with additional space at stops for customers;
- > Plantings and car parking at mid-block locations; and
- > Separated cycle facilities and opportunities for site-specific footpath widening.

Concept layouts from west to east are shown in **Figure 8-2**.

Figure 8-2 Parramatta Road concept layouts





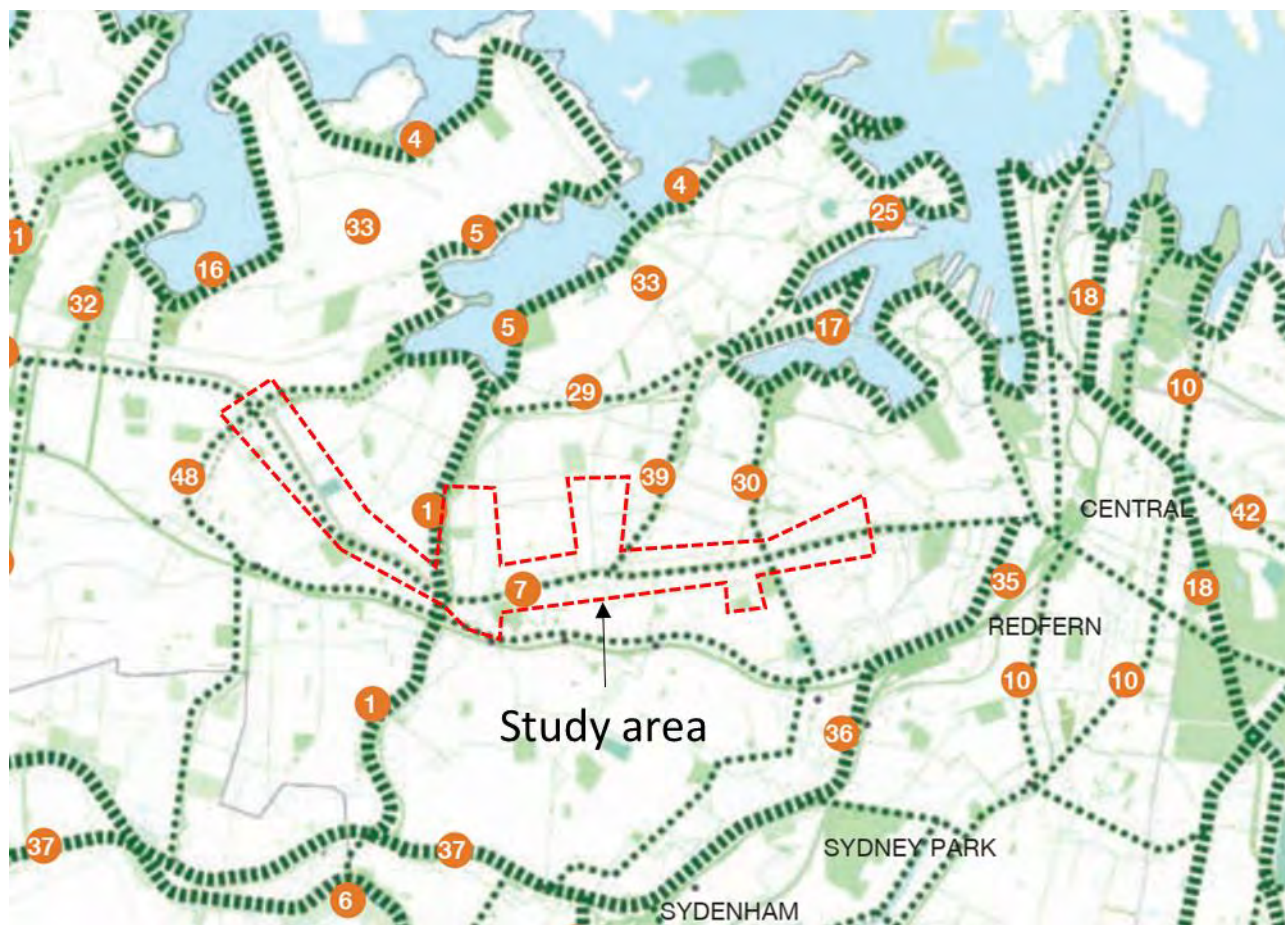
### 8.5.2 The GreenWay and The Green Grid

The Sydney Green Grid, which includes all of metropolitan Sydney, was developed in recognition of the importance of natural land uses the environment and people. Some Green Grid corridors also provide the opportunity to be part of and integrate with active transport links.

PRCUTS IWC precincts have several existing or proposed projects with active transport opportunities as numbered in **Figure 8-3**. These include:

- > 1 – The Greenway and Hawthorn Canal;
- > 7 – Parramatta Road Urban Renewal Corridor;
- > 30 – Johnsons Creek and Harold Park;
- > 39 – Whites Creek and Whites Creek Lane, Leichhardt; and
- > 48 – Cooks River Secondary Green Links: Ashfield to Canterbury (from Iron Cove Creek).

Figure 8-3 Green Grid



Base image source: Central District, Sydney Green Grid Spatial Framework and Project Opportunities, Tyrrell Studio, 2017

### 8.5.3 Inner West Pedestrian Network and Cycle Network

The Inner West Strategic Pedestrian and Cycle Network identifies a priority mesh network that covers the entire IWC and connects people from where they live to places they need and want to be. The strategic pedestrian and cycling network was developed to align with the Green Grid and Greenways.

These priority networks have interfaces with the study area and will be used to align recommended actions.

A schedule of the strategic networks as they interface with PRCUTS Inner West precincts is outlined in **Table 8-2**. Map extracts of the strategic pedestrian and bicycle network are shown in **Figure 8-4** and **Figure 8-5**.

Table 8-2 Strategic pedestrian and bicycle network

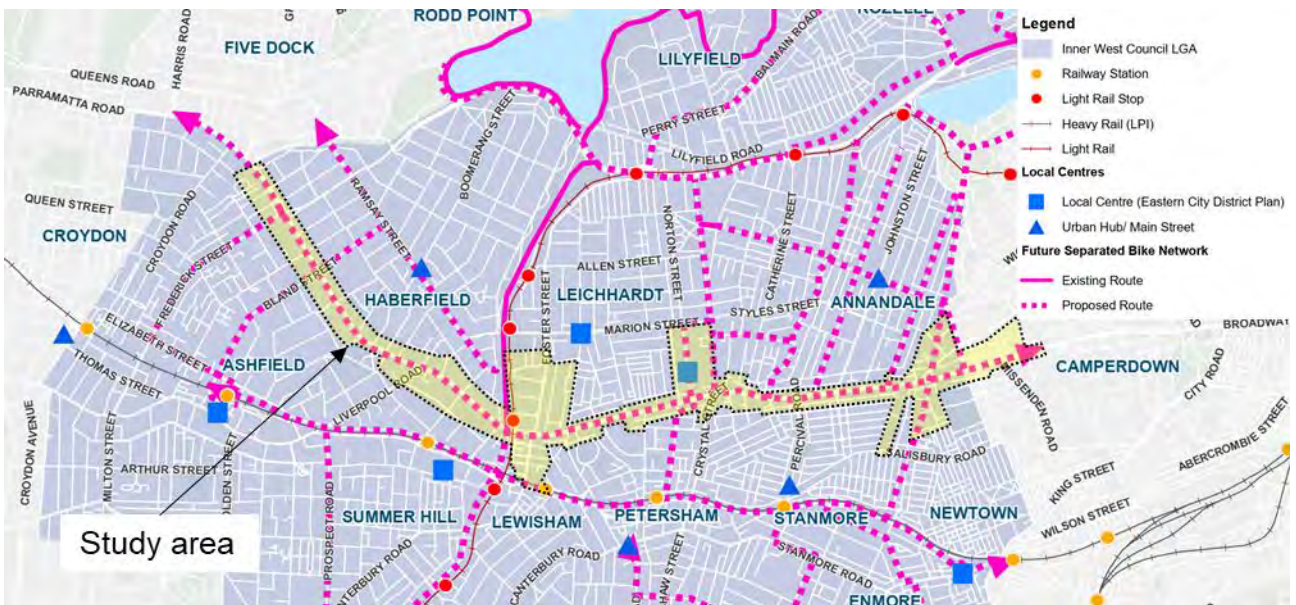
Precinct	Location	Side of Parramatta Road	Strategic pedestrian network	Strategic bicycle network
Taverners Hill	Parramatta Road	Both	Yes	Proposed
	Iron Cove Creek	North	Proposed	No
	Wattle Street	North	Yes	Yes
	Fedrick Street	South	Yes	Proposed
	Bland Street	Both	No	Proposed
	Dalhousie Street	North	Yes	No
	Liverpool Road	South	Yes	No
	Sloane Street	Both	Yes	No
	Greenway	North	Yes	Yes
	Greenway	South	Proposed	Proposed
	Flood Street	North	Yes	No
Taverners Hill/ Leichhardt	West Street	South	Yes	No
Leichhardt	Palace Street	South	Yes	No
	Railway Street	South	No	Proposed
	Renwick Street	North	No	Proposed
	Norton Street	North	Yes	Proposed
	Balmain Road	North	Yes	Proposed
	Catherine Street	North	Yes	No
	Whites Creek Lane	North	Proposed	Proposed
	Percival Road	South	Yes	No
	Annandale Street	North	Yes	Proposed
Leichhardt/ Camperdown	Johnston Street	North	Yes	No
Camperdown	Nelson Street	North	Yes	Proposed
	Johnstons Creek	North	Proposed	Proposed
	Denison Street	South	Yes	No
	Booth Street	North	No	Proposed

Figure 8-4 Strategic pedestrian network – existing and proposed



Base image source: *Our Place Inner West Going Places, An Integrated Transport Strategy for Inner West, Inner West, 2020*

Figure 8-5 Strategic bicycle network – existing and proposed



Base image source: *Our Place Inner West Going Places, An Integrated Transport Strategy for Inner West, Inner West, 2020*

### 8.5.4 Grid Bus Network

The existing bus network is complex due to the large number of routes traversing through the Inner West which reduces the convenience, propensity for a customer to use multiple services. This can also result in buses bunching on key corridors.

The Grid Bus Network proposes Transport for NSW simplify the bus network into a mesh/ grid system comprising of north-south and east-west routes. This would ideally serve higher capacity networks such as rail and an improved mass transit service on Parramatta Road.

For the PRCUTS IWC precincts, this would mean:

- > Rationalisation of existing bus services along Parramatta Road replacing multiply routes with a single high capacity and frequency service and improved integration with Taverners Hill light rail stop;
- > A north south route linking the Balmain peninsula to Dulwich Hill via Lewisham train station;
- > A north south route linking Drummoyne to Hurlstone Park via Ashfield Station;

> A north south route linking Rozelle to Marrickville via Petersham train station.

The proposed grid bus network is shown in **Figure 8-6**.

Figure 8-6 Grid bus network



Base image source: *Our Place Inner West Going Places, An Integrated Transport Strategy for Inner West, Inner West, 2020*

### 8.5.5 Increase support for efficient goods delivery

Council recognises the economic benefits and needs for the movement of goods. With increased online shopping culture as well as business needs, space for deliveries provides a higher value benefit.

The project identifies a kerbside hierarchy which will apply to PRCUTS precincts. This has been identified by factors that support sustainability, the economy and the highest number of beneficiaries. This is outlined in **Table 8-3**.

Table 8-3 Kerbside space use hierarchy

Priority	Use	Rationale
	Bicycle and personal mobility devices	Space is made for sustainable transport device parking
	Public transport stops	A higher priority is given to the provision of public transport stops.
	Service vehicle zones	Provision of servicing space is given a high priority to support safe conditions for workers and supporting the economy.
	Mail zones	
	Truck zones	
	Loading zones	
	Taxi/ rideshare zones	Space provided for safer pick up and drop off which supports people who do not own a private car.
	Car share zones	Provide spaces to support residents without a car and workers who do not drive to work and may be required to undertake workday trips. Car share has many beneficiaries throughout the day and week.
	Motorbike parking	Provides a benefit to more people per a given area.
	Private vehicle parking:	Private vehicle parking occupies a considerable space and benefits fewer people. Accessible parking takes highest priority in this category to support equity.
Accessible parking		
Electric vehicle parking		
Non-electric vehicle parking		

**8.5.7 Innovative Mass Transit for Parramatta Road.**

The strategy examines potential options for mass transit along Parramatta Road including:

- > High-Spec buses;
- > Guided Buses;
- > Trams or Light Rail Vehicles.
- > Bus Rapid Transit;
- > Optically-Guided Trams; and

The strategy states service must have the following benefits:

- > Features to identify the service and attract passengers to use it;
- > High frequency and comfort; and
- > Easy to understand service.

Inner had previously undertaken a detailed mass transit study along Parramatta Road which is described in the next section.

**8.6 Parramatta Road Transport Opportunities Study Summary, Inner West Council & City of Canada Bay Council, 2017**

This study was developed in response to PRCUTS and the potential reduction of traffic on Parramatta Road due to WestConnex and the approval condition of WestConnex which is to convert two lanes on Parramatta Road between Burwood and Haberfield. The study was conducted to examine the existing carriageway of Parramatta Road and provide recommendations on the public transport opportunities on the Corridor.

The study examines various options and configuration of public transit options including light rail, bus rapid transit, guided electric transit system and bike sharing.

The study recommended Guided Electric Transit System (GETS) emerged as the preferred option for Parramatta Road, feasible for operation from 'Day-One' of WestConnex Stage 3. It recommended centre-running dedicated lanes for the GETS which supports accessible transport and kerbside parking of other vehicles.

GETS is also scalability for a spine and spur network with first and last mile infrastructure in the future. The system can:

- > Be accommodated within the corridor between Strathfield and Sydney City;
- > Innovative image which can encourage confidence in developers and future residents and hence, promote revitalisation of the Corridor; and
- > Cost effective while providing sufficient capacity, frequency and flexibility.



## 9 Emerging travel trends and technology

Emerging travel trends and technology are likely to impact the need and the way people travel in future. New transport technologies and innovations provide an opportunity to improve the transport network by providing benefits through improving safety, accessibility, mobility, sustainability and productivity.

Consideration must be given to technologies that help to give effect to the vision of PRCUTS and being aware of when and what technology may have negative impacts. The Inner West Council Transport Strategy outlines a number of initiatives. **Table 9-1** updates and summarises the emerging technology and megatrends as they could apply to PRCUTS IWC precincts.

Table 9-1 Emerging technologies and megatrends

Transport technology/ innovation	Source/ status & timing	Location	Key details	Implications PRCUTS IWC precincts
Mobility as a Service (MaaS)	Discussed in Future Transport 2056. <i>No official policy as yet.</i>	Global.	Application-based services would market and integrate transport modes including, rideshare, car share or public transport.	Easier to use transport network, reducing reliance on private vehicles within precincts.
E-bikes	Online	Global.	Bicycles with batteries and electric motors to assist when pedalling is not desirable.	Advances in technology are making these vehicles cheaper and more accessible to all. Additional bike volumes on the local transport network for local and through movements needs to be considered and accommodated for. This could have safety implications for pedestrians or users without the right support and application of safety and risk reduction initiatives. Additional parking opportunities will need to be provide in the public domain and new development.
E-scooters	Online	Global.	Scooters with batteries and electric motors to assist when desirable.	Currently illegal to ride on footpaths and roads in NSW. Nonetheless, a change in policy would allow E scooters to become a convenient tool for short local trips to shops and transit nodes. Scooters also take up less space than bicycles when parked on footpaths. Consideration of safety and parking opportunities as per bikes.

Transport technology/ innovation	Source/ status & timing	Location	Key details	Implications PRCUTS IWC precincts
Intelligent transport systems and infrastructure	Online/ Ongoing	Global.	Applying computing power and data to improve transport networks. Real-time vehicle position. Traffic management software and infrastructure. Integration of systems to support multi-modal systems.	Efficient management of transport through PRCUTS and providing customers timely information to inform optimal travel choices.
Track-free trams or Guided Electrical Transit System (GETS) <sup>2</sup>	IWC – aspirational. <i>No committed timeframe and dependent on State Government funding assistance.</i>	Global Interest, already running in China and parts of Europe.	These vehicles look like a light rail vehicle but run on rubber tyres and are electrically powered. They can run autonomously with laser guided tracking along a set path on normal roads. Control can be assumed by human intervention if required, usually to help divert it from its normal passage during disruption. Vehicles are designed to run at 70 kilometres an hour, at high frequency. Capacity is dependent on configuration, with a typical unit able to accommodate 300 customers.	It has similar benefits to trams but far lower costs and time required for implementation. Potential as high capacity mass transit on Parramatta Road, providing opportunity for pedestrian friendly vibrant streets.
Electric buses	Online	Global. Transit System trial to begin mid 2019	Buses with electric motors, powered by batteries. Buses typically have capacity for 50 – 100 customers depending on configuration.	Quieter public transport movements with cleaner air and lower running costs on existing bus routes.
Smart shuttles	Trials underway by TfNSW at Sydney Olympic Park and regional NSW.	Global.	Vehicles carry up to 14 people and follow variable route corridors with the ability to react to customer needs.	Existing public transport service and coverage likely to negate the need for Smart Shuttles.
On demand public transport	Trials underway by TfNSW in the Northern Beaches, and The Hills Shire Council in Metro Station Precincts. .	Global.	Buses made available by online bookings, mostly to reach local transit nodes as a 'last mile' service. Generally used to fill in public transport service coverage gaps.	Existing public transport service and coverage likely to negate the need for On Demand buses.

<sup>2</sup> <https://theconversation.com/why-trackless-trams-are-ready-to-replace-light-rail-103690>

Transport technology/ innovation	Source/ status & timing	Location	Key details	Implications PRCUTS IWC precincts
Automated freight delivery methods	Connected and Automated Vehicles Plan 2019 by NSW Government	Global.	Artificial intelligence will drive vehicles for us, pre-empt changes in traffic, provide opportunity for centrally control traffic routing cognisant to the environment. More efficient use of road space and reduction in circulating vehicles if multiple deliveries are undertaken with one vehicle.	These have the potential to provide smaller sized deliveries to homes and businesses and could include read to eat food delivery. These may be undertaken on footpaths and would require standards to manage safety and space.
Rideshare	Implemented	Global	Rideshare technology has disrupted the taxi industry. It provides the convenience of users being able to request a point to point service from a mobile device.	Reduces the need to own and use a private vehicle, particularly for shorter trips. More kerbside space is required in conspicuous locations to support safe pick-up and drop-off access to services.
Electric vehicles (EV)	Electric and Hybrid Vehicle Plan (2019), NSW Government. Future Transport 2056. <i>Initiatives for Investigation (0-10 years).</i>	Global.	Embraces the growing availability of electric and hybrid vehicles. Roll-out of electric vehicle charge points as necessary to facilitate the future of electric vehicle use.	Opportunities to trial charging points in local centres and in new developments. New development should consider the need to easily add infrastructure to charge electrical vehicles.
Connected and autonomous vehicles (CAVs)	Connected and Automated Vehicles Plan 2019 by NSW Government	Global.	Artificial intelligence will drive vehicles for us, pre-empt changes in traffic and tune in to the movements of all around them. It is quite possible that private ownership of cars will become a thing of the past, replaced by rideshare fleet memberships. Shared CAVs would likely allow for a more efficient use of existing road space and parking spaces, reduce traffic volume, improve network efficiency and improve road safety by removing human error.	This could make some car parking redundant into the future. Consideration should be given providing less car parking and readapt able car parking space in development.



## 10 Land use – existing conditions

This section summarises existing land use characteristics in Taverners Hill, Leichhardt and Camperdown and discusses future plans in each precinct. Core and frame areas of each precinct are shown in **Figure 10-3**.

### 10.1.1 Camperdown

The Camperdown Precinct spans across the Inner West and the City of Sydney LGA's. The Camperdown Core Precinct falls wholly in the Inner West.

#### 10.1.1.1 Camperdown Core Precinct

The Camperdown Core Precinct is bounded by Johnston Creek, Mallet Street north of Parramatta Road and Australia Street, Cardigan Lane and Derby Street south of Parramatta Road. The Precinct is strategically located near the Sydney CBD, University of Sydney and Royal Prince Alfred Hospital.

The Camperdown core precinct comprises primarily of industrial areas to the north and south of Parramatta Road. A number of bulky goods are located on Pymont Bridge Road and a small number of high street retail front the southern side of Parramatta Road.

Proximity to the city and university, availability of light industrial spaces and good arterial road access has supported employment of researchers and creatives in businesses such as design studios and start-ups. A large proportion of industrial buildings located between Mallet Street, Pymont Bridge Road and Parramatta Road were demolished to accommodate the WestConnex construction.

Camperdown is shown in **Figure 10-1** and **Figure 10-2**.

Figure 10-1 Camperdown Hotel



Figure 10-2 Parramatta Road, Camperdown



#### 10.1.1.2 Camperdown Frame Area

The Camperdown Frame Area is an approximately 1.3-kilometre long corridor on Parramatta Road that connects between Johnston Street in the west and Missenden Road to the east. The frame areas support a variety of retail businesses including homeware stores, furniture shops, automotive shops, hardware stores and eateries.

#### 10.1.1.3 PRCUTS planned future

PRCUTS and the Camperdown-Ultimo Collaboration Area Place Strategy (CUCAPS) are in alignment with developing Camperdown as a health, education and innovation precinct. Leveraging on Camperdown's proximity with the Sydney CBD, University of Sydney and Royal Prince Alfred Hospital, an opportunity exists to support tech start-ups, innovative and creative industries to expand the research and knowledge-based activities in the precinct. This includes a biotechnology hub in the 'Camperdown Triangle', which consists of land bound by Parramatta Road, Mallett Street and Pymont Bridge Road. The site is currently a WestConnex dive site.

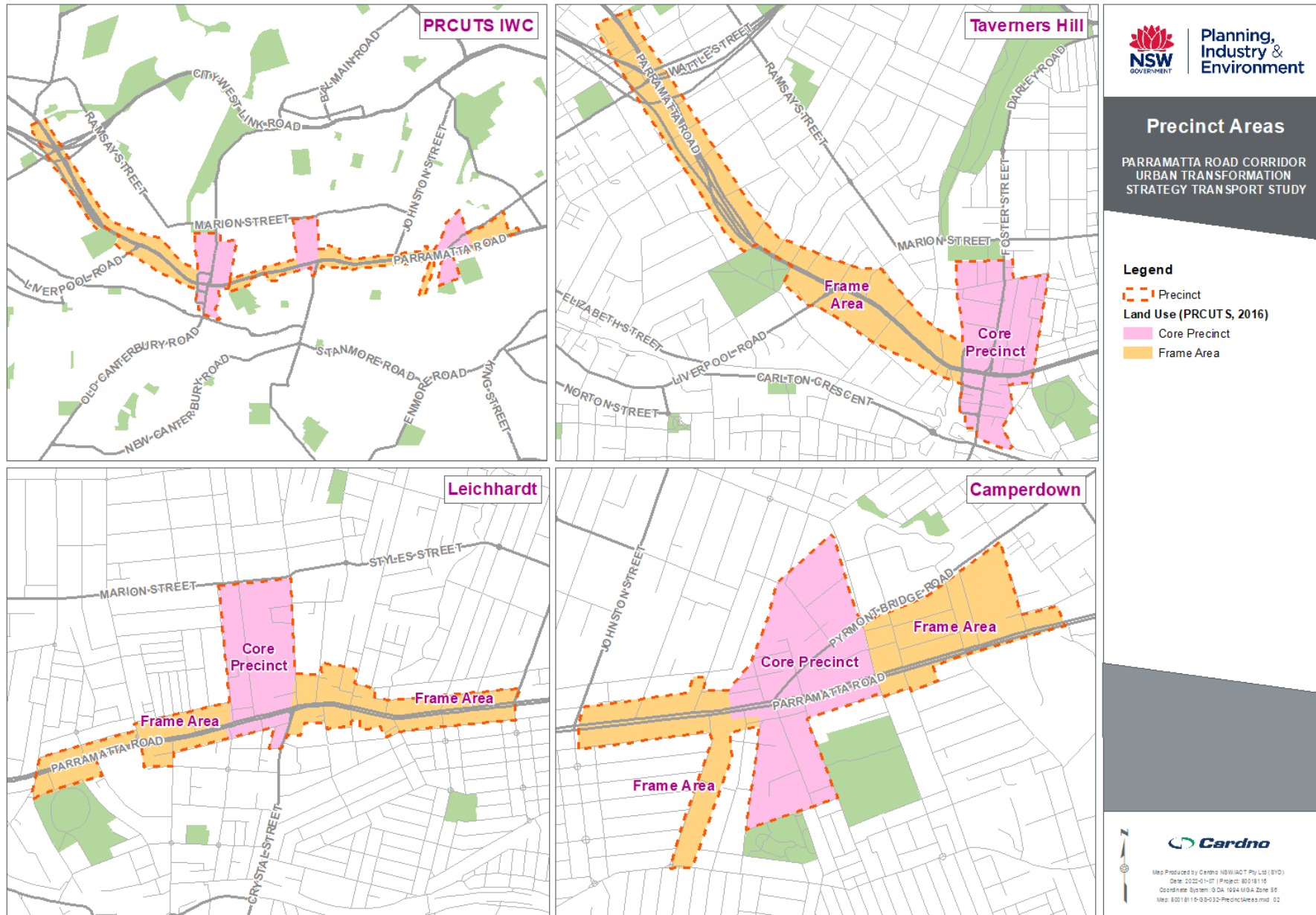
The CUCAPS and the IWC Employment and Retail Land Study (EaRLS) are in support of safeguarding business zone lands from being converted into residential lands and safeguarding existing and potential innovative and research activities from unrelated commercial activities. This will be done through:

- > Maintaining existing light industrial zone to allow for affordable employment options; and
- > A pilot project that introduces a minimum percentage requirement for affordable space in new developments to encourage innovative and creative industries.

A masterplan is planned to establish Camperdown as a health and education precinct. A \$750 million redevelopment of the Royal Prince Alfred Hospital was announced in 2019. The future redevelopment aims to increase jobs and improve health services in the local area. Relocation of the Faculty of Health Sciences, Faculty of Nursing and Midwifery and Central Clinical School at University of Sydney will reinforce the vision of Camperdown as a biotechnology and biomedical hub. The University of Sydney is set to become a more active and dynamic activity node with plans to open up the campuses to the broader community including the Chau Chak Wing Museum opened in November 2020 and a future new gateway to City road.

East of the Camperdown precinct, the Central Station Precinct development will accommodate more than 200,000 additional users within 20 years, and to the north, the Bays Precinct is set to be revitalised with the completion of the Sydney Metro West Station and surrounding development.

Figure 10-3 Core and frame precinct areas



## 10.1.2 Leichhardt

### 10.1.2.1 Existing conditions

Leichhardt is a local centre in the Inner West, providing access to essential goods and services near for local residents.

The Leichhardt Core Precinct as defined in PRCUTS is bounded by Renwick Street, Balmain Road, Parramatta Road and Marion Street in addition to a row of properties fronting Crystal Street. The precinct contains residential buildings, restaurant and retail outlets. The precinct’s existing activity centre is concentrated on Norton Street, running north-south along the precinct. This is shown in **Figure 10-4** and **Figure 10-5**. Many restaurants and eateries are located along Norton Street and Parramatta Road. The precinct has a specialisation in wedding related retail services, with more than a dozen shops clustered along Parramatta Road.

Key destinations in Leichhardt Core Precinct are:

- > Leichhardt Public School;
- > Norton Plaza;
- > The Italian Forum (Leichhardt Library on the ground floor); and
- > Palace Norton Street (Cinema).

Leichhardt Town Hall is located north of the Precinct’s northern boundary, Marion Street.

Figure 10-4 The Italian Forum



Figure 10-5 Norton Street



### 10.1.2.2 Leichhardt Frame Area

The Leichhardt Frame Area extends 1.8 kilometres along Parramatta Road between Flood Street in the west and Johnston Street in the east. On the western end, the Frame Precinct contains industrial warehouse buildings and modern showrooms. East of the Leichhardt Frame Precinct, there contains smaller sized employment centres with mixed urban services and retail. The eastern end also accommodates two council owned carparks: Hay Street car park with 61 spaces and Renwick Street Car Park with 10 spaces. The Italian Forum Car Park has 455 spaces. There is a notable amount of vacant floor spaces within this area. The Corridor also supports a high number of automotive businesses.

Petersham Park accessed via Park Street and West Street provides a public amenity in vicinity of the Frame Precinct. Fort Street High School on Parramatta Road is also a key attractor on the Corridor.

### 10.1.2.3 PRCUTS planned future

PRCUTS sets the vision for the Leichhardt Precinct to leverage on its existing strengths as a vibrant people orientated area with improved public amenity along Parramatta Road. Existing Improved amenity along PRC including the planned transport projects to improve pedestrian experience will allow for more opportunities in outdoor dining and footpath trading.

The E&RL Study forecasts that an additional 20,065 square metres of office floor space and 11,511 square metres of retail floor space by 2036 will be required on Norton Street. A minimum floor space ratio control for

non-residential uses and requirement for ground floor retail to support the forecasted increase in employment will be required.

Leichhardt's night time economy will grow. Markets and street festivals will attract visitors to the area along with the establishment of small bars and late night trading.

Existing light industrial and enterprise corridor zone lanes in Leichhardt will be preserved and protected from conversion to other uses.

The Leichhardt Frame Precinct will benefit from more flexible employment areas, particularly for tenants on ground level, which support a broader range of businesses. A planning response will be developed to achieve renewal of employment floor space while maintaining affordability and urban amenity.

A place-based study is planned to review planning controls for the Leichhardt Precinct in the context of PRCUTS and the former Leichhardt Urban Design and Heritage Studies (2016). As anecdotal evidence has shown that there is currently a low demand for mixed-use development, a feasibility study will be undertaken to ascertain what makes a mixed-use development viable.

### 10.1.3 Taverners Hill

#### 10.1.3.1 Existing conditions

Taverners Hill is a local centre within the suburb of Leichhardt. The Taverners Hill Core Precinct is a mixed use area with dwellings in a range of densities focused nearer to Parramatta Road.

The precinct supports a range of businesses including car dealerships, offices, automotive repair stores, events specialists, artistic education centres, print shop, a gym and a meat wholesaler, concentrated along Parramatta Road. Residential land uses include apartments, terrace housing and workers cottages.

The active main streets Old Canterbury Road and Tebbutt Street provide north-south connection linking Lewisham Station to Marion Street. Adjacent to Lords Road is an industrial and urban services estate.

Key destinations in and in vicinity of Taverners Hill Core Precinct are:

- > Kegworth Public School;
- > Leichhardt Community Church;
- > Lambert Park Sportsfield; and
- > MarketPlace Leichhardt.

Some places in Taverners Hill are shown in **Figure 10-6** and **Figure 10-7**.

Figure 10-6 MarketPlace Leichhardt



Figure 10-7 Parramatta Road, Taverners Hill



#### 10.1.3.2 Taverners Hill Frame Area

The Taverners Hill Frame Area encompasses a 2.4 kilometre section of Parramatta Road between Iron Cove Creek and Hawthorne Canal. The Corridor supports a wide range of retail and services including car dealerships, automotive repair shops, homeware shops, motels and inns. Interchange of Parramatta Road and WestConnex is located west of the precinct.

Key destinations in and in vicinity of Taverners Hill Frame Precinct are:

- > NSW Ambulance Haberfield Superstation;
- > Uniting Church in Australia;
- > Bunnings Ashfield; and
- > The Willows Private Nursing Home Pty.

#### *10.1.3.3 PRCUTS planned future*

Within the Taverners Hill Precinct, employment land use is expected to be maintained on both sides of Parramatta Road, Tebbutt Street, Upward Street and George Street. Industrial and urban services land in Taverners Hill will also be retained and protected from conversion into residential uses to maintain employment opportunities.

To accommodate increase in population and employment in the future, adoption of increased height and floor space ratio controls along the northern side of Parramatta Road is proposed by IWC. Plans to undertake a detailed precinct planning for Taverners Hill to achieve improved urban design and support site specific redevelopment for employment purposes are underway.

# 11 Travel demand

The PRC contains some well-established transport networks including road, rail, bus and active transport provisions. The following sections detail the existing conditions and transport services available within the study area.

## 11.1 Mode share

The Household Travel Survey (HTS) collated by the Transport Performance and Analytics (TPA) division of Transport for NSW provides indicative travel behaviour information from dwellings across the Sydney Greater Metropolitan Area (GMA). Samples of residents provide detailed travel information over a typical weekday. The data is scaled up and uses data from three years of surveys to provide a snapshot of travel patterns of LGAs.

HTS mode estimations for IWC residents in years 2018 – 2019 indicate there were approximately 1,055,000 trips on a typical weekday. These trips are measured by mode, so one trip can be measured as several and this is generally captured by “Walk Linked” trips as part of a multi-modal journey.

A breakdown of the number of estimated trips on a typical weekday in 2018 – 2019 is shown in **Figure 11-1** and the percentage compared with Sydney GMA in **Figure 11-2**.

Figure 11-1 IWC average trips per day/ mode

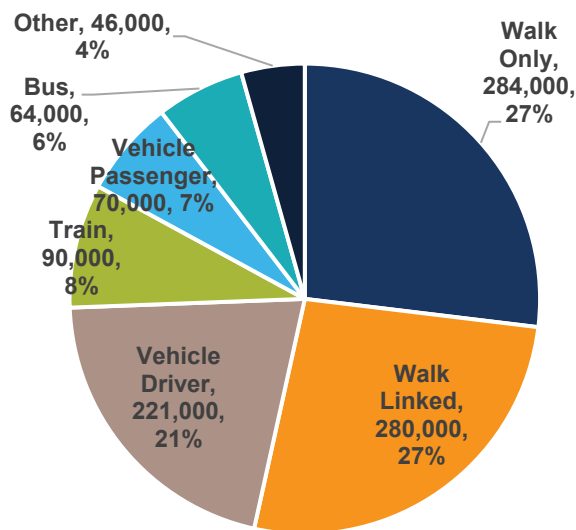
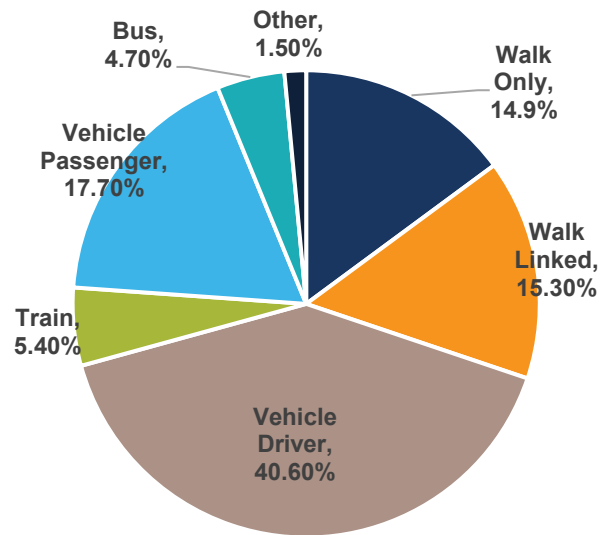


Figure 11-2 Sydney GMA average percentage of trips/ day



Data source: Household Travel Survey 2008/09 – 2018/19 – Data by LGA, TPA, 2021

**Figure 11-1** shows that over half of the trips involve walking and this highlights the importance of supporting pedestrians with safe and high quality facilities. A “Walk Linked” trip indicates walking to another mode, i.e. the public transport stop/ station.

Approximately 154,000 public transport (train + bus) trips on a typical weekday, with a portion of the 46,000 trips categorised as “other” likely to be attributed to light rail. This shows that car use (vehicle driver and vehicle passenger) represents the highest portion of motorised travel with just under 300,000 trips.

It is understood that “Other” trips includes cycling trips. It can be anticipated that cycling trips could represent at least 1 per cent of all trips, which would be over 10,000 trips per day.

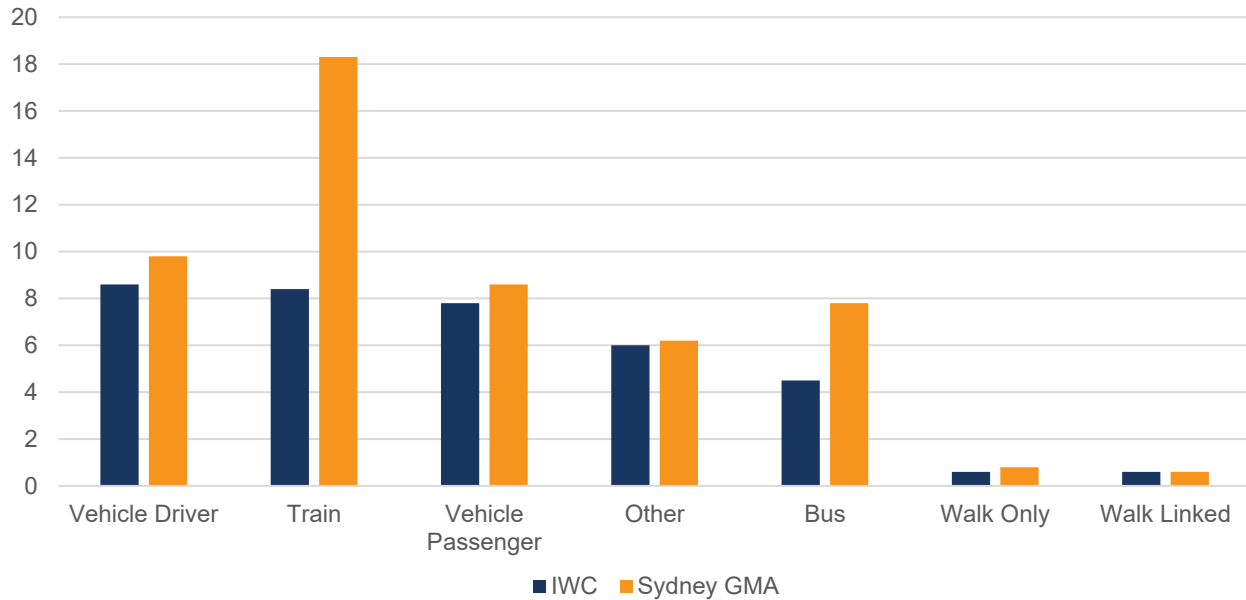
Comparisons to the Sydney GMA shows that the Inner West has higher rates of walking and sustainable transport use.

This information suggests it is important to provide and maintain a high quality walking network to support people within and passing through PRCUTS precincts.

## 11.2 Average trip distance

Average trip distance for each mode is shown in **Figure 11-3**. This shows the longest average trips for Inner West residents occur in cars and on trains. “Other” trips average six kilometres which aligns with the assumption that many of these represent light rail and bicycle trips. On average, Inner West residents have shorter public transport trips, reflective the location in Sydney. Walking trips represent the shortest trips at approximately 600 metres each.

Figure 11-3 Modal average trip distance



Data source: Household Travel Survey 2008/09 – 2018/19 – Data by LGA, TPA, 2021

The data indicates that on average, IWC residents travel shorter distances which is indicative that the daily needs of people can be met closer to home. Maintaining land use diversity will continue to support shorter trips, improving liveability for residents.

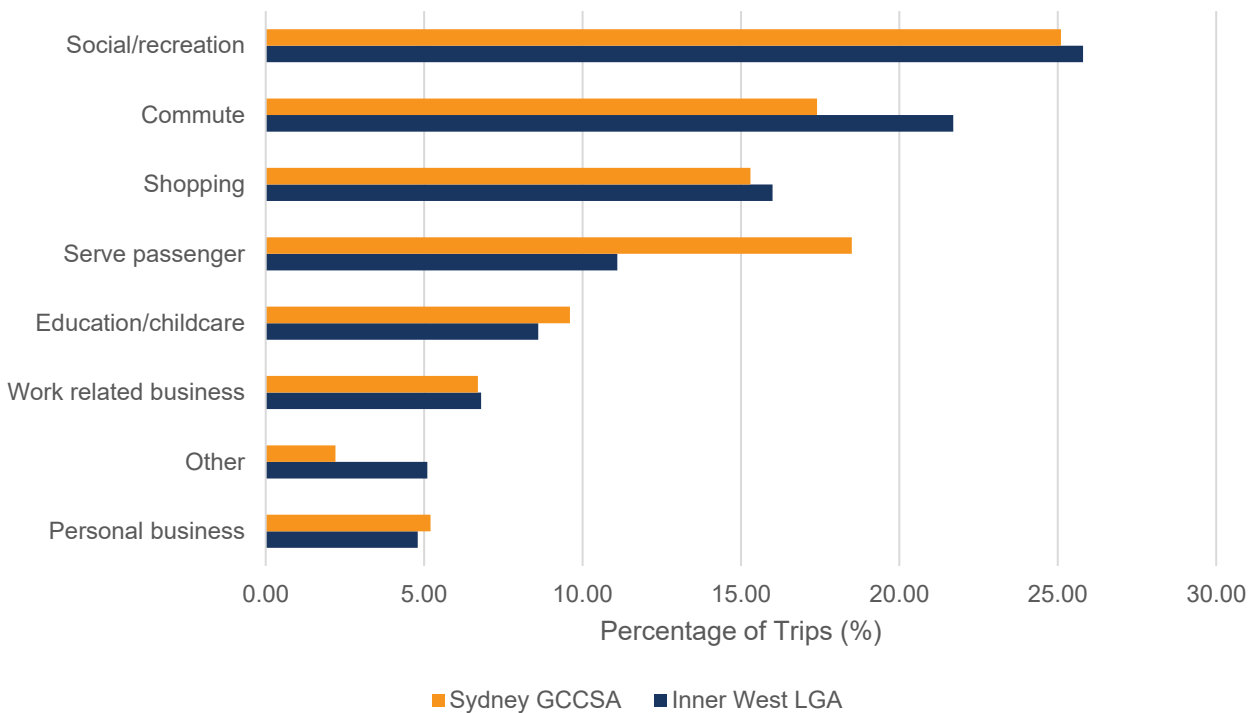
## 11.3 Trip purpose

Trip purpose is a subset and aggregate of mode share trips. One trip purpose can utilise multiple modes of travel, as such there are only 722,000 trips identified on a typical weekday. Based on the estimated population of 199,000, each resident makes approximately 3.6 trips per typical weekday.

There are eight trip purpose categories in the data. A comparison on Inner West trip purpose percentage split against the Sydney Metropolitan area is shown in **Figure 11-4**.



Figure 11-4 Trip purpose portion



Data source: Household Travel Survey 2008/09 – 2018/19 – Data by LGA, TPA, 2021

The data shows the most occurring trip purpose is for social/ recreation purposes followed by commuting and shopping. Trip purposes are generally consistent with Greater Sydney. Inner West has a smaller “serve passenger” trip share less people being driven around by others which could be a result of improved public transport and ride share availability.

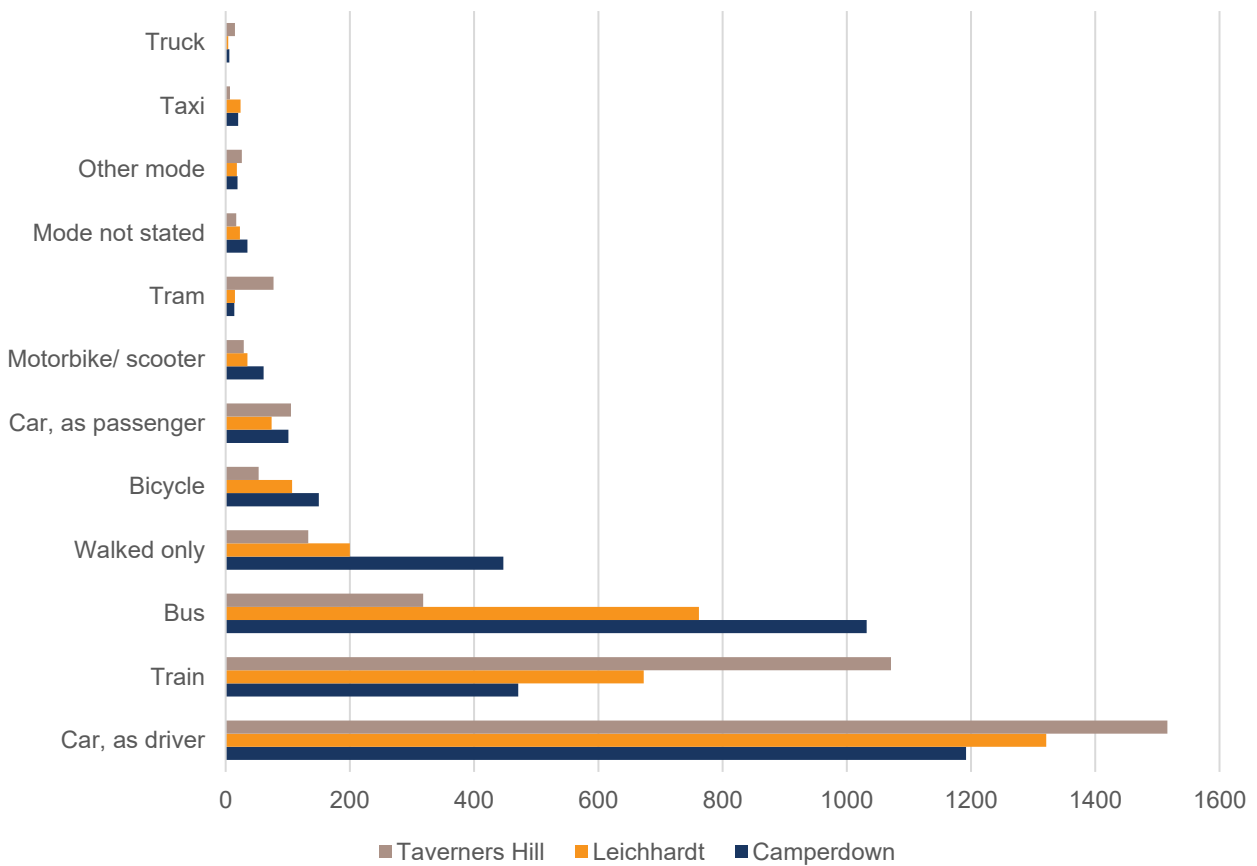
Commuting accounts for approximately 22 per cent of all trips. Due typical business hours and the common times people commute, commuting trips create weekday AM and PM peak periods. Commute trips are discussed in the next section.

PRCUTS transport recommendations must support all trip types, recognising that trips happen throughout the day and despite the network peaks, commute trips represent only 22 per cent of daily trip purposes.

### 11.4 Journey to work

Journey to work data from Census 2016 has been collated from statistical Area 1 (SA1) geographies selected that best align to the study area. The data indicates that approximately 10,200 commuters commuted from PRCUTS IWC precincts. Public transport combined (train + bus + tram) represents approximately 44 per cent of mode chose which is greater than Car as driver and Car as passenger which represents 42 per cent. This has been graphed in **Figure 11-5**.

Figure 11-5 Journey to work 2016 mode share



Data source: Census, ABS, 2016

Figure 11-5 show that car as driver is the highest mode share from all precincts. The public transport mode share is reflective of the difference in accessibility in each precinct. Train mode share is high in Taverners Hill and lower in Camperdown. Bus use is high in Camperdown and low in Taverners Hill. Most light rail passenger are from Taverners Hill. Bicycles represent 3 per cent and motorcycle and scooters represent 1 per cent of Journey to Work trips. This should be considered and accommodated with on-site provisions for new land uses.

The data demonstrates that active transport links to nearby train stations are important for all precincts and improvements to public transport should be provided to help lower car mode share.

The Transport Plan will use the transport modelling and transformational planning informed by the PRCUTS vision to establish a mode shift target for reduced private car dependency.

## 12 Transport network – existing conditions

### 12.1 Connectivity and major movement

The PRC has high capacity east-west connectivity with multiple transport modes available. East-west connectivity is available on either side of Parramatta Road although it is limited within close proximity to the study area. North-south connectivity is limited in capacity and efficiency.

The major east-west movement corridors in and surrounding the PRC are:

- > Parramatta Road;
- > Marion Street/ Style Street/ Collins Street;
- > Main Suburban railway line;
- > City-West Link Road;
- > Douglas Street/ Salisbury Road;
- > Carlton Crescent/ Longport Street/ Railway Terrace/ Trafalgar Street; and
- > New Canterbury Road/ Stanmore Road.

The major north-south movement corridors in and surrounding the PRC are:

- > L1 Inner West Light Rail.
- > Frederick Street/ Wattle Street;
- > Dalhousie Street;
- > Liverpool Road (Hume Highway);
- > Tebbutt Street/ Old Canterbury Road;
- > Norton Street;
- > Balmain Road,
- > Crystal Street,
- > Johnston Street;
- > Pyrmont Bridge Road;
- > Livingstone Road; and
- > King Street.

### 12.2 Active transport

#### 12.2.1 Pedestrian network

Footpaths are generally provided on both sides of the road within most built-up or residential areas. Footpaths provided along Parramatta Road are generally wide (generally between two and four metres in Leichhardt and Camperdown, and between one and three metres in Taverners Hill) and configured in a paved kerb to property line format. Footpath width is generally narrower in laneways. Footpath widths are shown in **Figure 12-1**.

Most of the network contains kerb ramps at intersections, however many of these are misaligned with the kerb ramp on the opposite side of the road.

Shared paths are generally provided as recreational paths. The main shared paths servicing the study area are located along the Hawthorne Canal and around Petersham Park.

#### 12.2.2 Pedestrian walking experience

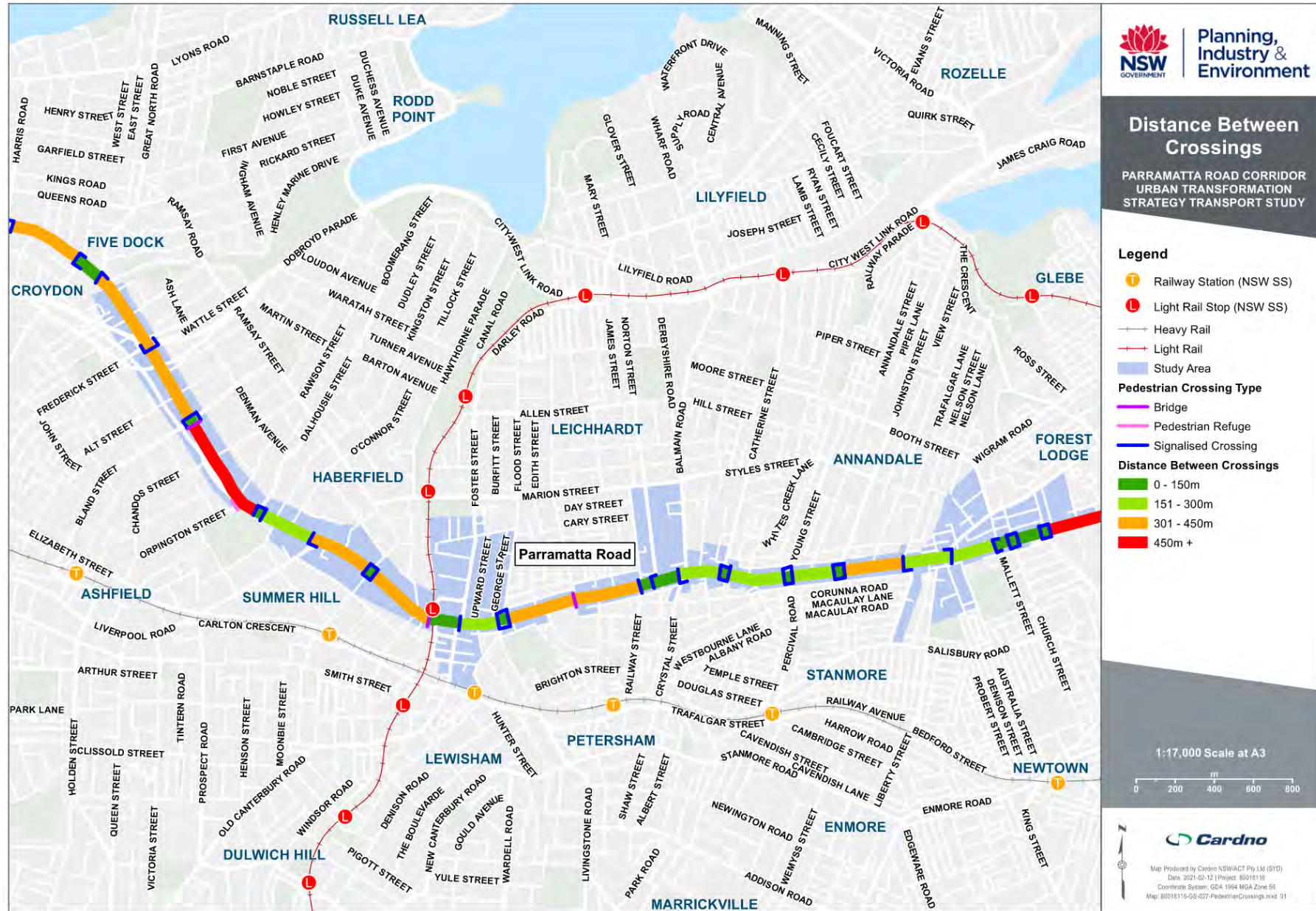
High traffic volumes and speed along Parramatta Road, as well as obstacles created by utilities and lack of shade contribute to low amenity and pedestrian comfort. Parramatta Road is a major impediment in the pedestrian network, where pedestrian crossing wait times can be longer than one minute and distances between formal crossings are large, shown in **Figure 12-2**. This issue creates a physical barrier that lowers attractiveness for use by foot. Land uses along Parramatta Road are not conducive to creating walking trips, being predominantly retail with several boarded-up frontages. High traffic volumes and speeds also produce noise and air pollution that reduces pedestrian comfort and amenity.

Local roads other than Parramatta Road generally provide a comfortable walking experience. These roads have lower traffic volumes and offer a high level of amenity; separation from traffic, via street parking and landscaping, and trees for shade. Most side streets have a maximum speed limit of 40-50 kilometres per hour.

Figure 12-1 Footpath widths



Figure 12-2 Distance between formal pedestrian crossings along Parramatta Road



### *Taverners Hill precinct*

The Taverners Hill precinct includes, and is surrounded by, a number of pedestrian generating land uses including:

- > In the north: MarketPlace Leichhardt, Marion Street shops and restaurants, Lambert Park, Kegworth Public School and high-density residential apartments.
- > Around Parramatta Road: Taverners Hill light rail stop, Parramatta Road bus stops, the Louis Hotel and SBG Martial Arts & Fitness.
- > In the south: Lewisham Train Station, retirement homes, churches, schools, and Petersham Park.

Key roads in the precinct have footpaths on each side, with the exception of the Brown Street bridge at Taverners Hill, which has a footpath on the east side only. The GreenWay along the precinct's western boundary provides regional walking and cycling connections and provides access to open space north of the precinct. In addition, an east-west active transport link across The GreenWay and light rail line connects Lords Road and Kegworth Street with Hawthorn Parade.

Two mid-block links between Upward Street and George Street are provided as part of the apartment development between these roads.

### *Leichhardt precinct*

Leichhardt is a local centre that attracts high pedestrian numbers and offers high walkability. The Leichhardt precinct consists of a variety of pedestrian generating land uses, supporting a high place function across the road network. These land uses include:

- > In the North: parks, playground, churches, medical centres and day care centres.
- > Along Norton Street: Leichhardt Library, cafes, restaurants and shops, Leichhardt Public School, Leichhardt Town Hall, The Norton Plaza and The Italian Forum.
- > Around Parramatta Road: restaurants, pubs, retailers, gyms and bakeries.
- > South of Parramatta Road: Fort Street High School, TAFE NSW Petersham and low density residential housing.

The key roads within the Leichhardt precinct provide footpaths on both sides. The footpath network provides many opportunities for north-south movement within the precinct, however block lengths of up to 450 metres along key streets restrict east-west connectivity.

### *Camperdown precinct*

The Camperdown precinct comprises of pedestrian generating land uses surrounding the Parramatta Road corridor. The key locations include:

- > In the north: schools, playgrounds, reserves and medium density residential apartments.
- > Around Parramatta Road: University of Sydney, gyms, restaurants and shops.
- > In the south: University of Sydney School of Nursing, Camperdown Park and Courts, Royal Prince Alfred Hospital and high density residential housing.

The Camperdown precinct provides effective pedestrian accessibility and manoeuvrability with footpaths on both sides of all key roads. Walking and cycling pathways connecting The Crescent, Minogue Street and Nelson Street link provide a link to streets that are separated by parkland and Johnstons Creek. An additional through-reserve route connects Taylor Street to Chester Street over Johnstons Creek.

There are four signalised intersections with pedestrian crossings provided to cross Parramatta Road. The crossings are separated by irregular intervals, separated by a walking distance of up to 300 metres in some areas of the precinct.

### **12.2.3 Cycling network**

The cycling network consists of mixed traffic routes of varying difficulty and shared paths. Infrastructure on these routes typically includes bicycle road markings and wayfinding signage. The bicycle network is shown in **Figure 12-3**. There are no formal provisions for cycling on Parramatta Road except for a 180metre shared path at Ashfield Park.

## 12.2.4 Cycling experience

Cycling is popular in the Inner West. Local roads provide safe, comfortable and low speed environments, whereas infrastructure is often disconnected in higher speed environments such as on Parramatta Road. While major roads are often the most direct routes through the study area, they don't provide cycling infrastructure, reducing cyclist safety and amenity in high speed, high volume environments. As such Parramatta Road is currently not suitable for beginner cyclists as a mixed traffic cycling route.

The majority of the cycling network within the three precincts are on-road mixed traffic routes, which does not represent an attractive mode choice for low confidence or beginner cyclists.

### *Taverners Hill precinct*

The Taverners Hill precinct provides a network of on-road and off-road cycling routes. The GreenWay shared path runs along the Hawthorne Canal at the precinct's western boundary. This regional route supports north-south movement through the precinct linking Taverners Hill with Drummoyne to the north and Summer Hill to the south. Flood Street and Foster Street provide an on-road corridor for north-south movement. Flood Street functions as a mixed-traffic cycling route from Marion Street to Lords Road. The remainder of Flood Street provides dedicated cycle lanes, turn markings at intersections and bicycle road markings at regular intervals. This street connects the northern border of the precinct to Parramatta Road. Foster Street runs parallel to Flood Street, offering an alternative north-south mixed-traffic route. South of Parramatta Road, Thomas Street provides a mixed-traffic cycling route from the residential areas near Lewisham train station.

Marion Street and Lords Road function as the precinct's key east-west cycling corridors. Marion Street provides a mixed-traffic route connecting local businesses with Marion light rail stop. The street also includes a bridge providing connection to Haberfield. Lords Road provides a second corridor for east-west movement. This route includes a dedicated bicycle lane, bicycle road markings at regular intervals and an underpass linking Taverners Hill and Haberfield.

### *Leichhardt precinct*

The Leichhardt precinct contains on-road cycling routes. Norton Street currently functions as the precinct's key north-south cycling corridor. This mixed traffic cycling environment connects businesses to Parramatta Road and the precinct's northern border. Balmain Road, which is a one way road, provides a bicycle lane supporting northbound cycling movements parallel to Norton Street. The route offers an alternative link from Parramatta Road into the Leichhardt precinct.

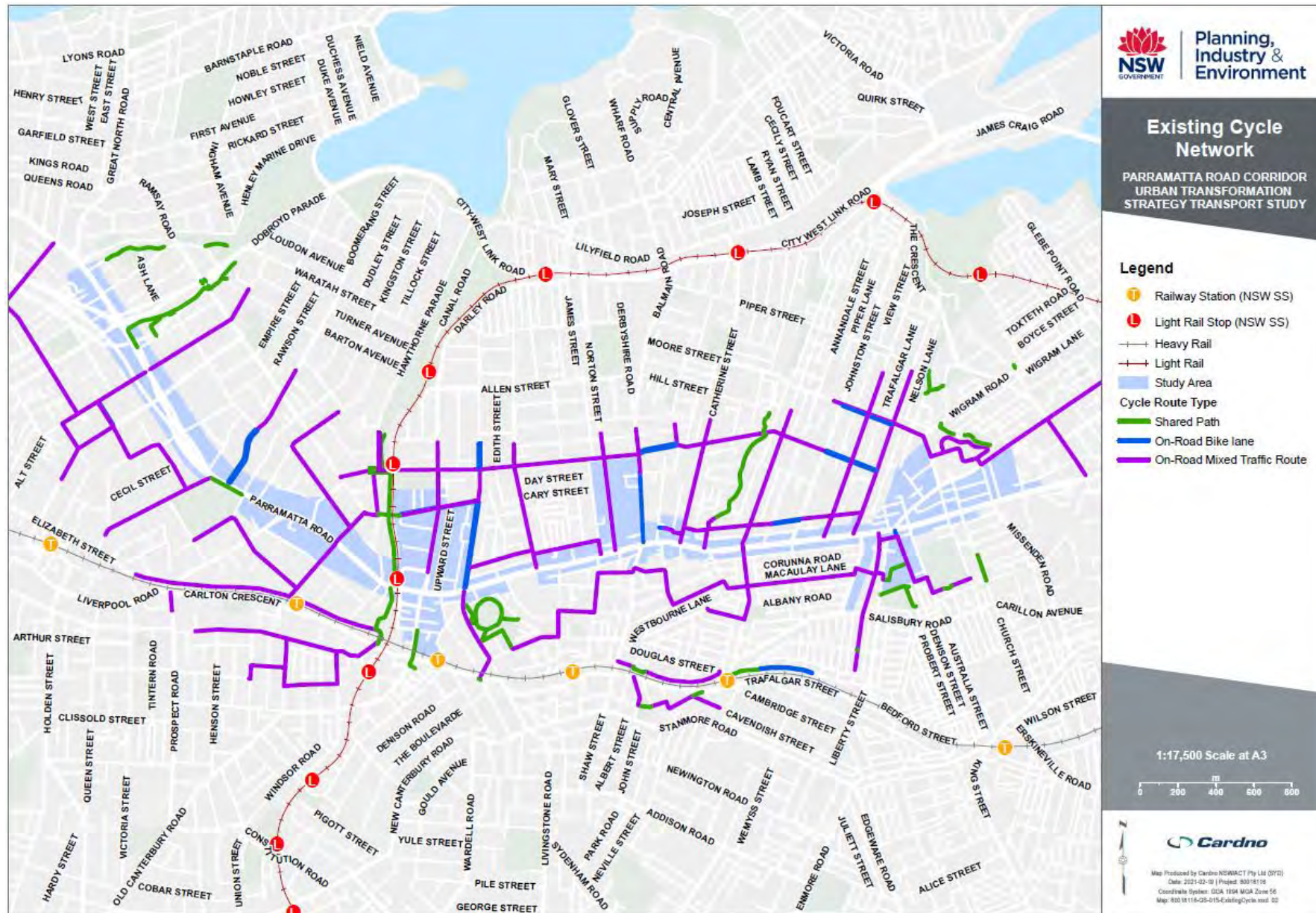
Marion Street provides the key east-west cycle path for the Leichhardt precinct. This mixed-traffic route connects key cycle routes such as Norton Street and Balmain Street, as well as the neighbouring suburbs of Haberfield and Annandale. An additional east-west route is planned for Leichhardt along Dot Lane between Norton Street and Hay Street.

### *Camperdown precinct*

Camperdown has a network of on-road and off-road cycling routes. South of Parramatta Road, Bridge Road and Mallett Street serve as key north-south movement corridors in addition to Nelson Street and Young Street to the north. The mixed-traffic cycling routes connect Parramatta Road to the residential areas within the Camperdown precinct. Additionally, the planned Johnstons Creek shared path will facilitate north-south movement between Wigram Road and Chester Street. This new regional route will connect the Camperdown precinct with the surrounding suburbs of Annandale and Forest Lodge. Although Johnston Street provides no cycling infrastructure, it remains the most popular north-south route according to Strava's heatmap. This informal route will continue to have an increasing importance as Rozelle Railyards Park, The Bays Metro Station, The Bays Precinct and CUCP develop.

Moore Street/ Booth Street provides the key east-west cycling route through the Camperdown precinct. This route provides on-road cycling lanes and sections with mixed traffic. Pyrmont Bridge Road functions as the precinct's key east-west route from Parramatta Road to Glebe and Pyrmont. Currently no cycling infrastructure is provided along the route although a dedicated cycle path is planned between Parramatta Road and Mallett Street.

Figure 12-3 Bicycle network in and adjacent to PRCUTS





### 12.2.5 Supporting PRCUTS population and employment growth

The active transport network in the IWC PRCUTS precincts is well developed and should be further enhanced to assist in catering for the projected future growth. There is a lack of dedicated separated cycleways which should be provided to increase safety and connectivity and further increase the update of active transport in the Inner West community. The network provides good coverage and is currently not near capacity. Any improvements to the network and supporting infrastructure will enhance the user experience and improve the safety, comfort and attractiveness of active travel. New routes will also provide increased efficiency, reducing travel times. This is important for encouraging a mode shift from private vehicles to active travel into the future as travel demand increases with future development, especially for short trips.

## 12.3 Public transport

The study area is serviced by heavy rail, light rail and bus. Bus services were commonly full during peak hours prior to the Covid-19 pandemic, with passengers often having to wait long periods before the next service. Further investigation is required by TfNSW in collaboration with Council to understand the impacts of Covid-19 on transport movements, specifically public transport demand, with the aim to agree future planning scenarios for Parramatta Road. The public transport networks in the study area are shown in 0.

### 12.3.1 Suburban rail

The study area is serviced by the T2 Inner West and Leppington Line, providing connection east to Sydney CBD and west to Strathfield, Lidcombe, Parramatta and Liverpool. A summary of services is shown below in **Table 12-1**.

Table 12-1 Rail services summary

Station	Precinct	Services per peak hour (7:30am to 8:30am) - eastbound	Services per peak hour (7:30am to 8:30am) - westbound	Services per midday hour (12:00pm to 1:00pm) – each direction	Typical travel time to Central Station (minutes)	Walking distance to Parramatta Road (metres)
Newtown	Camperdown	14	10	8	7	1,300
Stanmore	Leichhardt	11	5	4	10	700
Petersham		10	5	4	12	650
Lewisham	Taverners Hill	10	5	4	14	400
Summer Hill		10	5	4	16	400
Ashfield		15	13	8	14-18	1,000

Source: T2 Inner West & Leppington Line Timetable, TfNSW, accessed 30/03/2021

Ashfield and Newtown are the only stations listed above that accommodate limited stops services.

### 12.3.2 Light rail

The Taverners Hill Precinct is serviced by the L1 Dulwich Hill Light Rail Line, providing connection south to Dulwich Hill and northeast to Glebe, Pyrmont and Central Station. A light rail stop at Taverners Hill directly services the study area while Lewisham West and Marion are within walking distance from the Taverners Hill precinct. These stops provide a typical travel time of just over 30 minutes to Central Station.

The conversion of the T3 Bankstown Line to Metro will increase the importance of light rail as an access mode to the Metro. There are currently infrastructure limitations that limit the ability to increase light rail frequency to/ from Dulwich Hill. It is understood the DDA compliant interchange will be provided with the introduction of Sydney Metro.

Pedestrian access to the Taverners Hill Light Rail and Marion light rail stops is limited to the western side of the light rail line, where customers must use the stairs provided or use the lift. Passengers alighting and boarding on the Dulwich Hill bound platform must cross over the light rail line from the Central bound platforms.

At Taverners Hill, customer access from the north via Brown Street must cross to the southern side of Parramatta Road via the overpass before crossing back to the northern side via the stairs or lift. A view of the stop from Brown Street is shown in **Figure 12-4**.

Figure 12-4 Taverners Hill light rail stop from Brown Street



Service information for the light rail line is shown below in **Table 12-2**.

Table 12-2 L1 Dulwich Hill Line weekday service information

Direction	Peak frequency	Off-peak frequency	Peak times	Service times
Dulwich Hill to Central	8 minutes	10-15 minutes	6:30AM – 8:53AM	5:50AM – 12:08AM
Central to Dulwich Hill	8 minutes	10-15 minutes	2:25PM – 7:20PM	6:00AM – 12:00AM

Source: L1 Dulwich Hill Line Timetable, TfNSW, accessed 01/02/2021

### 12.3.3 Bus

The bus network provides good coverage of the study area which is serviced by 15 bus routes, including two express routes and two nightrider routes.

The bus network is Sydney City centric with 11 of the 15 routes commencing and ending in the Sydney CBD. This results in a skewing towards a high number of east-west routes.

Parramatta Road is a major bus corridor in Sydney, and this is particularly the case east of Norton Street. Bus routes servicing Parramatta Road are shown in **Table 12-3** with details listed for eastbound services.

#### 12.3.3.1 Bus stops

Bus stops are provided at all train stations for interchange with the rail network. They are also provided within close proximity to the light rail stops servicing the Taverners Hill precinct.

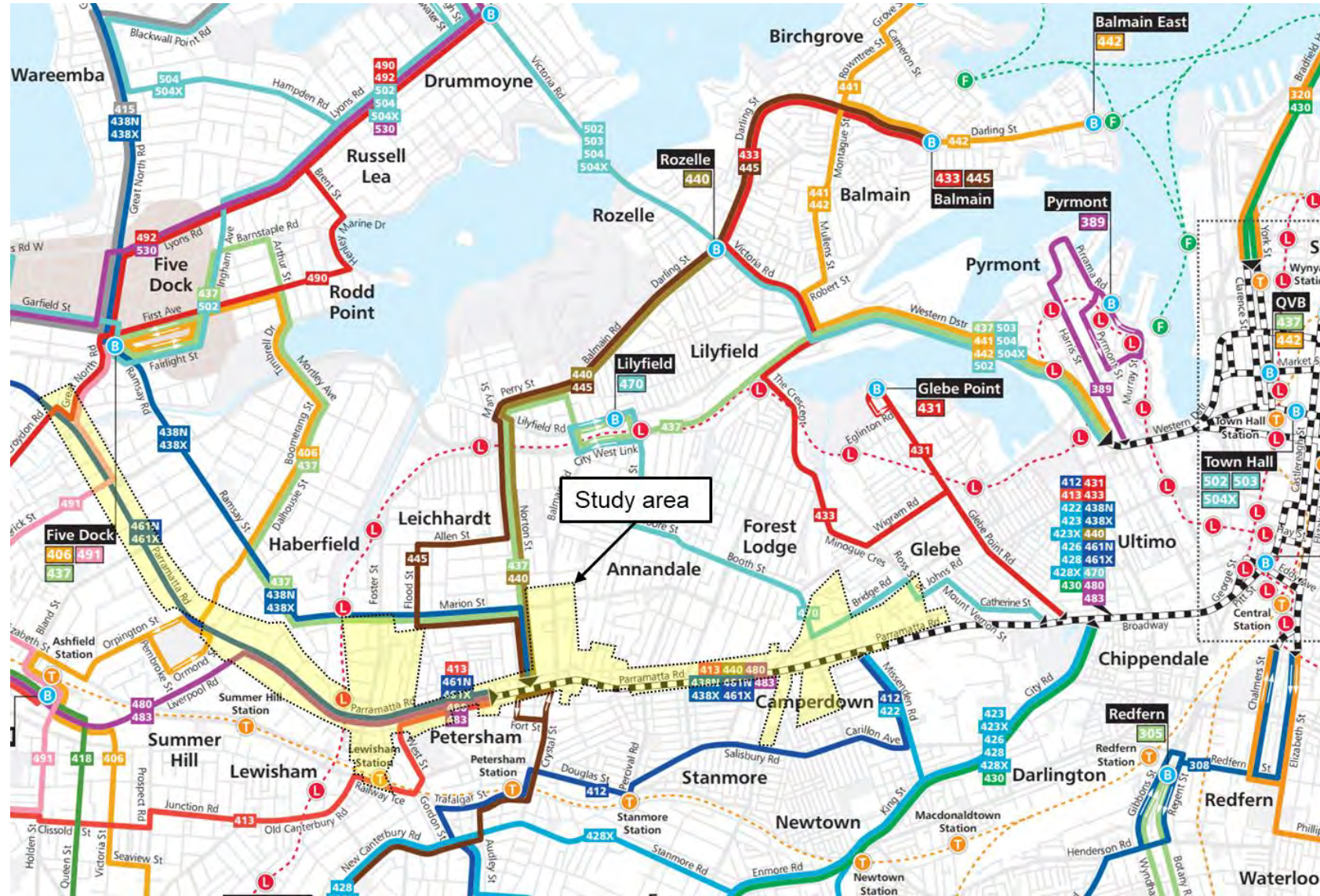
In total, there are 60 bus stops located within and just outside of the PRCUTS precincts study area. Generally, they are in good condition however approximately 50 per cent do not provide all of sufficient shelter, seating, signage and tactile indicators and require improvements. The majority of bus stops that do not provide seating or shelter are located on the western end of the PRC in IWC.

Table 12-3 PRCUTS IWC bus routes

Route	Description	Deviates from Parramatta Road at	Precincts Served Taverners Hill (TH), Leichhardt (L), and Camperdown (C)			Frequency (indicative)		Approximate weekday operating period
			TH	L	C	Peak period	Non-peak period	
370	Leichardt Marketplace to Coogee	Glebe Point Road, Glebe		Y		8-10 minutes	20 – 30 minutes	5:00AM – 1:00AM
406	Five Dock to Hurlstone Park	Dalhousie Street and Orpington Street	Y			30 minutes	60 – 75 minutes	6:30AM – 12:30AM
412	Campsie to City (Martin Place) via Earlwood and Dulwich Hill	Missenden Road, Camperdown			Y	10-15 minutes	20-30 minutes	5:15AM – 11:45PM
413	Campsie to Central (Pitt Street)	West Street, Lewisham	Y	Y	Y	10-15 minutes	20-30 minutes	5:30AM – 11:30PM
422	Kogarah to Central (Pitt Street)	Missenden Road, Camperdown			Y	10-20 minutes	20-30 minutes	5:30AM – 11:45PM
437	Five Dock to City QVB via City West Link	-	Y			15 minutes	15 minutes	6:00AM – 23:15PM
438X	Abbotsford to City (Martin Place) [Express Service]	Norton Street, Leichhardt		Y	Y	2-5 minutes	10-15 minutes	5:45AM – 9:30PM
438N	Abbotsford to City (Martin Place) [Night Service]	Norton Street, Leichhardt		Y	Y	15 minutes	30-60 minutes	10:00PM – 5:30AM
440	Bondi Junction to Rozelle	Norton Street, Leichhardt		Y	Y	3-8 minutes	10-15 minutes	4:30AM – 1:00AM
445	Campsie to Balmain via Leichhardt Marketplace	Norton Street, Leichhardt and Crystal Street, Petersham.	Y	Y		15 minutes	30 minutes	5:00AM – 12:00AM
461X	Burwood to City (Domain) [Express Service]	Burwood Road, Burwood	Y	Y	Y	6-10 minutes	15-20 minutes	6:00AM – 10:00PM
461N	Burwood to City (Hyde Park) [Night Service]	Burwood Road, Burwood	Y	Y	Y	30 minutes	3 hours	10:30PM – 5:30AM
470	Lilyfield to Martin Place	Derwent Street, Glebe.			Y	10 – 15 minutes	20-30 minutes	5:00AM – 1:00AM
480	Strathfield to Central (Pitt Street) via Homebush Road	Liverpool Road, Ashfield	Y	Y	Y	15-25 minutes	30-60 minutes	5:15AM – 7:00PM
483	Strathfield to Central (Pitt Street) via South Strathfield	Liverpool Road, Ashfield	Y	Y	Y	20 minutes	30-60 minutes	5:45AM – 1:00AM
491	Hurstville to Five Dock	Great North Road and Frederick Street	Y			30 minutes	30 minutes	6:00AM – 21:45PM

Source: Sydney Bus Network timetables, TfNSW, accessed 01/02/2021 and incorporated in the traffic model developed for the project

Figure 12-5 Public transport network

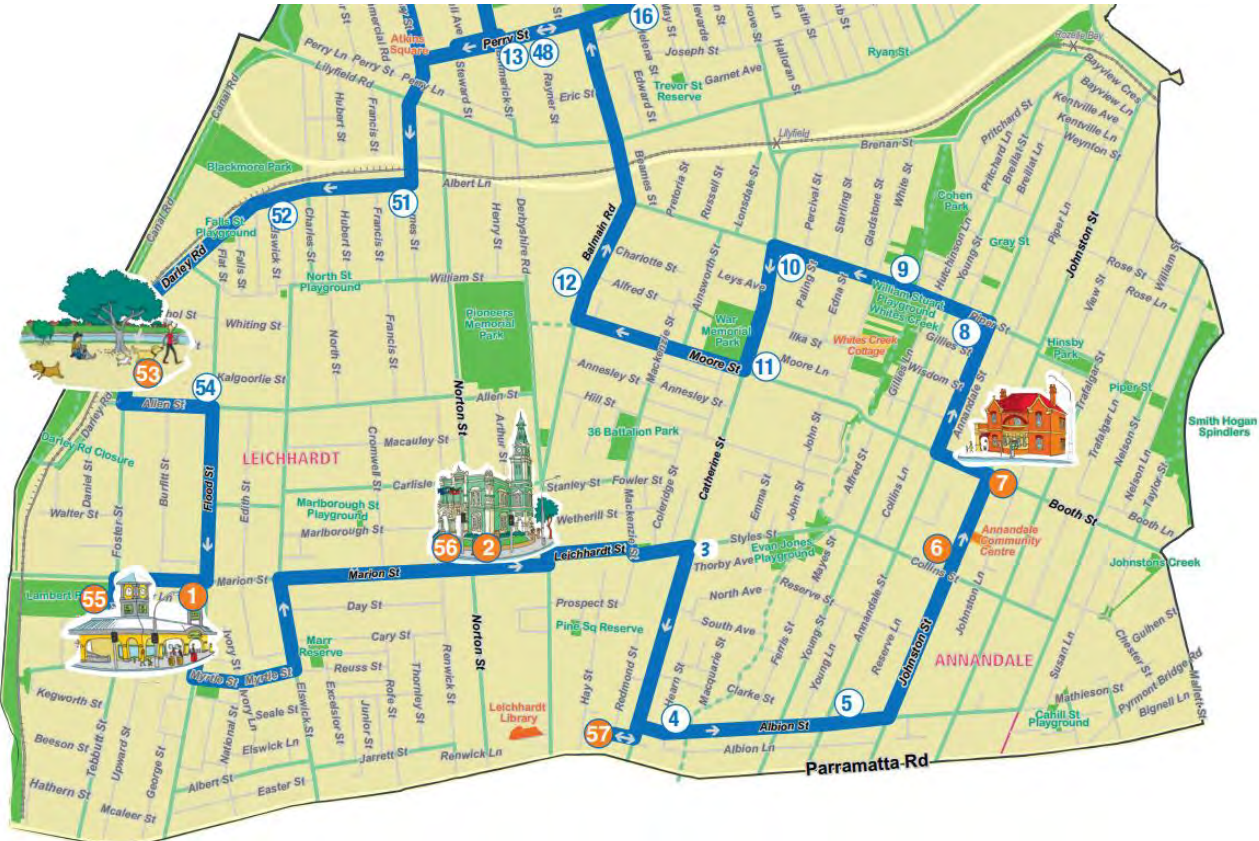


Base image source: <https://transportsw.info/travel-info/ways-to-get-around/bus/bus-operator-maps>, accessed 09/02/2021

### 12.3.4 Community buses

The Leichhardt Local Link is a free community bus connecting between local services such as Leichhardt Park Aquatic Centre, health services, transport services, community facilities, hopping precincts and high streets. The bus runs between 8:30am and 2:45pm on Mondays and Thursdays.

Figure 12-6 Leichhardt Local Link bus route



Source: Leichhardt Local Link, Inner West Council, accessed 01/02/2021

### 12.3.5 High frequency public transport

High frequency public transport consists of public transport with a waiting time of 15 minutes or less in between services. As shown in **Table 12-3**, not all services include high frequency servicing during peak periods and generally wait times tend to increase to 30minutes on average for most services outside of the peak periods.

The high frequency public transport servicing the study area was analysed for 12-1PM and 9-10PM on a typical weekday. The study area is serviced by nine high frequency bus routes during the 12-1PM period and four high frequency bus routes during the 9-10PM period. Leichhardt and Camperdown precinct are well serviced by high frequency buses, particularly along Norton Street and Parramatta Road. Taverners Hill precinct is mainly serviced by the high frequency light rail and train services.

Figure 12-7 Midday high frequency public transport services 12:00PM – 1:00PM

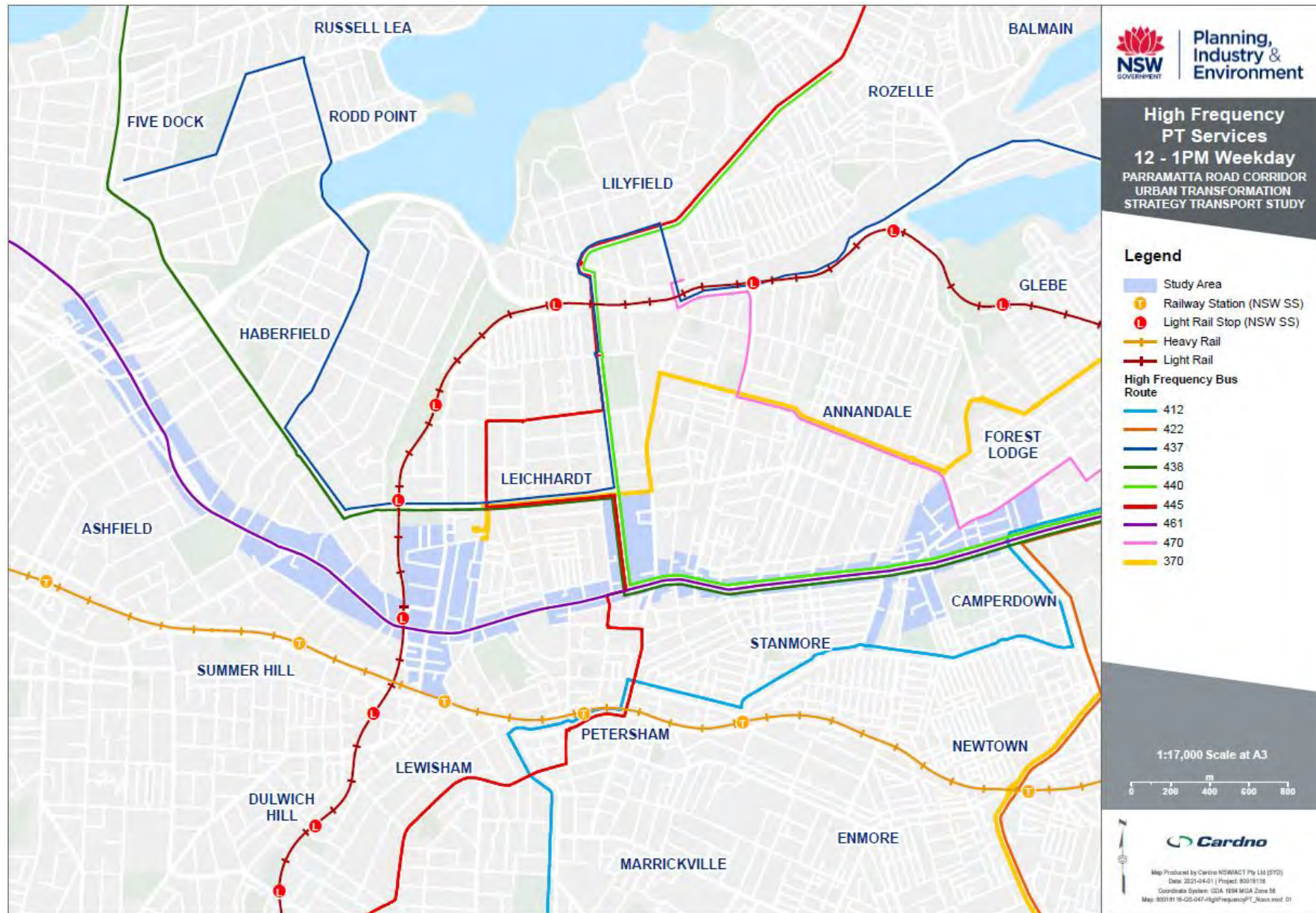
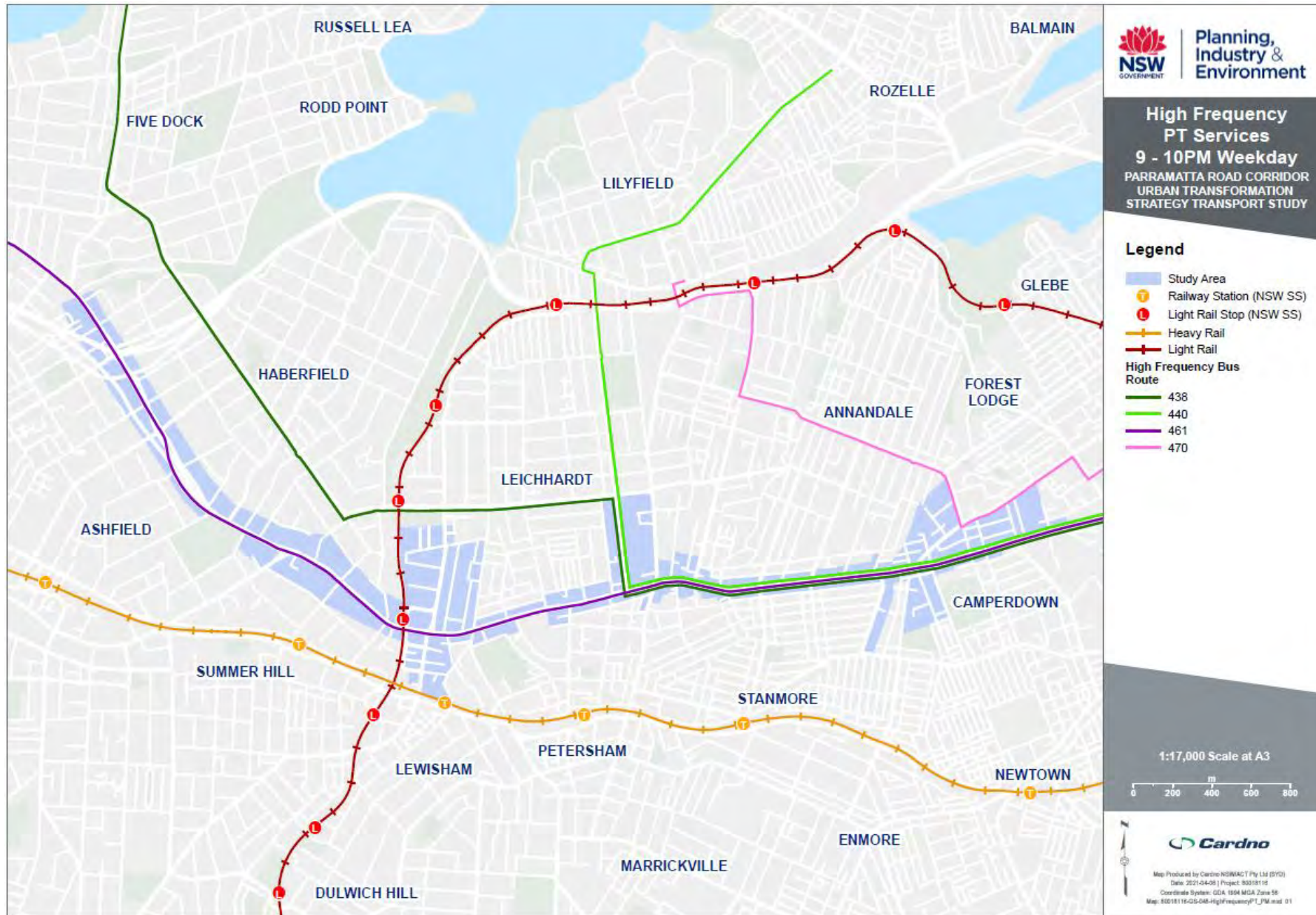


Figure 12-8 Evening high frequency public transport services 9:00PM – 10:00PM



### 12.3.6 Supporting PRCUTS population and employment growth

The public transport network consisting of heavy rail, light rail and buses provides good connectivity for long-distance trips outside the area east to Sydney CBD, west to Burwood, Strathfield and Parramatta and to other locations within the LGA. Access to heavy rail services is hindered by distance to the PRC. East-west connectivity is strong, however north-south connectivity could be improved to facilitate interchange between public transport services. The interface between the three public transport modes is currently weak. There is potential for bus services to provide a solid link between heavy rail, light rail and Parramatta Road.

Due to the constrained nature of existing road network, as well as the vision of providing a revitalised corridor, public transport services will continue to be crucial in the movement of people in and through the area however some network constraints may also limit the ability of existing public transport services to improve sufficiently to cater for the anticipated increased travel demand. Consequently, infrastructure and services should be enhanced to support higher volumes of patrons and routes will need to be rationalised to provide services where they are most required.

High frequency public transport is becoming increasingly important as lifestyles continue to change. COVID-19 has seen more people working from home, creating a more even spread of travel demand throughout the day as opposed to the traditionally concentrated morning and evening peaks. Rapid transit along Parramatta Road would assist in reducing private vehicles trips through traffic evaporation, discussed further in **Section 13.1.1**.

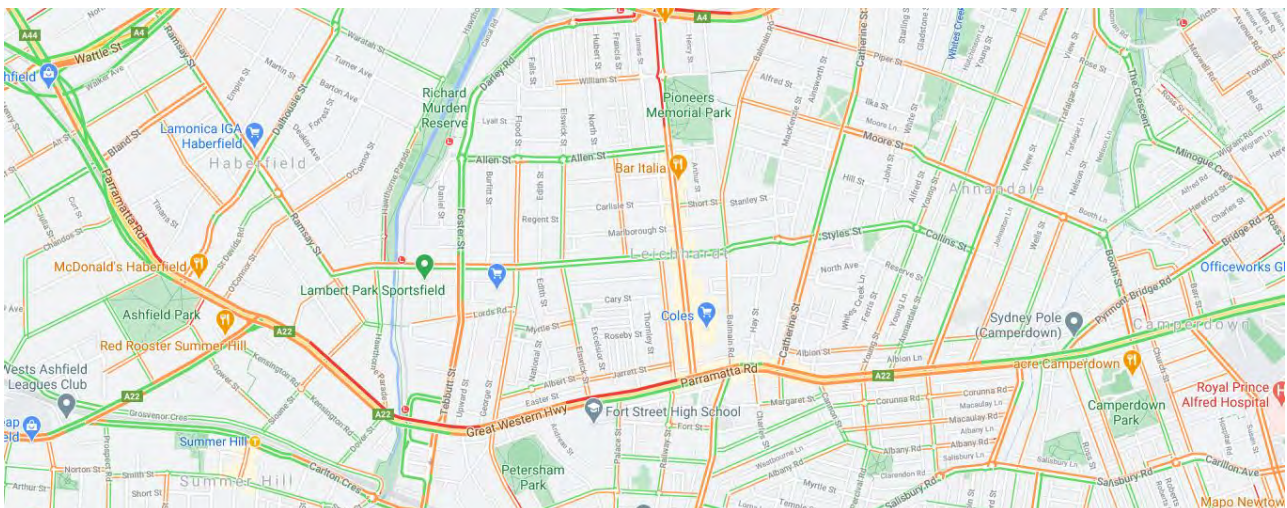
## 12.4 Road network

The road network generally accommodates multiple modes including pedestrians, cyclists, public transport, freight/ delivery, private vehicles and parking. The road network serves various movement and place functions throughout the study area, accommodating heavy vehicle through movements on arterial corridors such as Parramatta Road, while providing places for people to rest, eat and dwell.

Key characteristics of Parramatta Road and each precinct’s road network are described in the following sections, with details of key roads listed in **Section 12.4.6**.

Google Typical Traffic is shown for the typical peak periods of a weekday (Thursday) at 8:00am and 5:00pm, and Saturday 12:00pm in **Figure 12-9**, **Figure 12-10** and **Figure 12-11** respectively.

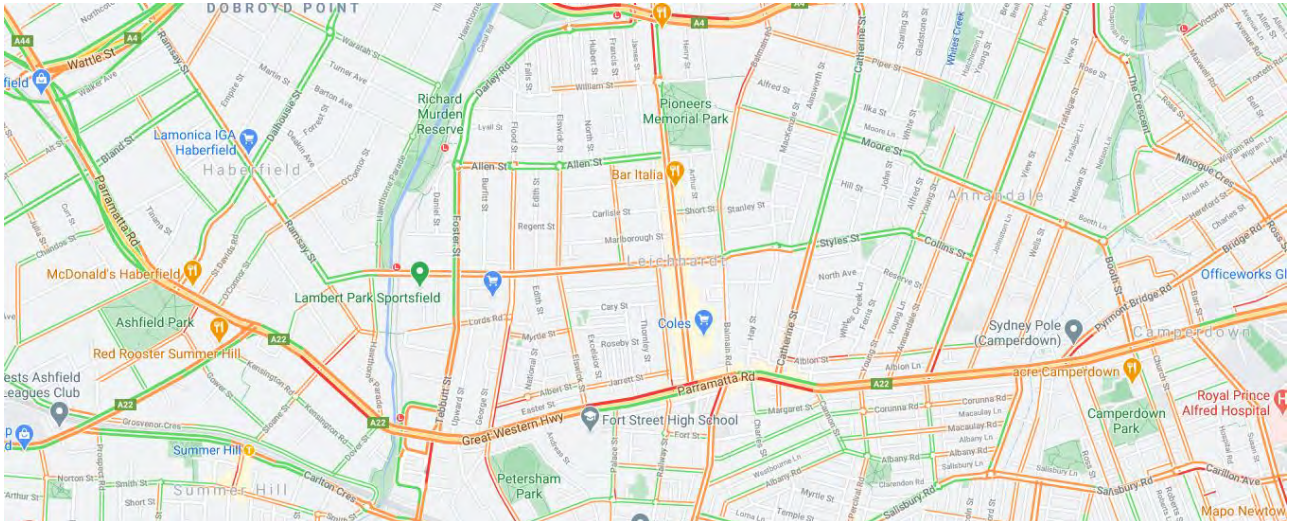
Figure 12-9 Google typical traffic (Thursday 8:00am)



Source: Google typical traffic, accessed 12/02/2021

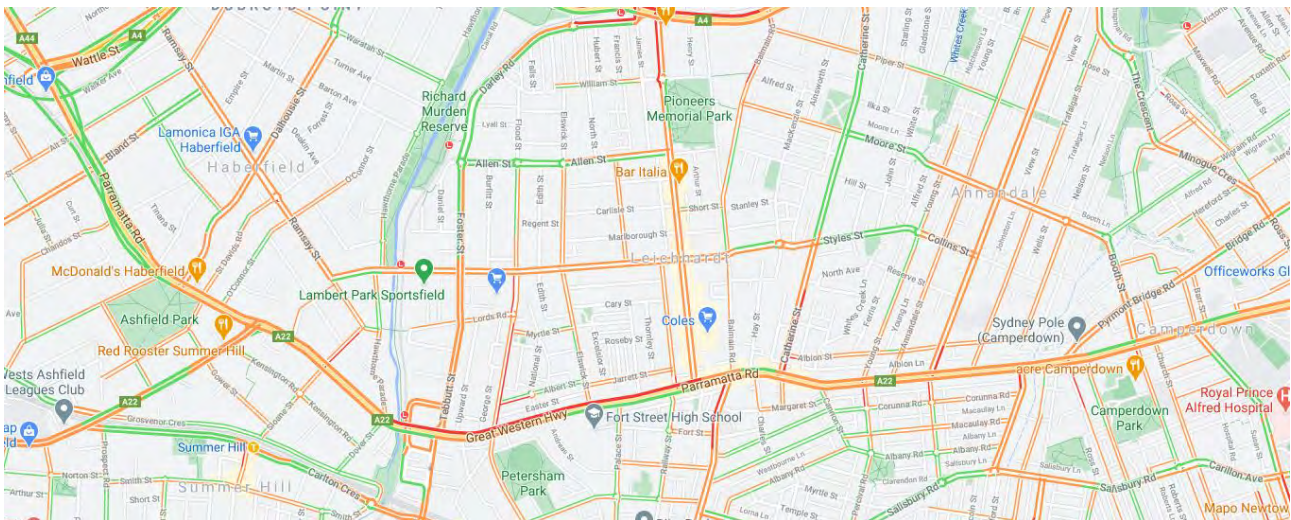


Figure 12-10 Google typical traffic (Thursday 5:00pm)



Source: Google typical traffic, accessed 12/02/2021

Figure 12-11 Google typical traffic (Saturday 12:00pm)



Source: Google typical traffic, accessed 12/02/2021

All three peak periods exhibit delays on all major roads. The weekday morning peak exhibits delays eastbound along Parramatta Road between Trafalgar Street and Bland Street, with slow vehicle speeds on intersecting streets to the north. The weekday evening peak exhibits delays westbound along Parramatta Road between Sydney CBD and Crystal Street as well as Palace Street and Orpington Street, with slow vehicle speeds on intersecting streets to the north and south. Delays are also experienced eastbound along Parramatta Road during the weekday evening peak. Slow vehicle speeds are seen throughout the network during the weekend peak period with delays on all streets intersecting with Parramatta Road.

### 12.4.2 Parramatta Road

Parramatta Road, is a one of Sydney’s busiest roads for public and private transport, providing an east-west connection between Parramatta and the Sydney CBD, through the centre of the Inner West. Within the Inner West, there are generally three lanes in each direction, including 1.9 kilometres of bus lane in the eastbound direction and 1.3 kilometres in the westbound direction, which accommodates a number bus routes. As a divided road with high traffic volumes and narrow lanes (often less than three metres), the 60 kilometres per hour speed limit is consistent with the current speed limit guidelines.

Current land use along the Parramatta Road corridor includes vehicle-accessed commercial buildings such as showrooms and auto shops, small-scale retail and speciality shops. A high number of driveways in the western section of the Inner West affects amenity for pedestrians and cyclists.

Figure 12-12 Parramatta Road



### 12.4.3 Taverners Hill precinct road network

The Taverners Hill road network supports regional east-west and north-south trips, as well as access to local destinations and residential areas. Parramatta Road provides the only regional east-west connection through the precinct. The Dulwich Hill Light Rail Line and GreenWay corridor run north-south along the precinct's western boundary, limiting opportunities for additional east-west links to the north until Marion Street. Parramatta Road limits some vehicle movements to and from the precinct as vehicles travelling from the south cannot turn right onto Parramatta Road and vehicles travelling west along Parramatta Road cannot turn right to enter the northern parts of the precinct.

Brown Street includes a bridge providing connection over and across Parramatta Road. The route utilising Foster Street/ Tebbutt Street, Hathern Street, Brown Street, Cook Street/ Barker Street and Old Canterbury Road provides an important north-south connection between City-West Link Road and suburbs south of Parramatta Road such as Lewisham, Dulwich Hill and Marrickville.

Parramatta Road at Taverners Hill is shown in **Figure 12-13**.

Figure 12-13 Parramatta Road at Taverners Hill



The key roads in the Taverners Hill precinct are detailed in **Table 12-4**.

#### 12.4.4 Leichhardt precinct road network

The Leichhardt precinct road network allows regional east-west trips and north-south trips. Marion Street/ Styles Street and Parramatta Road provide east-west connections along the upper and lower boundaries of the precinct. The only locations to turn right into Parramatta Road for vehicles travelling from either the north or south regions of the precinct are at Norton Street (from the north) and Crystal Street (from the south).

Norton Street allows north-south movement between Parramatta Road and City-West Link Road. Balmain Road and Renwick Street provide alternative north-south routes to Marion Street, with Balmain Road/ Derbyshire Road providing a second connection to City-West Link Road and Lilyfield. To the south of the precinct, Crystal Street connects Parramatta Road to New Canterbury Road. Parramatta Road separates the northern and central areas of the precinct from the south. Therefore, north-south movement through the precinct is restricted due to the absence of overpass/underpass infrastructure across Parramatta Road such as Brown Street in the Taverners Hill precinct.

Marion Street intersects Norton Street at the northern boundary of the precinct. These two roads provide links to medical facilities, the local library, public school and local shops. The surrounding roads provide access to residential areas as well as local parks and reserves. Although Norton Street provides a vital north-south route through the precinct, the 470 metre block length along this street restricts local east-west movement. Norton Street is shown in **Figure 12-14**.

Figure 12-14 Norton Street, Leichhardt



The key roads in the Leichhardt precinct are detailed in **Table 12-4**.

#### 12.4.5 Camperdown precinct road network

The Camperdown precinct has a well-connected road network allowing regional east-west trips and north-south trips. Pymont Bridge Road/ Bridge Road and Parramatta Road deliver effective east west navigation through the precinct.

Parramatta Road provides limited opportunities to enter the Camperdown precinct. Vehicles travelling eastbound are only able to enter the southern region of the precinct via a right turn at Bridge Street and Missenden Road. Westbound travel on Parramatta Road is more restrictive with the only right turn opportunity at Johnston Street.

Booth Street/ Mallet Street serves as the precinct's key north-south movement corridor. Booth Street joins Moore Street and Catherine Street, providing a vital connection between City-West Link Road and Parramatta Road. Denison Street and Australia Street are key roads providing north-south movement south of Parramatta Road. Both streets allow thoroughfare between Parramatta Road and Salisbury Road. These roads connect a park, playground, childcare and restaurants with medium density housing. The surrounding streets function as low to medium density residential areas, separated by appropriate block sizes permitting efficient movement within the precinct.

Parramatta Road in Camperdown is shown in **Figure 12-15**.

Figure 12-15 Parramatta Road, Camperdown



The key roads of the Camperdown precinct are detailed in **Table 12-4**.

### 12.4.6 Key roads

The PRC generally accommodates multiple modes including pedestrians, cyclists, buses, freight / delivery, private vehicles and parking.

Roads are managed by an administrative framework of state, regional and local road categories. Classification is based on each road's connectivity and importance to the broader road network. State roads are managed and funded by Transport for NSW, and regional / local roads are managed and funded by councils. Roads that have a high freight task are generally assigned a state road classification. Regional roads perform an intermediate function and due to their network significance, Transport for NSW provides financial assistance to councils for the management of their regional roads.

Key roads within the study area are listed in **Table 12-4**.

Table 12-4 Key roads

Area	Road name	Road classification and number	Managing authority	Speed limit	Description and configuration	Freight network delegation
All	Parramatta Road	<ul style="list-style-type: none"> <li>State, Highway, 2, Route A22</li> </ul>	TfNSW	60km/h	Two to three travel lanes in each direction with a peak hour bus lane and a travel lane converted to parking lane during off peak periods. Right turns are only provided as dedicated turning lanes. A median strip separates traffic for the length of the road.	Primary freight route west of Old Canterbury Road and tertiary freight route to the east.
Taverners Hill	Frederick Street	<ul style="list-style-type: none"> <li>Regional, Secondary Road, 2064, SR2014</li> </ul>	Inner West Council	60km/h	One travel lane in each direction, widening to two lanes at intersections. Unrestricted on street parking available away from intersections and bus stops. One bus service shares road with general traffic.	Tertiary freight route.
	Dalhousie Street	<ul style="list-style-type: none"> <li>Local Road</li> </ul>	Inner West Council	50km/h	One travel lane and one parking lane in each direction. Lanes widened at intersections. Bus services share road with general traffic.	-
	Liverpool Road	<ul style="list-style-type: none"> <li>State, Highway, 2, Route A22</li> </ul>	TfNSW	60km/h -	Generally, two travel lanes in each direction with clearways during peak hour periods. Limited parking is available where road crosses through business precincts.	Tertiary freight route.
	Ramsay Street	<ul style="list-style-type: none"> <li>State, Main Road, 649</li> <li>Regional, Secondary Road, 2013</li> </ul>	TfNSW/ Inner West Council	60km/h	Generally, one travel lane in each direction with a dedicated parking lane throughout. Bus services share road with general traffic.	-
	Tebbutt Street/ Foster Street	<ul style="list-style-type: none"> <li>State, Main Road, 652</li> </ul>	TfNSW	50km/h	One travel lane and one parking lane in each direction.	Tertiary freight route.
	Old Canterbury Road	<ul style="list-style-type: none"> <li>State, Main Road, 652, 664</li> <li>Regional, Secondary Road, 2028</li> </ul>	TfNSW/ Inner West Council	50km/h	One travel lane and one parking lane in each direction. One bus service shares road with general traffic.	Primary freight route north of train line and tertiary route south of train line.

Area	Road name	Road classification and number	Managing authority	Speed limit	Description and configuration	Freight network delegation
Leichhardt	Crystal Street	▪ Regional, Secondary Road, 2007	Inner West Council	50km/h	Two travel lanes in each direction with second travel lane used as parking lane during off peak periods. One bus service shares road with general traffic.	-
	Norton Street	▪ Local Road	Inner West Council	40km/h	One travel lane in each direction with additional parking lanes. Frequent bus services share roadway with general traffic.	-
	Marion Street/ Collins Street/ Styles Street	▪ Regional, Secondary Road, 2013	Inner West Council	50km/h	One travel lane and one parking lane in each direction. Frequent bus services share road with general traffic.	-
	Catherine Street	▪ Local Road	Inner West Council	50km/h	One travel land and one parking lane in each direction. Angle parking replaces parking lane in some areas. One bus service sharing roadway with general traffic.	-
	Johnston Street	▪ State, Main Road 655, 666 ▪ Regional, Secondary Road 2013	TfNSW/ Inner West Council	50km/h	Two lanes of travel and one parking lane in each direction. Angled parking included in place of parking lane in some areas. Dedicated right turn lanes and medians strips provided at intersections.	-
Camperdown	Moore Street/ Booth Street/ Mallet Street	▪ Unclassified, Regional, 7314	Inner West Council	50km/h	One lane of travel and one parking lane in each direction. Bus services sharing roadway with general traffic.	-
	Douglas Street, Percival Road, Salisbury Road, Carillon Avenue	▪ Unclassified, Regional, 7085	Inner West Council	50km/h	One lane of travel and one parking lane in each direction.	-
	Bridge Street	▪ Local Road	Inner West Council	50km/h	One lane of travel and one parking lane in each direction.	-
	Missenden Road	▪ Unclassified, Regional, 7094	Inner West Council	50km/h	One lane of travel in each direction with one parking lane provided in some areas Bus services share roadway with general traffic.	-
	Pyrmont Bridge Road/ Bridge Road	▪ State, Main Road, 523	TfNSW	60km/h	Two lanes of travel in each direction with one lane functioning as parking lane during off peak periods. Two lanes of traffic merges to one at Bridge Road. One bus service shares roadway with general traffic.	-

### 12.4.7 Supporting PRCUTS population and employment growth

The road network along the IWC PRC precincts is congested for long periods during the weekday and weekend peaks, especially along Parramatta Road and intersecting arterial roads. High population and employment growth cannot be supported with existing mode share due to lack of capacity and inconsistency with place-making and sustainability objectives. Mode shift towards sustainable modes through provision of sustainable transport infrastructure and prioritisation is essential to reduce demand on the road network and improve network performance.

There is currently very low excess capacity on the road network during peak periods. Additional travel demand generated by future developments will need to be supported primarily by public transport and active transport. Options for the future of Parramatta Road are considered in **Section 6.1**.

## 12.5 Freight network

The freight network in and surrounding the study area consists of primary, secondary and tertiary routes. The Metropolitan Road Freight Hierarchy on the State Road Network document describes the routes as the following<sup>3</sup>:

- > Primary freight routes serve the needs of freight for access interstate and to strategically important ports, airports, industrial areas, freight terminals, intermodal terminals and hubs within Sydney. These roads carry typically high volumes of heavy freight vehicles (>4,000 heavy vehicle AADT).
- > Secondary freight routes provide links within regions for significant flows of freight. These roads can carry medium volumes of heavy vehicles (1,000 - 5,000 AADT).
- > Tertiary freight routes provide connections from the local road network, serving numerous major business and freight origins and destinations. These roads carry lower volumes of heavy vehicles (<2,000 heavy vehicle AADT).

Parramatta Road is listed as a primary freight route west of Old Canterbury Road and a tertiary freight route to the east. Other tertiary freight routes close to the study area include Frederick Street/ City West Link, Foster Street/ Old Canterbury Road and Liverpool Road as shown in **Figure 12-16**. WestConnex will perform a high freight function and act to redirect through-traffic from Parramatta Road.

Key freight origins, destinations are:

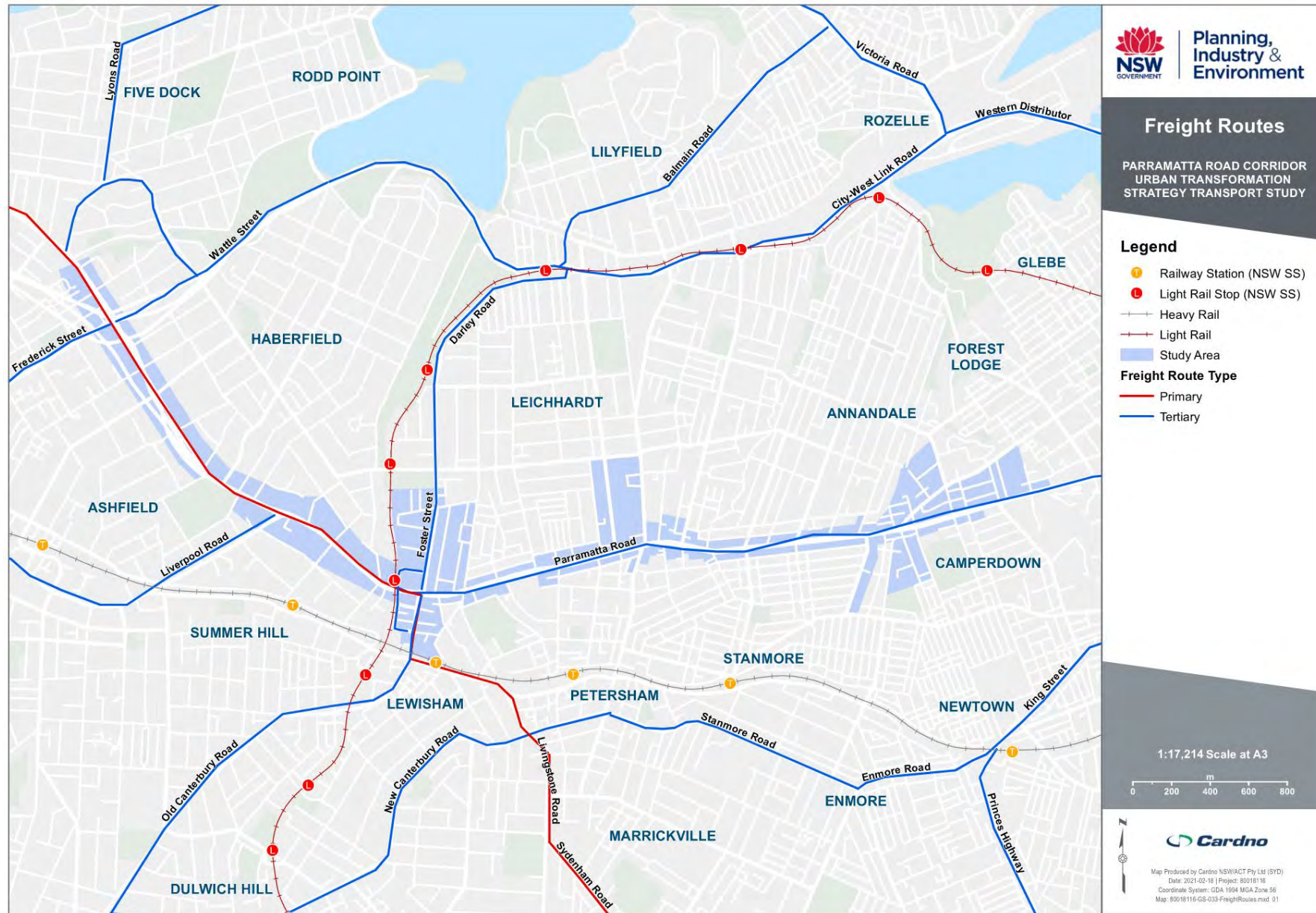
- > WestConnex M4 Motorway;
- > Bankstown industrial area; and
- > Intermodal terminals at Enfield, St Peters, Port Botany.

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<sup>3</sup> Metropolitan Road Freight Hierarchy on the State Road Network Practice Note, NSW Government, 2011



Figure 12-16 Freight routes



## 12.6 Crash history

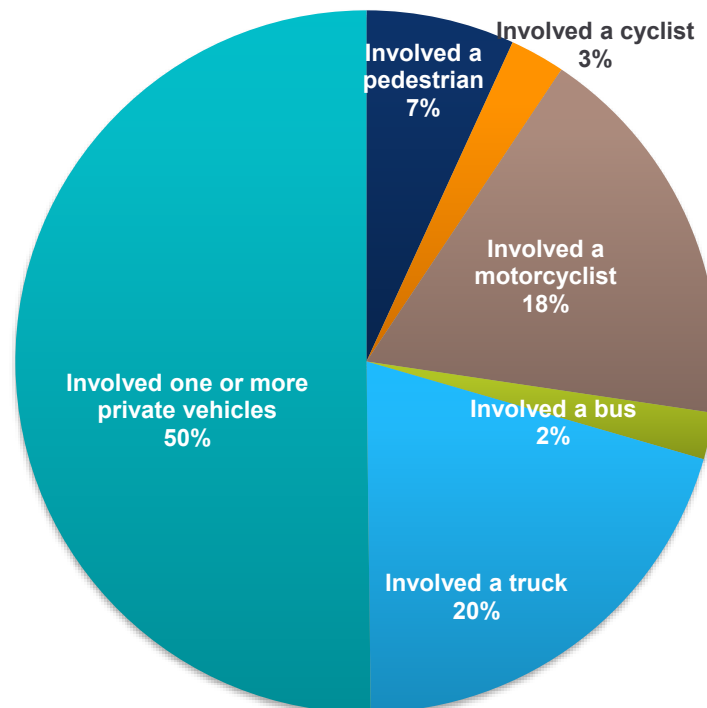
Crash data is reliant on incidents being reported to the NSW police, either through police attendance at a crash scene or reporting by involved parties. It is generally understood that minor collisions without injuries are not reported. As such, analysis of all crashes is not possible. Notwithstanding, crash data does include more serious incidents. This allows analysis to identify trends in accidents and location issues / crash clusters.

Crash data was analysed in the development of the IWC ITS, for the five year period between January 2013 and November 2017. During this period, 513 crashes occurred within 10 metres of the precinct boundaries, including 390 crashes located on Parramatta Road. There was one fatality, 341 injuries and 171 non-casualties.

### 12.6.1 Crashes by road user and location

The breakdown of crashes by road user are shown in **Figure 12-17**.

Figure 12-17 Crashes within precincts (2013 – 2017)



Pedestrian and cyclist crashes made up 10 per cent of the crashes during this period. The locations of these crashes is shown in **Figure 12-18**.

Within the Inner West LGA, there were six major crash cluster locations along the PRC, ranked in **Table 12-5** and shown in **Figure 12-19**.

Table 12-5 Crash cluster locations

General area	Crash count (2013 – 2017)
Parramatta Road between Wolseley Street and Wattle Street.	65
Parramatta Road between Norton Street and Macquarie Street, and Crystal Street between Parramatta Road and Elswick Street.	64
Parramatta Road between Australia Street and Bridge Road.	40
Parramatta Road between Brown Street and Flood Street.	23
The intersection of Parramatta Road, Northumberland Avenue and Johnston Street.	23
Parramatta Road between Liverpool Road and Dalhousie Street.	22

Figure 12-18 Pedestrian and cyclist crash locations (2013 – 2017)

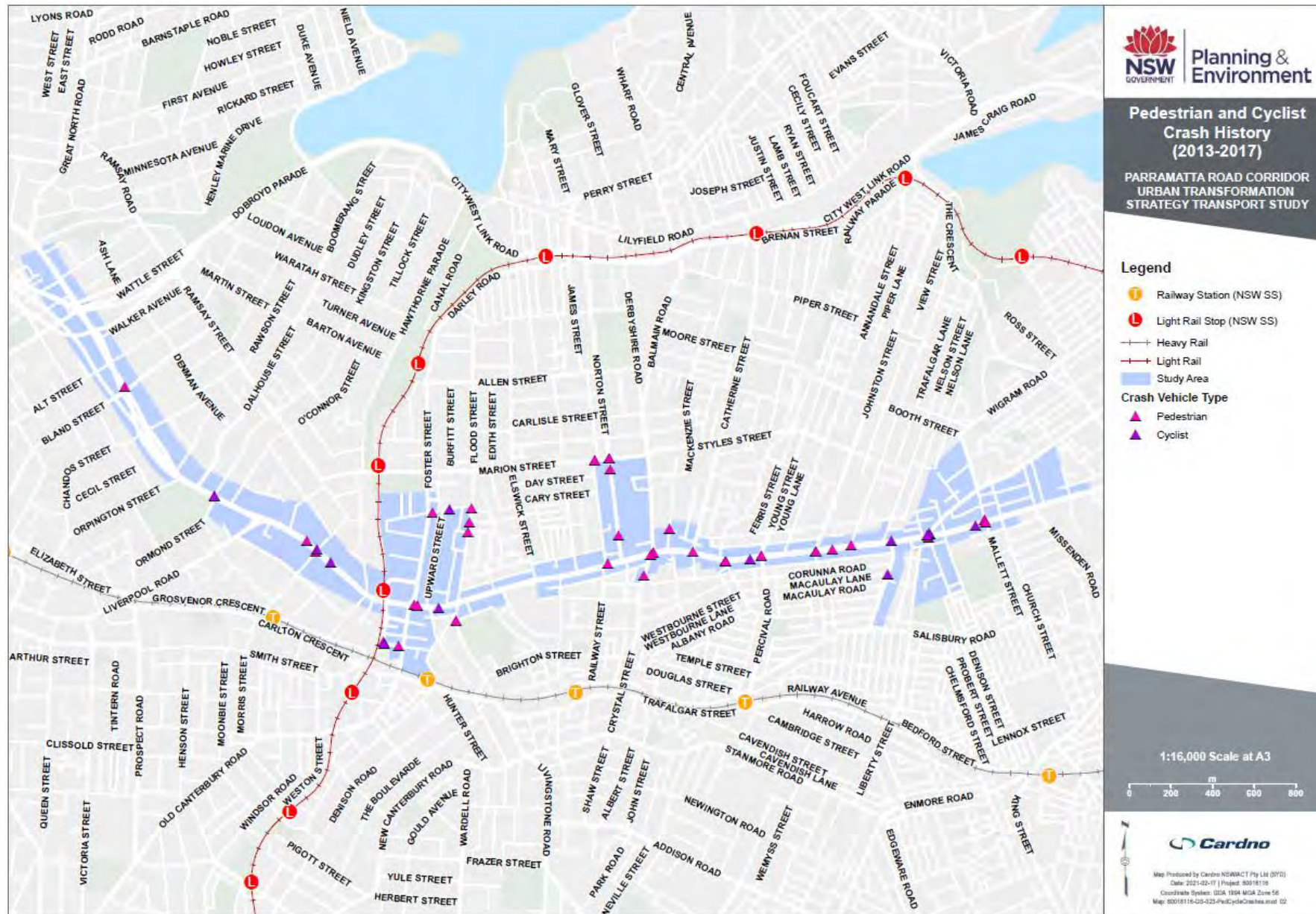


Figure 12-19 Crash cluster locations (2013 – 2017)



### 12.6.2 Crash type

Each crash type is categorised using a Road User movement (RUM) code from TfNSW. Rear ends were the most common crash type, all of which occurred on Parramatta Road. The top four crash types were:

Table 12-6 Top four crash types by RUM code (2013 – 2017)

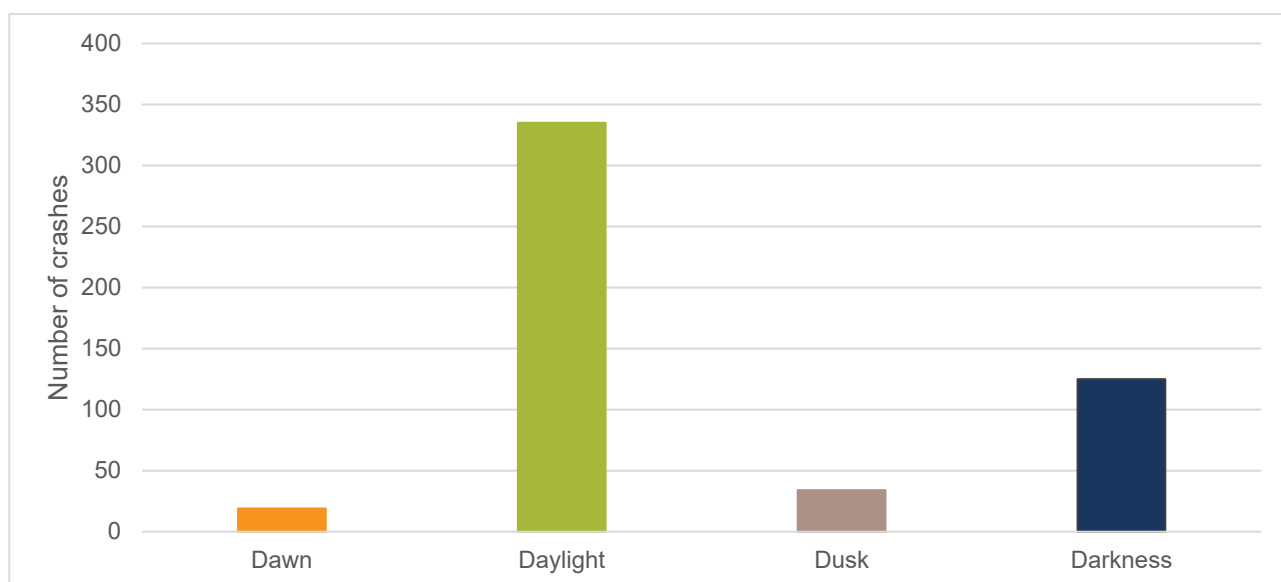
RUM code	RUM description	Number of crashes
30	Rear end	184
21	Right through	40
71	Left off road into object	30
39	Same direction - other	23

The high number of rear end crashes is typical of high traffic volume and congested networks and speed limit arterial roads in an urban environment with a high number of conflict points and signalised intersections.

### 12.6.3 Weather and natural light conditions

A total of 59 crashes (11 per cent) occurred during periods of wet weather, and 178 crashes (34 per cent) occurred during hours of dawn, dusk or night. The natural light conditions of crashes based on the time of day are displayed in **Figure 12-20**.

Figure 12-20 Natural light conditions of crashes (2013 – 2017)



The findings of **Figure 12-20** show that adverse light conditions generally are not contributors to crashes. The highest volume of traffic is during daylight hours, reflective of when crashes occur.

## 12.7 Parking

A separate car parking paper has been prepared to discuss conditions, issues and opportunities for car parking in detail.

General principles regarding car parking are:

- > Car parking takes up space and this needs to be considered against the opportunity cost for other uses of the space.
- > Car parking increases the cost of development. In multi-deck car parks, one car parking space can easily cost \$50,000 and this cost must be borne by the users a given site/ locality through the purchase price or lease costs.
- > The amount and availability of car parking has a relationship to traffic generation.

The parking ‘system’ is defined to be all public and private parking, designed for the use of employees, residents or visitors and located on-street or off-street. Through a range of mechanisms, Council has direct control or influence on all aspects of this system.

Public on-street and off-street parking is provided by Council for the benefit of the community, and managed to support specific land uses or functions. The form of management used includes supply restrictions by time, duration or type, as well as demand reduction measures such as paid parking.

Private parking provision is governed by the Council’s statutory parking policies. These regulate the supply of parking to meet the broader land use and transport goals for individual precincts and areas.

### 12.7.1 On-street parking

Publicly accessible on-street car parking is provided throughout the study area. On some key roads, parking is restricted at peak times through clearway management to facilitate additional traffic capacity. Outside of these key corridors, on-street parking is either uncontrolled or managed through short-stay duration restrictions during business hours.

On-street paid parking has been implemented along Norton Street in the Leichhardt precinct to assist with parking demand management. In other areas, parking is managed exclusively through timing and duration restrictions.

#### 12.7.1.1 Permit parking

The Inner West Council Residential Parking Scheme allows residents priority for on-street parking, reflecting concessions towards heritage dwellings constructed without on-site car parking. Parking permits are provided to eligible residents free of charge and is provided to protect parking encroachment from surrounding land uses. This scheme applies in parts of the study area identified in **Table 12-7**.

Table 12-7 Residential Parking Scheme areas

Precinct	Parking Scheme area	Streets with applicable areas
Taverners Hill	Ashfield Area 9	▪ Sloane Street, Hawthorne Parade
	Leichhardt L1	▪ Benson Street
	Marrickville M16	▪ Carrington Street, Thomas Street, Barker Street, Station Street
Leichhardt	Leichhardt L1	▪ Renwick Street
	Leichhardt L2	▪ Renwick Street, Balmain Road
	Leichhardt L3	▪ Norton Street
	Marrickville M5	▪ Queen Street, Charles Street, Phillip Street
Camperdown	Leichhardt A1	▪ Taylor Street, Chester Street, Water Street, Cahill Street, Gordon Street
	Marrickville M1	▪ Cardigan Street, Cardigan Lane

Source: <https://www.innerwest.nsw.gov.au/ArticleDocuments/978/Map%20Leichhardt%20Parking%20areas.pdf.aspx>, Inner West Council, accessed 02/02/2021

### 12.7.2 Off-street parking

Inner West Council owns and manages off-street parking across the LGA, supported by the provision of exclusive and publicly available private parking associated with commercial land uses, in accordance with statutory parking policies.

Public off-street car parks are shown in **Figure 12-21**.

Figure 12-21 Off-street car parking



## 13 Road space reallocation case studies

Historically, major road projects that bypass existing roads in Sydney have been leveraged to improve urban amenities for the community.

Proposals to reduce space for vehicles are often accompanied by alarmist media reports and opposition by motorists. Reallocating road space requires planners to be courageous in decisions to implement this and withstand initial criticism while people change their travel behaviour.

After implementation, these schemes are often celebrated because of the urban environment improvements they bring.

### 13.1.1 Induced demand versus traffic evaporation

Induced demand is the phenomenon whereby an increase in road capacity generates additional traffic demand. In rapidly growing areas where roads were not designed for the current population, there may be a large amount of latent demand for new road capacity. Once new lanes are opened, new drivers immediately take to the road, quickly clogging them up again. The induced demand is a result of a changed travel choice and can represent mode shift away from alternative modes of transport.

The inverse of this effect is known as traffic evaporation, which results from the strategic removal of road space previously dedicated to motor vehicles. A reduction in road capacity does not completely displace traffic onto alternative routes. It encourages a mode shift to alternate modes of transport which are often more sustainable. Walking or cycling is the usual substitute for shorter journeys, with public transport taking up those travelling longer distances.

The concept of traffic evaporation is relevant to the PRC and its challenges. Issues of congestion may be solved by a reduction in road capacity for motor vehicles, rather than an increase and would need to be supported by improving conditions for alternative modes. This would encourage a mode shift to sustainable transport modes such as walking, cycling, buses, light rail and heavy rail. It also provides an opportunity for road space to be reallocated to support active and public transport modes. Benefits of a reduction in car traffic include reduced street pollution and noise in the short term and safer and cleaner streets in the long term.

### 13.1.2 Case study: Eastern Distributor

The Eastern Distributor is a six-kilometre motorway which links the Cahill Expressway to Southern Cross Drive. Vehicle drivers had to drive through the residential streets of Darlinghurst and Woolloomooloo on their journey between Cahill Expressway and Southern Cross Drive prior to the completion of the tunnel in 1999.

The opening of the tunnel resulted in a number of changes to the surface streets in the East Sydney/Darlinghurst Area. These changes discouraged through traffic on the surface and improved the accessibility and safety of pedestrian and cyclists by transforming these streets into low speed streets. These changes included:

- > Conversion of Crown Street (formerly one-way northbound) to two-way traffic;
- > Conversion of Palmer Street (formerly one-way southbound) to two-way traffic;
- > Conversion of Bourke Street to two-way traffic; and
- > Creation of pedestrian malls through closure of vehicle access from Bourke Street to Oxford Street/ Flinders Street at Taylors Square.

The project resulted in diversion of through traffic onto the Eastern Distributor and other routes and the streets have returned to a local access/ residential street function.

A historic photo of Crown Street, Darlinghurst with a one-way traffic condition is shown in **Figure 13-1** and how it looks in 2021 is shown in **Figure 13-2**.

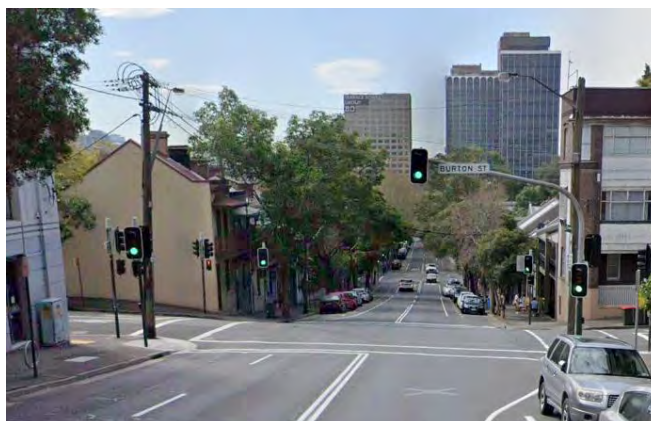


Figure 13-1 Traffic congestion on Crown Street, Darlinghurst in the 1970s



Source:  
<https://www.ozroads.com.au/NSW/Freeways/F7/history.htm>,  
viewed 02/02/2021

Figure 13-2 Crown Street 2021



Source: Google Streetview, viewed 08/03/2021

Several years after the opening, a separated cycleway and further streetscape and amenity improvements were provided on Bourke Street (shown in **Figure 13-3** and **Figure 13-4**), which would not have been possible under its previous role in Sydney's road network.

Figure 13-3 Bourke Street cycleway



Source: Google Streetview, viewed 08/03/2021

Figure 13-4 Taylors Square from Bourke Street



Source: Google Streetview, viewed 08/03/2021

### 13.1.3 Case study: Lane Cove Tunnel

The Lane Cove Tunnel is a 3.6-kilometre twin tunnel, opened in 2007, which links the Warringah Freeway to the M2 Motorway at Lane Cove River.

Prior to this, Epping Road was the key link between the two roads and accommodated approximately 90,000 vehicle movements per day. Epping Road was generally configured with six-lanes, with the outer lanes being bus lanes and four-lanes for general traffic. The Lane Cove Tunnel project provided the opportunity for space reallocation and amenity improvements to Epping Road in Lane Cove including:

- > A new bus interchange on the corner of Longueville Road and Parklands Avenue;
- > A new pedestrian bridge across Longueville Road;
- > 24-hour bus lanes provided in each direction between Mowbray Road West and Longueville Road;
- > A new cycleway and pedestrian pathway was also constructed between Mowbray Road and Pacific Highway;
- > Improved street ambience and amenity through tree plantings and new landscaping along Epping Road;
- > Reinstatement of right-turn lanes at various intersections.

The Transport for NSW traffic volume viewer indicates that average daily traffic volumes in 2019 were approximately 41,000 vehicles per day, showing a reduction in traffic by more than half. This case shows the benefits and opportunities of a bypassing motorway project on returning streets back to the community.

A typical section of Epping Road is shown aerially in **Figure 13-5** and in **Figure 13-6**. This shows the bus lanes in red and the separated cycleway in (faded) green.

Figure 13-5 Epping Road aerial photograph



Source: Nearmap, viewed 02/02/2021

Figure 13-6 Epping Road



Source: Google Streetview, viewed 02/02/2021

### 13.1.4 Case study: Champs-Élysées, Paris, France

The Champs-Élysées is a two-kilometre road in central Paris that accommodates eight lanes of traffic including on-street parking, and a separated cycleway on either side of the road. Land uses along the road include restaurants, cafés, luxury retail stores and hotels. The road experiences significant traffic congestion due to being a major tourist attractor.

Plans have been approved to reduce road space for vehicles by half and reallocate it to create an urban garden. This will include a removal of the outer lanes to create wider footpaths and dedicated cycleways as well as the planting of trees and greenery. The changes have been successfully modelled to improve air quality and make the space more people-centred.

Figure 13-7 Champs-Élysées 2021



Source: Google Streetview, viewed 09/03/2021

Figure 13-8 Concept plans for Champs-Élysées



Source: PCA-Stream, 2021

### 13.1.5 Summary

The case studies for Sydney demonstrate road space reallocation has already occurred successfully in Sydney. Internationally, city leaders are implementing bolder schemes to reduce vehicle traffic on city streets to give the space back to people to use and enjoy.

With the support of alternative transport networks including road or public transport initiatives, road space and functions can be changed to better serve the needs and values of a community.

APPENDIX

A

PRCUTS LAND USE REVIEW

# PRCUTS Land Use Review

31/05/21





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# Background and scope

The Department of Planning, Industry and Environment (DPIE) and Inner West Council (IWC) are working to progress traffic modelling for the Parramatta Road Corridor Urban Transformation Strategy (PRCUTS).

To inform that broader work program SGS have been engaged to:

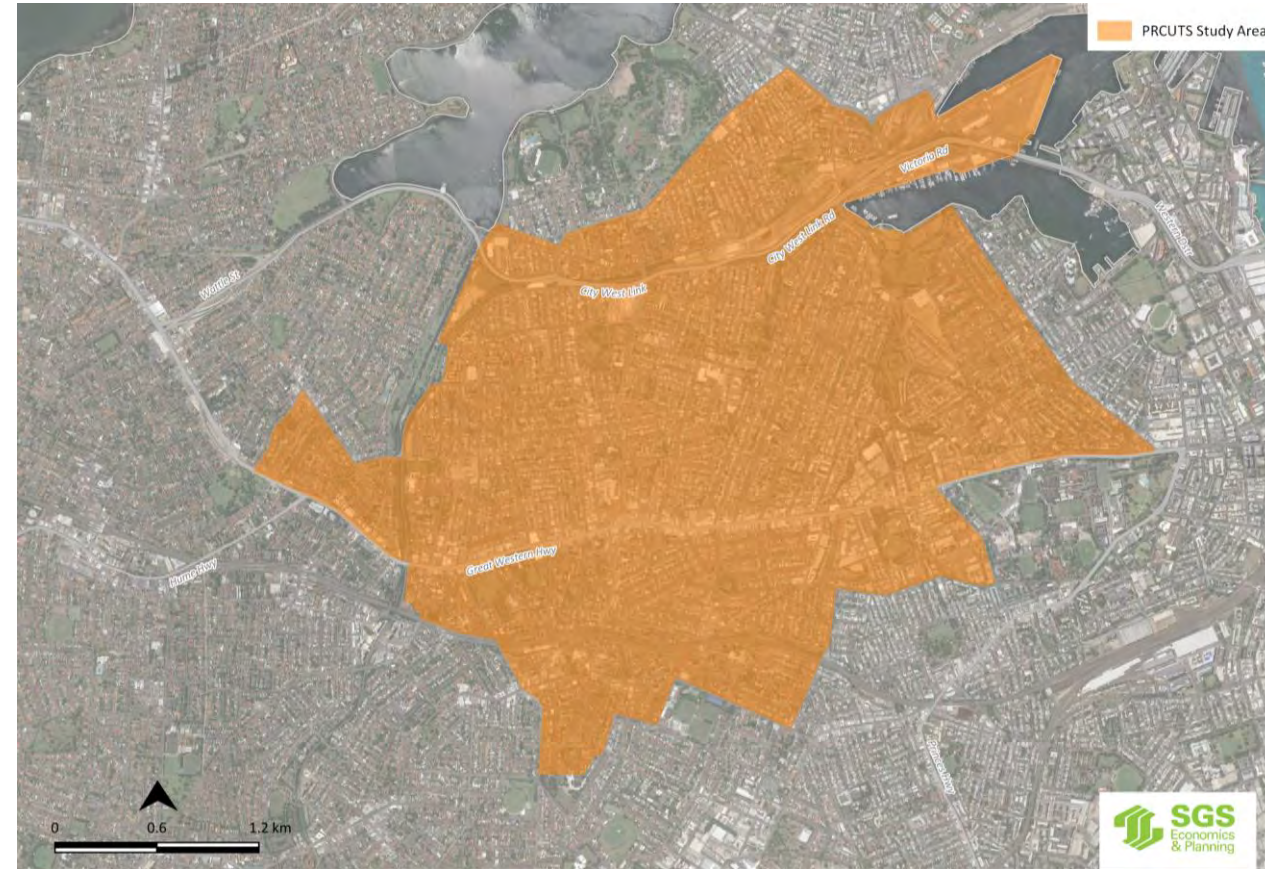
- Rapidly review land use projections and development capacity for the PRCUTS study area and surrounds, and
- from this rapid review and the latest available data, SGS has estimated three revised land use scenarios at a fine grain spatial scale for dwellings, population and employment

## Scope limitations

For this rapid review, SGS has relied on existing capacity and development information provided by DPIE, IWC or from other readily available sources. No primary analysis of capacity was within scope. Where data was not available, assumptions have been made to fill gaps.

## Project study area

The project study area is presented in Figure to the right.

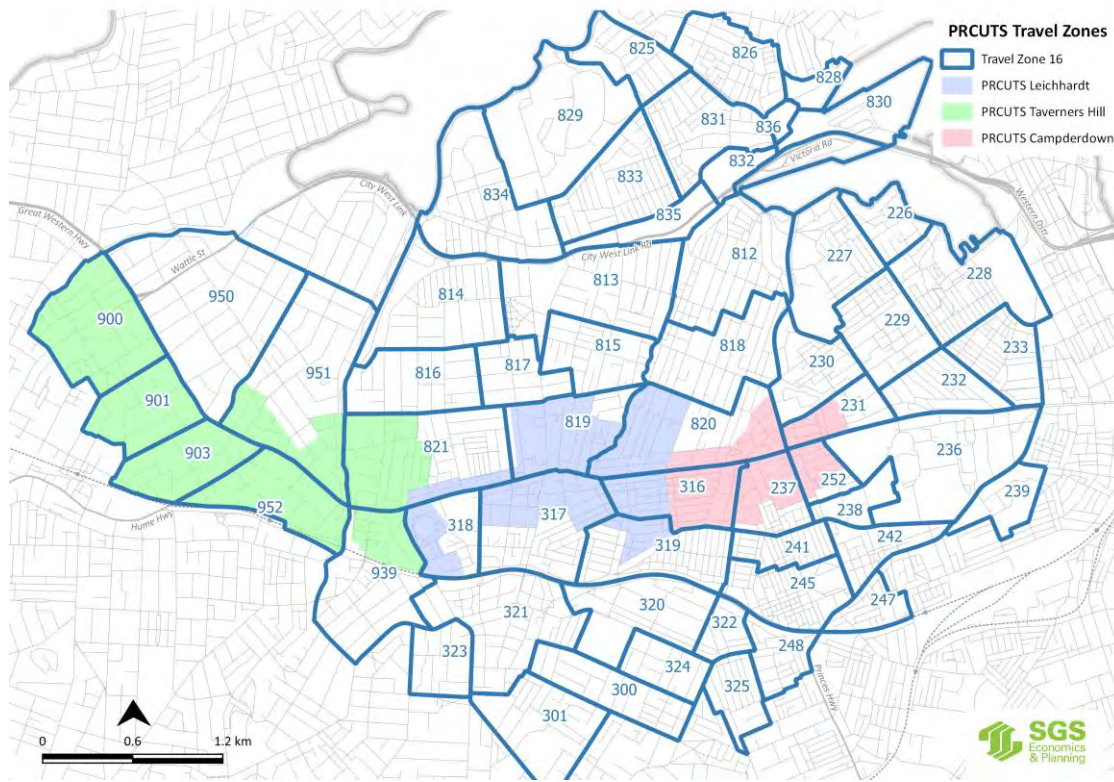


# Project geographies

The following key zone geographies were used in the study.

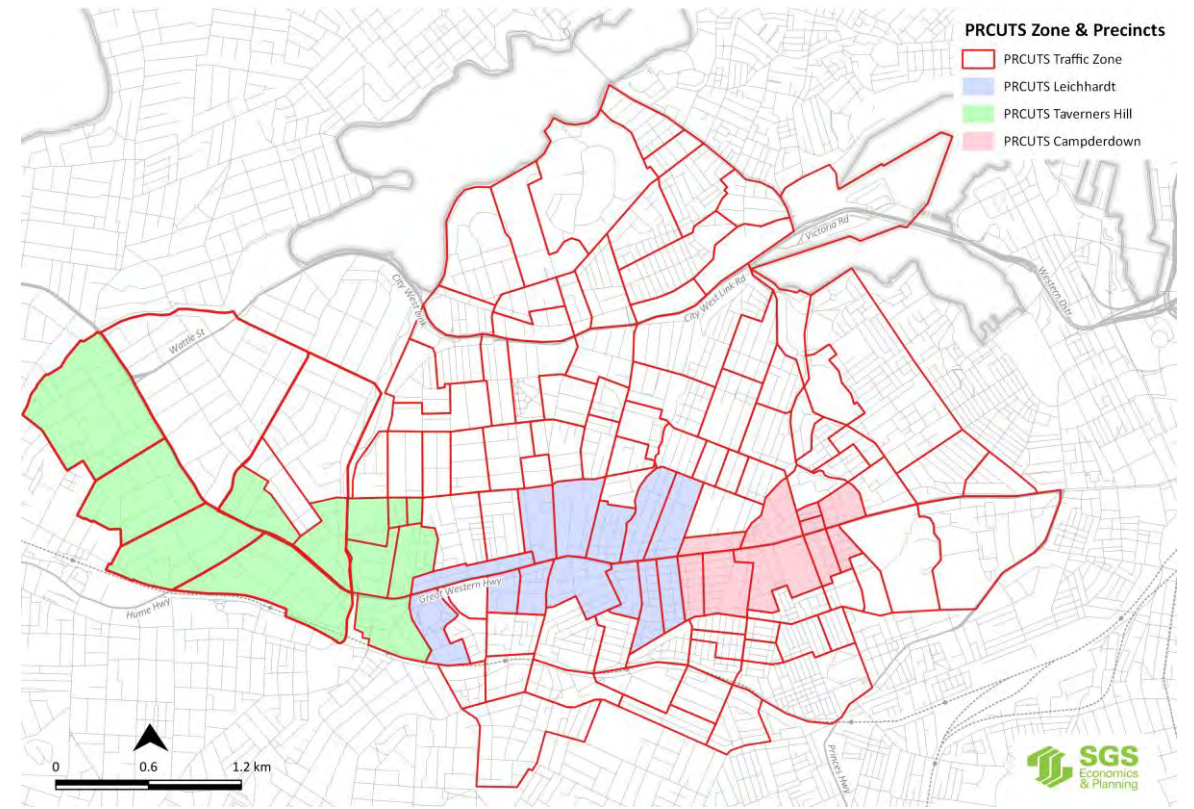
## Travel Zones (TZ) (blue)

2016 Travel Zones (TZ) developed by Department of Transport



## PRCUTS traffic zones (PTZ) (red)

PTZ geography and base spatial output of project





# Land use data variables

The following data variables have been produced:

- Geography:
  - PRCUTS Traffic Zones (PTZ)
  
- Time periods
  - 2026
  - 2036
  - *The analysis base year is 2016 to align with TZP16 v1.5. An interim base year of 2021 has also been defined to align with current 'additional' capacity data.*
  
- Data variables
  - Residents (count of)
    - Dwellings
    - Population
  - Employment (count of jobs and GFA)
    - Industrial
    - Office
    - Retail
    - Hospital (and hospital beds)
    - Other (i.e. Construction, Arts and Recreation )
  - Schools (count of)
    - Primary students
    - Secondary students
    - TAFE student
    - University students

# Data variable definitions

## Dwellings and population attributes

### Dwellings

= Structural Private Dwellings (SPD)

= Occupied and Unoccupied Dwellings

*(Note typically 95 per cent of dwellings are occupied)*

### Population

= People in Occupied Private Dwellings (POPD)

*This excludes people in non-private dwellings, such as; people in aged care, hospitals, university dorm, corrections facilities*

## Broad employment categories

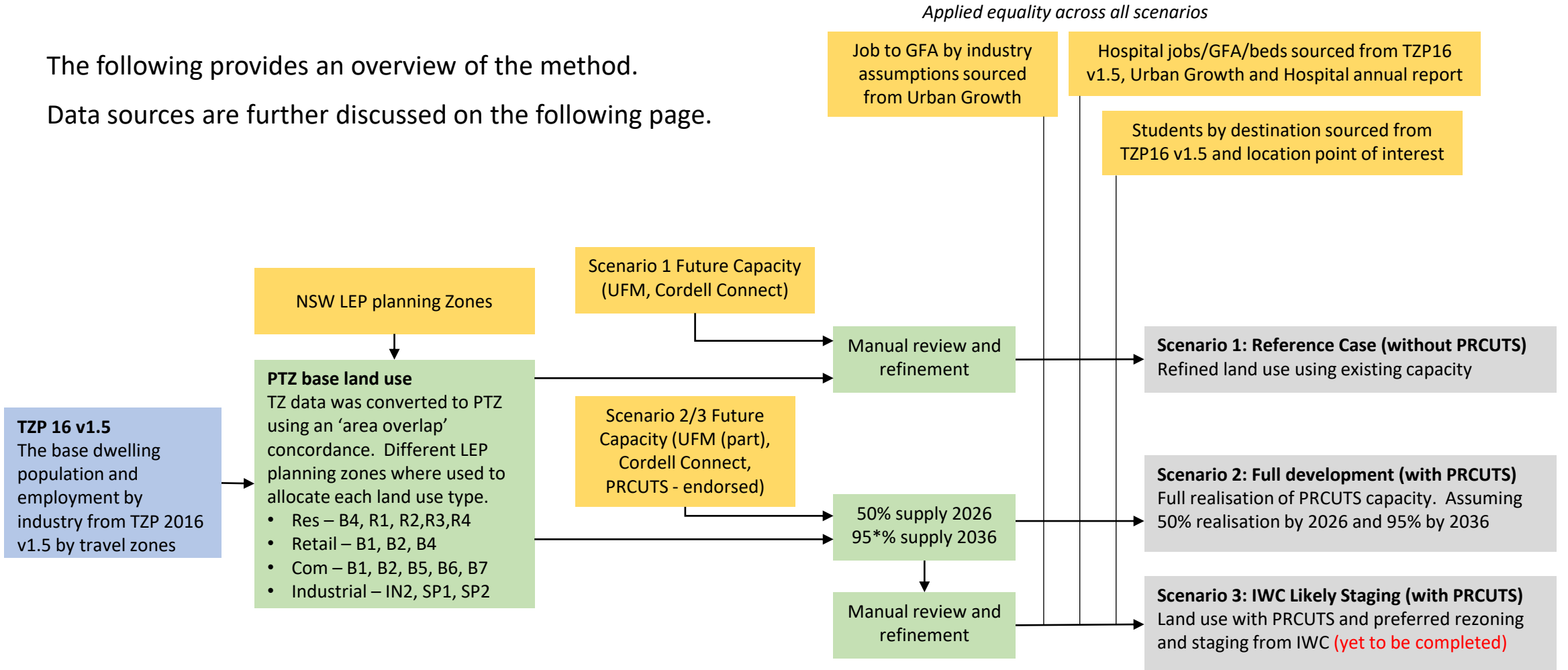
ANZSIC06 Industry	Broad Industry
Agriculture, Forestry and Fishing	Industrial
Mining	Industrial
Manufacturing	Industrial
Electricity, Gas, Water and Waste Services	Industrial
Construction	Other
Wholesale Trade	Industrial
Retail Trade	Retail
Accommodation and Food Services	Retail
Transport, Postal and Warehousing	Industrial
Information Media and Telecommunications	Office
Financial and Insurance Services	Office
Rental, Hiring and Real Estate Services	Office
Professional, Scientific and Technical Services	Office
Administrative and Support Services	Office
Public Administration and Safety	Office
Education and Training	Schools
Health Care and Social Assistance	Hospitals*
Arts and Recreation Services	Other
Other Services	Office

\* Adjustment has been made to include education and professionals services employment in the hospital PTZ

# Method

The following provides an overview of the method.

Data sources are further discussed on the following page.



*\* Full development was assumed to be 95% of supply. While any one site could achieve 100% of the capacity it is unrealistic to assume every single property across the entire study area could be built out to their maximum potential within a 20 year horizon or ever. There are a range of development, market, behavioural and other factors which means this is never possible.*

# Global conversation assumptions

LEP zones have been used to disaggregate dwellings and employment by type from Travel zones to PTZ.

Employment to space assumptions

Residential	Industrial	Office	Retail
B4	IN2	B5	B4
R1	SP1	B6	B1
R2	SP2	B7	B2
R3			
R4			
B4			

	Gross Floor Area (GFA) per work ratios	Efficiency rate to estimates Gross Leasable Floor Area (GLFA)
Retail	45 sqm	75%
Industrial	100 sqm	-
Office	20 sqm	-
Other	-	-

\* Schools and hospitals were manually identified and aligned to a PTZ

Source: Landcom, NSW  
<https://www.landcom.com.au/approach/sustainability/productive-places/#element-accordion-510>

# Overview of data sources

The following data inputs were used:

Source	Geographic coverage	Variables	Time	Key figures	Comments
Travel Zone Projections 2016 v1.5 (TZP16 v1.5), DOT	TZ for entire study area	All (SPD, ERP and emp by Ind)	2016, 2020, 2026, 2036	SPD – 44,750 (2036) ERP – 100,600 (2036) Emp – 47,495 (2036)	TZP16 v1.5 growth from 2016 to 2020 used to fill development gap in capacity data. Translated to PTZ using LEP based area overlap
Urban Feasibility Model (UFM), DPIE	PTZ for entire study area	SPD	March 2020 Extract of Feasible Future Capacity under Current LEP	SPD - 3,792 (FD)	Translated to PTZ using LEP based area overlap
Local Environment Plan (LEP) Planning Zones, DPIE	Aligned to PTZ and TZ	-	-	-	
PRCUTS 2016 – Endorsed	Aggregate figures for <ul style="list-style-type: none"> <li>Taverners Hill precinct</li> <li>Leichhardt precinct</li> <li>Camperdown precinct</li> </ul>	SPD, ERP, Emp	Additional from 2020 by 2050	SPD – 1,300 (TH), 1,100 (L), 700 (CD) ERP – 3,300 (TH), 2,100 (L), 1,400 (CD) Emp – 4,100 (TH), 3,250 (L), 2,300 (CD)	Used TZP16 v1.5 and LEP data to spatially distribute precinct totals and employment by industry
Cordell Connect	Entire study area	Capacity	Additional from March 1st 2020 until 2036 (no developments noted completing after 2026)	SPD - 1,490	

# Assumed recent development

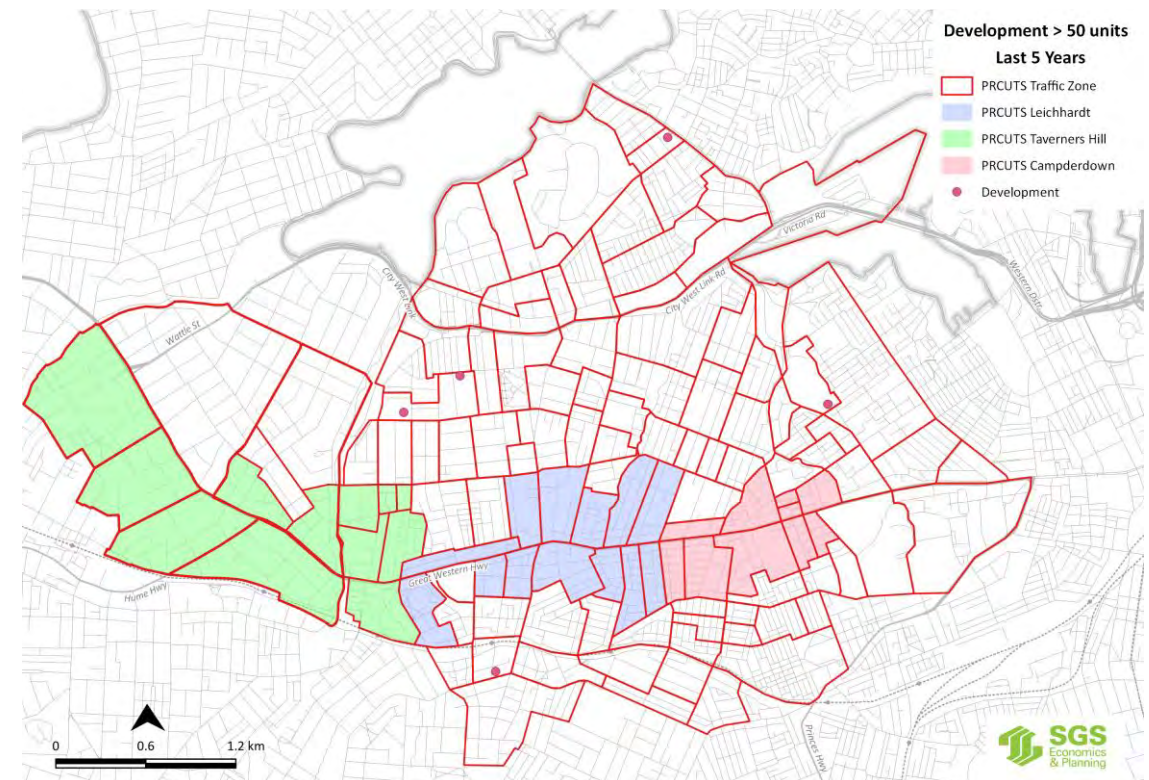
TZP16 v1.5 has been used to estimate recent development since 2016 up to when future capacity/development sources (Cordell/UFM) provide information on additional development

SPD	2016	2020	2016-20
<b>TZP16 v1.5</b>			
Leichhardt	3,687	3,821	135
Camperdown	2,768	2,933	164
Taverners Hill	7,660	8,080	420
Remainder	29,588	30,797	1,209
<b>Total (Entire Study Area)</b>	<b>43,704</b>	<b>45,632</b>	<b>1,928</b>
Total (Traffic Model Area)	37,616	39,483	1,867

Employment	2016	2020	2016-20
<b>TZP16 v1.5</b>			
Leichhardt	2,766	2,926	160
Camperdown	3,354	3,593	239
Taverners Hill	4,705	5,097	391
Remainder	12,294	13,880	1,586
<b>Total (Entire Study Area)</b>	<b>23,119</b>	<b>25,496</b>	<b>2,377</b>
Total (Traffic Model Area)	19,755	21,863	2,107

Some major recent developments during 2016 to 2020 include:

- 4 developments above 50 units over the last 5 years. Combined they represent 925 new dwellings (see map below)
- A further 1,488 units across 34 developments



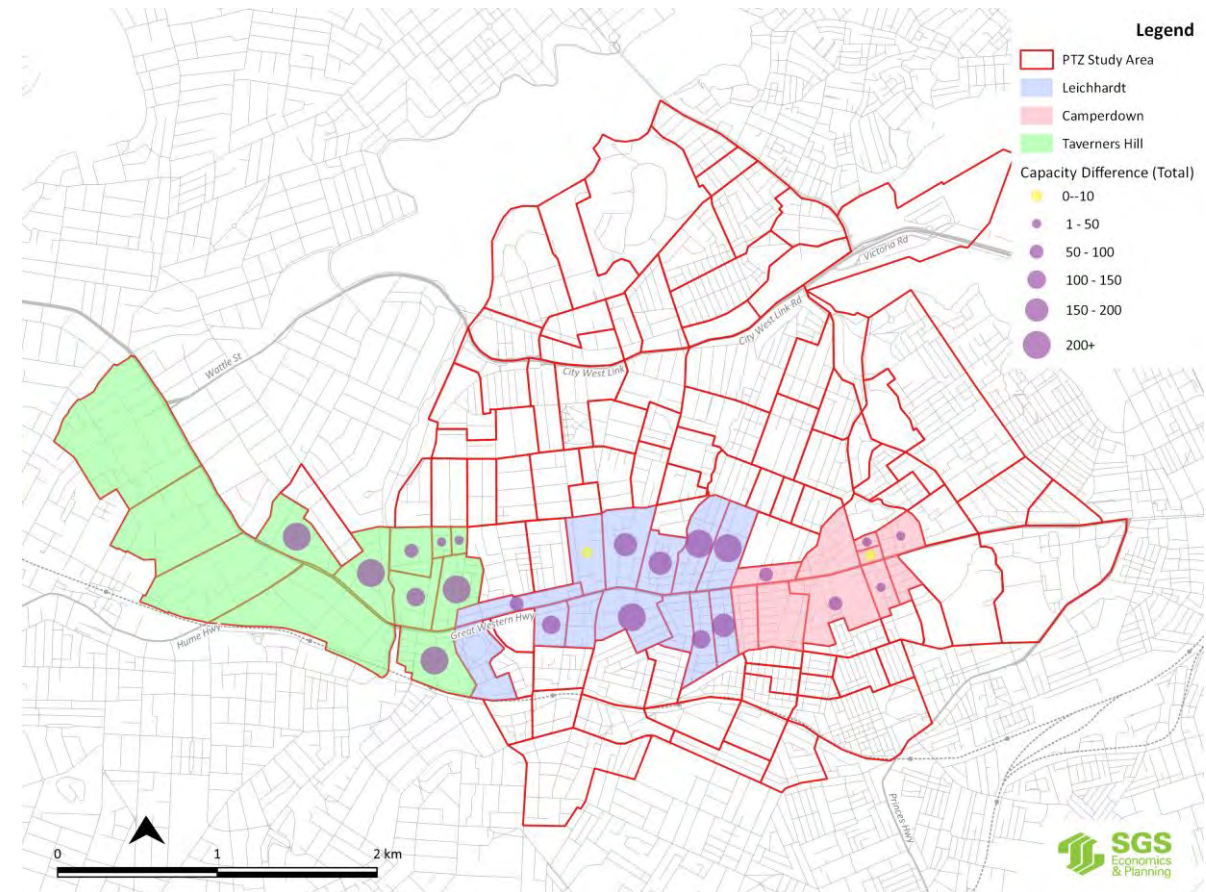
# Combined development capacity Inputs

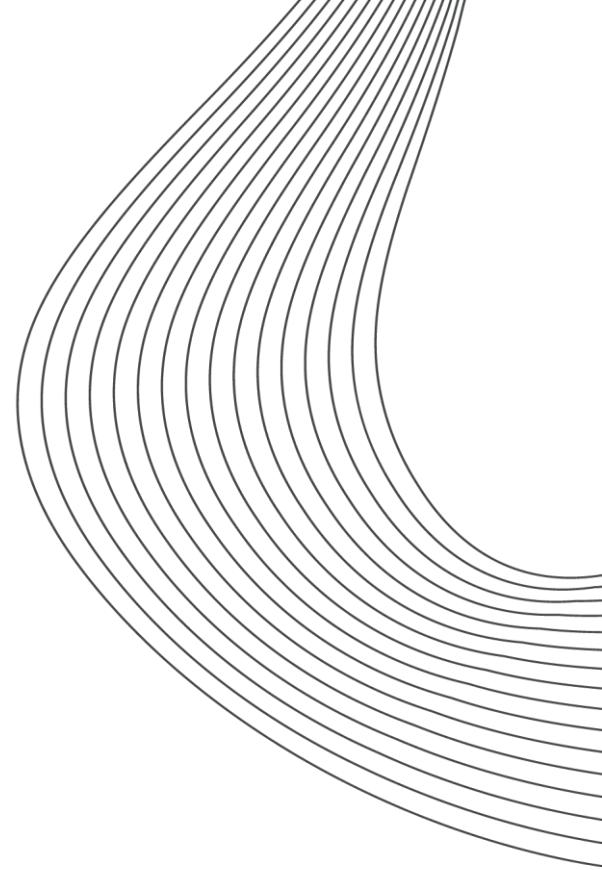
A range of development capacity inputs have been combined:

- S1: Cordell Connect and UFM (under current planning controls)
- S2: Cordell Connect, UFM (under current planning controls outside PRCUTS precincts) and UFM (PRCUTS 'as corrected')

SPD	2020-26	2026-36	Total additional from 2020
<b>Scenario 1: Reference Case (without PRCUTS)</b>			
Camperdown	225	189	413
Leichhardt	260	150	410
Taverners Hill	73	73	145
Remainder	2,186	1,137	3,322
<b>Total (Traffic Model Area)</b>	<b>2,743</b>	<b>1,548</b>	<b>4,290</b>
<b>Scenario 2: Full development (with PRCUTS)</b>			
Camperdown	565	496	1,061
Leichhardt	1,180	1,052	2,232
Taverners Hill	813	731	1,544
Remainder	2,202	1,150	3,352
<b>Total (Traffic Model Area)</b>	<b>4,759</b>	<b>3,429</b>	<b>8,188</b>

Difference in capacity inputs between S1 and S2





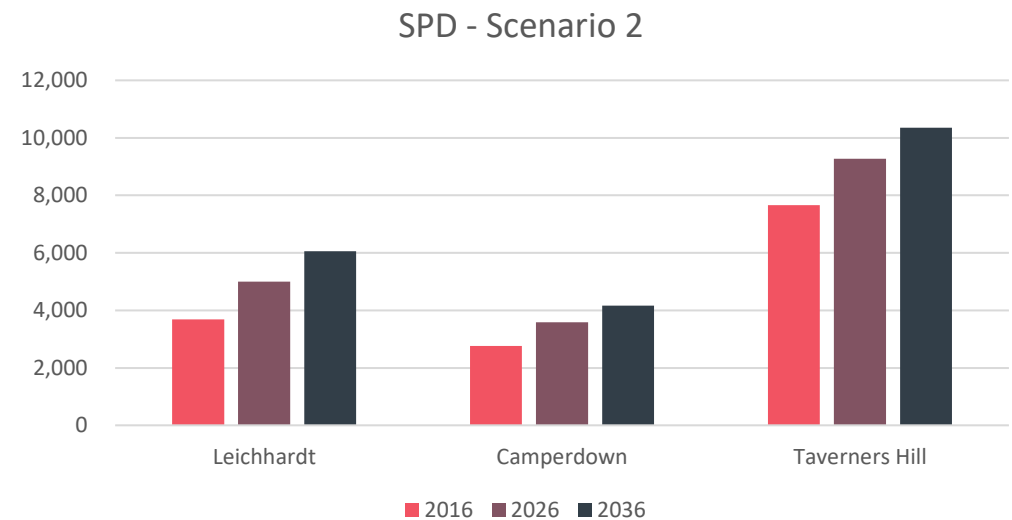
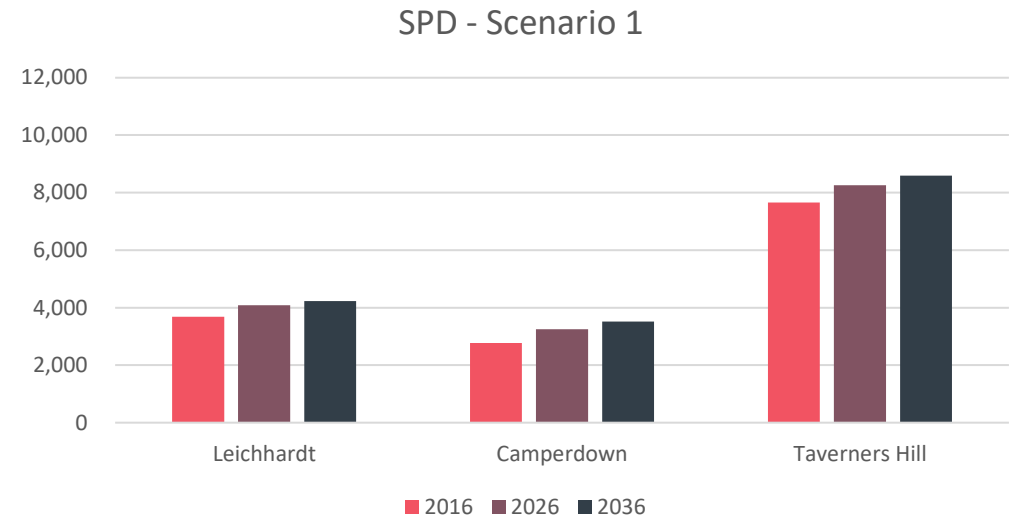
# Land use review results



# Dwelling scenario overview

SPD	2016	2026	2036	2016-26	2016-36
<b>Scenario 1: Reference Case (without PRCUTS)</b>					
Leichhardt	3,687	4,081	4,231	395	545
Camperdown	2,768	3,245	3,521	476	752
Taverners Hill	7,660	8,257	8,591	597	931
Remainder	29,588	32,883	33,920	3,294	4,332
<b>Total (Entire Study Area)</b>	<b>43,704</b>	<b>48,466</b>	<b>50,263</b>	<b>4,762</b>	<b>6,560</b>
<i>Total (Traffic Model Area)</i>	<i>37,616</i>	<i>42,226</i>	<i>43,773</i>	<i>4,610</i>	<i>6,157</i>
<b>Scenario 2: Full development (with PRCUTS)</b>					
Leichhardt	3,687	5,001	6,053	1,315	2,366
Camperdown	2,768	3,585	4,168	817	1,400
Taverners Hill	7,660	9,275	10,350	1,615	2,690
Remainder	29,588	32,867	33,888	3,279	4,300
<b>Total (Entire Study Area)</b>	<b>43,704</b>	<b>50,728</b>	<b>54,460</b>	<b>7,025</b>	<b>10,756</b>
<i>Total (Traffic Model Area)</i>	<i>37,616</i>	<i>44,227</i>	<i>47,640</i>	<i>6,611</i>	<i>10,024</i>
<b>TZP16 v1.5* (unaltered - for reference)</b>					
Leichhardt	3,687	4,024	4,123	337	436
Camperdown	2,400	2,740	3,226	340	826
Taverners Hill	8,600	9,651	10,007	1,051	1,407
Remainder	29,017	32,109	36,454	3,092	7,437
<b>Total (Entire Study Area)</b>	<b>43,704</b>	<b>48,524</b>	<b>53,809</b>	<b>4,820</b>	<b>10,106</b>
<i>Total (Traffic Model Area)</i>	<i>37,616</i>	<i>42,284</i>	<i>47,319</i>	<i>4,668</i>	<i>9,703</i>

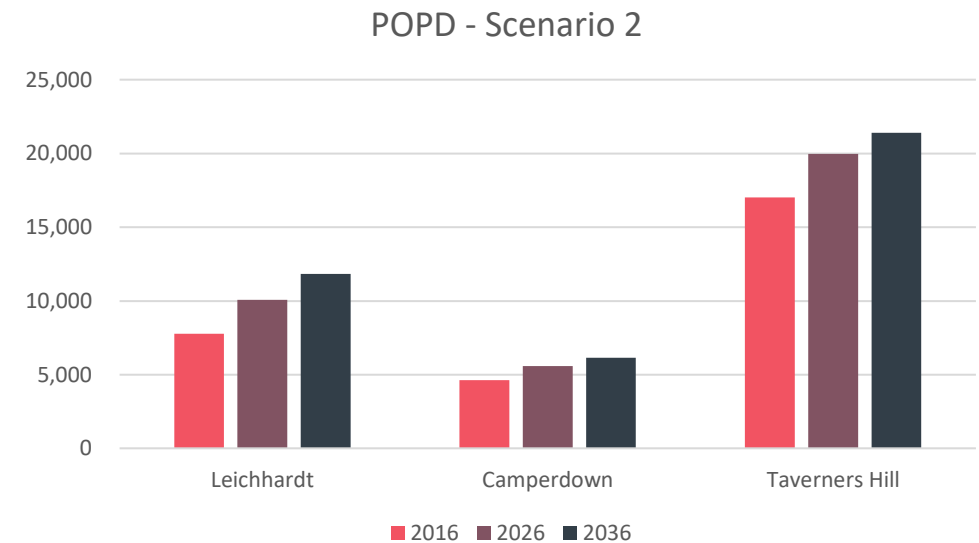
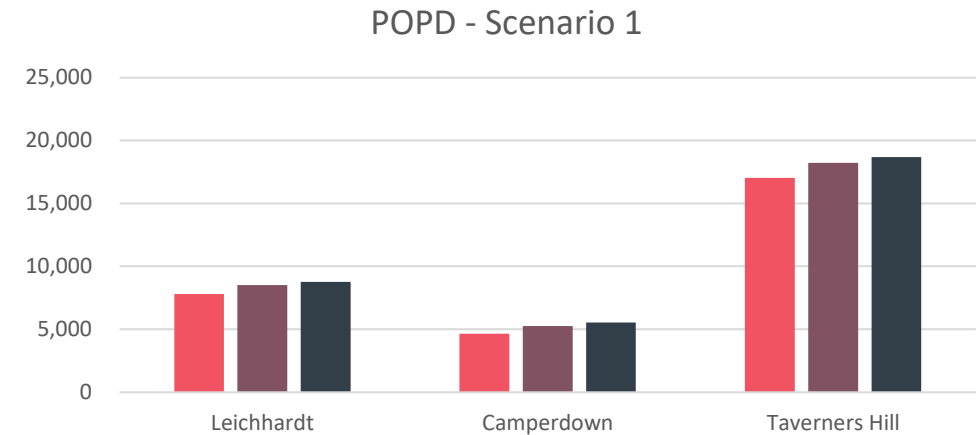
\* Unaltered TZP16 v1.5 data has been spatially disaggregated and aligned to the study precincts for reference.



# Population scenario overview

POPD	2016	2026	2036	2016-26	2016-36
<b>Scenario 1: Reference Case (without PRCUTS)</b>					
Leichhardt	7,786	8,519	8,769	732	983
Camperdown	4,637	5,247	5,533	611	897
Taverners Hill	17,018	18,211	18,679	1,193	1,661
Remainder	62,459	68,116	69,437	5,657	6,978
<b>Total (Entire Study Area)</b>	<b>91,900</b>	<b>100,093</b>	<b>102,419</b>	<b>8,193</b>	<b>10,519</b>
Total (Traffic Model Area)	78,130	86,041	88,014	7,912	9,885
<b>Scenario 2: Full development (with PRCUTS)</b>					
Leichhardt	7,786	10,075	11,834	2,289	4,048
Camperdown	4,637	5,589	6,159	953	1,523
Taverners Hill	17,018	19,964	21,409	2,946	4,391
Remainder	62,459	68,093	69,416	5,634	6,957
<b>Total (Entire Study Area)</b>	<b>91,900</b>	<b>103,721</b>	<b>108,818</b>	<b>11,821</b>	<b>16,919</b>
Total (Traffic Model Area)	78,130	89,226	93,913	11,097	15,784
<b>TZP16 v1.5* (unaltered - for reference)</b>					
Leichhardt	7,786	8,356	8,522	570	736
Camperdown	4,177	4,519	4,968	342	791
Taverners Hill	19,402	21,232	21,719	1,830	2,317
Remainder	60,534	65,148	70,682	4,613	10,148
<b>Total (Entire Study Area)</b>	<b>91,900</b>	<b>99,255</b>	<b>105,892</b>	<b>7,355</b>	<b>13,992</b>
Total (Traffic Model Area)	78,130	85,315	91,653	7,185	13,523

\* Unaltered TZP16 v1.5 data has been spatially disaggregated and aligned to the study precincts for reference.



# Persons per Dwelling

POPD per SPD	2016	2026	2036	2016-26	2016-36
<b>Scenario 1: Reference Case (without PRCUTS)</b>					
Leichhardt	2.1	2.1	2.1	1.9	1.7
Camperdown	1.7	1.6	1.6	1.3	1.0
Taverners Hill	2.2	2.2	2.2	2.0	1.4
Remainder	2.1	2.1	2.0	1.7	1.3
<b>Total (Entire Study Area)</b>	<b>2.1</b>	<b>2.1</b>	<b>2.0</b>	<b>1.7</b>	<b>1.3</b>
Total (Traffic Model Area)	2.1	2.0	2.0	1.7	1.3
<b>Scenario 2: Full development (with PRCUTS)</b>					
Leichhardt	2.1	2.0	2.0	1.7	1.7
Camperdown	1.7	1.6	1.5	1.2	1.0
Taverners Hill	2.2	2.2	2.1	1.8	1.3
Remainder	2.1	2.1	2.0	1.7	1.3
<b>Total (Entire Study Area)</b>	<b>2.1</b>	<b>2.0</b>	<b>2.0</b>	<b>1.7</b>	<b>1.4</b>
Total (Traffic Model Area)	2.1	2.0	2.0	1.7	1.4
<b>TZP16 v1.5* (unaltered - for reference)</b>					
Leichhardt	2.1	2.1	2.1	1.7	1.7
Camperdown	1.7	1.6	1.5	1.0	0.9
Taverners Hill	2.3	2.2	2.2	1.7	1.4
Remainder	2.1	2.0	1.9	1.5	1.3
<b>Total (Entire Study Area)</b>	<b>2.1</b>	<b>2.0</b>	<b>2.0</b>	<b>1.5</b>	<b>1.3</b>
Total (Traffic Model Area)	2.1	2.0	1.9	1.5	1.3

\* Unaltered TZP16 v1.5 data has been spatially disaggregated and aligned to the study precincts for reference.

Assumptions:

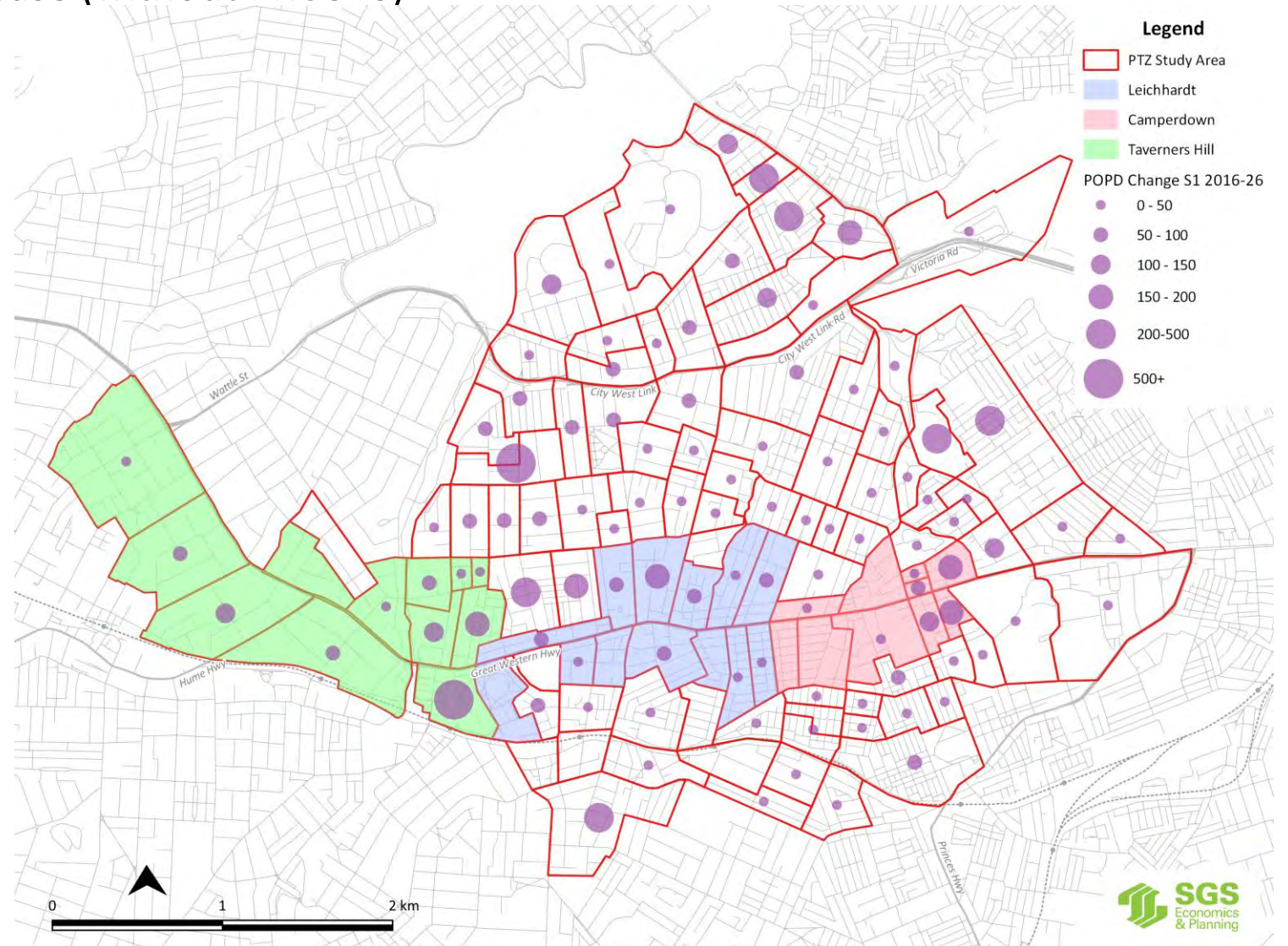
New dwellings in PCRUTS precincts follow pre-set Persons Per dwellings:

	2026	2036
Leichhardt	1.9	1.9
Camperdown	2.0	2.0
Taverners Hill	2.5	2.5

For PTZ's outside these areas the Persons per Dwelling defaults to the TZ\_16 Trend

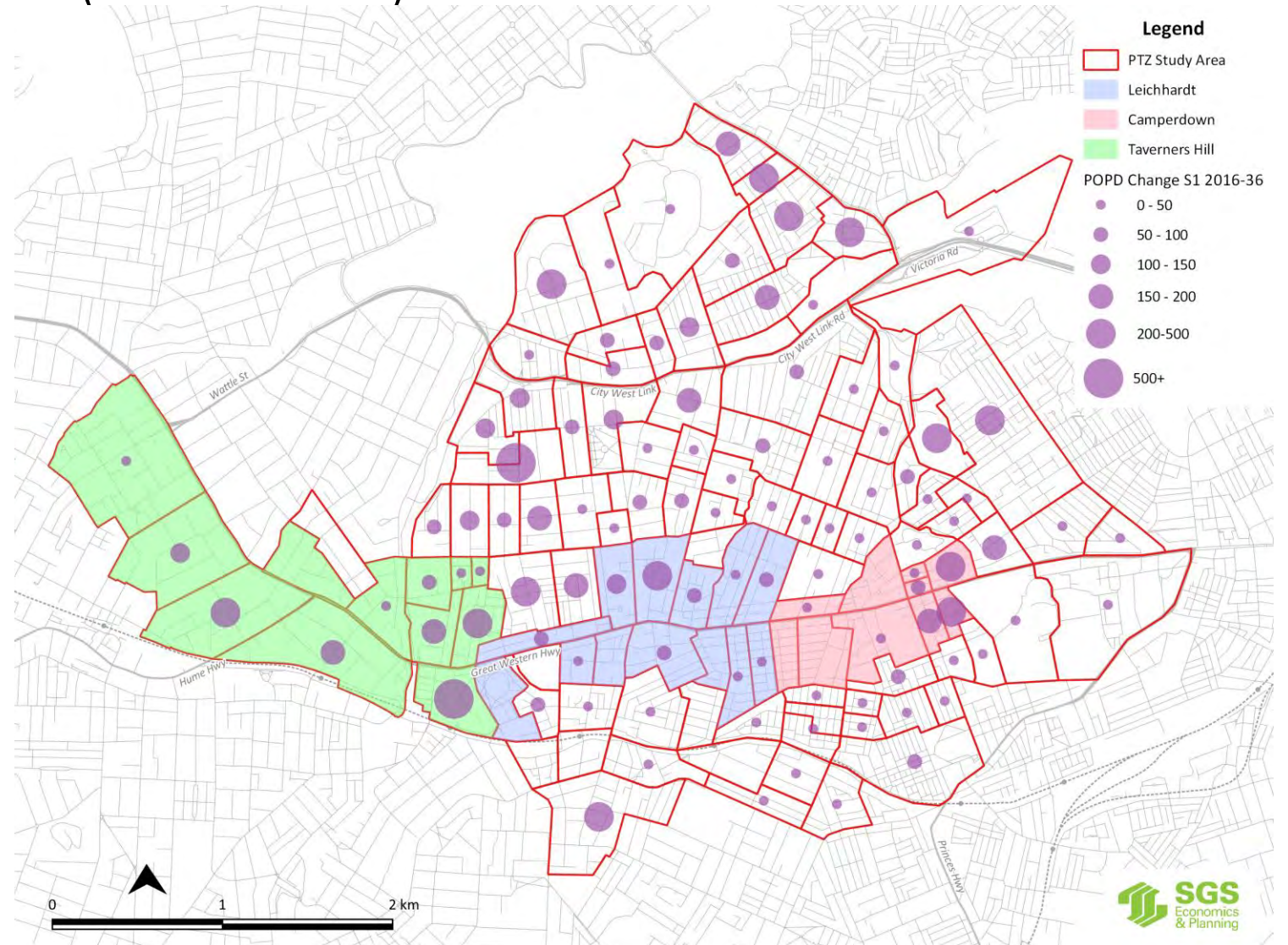
# Population Change

2016 to 2026 - Scenario 1: Reference Case (without PRCUTS)



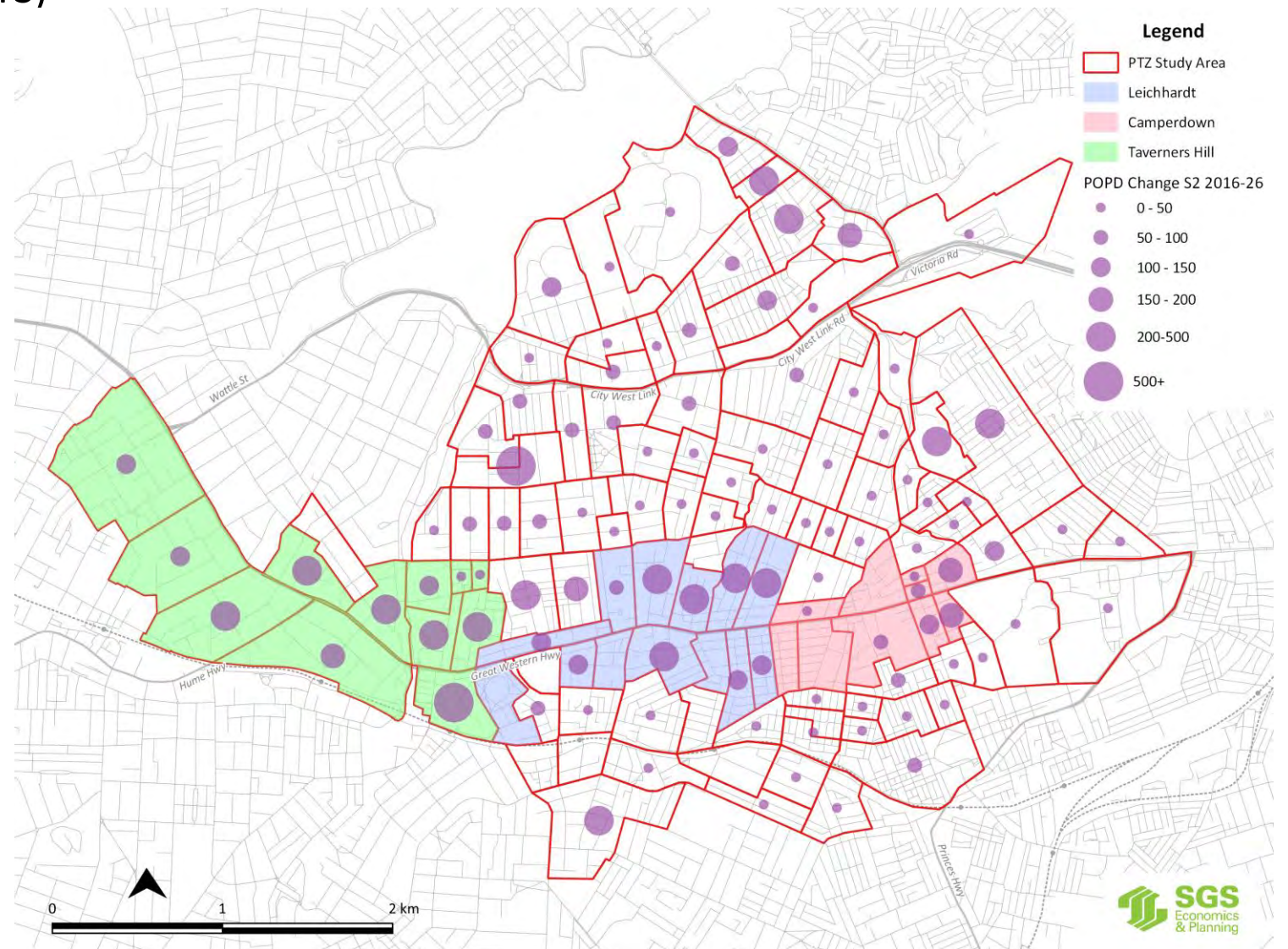
# Population Change

2016 to 2036 - Scenario 1: Reference Case (without PRCUTS)



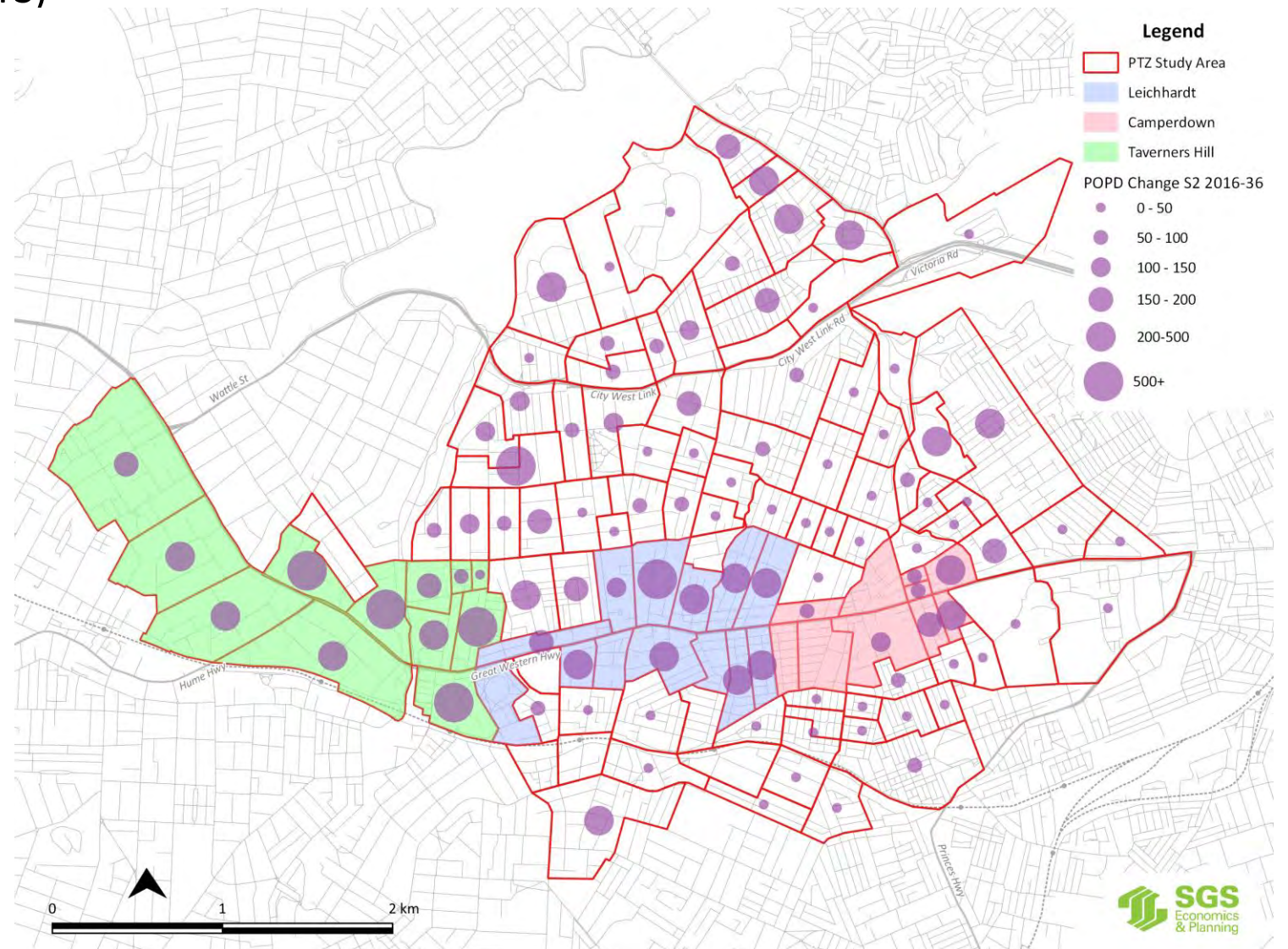
# Population Change

2016 to 2026 - Scenario 2 (With PRCUTS)



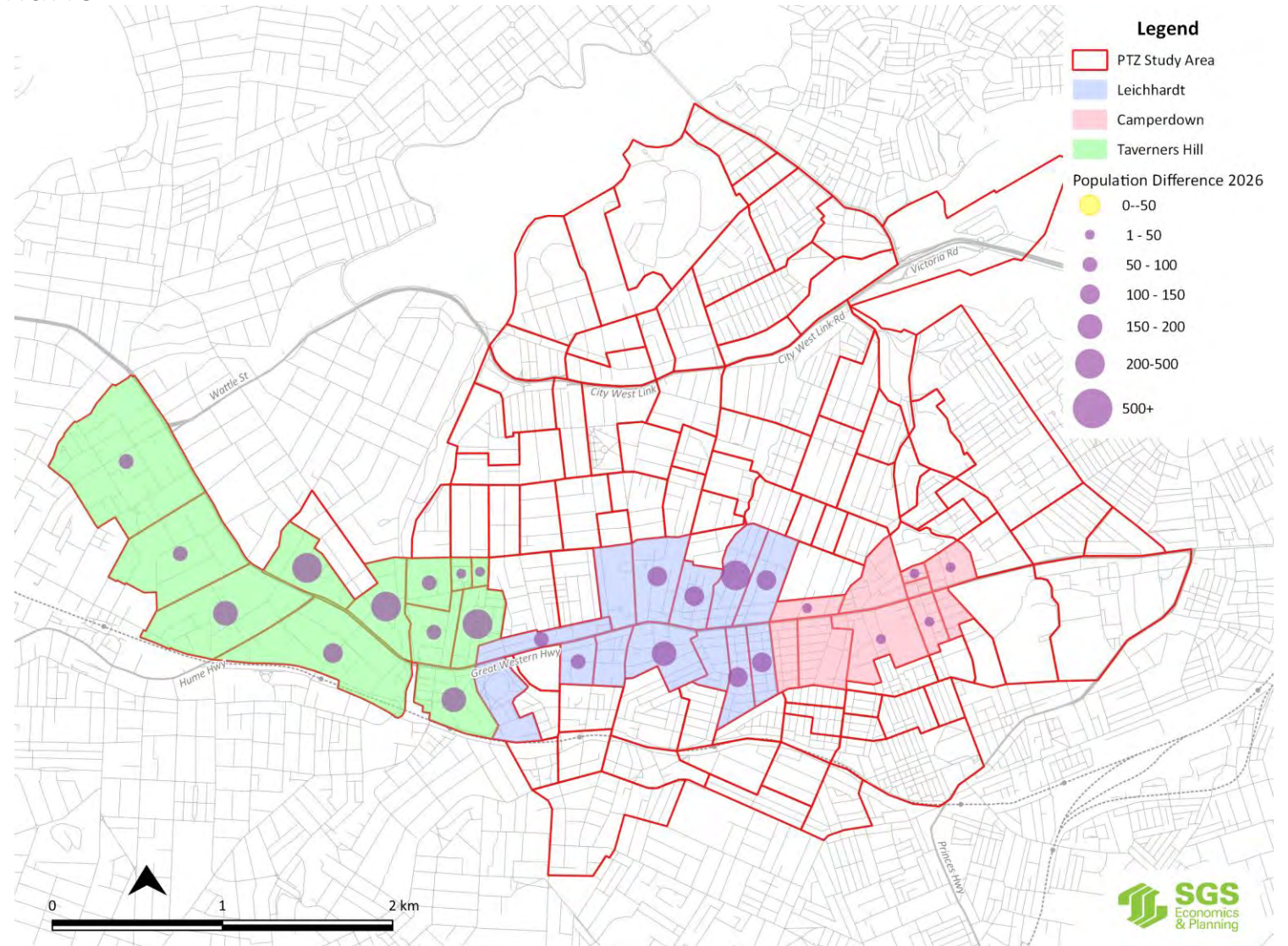
# Population Change

2016 to 2036 - Scenario 2 (With PRCUTS)



# Scenario Population Difference

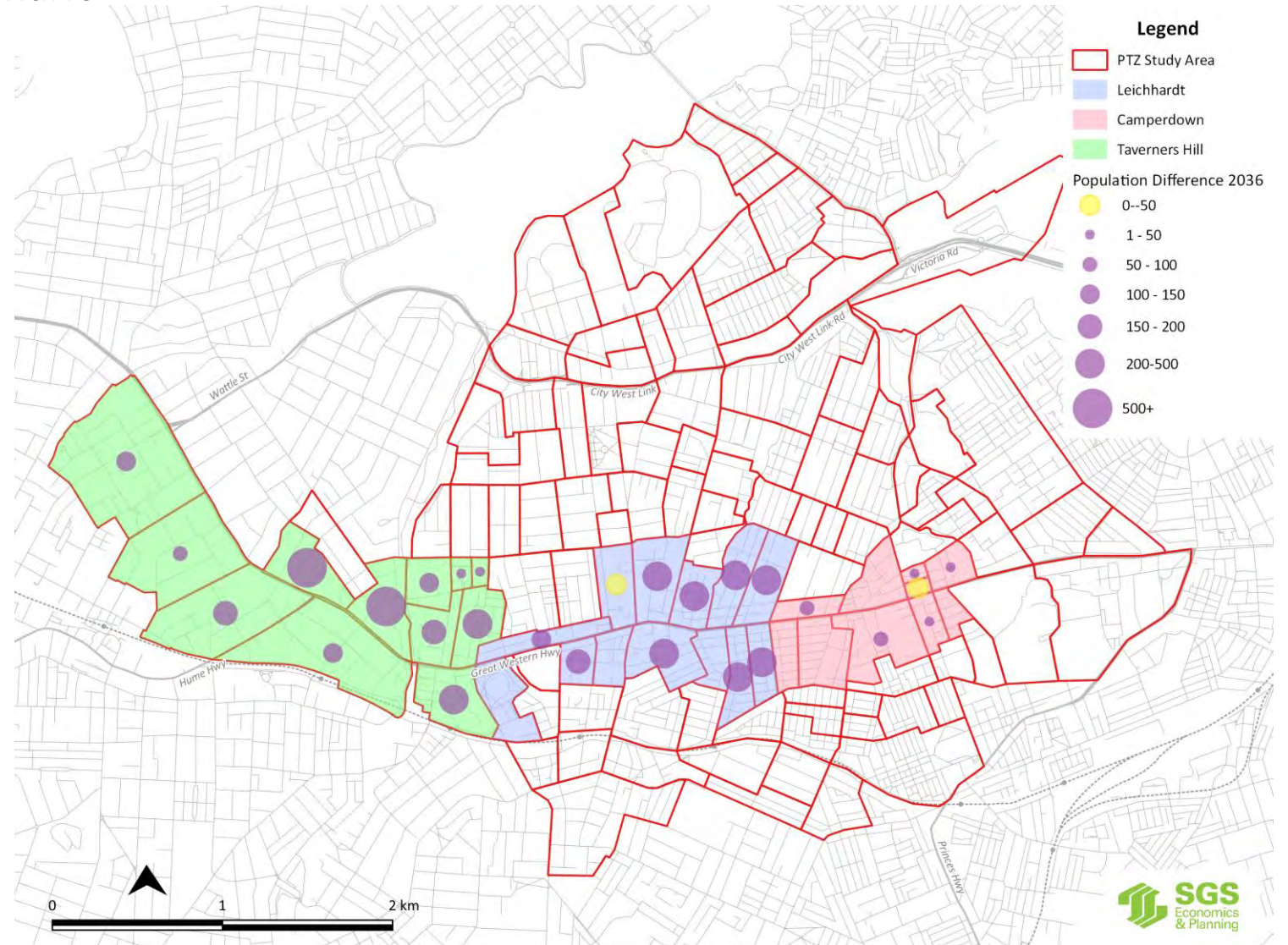
2026 - Scenario 2 (With PRCUTS) – Scenario 1





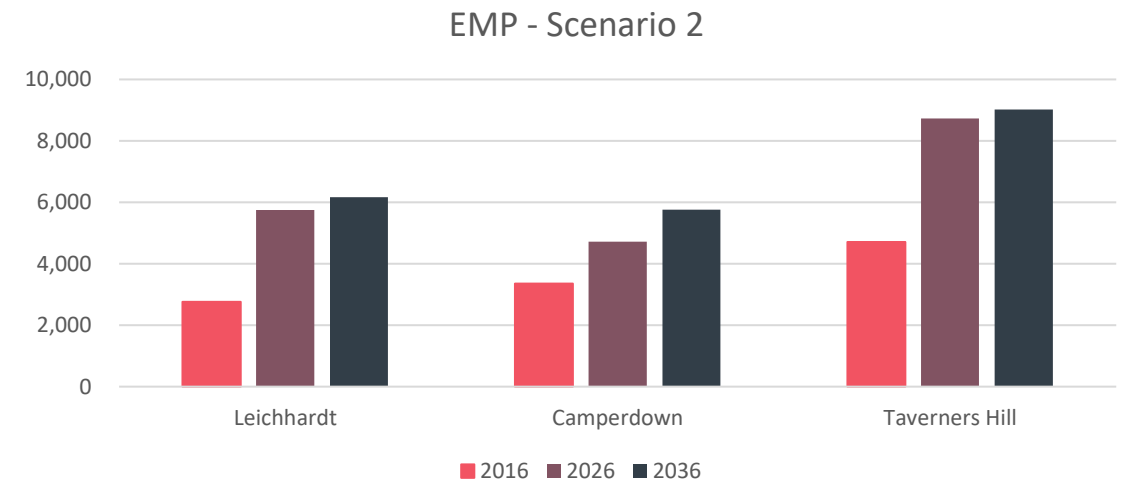
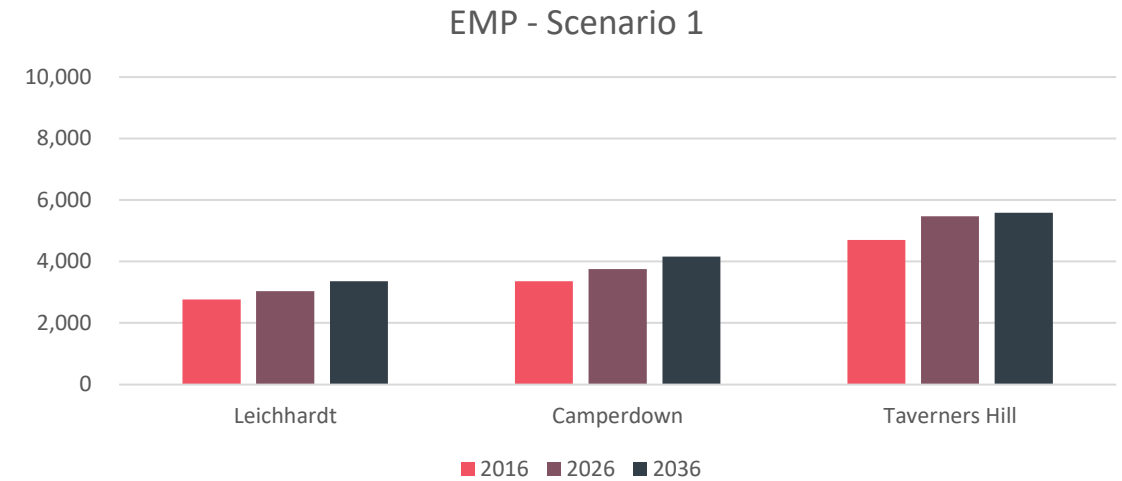
# Scenario Population Difference

2036 - Scenario 2 (With PRCUTS) – Scenario 1



# Employment overview

EMP	2016	2026	2036	2016-26	2016-36
<b>Scenario 1: Reference Case (without PRCUTS)</b>					
Leichhardt	2,766	3,033	3,363	267	597
Camperdown	3,354	3,752	4,162	398	808
Taverners Hill	4,705	5,471	5,590	765	884
Remainder	12,294	14,978	19,804	2,685	7,510
<b>Total (Entire Study Area)</b>	<b>23,119</b>	<b>27,234</b>	<b>32,918</b>	<b>4,115</b>	<b>9,799</b>
Total (Traffic Model Area)	19,755	23,268	29,299	3,512	9,543
<b>Scenario 2: Full development (with PRCUTS)</b>					
Leichhardt	2,766	5,748	6,172	2,983	3,406
Camperdown	3,354	4,716	5,767	1,362	2,413
Taverners Hill	4,705	8,732	9,025	4,026	4,319
Remainder	12,294	15,131	19,965	2,838	7,672
<b>Total (Entire Study Area)</b>	<b>23,119</b>	<b>34,327</b>	<b>40,929</b>	<b>11,208</b>	<b>17,811</b>
Total (Traffic Model Area)	19,755	30,361	37,310	10,606	17,555

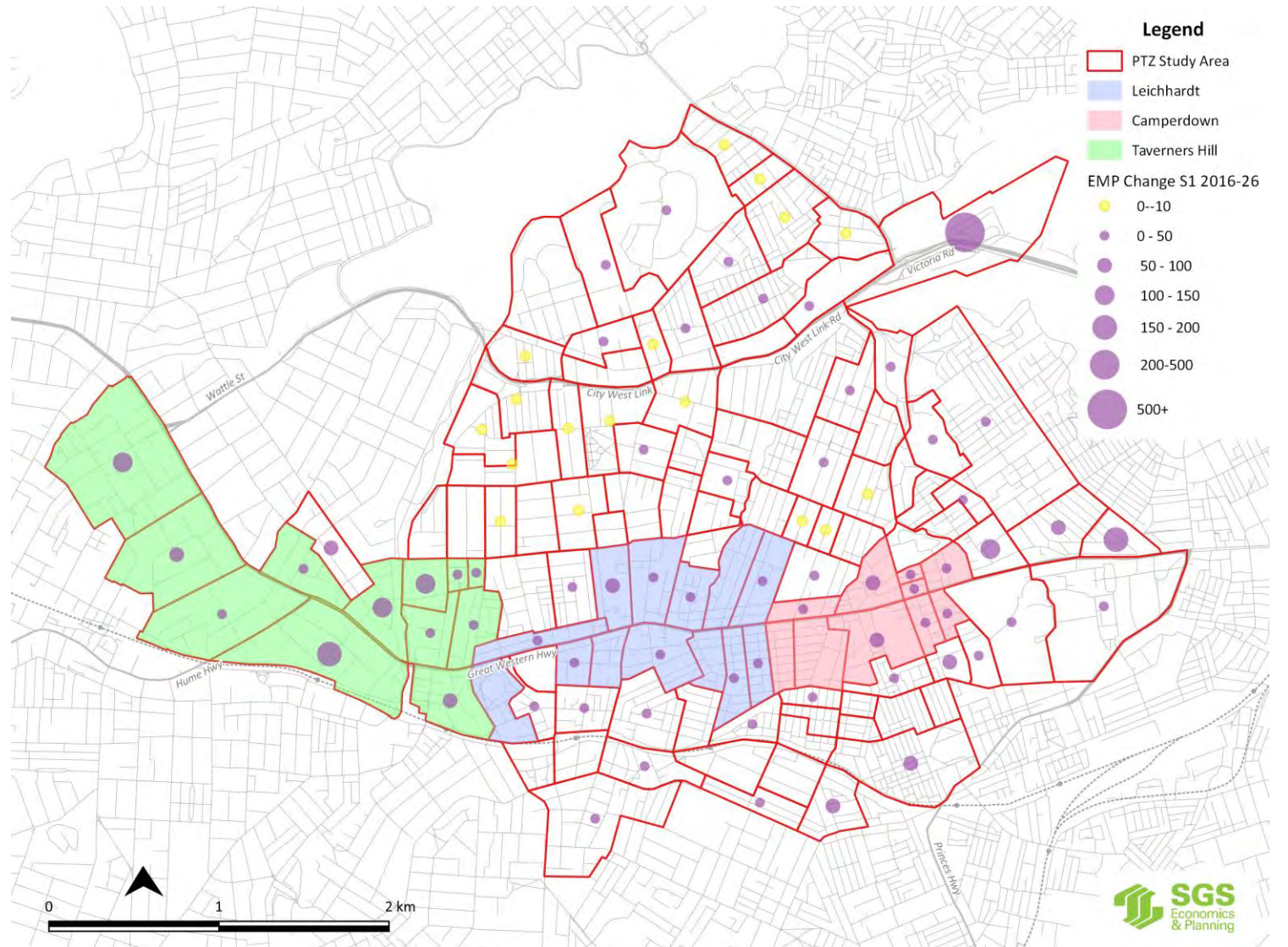


# Employment overview

	Retail			Office			Commercial			Other (inc. Hospital)		
EMP	2016	2036	2016-36	2016	2036	2016-36	2016	2036	2016-36	2016	2036	2016-36
<b>Scenario 1: Reference Case (without PRCUTS)</b>												
Leichhardt	1,351	1,569	218	2	3	1	337	444	107	759	880	121
Camperdown	803	997	194	1,068	1,384	316	461	573	112	951	1,105	154
Taverners Hill	1,080	1,236	156	1,420	1,891	471	476	701	225	270	343	73
Remainder	3,546	4,228	682	1,843	3,351	1,509	1,697	5,119	3,422	2,633	3,092	458
<b>Total (Entire Study Area)</b>	<b>6,780</b>	<b>8,030</b>	<b>1,249</b>	<b>4,333</b>	<b>6,629</b>	<b>2,296</b>	<b>2,970</b>	<b>6,836</b>	<b>3,866</b>	<b>4,614</b>	<b>5,420</b>	<b>806</b>
Total (Traffic Model Area)	6,049	6,582	533	3,741	5,055	1,314	2,783	6,594	3,811	4,271	4,953	682
<b>Scenario 2: Full development (with PRCUTS)</b>												
Leichhardt	1,351	2,932	1,580	2	4	2	337	824	487	759	1,675	916
Camperdown	803	1,700	898	1,068	1,384	316	461	699	239	951	1,878	926
Taverners Hill	1,080	1,520	441	1,420	4,294	2,874	476	1,366	890	270	425	155
Remainder	3,546	4,331	784	1,843	3,351	1,509	1,697	5,148	3,451	2,633	3,121	488
<b>Total (Entire Study Area)</b>	<b>6,780</b>	<b>10,483</b>	<b>3,703</b>	<b>4,333</b>	<b>9,033</b>	<b>4,701</b>	<b>2,970</b>	<b>8,038</b>	<b>5,067</b>	<b>4,614</b>	<b>7,099</b>	<b>2,486</b>
Total (Traffic Model Area)	6,049	9,590	3,541	3,741	8,252	4,511	2,783	7,795	5,013	4,271	6,632	2,361

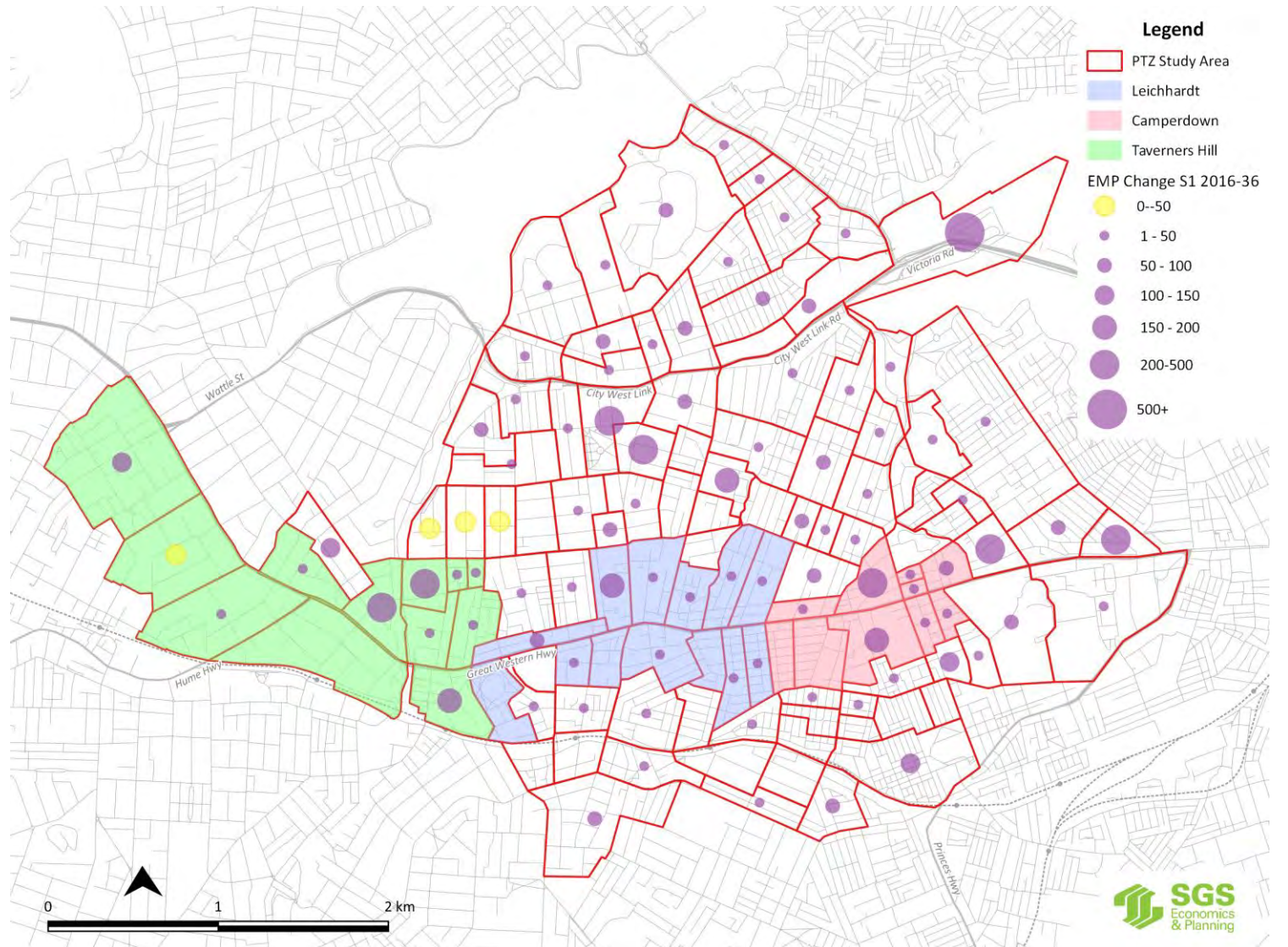
# Employment Change

- 2016 to 2026 - Scenario 1



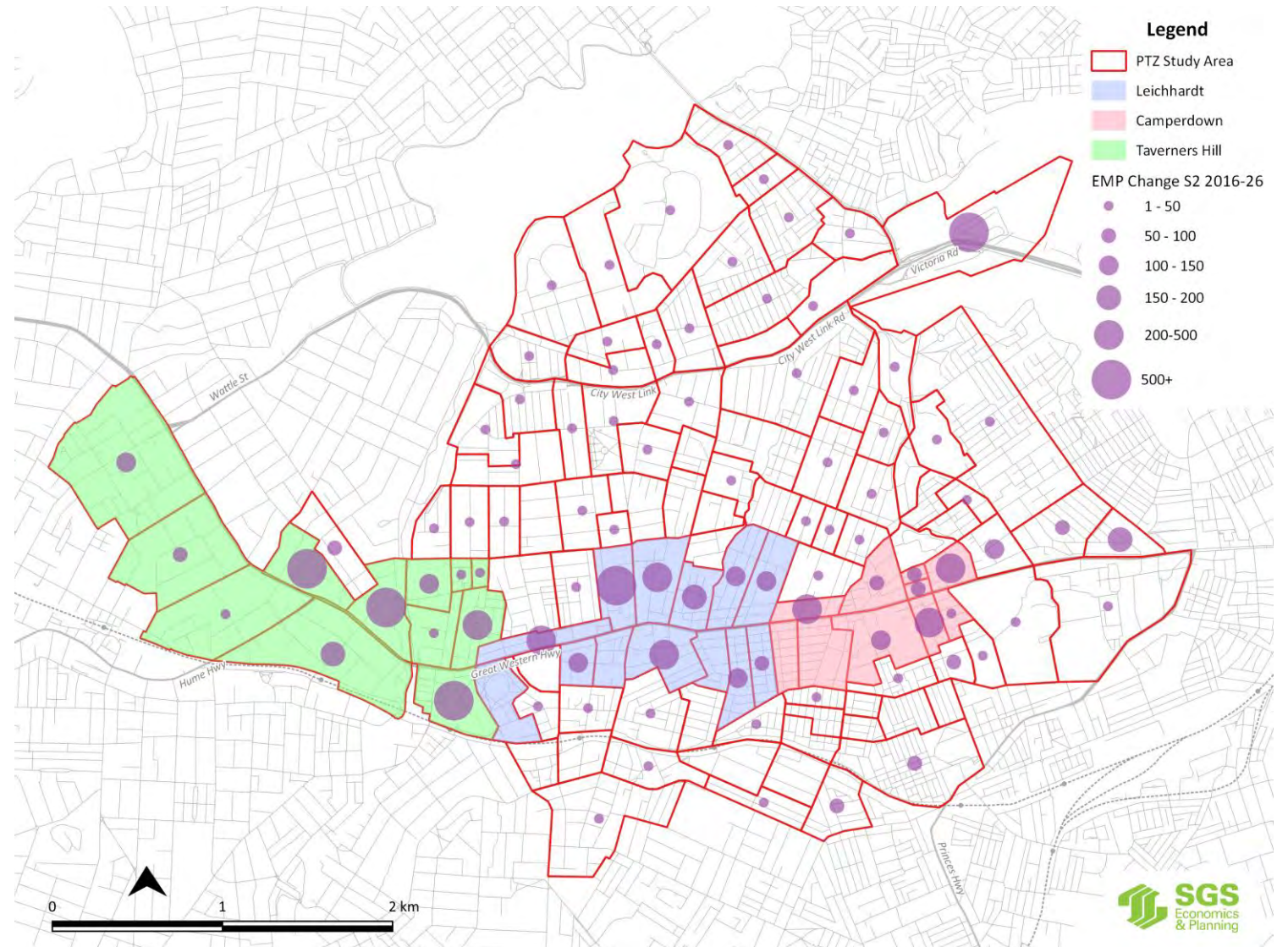
# Employment Change

- 2016 to 2036 - Scenario 1



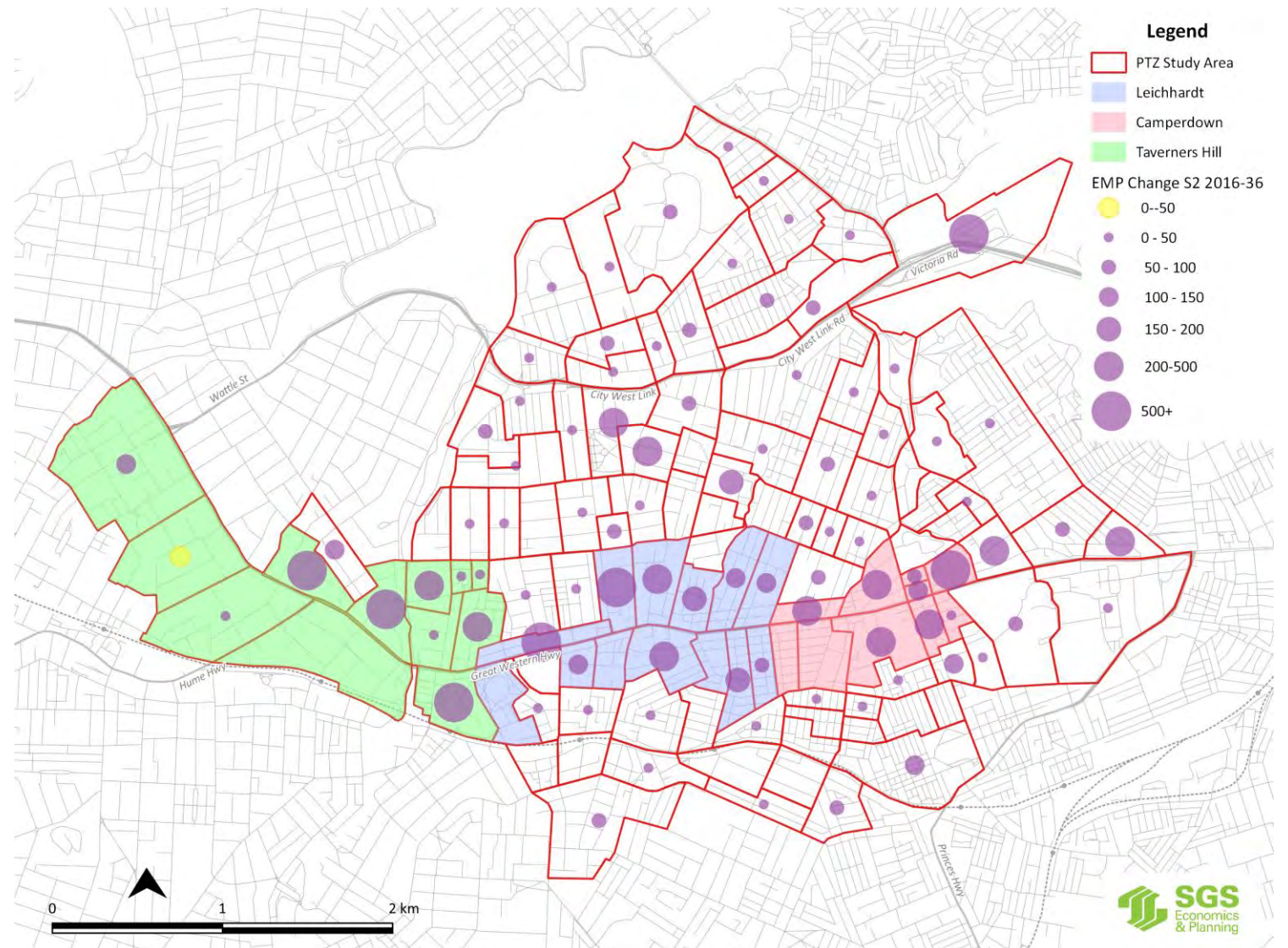
# Employment – Change

- 2016 to 2026 - Scenario 2



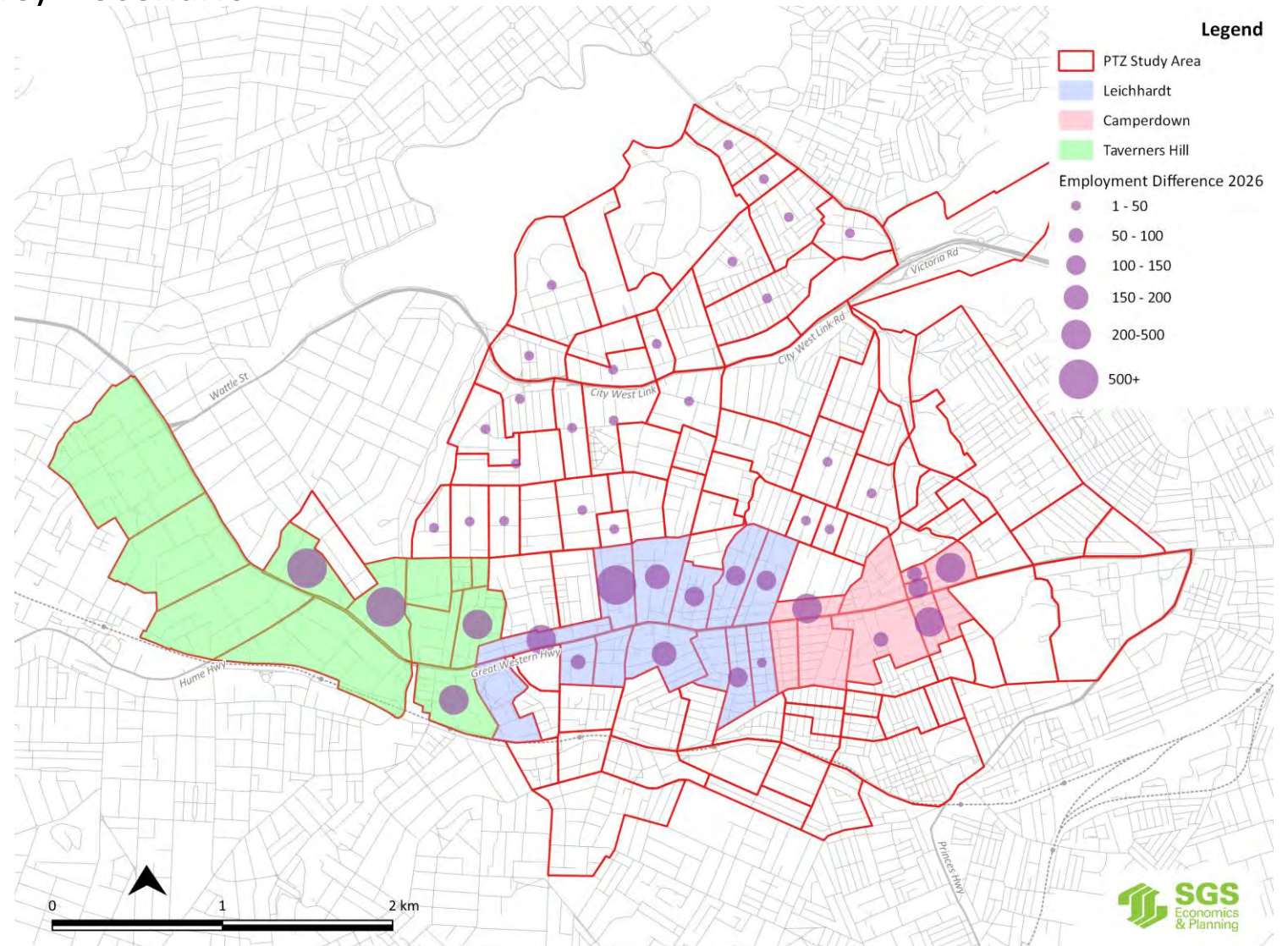
# Employment Change

- 2016 to 2036 - Scenario 2



# Employment Change

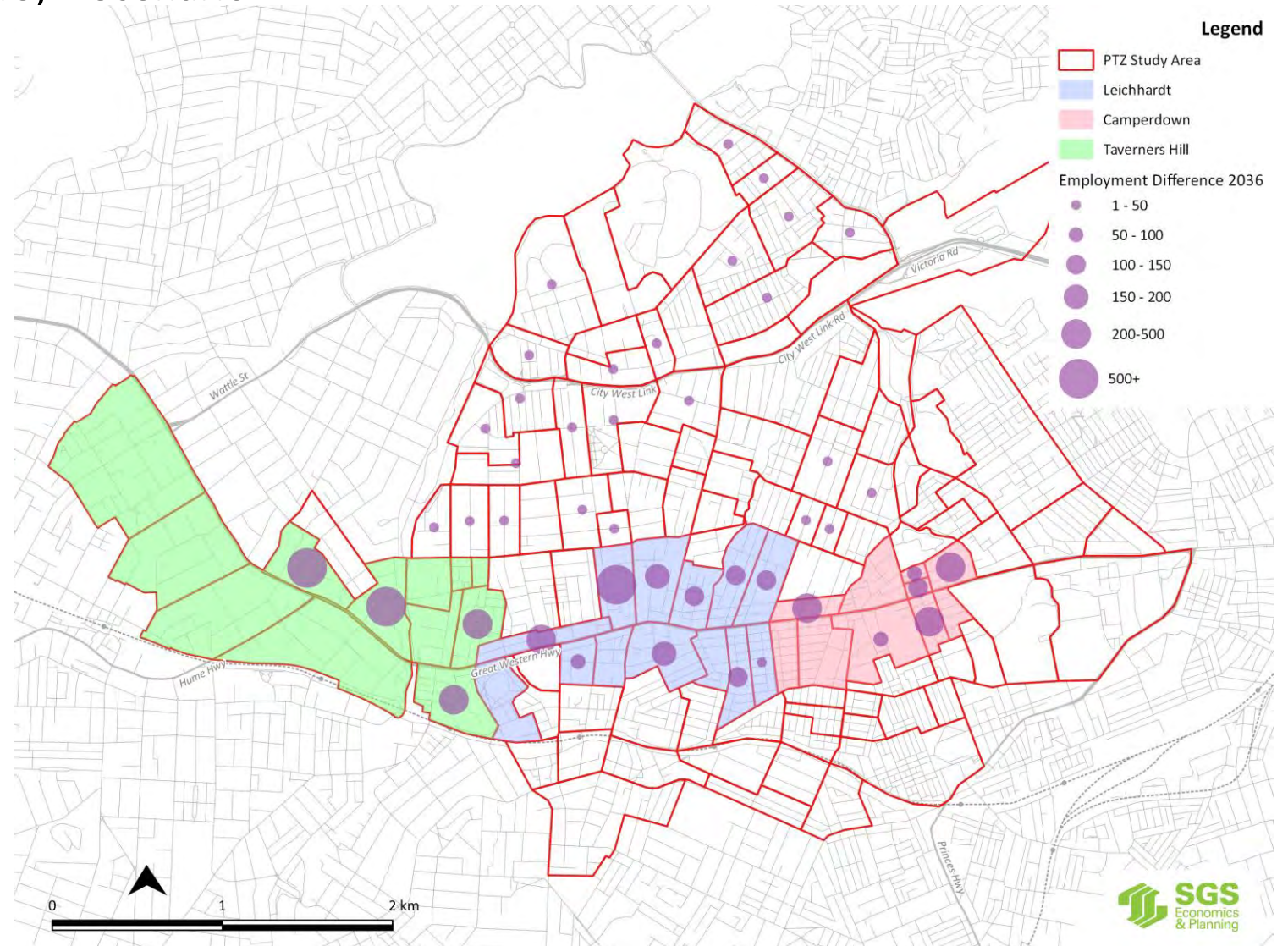
2016 to 2026 - Scenario 2 (With PRCUTS) – Scenario 1





# Employment Change

2016 to 2036 - Scenario 2 (With PRCUTS) – Scenario 1



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