SCT Consulting

ST LEONARDS SOUTH – TOP SPRING DEVELOPMENT PLANNING PROPOSAL

Traffic and Transport Study

5 FEBRUARY 2019

Quality Assurance

Project:	St Leonards South – Top Spring Development Planning Proposal		
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Client:	Top Spring Australia Properties PTY. LTD.	**ABN:**	73 609 089 330
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Document name:	St Leonards South – Top Spring Development Planning Proposal
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1.0	30 January 2019	Draft Report
2.0	4 February 2019	Updated Report based on comments
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4.0	5 February 2019	Updated Report based on comments

Contents

Executive Summary

The subject site for this proposal is the Top Spring owned land within St Leonards South, comprising 21-41 Canberra Avenue and 18-32 Holdsworth Avenue collectively (the site). The site is located within the St Leonards South Residential Precinct, which is currently in the process of a Council led planning proposal to deliver a high-density residential use with significant additional local infrastructure and green spaces.

This planning proposal which aims to make 350 – 370 apartments and townhouses permissible on 20 existing residential lots adjoining Canberra Avenue and Holdsworth Avenue.

This report contains a traffic and transport study of the proposed uplift on the surrounding transport systems, which builds on the exhibited St Leonards South Planning Proposal by Lane Cove Council (Council) and the St Leonards Crows Nest Land Use and Infrastructure Implementation Plan (LUIIP) by the Department of Planning & Environment (the Department). From a transport perspective, the proposed uplift is consistent with the previous work.

Based on traffic generation rates previously endorsed by Roads and Maritime Services of 0.14 vehicle trips per dwelling in the AM peak and 0.07 vehicle trips per dwelling in the PM peak, the traffic generation of the proposed uplift is less than 55 vehicular trips in both peak periods.

Previous traffic modelling undertaken by Council identified that with a suite of proposed upgrades, the network had the capacity to address the proposed uplift of 2,400 additional dwellings that comprise St Leonards South. The Department in their subsequently published LUIIP states that cumulative traffic impact assessment is required as part of the St Leonards South planning proposal. It is proposed that additional cumulative traffic impact assessment modelling would be undertaken post gateway decision by Department in partnership with Council, the Department, Roads and Maritime and Transport for NSW.

Previous work by Council and the Department identifies several walking and cycling opportunities to increase accessibility to the stations at St Leonards and Crows Nest, including provision of east-west through-site connections. The proposal includes a delivery of a walking connection on the site. The site will also contribute to local and state infrastructure through relevant mechanisms.

The site also has excellent access to transport, being less than 800m walk from St Leonards Station and less than 1km from the new Crows Nest Metro station. These two stations provide access to destinations across Sydney and make this development transit-oriented. The site is also located within 100 metres of bus services on River Road.

As the site is located within 400m of a rail station, the Lane Cove Council DCP – St Leonards Centre car park provisions apply to this development. As per the *Apartment Design Guide*, this rate is the smallest rate and therefore the binding rate for the property

This means the following spaces will need to be provided for each dwelling type;

– Studio: 0.5 spaces;

– 1 Bed: 0.5 spaces;

– 2 bed: 0.9 spaces;

– 3 bed: 1.4 spaces; and

– Visitor 0.2 spaces per dwelling.

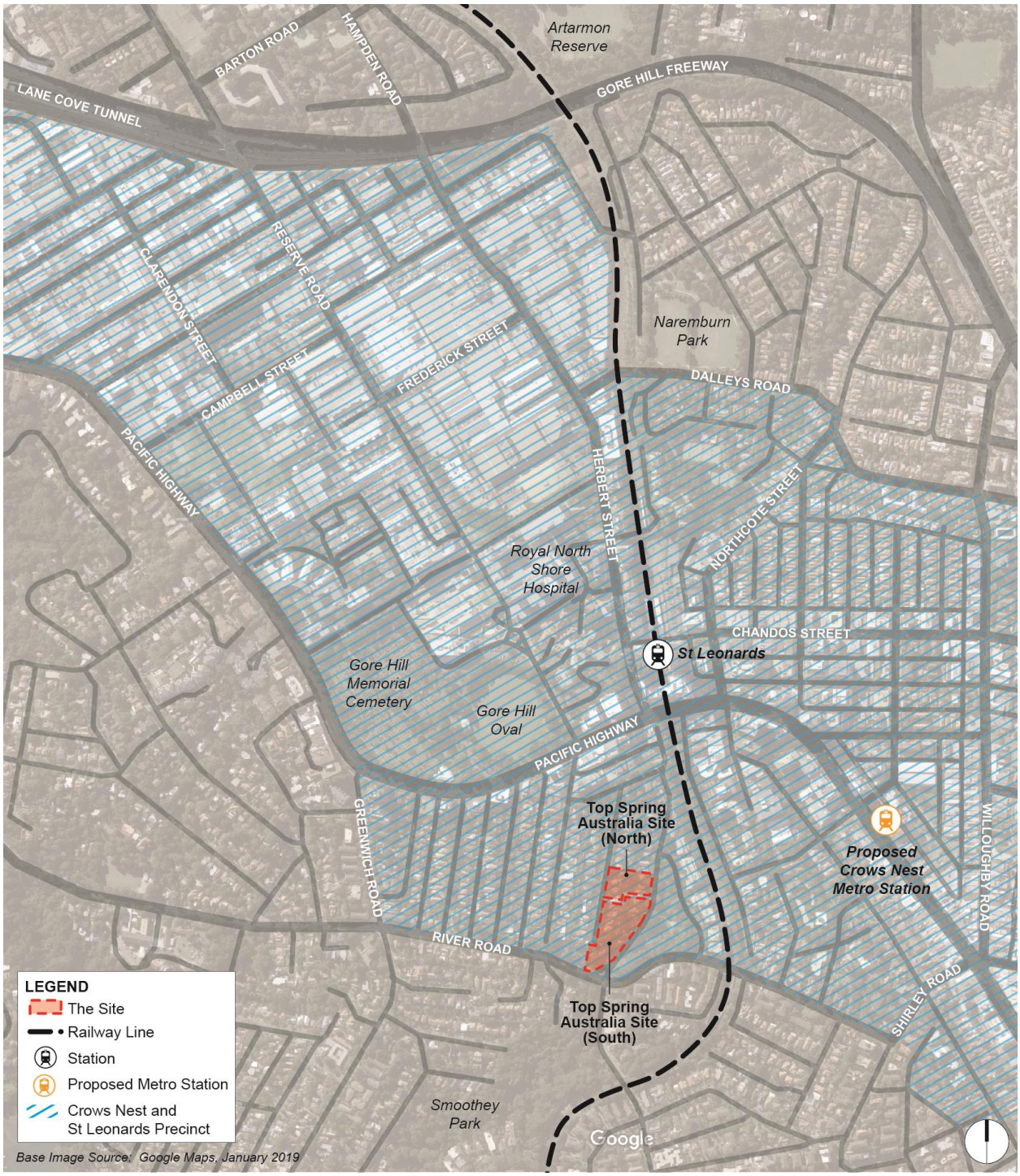
After lodgement, the proponent will work with Council and other stakeholders to refine the proposal in line with comments.

1.0 Introduction

1.1 Background

SCT Consulting has been engaged by Top Spring Australia to prepare a Traffic and Transport Study to support a Planning Proposal for St Leonards South – Top Spring site, as shown in **Figure 1-1**. The Planning Proposal is also supported by a Concept Development Application and a Traffic Report.

Figure 1-1 Proposed rezoning area



Source: SCT Consulting, January 2019

The subject site for this proposal is the Top Spring owned land within St Leonards South, comprising 21-41 Canberra Avenue and 18-32 Holdsworth Avenue. The site is located within the St Leonards South Residential Precinct, which is currently in the process of a Council led planning proposal to deliver a high-density residential use with significant additional local infrastructure and green spaces.

Key transport infrastructure that already exists near the site includes:

– Pacific Highway: a major route for general traffic and the majority of bus routes; and

– T1 Railway line: this provides a high capacity public transport service with the approximate 30-minute catchment to stations including Waitara, Pennant Hills, Edgecliff, Sydenham and just short of Burwood.

The site is ideally located approximately 450m south from the St Leonards Strategic Centre and rail station, and 100 metres from Route 261 bus stops on River Road. St Leonards is identified as a key health and education precinct and is anticipated to have substantial employment growth following the opening of the Crows Nest Metro Station. The site is also located 500m from Royal North Shore hospital which is a key employer in the area.

The proposed Sydney Metro City and Southwest (proposed to be operational by 2024) will provide significant capacity to the transport network in the Precinct with a station proposed at Crows Nest. Crows Nest Metro Station will increase the proportion of the Precinct within a convenient catchment of a high quality and high capacity rail transport infrastructure. This will improve the accessibility of the sites to other areas of Sydney and is expected to reduce the need for private vehicle ownership and car parking.

This precinct has been supported for uplift in every draft and published Local and State government strategic document for the past five years, to assist in meeting local housing targets and to provide housing diversity within walkable distance to strategic centres and infrastructure.

This planning proposal supports the growth of a high density residential precinct with high quality open space and public benefits, providing more homes close to jobs, as encouraged in the Greater Sydney Commission's (GSC) North District Plan.

1.2 Traffic assessment approach

Previously, detailed traffic assessments have been conducted for Lane Cove Council's St Leonards South Planning Proposal, as well as a Strategic Transport Study prepared for the St Leonards and Crows Nest 2036 Draft Plan.

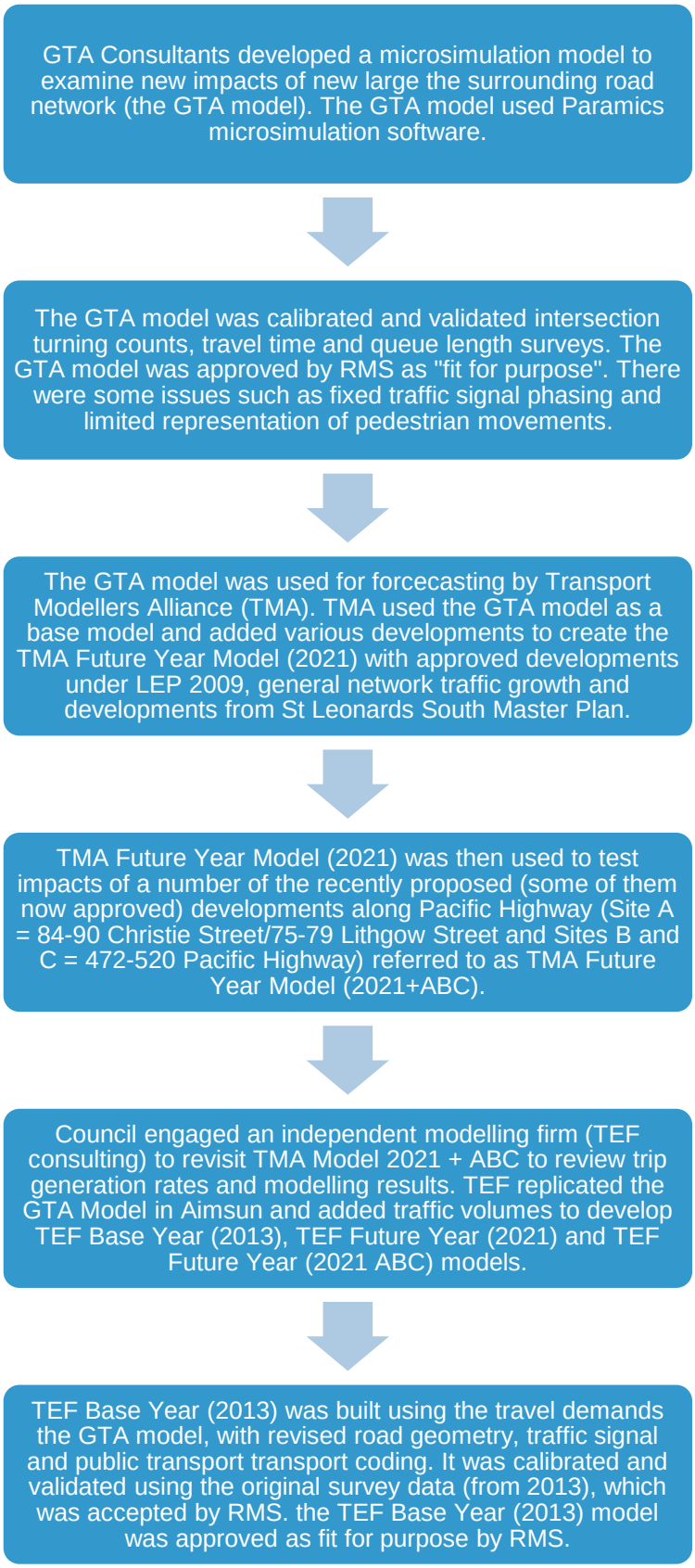
In 2017, TEF Consulting conducted a review and independent assessment of the cumulative traffic impacts of current proposals, and other approved proposals, within the St Leonards South (where the subject sites are located) and St Leonards East areas.

Commencing in October 2016, Cardno conducted a Strategic Transport Study for the Department of Planning and Environment for the St Leonards and Crows Nest Station Precinct, including the St Leonards South area. Five scenarios were tested through the modelling process.

See **Figure 1-2** for a flowchart of the assessment and modelling history.

This Traffic and Transport Study is consistent with the methodologies and findings of the traffic studies conducted for the St Leonards South Planning Proposal and the Land Use and Infrastructure Implementation Plan (LUIIP) for the St Leonards Crows Nest Planned Precinct. As such, due to the recent extensive traffic assessments already conducted in the area, a qualitative review of traffic implications was required for the traffic implications of the Top Spring development.

Figure 1-2 Historical assessment and modelling approach



Source: TEF Consulting and SCT Consulting, 2019

1.3 Purpose of report

The purpose of this report is to provide an assessment of the traffic and parking effects of the Planning Proposal. The purpose of this Traffic and Transport Study is to:

- Undertake a background research to inform the strategic context of the proposal;
- Collate existing traffic and travel pattern data;
- Review of existing traffic and transport conditions;
- Understand the status of any planned and committed infrastructure upgrades as well as land use changes;
- Estimate trip generation and trip distribution to understand likely implications of the proposed development;
- Determine likely infrastructure upgrades required to cater for the proposed development; and
- Identify public and active transport measures and sustainable travel initiatives for the development, as well as the likely required parking provision.

1.4 Report structure

This report has been structured into the following sections:

- **Section 2** provides a summary of the review of all relevant background documents;
- **Section 3** describes the existing transport conditions for all modes of transport;
- **Section 4** describes the proposed development, its access strategy and a review of Council parking and access requirements;
- **Section 5** outlines the traffic and transport appraisal which describes the likely trip generation and indicative impact from the proposed development as part of the Planning Proposal; and
- **Section 6** summarises presents the final conclusions and next steps of the study.

2.0 Strategic Context

Several relevant planning documents have been reviewed to provide background context for guiding the development of the concept plan and traffic and transport initiatives for this subject planning proposal.

2.1 Future Transport 2056 Strategy

The Future Transport Strategy 2056 (The NSW Government, March 2018) is an update of NSW's Long-Term Transport Master Plan. It is a vision for how transport can support growth and the economy of New South Wales over the next 40 years. The strategy is underpinned by the Regional Services and Infrastructure Plan and the Greater Sydney Services and Infrastructure Plan, as well as a number of supporting plans including Road Safety and Tourism.

The Future Transport Strategy 2056 sets the long-term vision for mobility and transport provision in NSW, explains how the customer experience of transport will change and what this means for NSW. The Future Transport Strategy 2056 identifies that Sydney will grow as a global metropolis with benefits distributed more evenly across the City. It sets out a vision of three cities to guide many of the planning, investment and customer outcomes including faster, convenient and reliable travel times to major centres, as shown in **Figure 2-1**.

Existing and potential transit connections, together with new technology and innovation, will make the network surrounding the Site more responsive to demand and better able to manage congestion in the future.

For the three cities identified, more specific outcomes listed as part of the Strategy which will benefit the Site's transport context, include:

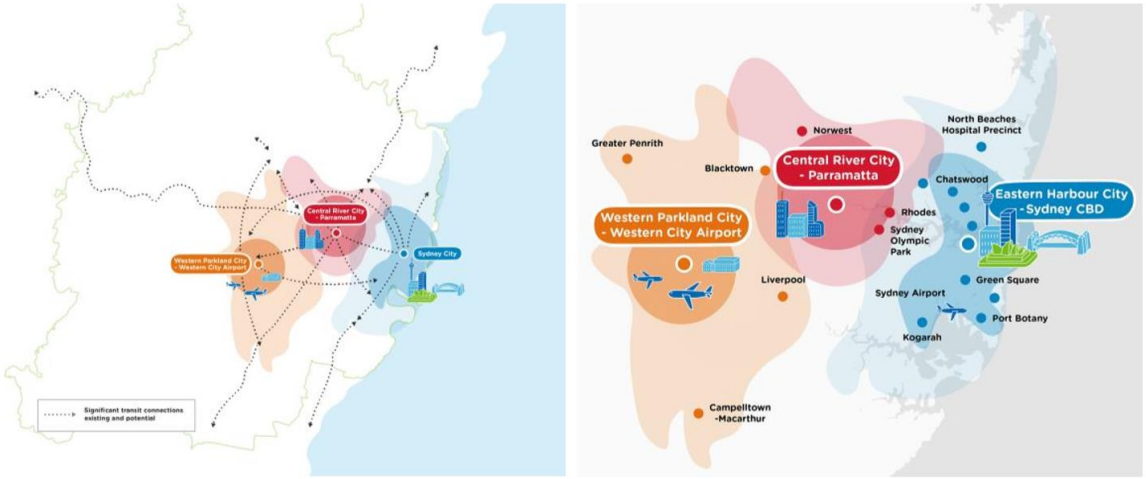
– A 30 minutes access for customers to their nearest Centre by public transport 7-days a week;

– Fast and convenient interchanging with walking times no longer than 5 minutes between services;

– Walking or cycling is the most convenient option for short trips around centres and local areas, supported by a safe road environment and attractive paths; and

– Fully accessible transport for all customers.

Figure 2-1 A future metropolis of three cities

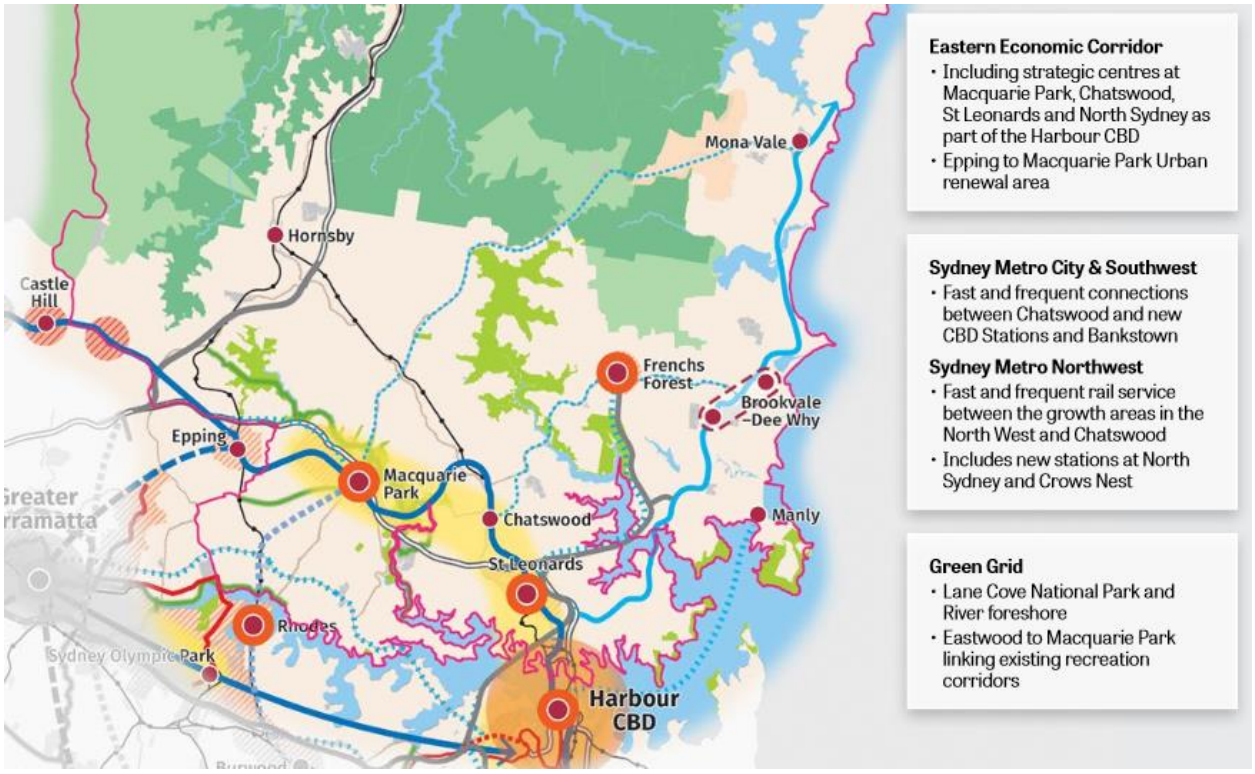


Source: Future Transport 2056 Strategy

2.2 North District Plan

The vision for the North District is to help residents have quicker and easier access to a wider range of jobs, housing types and activities as part of the transformation of their District. The vision will improve the District's lifestyle and environmental assets. It will also lead to fast and reliable transport connections including strategic centres. The North District Plan indicated that there will be demand for an additional 92,000 dwellings in the next 20 years, which will be provided through urban renewal around new and existing infrastructure, land release and infill developments.

Figure 2-2 North District Plan



Source: North District Plan

The District Plan informs local strategic planning statements and local environmental plans, the assessment of planning proposals as well as community strategic plans and policies. The District Plan also assists councils to plan for and support growth and change and align their local planning strategies to place-based outcomes. It guides the decisions of State agencies and informs the private sector and the wider community of approaches to manage for growth and change. Community engagement on the District Plan has contributed to a plan for growth that reflects local values and aspirations, in a way that balances regional and local considerations.

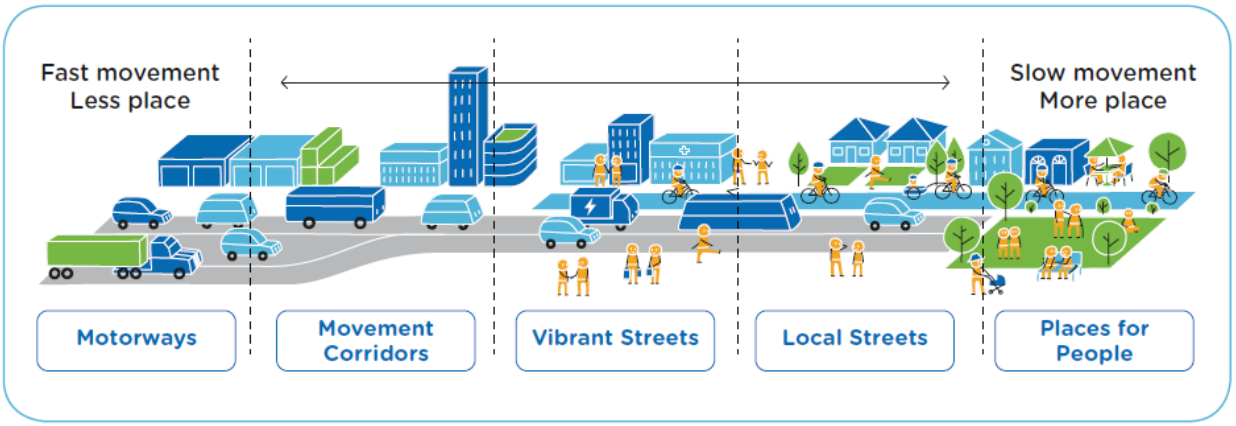
The vision for Greater Sydney is one where people can access jobs and services in their nearest metropolitan and strategic centre. The 30-minute city is a long-term aspiration that will guide decision-making on locations for new transport, housing, jobs, tertiary education, hospitals and other amenities. It means that they will be planned for metropolitan and strategic centres and more people will have public transport access to their closest metropolitan or strategic centre within 30 minutes. This will enable more efficient access to workplaces, services and community facilities.

2.3 Greater Sydney Services Infrastructure Plan

The Greater Sydney Services and Infrastructure Plan is a 40-year plan for transport in Sydney. It is designed to support the land use vision for Sydney. Building on the state-wide transport outcomes identified in the Future Transport Strategy 2056, the Plan establishes the specific outcomes transport customers in Greater Sydney can expect and identifies the policy, service and infrastructure initiatives to achieve these.

To support the liveability, productivity and sustainability of places for the transport network, a Movement and Place Framework was developed. The Framework acknowledges that transport networks have different functions and roles and serve as both a destination and as a means to move people and goods. The Movement and Place Framework will enable us to plan, design and operate the transport network to meet these different needs by providing greater transparency, supporting collaboration between those responsible for land use, transport and roads while also encouraging input from the community. Through the framework we will be able to design a future network that is better used and supports the safe, efficient and reliable movement of goods and the need for liveability of places along it.

Figure 2-3 Different movement environments under the Movement and Place Framework



Source: https://future.transport.nsw.gov.au/wp-content/uploads/2018/plans/Greater_Sydney_Services_Infrastructure_Plan.pdf (April, 2018)

2.3.1 Future Transport Network

2.3.1.1 City-shaping network

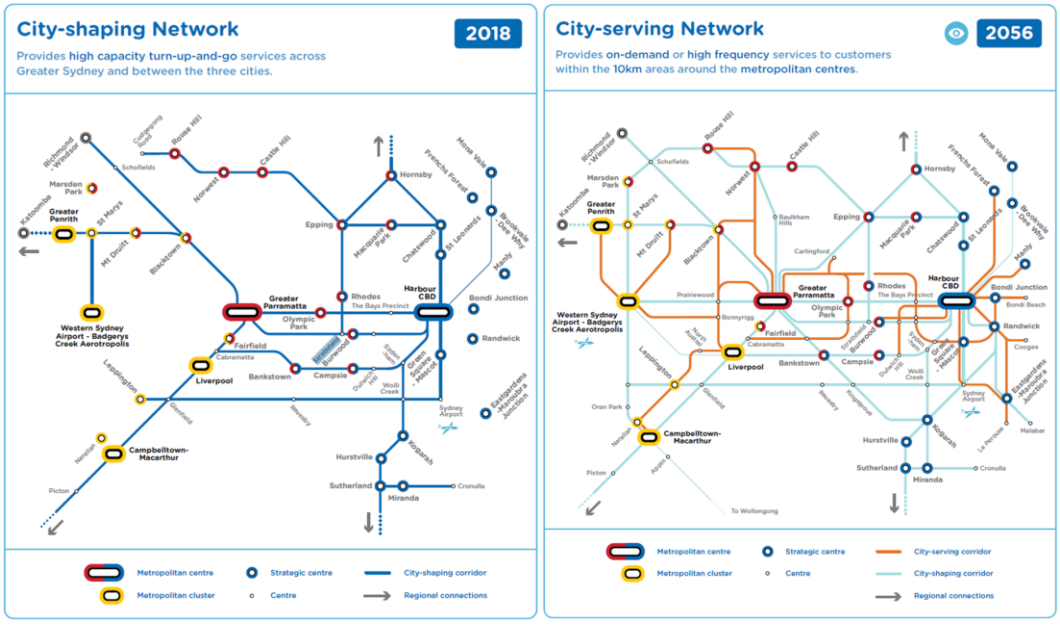
The city-shaping network includes higher speed and volume linkages between our cities and centres. The function of this network is to enable people living in any of the three cities to access their nearest metropolitan centre within 30 minutes and to be able to travel efficiently between these metropolitan centres.

As Greater Sydney transitions to a metropolis of three cities, the city-shaping network will need to expand to provide improved access to and between each metropolitan city/centre, particularly Greater Parramatta and centres in the metropolitan cluster in the Western Parkland City.

2.3.1.2 City-serving network

The city-serving network will provide high-frequency services within a ~10km radii of the three metropolitan cities/centres. This will support access within some of the densest land use in Greater Sydney where demand for travel is most concentrated. As these inner urban areas in each of the three cities develop and become denser, the government will investigate the prioritisation of on-street public transport services and invest in higher frequency services.

Figure 2-4 Greater Sydney and 2056 transport network vision



Source: https://future.transport.nsw.gov.au/wp-content/uploads/2018/plans/Greater_Sydney_Services_Infrastructure_Plan.pdf (April, 2018)

Implication for Top Spring Development: St Leonards is part of both city-shaping and city-serving networks that would bring St Leonards South development into reach of Greater Sydney and all three cities by high frequency and high capacity public transport links.

2.3.1.3 Bicycle Network

Building on the existing network, our immediate focus is working with local councils to deliver committed Priority Cycleway projects to address key missing links around the Harbour CBD, Greater Parramatta, Greater Penrith, Blacktown and Liverpool, such as the Nepean River Green Bridge and Inner West Greenway. Council partnership programs are delivering local bicycle infrastructure. Bicycle parking is also being rolled out at interchanges.

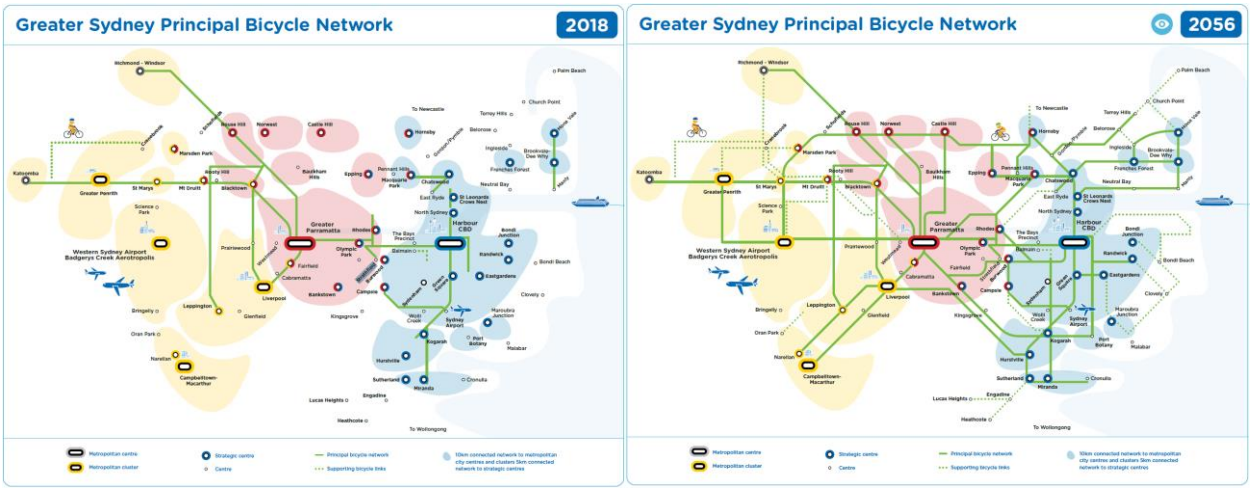
By 2056:

– Walking and cycling network coverage will be improved by using state held corridors for public transport, pipelines, waterways, crown land and service easements for bicycle network infrastructure; and

– That all strategic centres have connected walking and cycling networks, including strategic centres across the Western Parkland City.

Further investment in connections to strategic centres and in the Principal Bicycle Network will support walking or cycling being the most convenient option for short trips, improving health outcomes, safety and convenience for customers as well as boosting the productivity, liveability and sustainability of Greater Sydney. **Figure 2-5** shows the current/committed Greater Sydney Bicycle Network alongside the envisioned 2056 Bicycle Network.

Figure 2-5 Current/committed and 2056 Greater Sydney Principal Bicycle Network



Source: https://future.transport.nsw.gov.au/wp-content/uploads/2018/plans/Greater_Sydney_Services_Infrastructure_Plan.pdf (April, 2018)

2.4 Sydney Metro

2.4.1 Overview

Sydney Metro is one of Australia's biggest public transport projects aimed to be delivered by 2024. The project consists of 31 metro stations spanning over 66 kilometres aimed to deliver a new generation of fast, efficient and reliable train service. Stage 1 of the project is scheduled to be operational between the north-west region of Sydney and Chatswood on the first half of 2019.

Stage 2 of the project will encompass new stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street and Waterloo prior to connect with Central Station and is scheduled to be operational by 2024.

The Crows Nest Station will be located on the western fringe of Crows Nest Village, between Pacific Highway and Clarke Lane (eastern side of Pacific Highway and Oxley Street, south of Hume Street, for which the construction has already commenced.

The station provides new metro rail access to the Crows Nest residential area and serves people within walking and cycling distance. It improves travel to local schools, businesses and Crows Nest village. The station creates a new

transport focus on the southern side of the St Leonards specialised centre which supports the St Leonards southern gateway to commercial and mixed-use activities.

The station includes:

– A pedestrian crossing with traffic lights at the Pacific Highway / Oxley Street intersection;
– Pedestrian crossings on Clarke, Hume and Oxley streets;
– Bike parking at both station entries;
– On-road marked cycle links on Hume and Oxley Streets;
– Kiss and ride and taxi bays on Clarke Street;
– Existing bus stops close to the station retained on the Pacific Highway; and
– Wayfinding signage and Sydney Metro information.

Implication for Top Spring Development: The Sydney Metro project and Crows Nest station will:

– Improve public transport connectivity between the site and major employment centres across Metropolitan Sydney.
– Reduce future residents' reliance on private vehicles and result in a significant mode shift towards public transport.
– Improve walking, cycling and public transport connectivity from the surrounding areas to Crows Nest Station.

2.5 Western Harbour Tunnel Beaches Link

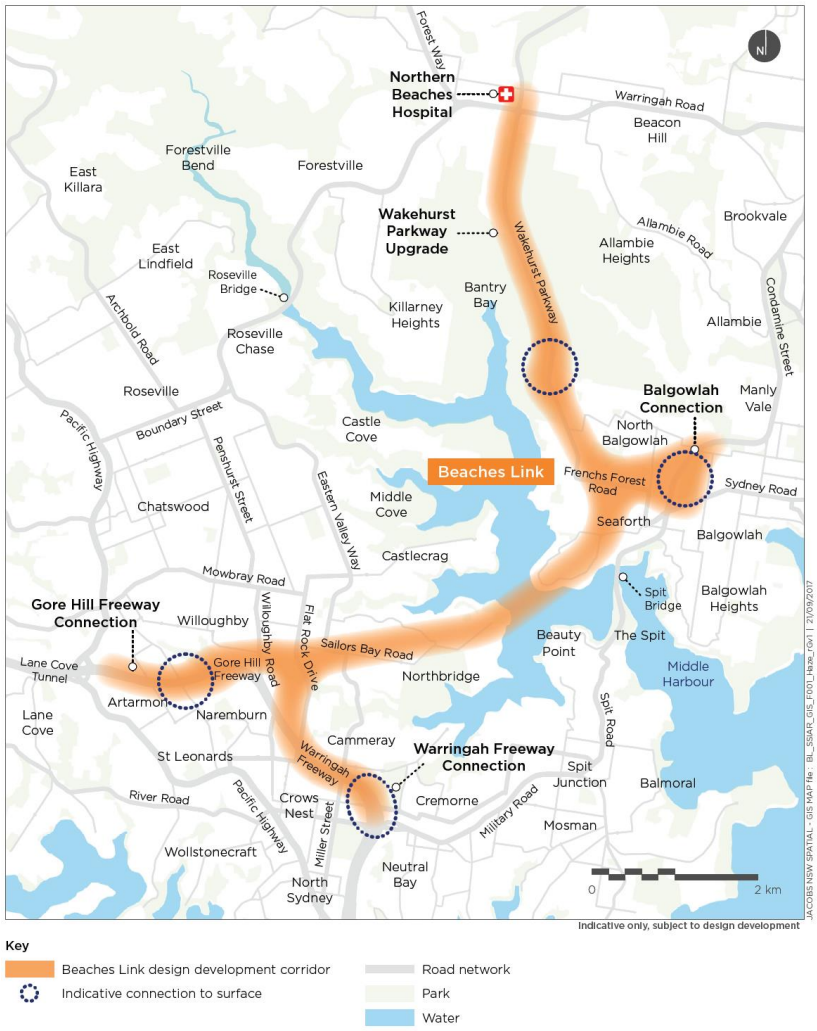
The Western Harbour Tunnel and Beaches Link (WHTBL) project is a NSW Government initiative to improve the capacity of the road network surrounding the Sydney Harbour as well as providing a direct link from Sydney Harbour to the northern beaches region. Together the Western Harbour Tunnel and Beaches Link program of works would form a new integrated north-south motorway connection that would reduce congestion, improve journey times, support rapid movement of people and freight, and enhance the resilience of the road network across Sydney.

The Western Harbour Tunnel and Beaches Link program of works includes:

– The Western Harbour Tunnel and Warringah Freeway Upgrade project, comprising a new tolled motorway tunnel connection across Sydney Harbour, and the Warringah Freeway Upgrade to integrate the new motorway infrastructure with the existing road network and to connect to the Beaches Link and Gore Hill Freeway Connection; and
– The Beaches Link and Gore Hill Freeway Connection, including a new tolled motorway tunnel connection from the Warringah Freeway to Balgowlah and Frenchs Forest, and upgrade and integration works to connect to the Gore Hill Freeway.

In particular, the Beaches Link project is proposed to span from Gore Hill Freeway, at Artarmon, to Burnt Bridge Creek Deviation, at Balgowlah, and Wakehurst Parkway at Seaforth, as shown in **Figure 2-6**.

Figure 2-6: Indicative alignment of the Beaches Link



Source: Roads and Maritime Services, 2017

2.6 St Leonards Crows Nest Planned Precinct

2.6.1 Overview

With the new metro station planned at Crows Nest, the Department of Planning and Environment recognises an opportunity to renew and activate the St Leonards and Crows Nest precinct by providing new homes and jobs close to transport, open space and social infrastructure. To facilitate this, a Land Use and Infrastructure Implementation Plan is currently under review to provide the strategic planning framework to guide the future development and infrastructure delivery over the next 20 years.

A Draft Plan was released for the precinct in October 2018 that identified the vision, objectives and design principles for the precinct.

The vision for the precinct in 2036 is that it will be a “major centre for workers, residents, students and visitors, offering a variety of homes, jobs and activities for the diverse local population. The area will continue to be a place that people are proud to work in, visit and call home”. It forecasts that over the next 20 years 16,500 new jobs will be delivered in the area due to continued growth in the health and technology centres. The vibrant community with cater for people of all ages, through a diverse range of homes supported by community services, open spaces and unique local experiences.

The vision for Movement in the Draft Plan shows the importance of the St Leonards Crows Nest precinct being an accessible place. This involves being an attractive and easy area to walk, cycle and move through and by improving a variety of local and regional connections.

The Movement objectives in the St Leonards and Crows Nest area include;

– Providing clear and direct pedestrian and cycle routes to priority destinations such as St Leonards Station, Crows Nest Station, Royal North Shore Hospital and St Leonards TAFE;
– Undertaking footpath and cycle path improvements;
– Improving pedestrian crossings;
– Strengthening connections between the two stations;
– Promoting the provision of end of trip facilities to support cycling;
– Limiting the amount of car parking provided with new developments subject to outcomes of traffic and transport modelling;
– Encouraging the use and accommodation of share car facilities; and
– Undertaking improvements to road connections.

Based on these movement principals, the following local character statement movement principles were established;

– Deliver connectivity improvements to and around St Leonards and Crows Nest stations to make it easy to travel to schools, work, shops and meet up with friends both within the area and further afield;
– Investigate new and improved cycleways and walkways to make it easy, safe and comfortable to move within the local area;
– Consider more opportunities to safely cross the Pacific Highway; and
– Consider a coordinated parking strategy to manage the community’s needs, while minimising traffic congestion.

Figure 2-7 highlights the Local Character Movement principles for the area.

Figure 2-7: St Leonards and Crows Nest local character movement principles

Source: NSW Department of Planning & Environment, October 2018

The Draft Plan also identified a number of requirements for St Leonards South in the Lane Cove Council Planning Proposal relevant to transport:

– Consider accessibility to St Leonards and Crows Nest Stations;

– Improve active transport connection; and

– Consider cumulative traffic impacts.

2.6.2 LUIIP St Leonards South Recommendations

The St Leonards South Planning Proposal involves changing the existing zoning in order to allow for higher density residential development of between four and 19 storeys. The proposed design principals of the site include considerations of accessibility to St Leonards and Crows Nest stations, minimised overshadowing of public open space and streets, improving active transport connections and considering cumulative traffic impacts. This proposal has been recommended for review by an independent panel.

Figure 2-8: St Leonards South boundary

Source: NSW Department of Planning & Environment, 2018

These selected recommendations relevant geographically for St Leonards South, identified in the St Leonards and Crows Nest 2036 Draft Plan (Department of Planning and Environment, 2018) are shown in **Table 2-1**.

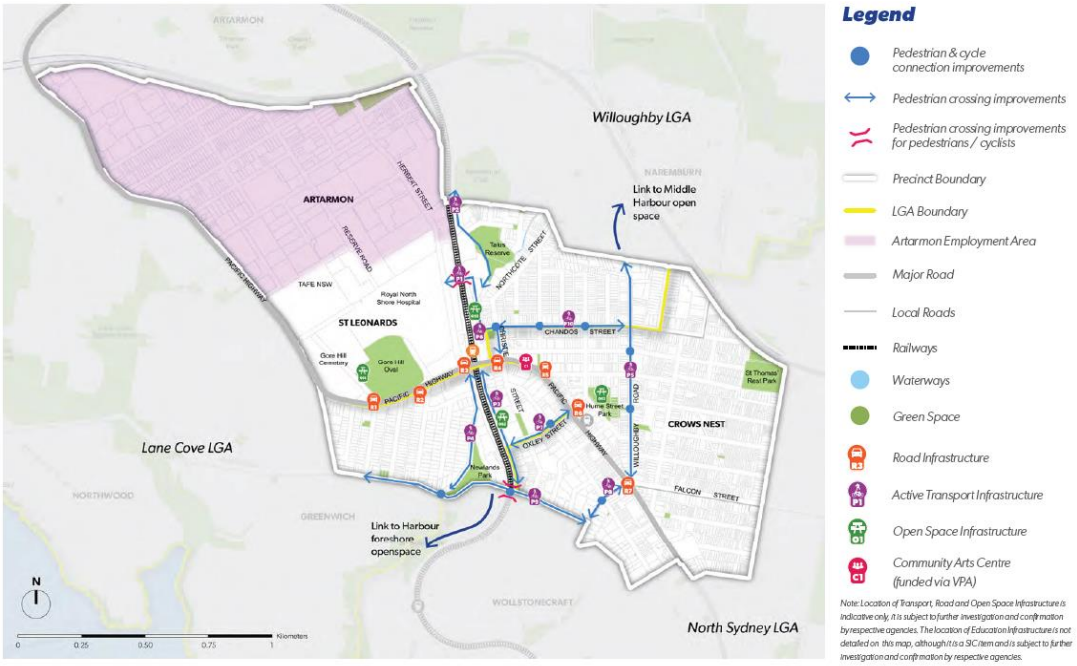
Table 2-1 St Leonards South planned transport infrastructure

#	Location	Description	Status	Rationale
Infrastructure to be funded by the Special Contribution Contribution (SIC) scheme				
P3	Pacific Highway to River Road via southern linear park	Pedestrian and cycle connection	Subject to further investigation and detailed design	Provide pedestrian and cycle connection from Pacific Highway to River Road via southern linear park.
P4	Canberra Avenue between Pacific Highway and Marshall Avenue	Pedestrian path widening	Subject to further investigation and detailed design	Canberra Ave is an important regional walking and cycling link between St Leonards Station, Newlands Park and Wollstonecraft Station. This link could be enhanced to cater for increased use.
P4	Canberra Avenue between the Pacific Highway and River Rd	Provide shared path on Canberra Avenue to link to River Road and provide pedestrian and cycle improvements	Subject to further investigation and detailed design	Canberra Ave is an important regional walking and cycling link between St Leonards Station, Newlands Park and Wollstonecraft Station. This link could be enhanced to cater for increased use.
P4	Intersection of Canberra Avenue and Duntroon Avenue	Enhance pedestrian crossing to link	Subject to further investigation and detailed design	Enhance pedestrian crossing to link with proposed footpaths on the eastern side of Canberra Avenue.

#	Location	Description	Status	Rationale
P4	Intersection of Canberra Avenue and River Road	New signalised intersection and crossing	Subject to further investigation, liaison with RMS, modelling and detailed design	A signalised crossing could be provided at the intersection of River Rd and Canberra Ave to improve crossing opportunities for pedestrians and cyclists. The north south link along Canberra Avenue is an important regional link between St Leonards, Greenwich and Wollstonecraft Station.
P9	River Road between Greenwich Road and Shirley Road.	Shared path	Subject to further investigation, liaison with RMS, modelling and detailed design	Improved east-west connectivity along the southern boundary of the precinct.
P9	Railway overpass on River Road between Lithgow Street and Duntroon Avenue	Widen rail bridge to provide shared path. Potential pedestrian crossing enhancements over River Rd.	Subject to further investigation, liaison with RMS, modelling and detailed design	Widening the existing railway bridge on River Rd could provide an opportunity for a shared pedestrian and cycle path which would contribute to regional links that provide access from the Lithgow St linear park to Newlands Park and St Leonards South.
R1	Pacific Highway, near Portview Road	Signalised pedestrian crossing	Subject to further investigation, liaison with RMS, modelling and detailed design	A new signalised crossing would improve connectivity between Gore Hill Oval/Park and St Leonards South and increase connectivity to the nearby bus stop.
R2	Intersection of Pacific Highway and Reserve Road	Signalised pedestrian improvement	Subject to further investigation, liaison with RMS, modelling and detailed design	Pedestrian crossing leg on the eastern side of this intersection would improve north-south connectivity and reduce delays for pedestrians.
R3	Intersection of Pacific Highway and Herbert Street	Signalised pedestrian improvement	Subject to further investigation, liaison with RMS, modelling and detailed design	Pedestrian crossing leg on the eastern side of this intersection (nearer St Leonards Station) would improve north-south connectivity and reduce delays for pedestrians and cyclists and support the regional green link through the precinct.
Infrastructure to be funded by Councils or other funding source				
13	St Leonards South	New pedestrian and cycle path in St Leonards South along an east-west axis.	Location and design subject to finalisation of St Leonards South Planning Proposal.	East to west pedestrian and cycling connections through St Leonards South will improve connectivity to regional open space (Gore Hill Oval) and the regional cycling network. The locations of these links are subject to finalisation of the St Leonards South Planning Proposal

Source: Department of Planning and Environment, 2018

Figure 2-9: St Leonards and Crows Nest proposed infrastructure map



Source: NSW Department of Planning & Environment, 2018

2.6.3 Existing Transport Conditions Report

The existing transport conditions as documented in the Existing Transport Conditions Summary Report prepared by Cardno (May 2017) highlighted the following opportunities relevant to the subject sites in St Leonards South:

– High public transport commuting mode share from precinct;

– Demonstrated cycling demand for direct routes;

– Popularity of, and support for, car share;

– Reduced need for vehicle ownership and parking spaces due to the potential for developments close to major transport interchanges;

– Comprehensive current and future public transport network;

– The introduction of Sydney Metro could be accompanied by optimisation of train and bus services;

– Crows Nest Metro Station provides the opportunity for the provision of cycling infrastructure; and

– Urban renewal will allow for street reconfiguration to accommodate walking and cycling facilities, reduce vehicle space, provide new through site links, pedestrianise areas and activate laneways.

2.6.4 Strategic Transport Study Report

The Strategic Transport Study Report identifies that residents and workers within the St Leonards and Crows Nest area use a range of transport options, which includes public transport and the use of private vehicles. The community recognise that use of private transportation must be managed to reduce traffic congestion.

Public transport options and access to other parts of Sydney are positive features the community like about the area, and they look forward to the further enhancement of public transport within the area when the new metro station comes online.

Sydney Metro will more than double the current rail capacity of the area. The Traffic and Transport study forecasts a shift towards even greater public transport use. By 2036, it is expected that a significantly larger proportion of trips to the precinct will be made by public or active transport.

The draft Local Character Statement identified that many community members walk or cycle around the area. This is consistent with statistics that show that the North Shore has one of the highest walking mode shares in Sydney, at

over 25 per cent. The NSW Government Architect identified a north-south pedestrian and cycle link through the area as a priority. This link is described in the draft Plan as the foreshore to foreshore link because it would connect to green links outside the precinct to Berry's Bay and Middle Harbour.

Strategic modelling indicated the road network (with some upgrade) has an ability to absorb the increased traffic expected although increase in demands along the Pacific Highway between Herbert Street and Christie Street place this part of the network under significant pressure under all scenarios. The demand is expected to exceed the capacity in this section of road for all tested future scenarios.

Recommendations that are relevant to St Leonards South are:

– **Pedestrian:** Deliver new and upgraded pedestrian infrastructure to enhance movements to improve access to rail services within the critical 800m to 1km walking catchments. Provide missing pedestrian crossings at intersections where this does not have a significant detrimental impact on existing traffic conditions. Footpath widening and enhancement treatments are also recommended where needed. Pedestrian crossings are proposed at intersections that lack safe and convenient connections.

– **Cycling**: Integrate plans for bicycle facilities from the three councils to support trips to local centres as well as through movements along regionally significant routes connecting to other centres including Chatswood, North Sydney and the Sydney CBD. Opportunities for interchange between rail services with routes connecting to St Leonards Station and Crows Nest Station and supporting facilities included such as bicycle parking.

– **Rail**: Support the use of the existing heavy rail services and proposed Sydney Metro by enhancing access via active transport and bus interchange to/ from stations.

– **Bus**: Improve access to the network and accompanying services. At St Leonards Station, suggestions address improvements to interchange between bus and rail as part of a future Lane Cove Council proposed interchange plaza development on the southern side of the Pacific Highway, and at the future Crows Nest Metro Station site, the improvements include consolidation of bus stops and consideration of pedestrian and bus customer conflict.

– **Car parking**: Car parking rates for future development, particularly close to the provision of high capacity and frequency public transport services should adopt a minimalist approach to reduce the impact of additional vehicle traffic in the Precinct. Investigate the feasibility of zero car parking allocations to some land uses.

The proposed pedestrian, road and bus infrastructure improvements/ opportunities for St Leonards South are presented in **Table 2-2**.

Table 2-2 St Leonards South planned transport infrastructure

#	Infrastructure description
17	Railway crossing – Support movement from uplift in St Leonards South and pedestrian access to Crows Nest Metro and Crows Nest village. (This crossing could be moved to the River Road region or widening of River Road to provide for improved pedestrian crossing of the railway at this location. May be associated with pedestrian crossing improvements of River Road).
18	Pedestrian link – Provide pedestrian link to support north-south movements along Canberra Avenue and link River Road with the Pacific Highway.
19	Pedestrian crossing – Enhance pedestrian crossing to link with proposed footpaths on the eastern side of Canberra Avenue.
23	Widened pedestrian path – Widen pedestrian path on the eastern side of Canberra Avenue and the western side of Duntroon Avenue to 1.5 metres to support anticipated uplift in pedestrian movements. This is consistent with Lane Cove Council plans for St Leonards South.
24	Signalised intersection with pedestrian crossings on Canberra Avenue and River Road legs - Improve pedestrian connectivity and safety along River Road and to/from the St Leonards South development. This is consistent with Lane Cove Council plans for St Leonards South.

Source: Cardno, 2018

2.7 Lane Cove Council St Leonards South Planning Proposal

2.7.1 Overview

Lane Cove Council prepared a Planning Proposal in September 2017 for the St Leonards South area, bounded by Marshall Avenue to the north, Park Road to the west, River Road to the south and Canberra Avenue to the east. The Planning Proposal is to amend Lane Cove Local Environmental Plan 2009 to implement the recommendations of Council's adopted St Leonards South Master Plan.

It proposes to create a high amenity residential precinct supporting the principles of transit-oriented development (TOD) and liveability near the existing St Leonards Rail Station and future Crows Nest Sydney Metro Station. The proposal would:

– Rezone the precinct for apartments with site-specific FSRs and heights; and

– Provide for two community facilities and child care centres, open space, shared green spines, east-west pedestrian/ cycle connectivity, key worker housing and a link road.

2.7.2 St Leonards Cumulative Transport and Accessibility Study

Lane Cove Council engaged ptc. to conduct a Transport and Accessibility Assessment (September 2017) for pedestrian, bike and public transport demand generated by the planned growth of the St Leonards South and East precinct, within the Lane Cove LGA. An additional 4,500 dwellings and 36,000m^2 of commercial floor space will be developed over the next 10-20 years in the Lane Cove portion of St Leonards, which are located on the southern side of Pacific Highway and both sides of the railway line.

The study identified that there are many gaps and deficiencies on the pedestrian network in both precincts due to all the major transport hubs being located on the northern side of Pacific Highway whereas the two precincts are located on the southern side. In the study area, a number of signalised pedestrian crossings are provided; however, marked foot crossings are not provided in all approaches. Motorised traffic is given priority at the highway whilst the pedestrian experience has low priority throughout the day. In addition, the existing steep topography in the southern precinct affects the pedestrian travel paths and there is currently no east-west connectivity between the precincts. This results in long detours while walking from one precinct to another. The planned development in the study area provides an opportunity to improve the pedestrian connectivity and permeability.

The current on-road bike network has poor coverage, not providing local or regional connections. The study identifies that a new cycling network can be integrated into the redevelopment of these precincts.

The existing bus network at St Leonards has good network coverage. Following the operation of Sydney Metro (2024), the existing bus network could be reviewed and altered as necessary by the State Government. A bus interchange could be incorporated as part of the plaza development.

The proposed over rail plaza and the additional pedestrian underpass across the Pacific Highway would improve the pedestrian connectivity and permeability between the precincts. However, the design of the proposed plaza should provide sufficient east-west bike connectivity.

2.7.2.1 Active Transport Network Recommendations

Due to the significant population and employment growth in the southern and eastern precincts, the future pedestrian networks should be integrated with the key public transport hubs, as well as the precincts' diverse land uses. Further, pedestrian connectivity and permeability should be established between the two precincts.

In the southern precinct, north-south pedestrian footpath should aim to achieve the maximum pedestrian grade (1:20) where feasible, along with appropriate crossing points to the new pedestrian desire lines.

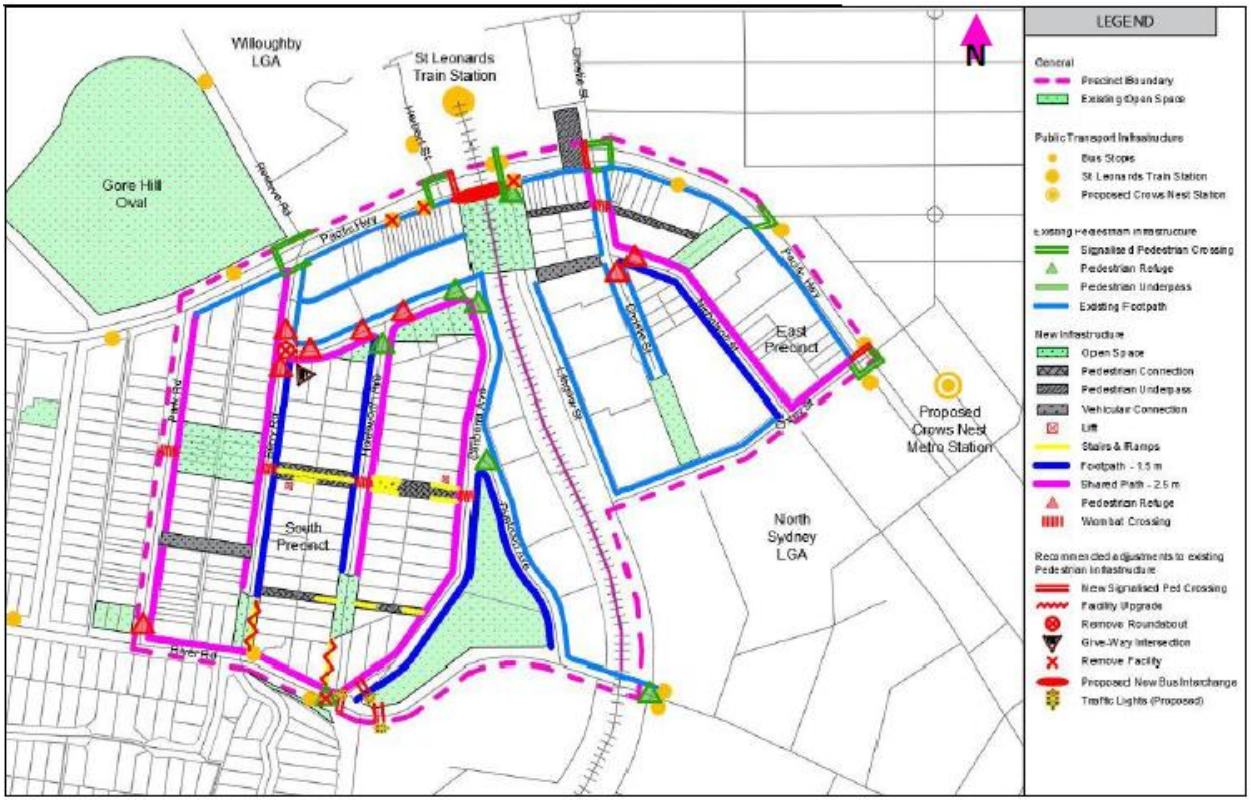
To accommodate the proposed level of growth, this report recommends the pedestrian infrastructure in the study area as shown in **Figure 2-10**. The pedestrian infrastructure that are relevant to St Leonards South includes:

– 2.5m wide shared path on the eastern side of Park Road that connects to the future park between Park and Berry Roads;

– 2.5m wide shared path on the eastern side of Holdsworth Avenue as it will provide pedestrian and bike connections to the north-east (towards the plaza);

- 2.5m wide shared path on the western side of Berry Road as it will provide a direct connection to Reserve Road via the Pacific Highway;
- 2.5m wide shared path on the western side of Canberra Avenue;
- 1.5m wide footpath on the eastern side of Berry Road and Canberra Avenue to minimise any gap or missing pedestrian link within the precinct;
- A new pedestrian and bike connection between Berry Road and Canberra Avenue is likely to be needed. This path would ideally be connected by stairs, ramps and lifts to ensure the usability and amenity of public and private open spaces;
- Refuge islands and wombat crossings are recommended at various locations for pedestrian safety and accessibility (refer to **Figure 2-10**);
- Additional pedestrian crossing facilities at the existing signalised intersections along Pacific Highway with Reserve Road, Herbert Street, Christie Street and Oxley Street;
- Traffic lights at the intersection of River Road / Canberra Avenue which will not only establish the regional pedestrian and bicycle connectivity to North Sydney Council (e.g. Wollstonecraft station) but also provide a secondary vehicular access to/ from the southern precinct. As an alternative, a signalised pedestrian crossing could be considered in River Road just west of Canberra Avenue; and
- Either a new pedestrian underpass, or an upgrade of the existing underpass.

Figure 2-10: St Leonards South recommended pedestrian network



Source: St Leonards Planning and Accessibility Study, ptc., 2018

The future bike network within the southern and eastern precincts should be integrated with the key public transport hubs and its diverse land uses such as residential, commercial, parks, hospital, educational institutions etc. A connected and accessible bicycle facility should also satisfy the needs of specific user groups by providing a common and legible network.

The proposed bicycle network in the study area is shown in **Figure 2-11**. The key consideration in developing the bike network is to establish the east-west and north-south connection to the diverse land uses and transport hubs. This would include:

– Construction of shared paths on at least one side of the north-south and east-west roads;

– Extension of the shared path between Greenwich Road and Greenwich Public School until Canberra Avenue;

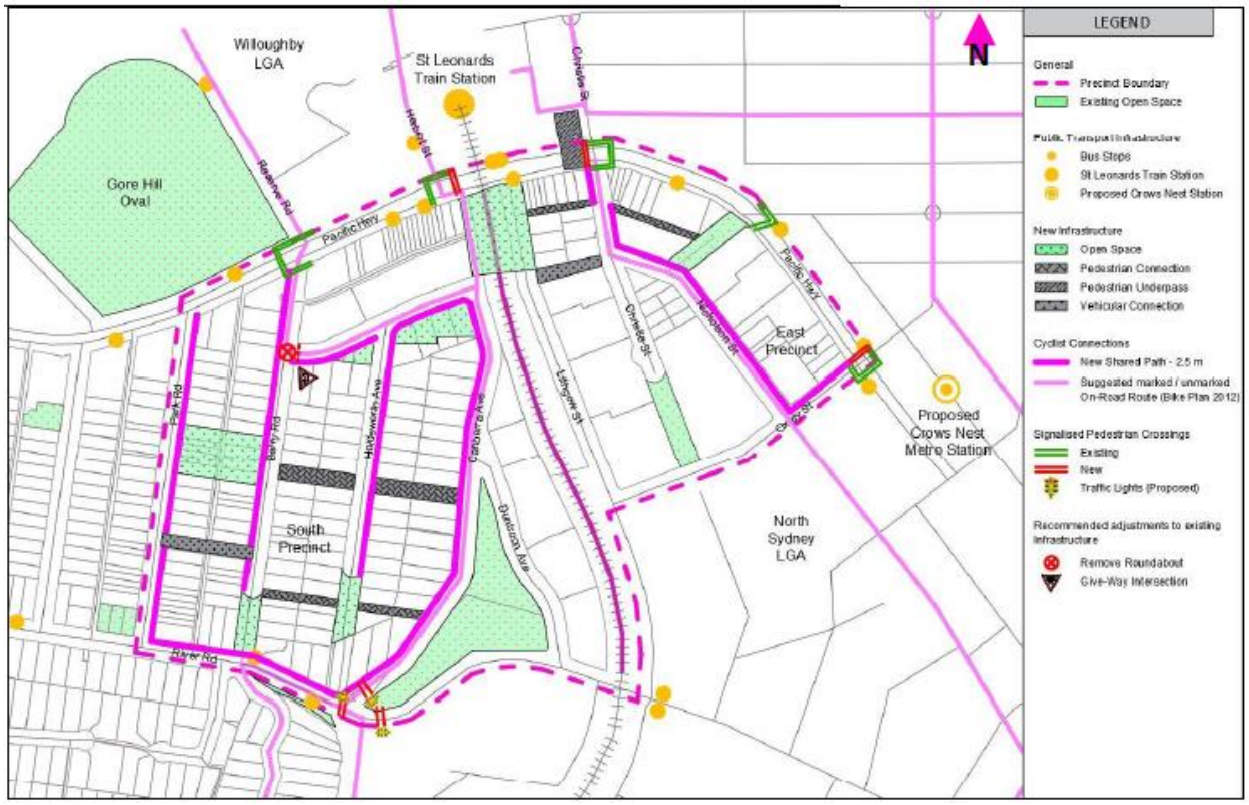
– Additional crossing facilities along Pacific Highway and River Road;

– Upgrade of bicycle parking;

– Installation of bicycle lanterns at signalised crossing facilities; and

– Installation of appropriate wayfinding signage.

Figure 2-11: St Leonards South recommended bicycle network



Source: St Leonards Planning and Accessibility Study, ptc., 2018

The study concluded that the above recommendations would be sufficient to cater for the estimated additional pedestrian and cyclist traffic daily.

2.7.2.2 Public Transport

The North Shore train line is nearing capacity during peak times and will not cater for the additional demand generated by development. However, the new Sydney Metro station will easily cater for further demand arising from the planned growth in St Leonards South. The Sydney Metro, together with upgrades across the existing rail network, will result in an increase in train capacity by more than double the existing. The current bus network operating within St Leonards has good coverage and, upon completion of the Metro, some buses could be rerouted to other areas as such a high frequency alternative transport will be available.

2.7.3 St Leonards South Traffic Impact Assessment

TEF Consulting (2017) conducted review and independent assessment of cumulative traffic impacts current proposal and other approved proposals within Lane Cove Council's portion of St Leonards.

The report aimed to address the cumulative impacts of current development in conjunction with other, approved developments in the St Leonards area listed in **Table 2-3**.

Table 2-3 Development assumptions in cumulative traffic impact assessment

Development	Location	Status	Residential yield	Non-residential yield
St Leonards South Master Plan development	Between Canberra Avenue and Park Road	Rezoning, Gateway determination	2,400 dwellings	N/A
Winten development	71 – 79 Lithgow St and 82 – 90 Christie St	Rezoning, being finalised by State government	450 dwellings	7,760m^2 commercial and retail
Loftex development	15 - 25 Marshall Ave	DA, approved	66 dwellings	105m^2 commercial and retail
	1-13 Marshall Ave		269 dwellings	290m^2 commercial and retail
Mirvac development	472-494 Pacific Hwy	DA, approved	539 dwellings	8,263 m^2 specialty retail and restaurant / cafe tenancies
New Hope & VIMG development	496-504 Pacific Highway	DA, awaiting final determination	495 dwellings	5,628 m^2 commercial

Source: TEF St Leonards South Traffic Impact Study, TEF, 2017

The peak hour trip rates for residential uses were 0.14 trips per dwelling (AM peak) and 0.07 trips per dwelling (PM peak), as per Roads and Maritime request detailed in letter dated 4th January 2016.

It is noted that while this traffic assessment is a cumulative traffic assessment as per the requirements of the St Leonards Crows Nest Planned Precinct, it does not include the uplift proposed by Department of Planning & Environment.

2.7.3.1 Road upgrades

Overall, this study found that traffic increases are moderate for each of the development sites, especially where proposed developments are "replacing existing substantial buildings". The report states, *"Levels of service remained essentially the same for all models"* compared to a pre-development base. The modelling indicated the to maintain satisfactory network function as a result of the proposed developments only relatively minor improvements would be needed. For the St Leonards South (residential) area, the recommended infrastructure improvements are:

– The roundabout at the intersection of Marshall Avenue and Berry Road be removed and replaced with a Give Way intersection (Further investigations required as this may have been introduced for modelling purposes rather than actual capacity issues); and

– A new road connection be provided between Berry Road and Park Road.

2.7.4 St Leonards South Draft DCP

The purpose of the draft St Leonards South Draft DCP is to provide objectives, controls and design criteria to achieve desirable development outcomes in line with Council's Vision for the St Leonards South Precinct. The following clauses are relevant to the proposed development:

Table 2-4 St Leonards Draft DCP relevant provisions

<table>
<tr><th>Clause</th><th>Control</th><th>Provision</th><th>Notes / Location</th></tr>
<tr><td>4.1</td><td>Access Network</td><td>– Provide new public streets and pedestrian connections in accordance with Figure 2-12; and
– Lighting, paving, street furniture and landscaping to be provided according to LMP and consultation with council. The following links are to be provided:
<table><tr><td>E-W link – path</td><td>Stairs</td></tr><tr><td>E-W link – path</td><td>Stairs/ramps</td></tr><tr><td>E-W link – road/lane</td><td>Public road</td></tr><tr><td>E-W link – pathway</td><td>Stairs plus lifts/ramps</td></tr><tr><td>E-W link – EW-link path</td><td>Stairs plus lifts/ramps</td></tr><tr><td>Interim connective lane</td><td>Interim connection to Berry Lane (commercial) for access/egress to lane</td></tr><tr><td>Berry Road</td><td>Additional street closure for open space</td></tr><tr><td>Holdsworth Avenue</td><td>Additional street closure for open space</td></tr><tr><td>Marshall Ave/Holdsworth Ave Berry Road</td><td>Pocket park</td></tr><tr><td>Marshall Ave/Canberra Ave</td><td>Pocket park</td></tr></table></td><td>New paths will be maintained by the landowner under Section 88E of the Conveyancing Act 1919.</td></tr>
<tr><td>4.2</td><td>Streets</td><td>– Create new road/lane between Berry and Park roads to improve traffic circulation and access to southern end of Berry Road and Holdsworth Avenue; and
– Close Berry Lane and incorporate into development sites.</td><td>Provide interim connections to maintain function of Berry Lane until fully redeveloped.</td></tr>
<tr><td>4.3</td><td>Pedestrian Connections</td><td>– Create E-W pedestrian links as indicated on Figure 2-14 with associated stairs/ramps and lifts to optimise accessibility;
– Pedestrian links are to be as specified in the LMP (and should be a minimum 6m wide with paving a minimum of 2m wide and landscaping as per LMP) and to Council satisfaction;
– Each site must coordinate E-W link construction with adjacent developers to ensure connective paths, levels, landscape, materials and treatments; and
– Each site should ensure that “Green Spine” connects/ integrates with E-W links.</td><td>Provide a pedestrian link that has the potential to be upgraded to a shareway between Berry Road and Holdsworth Avenue to improve E-W connectivity and provide alternative access/egress to the southern end of Holdsworth Avenue should future traffic necessitate.</td></tr>
<tr><td>4.4</td><td>Bicycle Network</td><td>– Facilitate E-W connections to establish a local bicycle network;
– Investigate connecting Canberra Avenue to south across River Road to extend bicycle potential from St Leonards Station to Wollstonecraft Station and beyond to the Lane Cove River; and
– Traffic calm streets within the Precinct to provide a safe cycle environment.</td><td></td></tr>
</table>

Clause	Control	Provision	Notes / Location
4.5	Sustainable Transport	– Facilitate improved pedestrian access to the Railway Stations and Station Square; – Investigate the use of innovative measures (GoGet, car share, Uber etc) to reduce car ownership; and – Reduce parking demand in response to improved transit accessibility.	Reduction of parking demand must be to the satisfaction of Council Traffic Manager.
6.8	Vehicle Access	– Provide vehicle access from street frontage at lower end/edge of site; and – Restrict vehicle access from River Road wherever possible. Note: Temporary arrangements may be required to Berry Lane to facilitate ultimate closure.	– Refer to **Figure 2-13** – Variations will be at the discretion of Council's Traffic Manager.
7.4.5	Pedestrian Links	– Provide E-W public pedestrian links as indicated in **Figure 2-14**. Pedestrian links should have the following attributes: – Shared pedestrian/cycle links – Accessible grades (1:20) where possible – Minimum 2.5m shared pathway – Shade trees and feature planting – Adequate and appropriate pedestrian lighting	These links should endeavour to provide full accessibility in an E-W direction between the new park (between Berry and Park Roads) and Canberra Avenue. This will require the incorporation of lift access associated with public buildings in areas 5 and 17.

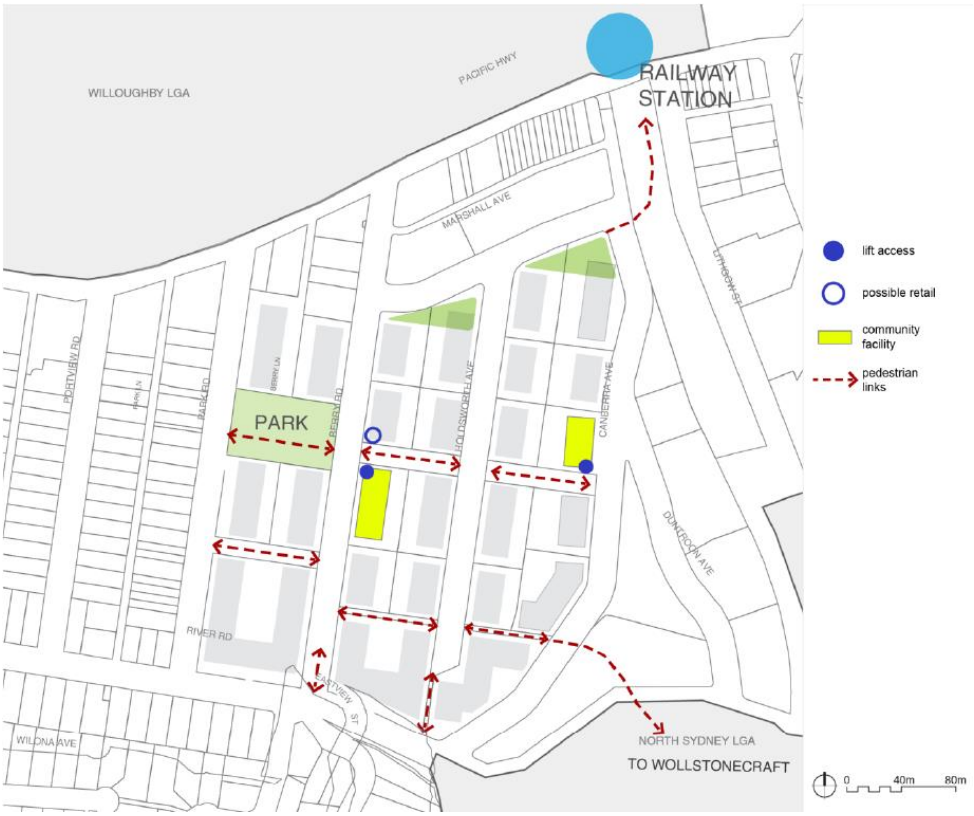
Figure 2-12: St Leonards South Draft DCP – access networks

Source: Annand Associates Urban Design, 2017

Figure 2-13: St Leonards South Draft DCP – indivative vehicle access

Source: Annand Associates Urban Design, 2017

Figure 2-14: St Leonards South Draft DCP – desirable pedestrian links



Source: Annand Associates Urban Design, 2017

2.8 Lane Cove Council bike plan

The 2013 Lane Cove Council Draft Bicycle Plan provides recommendations based on a review of the 2008 Plan, and the status of works proposed in 2008. In the Precinct, three routes were proposed in the 2008 Plan, which remain incomplete.

– Regional Route B3: A shared path along the western side of the Pacific Highway, extending from the intersection of Longueville Road near the Gore Hill Freeway to the intersection with Albany Street, past the LGA border;

– Regional Route B4: A shared path along the northern side of River Road, extending from the intersection of Longueville Road to the intersection with Shirley Road; and

– Local Route B18: A combination of shared paths, on-road shoulder lanes and mixed traffic facilities connecting Greenwich Road with St Leonards Station.

An additional route (Route A9) was proposed in the 2013 Plan. This route extends from the intersection of the Pacific Highway with Berry Street, and proceeds via Marshall Lane, Canberra Avenue, Lithgow Street, Christie Lane, Christie Street and Nicholson Street to tie in with existing routes at the intersection of the Pacific Highway with Christie Street, and Oxley Street with Nicholson Street. The primary aim of this route is to complete a missing link in the network on the southern side of the Pacific Highway and facilitate travel across Council LGA boundaries.

Lane Cove Council is also investigating a new east-west cycle link between Greenwich and Wollstonecraft.

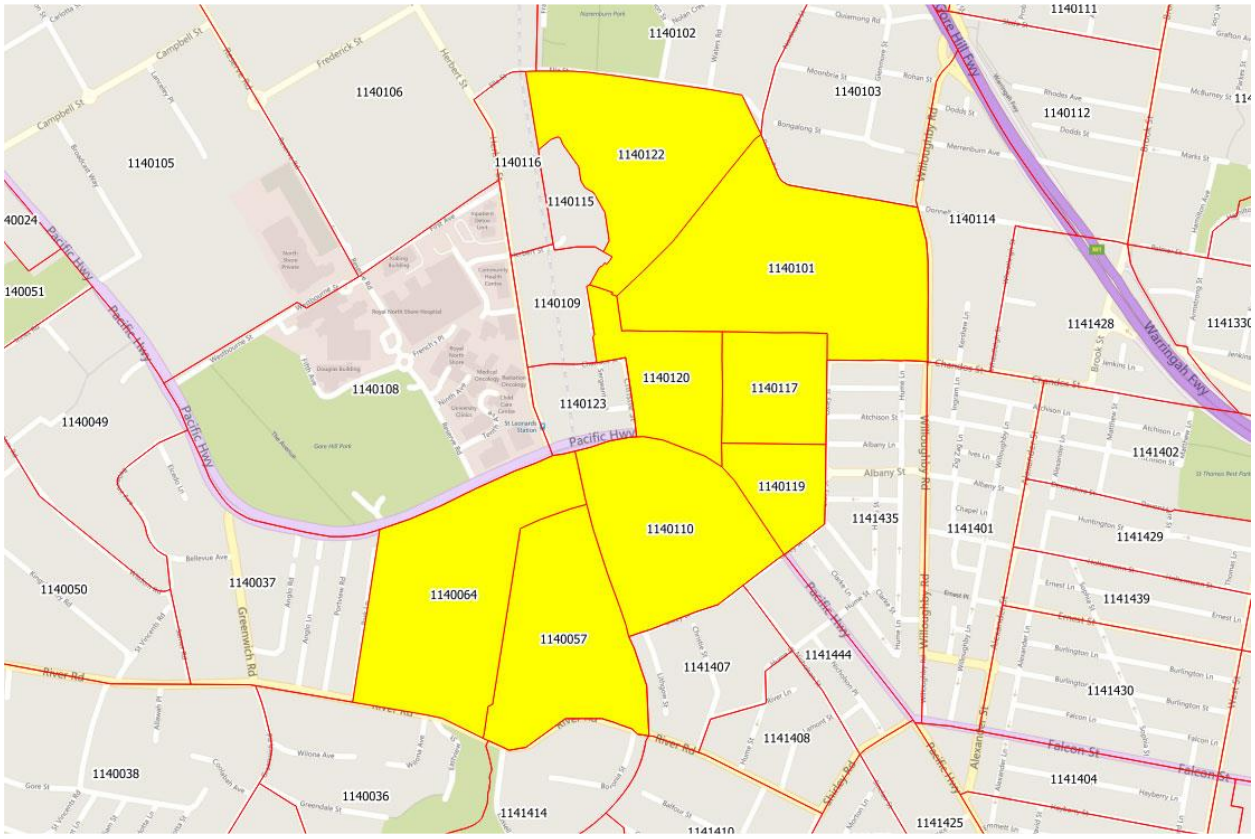
3.0 Existing conditions

3.1 Travel behaviour

3.1.1 Method of Travel to Work Data

2016 Method of Travel to Work (MTW) census data from the Australian Bureau of Statistics has been sourced to understand the existing travel behaviour of residents living in the area surrounding the subject site. Eight level one statistical areas have been selected surrounding St Leonards Station as shown in **Figure 3-1**.

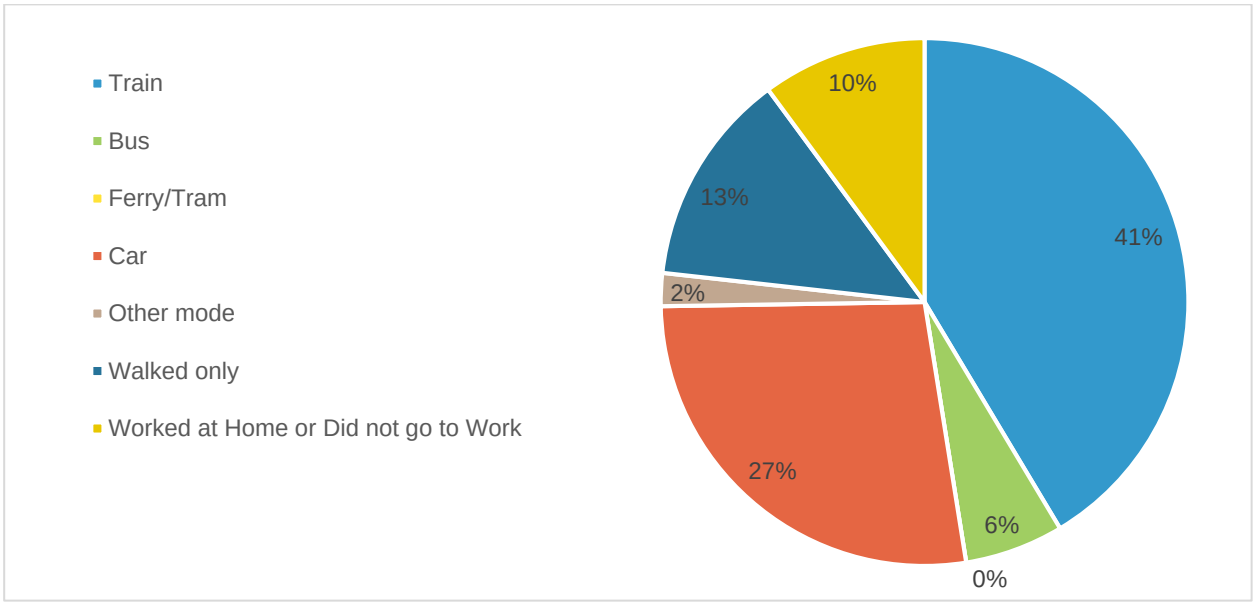
Figure 3-1 Travel zone 1832, 1844, and 1911 locations



Source: TTPP, 2019

In 2016 when the Journey to Work data was recorded, residences would have been characterised by a mix of low and high density residential with a mix of other uses around St Leonards Station and the Pacific Highway. The departure travel mode split is shown in **Figure 3-2**.

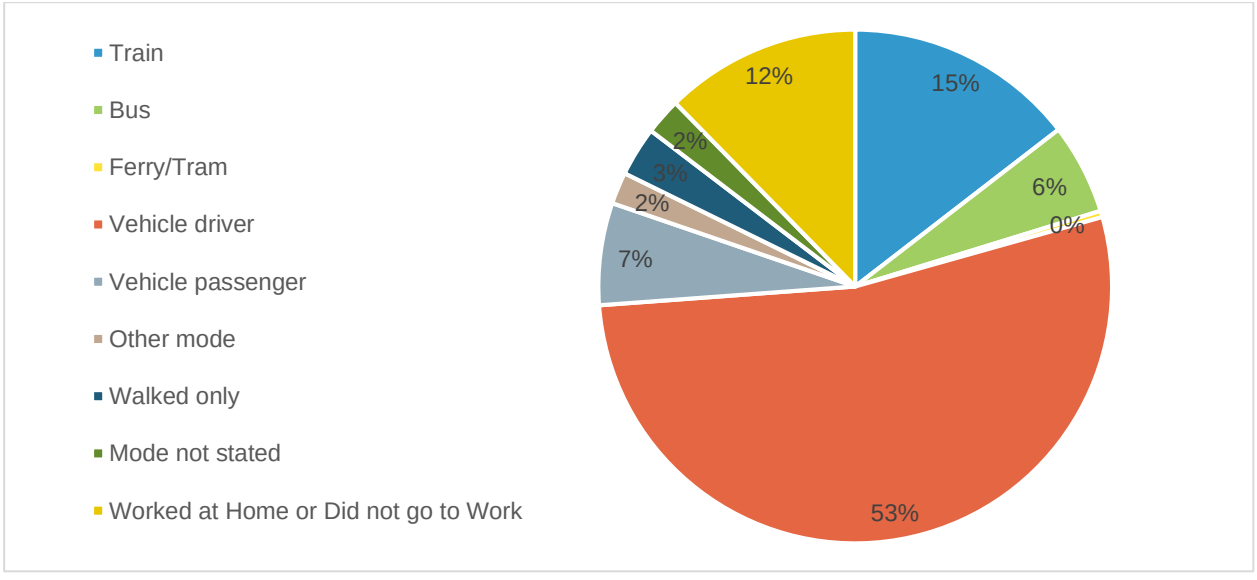
Figure 3-2 Departure travel modes to studies area



Source: TTPP, 2019

St Leonards residents demonstrate some notable differences in their method of travel to work when compared to the Sydney Greater Metropolitan Area (GMA), shown in **Figure 3-3.** 60% of residents in the Sydney GMA use private vehicles compared with 27% in the St Leonards area, indicating a low level of car dependency. As shown in **Figure 3-4,** 38.6% of residents head to Sydney CBD for work which has expensive parking and extensive public transport links to the St Leonards area, leading to less vehicle dependence. 15% of residents in the Sydney GMA residents use trains, compared with 41% in the St Leonards area. This is reflective of the close walking distance to the train station, and short travel times to a variety of destinations.

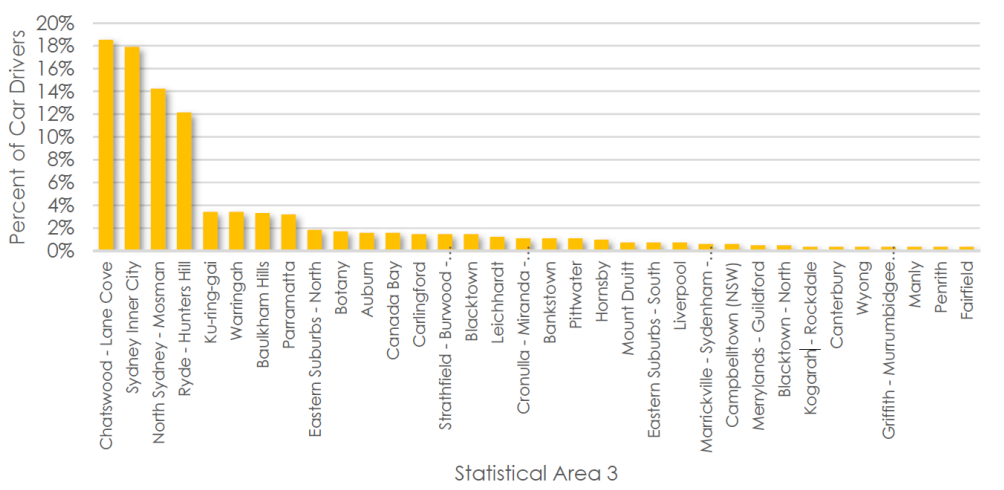
Figure 3-3 Departure travel modes from Sydney Greater Metropolitan Area (residents)



Source: Transport for NSW, 2019

Figure 3-5 shows the key destinations for departures from the study area by Statistical Area 3. Chatswood – Lane Cove attracts the greatest number of workers, followed closely by Sydney Inner City then North Sydney – Mosman. These areas are all well-serviced by public transport, which explains the significant public transport mode share.

Figure 3-4 Key destinations from studied area

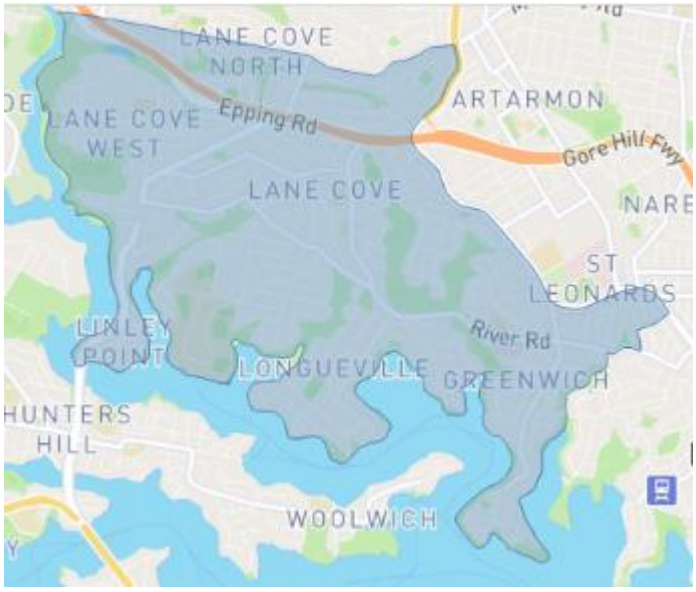


Source: TTPP, 2019

3.1.2 Household Travel Survey

The Planning Proposal area sits within the statistical area Lane Cove as defined by the Australian Bureau of Statistics, 2016/2017 Household Travel Survey. **Figure 3-5** shows the boundaries of this area.

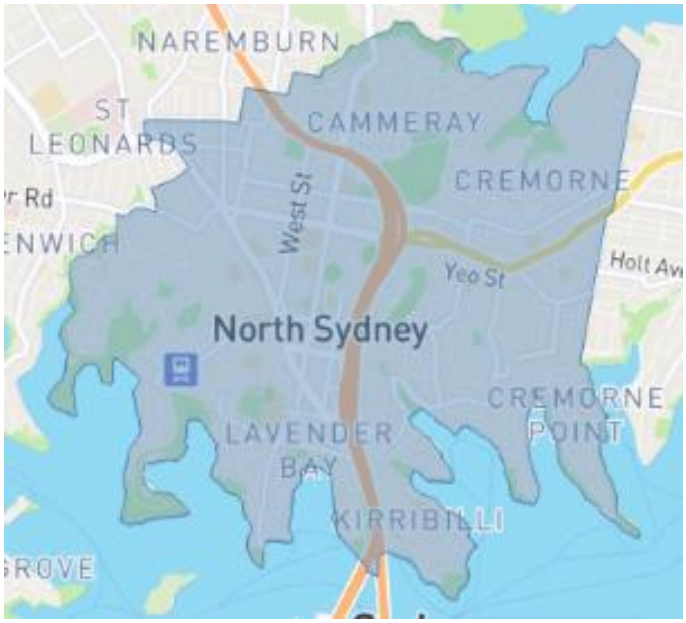
Figure 3-5 Lane Cove area map



Source: https://www.transport.nsw.gov.au/performance-and-analytics/passenger-travel/surveys/household-travel-survey-hts/household-travel, accessed January 2019

The statistical area North Sydney as defined by the Australian Bureau of Statistics, 2016/2017 Household Travel Survey has also been included in our data analysis for comparative purposes. As St Leonards South moves towards higher density, travel characteristics will transition to be more reflective the North Sydney LGA. **Figure 3-6** shows the boundaries of this area.

Figure 3-6 North Sydney area map



Source: https://www.transport.nsw.gov.au/performance-and-analytics/passenger-travel/surveys/household-travel-survey-hts/household-travel, accessed January 2019

Analysis of the 2016/2017 Household Travel Survey, which is reflective of the travel characteristics of residents throughout an average weekday, demonstrates travel trends throughout the larger area. **Table 3-1** provides a summary of the overall mode choice made by residents of Lane Cove, North Sydney and Greater Sydney statistical areas.

Table 3-1 Household Travel Survey – residents within Lane Cove, North Sydney and Greater Sydney - trip mode

Travel Mode	% of total trips (Lane Cove)	% of total trips (North Sydney)	% of total trips (Greater Sydney)
Vehicle Driver	38%	34%	48%
Vehicle Passenger	20%	13%	21%
Train	7%	7%	6%
Bus	11%	7%	6%
Walk Only	23%	36%	17%
Other	2%	3%	2%

Source: Transport for New South Wales, 2018

The survey indicated that the travel behaviours in Lane Cove and North Sydney are less car dependent than average for Greater Sydney, with a higher proportion of households preferring to walk or use buses. This is consistent with the proximity and range of public transport in the area. The localities within the Lane Cove statistical area include more low-density residential areas, which impacts on ease of access to public transport services and therefore car usage statistics. As St Leonards South transitions to a higher residential density area, and Crows Nest station is completed, some differences to this data would be expected. As the data is an average of all of Lane Cove, there are several suburbs such as Longueville and Riverview which bring down the whole-of-LGA average public transit use.

The travel purpose data (**Table 3-2**) indicates a different typology of travel in some areas when compared with Greater Sydney averages. There is a decrease in travel for work related business and to serve a passenger. Conversely, there is an increase in travel for social recreation and to change mode of travel.

Table 3-2 Household Travel Survey – residents within Lane Cove, North Sydney and Greater Sydney – trip purpose

Travel Purpose	% of total trips (Lane Cove)	% of total trips (North Sydney)	% of total trips (Greater Sydney)
Commute	9%	13%	12%
Work Related Business	2%	5%	7%
Education / childcare	7%	3%	8%
Shopping	16%	16%	14%
Personal Business	6%	6%	4%
Change Mode of Travel	18%	15%	14%
Social / Recreation	27%	30%	22%
Serve Passenger	12%	8%	17%
Other	3%	5%	2%

Source: Transport for New South Wales, 2018

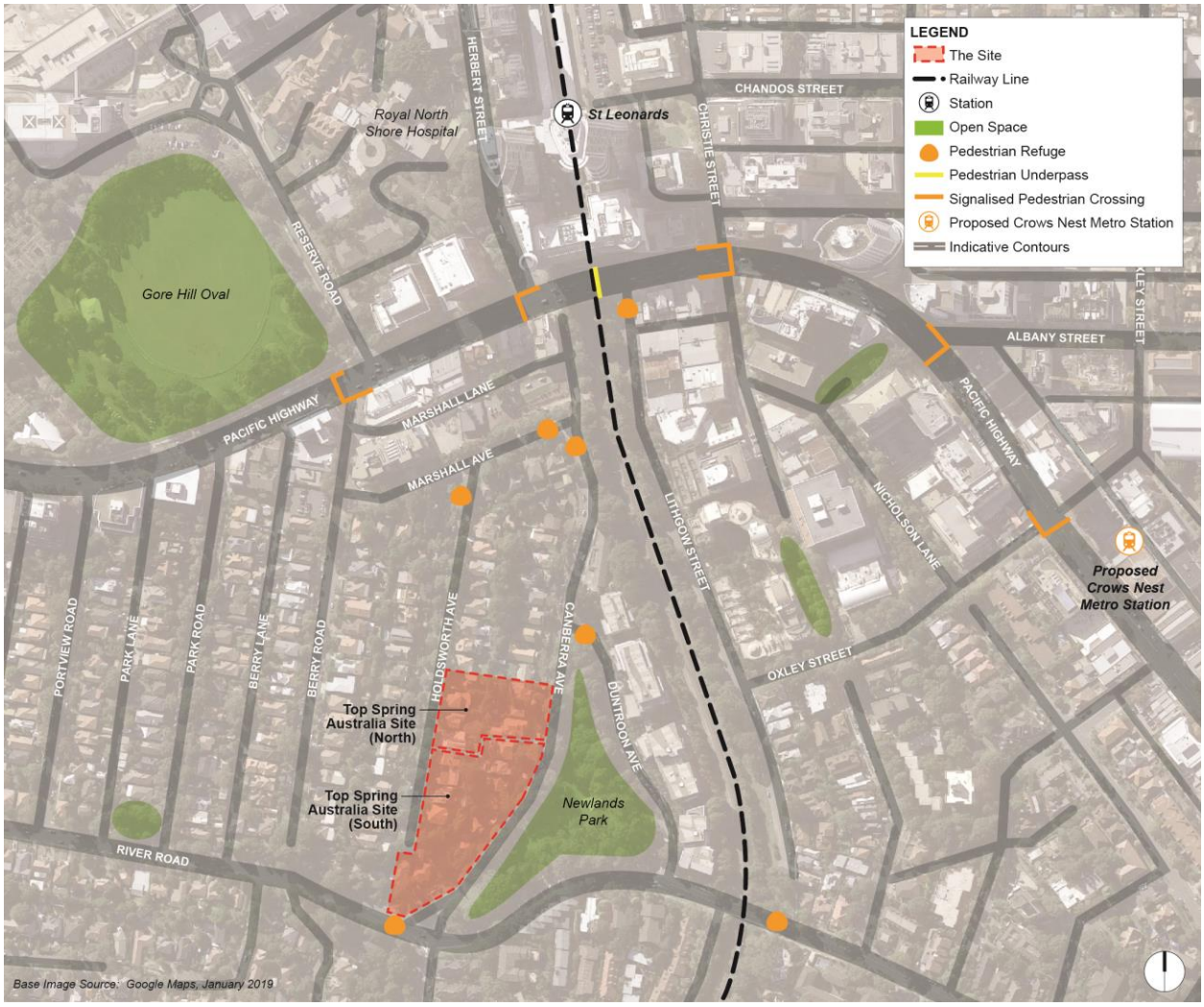
Only 9% of total trips in the Lane Cove statistical area are for commuting purposes, and 13% in the North Sydney statistical area. This is likely the explanation of the difference between a train usage of 35% for travel to work purposes (**Figure 3-2**) and of 7% for general transport purposes (**Table 3-1**). This is reflective of an area with a significant number of shopping and education opportunities.

3.2 Pedestrian network

The current conditions for pedestrians in St Leonards South have significant constraints. The lack of crossing facilities and substantial traffic congestion on Pacific Highway lead to pedestrian safety issues. Pedestrian desire lines make this is a popular place to cross. To the south, River Road carries significant volume of regional traffic and lacks a formalised crossing facility within the study area. A substandard refuge island is provided near Canberra Avenue, however, there is no other designated crossing facility within 400m to the west (at Greenwich Road) or 330m to the east (at Lithgow Street).

The existing pedestrian connections between Berry Road and Holdsworth Avenue with River Road via ramps and stairs are substandard and have night time security issues due to poor lighting. Refer to **Figure 3-7** for the existing pedestrian infrastructure.

Figure 3-7: Existing pedestrian infrastructure for St Leonards South



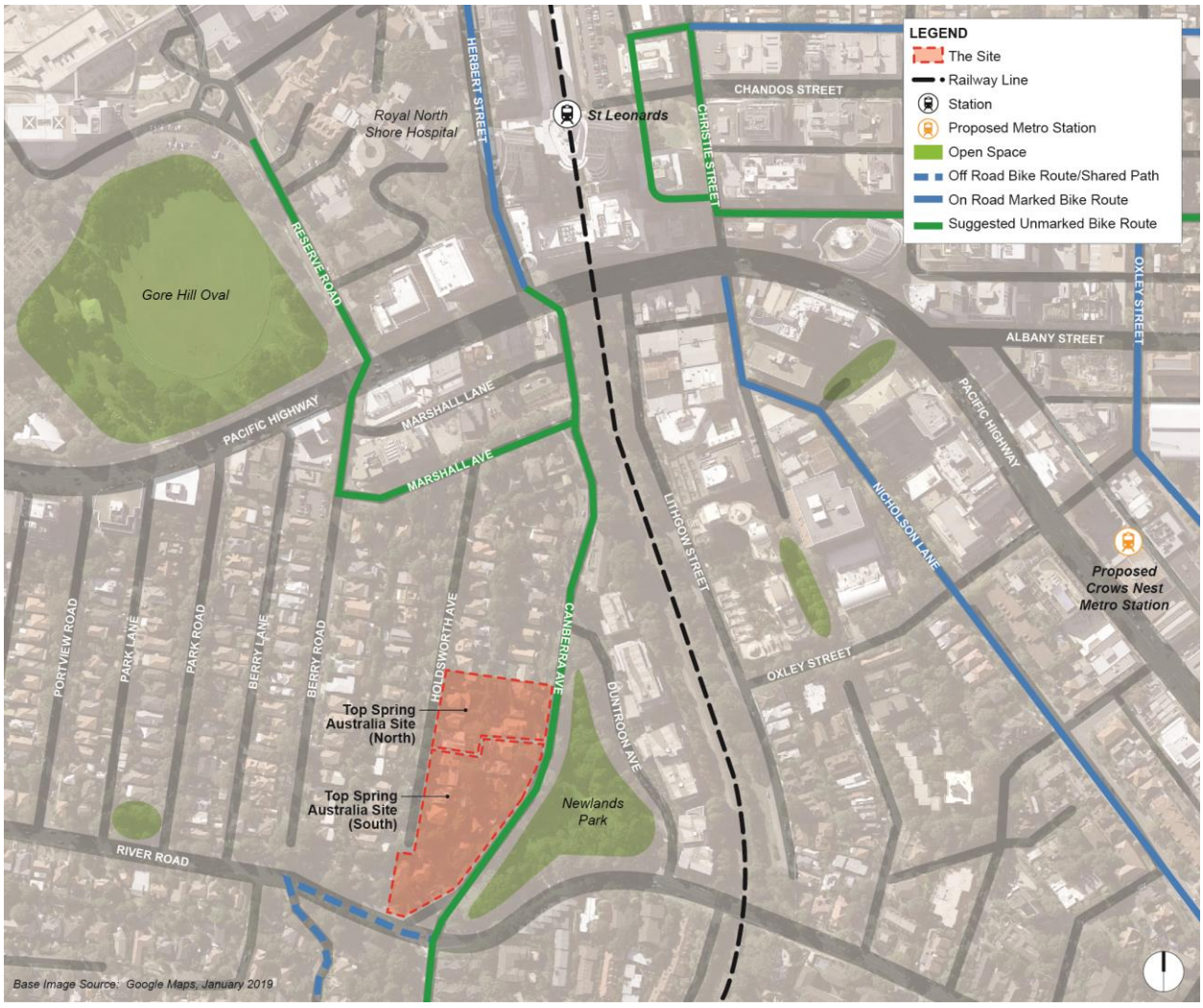
Source: SCT Consulting, January 2019

Additionally, the steepness of the St Leonards South precinct leads to issues for access for certain groups or people, such as people with disabilities and people with prams. This, along with a lack of wayfinding signage, leads to some difficulties navigating the area. Park Lane has a change in height of approximately 25m from Pacific Highway to River Road. The significant grade differences north-south make walking along the north-south axis challenging. East-west links have an important role in the future master plan to mitigate the grade challenges in the walk to the station. This is also important in providing connectivity to the future Sydney Metro Crows Nest Station, which is within 800m as the crow flies, but is over a kilometre from the heart of St Leonards South due to the lack of east-west connectivity.

3.3 Bicycle network

St Leonards South has limited provision of separate cycleways and shared paths, as well as the challenging topography, highly motorised roads and the prevalence of kerbside parking, has reduced the safety and attractiveness of cycling in the area. Some of the main constraints for cyclists in the area include inconsistent wayfinding signage, an incomplete cycling network, no bicycle lantern for crossing Pacific Highway and substandard bike parking at St Leonards Station.

Figure 3-8: Existing cycling facilities for St Leonards South



Source: SCT Consulting, January 2019

3.4 Public transport

The St Leonards South precinct is within easy walking distance of the St Leonards Station. St Leonards Station is located on the northern side of Pacific Highway. Additionally, Wollstonecraft Station is located within 800 metres of the area. Both stations provide rail connections along the T1 line. The T1 (the North Shore and Northern and the Western line) operates at a frequency of approximately 3 minutes during peak periods and between 5 to 10 minutes during the off-peak period.

In addition to frequent train services, a large number of bus services operate along Pacific Highway that provide connections to key centres including Chatswood, North Sydney, Manly, the Sydney CBD, Bondi as well as The Hills District. There is only one bus route that operates from River Road, operating between Lane Cove and the City. The bus services in vicinity of this site are:

– 143 – operated by State Transit, Manly to/from Chatswood via Balgowlah and St Leonards;
– 144 – operated by State Transit, Manly to/from Chatswood via Royal North Shore Hospital;
– 200 – operated by State Transit, Bondi Junction to/from Chatswood;
– 252 – operated by State Transit, Gladesville to/from City via North Sydney;
– 254 – operated by State Transit, McMahons Point to/from Riverview;
– 261 – operated by State Transit, Lane Cove to/from the City;
– 265 – operated by State Transit, Lane Cove to/from North Sydney via Greenwich;
– 286 – operated by State Transit, Denistone East to/from Milsons Point via St Leonards and North Sydney;
– 287 – operated by State Transit, Ryde to/from Milsons Point via St Leonards and North Sydney;
– 290 – operated by State Transit – Epping to/from City via Macquarie University and North Sydney;
– 291 – operated by State Transit – Epping to/from McMahons Point;
– 602X – operated by Hills Bus, Rouse Hill to/from North Sydney;
– 612X – operated by Hills Bus, Kellyville to/from Milsons Point;
– 622 – operated by Hills Bus, Dural to/from Milsons Point via Cherrybrook;
– 653 – operated by Hills Bus, West Pennant Hills to/from Milsons Point;
– M20 – operated by State Transit, Botany to/from Gore Hill;
– N90 – operated by State Transit, Hornsby to/from City via Chatswood; and
– N91 – operated by State Transit, Bondi Junction to Macquarie Park via City.

The Gore Hill Loop is a free shuttle bus service that connects St Leonards Station with the Gore Hill business and technology precinct, providing a dedicated public transport connection for employees transferring from train services. The service runs between a shared stop (with the Artarmon Loop) on the western side of Herbert Street and two stops adjacent to the Fox Sports and Australian Stock Exchange buildings at Gore Hill.

The Artarmon Loop is a free Willoughby City Council bus service that operates along three routes, connecting St Leonards Station with the Artarmon sub-precinct, Artarmon train station, or Royal North Shore Hospital depending on the time of day. During peak periods, the shuttle connects the shared bus stop (with the Gore Hill Loop) on Herbert Street with 16 designated stops through the industrial area. Outside of peak periods, the shuttle proceeds further north to service the Artarmon local centre and train station and diverts along Westbourne Street to link to the Royal North Shore Hospital.

Interchange is provided at Pacific Highway bus stops near St Leonards Station. The southbound stop provides a relatively simple interchange experience. Northbound stops near the station are across the Pacific Highway in several locations. The interchange between the northbound stops and St Leonards Station is longer and circuitous. The bus stops in vicinity of the site are summarised in **Table 3-3**.

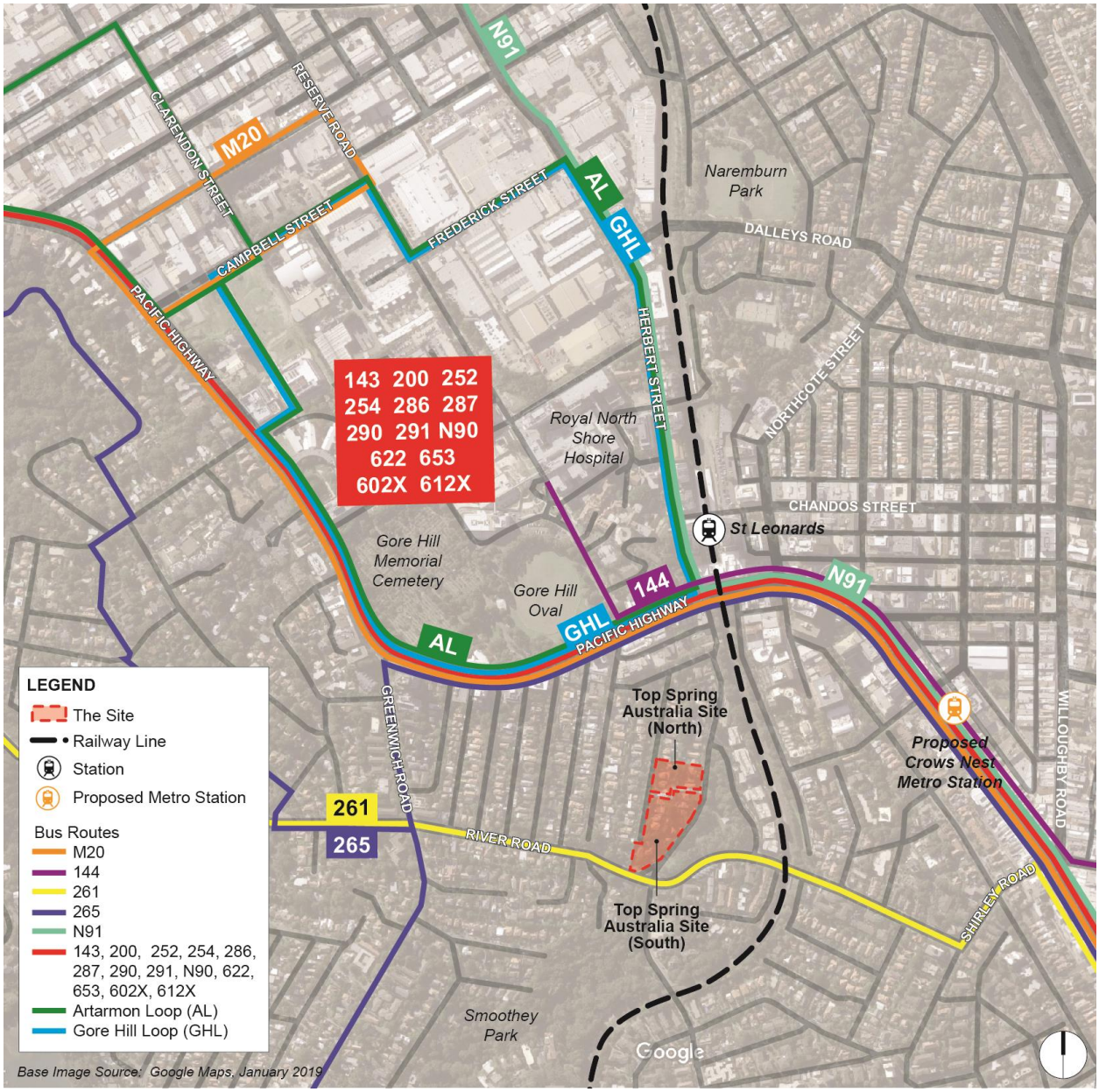
Table 3-3 Bus stop and services summary

Bus stop location	Bus services	Distance to site	Peak period frequency
Pacific Highway	143, 144, 200, 252, 254, 265, 286, 287, 290, 291, 602X, 612X, 622, 653, M20, N90, N91	250m	35 peak direction 15 off-peak direction
River Road	261	25m	2 peak direction 2 off-peak direction

Source: Transportnsw.info

The existing bus network diagram is shown in **Figure 3-9**.

Figure 3-9: Existing bus network



Source: https://transportnsw.info/document/1697/region-guide-north-shore-west.pdf, accessed January 2019

3.5 Road network

The site is situated in what is currently a low-density residential area. It is bounded by Canberra Avenue, River Road and Holdsworth Avenue.

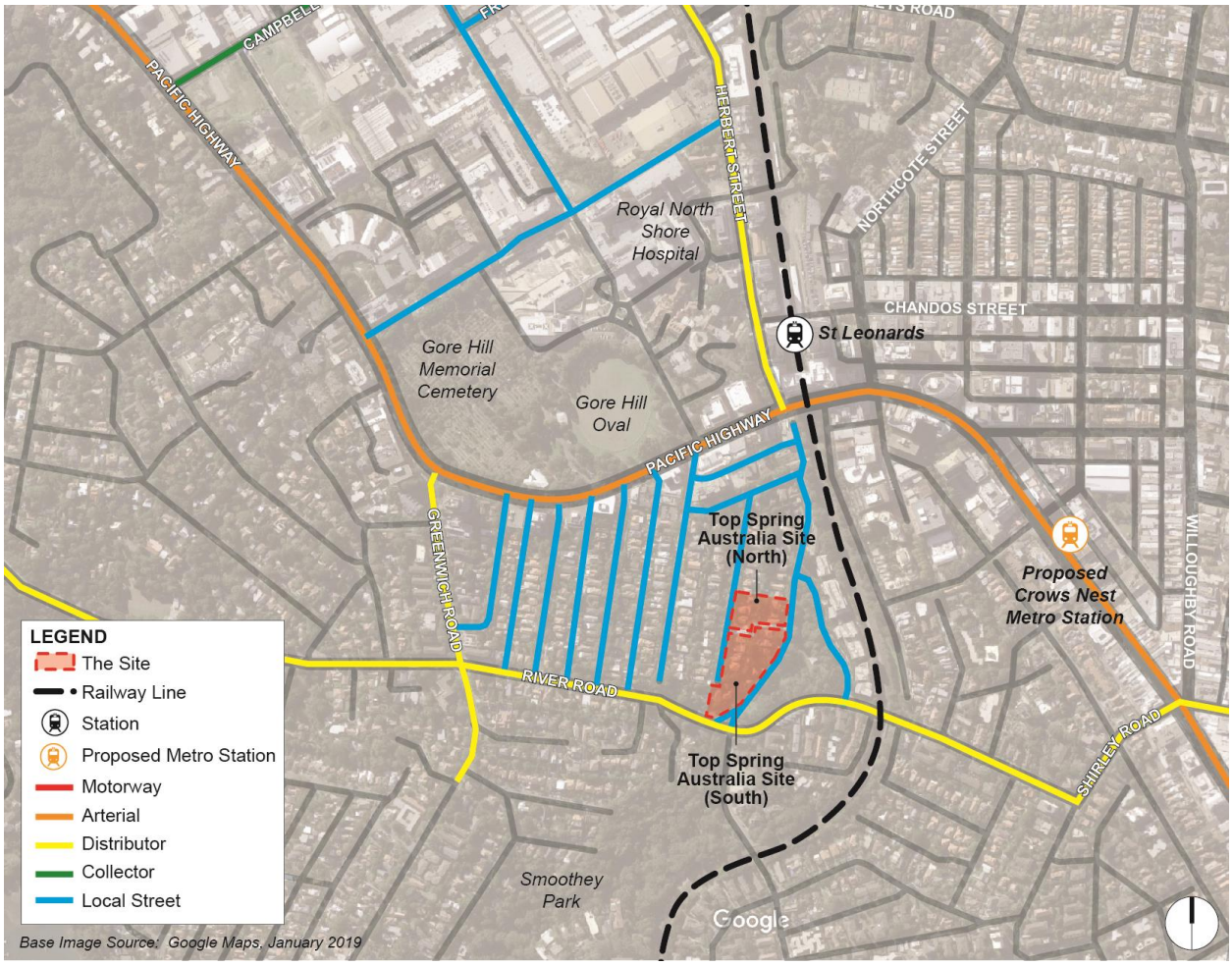
The Pacific Highway is a state road located just outside the St Leonards South precinct with a high movement function. It is generally configured with three through lanes in each direction, but occasionally with two lanes where turning lanes are provided at some intersections. Where there are three lanes, parking is generally allowed in the kerbside lane during off-peak periods. Through the St Leonards and Crows Nest Precinct, there are 14 signalised intersections. It is obvious from the frequent change in the number of through lanes that the corridor is space constrained by surrounding development.

The high movement function along the Pacific Highway is prioritised with restrictions to pedestrian crossing movements and vehicle turning movements at several locations within the corridor. This configuration leads to the circuitous movement of vehicles through the Precinct. In some locations, there are limited opportunities to turn right from Pacific Highway. Vehicles may be required to first turn left, traverse local streets to then go back to the Pacific Highway to cross to the opposite side.

River Road is located at the southern end of the St Leonards South precinct. It provides a key link to suburbs to the west of the area, including Greenwich, Longueville and Lane Cove. Shirley Road is at the eastern end of River Road, which also connects across the Pacific Highway to Falcon Street.

A number of local roads in the St Leonards South precinct are cul-de-sacs that direct general traffic onto the roads throughout the area that connect to the wider network. Lane Cove Council planned and designed the street network to discourage through traffic but still allow servicing. The roads in or immediately bordering the area are Park Road, Berry Lane, Berry Road, Holdsworth Avenue and Canberra Avenue running North – South, and River Road and Marshall Avenue running East – West.

Figure 3-10: Road network hierarchy



Source: SCT Consulting, January 2019

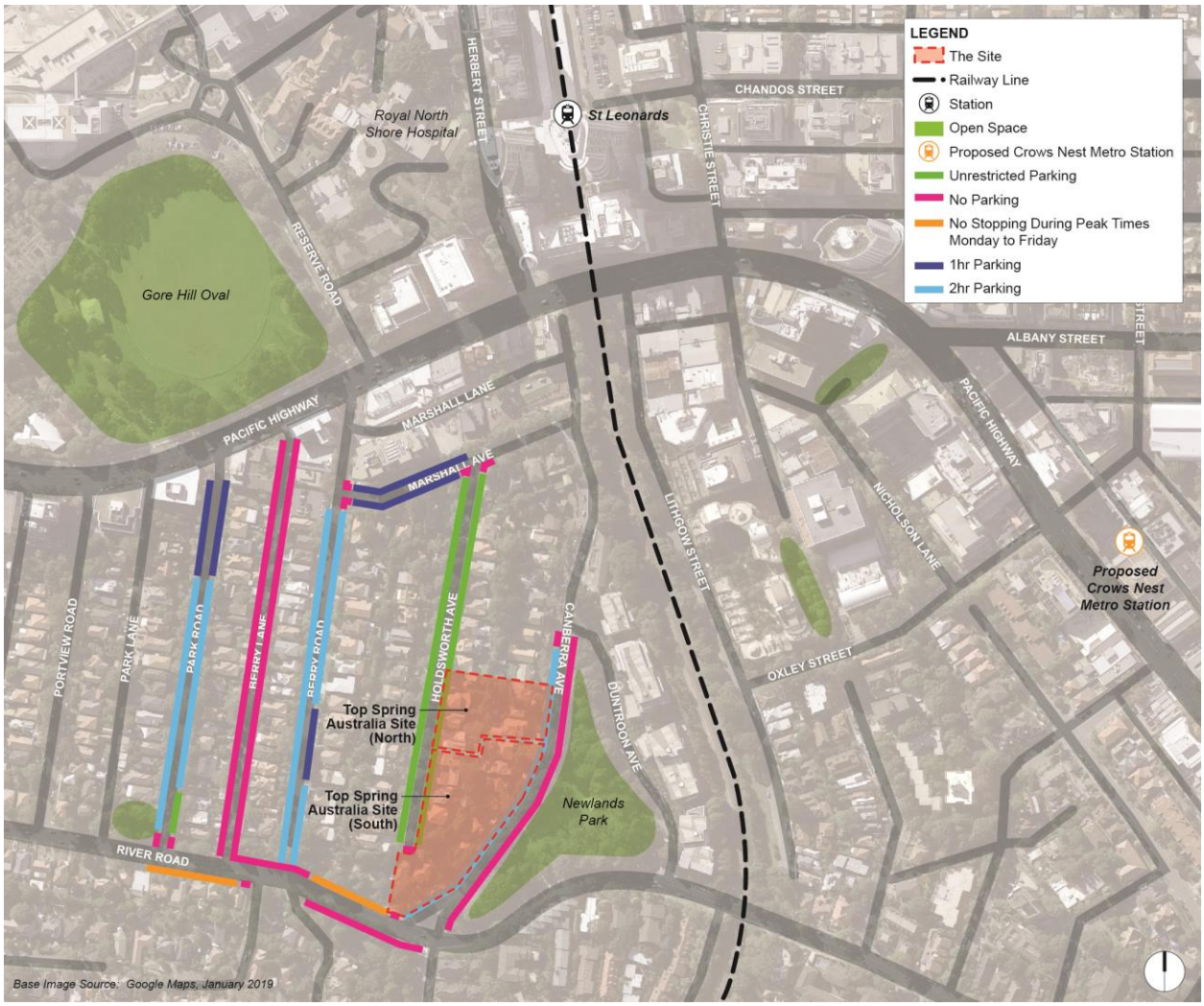
Daily vehicle volumes from the traffic surveys completed on 17th November 2016 at 18 locations throughout the Precinct confirm that the Pacific Highway is the main thoroughfare for drivers with over 20,000 vehicles using certain stretches of this road in both directions. There is also a high level of vehicles on Falcon Street, with approximately 10,000 vehicles in both directions. The Pacific Highway experiences the highest volume of private vehicles through the Precinct, and road network congestion is evident during peak periods.

Key distributor roads, such as Shirley Road, River Road, Herbert Street and Greenwich Road providing access to the Pacific Highway currently have a demand of between 4,000 – 8,000 vehicles per day.

3.6 Parking

There are a variety of street parking spaces surrounding the site. On-street parking is provided along Canberra Avenue, Berry Road and Park Road with restriction of 1 to 2-hour duration. Unrestricted on street parking is also provided on both sides of Holdsworth Avenue. Parts of River Road are no parking, while other parts do not allow parking between certain hours from Monday to Friday and provide unrestricted parking during other periods. See Figure 3-13 for a detailed breakdown of parking in the area.

Figure 3-11: On-street parking provision in St Leonards South



Source: SCT Consulting, January 2019

There are two off-street public car parks available a short distance from the site; Clemenger Garage and Gore Hill Oval. Clemenger Garage has a fee of $50 per day, while Gore Hill Oval has three sections with different restrictions;

– 2 hours free;

– 4-hour limit at $3.50 per hour; and

– All day parking for $11.

3.7 Car share

Car share decreases the need for some people to own a car or a second car and can therefore reduce parking demand and traffic generation. It differs from traditional car hire companies in that cars can be hired by half hour increments and cars are located near to where people live or work. Car share is available from either companies that own a vehicle fleet or peer-to-peer services for individual owners to share their vehicles.

Within the Precinct, GoGet is currently the sole operator. A map of the GoGet parking locations is shown in **Figure 3-11**. There are approximately 30 Go Get cars in the Precinct. There are two car share parking locations on Canberra Avenue within the St Leonards South precinct, as well as a significant number in the St Leonards and Crows Nest town centre within walking distance, generally close to higher density residential and business land uses.

Peer to peer car share services generally offer both cheaper and more expensive hire rates than GoGet depending on the value of the vehicle. Peer to peer car share services available in the Precinct include:

– Car next door; and

– Drive my car.

Figure 3-12: GoGet Car Share parking locations

Source: https://www.goget.com.au (viewed March 2017)

4.0 The Planning Proposal

4.1 Planning description

The subject site for this proposal is the Top Spring owned land within St Leonards South, comprising 21-41 Canberra Avenue and 18-32 Holdsworth Avenue collectively (the site). The site is located within the St Leonards South Residential Precinct, which is currently in the process of a Council led planning proposal to deliver a high-density residential use with significant additional local infrastructure and green spaces.

The sites are ideally located approximately 450m south from the St Leonards Strategic Centre and rail station. St Leonards is identified as a key health and education precinct, and is anticipated to have substantial employment growth following the opening of the Crows Nest Metro Station.

This precinct has been supported for uplift in every draft and published Local and State government strategic document for the past five years, to assist in meeting local housing targets and to provide housing diversity within walkable distance to strategic centres and infrastructure.

This planning proposal supports the growth of a high-density residential precinct with high quality open space and public benefits, providing more homes close to jobs, as encouraged in the Greater Sydney Commission's (GSC) North District Plan.

The objectives of the planning proposal are:

- To amend the Lane Cove Local Environment Plan (LCLEP 2009) to enable the redevelopment of the sites for high density residential, aligned with Lane Cove Council's Planning Proposal for St Leonards South Residential Precinct (Council's PP);
- To provide flexible amalgamation packages to what is outlined in Council's PP to ensure alternative solutions are available to deliver public benefit outcomes;
- To deliver housing diversity and stock in accessible locations close to jobs and services, assisting in achieving State and local housing targets;
- To deliver high quality open space of public domain thoroughfares;
- To facilitate a high quality urban and architectural design that responds to the envisioned development pattern and provides high level of amenity for public benefit and residents;
- To contribute to the transition of the wider St Leonards South Residential Precinct, creating a platform for future redevelopment of the surrounding earmarked sites;
- To provide and improve connectivity to the surrounding precinct; and
- To leverage the NSW Government's investment in major infrastructure including the provision of through site links and open space on site and providing new housing in close proximity to the infrastructure and services provided in St Leonards and Crows Nest.

The intended outcome for the Planning Proposal is to allow for the draft controls within Council's Planning Proposal, including the incentive FSR and height controls, to be applied to the identified sites, with flexibility around the delivery of amalgamation packages and public benefits. The planning proposal would result in an amendment to the LCLEP 2009 consistent with Council's own proposal. This Planning Proposal assumes that the Council's draft DCP controls will also be applied to the sites. The summary of the proposal is provided in **Table 4-1**:

Table 4-1: Summary of LEP amendments

Item	The Site (northern lot)	The Site (southern lot)
Zoning	R4 High Density Residential	R4 High Density Residential
Incentive height	37m	15m to 31m
Incentive FSR	3:1	2.75:1
Amalgamation of lots	21, 23, and 25 Canberra Avenue 18, 20, 22, and 24 Holdsworth Avenue	27, 27A, 29, 31, 33, 35, 37, 39, 41 Canberra Avenue 26, 28, 30, 32 Holdsworth Avenue

Item	The Site (northern lot)	The Site (southern lot)
Public benefit outcomes	15m wide east-west through-site link at northern boundary New north-south green spine connection through centre of site	6m wide east-west pedestrian pathway between Canberra Avenue and Holdsworth New north-south green spine connection through centre of site

Source: Mecone, January 2019

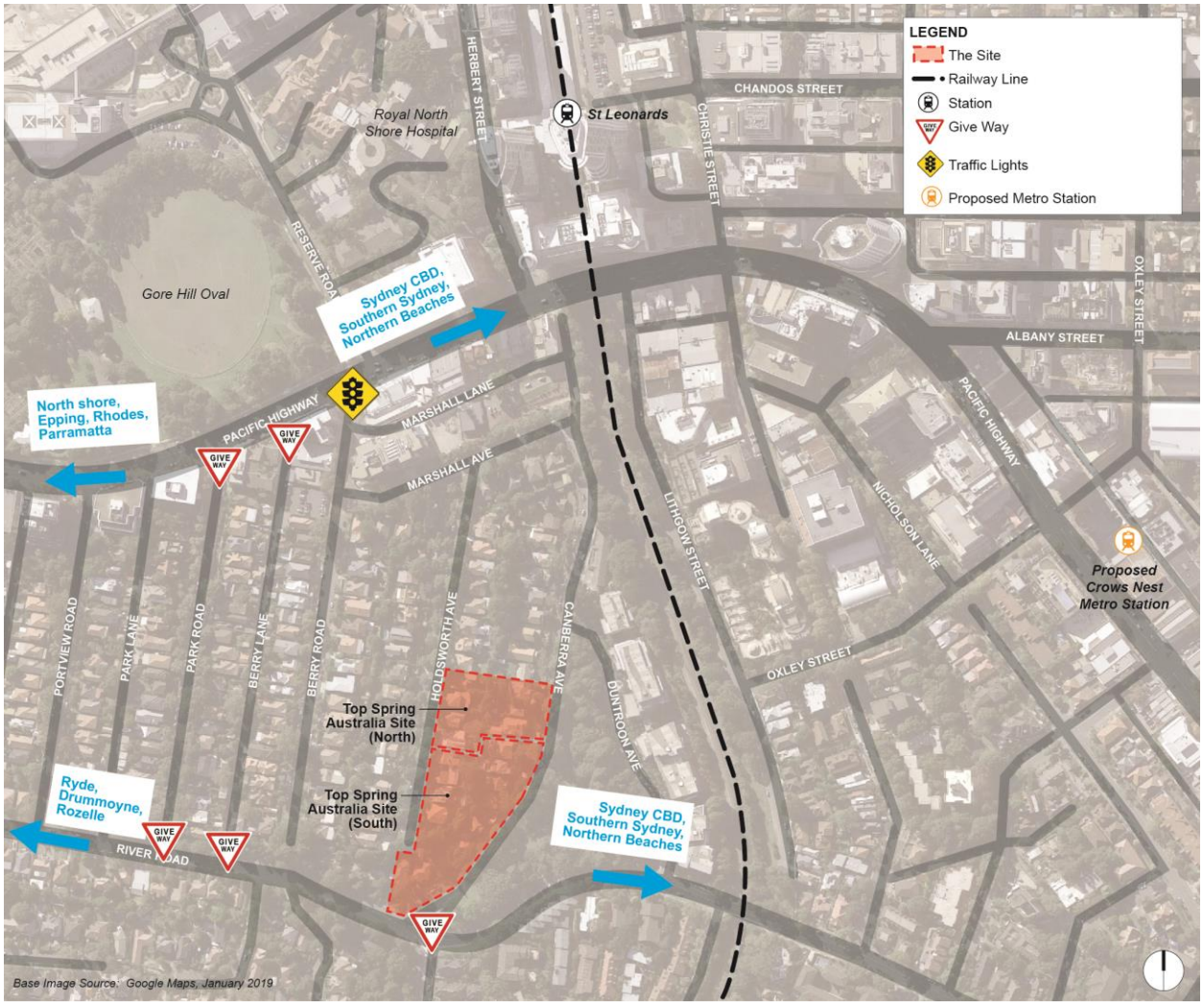
A Design Overview prepared by Bates Smart is provided with the planning proposal, which includes an analysis of the site and a massing study.

4.2 Proposed access strategy

4.2.1 Vehicular access

The proposed site has several access points along Pacific Highway and River Road, as shown in **Figure 4-1**. Pacific Highway can be accessed from Park Road, Berry Lane and Berry Road. River Road can be accessed from Park Road and Berry Lane. Residents can use the Pacific Highway access points to travel towards the North Shore, Epping, Rhodes and Parramatta, or the Sydney CBD, Southern Sydney and the Northern Beaches. Residents can use the River Road access points to travel towards Ryde, Drummoyne and Rozelle, or the Sydney CBD, Southern Sydney or the Northern Beaches.

Figure 4-1 Proposed vehicle access locations



Source: SCT Consulting, 2019

4.2.2 Public transport access and connections

There are no proposed changes to public transport access from the site. Being within 400 to 800m of St Leonards Station and 1km from Crows Nest Metro Station, the level of public transport access from the site is very high quality and consistent with that of a high-density residential area. The wide coverage of bus routes provide alternative transport options to private vehicle for trips outside of the train line and connect to key destinations in the Artarmon Industrial Area.

4.2.3 Active transport access and connections

Substantial work has already been completed to ensure adequate active transport access and connections throughout the planned St Leonards South area. Refer to **Figure 2-10** and **Figure 2-11** for the recommended

pedestrian and bicycle network as per the St Leonards Planning and Accessibility Study. Upgrades will continue to be made as per Council's work in the area (see **Table 2-4** and **Section 2.8**). This includes provision of East-West links to provide more direct routes with reduced gradients for pedestrians and cyclists. **Figure 4-2** shows the provision of two links proposed within the Top Spring sites:

– An east-west connection at the centre of the site (Area 11), providing a connection to the pocket park; and

– An east-west connection through the northmost part of the site (Areas 7 & 8).

The proponent will contribute to these upgrades via a Section 7.11 local government contribution including delivery of pedestrian infrastructure on TSA land.

Figure 4-2 Proposed East-West active transport connections within site area

Source: Bates Smart, January 2019

4.3 Travel Demand Management measures

Sustainable transport and Travel Demand Management (TDM) strategies involve the application of policies, objectives, measures and targets to influence travel behaviour, to encourage uptake of sustainable forms of transport, i.e. non-car modes, wherever possible. TDM measures have proven to reduce congestion created by growth within urban areas and unlock urban renewal opportunities. They result in travel behaviour that uses less road space than a single occupant vehicle commute and takes advantage of spare transport capacity outside the morning and afternoon peaks.

TDM strategies generally guide all relevant customers (residents, employees and visitors) in changing the travel behaviour in the following ways:

– Reduce travel;

– Re-mode (consideration of travel via alternative modes);

– Re-time (consideration of travel at alternative times); and

– Re-route.

Top Spring set up a framework for a more sustainable travel, which has been used as a key principle of planning for the development. The key initiatives and measures of Travel Demand Management Strategies would be important to:

– Reduce the need to travel

- Planning of the wider St Leonards South as a mixed-use community to maximise trip containment within the precinct and encourage use of active transport (walking and cycling) for short trips.

– Re-think the mode of travel
  - Walking and cycling:
    - A highly permeable and safe pedestrian network throughout the development.
    - Dedicated cycle routes that connect to the regional routes and major transport hubs.
    - Key design principles to integrate walking and cycling network and facilities into the planning and delivery of the development.
    - High quality, safe and accessible end-of-trip facilities (centralised cycle hubs that are integrated within development at convenient locations, on-street secure bicycle storage located conveniently at end of cycle destinations, parking hubs for shared bikes, lockers and showers).
    - Promotion of bicycle initiatives – NSW bicycle week, cycle to work day, free bike check-up events.
    - Establishment of a Bicycle User / Consultation Group.
  - Public transport:
    - Provision of frequent public transport services to establish a non-car travel behaviour.
    - Good quality public transport stops near the development.
    - Tailored information with clear mapping and walking catchments at public transport stops.
    - Provision of public transport information from home via television channel or community app.
  - Parking measures to encourage alternative modes of travel:
    - Reduced parking rates with flexibility in parking arrangements such as shared parking between non-conflicting uses, shared vehicles parking and / or carpooling to accommodate parking needs of all employees.
    - Parking spaces dedicated to electric vehicles, with charging stations.
    - Parking spaces dedicated to car share scheme and community car-share vehicles, both on-street and incorporated in easily-accessed public car parks.
  - Development and use of carpooling app for the wider precinct and community.

– Re-time and Re-route journeys:
  - Development of specific community app / community engagement program to enable changing travel behaviour which includes:
    - Active and public transport maps
    - Personalised journey planner
    - Notifications to latest travel information
    - Shared vehicles information
    - Car-pooling opportunities
    - Other precinct-related information
  - Real-time information embedded into development and public transport stops.
  - Employers to promote and encourage flexible working hours and arrangements.

4.4 Car parking proposal

Guidance on parking rates in several relevant state and local planning frameworks as well as RMS Guide to Traffic Generating Developments could be applied to estimate likely parking provision for the site.

Transit-oriented developments must aim to adopt car parking rates that provide a balance between meeting car parking demand whilst encouraging sustainable and active transport by residents. New developments are

encouraged to minimise car parking provision and demonstrate the inclusion of transport alternatives or strategies to discourage private motor vehicle use.

The guidelines considered appropriate for review, for the residential and non-residential components of the proposed development, are the Roads and Maritime Guidelines and the Lane Cove DCP (2011) rates. A comparison of the relevant parking rates applicable to the residential component of the proposed development is presented in **Table 4-2**.

Table 4-2: Car parking requirements for residential developments

Dwelling type	Number of parking spaces required			
	Traffic Generating Developments guidance for Metro Regional CBD Centres	Traffic Generating Developments guidance for Metro Sub-Regional CBD Centres	Lane Cove Council DCP	Lane Cove Council DCP – St Leonards Centre
Studio	N/A	N/A	0.5 spaces	**0.5 spaces**
1 Bed	Min 0.4 space	Min 0.6 spaces	1 space	**0.5 spaces**
2 Bed	Min 0.7 space	Min 0.9 space	1.5 spaces	**0.9 spaces**
3 Bed	Min 1.2 space	Min 1.4 spaces	2 spaces	**1.4 spaces**
Visitor	Min 0.14 spaces per dwelling	Min 0.2 spaces per dwelling	0.25 spaces per dwelling	**0.2 spaces per dwelling**

Source: SCT Consulting, 2019

The *State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development (SEPP 65)* and the *Apartment Design Guide* state that:

> *"Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas"*
>
> *"For development on sites that are within 800m of a railway station or light rail stop in the Sydney Metropolitan Area the minimum car parking requirement for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less"*

Where any part of a street block falls within 400m of St Leonards Railway Station, the whole block is considered to be included within the catchment. Therefore, the location of the Top Spring site is within 400m from St Leonards train station (see Figure 4-3).

Figure 4-3 St Leonards Railway Station – 400m Catchment

Source: Lane Cove Council, 2016

Therefore, the rate for *Lane Cove Council DCP – St Leonards Centre* would be the relevant rate for the property. Dependent on the mix of apartments, the average is recommended to be approximately 1.1 car parking spaces per apartment, comprising a mix of dedicated and visitor spaces.

Reduced car parking provision beyond the *Lane Cove Council DCP* as mandated by legislation will encourage a balance between meeting car parking demand whilst encouraging sustainable and active transport by residents. The car parking needs of future residents can still be met through several flexible and sustainable parking management measures / options such as:

– Decoupled parking, shared vehicles parking to accommodate parking needs of all residents.

– No dedicated parking space for small (1-bedroom) apartments to increase housing affordability. Car travel needs can be addressed via carpooling and / or using shared vehicles.

– Parking spaces dedicated to electric vehicles, with charging stations.

– Parking spaces dedicated to car share scheme and community car-share vehicles, both on-street and incorporated in easily-accessed public car parks.

The total number of spaces provided using the current proposed apartment type breakdown is provided in

4.5 Motorcycle and bicycle parking requirements

4.5.1 Motorcycle provisions

The rate of provision of motorcycle spaces under the *Lane Cove Council DCP* is 1 space per 15 car spaces for all types of development.

4.5.2 Bicycle provisions

Bicycle parking provisions for this type of development under the *Lane Cove Council DCP* are:

– 1 space per 4 dwellings for residents; and

– 1 rack + 1 rack per 10 dwellings for visitors.

The bicycle parking provision for this development is therefore:

– 91 bicycle parking spaces for residents; and

– 37 bicycle racks for visitors.

4.6 Trip generation

4.6.1 Vehicle trip generation

Previous consultation undertaken between Lane Cove Council and Roads and Maritime Services resulted in a request from Roads and Maritime Services (4 January 2016) to use the rate of 0.14 vehicle trips per dwelling in the AM peak and 0.07 vehicle trips per dwelling in the PM peak. Given the recent nature of this advice, these rates will be adopted for the testing of traffic impacts.

Table 4-3 Vehicle trip generation

Item	Site generation
Total dwellings	362
AM peak traffic generation rate	0.14 cars per dwelling
AM peak total traffic	51
PM peak traffic generation rate	0.07 cars per dwelling
PM peak total traffic	25

Source: SCT Consulting, 2019

The total scale of traffic impacts for the proposed development is less than 55 vehicles per hour in both peak periods. Given the scale of other growth in the area, this planning proposal represents 9.5% of the anticipated St Leonards South potential uplift and an even smaller proportion of the total uplift anticipated by the Land Use and Infrastructure Implementation Plan.

4.6.2 Person trip generation

Using the mode share estimated by the ptc. report, the number of trips using each mode of transport is estimated in **Table 4-4**.

Table 4-4 Person trip generation

Mode of travel	Mode share	Site trips (AM|PM)
Car	12.5%	51 | 25
Car as passenger	2.5%	10 | 5
Train	56%	228 | 112
Walk only	19%	78 | 38
Bus	6%	24 | 12
Other	4%	16 | 8
Total	**100%**	**407 | 200**

Source: SCT Consulting, 2019

5.0 Traffic and transport impact appraisal

5.1 Approach to appraisal

With the significant volume of quantitative work already undertaken, the impact assessment will rely on that work as it has been endorsed by Council for public exhibition.

5.2 Public transport impacts

Public transport mode share is expected to be very high in the St Leonards South area, with 62% of peak hour trips occurring on trains and buses. The Top Spring development would create an additional 252 public transport trips predicted during the AM peak, and 124 trips predicted during the PM peak, using public transport (see **Table 4-4**). While the public transport network in the area is currently very close to capacity, the completion of the Crows Nest Metro planned service by 2024, in combination with current services, will be more than sufficient to accommodate for the increased capacity.

5.3 Active transport impacts

The proposed upgrades to the pedestrian and cycle networks include undertaking footpath and cycle path improvements, improving pedestrian crossings and creating East-West links to enhance connectivity within the precinct. The number of walking trips generated during peak periods is 78 during the AM peak period and 38 during the PM peak period, which are relatively small figures. Therefore, the number of trips generated by the Top Spring development during the peak periods is at a level able to be accommodated by the existing and planned services.

5.4 Road network impacts

The scale of additional vehicle trips in the network is less than 55 vehicles per hour in each peak period, which is small in comparison to the other proposed developments in the area. Previous traffic modelling by Lane Cove Council indicated that with improvements to the network, the cumulative impact of the growth (prior to the Land Use and Infrastructure Implementation Plan) was manageable.

It is recommended that east-west connectivity as defined in the TEF Consulting St Leonards South Traffic Report – being a road connection between Park Road and Berry Road be delivered as part of broader planning, as the road connection would reduce pressure on individual intersections.

It is noted that the Department of Planning & Environment's Land Use and Infrastructure Implementation Plan identifies a requirement to undertake cumulative impact assessment. With the significant volume of work undertaken to date, there is sufficient evidence for the Department of Planning & Environment to undertake a gateway review and consultation with other agencies, with the cumulative traffic impact modelling to follow gateway. The typical process for this task would comprise:

– Engagement with road network stakeholders, such as Council, Roads and Maritime Services and Transport for NSW to prepare a traffic modelling methodology that addresses the needs of all parties;

– Engagement with Department of Planning & Environment to confirm the appropriate growth assumptions for the surrounding area; and

– A consultative modelling process where the traffic modelling methodology is delivered by the proponent in partnership with stakeholder agencies.

5.5 Infrastructure summary

The proponent will deliver the following transport infrastructure on their land:

– An east-west through site pedestrian link in Area 11; and

– An east-west through site pedestrian link in Areas 7 & 8.

5.6 Satisfaction of LUIIP requirements

The requirements of the LUIIP for St Leonards South are satisfied as follows:

- **Consider accessibility to St Leonards and Crows Nest Stations:** the site is located with a direct north-south link to St Leonards Station, which is the most direct route possible for the site. Internal footpaths also promote these connections. Station access is also considered regarding car parking requirements, with the St Leonards Station rates applying;
- **Improve active transport connections:** the delivery of footpath connections east-west through the site provide the best possible connections to the stations by reducing the need to walk up steep grades for transport users across St Leonards South;
- **Consider cumulative traffic impacts:** cumulative traffic impact modelling was undertaken in the previous stage of planning, which considered relevant uplift in the area. Consideration of the cumulative traffic impacts of the LUIIP uplift is proposed post-gateway.

6.0 Conclusions and next steps

6.1 Conclusions

The Traffic and Transport Study indicates that the impacts of the planning proposal can be appropriately mitigated by the proposed infrastructure schedule.

From a transport perspective, the proposal is consistent with the St Leonards South Planning Proposal and Department of Planning & Environment LUIIP.

The scale of traffic impacts for the proposed development is minor and not significant relative to the other proposals in the area – comprising only 9.5% of the total St Leonards South yield. The total traffic generation is less than 55 vehicles per hour in the peak periods.

The site is topographically challenged, but the proposed east-west walking and cycling mitigate this so far as is practicable. The topography is significantly less steep along the east-west axis, so these links make the station easier to access.

The Department of Planning & Environment LUIIP requirements are fully met by the proposal.

6.2 Next steps

After lodgement, the proponent will work with Council and other stakeholders to refine the proposal in line with comments.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