Epic Leisure Pty Ltd 50-56 Atchison Street, St Leonards Transport Impact Assessment

Issue 01 | 15 February 2018

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1 Introduction

1.1 Background

Epic Leisure Pty Ltd has commissioned Arup to carry out a traffic and transport assessment of the Planning Proposal for the site at 50-56 Atchison Street, St Leonards (the site). The proposal is for the development of a high rise building which will include three (3) basement levels, one (1) level of retail premises on the ground floor, two (2) levels of commercial premises on Level 1 and Level 2 as well as 13 levels of residential apartments.

The site is located within the North Sydney Local Government Area (LGA) and is subject to that Council's controls. It is currently zoned as *'B4 Mixed-use'* and located in the Precincts 2 & 3 under the North Sydney Development Control Plan (DCP) 2013.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects (SEE) prepared separately. The development proposes 65 residential units and 2,378m² gross floor area (GFA) of retail / commercial floor area therefore is not exceeding a threshold of 300 apartments or 10,000m² GFA of commercial space. It will thereby not require formal referral to the Roads and Maritime Services (Roads and Maritime) under the provisions of SEPP (Infrastructure) 2007.

1.2 Scope of works

This transport assessment will address the following:

- An overview of the existing transport and planning context
- Generation of car trips
- Traffic impacts of the development
- Public transport accessibility
- Car parking arrangements
- Pedestrian and bicycle access
- Green initiatives

2 Existing Conditions

2.1 Site description

The proposed development site is located at 50-56 Atchison Street, St Leonards which is shown in Figure 1. It is approximately 2 kilometres north-west of North Sydney CBD and within 500 metres of St Leonards Railway Station. It is legally described as Lot 6 in DP2872 and Lot 7 in DP2872. The site is located within the North Sydney Council LGA (precincts 2 & 3) and is currently zoned as B4 Mixed Use.

The existing site has an area of approximately 720m² and comprises of a four (4) storey office building with 19 parking spaces in the ground floor area. St Leonards is identified as a strategic centre by the NSW Government in 'A Plan for Growing Sydney' (the old Metropolitan Strategy for Sydney) due to the area's accessibility to public transport. The area surrounding the site has a mixture of high density residential, commercial and retail uses.



Figure 1: Site location

2.2 Travel behaviour

Travel to Work data from the 2016 Census for the site is shown in Figure 2. The data indicates that over 51% of the residents living in the area take the train to work.

2016 Census QuickStats



Travel to work, top responses Employed people aged 15 years and over	St Leonards (NSW)	%
Train	1,470	41.2
Car, as driver	759	21.3
Walked only	473	13.3
Bus	203	5.7
Worked at home	115	3.2
People who travelled to work by public transport	1,847	51.4
People who travelled to work by car as driver or passenger	881	24.5

Figure 2: Existing travel patterns

Source: ABS Census Quickstats

Mode share patterns at the site were also analysed using 2011 Journey to Work (JTW) Census data from the Transport Performance and Analytics (TPA) from Transport for NSW. The JTW data for travel zone 1844 was used to assess the likely mode of peak hour trips to and from the site. The location and the coverage of travel zone 1844 is shown in Figure 3. The results of the analysis are shown in Table 1.



Figure 3: Journey to Work travel zone coverage

Source: TPA, 2011

Mode	Inbound trips to work	Outbound trips to work
Train	37%	49%
Bus	8%	15%
Car	44%	24%
Walk	5%	15%
Other	2%	2%
Mode not stated	1%	0%
Total trips	10,938	1,959

Table 1: Journey to Work travel patterns

The JTW data shows that residents of travel zone 1844 rely primarily on public transport to commute to work. The data reveals that commuting to work by train is the most heavily used mode of transport at 49%. This can be attributed to the close proximity of St Leonards Station and the frequency of services to the Sydney CBD and Chatswood CBD.

The JTW data also reveals that commuters travelling to travel zone 1844 rely more heavily on car trip modes which makes up 44% of inbound trips. Commuters travelling to work by train make up 37% of inbound trips and trips made by bus make up 8%.

2.3 **Public transport**

The site has good access to public transport and is located within 400m walking distance from St Leonards Station and within 300m walking distance from bus stops located on the Pacific Highway which are illustrated in Figure 4. It is also within 350m walking distance of the future Crows Nest Metro Station.



Figure 4: Existing public transport around the site

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2.3.1 Bus

The existing bus routes serving the site are shown in Figure 5. Bus M20 provides access to the City via the Pacific Highway, while the other buses serve various suburbs regionally.



Figure 5: Bus routes serving the site

The bus routes connecting to the bus stops shown in Figure 4 are summarised in Table 2. Buses connect the local area to the Sydney CBD, Chatswood CBD, Crows Nest, Epping, Lane Cove and surrounding suburbs. The bus stops are well served, with frequent services throughout the day and express buses operating during the peak periods.

Bus Route	Service description
Route 143, Manly and Macquarie University	Services every 30 minutes throughout the day in each direction.
Route 144, Chatswood and manly via Royal North Shore Hospital	Services every 30 minutes throughout the day in each direction.
Route 252, Lane Cove West and City via Pacific Highway	Services every 30 minutes throughout the day in each direction.
Route 254, Riverview and City via Pacific Highway	Services every 30 minutes throughout the day in each direction.
Route 257, Chatswood to Balmoral Beach	Services every 30 minutes throughout the day in each direction.
Route 265, McMahons Point and Lane Cove via Greenwich Wharf	Services every 30 minutes throughout the day in each direction.
Route 286, Denistone East and City via Pacific Highway	Services every 30 minutes during the peak periods between Monday to Friday
Route 287, Ryde and Milsons Point via Pacific Highway and North Sydney	Services every 30 minutes during the peak periods between Monday and Friday in each direction
Route 290, Epping and City via Macquarie Centre and Pacific Highway	Services every 15 minutes during the peak periods between Monday and Friday in each direction
	Services every hour at all other times.
Route M20, Botany and Gore Hill	Services every 10 minutes during the peak periods in each direction.
	Services every 15 minutes at all other times.

Table 2: Bus routes and frequencies

2.3.2 Trains

St Leonards Station services the T1 North Shore and Northern lines, and the Central Coast and Newcastle lines. The railway station is directly connected to other major railway stations such as Central Station, Chatswood Station and Epping Station. The railway station is well served by trains with services every three minutes during the peak periods in both directions of travel. The advent of Sydney Metro will provide additional connectivity to and from the site. From the future Crows Nest Station (approximately 250m from the site), Central Station may be reached in 11 minutes (indicative), and Sydney Metro 's future Martin Place Station in 7 minutes (indicative). The Sydney Metro route and station locations are shown in Figure 6.



Figure 6: Sydney Metro route and station locations

2.3.3 Walking

Walking facilities surrounding the site are efficient with a comprehensive network of footpaths linking key attractors, such as the railway station, bus stops and the Royal North Shore Hospital.

2.3.4 Cycling

The recommended Roads and Maritime cycle routes are shown in Figure 7. Atchison Street provides east-west cycle routes, while Herbert Street and Canberra Avenue provide north-south cycle routes. The site is well situated to take advantage of these cycle routes to encourage use of green travel methods.



Figure 7: Roads and Maritime recommended cycle routes near the site

2.3.5 Travel times

The transport interchange at St Leonards serves a number of areas across Sydney. An accessibility map (as shown in Figure 8) illustrates the locations within 30minute public transport travel time of the site.



Figure 8: Locations within 30-minute public transport travel time of site *Source: Arup's T3A tool*

2.4 Vehicle access

Existing vehicular access to the site is located on Atchison Lane as shown in Figure 9. Driveway surveys were carried out at the site during school term in December 2017 during peak hours, with the following results:

- AM, 7:30am to 8:30am, 1 cars entered, 4 cars departed the site
- PM, 5:00am to 6:00pm, 3 cars entered, 1 cars departed the site



Figure 9: Vehicle access to the existing site

2.5 Road network

The main roads surrounding the site are Pacific Highway to the south, Atchison Street to the north, Christie Street to the west, and Willoughby Road to the east, shown in





Regional Roads perform an intermediate function between the main arterial network of State Roads and Council controlled Local Roads. Due to their network significance Roads and Maritime provides financial assistance to Council for the management of their Regional Roads. Vehicle entry to the site fronts Atchison Street, which is a local road.



Figure 10: Classified roads surrounding the site

Christie Street is a regional road north of Pacific Highway operating with a 50km/h speed restriction.

Chandos Street is a regional road that runs between Christie Street to the west and connects Brook Street from the Warringah Freeway to the east. It is subject to a 50 km/hr speed limit restriction and on street parking is permitted for up to 2hours during 8:30am to 6.0pm Monday to Friday on both sides of the road.

Atchison Lane is a local road that connects to Christie Street to the west and Hume Lane to the east. Atchison Lane carries two-way traffic flow between Christie Street and Hume Lane.

Atchison Street operates as a one-way eastbound local street between Christie Street and Mitchell Street with parking on both sides and includes a line marked contra-flow bicycle lane as shown in Figure 11. This street operates as a two way two lane between Mitchell Street and Matthew Lane with parking on both sides. Atchison Street runs parallel to Pacific Highway and provides the access driveways to the site and adjacent properties.



Figure 11: Atchison Street, St Leonards

Willoughby Road is a regional road that runs between Falcon Street to the south and Mowbray Road to the north. This street operates as a two way two lane with parking on both sides of the road. It is subject to a 50km/hr speed limit restriction in the vicinity of the site and on street parking is permitted for up to 1hour during 8:30am to 3.30pm Monday to Friday and 8:30am to 12.30pm on Saturdays on western side of the road. On eastern side of the road, on street parking is permitted for up to ½ hours during 8:30am to 6.0pm Monday to Friday and 8:30am to 12.30pm on Saturdays.

Pacific Highway is a divided six-lane, two-way arterial road with restricted parking opportunities available on each side of the road outside of the peak periods. The Pacific Highway within the vicinity of the site connects the M1 Bradfield Highway to the M1 Gore Hill Freeway / M2 Lane Cove Tunnel via the North Sydney CBD and Lower North-Shore suburbs. It is a major bus corridor servicing a large number of bus routes connecting the Sydney CBD to the North-Shore region. There are 60km/h speed restrictions in the section of Pacific Highway relevant to the study area.

2.6 On street parking

There are only metered restricted parking opportunities available on surrounding streets. Christie Street and Atchison Street are all metered with a 2-hour restriction between 8.30am and 6pm, Monday to Friday and 8.30am- 12.30pm Saturday. The section of Pacific Highway within the vicinity of the site operates as a T3 transit lane during 3pm to 7pm, Monday to Friday and has a 1-hour restriction at other

times. Due to the lack of unrestricted parking opportunities on surrounding streets, residents and office workers are generally discouraged from parking on streets.

2.7 Existing traffic volumes

Traffic count data for the purposes of the analysis was sourced from two previous studies, namely the St Leonards South Strategy, Paramics Base Model – AM Peak, Calibration and Validation Report and the St Leonards South Strategy, Paramics Base Model – PM Peak, Calibration and Validation Report for this section of the Pacific Highway (Lane Cove Council, 2013).

Additional data for streets surrounding the site were obtained from a previous traffic impact assessment, Traffic, Parking and Accessibility Report (Brown, 2014), which accompanied a planning proposal for Leighton and Charter Hall's development sites to the east of the site. Existing mid-block traffic volumes during the AM and PM peak periods are shown in Figure 12 and Figure 13. Daily traffic flows in the vicinity of the site are also presented in Figure 14.



Figure 12: Existing AM peak mid-block traffic volumes



Figure 13: Existing PM peak mid-block traffic volumes



Daily traffic movements in the precinct are presented in Figure 14 below.

Figure 14: Daily traffic flows

Source: St Leonards and Crows Nest Station Precinct Transport Study (Cardno, 2017)

3 Description of Planning Proposal

3.1 Overview

The Planning Proposal for the site located at 50-56 Atchison Street, St Leonards seeks approval to facilitate a future redevelopment. As demonstrated in the indicative concept design that accompanies the Planning Proposal, the future development could consist of:

- 65 units residential premises
 - 40% 1 bedroom units (26 units)
 - 20% 1 bedroom units + study room (13 units)
 - 40% 2 bedroom units (26 units)
- 2,426m² non-residential GFA
- 32 car parking spaces located in the basement levels

3.2 Vehicle access

According to the indicative concept design, vehicle access is proposed to be maintained on Atchison Lane, with the location unchanged from the existing arrangement. The loading dock is also proposed to be adjacent to the car park ramp. Loading/ unloading will be taken place from the ground level, with one (1) 8.8m mediums rigid vehicle (MRV) space proposed as shown in Figure 15.

The car park is designed as an efficient ramp system shown in Figure 15. Both the car park and the loading dock will be designed to meet AS2890.1 and AS2890.2 requirements respectively.



Figure 15: Ground Level layout, vehicles car park entry ramp and loading dock

The proposed development proposes a total of 32 parking spaces with access to Atchison Lane, which is categorised as a local street. It will therefore require a Category 1 Driveway under AS2890.1 (2004), being a combined entry and exit driveway of 3.0 to 5.5 metres. In response, the development proposes a 5.5-metrewide driveway between kerbs to comply with two-way access in AS2890.

A swept path analysis of a 99th percentile (B99) vehicle entering and exiting the proposed development has been included in Appendix A, demonstrates satisfactory operation of the proposed Atchison Lane access.

The proposed loading dock accommodates one (1) MRV vehicle. According to the swept path analysis, the MRV will need to reverse into the loading area from the laneway which is considered acceptable given that:

- Existing service vehicles for adjacent developments already undertake this • manoeuvre;
- The low frequency of service vehicles; and
- Deliveries would be made out of hours which minimise interactions with other • vehicles and pedestrians.

A swept path analysis of these MRVs entering and exiting the proposed loading dock has also been presented in **Appendix A**.

In summary, the proposed access arrangements are expected to operate satisfactorily and hence, are considered acceptable.

4 Parking Assessment

4.1 Off-street car parking

The proposed development lies within 400m of a train station. Provision P1 and P7 of Section 10.2.1 from the *North Sydney DCP 2013* requires car parking for the respective uses of the proposed development to be provided in accordance with the parking rates shown listed in Table 3. It is noteworthy that the site is zoned as '*B4-Mixed Use*' and located in *St Leonards Precincts 2 & 3*.

The required parking for this development has been summarised in Table 4.

Development type		DCP requirement
	1 bedroom	0.25 spaces per apartment
Residential	2 bedrooms	0.5 space per apartment
(Zone B4)	3+ bedrooms	0.5 spaces per apartment
	Visitor parking	Not required
Non-residential	Commercial / retail premises	1 space per 400m ² of GFA

Table 3: North Sydney Council car parking rates Precinct 2&3

Table 4:	Parking	requirements	and	provisions
		· · · · · · · · · · · · · · · · · · ·		r · · · · ·

Development typ	e	Number of apartments / GFA	DCP maximum parking	Proposed parking provision
D 1 (. 1	1 bedroom	39 units	10	16 standard parking spaces, 7
(assuming Zone B4 mixed	2 bedrooms	26 units	13	adaptable parking spaces
precinct 2&3)	Visitor parking	NA	0	0 visitor parking spaces, 1 carwash bay and 1 Car share
Commercial / Retail	Office	2,426m ²	6	6 commercial/retail parking spaces and 1 accessible parking space
Maximum allowa	able car parkin	g spaces	29 spaces	30 parking spaces and 1 carwash and 1 car share

As noted in Table 3, the proposed development is permitted to provide a maximum of 29 car parking spaces. In response, the development provides a total of 30 parking spaces including 16 standard residential, 7 adaptable parking, one (1) accessible, and six (6) commercial parking spaces. One (1) car wash bay and one (1) car share space have also been provided within basement level 1 and 2 respectively.

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4.1 Motorcycle parking

Provision P1 and P12 of Section 10.2.1 from the DCP requires a motorcycle parking to be provided at a minimum rate of one space for every 10 car parking spaces or part thereof. Therefore, with 42 car parking spaces, the development is required to provide a minimum of 6 motorcycle parking spaces.

4.2 Accessible parking

Provision P6 of Section 10.2 from North Sydney Development Control Plan 2013 requires the development to provide at least one (1) accessible parking space per each adaptable unit. The development proposes seven adaptable units and in response, the plans provide seven accessible parking spaces which is compliant with the DCP.

In addition, to comply with Section D3.5 Class 3 of the Building Code of Australia, 1-2% of all non-residential parking spaces are to be designated as accessible = 1 space.

4.3 Bicycle parking

Council's DCP requires bicycle parking for the respective uses of the development to be provided in accordance with the rates listed in the sub-sections below. Bicycle parking would need to be provided at all basement levels for use by residents and commercial/community facilities as appropriate. These will be designed in future planning of the basements.

4.3.1 Residential

For residential uses, the following rates and provisions apply:

- Residential occupants: 1 space / dwelling = 65 bicycle lockers (Class 1 preferred) or racks in locked room (Class 2)
- Visitors/ customers: 1 space / 10 dwelling = 7 racks (Class 3)

It is noted that where an apartment in a residential building has a storage area on title that is large enough to accommodate a bike (i.e. being no smaller than a Class 1 bike locker as defined by AS2890.3:2015), then additional bike parking for that apartment is not required.

4.3.2 Commercial

For commercial uses, the following rates and provisions apply:

- Occupants: 1 space / $150m^2 = 15$ racks in locked room (Class 2)
- Visitors/ customers: 1 space / $400m^2 = 5$ racks (Class 3)

4.4 Car share

The installation of car share parking to replace general off-street parking is optional and at the discretion of the developer. Subject to future detailed design and planning, the site could provide one car share space.

4.5 Car wash bay

Provision P3 of Section 10.2.1 from the DCP requires a car wash bay to be provided for residential developments containing four or more dwellings. In response, one (1) carwash bay is proposed on Basement Level 3.

4.6 Loading and Servicing

Provision P1 of Section 10.4 from the DCP requires off-street loading and unloading facilities for all commercial premises having regard to the frequency of deliveries and size of goods to be delivered. Furthermore, provision P3 requires at least one (1) service delivery area, capable of accommodating either one (1) 12.5m Heavy Rigid Vehicle (HRV) or two (2) 8.8m Medium Rigid Vehicles (MRV) for the developments containing more than 60 dwellings. In addition, for the developments containing more than 30 dwellings but less than 60 units, one (1) service delivery space accommodating at least one (1) MRV must be provided.

Having regard for the scale and composition of the proposed residential yield and its commercial/retail premises, the number of residential dwellings is low with a total of just above 60 units. The proposed development residential makeup is considered to be small and it is considered that the service vehicle requirements of such developments would be less than that of a standard complex exceeding 60 apartments. Therefore, the development can be provided by one (1) combined residential and retail loading/unloading dock within the ground level to cater for delivery vehicles (up to an MRV).

In response, a shared loading/unloading area is proposed on Ground Floor fronting Atchison Lane, and bins would be transferred to the waste room next to the loading dock area for collection.

According to the swept path analysis, the MRV will need to reverse into the loading area from the laneway which is considered acceptable for the reasons outlined in section 3.2.

Overall, the servicing arrangements are considered to be acceptable and appropriate given the nature and scale of the proposed development.

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The loading/ unloading management plan is recommended be applied to the development as following:

- All delivery vehicles for the retail/commercial premises be scheduled to arrive at the site outside of periods required for residential removals vehicles
- All garbage collection be undertaken kerbside on Atchison Lane by Council's waste collection vehicle

5 Transport Assessment

5.1 **Person trip generation**

The person trips generated by a development of the scale shown in the indicative concept design are 0.64 per unit during the AM peak hour and 0.54 per unit during the PM peak hour. This equates to a development person trip generation of 42 person trips during the AM peak hour and 35 person trips during the PM peak hour.

The commercial trips generated by the site during peak hours are 0.5 trips per employee. Assuming that for every $15m^2$ of commercial floor area, there is one employee, the site will attract 114 employees (1,704m² commercial floor area). This equates to 57 person trips during the AM peak hour, and 57 person trips during the PM peak hour. The mode split for the development is estimated to be as presented in Table 5.

It is noted that to estimate the mode share split for the development, the Green Travel Plan (GTP) objectives are being taken into consideration. To encourage people to make greater use of public transport, cycling, walking and car sharing for commuting as well as to encourage people to leave their private cars behind at home and use public transport services are major objectives of GTP. Therefore, it is estimated that there would be a decrease in the car driver mode percentages and an increase in other modes (Train, Bus, Walk, Cycling, and Car passenger) percentages when comparing them with Travel to Work and Journey to Work percentages.

Mode Shar	re	Residential		Commercial/R	etail
(Estimated	l)	AM Peak Trips	PM Peak Trips	AM Peak Trips	PM Peak Trips
Car Driver	11%	6	5	6	6
Car Passenger	5%	3	2	3	3
Train / metro	45%	25	21	26	26
Bus	15%	8	7	9	9
Walk	21%	12	10	12	12
Cycling/Other	3%	2	1	2	2
Sub-Total	100%	55	46	57	57

Table 5: Mode share and peak hour person trips

5.2 **Public transport**

A development in accordance with the indicative concept design is forecast to generate demand for 18 trips by train/metro and 8 trips by bus during the AM peak hour. The distance to the train station is less than a 4-minute walk, while the bus stops on Pacific Highway are also within a 5-minute walk.

In addition, the future Crows Nest Metro Station will be within viable walking distance for residents and employees. Once operational, the Sydney Metro is expected to operate at a four-minute frequency and will provide high quality public transport access to the site. Sydney Metro will also provide additional capacity at St Leonards train station to facilitate the additional trips generated by any new development on the subject site.

5.3 Vehicle trip generation

Residential

Recent surveys undertaken by Roads and Maritime of high density residential developments in key centres such as St Leonards has one of the lowest traffic generation rates during peak hours. For every 100 residential car parking spaces, only 10 car trips are generated during the AM peak hour and 5 car trips during the PM peak hour. Any residential development on this site would be considered to be reasonably similar to the results of the recent surveys.

Notwithstanding the expected lower rates, the Sydney-wide average rate of 0.15 trips / space in the AM peak hour and 0.12 trips / space in the PM peak hour has been adopted for the analysis conservatively. Application of these rates to the 26 residential and residential/visitor spaces envisioned in the development results in the following traffic generation:

- 4 vehicle trips per hour during the AM peak period (1 in, 3 out); and
- 3 vehicle trips per hour during the PM peak period (2 in, 1 out).

Commercial/ Retail (Office)

Office traffic generation rates are directly proportional to the number of off-street parking spaces provided within the site. This is because existing on-street parking on Christie Street and Atchison Street are all metered with a 2-hour restriction between 8.30am and 6pm, Monday to Friday. For the purpose of this report, we have assumed that all 6 car spaces will be occupied, with a conservative 50% of the car trips made during the road network peak hour. Application of this car trip rate to the parking spaces assigned to the commercial/retail component of the development result in the following traffic generation:

- 3 vehicle trips per hour during the AM peak period (2 in, 1 out); and
- 3 vehicle trips per hour during the PM peak period (1 in, 2 out).

Combined traffic Generation

Having regard for the trip generation rates for the above uses, the mixed use development is expected to generate the following traffic during peak periods:

- 7 vehicle trips per hour during the AM peak period (3 in, 4 out); and
- 6 vehicle trips per hour during the PM peak period (3 in, 3 out).

Existing traffic generation

The existing traffic surveyed is discounted to gain an understanding of the net increase in traffic that would be generated from the site.

Net traffic generation

When accounting for the existing development on-site, future development permissible under the planning controls sought within the planning proposal is estimated to result in the following net change in traffic generation:

- 2 vehicle trips (2 in, 0 out) in the AM peak. •
- 2 vehicle trips (1 in; 1 out) in the PM peak.

A breakdown of the calculations is shown in Table 6. The site is estimated to generate a net increase of no more than 6 car trips during the peak hours.

Development	Number	Unit	AM peak hour		PM peak hour	
type			Rate	Car trips	Rate	Car trips
Residential	26	Parking spaces	15 car trips per 100 spaces	4(1 in, 3 out)	12 car trips per 100 spaces	3 (2 in, 1 out)
Commercial / Retail	6	Parking spaces	50% arrive during peak hour	3 (2 in, 1 out)	50% leave during peak hour	3 (1 in, 2 out)
Existing site	19	Parking spaces	Surveyed ins and outs	5 (1 in, 4 out)	Surveyed ins and outs	4 (3 in, 1 out)
Net trips gener	ated		Future Total	2 (2 in, 0 out)	Future Total	2 (0 in, 2 out)

Table 6: Trip generation upon completion of the site

* Existing spaces within the car park

5.4 **Traffic Distribution**

Traffic distribution profiles leaving and entering the development are shown in Figure 16 and Figure 17. These were based on existing JTW data discussed in Section 2.2 and the general location of the destination in relation to the site.



Figure 16: Trip distribution of vehicles leaving the site



Figure 17: Trip distribution of vehicles entering the site

Based on the traffic distribution and the vehicle trip generation discussed in Section 5.3, the likely increase in traffic from the site is shown in Figure 18 and Figure 19.



Figure 18: Traffic increase from completion, leaving the site



Figure 19: Traffic increase from completion, entering the site

The future estimated traffic generated from the site, after considering the discount in existing traffic (Section 2.4) is negligible during the peak periods. This estimate considers recent residential traffic generation rates and driveway surveys as well as conservative commercial/retail traffic generation assumptions.

In addition, given the proximity of the site to significant levels of employment in North Sydney, the estimated vehicle trip generation is considered to be conservative. Further, the opening of the Sydney Metro from 2024 which will increase the alternative transport options available to residents.

5.5 Road network impacts

It can be seen from the above sections that the development would generate a net increase of six and five vehicle trips per hour compared to existing conditions during AM and PM peak hours. The volumes during the AM and PM peak hours would equate to an additional vehicle trip being generated every 30 minutes and is considered to result in minimal impacts on the surrounding road network. As the development is not situated in proximity to any signalised intersections, intersection modelling is not considered warranted for this development application.

It should also be noted that the trip rates adopted in this analysis are conservative given the excellent access to public transport available within proximity to the site, which is likely to offset traffic generation for residents and employees further. In summary, the traffic impacts for the development are considered minimal.

6 Travel Demand Management

6.1 Green Travel Plan

A Green Travel Plan (GTP) is a tool to minimise the negative impact of private vehicle travel on the environment. The GTP is a package of measures put in place to encourage more sustainable travel, and describes ways in which the use of sustainable transport may be encouraged. Using public transport, cycling, walking, working from home, carpooling, making business vehicles more fuel efficient and the use alternative fuels are all more sustainable means of transport than single occupant driving.

More generally, the principles of a GTP are applied to all people travelling to and from a site. The main objectives of the GTP are to reduce the need to travel and promotion of sustainable means of transport.

The more specific objectives include:

- To reduce the level of single occupancy car borne trips associated with commuting.
- To facilitate the sustainable and safe travel of visitors to the site.
- To reduce site traffic congestion and associated pollution in order to enhance, improve and make safe journeys of minority/sustainable transport mode users.
- To work in partnership with neighbouring organisations/developments, local authorities, retailers and other relevant bodies in achieving the maximum mode shift away from the private car.
- To continually develop, implement, monitor, evaluate and review the progress of the travel plan strategy.
- To facilitate all residents' access to key facilities such as retail, leisure, health and education.

6.2 Green Travel Plan Measures

In order to meet the objectives and targets of a GTP, the following physical and management measures should be implemented in future design and planning of the site.

- Travel packs
- General marketing and promotion
- Car sharing
- Alternatives to travel during the day
- Cycling
- Public transport
- Walking
- Residents' and employee's travel plan group

7 Conclusion

This review has described the potential traffic and transport impacts of a redevelopment at 50-56 Atchison Street, St Leonards, in line with the Planning Proposal. Key findings of the review are as follows:

- The site is located within the current zoning of B4 Mixed Use, Precincts 2&3 of St Leonards;
- The indicative concept design identifies 32 off-street parking bays which is consistent with the current North Sydney Council DCP requirements. The final amount of parking is subject to detailed development application design;
- The site is located within 400m of various modes of St Leonards Station and bus stops, thus any future development is expected to not generate a large parking demand;
- The proposed servicing arrangements are considered acceptable on traffic grounds in the circumstances, for the reason discussed and provides an appropriate planning outcome;
- The traffic generation for the development has been assessed to be a net increase compared to existing conditions, with an additional 2 vehicles during both AM and PM peak hours. The volumes during the PM peak hours would equate to an additional vehicle trip being generated every 30 minutes and is considered to result in minimal impacts on the surrounding road network;
- Based on the traffic generation assumptions, the analysis indicates that the potential net increase in traffic is negligible and is not envisaged to affect the existing intersection performances adversely;
- Any future development in line with the Planning Proposal would be responsible for a small increase in peak hour traffic flows along surrounding key roads. Due to the small increase in development traffic, it is expected that surrounding key roads will continue to operate in the same way;
- Secure bicycle parking would be provided as a component of any future proposed development; and
- Travel demand management measures have also been suggested to improve the mode share of public transport and active transport. These items should be considered further at detailed design stage.

It is therefore concluded that the proposal is supportable on traffic and transport planning grounds and will operate satisfactorily.

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Appendix A

Swept path Analysis

A1





8.800m 2.500m 3.633m 0.428m 2.500m 4.00s 10.000m

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Arup, Level 10, 201 Kent St Sydney, NSW, 2000 Tel +61(02)9320 9320 Fax +61(02)9320 9321 www.arup.com.au

50-56 Atchison Street, St Leonards

Swept Path Analysis 8.8m Medium Rigid Vehicle Entry and Exit Movement Turning Right on Atchison Lane

© Arup

Issue

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Do not scale

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Legend

Design Vehicle(s)

Body Envelope 300mm Envelope 600mm Envelope Wheel Envelope



		Body E 300mm 600mm Wheel I	nvelope Envelope Envelope Envelope	
Design	Realistic Height	le(s)	2004)	5.200m 1.940m 1.878m 0.272m
Lock-to-lock 1 Curb to Curb	time Turning	Radius		4.00s 6.250m
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