

Appendix 16

Traffic, Parking and Pedestrian Study



Traffic, Parking and Pedestrian Study

Timbrell Park

7 September 2023

Prepared for:

City of Canada Bay Council

Prepared by:

Sabal Sharma



TIMBRELL PARK - TRAFFIC, PARKING AND PEDESTRIAN STUDY

September 7, 2023

Revision	Description	Author		Quality Check		Independent Review	
A	Rev A Submission	Sabal Sharma	27/2/2023	Hayden Calvey	27/2/2023	Hayden Calvey	27/2/2023
B	Rev B Submission	Sabal Sharma	4/7/2023	Carla Bradley	4/7/2023	Steve Manton	4/7/2023
C	Rev C Submission	Sabal Sharma	3/08/2023	Carla Bradley	3/08/2023	Steve Manton	3/08/2023
D	Rev D Submission	Sabal Sharma	28/08/2023	Steve Manton	28/08/2023	Steve Manton	28/08/2023
E	Rev E Submission	Sabal Sharma	07/09/2023	Steve Manton	07/09/2023	Steve Manton	07/09/2023



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Prepared by:



Signature

Sabal Sharma

Printed Name

Reviewed by:



Signature

Steve Manton

Printed Name

Approved by:



Signature

Steve Manton

Printed Name



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1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

Stantec has been engaged by the City of Canada Bay Council (Council) to undertake a Traffic, Parking and Pedestrian study of Timbrell Park. This study is a result of community feedback in response to amenity upgrades that will improve the park's inclusivity and accessibility by providing improved shared-use facilities for the community. The upgrade of amenities at Timbrell Park will not result in any intensification or change in the use of Timbrell Park.

Council has received feedback from the community on several transport issues in regard to Timbrell Park and its surroundings. In particular, the park experiences challenges in managing the high traffic and parking demand due to sporting events and ensuring safe access for pedestrians and cyclists.

Council seeks to address these issues through a Traffic, Parking, and Pedestrian Study as part of the Timbrell Park Plan of Management and Masterplan. This is to ensure that all park user groups, and the local community can enjoy the amenity provided by Timbrell Park. Furthermore, in October 2022, Council installed a bike lane and refuge island at the intersection of Heath Street and Henley Marine Drive and received responses from the residents which have also been reviewed as part of this study.

1.2 STUDY OBJECTIVES

The objectives of this Traffic, Parking and Pedestrian Study are to:

- Identify parking issues through investigation of the current supply and demand of on-street parking around Timbrell Park during sporting events.
- Develop recommendations to improve traffic flow and parking management in local streets around Timbrell Park.
- Identify and detail issues and opportunities to improve pedestrian and traffic safety for all users of Timbrell Park.

1.3 REPORT STRUCTURE

- **Introduction** – provides project background, scope, and objectives for the study.
- **Background Review** – provides a review of the background documents.
- **Existing Transport Provision** – provides a description of the current study area context. Outlines the traffic and parking surveys and period/s during which these were completed and presents the data collected from the surveys.
- **Site Visit Observations** – provides a description of the site visit findings.
- **Proposed Works** – provides a description of the proposal.
- **Issues and Opportunities** – identifies potential areas of conflict and suggests mitigation measures.
- **Recommendations** – provides recommendations for Council.



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1.4 REFERENCE DOCUMENTS

The following documentation has been taken into consideration in the preparation of this assessment:

- Austroads Guide to Traffic Management Part 11: Parking (2020)
- Australian Standards AS 2890.5 – 2020
- Delineation Section 4 Longitudinal Markings (TfNSW, 2008)
- TfNSW Supplement to Austroads Guide to Traffic Management Part 10 (2017)
- Austroads Guide to Traffic Management Part 8: Local Area Traffic Management
- Supplement to Australian Standard AS 1742.10-2009
- Austroads Guide to Traffic Management Part 7: Traffic Management (2020)
- City of Canada Bay Pedestrian Access and Mobility Plan (2021)
- Timbrell Park Plan of Management and Masterplan Community Engagement Report (2020)
- City of Canada Bay Development Control Plan (2020)
- City of Canada Bay Parking Policy (2017)
- Concord to Bay Run Cycleway Concept Plans (2020)



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2.0 BACKGROUND REVIEW

2.1 A PRACTITIONER'S GUIDE TO MOVEMENT AND PLACE, GOVERNMENT ARCHITECT NSW, 2020

The Practitioner's Guide to Movement and Place provides practitioners involved in the planning, design, delivery, and operation of transport networks with a common structure of place-based transport, and city and town planning across NSW. It explains the need for collaboration on strategies, plans, and projects, across all stages of the design and delivery, to achieve better-built environments.

The guide outlines:

- A collaborative method for practitioners, stakeholders, and the community to work together.
- Shared responsibility and a shared language to support collaboration across disciplines, agencies, and levels of government.
- A process for consistently implementing this approach in a range of decisions and project types, at various scales, and throughout the life cycle of a plan, project, or asset.
- Criteria for measuring and evaluating the alignment of movement and place both in existing contexts and in comparing future options.

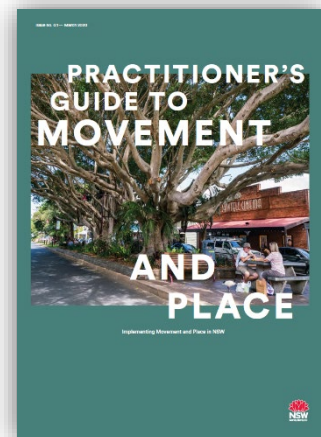
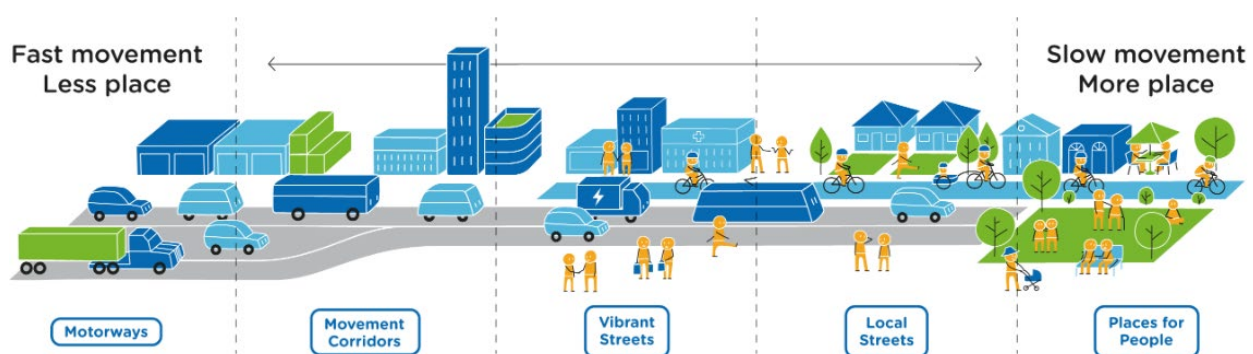


Figure 1 shows street environments with different classifications based on their movement and place significance.

Figure 1 Movement and Place Framework



Source: *Future Transport 2056, Transport for NSW, 2018*

The road network must accommodate the safe and efficient movement of people and goods (Movement), as well as support the surrounding communities that it serves (Place). The key movement functions and place intensities must be carefully considered and balanced to respond to growth and increased land use development. Balancing Movement and Place recognises that trade-offs may be required to achieve the best fit for the objectives.



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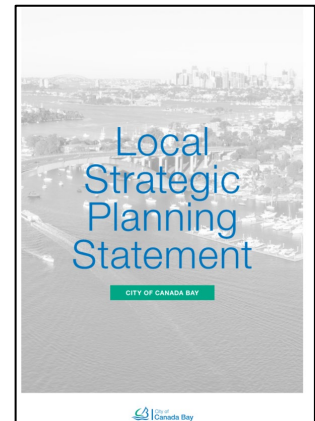
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2.2 CITY OF CANADA BAY LOCAL STRATEGIC PLANNING STATEMENT, CITY OF CANADA BAY, 2020

The Local Strategic Planning Statement (LSPS) outlines the overall strategic land use management and planning objectives for the City of Canada Bay. The LSPS aims to provide a framework for future land use planning and to ensure that planning for land use and transport occurs in an integrated manner and, amongst other things, reduces private car use.

The LSPS brings together and builds on planning work found in Council's other plans, studies, and strategies such as the Local Environmental Plan (LEP), Development Control Plans (DCPs), and Contributions Plans. The LSPS will be used to update key components of these plans.

The LSPS sets out a vision for Canada Bay that prioritises key planning issues, such as protecting local character, and housing affordability, aligning infrastructure delivery to growth in the renewal areas of Rhodes and the Parramatta Road Corridor, improving connectivity, and enhancing the environment.



The relevant transport planning priorities and actions from the LSPS are summarised below.

- Implement the City of Canada Bay Local Movement Strategy to increase connectivity across the LGA and encourage a modal shift to active and public transport.
- Advocate for improvements to public transport.



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- Develop a Walking Strategy that aims to build a physical and cultural environment that supports and encourages walking, with vibrant streets, parks, public spaces, and neighbourhoods where people will choose to walk more often.
- Support implementation of travel behaviour change programs by Transport for NSW, including Travel Demand Management (TDM) measures to increase the use of sustainable transport choices.
- Deliver social infrastructure, high-quality public domain, and local open space.

The Timbrell Park redevelopment is consistent with the LSPS as development throughout Canada Bay will generate demand for new and improved infrastructure and the redevelopment will deliver high-quality public domain and local open space.

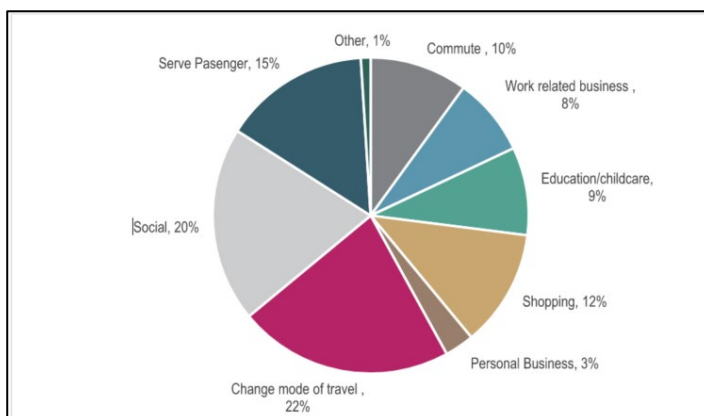
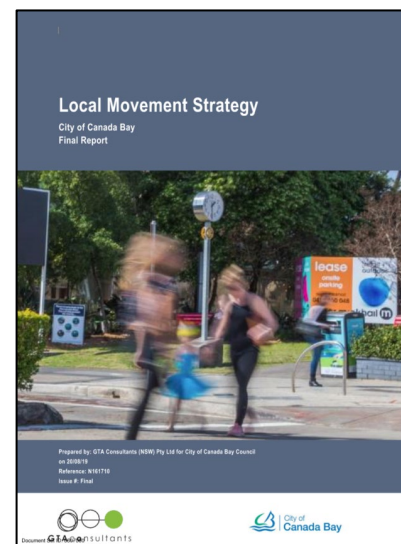
2.3 CITY OF CANADA BAY LOCAL MOVEMENT STRATEGY, CITY OF CANADA BAY & GTA CONSULTANTS, 2019

This strategy provides an overview of the existing transport situation, relevant transport opportunities and constraints, future transport, and land-use trends and changes.

The strategy highlights that 65% of trips in the LGA are undertaken by private vehicles (car drivers, car passengers, and taxi). Only 5% of trips are being undertaken by walking and cycling, which should be increased.

Furthermore, the trip purposes for residents in Canada Bay are shown in **Figure 2**. The highest percentage was 22% for people travelling in order to change on to a different mode. Social/ recreational trips were also high (20%).

Figure 2 Trip Purpose in Canada Bay



The strategy states that despite being close to the Sydney CBD, the overall percentage of trips by public transport is low in comparison to other similar LGAs. The majority of the public transport corridors (rail and high-frequency buses) skirt the edges of the Canada Bay LGA with little penetration. Bus routes within the LGA suffer from indirect and often infrequent services.

The potential introduction of Sydney Metro West will be a catalyst for changing the focus of the public transport network in the LGA.



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2.4 CITY OF CANADA BAY DEVELOPMENT CONTROL PLAN, CITY OF CANADA BAY, 2020

The purpose of this Development Control Plan (DCP) is to supplement the Canada Bay Local Environmental Plan (LEP) 2013 and provide more detailed provisions to guide development.

The aim of the DCP includes the following:

- Encourage development that responds to its context and is compatible with the existing built environment and public domain.
- Recognise and reinforce the distinctive characteristics of Canada Bay's neighbourhood and centres.
- Build upon the detailed objectives and controls under Canada Bay LEP 2013.
- Protect and enhance the public domain.
- Encourage design that maintains and enhances the character and heritage significance of heritage items and heritage conservation areas.
- Encourage ecologically sustainable development and reduce the impacts of development on the environment.



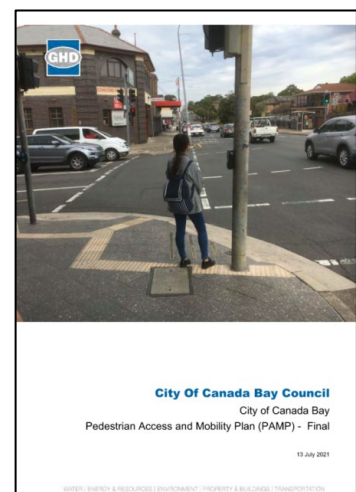
The DCP encourages the use of bicycles by residents, employees, and visitors of Canada Bay for recreational use and as an alternative mode of transport.

2.5 CITY OF CANADA BAY COUNCIL PEDESTRIAN ACCESS AND MOBILITY PLAN (PAMP), 2021

The purpose of this Pedestrian Access and Mobility Plan (PAMP) is to review the current pedestrian needs in the City of Canada Bay (Council) Local Government Area (LGA), to improve the walking environment for all pedestrians.

A PAMP provides a list of prioritised pedestrian infrastructure improvements for safer, more attractive transport choices for residents and visitors, to increase pedestrian activity, and to improve the amenity for all in the Council LGA. The specific objectives of a PAMP are to:

- Increase the use of the pedestrian network for short trips (0 – 2 kilometres).
- Reduce the number of missing links within the pedestrian network.
- Reduce the number of pedestrian crashes.
- Improve pedestrian connectivity with other transport modes, primarily train, bus, bicycle, and car.
- Provide pedestrian facilities that cater to the needs of all pedestrians, including people with disabilities, commuters, children, seniors, and recreational walkers.
- Complement existing and planned pedestrian and bicycle facilities.



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2.6 TIMBRELL PARK PLAN OF MANAGEMENT AND MASTERPLAN COMMUNITY ENGAGEMENT REPORT, 2020

The City of Canada Bay is currently developing a new 10-year Plan of Management and Masterplan for Timbrell Park, Five Dock. The report sets out the process and outcomes of community and stakeholder engagement undertaken during the preparation of the Timbrell Park Plan of Management and Landscape Masterplan.

The suggested parking and traffic-related changes and improvements from the community engagement are listed in **Table 1**.

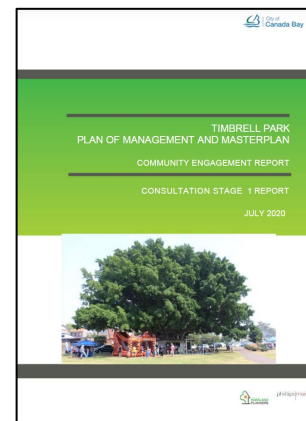


Table 1 Timbrell Park Plan of Management Suggested Changes

Stakeholder/ Issues	Suggested Changes/ Improvements
Canada Bay Bicycle User Group	<ul style="list-style-type: none">• High volume traffic on Henley Marine Drive. The refuge across Timbrell Drive for cyclists and pedestrians is inadequate for safety and efficiency of access. Poor sightlines in both directions for walkers and riders crossing Henley Marine Drive.• Extend the kerb at the crossing point of Henley Marine Drive at Ingham Avenue.• Intersection treatment at Henley Marine Drive and Heath Street.• Extend the separated path from Timbrell Drive to opposite Heath Street to Minnesota Avenue.• Upgrade the path in the park.
Pedestrian/ cycle crossing of Henley Marine Drive	<ul style="list-style-type: none">• Pedestrian crossing to allow safe access to Livvi's Place.• A pedestrian crossing or speed bumps on Henley Marine Drive at Augusta Street to slow traffic down.• The path entry into the park on Henley Marine Drive at Ingham Avenue is too far east of the curve, it is hard to see traffic coming from west of Henley Marine Drive. If it could be relocated at the corner apex, the vision for cyclists/pedestrians wanting to cross would be greatly improved.• Some protection (island garden beds, no stopping signs, etc) of the ramp at Livvi's Place which gets parked across most weekends.• Pedestrian crossings at intersections like Heath Street, Arthur Street, and Norman Street, etc allow families and kids to walk down the hill to the park and cross the road safely.• Install a pedestrian crossing perhaps near an entry point at the eastern end of the park as well as one near the corner of Connecticut Avenue.• There should be protected ramps at every point where a road comes down and meets the park - to improve accessibility for all ages and abilities to the park.• The various pram ramps need to be built out with concrete kerbs/islands to stop drivers from parking across them. There should be no parking on either side of the ramps - a sufficient distance to provide safe sightlines in both directions for people exiting the park.



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Stakeholder/ Issues	Suggested Changes/ Improvements
Traffic on Henley Marine Drive	<ul style="list-style-type: none"> Approach other government bodies, such as Roads and Maritime Services, Sydney Water, etc to address traffic issues. Traffic calming on Henley Marine Drive - speed limiting devices, speed humps or chicanes e.g. Hawthorne Parade, coloured or textured road surface, especially near Livvi's playground, the corner of Augusta Street, the corner of Ingham Avenue 40km/hr speed limit zone during sports e.g. school zone. Install roundabouts near the "blind" corners of Connecticut Avenue/Henley Marine Drive as well as Minnesota Avenue/Henley Marine Drive. Create a different surface on the road at Livvi's Place to slow traffic speed delimiters.
Pedestrian/ cycle crossing of Timbrell Drive	<ul style="list-style-type: none"> Traffic lights would help at the corner of Henley Marine Drive and Timbrell Drive. Just zebra lines won't slow down the traffic. Construct an overpass at the corner of Timbrell Drive and Henley Marine Drive for bikes and kids from the park to the Bay Run. Address cars blocking access ramps on Henley Marine Drive This is the entry/exit point for cyclists heading east-west and wanting to get across Timbrell Drive. At present, it is almost hidden (there is an abandoned trailer sitting in front of it) and lacks any signage so that cars are unaware of bikes coming in or out of it. I have nearly been hit by cars overtaking not realising that I am indicating to turn into this path (they likely think I want to turn right at the road intersection further on, and simply want to get ahead of me). At present, it is a hazardous entry/egress point. For the safety of walkers/cyclists who use the (often crowded) pedestrian refuge island on Timbrell Drive: erect a "No Right Turn" sign at Henley Marine Drive (west) to be enforced during certain (peak) hours. Vehicles turning right to enter Timbrell Drive from Henley Marine Drive west need to look out for "four-way" traffic: <ol style="list-style-type: none"> 1) vehicles heading north along Timbrell Dr 2) vehicles heading south along Timbrell Dr (from HMD east) 3) vehicles turning right into HMD west from HMD east, and 4) the pedestrians/cyclists who could be crossing from the refuge island. <p>During peak times many vehicles on HMD west turn left anyway in order to go via the roundabout (at the bottom of Arthur St) to get back onto Timbrell Drive in their intended direction (which is often much quicker/safer than waiting for the long line of traffic on their right to pass during each traffic light change). It would be safer for everyone (from all directions) if right-hand turns were restricted here at certain times.</p>
Parking	<ul style="list-style-type: none"> More Opportunities for parking; perpendicular parking (front to kerb), parallel parking, 45-degree angle parking, and parking bays. If you move bike tracks in towards the park by 5 metres and add 90 degree parking the full length of Henley Marine Drive, this should fix all the issues. Ranger presence on busy days, such as Monday afternoon during touch football. Parking along the side street. Promote active transport. Time limits for parking to stop the boat, trailer, and caravan parking.
Bike Parking	<ul style="list-style-type: none"> Provision of bike parking bays so that people can safely store and lock up their bikes while they are there. Should encourage people to get there actively, not drive to minimise parking issues and congestion for local residents.
Public Transport Access	<ul style="list-style-type: none"> Encourage direct public transport to Timbrell Park. Local or State governments of demand bus services to connect all council recreation areas in LGA to keep cars off local streets.



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2.7 CITY OF CANADA BAY PARKING POLICY, CITY OF CANADA BAY, 2017

The purpose of the parking policy is to manage on-street parking throughout Canada Bay so as to provide reasonable access for all users. This policy lays down a rational and consistent approach to the provision of on-street parking including permissive parking, pay parking schemes, permit parking schemes, restricted parking areas, and exclusive parking zones.

The policy also provides guidance for the provision and location of restrictive parking such as No Stopping, No Parking, Clearways, Bus Lanes, and Transit Lanes.

The policy recognises that in the allocation of on-street parking, a balance for competing demands and the mix of the users in an area must be considered on a site-by-site basis. However, the priority in parking in these areas and adjacent streets should be based on the parking hierarchy as detailed in

Figure 3 below. Parking on “Local Roads” is generally identified as areas with a predominant component of residential demand.

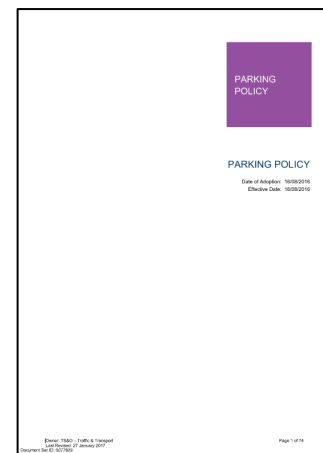
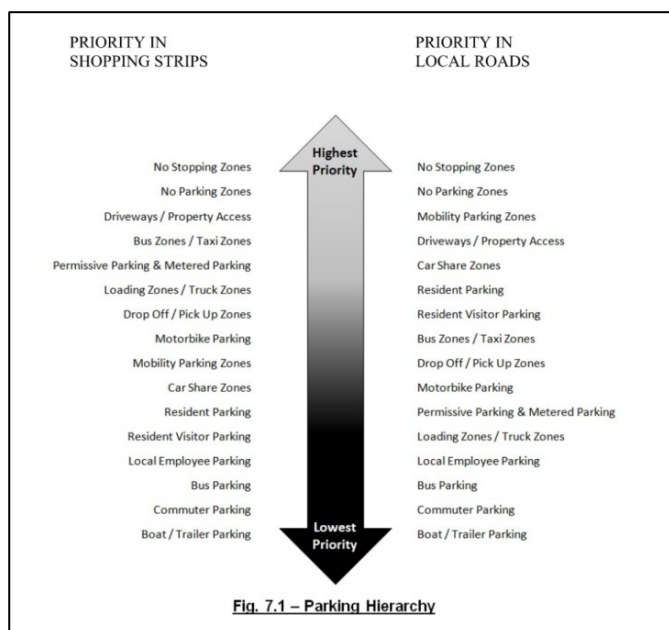


Figure 3 Parking Hierarchy



The guide states that unrestricted Parking should be retained unless parking is unduly affected by external influences. Period parking restrictions should be introduced when parking turnover is insufficient to meet parking demand. Period parking restrictions should initially be introduced to reflect the turnover required such as 4P, 3P, 2P, or 1P with subsequent progression to 1P and ½P as required. Period parking restrictions should be allocated in a pattern radiating out from the main attractor.



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Period parking restrictions may be introduced along the side boundaries of residential properties where the residential property abuts a commercial, business, industrial or operational site. 2P or more should be considered in areas requiring lower turnover (e.g., sports venues, theatres, and restaurants).

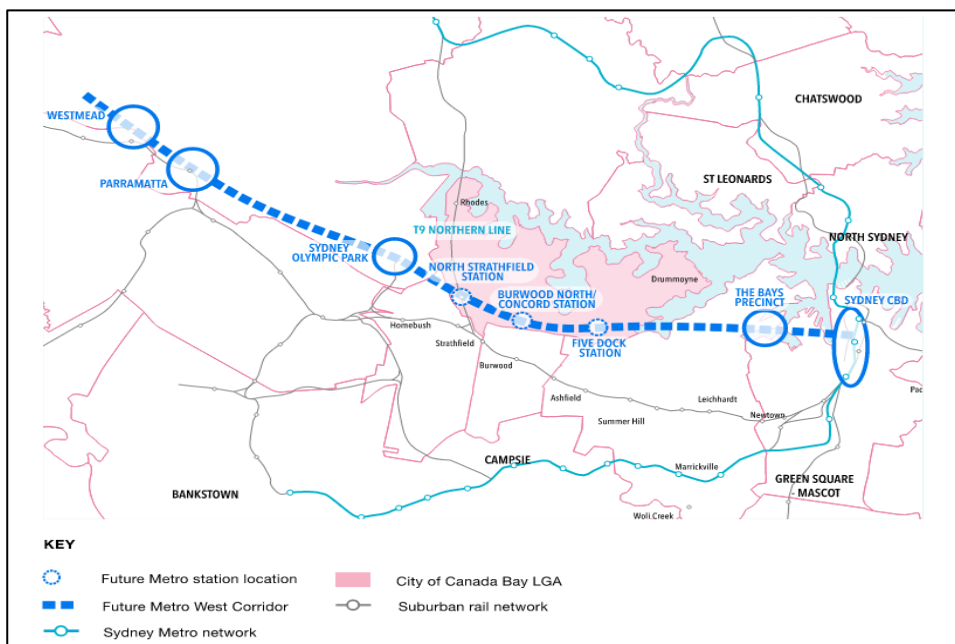
2.8 SYDNEY METRO WEST, SYDNEY METRO, 2019

Sydney Metro West is a new 24-kilometre metro line with stations confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont, and Hunter Street in the Sydney CBD, as illustrated in **Figure 4**. Formal project planning for Sydney Metro West started in 2019 and construction started on Sydney Metro West in 2020.

Five Dock Station will be located off Great North Road, near Second Avenue. The station entrance will be located at Fred Kelly Place off Great North Road.

The metro station will be approximately 1.3km northwest of Timbrell Park. This area is currently not served by rail and relies on road-based transport. The Sydney Metro West rail line will be a catalyst for further transport improvements and a shift to public and active transport.

Figure 4 Sydney Metro West Line



2.9 SYDNEY WATER CHANNEL NATURALISATION PROJECT, SYDNEY WATER

Sydney Water are investigating naturalisation of the channel from Ramsay Road to Livvi's Place, Five Dock. This would involve removing the deteriorating concrete banks and replacing them with a combination of rocks, native plants, sandstone blocks, and concrete.

Also, a shared path along the Iron Cove Creek between Livvi's Place and Ramsay Road is being investigated.



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2.10 CONCORD TO THE BAY RUN CYCLEWAY, CITY OF CANADA BAY, 2021

The NSW Government is funding this \$7 million project as part of the Parramatta Road Urban Amenity Improvement Program (PRUAIP). The program brings state agencies and councils together to work collaboratively on the delivery of projects to improve open space and active transport links along the Parramatta Road corridor.

The City of Canada Bay has been working closely with key stakeholders to design a regional cycling route that will suit the needs of its community as much as possible. The identified route runs from Patterson Street, Concord, through Canada Bay and Five Dock, culminating with improved access to the celebrated Bay Run. It will provide access to a number of schools and sporting facilities, and other existing and future cycle routes.



The route will be constructed in stages as some sections require further engagement with the community and some sections will take longer to design than others. Staged construction will mean timing can be varied to minimise impacts on the community.

The segment 1 routes are between Bay Run and Five Dock Park. At the Council meeting on 1 December 2020, it was resolved to proceed with the construction of this segment of the route. The cycleway in this segment comprises a mixture of treatments including:

- Raised pedestrian/cyclist crossing on Timbrell Drive (subject to further investigation/design)
- Separated pedestrian/cyclist path linking Heath Street to the Bay Run, through Timbrell Park
- New pedestrian/cyclists' refuges at the intersection of Henley Marine Drive and Heath Street
- Mixed traffic lanes, with bicycle logos on Heath Street between First Avenue and Henley Marine Drive
- Three traffic calming devices on First Avenue
- On-road mixed traffic on Howley Street and Heath Street
- New pedestrian/cyclists' refuge on Ingham Avenue
- New shared path through Five Dock Park
- General line-marking and signage upgrades.

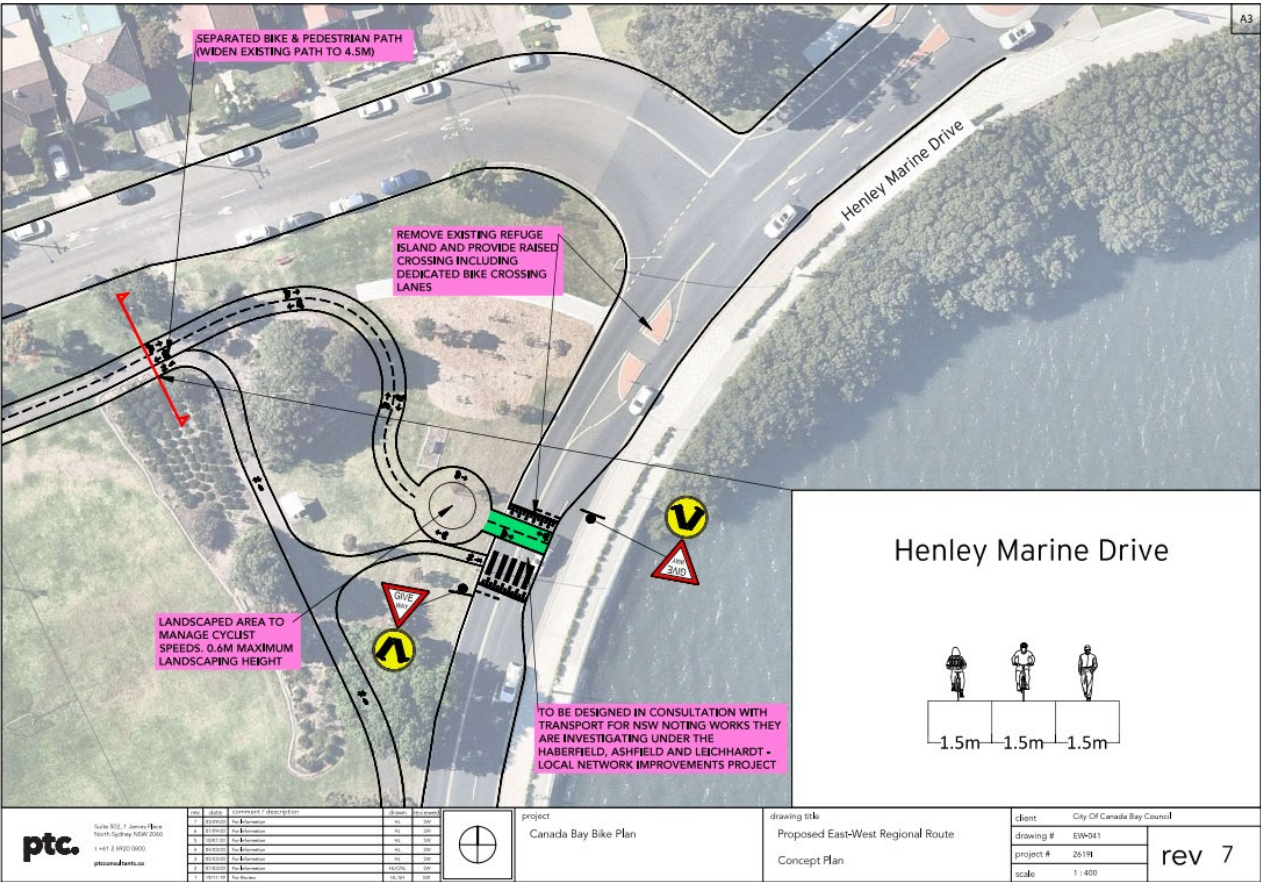
The current concept plan/ upgrades within and surrounding the study area are shown in **Figure 5** to **Figure 8**.



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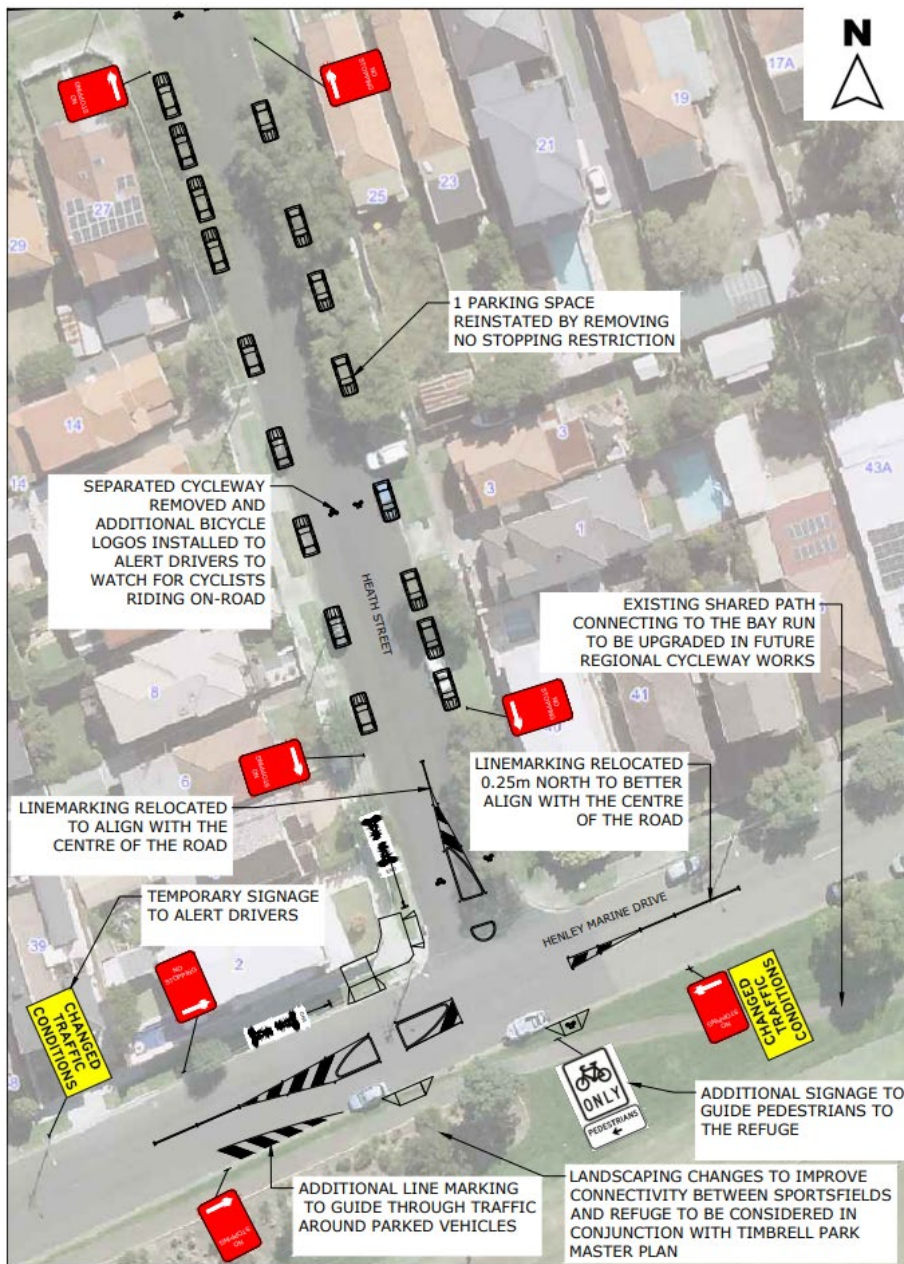
Figure 5 Henley Marine Drive/Timbrell Drive Concept Plan



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Figure 6 Henley Marine Drive/ Heath Street Concept Plan



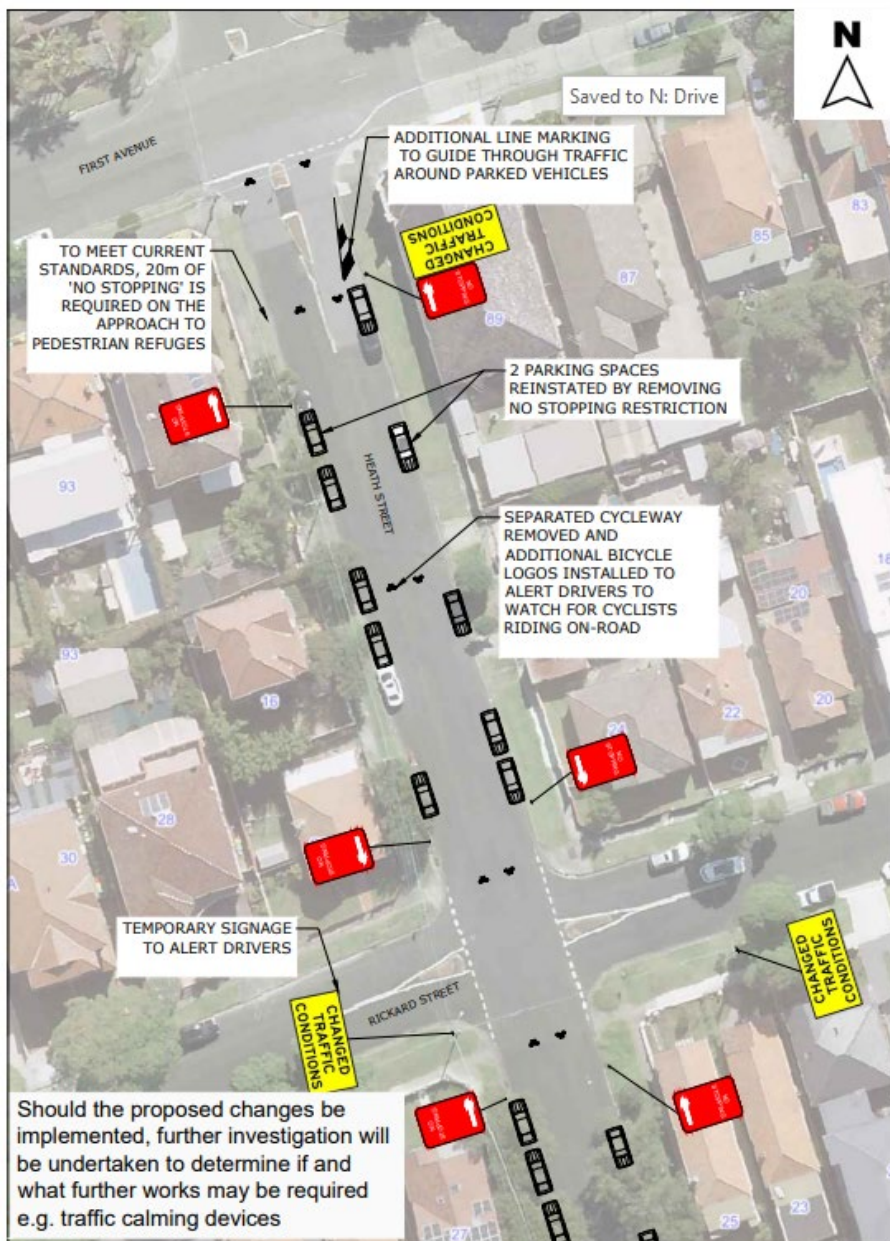
Source: <https://collaborate.canadabay.nsw.gov.au/ewcycleway/seg1heathst>



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Figure 7 Heath Street/Rickard Street Concept Plan



Source: <https://collaborate.canadabay.nsw.gov.au/ewcycleway/seg1heathst>



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Figure 8 First Avenue/Augusta Street Concept Plan



As part of the cycleway initiative within the study area, traffic calming measures on First Avenue and Heath Street were proposed. This includes the installation of a refuge island on Henley Marine Drive near Heath Street (which has been installed recently). Other key infrastructure upgrades within the study area include the proposed upgrade of the existing refuge island on Timbrell Drive near Henley Marine Drive to a raised pedestrian and cyclist crossing.



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3.0 EXISTING TRANSPORT CONDITIONS

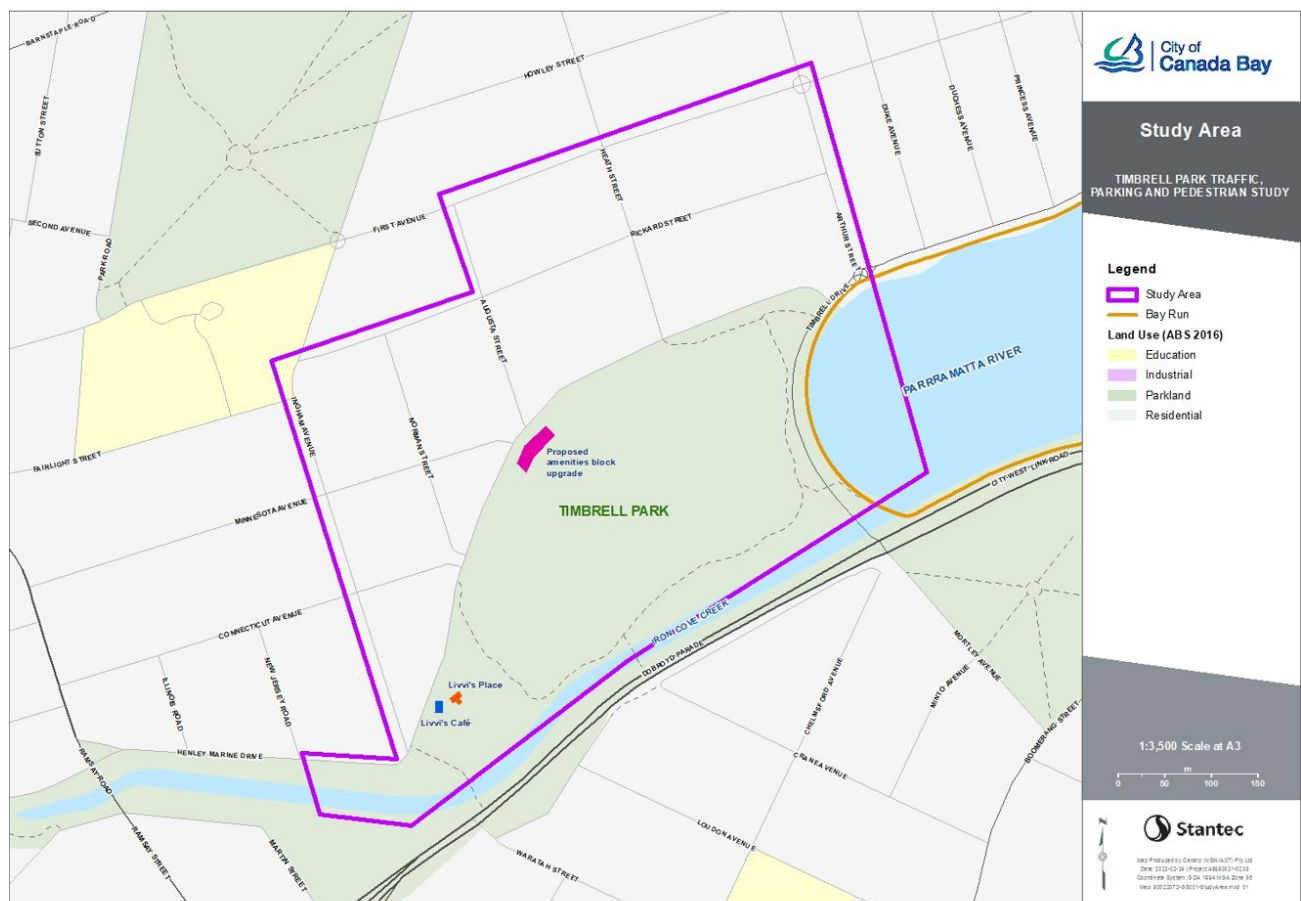
3.1 STUDY AREA

Timbrell Park is located in the suburb of Five Dock within the City of Canada Bay LGA and is surrounded by Iron Cove Creek to the south, Parramatta River to the east, and Henley Marine Drive to the north and west. Timbrell Park is a strategically located open space area supporting a wide range of activities including exercise, children's play at Livvi's Place, visiting Livvi's Café, dog walking, cycling, and organised sports.

The Bay Run is a popular recreational active transport route that accommodates up to approximately 3,000 people on a typical Sunday morning. Timbrell Park provides access to this seven-kilometre pedestrian and cycling route around Iron Cove which extends along Henley Marine Drive and Timbrell Drive.

The location of Timbrell Park is shown in **Figure 9**.

Figure 9 Study Area



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3.2 ROAD NETWORK

3.2.1 Road Network Hierarchy

The NSW Road network can be described in terms of administrative and functional classifications. The general relation between the two classifications and road function priority is shown in **Table 2**.

Table 2 Road Classification Comparison

Administrative classification (Transport for NSW)	Functional classification (Austroads)	Road function priority	Function
State Roads	Motorways/ freeways Primary arterials	Movement	High mobility, movement function, limited if any land access function. Generally higher speed limits apply, 60km/h+
Regional Roads	Secondary/ sub-arterials		Intermediate roads, can have a high mobility or access function and are generally a combination of the two.
Local Roads	Distributor/ collector roads	Place	Higher access function to land uses. Generally lower speed limits of 60km/h or less.

The Key roads within the study area are listed in **Table 3**. The roads in the study area have 50km/h default speed limits.

Table 3 Study Area Roads

Road name	Configuration	Classification	Speed limit (km/h)
Henley Marine Drive	One lane in each direction with kerbside parking available on both sides of the road.	Regional	50 km/h
Timbrell Drive	Two lanes in southbound and one lane in northbound direction separated by double white lines with no kerbside parking available between Henley Marine Drive and Dobroyd Parade.	Regional	50 km/h
Ingham Avenue	One lane in each direction with kerbside parking available on both sides of the road.	Local	50 km/h School zone speed limit of 40 km/h applicable
Norman Street	One lane in each direction with kerbside parking available on both sides of the road.	Local	50 km/h
Minnesota Avenue	One lane in each direction with kerbside parking available on both sides of the road.	Local	50 km/h
Rickard Street	One lane in each direction with kerbside parking available on both sides of the road.	Local	50 km/h School zone speed limit of 40 km/h applicable
Augusta Street	One lane in each direction with kerbside parking available on both sides of the road.	Local	50 km/h
Heath Street	One lane in each direction with kerbside parking available on both sides of the road.	Local	50 km/h
Connecticut Avenue	One lane in each direction with kerbside parking available on both sides of the road.	Local	50 km/h



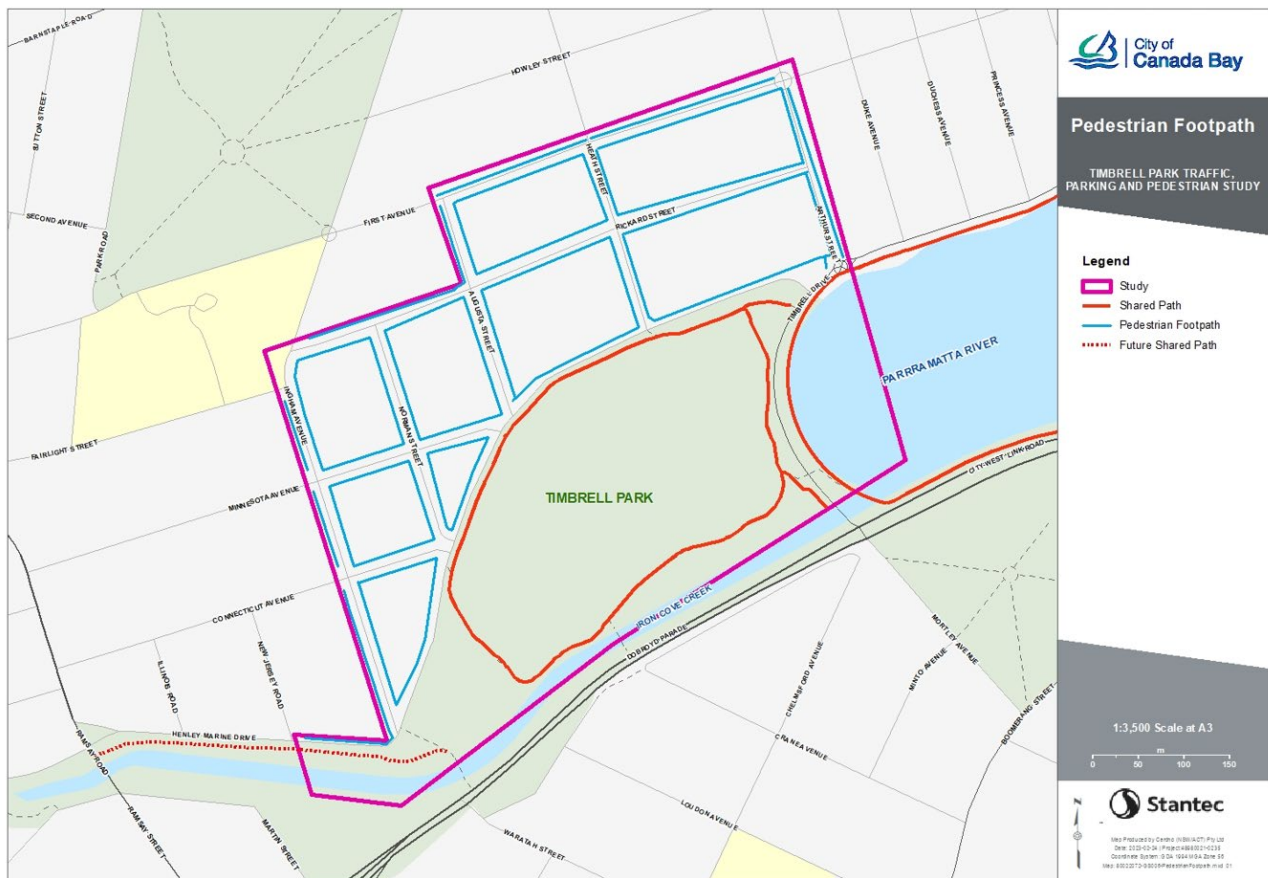
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3.3 ACTIVE TRANSPORT

The pedestrian network in the study area is comprised of footpaths and shared paths along with the road network. Pedestrian footpaths are generally provided on all residential roads within the study area and are shown in **Figure 10**.

Figure 10 Existing Shared Path and Pedestrian Footpath Network



Timbrell Park provides access to the Bay Run, a seven-kilometre pedestrian and cycling route around Iron Cove which extends along Henley Marine Drive and Timbrell Drive.

A future shared path is also being investigated along Iron Cove Creek between Livvi's Place and Ramsay Road as part of the Sydney Water Channel Naturalisation project.

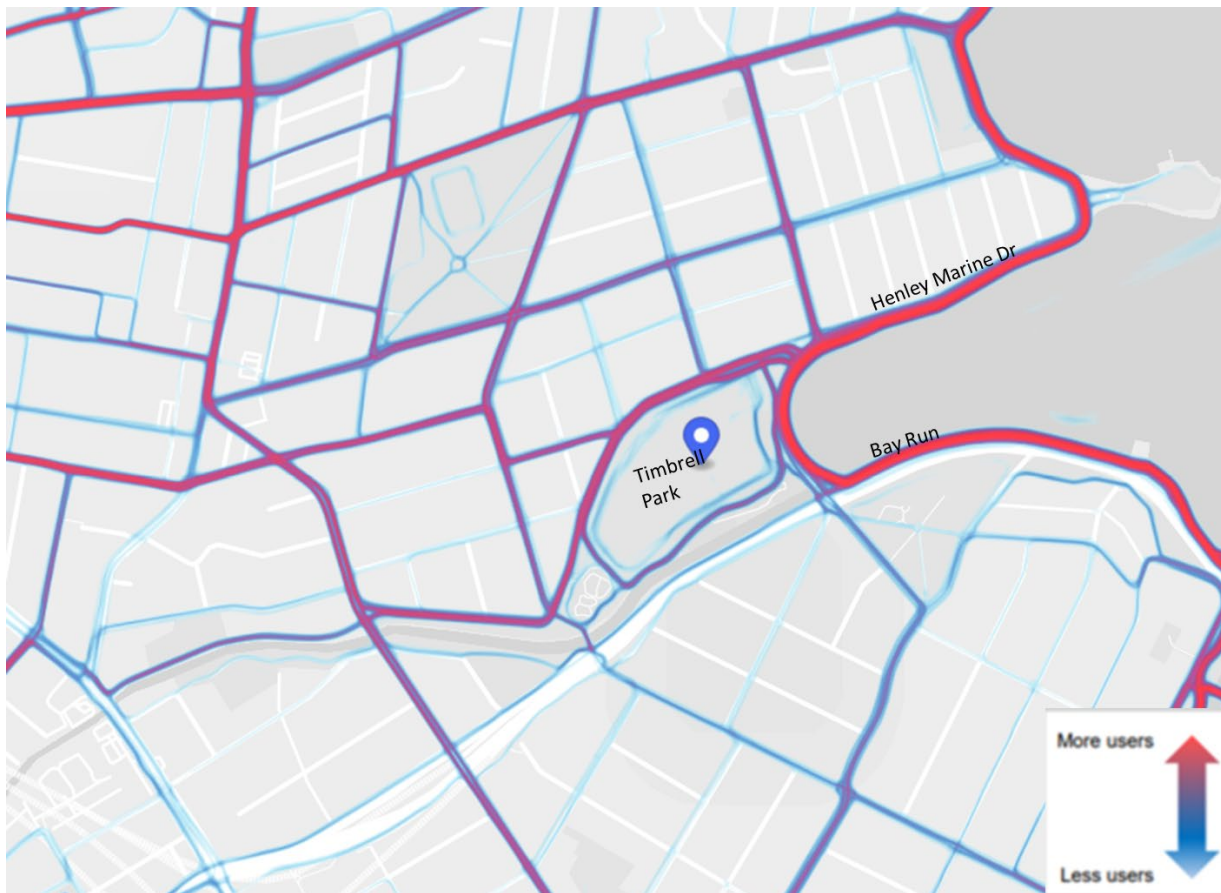
The TfNSW Cycleway finder was accessed and reviewed and the cycleways in the study area are shown in **Figure 11**.



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Figure 12 Popularity of Cyclist Route



Source: <https://www.strava.com/heatmap#14.24/150.91068/-34.37114/bluered/ride>, Accessed: 09/03/2022

3.4 SPEED ENVIRONMENT

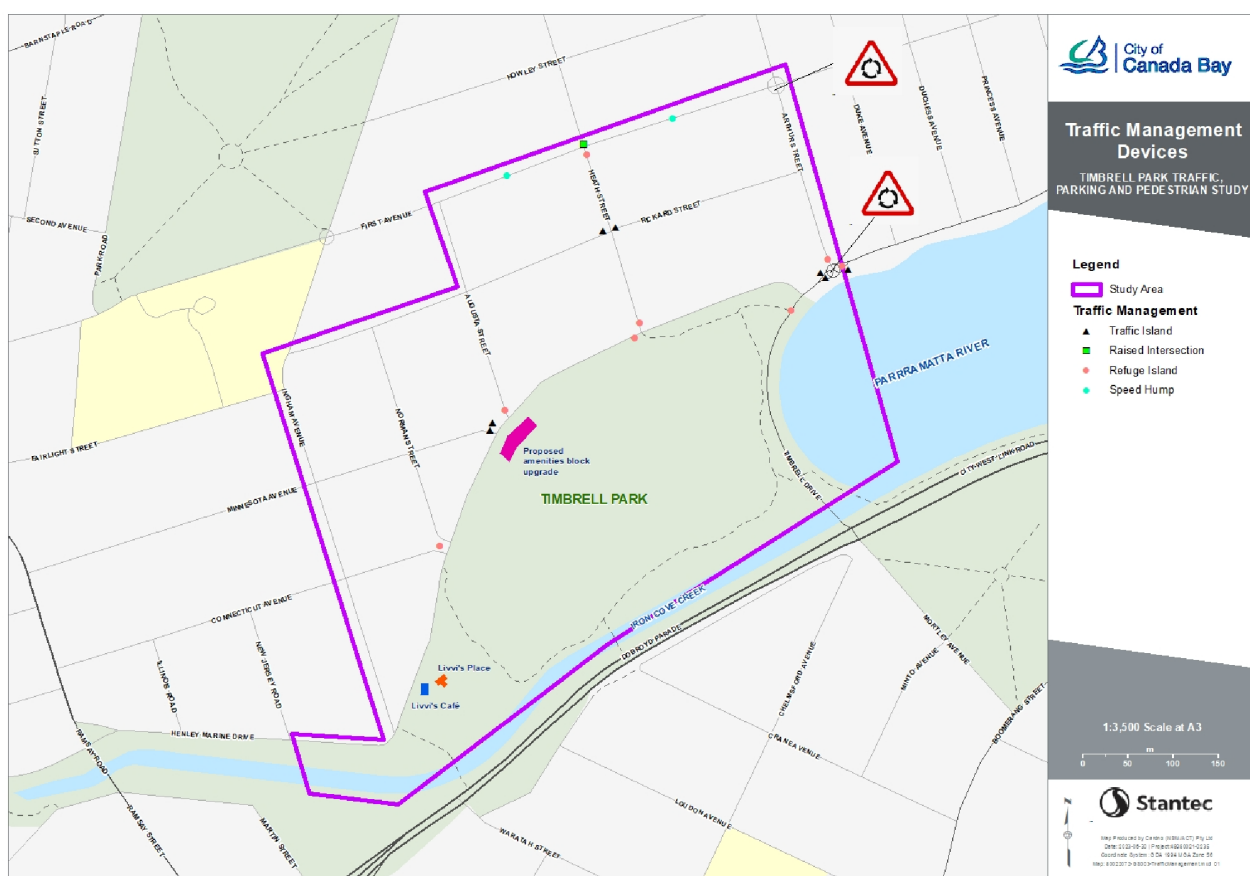
The study area is mostly configured as two-lane roads with one lane in each direction, with a speed limit of 50km/h and 40km/h for some segments of the network during school zone times of 8am – 9.30am and 2.30pm – 4pm.

Figure 13 illustrates the speed limits and traffic control devices in the study area.



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Figure 14 Traffic Management Devices



3.6 PUBLIC TRANSPORT

Currently, two public and five school services run through the study area and are shown in **Figure 15**. The closest Bus Stop to Timbrell Park is located on Henley Marine Drive at Arthur Street (Stop ID: 2046108).

Table 4 summarises the public and school bus routes passing through the study area and their frequency.



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Figure 15 Bus Routes

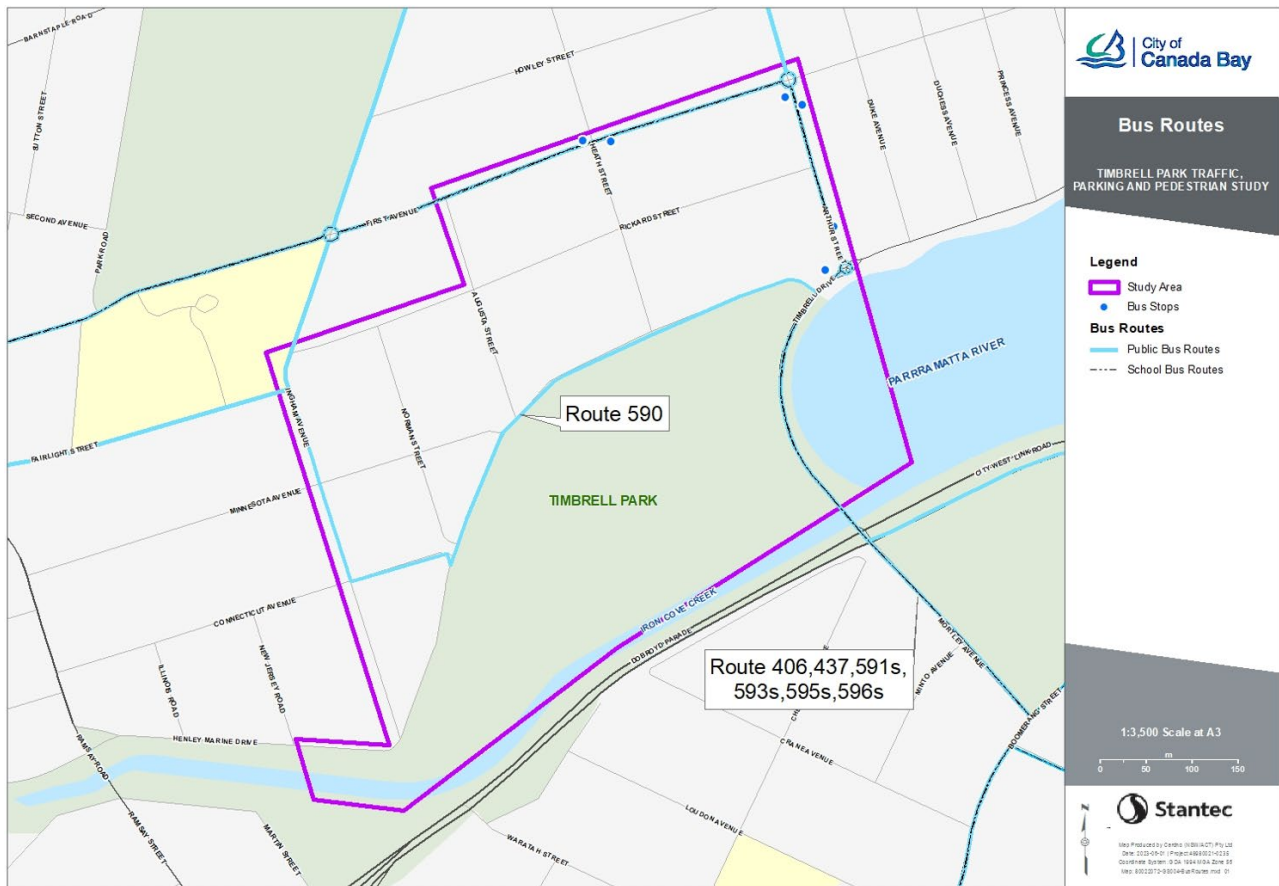


Table 4 Bus Timetable

Route Number	Route Name	Key Destinations	Weekday Frequency	Weekday Service Time	Weekend Frequency	Weekend Service Times
406	Five Dock to Hurlstone Park	Hurlstone Park, Ashfield, Haberfield, Five Dock	30 Minutes	07:00 am-19:01 pm	1 Hour	08:08 am-18:08 pm
437	Five Dock to City QVB via City West Link	Leichhardt, Haberfield, Rodd Point, Five Dock	20 Minutes	07:06 am-22:13 pm	1 Hour	07:13 am-00:33 am
School Bus						
590w	Glebe to Holy Cross College	Glebe, Rozelle, Russell Lea, Ryde	*			
591s	De La Salle Ashfield to Rodd Point	Ashfield, Haberfield, Rodd Point	*			
593s	Haberfield to Homebush Public School	Haberfield, Rodd Point, Five Dock, Strathfield	*			



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Route Number	Route Name	Key Destinations	Weekday Frequency	Weekday Service Time	Weekend Frequency	Weekend Service Times
595s	Parramatta Rd & Dalhousie Sts to Burwood Girls High	Haberfield, Five Dock, Croydon	*			
596s	Burwood Girls High to Leichhardt Town Hall	Croydon, Five Dock, Leichhardt	*			

* Coinciding school start/finish times

3.7 CRASH DATA

Crash data for the study area was provided by Council and was assessed for the last five years from 2018-2022. The crash severity is categorised under five classes which include non-casualty (tow away), minor/other injuries, moderate injury, serious injury and fatal. Approximately 25% of crashes resulted in a serious injury, however, there have been no reported fatalities. **Table 5** provides a detailed summary of the number of crashes for each crash severity class. This is also illustrated in **Figure 16**.

Table 5 Crash Severity

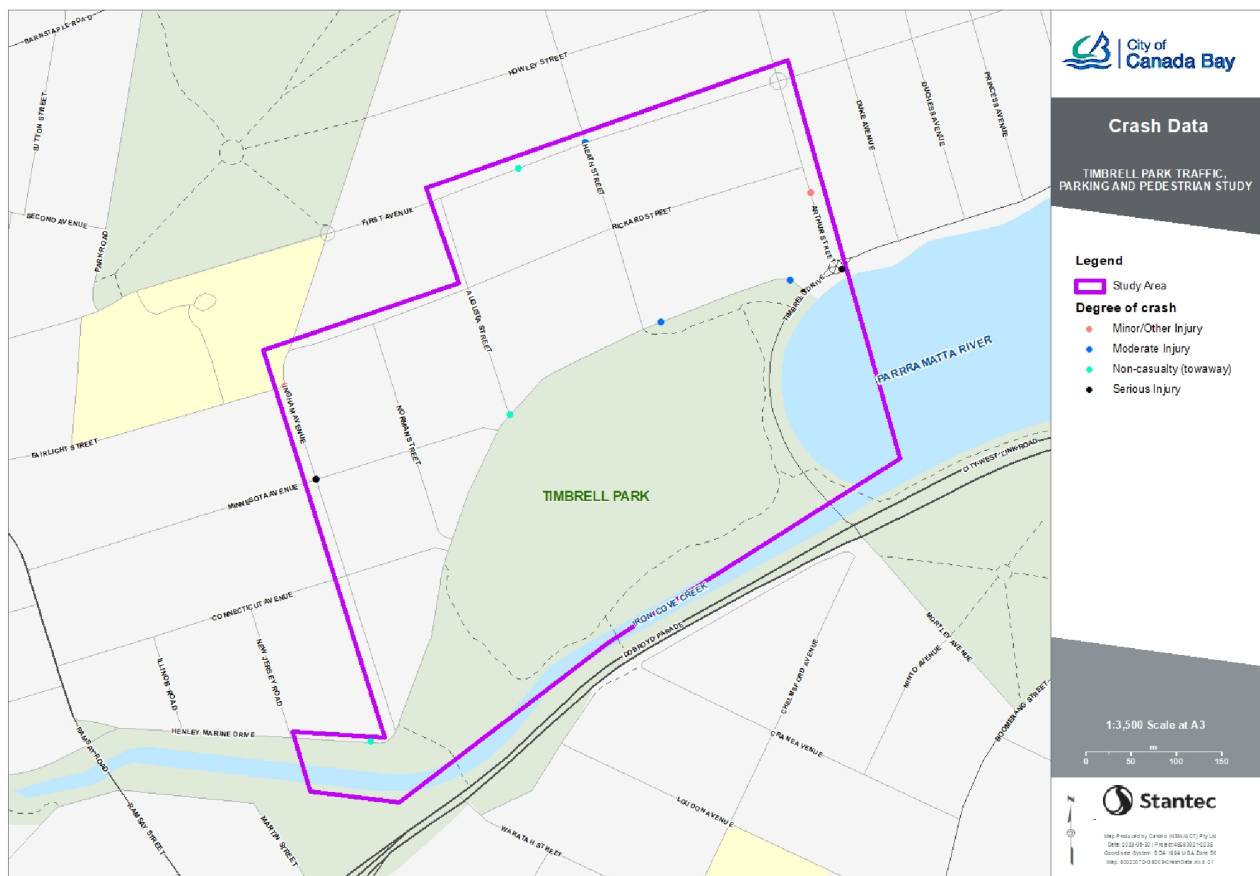
Degree of crash	Number of Crashes	Percentage
Non-casualty (tow away)	3	25%
Minor/Other Injury	2	17%
Moderate Injury	4	33%
Serious Injury	3	25%
Fatal Injury	0	0%
Grand Total	12	100%



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Figure 16 Crash Map by Degree of Crash - All Users



3.7.1 Crash Type

Crash types are classified by the Road User Movement (RUM) codes that describe the impact of the crashes based on a number of categories and are a standard code to identify the movements involved in a crash.

For example, a “rear end” type accident (RUM code 30) is classified as an accident between two vehicles travelling in the same direction with one vehicle rear-ending the other vehicle. Analysis of the RUM codes was undertaken and shows that there were 8 different crash types, with approximately 42% of the crash types captured by two RUM codes. These include Rear End (RUM code 30) and Cross Traffic (RUM code 10). These crash types are illustrated in **Figure 17**.

A summary of the crash types is provided in **Table 6**.

Figure 17 Top Two RUM Codes



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Table 6 Total Crashes Based on RUM

RUM Code	Minor/Other Injury	Moderate Injury	Non-casualty (tow away)	Serious Injury	Total	Percentage
30	2			1	3	25%
10		1		1	2	17%
21		1	1		2	17%
11				1	1	8%
42		1			1	8%
71			1		1	8%
73		1			1	8%
81			1		1	8%
Grand Total	2	4	3	3	12	

Road safety crash data from the past five years (2018-2022) shows that most of the crashes occurred along Henley Marine Drive with the following key crash locations:

- Henley Marine Drive/Timbrell Drive intersection – one serious injury crash.
- Henley Marine Drive/Arthur Street intersection – one serious injury crash.
- Ingham Avenue/Minnesota Avenue – one serious injury crash.

3.7.2 Lighting Conditions

The proportion of crashes under each lighting condition was observed to be as follows:

- 66% of all crashes occurred in daylight.
- 17% of crashes occurred in darkness.
- 17% of crashes occurred at dusk.

Overall, the majority of crashes occurred in daylight conditions.

3.8 EXISTING FIELD USAGE

A number of sports teams utilise Timbrell Park throughout the year including Balmain Junior Touch, Balmain Touch Football, Five Dock Falcons Baseball Club, Inner West Harbour Cricket Association, and Five Dock Football Club. Balmain Touch Football has over 600 players which play at Timbrell Park in varying intensities throughout the year.

Livvi's Place Five Dock is also located at Timbrell Park which provides an inclusive and accessible play space for children of all ages and abilities. Timbrell Park is well equipped, with BMX tracks, walking and running paths, picnic tables, play equipment, barbeques, drinking water, and toilets.

The park has three baseball diamonds and a large open field that is utilised in a variety of configurations for cricket, touch football and soccer. Based on the information provided by Council, **Table 7** summarises the current sports field booking/usage for games.



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Table 7 Current Field Usage November 2022

Sporting league/Club	Days	Booking Times
Balmain Touch Senior Competition	Weekdays (Tuesday, Wednesday)	5pm- 9pm
Balmain Touch Junior Competition	Weekday (Monday)	5pm- 9pm
Five Dock Falcons Baseball	Weekdays (Tuesday, Wednesday, Thursday)	4pm- 8pm
	Weekend (Saturday, Sunday)	8am- 5pm
Inner West Harbour Cricket	Weekdays (Tuesday, Wednesday, Thursday)	4 pm- 7.30 pm
	Weekend (Saturday, Sunday)	8am- 5pm

3.9 TRAFFIC AND PEDESTRIAN DATA

3.9.1 Traffic Data Collection

Automatic tube counts (ATCs) were carried out at selected locations within the study area, which captured classified traffic volumes for 24 hours and 7 consecutive days from Monday 21st November 2022– Sunday 27th November 2022. Pedestrian counts were also conducted on Saturday 26th November 2022.

The traffic survey locations are summarised in **Table 8** and shown in **Figure 18**.

Table 8 Traffic Survey Locations

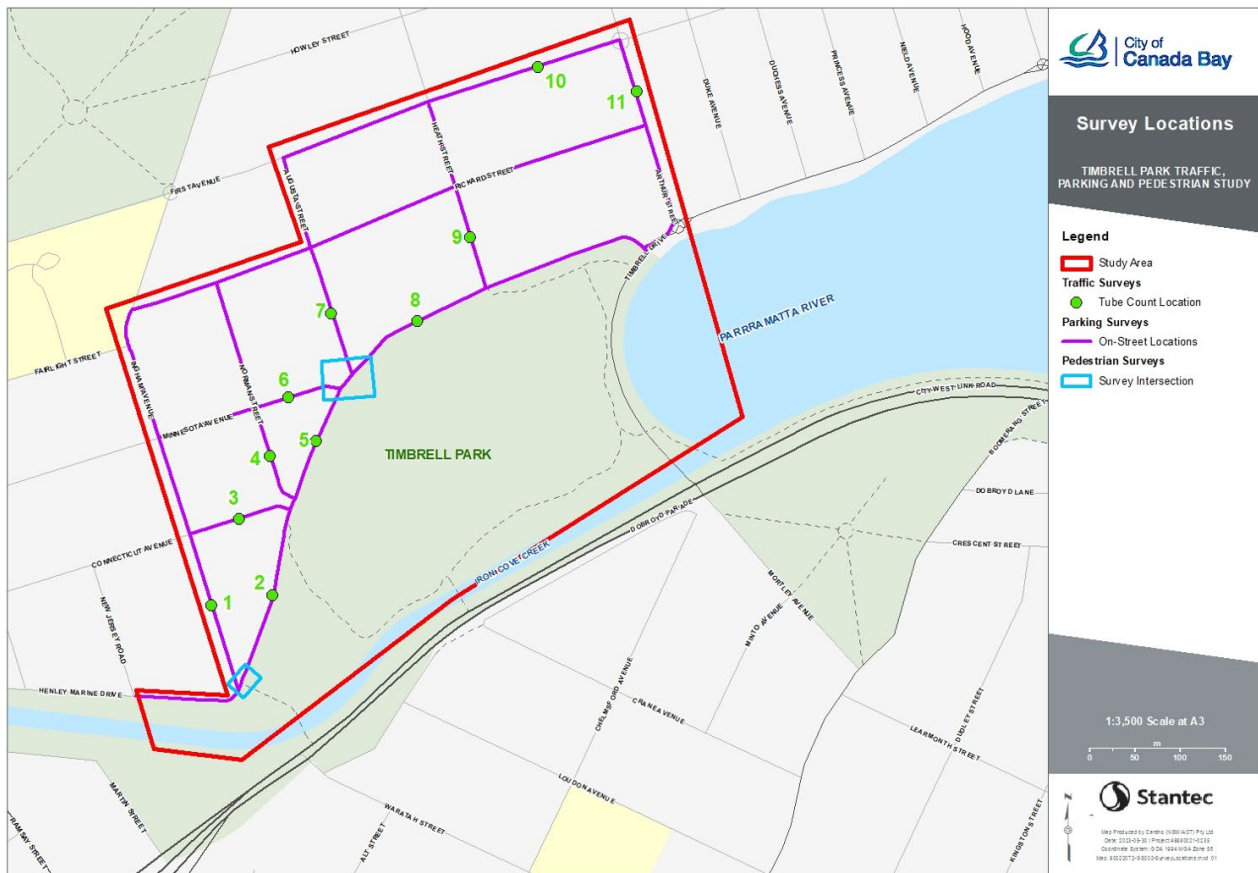
Survey Type	Location
Pedestrian Counts	PED1: Henley Marine Drive intersection with Minnesota Avenue and Augusta Street PED2: Henley Marine Drive intersection with Ingham Avenue
Midblock Automatic Tube Counts (ATC)	ATC1: Ingham Avenue between Connecticut Avenue and Henley Marine Drive
	ATC2: Henley Marine Drive between Ingham Avenue and Connecticut Avenue
	ATC3: Connecticut Avenue between Ingham Avenue and Henley Marine Drive
	ATC4: Norman Street between Minnesota Avenue and Henley Marine Drive
	ATC5: Henley Marine Drive between Norman Street and Minnesota Avenue
	ATC6: Minnesota Avenue between Norman Street and Henley Marine Drive
	ATC7: Augusta Street between Rickard Street and Henley Marine Drive
	ATC8: Henley Marine Drive between Augusta Street and Heath Street
	ATC9: Heath Street between Rickard Street and Henley Marine Drive
	ATC10: First Avenue between Arthur Street and Heath Street
	ATC11: Arthur Street between Rickard Street and First Avenue



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Figure 18 Survey Locations



3.9.2 Automatic Tube Counts

Automatic tube counts were undertaken at eleven locations across the study area as described above.

The purpose of the ATCs was to provide 24-hour classified traffic volume profiles at the midblock locations. This allows us to identify typical weekday and weekend traffic volume patterns and derive average annual daily traffic (AADT) volumes. The ATCs also allow an assessment of the 85th percentile speeds at each of the surveyed locations. **Table 9** provides a summary of the traffic volumes and speeds observed at the surveyed locations.



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Table 9 AADT Volumes

ATC	Location	Average 7 Days	Average Weekday	Average Weekend	Traffic Change (Weekend Vs Weekday)	85 th Percentile Speed (km/h)	Speed Limit (km/h)
1	ATC1: Ingham Avenue between Connecticut Avenue and Henley Marine Drive	984	1039	847	-18.5%	55.7	50
2	ATC2: Henley Marine Drive between Ingham Avenue and Connecticut Avenue	1332	1371	1233	-10.1%	50.2	50
3	ATC3: Connecticut Avenue between Ingham Avenue and Henley Marine Drive	380	394	347	-11.9%	37.8	50
4	ATC4: Norman Street between Minnesota Avenue and Henley Marine Drive	110	113	205	81.4%	33.6	50
5	ATC5: Henley Marine Drive between Norman Street and Minnesota Avenue	1528	1553	1466	-5.6%	52.8	50
6	ATC6: Minnesota Avenue between Norman Street and Henley Marine Drive	954	998	846	-15.2%	38.8	50
7	ATC7: Augusta Street between Rickard Street and Henley Marine Drive	327	341	294	-13.8%	30.9	50
8	ATC8: Henley Marine Drive between Augusta Street and Heath Street	2441	2562	2139	-16.5%	48.8	50
9	ATC9: Heath Street between Rickard Street and Henley Marine Drive	818	849	740	-12.8%	43.9	50
10	ATC10: First Avenue between Arthur Street and Heath Street	3240	3377	2899	-14.2%	37.2	50
11	ATC11: Arthur Street between Rickard Street and First Avenue	6398	6603	5884	-10.9%	42.4	50

Figure 19 shows the average daily traffic (ADT) volumes in the study area for weekdays and weekends as well as the 7-day AADT. The roads within the study area carry up to 6,000 vehicles per weekday. Also, the average weekend traffic is generally slightly lower than weekday traffic.



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Figure 19 Traffic Volumes Across Study Area

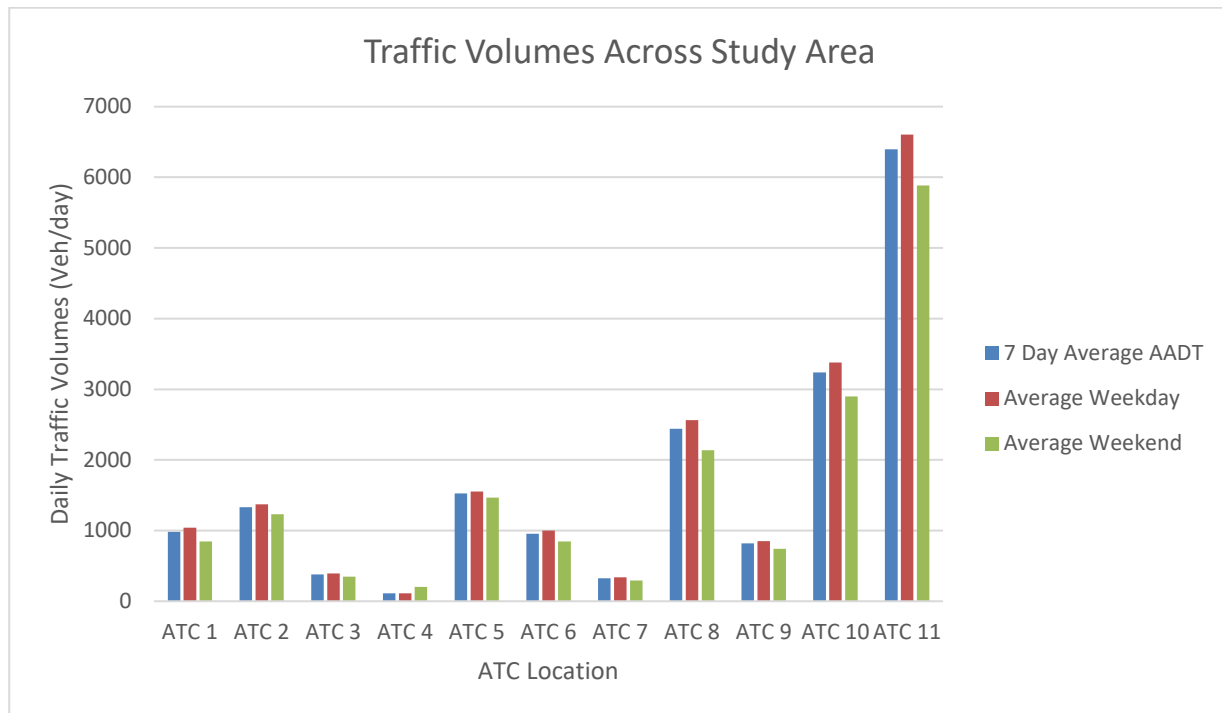
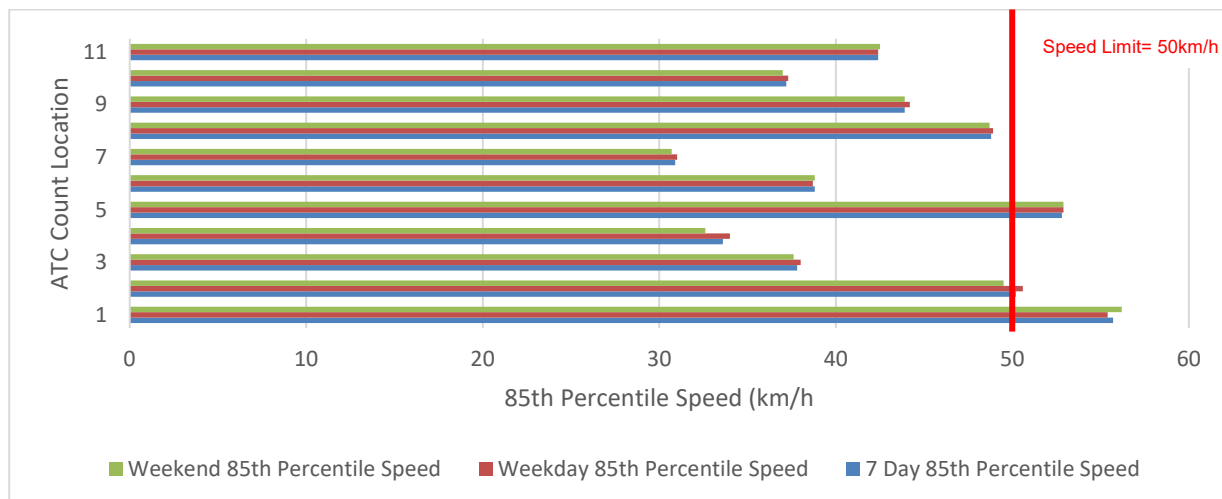


Figure 20 shows the 85th percentile speeds observed at each of the survey locations on weekdays, weekends and across the full 7 days.

Figure 20 85th Percentile Speed in Study Area



The 85th percentile speed at ATC 1 (Ingham Avenue between Connecticut Avenue and Henley Marine Drive) is 55.7km/h and at ATC 5 (Henley Marine Drive between Minnesota Avenue and Norman Street) is 52.8km/h, both of which are slightly higher than the 50km/h speed limit. For most of the other streets, the 85th percentile speeds are lower than 50km/h reflecting a low-speed environment.



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Average weekday and average weekend traffic volume profiles for the various locations are shown in detail in **Appendix A**.

3.9.3 Pedestrian Counts

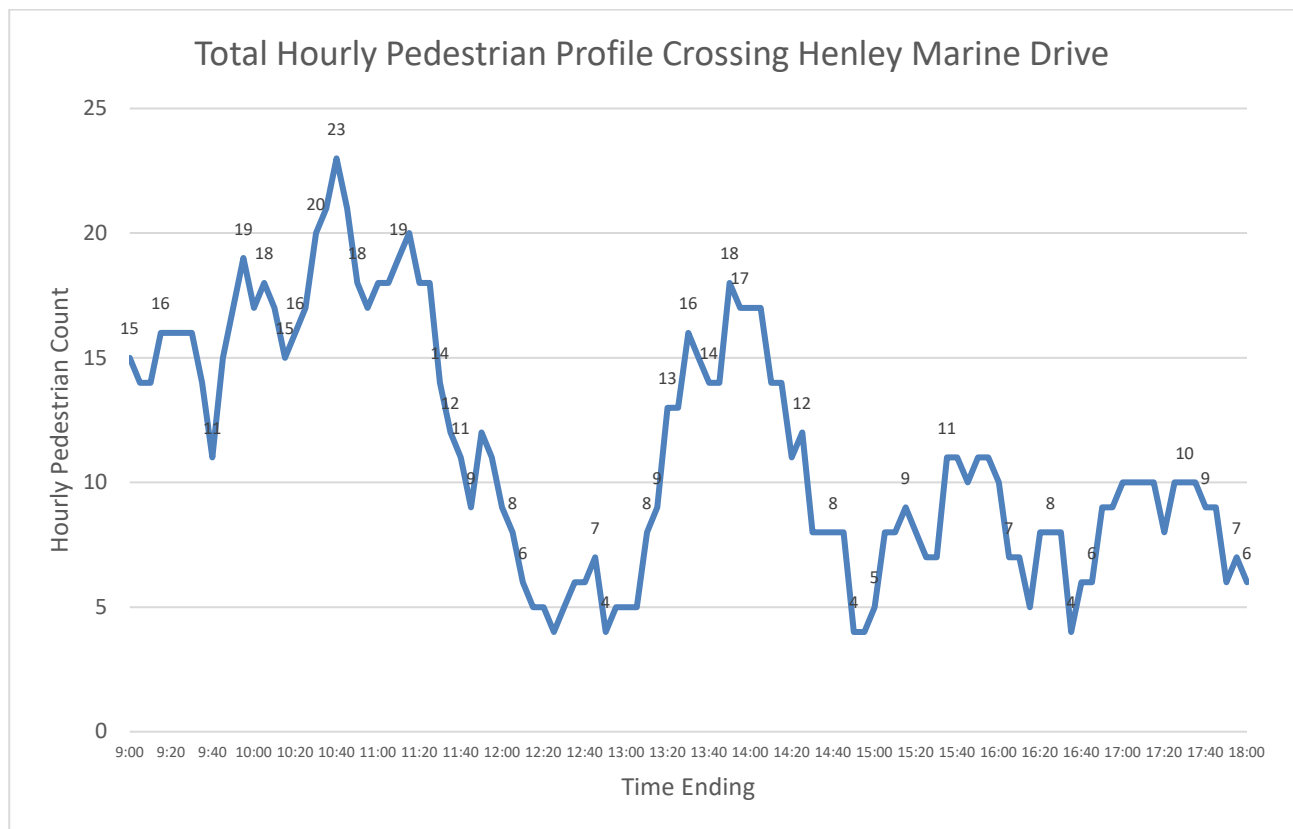
Pedestrian movements were counted at the following locations on Saturday 26th November 2022.

- Henley Marine Drive/Minnesota Avenue/Augusta Street
- Henley Marine Drive/Ingham Avenue

3.9.3.1 Henley Marine Drive/ Minnesota Avenue/Augusta Street

Figure 21 provides an hourly profile of the total number of pedestrians crossing Henley Marine Drive midblock near its intersection with Minnesota Avenue and Augusta Street.

Figure 21 Hourly Pedestrian Profile - Crossing Henley Marine Drive near Minnesota Avenue/Augusta Street



Based on the existing survey of pedestrian movements, the data suggests that the pedestrian demand crossing Henley Marine Drive midblock near Minnesota Avenue/Augusta Street is up to 23 ped/h. The result shows there is a desire line crossing Henley Marine Drive.

The detailed pedestrian counts at the intersection (for all movements) are presented in separate one-hour periods in **Figure 22** for the following AM and PM peak pedestrian demand periods.

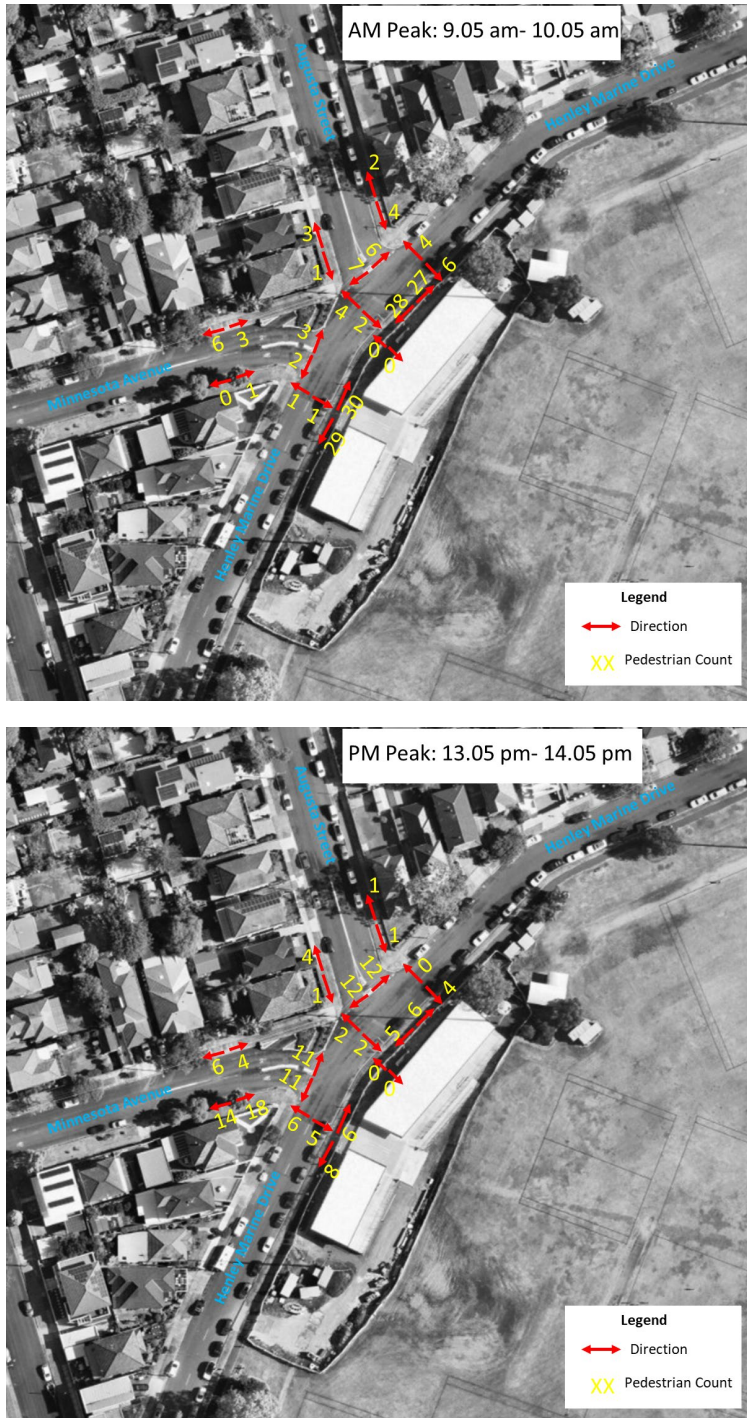


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- AM Peak: 9:05am-10:05am
- PM Peak: 13:05pm-14:05pm
-

Figure 22 Peak Hour Ped Count Henley Marine Drive, Minnesota Avenue and Augusta Street



The results show that the pedestrian demand is high as early as 9am and this coincides with the bookings for sporting activities on weekends from 8am until 5pm.



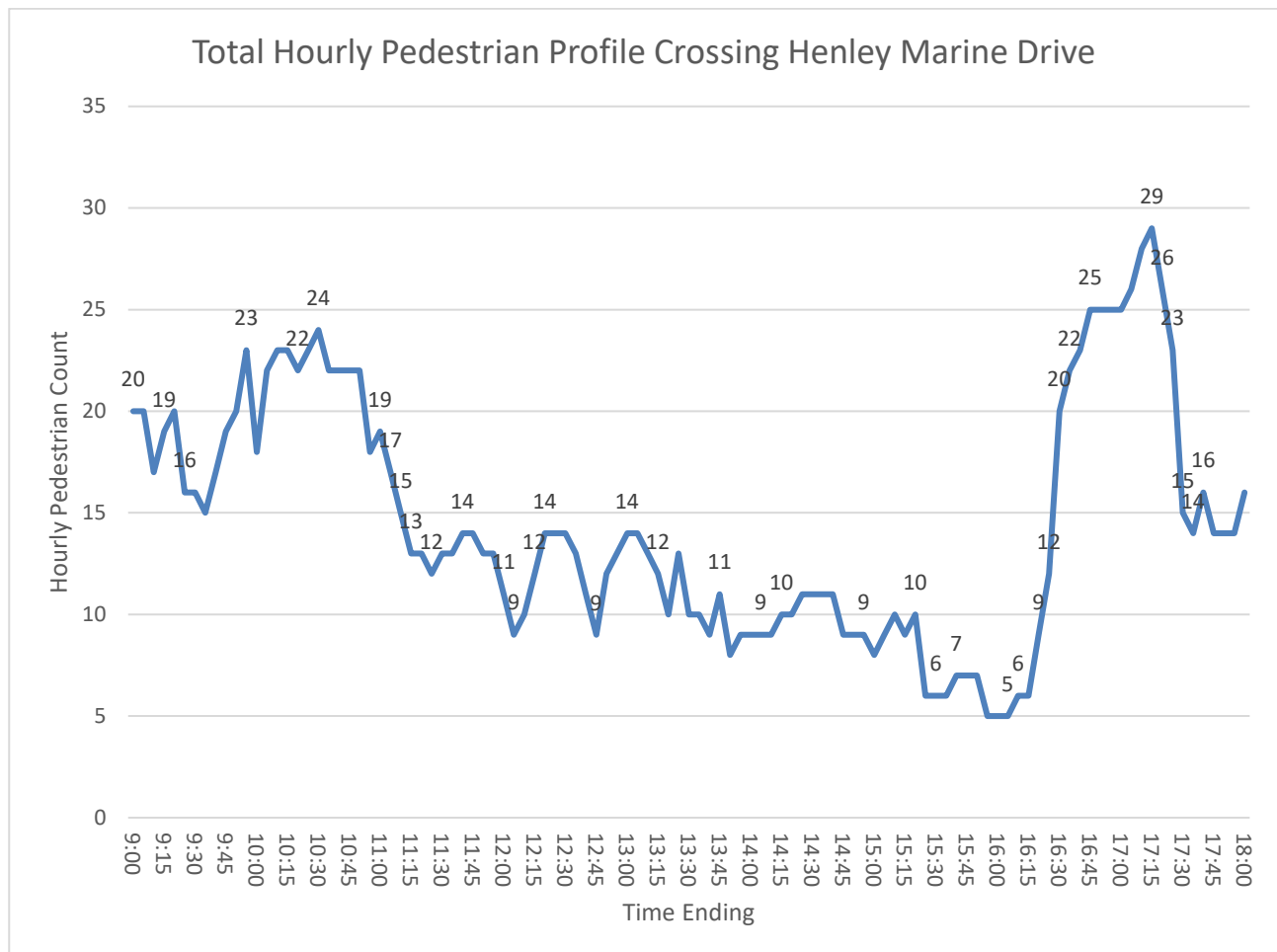
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3.9.3.2 Henley Marine Drive intersection with Ingham Avenue

Figure 23 provides an hourly profile of the total number of pedestrians crossing Henley Marine Drive midblock near its intersection with Ingham Avenue.

Figure 23 Hourly Pedestrian Profile - Henley Marine Drive near Ingham Avenue



Based on the existing survey of pedestrian movements, the data suggests that the pedestrian demand crossing Henley Marine Drive midblock near Ingham Avenue is up to 29 ped/h.

The detailed pedestrian counts at the intersection (for all movements) are presented in separate one-hour periods in **Figure 24** for the following AM and PM peak pedestrian demand periods.

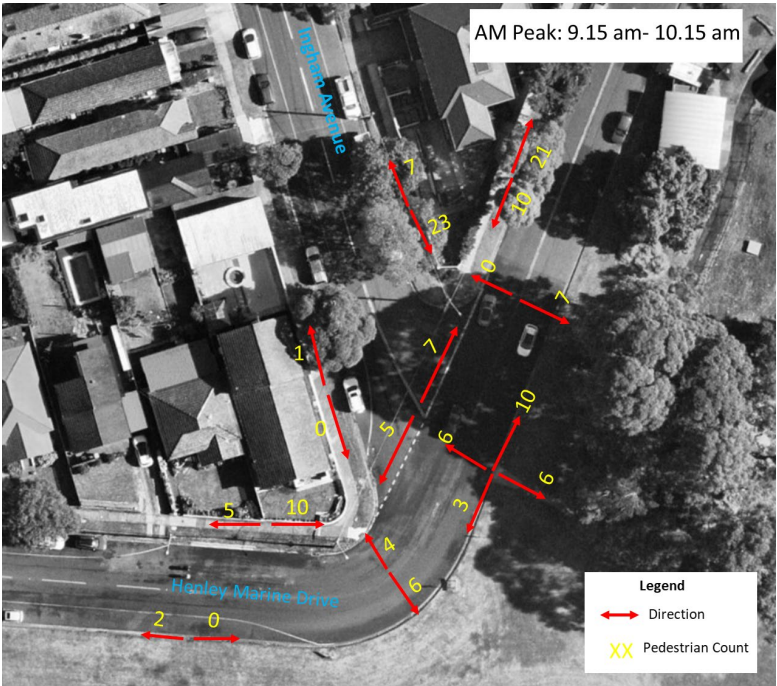
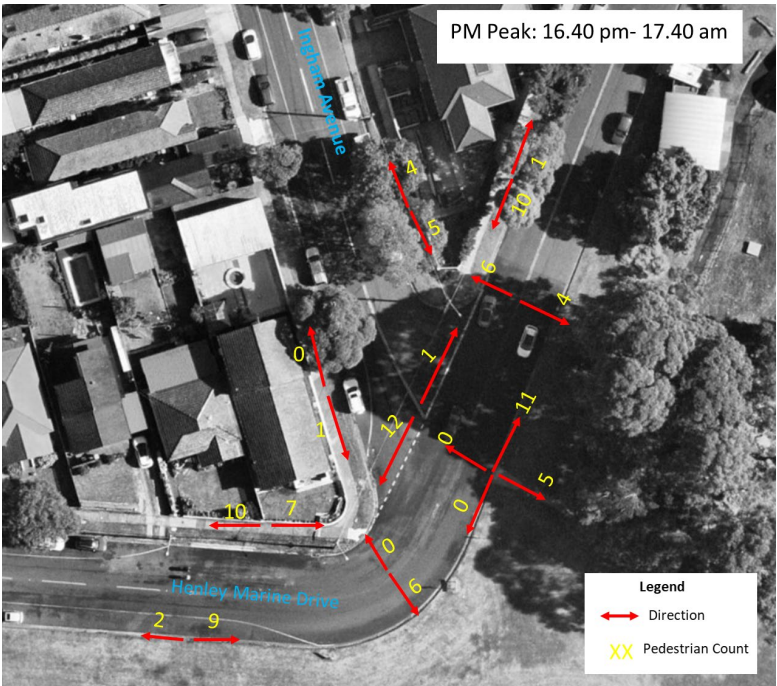
- AM Peak: 9:15am – 10:15am
- PM Peak: 16:40pm – 17:40pm



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Figure 24 Peak Hour Ped Count Henley Marine Drive/Ingham Avenue



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3.10 PARKING ANALYSIS

3.10.1 Parking Data Collection

Parking occupancy and duration of stay surveys were conducted by Matrix Traffic and Transport Data on Monday 21 November 2022, Tuesday 22 November 2022, Saturday 26 November 2022, and Sunday 27 November 2022.

Table 10 summarises the periods for the parking surveys. The survey periods were aligned with the expected demand from the sports fields. Timbrell Park is booked for sporting activities in the evenings during the weekday and until 5pm on weekends.

Table 10 Parking Survey Periods

Survey Type	Days	Time Period
Parking Surveys	Weekday Monday 21 November 2022 Tuesday 22 November 2022	5pm - 9pm
	Weekend Saturday 26 November 2022 Sunday 27 November 2022	9am - 5pm

Source: Matrix Traffic and Transport Data

For the purpose of assessing the parking survey results and understanding parking supply/demand, the study area was divided into ten sections. The sections are described in **Table 11** and shown in **Figure 25**.

Table 11 Parking Analysis Sections

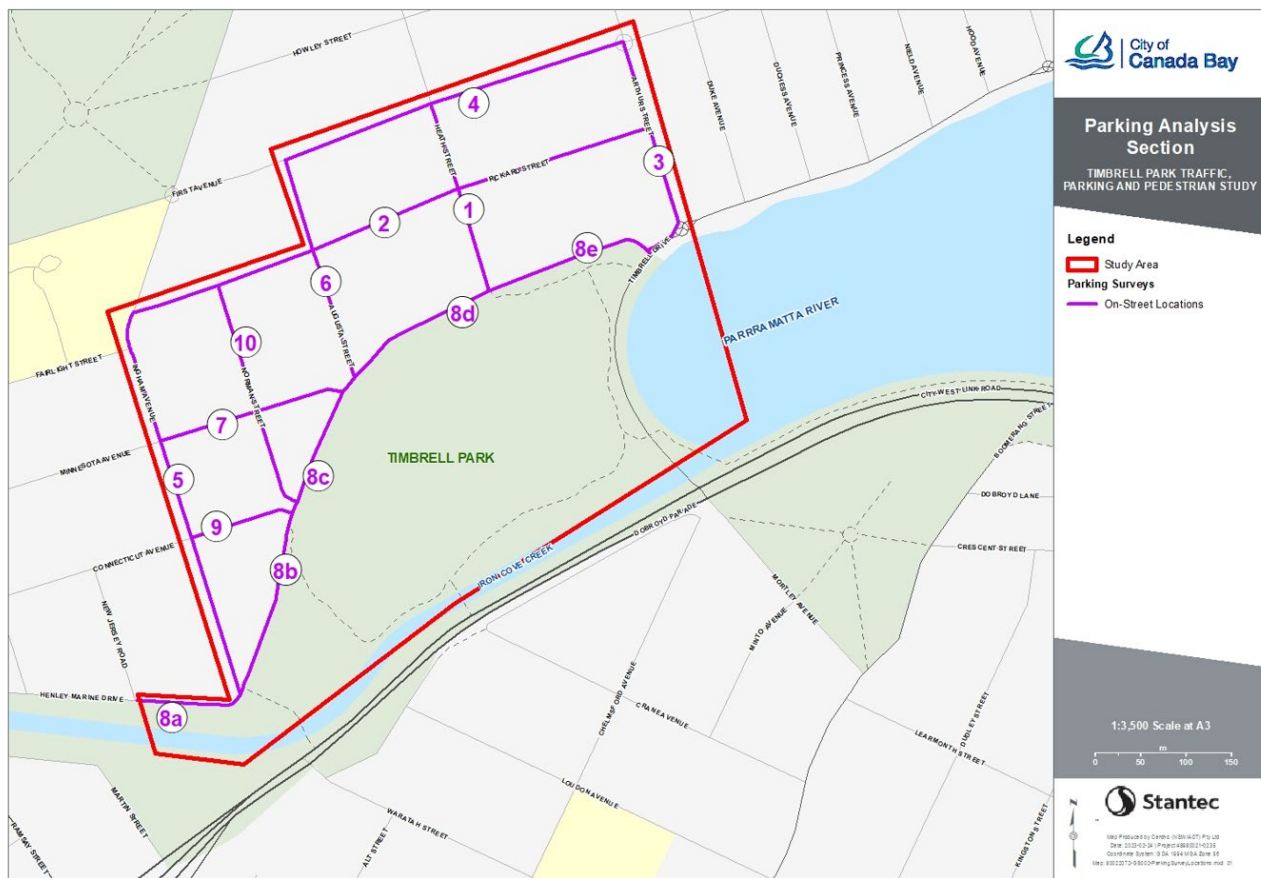
Section	Road
1	Heath Street between First Avenue and Henley Marine Drive
2	Rickard Street between Ingham Avenue and Arthur Street
3	Arthur Street between First Avenue and Henley Marine Drive
4	First Avenue between Augusta Street and Arthur Street
5	Ingham Avenue between Rickard Street and Henley Marine Drive
6	Augusta Street between First Avenue and Henley Marine Drive
7	Minnesota Avenue between Henley Marine Drive and Ingham Avenue
8	Henley Marine Drive between New Jersey Road and Arthur Street
9	Connecticut Avenue between Ingham Avenue and Henley Marine Drive
10	Norman Street between Rickard Street and Henley Marine Drive



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Figure 25 Parking Analysis Sections



Each section was investigated to determine parking utilisation and demand. The parking analysis included quantifying:

- Parking supply
- Parking occupancy
- Duration of Stay

The parking supply and restrictions at each location are summarised in **Table 12** and illustrated in **Figure 26**.

For this analysis, parallel kerbside parking has been derived based on Australian Standards (AS2890.5), which specifies car parking space lengths of between 5.4m to 6.7m. The assessment has adopted 5.4m for unobstructed end spaces and 6m for obstructed middle spaces. The supply is therefore a notional supply, with the potential for on-site parking occupancy to exceed the measured supply. There are several reasons why the on-site observed parking occupancy may exceed the notional supply, including:

- Kerbside parking in the surveyed area does not include pavement markings to delineate individual bays, therefore cars may park closer together enabling additional cars to be parked, particularly in long uninterrupted stretches of kerbside parking.
- NSW Road Rules indicate that No Stopping restrictions apply for the first 10 metres from an adjacent intersection. In the surveyed area these restrictions are not typically signed and therefore some cars may



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illegally encroach on this area, particularly where the distance between an adjacent intersection and the first driveway is approximately 14 metres.

- The average Australian car length is less than 5.4 metres, with some less than 4 metres, therefore distances between driveways of between 4 – 5.4 metres (which have been excluded from the parking supply) may be able to accommodate a small car.

Table 12 Current Parking Supply and Restrictions

Section	Road	Direction	Parking Restriction	Capacity
1	Heath Street	West	No Restriction	13
		East	No Restriction	16
2	Rickard Street	North	No Restriction	52
		South	No Restriction	48
3	Arthur Street	West	No Restriction	12
		East	No Restriction	12
4	First Avenue	North	No Restriction	34
		South	No Restriction	32
5	Ingham Avenue	West	No Restriction	28
		East	No Restriction	36
6	Augusta Street	West	No Restriction	20
		East	No Restriction	22
7	Minnesota Avenue	North	No Restriction	17
		South	No Restriction	16
8	Henley Marine Drive	North/West	No Restriction	58
		South/East	No Restriction	116
			Disabled	3
9	Connecticut Avenue	North	No Restriction	12
		South	No Restriction	10
10	Norman Street	West	No Restriction	22
		East	No Restriction	23
Total		Overall (All Directions)	No Restriction	599
			Disabled	3

As shown in **Table 12** the total parking supply in the surveyed area surrounding Timbrell park is 602 spaces, inclusive of 3 disabled parking spaces along Henley Marine Drive.



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Figure 26 Current Parking Supply and Restrictions



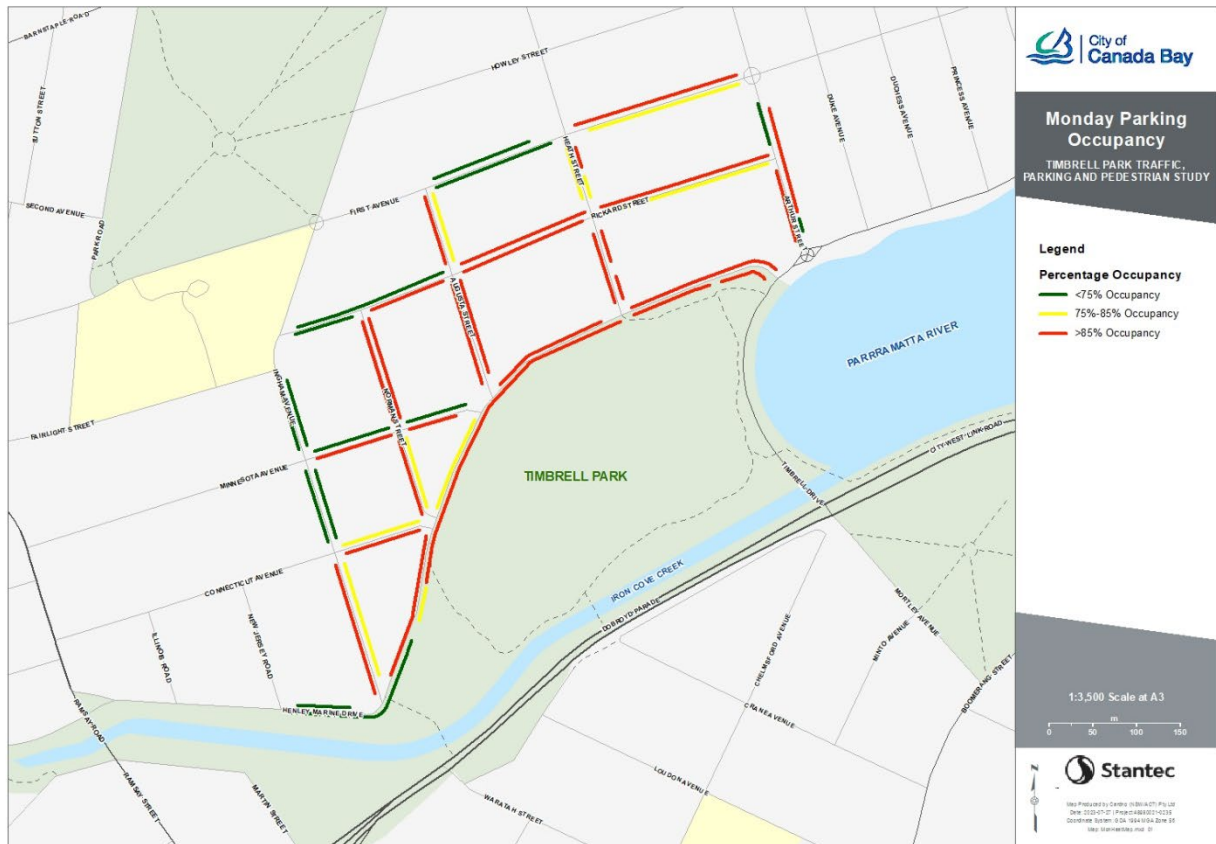
Occupancy data has been analysed to provide insights into the utilisation of parking in each street. The overall parking occupancy across the entire study area during the peak periods for a typical weekday and weekend is shown in **Figure 27** and **Figure 28**.

The peak weekday parking occupancy across the study area was observed to occur on Monday 21 November 2022 at 5.30pm as shown below.

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Figure 27 Peak Weekday Parking Occupancy - Monday



The peak weekday parking demand for the study area shows that the on-street parking along Henley Marine Drive contributes to a relatively large proportion of the overall parking demand. Along most sections of Henley Marine Drive, the parking demand was observed to mostly exceed 85% of the theoretical capacity. The results show that the preferred parking locations are on street parking locations which are closest to Timbrell Park, for example along Henley Marine Drive and the southern extents of Heath Street and Augusta Street.

Detailed Weekday parking occupancies across all Study Area streets are shown in **Table 13** and **Table 14** on the following pages.



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Table 13 Monday 21 November 2022 Parking Occupancy

Road	Direction	Parking Restriction	Supply#	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30
1 Heath Street	West	No Restriction	13	85%	100%	100%	92%	92%	85%	85%	85%
	East	No Restriction	16	100%	100%	100%	100%	100%	100%	63%	63%
	Street Total		29	93%	100%	100%	97%	97%	93%	72%	72%
2 Rickard Street	North	No Restriction	52	73%	75%	81%	75%	83%	81%	67%	67%
	South	No Restriction	48	85%	83%	77%	81%	79%	67%	69%	69%
	Street Total		100	79%	79%	79%	78%	81%	74%	68%	68%
3 Arthur Street	West	No Restriction	12	75%	83%	75%	75%	75%	83%	75%	75%
	East	No Restriction	12	83%	83%	83%	83%	83%	67%	58%	50%
	Street Total		24	79%	83%	79%	79%	79%	75%	67%	63%
4 First Avenue	North	No Restriction	34	68%	65%	65%	65%	65%	65%	62%	59%
	South	No Restriction	32	66%	66%	66%	66%	66%	66%	72%	72%
	Street Total		66	67%	65%	65%	65%	65%	65%	67%	65%
5 Ingham Avenue	West	No Restriction	28	68%	68%	75%	75%	75%	71%	75%	75%
	East	No Restriction	36	64%	67%	58%	58%	58%	50%	58%	56%
	Street Total		64	66%	67%	66%	66%	66%	59%	66%	64%
6 Augusta Street	West	No Restriction	20	100%	95%	90%	90%	100%	90%	95%	70%
	East	No Restriction	22	91%	91%	73%	73%	77%	73%	59%	59%
	Street Total		42	95%	93%	81%	81%	88%	81%	76%	64%
7 Minnesota Avenue	North	No Restriction	17	47%	53%	76%	65%	65%	71%	47%	41%
	South	No Restriction	16	100%	106%	106%	94%	81%	69%	69%	69%
	Street Total		33	73%	79%	91%	79%	73%	70%	58%	55%
8a Henley Marine Drive	North	No Restriction	5	40%	40%	60%	60%	60%	60%	60%	40%
	South	No Restriction	18	22%	22%	22%	22%	17%	17%	17%	17%
	Street Total		23	26%	26%	30%	30%	26%	26%	26%	22%
8b Henley Marine Drive	North	No Restriction	17	88%	100%	82%	82%	76%	47%	65%	24%
	South	No Restriction	33	91%	70%	52%	45%	30%	42%	45%	9%
		Disabled	2	0%	0%	0%	50%	0%	50%	0%	0%
	Street Total		52	87%	77%	60%	58%	44%	44%	50%	13%



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Road	Direction	Parking Restriction	Supply#	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30
8c Henley Marine Drive	North	No Restriction	12	75%	83%	100%	100%	100%	92%	67%	58%
	South	No Restriction	23	100%	100%	109%	113%	113%	109%	78%	43%
	Street Total		35	91%	94%	106%	109%	109%	103%	74%	49%
8d Henley Marine Drive	North	No Restriction	11	118%	118%	109%	91%	109%	109%	91%	91%
	South	No Restriction	22	105%	105%	105%	91%	105%	95%	59%	82%
	Street Total		33	109%	109%	106%	91%	106%	100%	70%	85%
8e Henley Marine Drive	North	No Restriction	13	115%	123%	115%	92%	108%	123%	92%	85%
	South	No Restriction	20	100%	95%	95%	85%	85%	100%	80%	70%
		Disabled	1	100%	100%	0%	0%	100%	100%	0%	0%
	Street Total		34	106%	106%	100%	85%	94%	109%	82%	74%
9 Connecticut Avenue	North	No Restriction	12	83%	83%	75%	75%	42%	67%	33%	8%
	South	No Restriction	10	90%	90%	40%	40%	60%	80%	40%	40%
	Street Total		22	86%	86%	59%	59%	50%	73%	36%	23%
10 Norman Street	West	No Restriction	22	100%	100%	100%	86%	77%	68%	50%	55%
	East	No Restriction	23	83%	87%	87%	87%	83%	57%	52%	52%
	Street Total		45	91%	93%	93%	87%	80%	62%	51%	53%

Parking supply has been derived based on Australian Standards (AS2890.5) and this study has adopted 5.4m for unobstructed end spaces and 6m for obstructed middle spaces. The supply is therefore a notional supply, with the potential for on-site parking occupancy to exceed the measured supply.

The following observations are made regarding the Monday 21 November 2022 weekday parking analysis results:

- The theoretical parking supply is exceeded along Henley Marine Drive (between Norman Street and Arthur Street), which is largely related to vehicles parking close together.
- At Heath Street the parking demand was observed to generally be at or near the theoretical capacity.
- Parking occupancy in Rickard Street, Arthur Street, Augusta Street, Connecticut Avenue and Norman Street is generally at or above 80% occupied, with demand reducing towards 7:30 to 8:00pm
- Parking occupancy in Ingham Avenue and Henley Marine Drive west of Norman Street is generally low throughout the survey period.



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Table 14 Tuesday 22 November 2022 Parking Occupancy

Road	Direction	Parking Restriction	Supply [#]	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30
1 Heath Street	West	No Restriction	13	69%	62%	62%	62%	92%	77%	62%	85%
	East	No Restriction	16	63%	69%	69%	81%	81%	75%	75%	63%
	Street Total		29	66%	66%	66%	72%	86%	76%	69%	72%
2 Rickard Street	North	No Restriction	52	42%	44%	48%	52%	56%	44%	48%	48%
	South	No Restriction	48	46%	48%	65%	65%	71%	71%	71%	71%
	Street Total		100	44%	46%	56%	58%	63%	57%	59%	59%
3 Arthur Street	West	No Restriction	12	67%	83%	75%	75%	67%	58%	83%	83%
	East	No Restriction	12	50%	58%	58%	58%	58%	67%	58%	50%
	Street Total		24	58%	71%	67%	67%	63%	63%	71%	67%
4 First Avenue	North	No Restriction	34	59%	59%	53%	50%	53%	53%	59%	59%
	South	No Restriction	32	63%	59%	66%	66%	66%	59%	56%	56%
	Street Total		66	61%	59%	59%	58%	59%	56%	58%	58%
5 Ingham Avenue	West	No Restriction	28	82%	75%	79%	79%	79%	82%	82%	79%
	East	No Restriction	36	58%	58%	56%	53%	53%	56%	58%	67%
	Street Total		64	69%	66%	66%	64%	64%	67%	69%	72%
6 Augusta Street	West	No Restriction	20	65%	70%	80%	95%	85%	85%	100%	100%
	East	No Restriction	22	18%	32%	41%	41%	59%	59%	59%	59%
	Street Total		42	40%	50%	60%	67%	71%	71%	79%	79%
7 Minnesota Avenue	North	No Restriction	17	24%	24%	41%	65%	59%	65%	71%	65%
	South	No Restriction	16	13%	19%	31%	38%	31%	38%	56%	31%
	Street Total		33	18%	21%	36%	52%	45%	52%	64%	48%
8a Henley Marine Drive	North	No Restriction	5	40%	60%	60%	60%	40%	40%	40%	40%
	South	No Restriction	18	17%	17%	28%	17%	17%	22%	17%	17%
	Street Total		23	22%	26%	35%	26%	22%	26%	22%	22%
8b Henley Marine Drive	North	No Restriction	17	29%	24%	35%	41%	35%	29%	29%	29%
	South	No Restriction	33	21%	21%	39%	39%	33%	45%	36%	30%
		Disabled	2	0%	0%	0%	0%	0%	0%	0%	0%
	Street Total		52	23%	21%	37%	38%	33%	38%	33%	29%
8c Henley Marine Drive	North	No Restriction	12	58%	58%	83%	75%	83%	67%	75%	58%
	South	No Restriction	23	30%	35%	104%	100%	100%	65%	65%	35%
	Street Total		35	40%	43%	97%	91%	94%	66%	69%	43%



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Road	Direction	Parking Restriction	Supply#	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30
8d Henley Marine Drive	North	No Restriction	11	55%	64%	100%	91%	100%	100%	82%	82%
	South	No Restriction	22	32%	68%	55%	64%	73%	91%	68%	59%
	Street Total		33	39%	67%	70%	73%	82%	94%	73%	67%
8e Henley Marine Drive	North	No Restriction	13	92%	100%	108%	77%	85%	108%	100%	108%
	South	No Restriction	20	70%	80%	70%	70%	70%	75%	85%	45%
		Disabled	1	100%	100%	0%	0%	100%	0%	0%	0%
	Street Total		34	79%	88%	82%	71%	76%	85%	88%	68%
9 Connecticut Avenue	North	No Restriction	12	8%	8%	8%	25%	17%	8%	25%	25%
	South	No Restriction	10	20%	20%	30%	30%	40%	50%	60%	60%
	Street Total		22	14%	14%	18%	27%	27%	27%	41%	41%
10 Norman Street	West	No Restriction	22	45%	45%	45%	36%	36%	50%	55%	55%
	East	No Restriction	23	43%	39%	43%	52%	48%	52%	61%	61%
	Street Total		45	44%	42%	44%	44%	42%	51%	58%	58%

Parking supply has been derived based on Australian Standards (AS2890.5) and this study has adopted 5.4m for unobstructed end spaces and 6m for obstructed middle spaces. The supply is therefore a notional supply, with the potential for on-site parking occupancy to exceed the measured supply.

The following observations are made regarding the Tuesday 22 November 2022 weekday parking analysis results:

- Overall parking demand was generally lower than observed on Monday 21 November 2022.
- The parking area with the highest occupancy rates was Henley Marine Drive (between Norman Street and Arthur Street), with limited spare capacity and in some locations the occupancy exceeding the theoretical supply (likely related to vehicles parking close together).
- Not all parking areas in the study area experienced high parking occupancy. Rickard Street, First Avenue, Minnesota Avenue, Henley Marine Drive (west of Norman Street), Connecticut Avenue, and Norman Street all have occupancy levels that are generally below 60%.
- The results show that the preferred parking locations are along Heath Street and Henley Marine Drive (between Norman St and Arthur St) which is the closest to Timbrell Park. It was observed during the site visit that most fields were occupied at 7pm, which corresponds with the maximum parking demand from the surveys which peaks at 7pm around streets closer to the park.

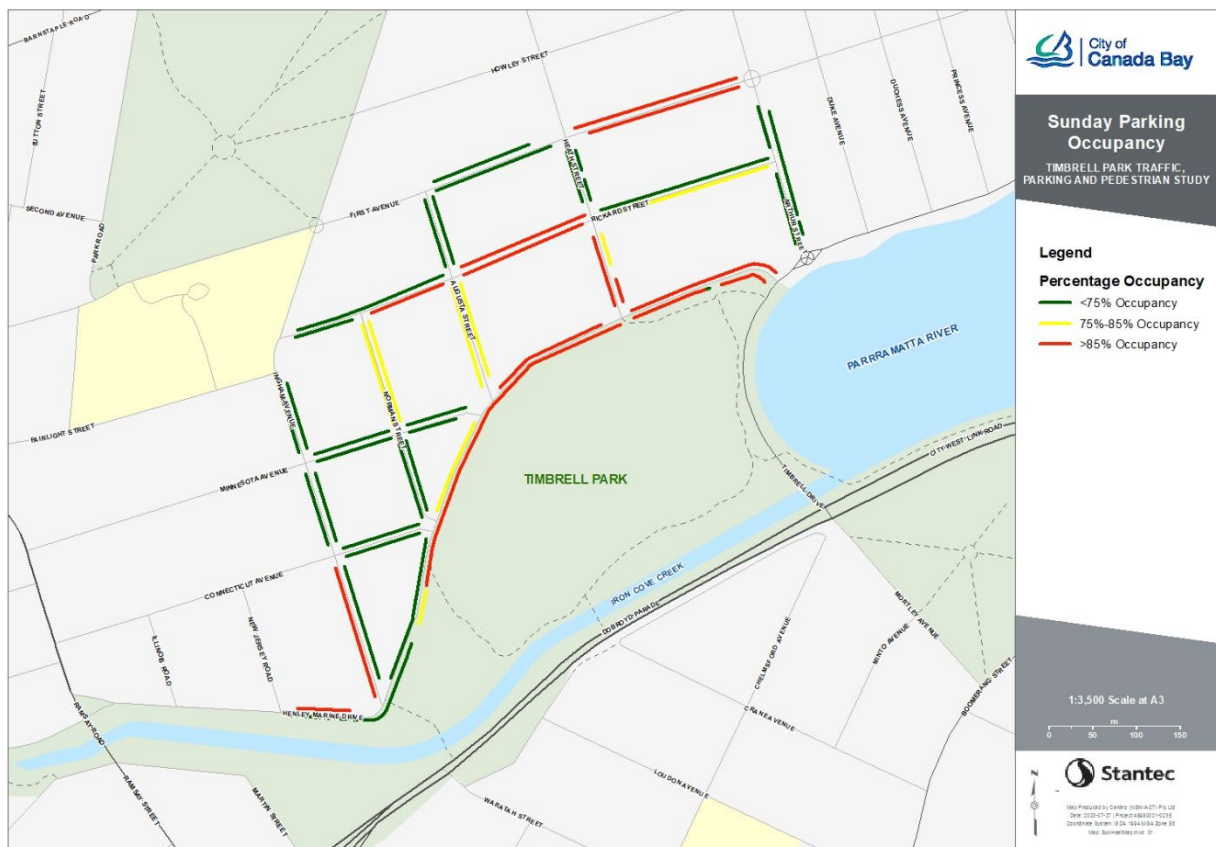
The peak weekend parking occupancy across the study area was observed to occur on Sunday 27 November 2022 at 9.30am as shown below.



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Figure 28 Peak Weekend Parking Occupancy - Sunday



The peak weekend parking demand shown for the study area shows that the on-street parking along Henley Marine Drive contributes to a relatively large proportion of the overall parking demand. On the southern side of Henley Marine Drive (between Timbrell Drive and Norman Street) the parking demand was observed to mostly exceed 85% of the theoretical capacity. The results show that the preferred parking locations are along on street parking locations which are closest to Timbrell Park, in particular along Henley Marine Drive and the southern extent of Heath Street.

Detailed weekend parking occupancies across all Study Area streets are shown in **Table 15** and **Table 16** on the following pages.



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Table 15 Saturday 26 November 2022 Parking Occupancy

Road	Direction	Parking Restriction	Supply#	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30
1 Heath Street	West	No Restriction	13	69%	54%	46%	62%	69%	54%	46%	46%	54%	54%	62%	69%	77%	92%	92%	85%
	East	No Restriction	16	75%	75%	75%	75%	69%	63%	63%	63%	69%	69%	75%	69%	63%	63%	75%	69%
	Street Total		29	72%	66%	62%	69%	69%	59%	55%	55%	62%	62%	69%	69%	69%	76%	83%	76%
2 Rickard Street	North	No Restriction	52	50%	44%	50%	52%	54%	50%	48%	48%	50%	50%	52%	52%	50%	58%	58%	54%
	South	No Restriction	48	56%	54%	58%	56%	63%	58%	63%	54%	56%	54%	65%	67%	67%	69%	79%	73%
	Street Total		100	53%	49%	54%	54%	58%	54%	55%	51%	53%	52%	58%	59%	58%	63%	68%	63%
3 Arthur Street	West	No Restriction	12	58%	42%	33%	50%	50%	50%	33%	33%	33%	33%	50%	50%	50%	58%	67%	75%
	East	No Restriction	12	42%	33%	25%	42%	33%	25%	33%	33%	58%	33%	25%	25%	33%	25%	25%	33%
	Street Total		24	50%	38%	29%	46%	42%	38%	33%	33%	46%	33%	38%	38%	42%	42%	46%	54%
4 First Avenue	North	No Restriction	34	62%	62%	56%	56%	76%	79%	71%	76%	76%	68%	71%	71%	65%	68%	65%	65%
	South	No Restriction	32	81%	75%	69%	72%	69%	56%	59%	66%	66%	63%	69%	66%	69%	69%	66%	66%
	Street Total		66	71%	68%	62%	64%	73%	68%	65%	71%	71%	65%	70%	68%	67%	68%	65%	65%
5 Ingham Avenue	West	No Restriction	28	71%	75%	71%	64%	64%	64%	64%	61%	61%	64%	61%	71%	64%	75%	75%	71%
	East	No Restriction	36	64%	56%	64%	56%	56%	58%	56%	56%	64%	67%	58%	58%	58%	61%	61%	56%
	Street Total		64	67%	64%	67%	59%	59%	61%	59%	58%	63%	66%	59%	64%	61%	67%	67%	63%



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Road	Direction	Parking Restriction	Supply#	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30
6 Augusta Street	West	No Restriction	20	55%	55%	55%	55%	55%	55%	60%	50%	50%	65%	70%	65%	65%	65%	70%	75%
	East	No Restriction	22	41%	41%	45%	41%	45%	36%	36%	50%	41%	41%	45%	36%	27%	41%	45%	55%
	Street Total		42	48%	48%	50%	48%	50%	45%	48%	50%	45%	52%	57%	50%	45%	52%	57%	64%
7 Minnesota Avenue	North	No Restriction	17	41%	41%	35%	35%	29%	29%	35%	47%	47%	47%	47%	29%	29%	29%	41%	41%
	South	No Restriction	16	25%	25%	31%	31%	31%	19%	19%	19%	31%	63%	69%	19%	25%	25%	25%	25%
	Street Total		33	33%	33%	33%	33%	30%	24%	27%	33%	39%	55%	58%	24%	27%	27%	33%	33%
8a Henley Marine Drive	North	No Restriction	5	20%	20%	20%	40%	40%	80%	100%	100%	80%	100%	100%	100%	80%	80%	80%	80%
	South	No Restriction	18	28%	28%	22%	33%	28%	22%	17%	17%	17%	17%	17%	17%	11%	17%	22%	17%
	Street Total		23	26%	26%	22%	35%	30%	35%	35%	35%	30%	35%	35%	35%	26%	30%	35%	30%
8b Henley Marine Drive	North	No Restriction	17	71%	65%	65%	35%	41%	35%	35%	47%	59%	65%	65%	59%	53%	59%	59%	29%
	South	No Restriction	33	79%	79%	64%	45%	52%	45%	52%	52%	73%	82%	82%	82%	76%	76%	61%	45%
		Disabled	2	0%	0%	0%	50%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%
	Street Total		52	73%	71%	62%	42%	48%	42%	44%	48%	65%	73%	73%	71%	65%	67%	60%	38%
8c Henley Marine Drive	North	No Restriction	12	75%	75%	58%	58%	50%	42%	33%	50%	67%	50%	42%	42%	50%	58%	75%	75%
	South	No Restriction	23	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Street Total		35	26%	26%	20%	20%	17%	14%	11%	17%	23%	17%	14%	14%	17%	20%	26%	26%



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Road	Direction	Parking Restriction	Supply#	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30
8d Henley Marine Drive	North	No Restriction	11	64%	64%	64%	45%	45%	36%	36%	36%	36%	55%	55%	55%	55%	64%	73%	82%
	South	No Restriction	22	68%	45%	36%	36%	32%	27%	27%	27%	36%	27%	18%	27%	23%	27%	45%	36%
	Street Total		33	67%	52%	45%	39%	36%	30%	30%	30%	36%	36%	30%	36%	33%	39%	55%	52%
8e Henley Marine Drive	North	No Restriction	13	108%	85%	100%	85%	77%	69%	54%	62%	77%	92%	108%	115%	85%	100%	92%	77%
	South	No Restriction	20	105%	50%	60%	60%	45%	25%	50%	45%	60%	60%	65%	80%	65%	65%	65%	75%
		Disabled	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Street Total		34	103%	62%	74%	68%	56%	41%	50%	50%	65%	71%	79%	91%	71%	76%	74%	74%
9 Connecticut Avenue	North	No Restriction	12	8%	8%	8%	8%	8%	0%	0%	0%	8%	8%	8%	8%	8%	8%	0%	8%
	South	No Restriction	10	20%	20%	40%	30%	30%	30%	40%	40%	40%	40%	60%	60%	70%	70%	70%	50%
	Street Total		22	14%	14%	23%	18%	18%	14%	18%	18%	23%	23%	32%	32%	36%	36%	32%	27%
10 Norman Street	West	No Restriction	22	45%	45%	45%	45%	55%	41%	45%	45%	41%	59%	59%	45%	50%	50%	55%	59%
	East	No Restriction	23	35%	35%	35%	43%	35%	35%	22%	35%	35%	39%	39%	35%	43%	48%	43%	43%
	Street Total		45	40%	40%	40%	44%	44%	38%	33%	40%	38%	49%	49%	40%	47%	49%	49%	51%

Parking supply has been derived based on Australian Standards (AS2890.5) and this study has adopted 5.4m for unobstructed end spaces and 6m for obstructed middle spaces. The supply is therefore a notional supply, with the potential for on-site parking occupancy to exceed the measured supply.



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The following observations are made regarding the Saturday 26 November 2022 weekend parking analysis results:

- Saturday parking demand is generally below the observed weekday parking demand.
- The total parking demand along Henley Marine Drive (between Heath Street and Arthur Street) and Heath Street was observed to be high, however most of the area did not exceed 85% of the theoretical capacity.
- Not all parking areas in the study area experienced high parking occupancy. Rickard Street, Arthur Street, Augusta Street, Minnesota Avenue, Connecticut Avenue and Norman Street generally have occupancy levels below 60%.

Table 16 Sunday 27 November 2022 Parking Occupancy

Road	Direction	Parking Restriction	Supply [#]	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30
1 Heath Street	West	No Restriction	13	85%	85%	77%	62%	62%	54%	46%	62%	69%	62%	62%	69%	62%	85%	77%	77%
	East	No Restriction	16	81%	75%	69%	75%	75%	69%	69%	69%	69%	69%	69%	69%	69%	69%	69%	69%
	Street Total		29	83%	79%	72%	69%	69%	62%	59%	66%	69%	66%	66%	69%	66%	76%	72%	72%
2 Rickard Street	North	No Restriction	52	63%	67%	62%	56%	60%	54%	63%	63%	63%	67%	62%	63%	60%	54%	65%	67%
	South	No Restriction	48	77%	79%	67%	63%	56%	56%	60%	73%	73%	60%	73%	73%	77%	77%	83%	85%
	Street Total		100	70%	73%	64%	59%	58%	55%	62%	68%	68%	64%	67%	68%	68%	65%	74%	76%
3 Arthur Street	West	No Restriction	12	50%	50%	58%	67%	58%	58%	58%	42%	33%	33%	25%	50%	42%	50%	42%	58%
	East	No Restriction	12	25%	25%	25%	50%	50%	42%	25%	42%	33%	33%	42%	33%	25%	25%	33%	42%
	Street Total		24	38%	38%	42%	58%	54%	50%	42%	42%	33%	33%	33%	42%	33%	38%	38%	50%
4 First Avenue	North	No Restriction	34	71%	71%	71%	65%	59%	59%	65%	74%	74%	74%	71%	74%	74%	74%	76%	79%
	South	No Restriction	32	75%	72%	72%	72%	81%	72%	63%	69%	69%	69%	78%	75%	72%	72%	63%	66%
	Street Total		66	73%	71%	71%	68%	70%	65%	64%	71%	71%	71%	74%	74%	73%	73%	70%	73%



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Road	Direction	Parking Restriction	Supply#	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30
5 Ingham Avenue	West	No Restriction	28	68%	71%	64%	68%	79%	75%	75%	82%	79%	86%	71%	71%	68%	61%	61%	61%
	East	No Restriction	36	56%	56%	53%	53%	56%	56%	56%	58%	58%	53%	50%	50%	53%	53%	53%	53%
	Street Total		64	61%	63%	58%	59%	66%	64%	64%	69%	67%	67%	59%	59%	59%	56%	56%	56%
6 Augusta Street	West	No Restriction	20	70%	75%	80%	75%	65%	65%	70%	55%	60%	60%	65%	65%	65%	60%	70%	75%
	East	No Restriction	22	68%	55%	50%	45%	41%	45%	45%	41%	36%	36%	41%	41%	50%	50%	59%	64%
	Street Total		42	69%	64%	64%	60%	52%	55%	57%	48%	48%	48%	52%	52%	57%	55%	64%	69%
7 Minnesota Avenue	North	No Restriction	17	41%	41%	47%	47%	35%	35%	35%	35%	35%	35%	35%	35%	24%	24%	24%	29%
	South	No Restriction	16	31%	31%	13%	13%	31%	25%	25%	31%	25%	25%	19%	19%	6%	6%	6%	6%
	Street Total		33	36%	36%	30%	30%	33%	30%	30%	33%	30%	30%	27%	27%	15%	15%	15%	18%
8a Henley Marine Drive	North	No Restriction	5	100%	100%	120%	120%	100%	80%	100%	80%	80%	100%	100%	100%	100%	80%	80%	80%
	South	No Restriction	18	17%	17%	17%	17%	22%	22%	22%	22%	33%	22%	22%	22%	22%	33%	28%	28%
	Street Total		23	35%	35%	39%	39%	39%	35%	39%	35%	43%	39%	39%	39%	39%	43%	39%	39%
8b Henley Marine Drive	North	No Restriction	17	47%	59%	82%	106%	106%	82%	71%	82%	76%	65%	59%	76%	59%	35%	18%	18%
	South	No Restriction	33	52%	67%	67%	67%	58%	52%	55%	45%	42%	36%	42%	42%	39%	30%	24%	27%
		Disabled	2	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%
	Street Total		52	50%	63%	69%	77%	71%	60%	58%	56%	52%	44%	46%	52%	46%	33%	21%	23%



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Road	Direction	Parking Restriction	Supply#	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30
8c Henley Marine Drive	North	No Restriction	12	92%	75%	75%	75%	58%	33%	33%	25%	25%	25%	25%	25%	25%	25%	17%	25%
	South	No Restriction	23	109%	109%	87%	87%	87%	35%	26%	9%	13%	13%	13%	13%	9%	9%	9%	9%
	Street Total		35	103%	97%	83%	83%	77%	34%	29%	14%	17%	17%	17%	17%	14%	14%	11%	14%
8d Henley Marine Drive	North	No Restriction	11	100%	100%	91%	73%	91%	82%	82%	82%	82%	82%	64%	73%	55%	45%	36%	27%
	South	No Restriction	22	86%	86%	73%	82%	82%	77%	64%	73%	68%	68%	64%	64%	32%	27%	32%	32%
	Street Total		33	91%	91%	79%	79%	85%	79%	70%	76%	73%	73%	64%	67%	39%	33%	33%	30%
8e Henley Marine Drive	North	No Restriction	13	108%	115%	108%	123%	100%	108%	115%	108%	100%	100%	92%	92%	92%	100%	92%	85%
	South	No Restriction	20	95%	95%	90%	95%	85%	90%	85%	95%	80%	80%	80%	85%	65%	65%	80%	65%
		Disabled	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Street Total		34	97%	100%	94%	103%	88%	94%	94%	97%	85%	85%	82%	85%	74%	76%	82%	71%
9 Connecticut Avenue	North	No Restriction	12	17%	42%	42%	42%	33%	0%	0%	0%	0%	8%	8%	8%	8%	17%	17%	17%
	South	No Restriction	10	60%	70%	60%	60%	40%	20%	20%	20%	20%	20%	50%	50%	60%	60%	50%	50%
	Street Total		22	36%	55%	50%	50%	36%	9%	9%	9%	9%	14%	27%	27%	32%	36%	32%	32%
10 Norman Street	West	No Restriction	22	64%	64%	55%	50%	64%	68%	68%	59%	59%	59%	59%	59%	59%	59%	64%	64%
	East	No Restriction	23	65%	61%	48%	48%	39%	35%	39%	48%	35%	30%	35%	30%	22%	26%	26%	17%
	Street Total		45	64%	62%	51%	49%	51%	51%	53%	53%	47%	44%	47%	44%	40%	42%	44%	40%

Parking supply has been derived based on Australian Standards (AS2890.5) and this study has adopted 5.4m for unobstructed end spaces and 6m for obstructed middle spaces. The supply is therefore a notional supply, with the potential for on-site parking occupancy to exceed the measured supply.



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The following observations are made regarding the Sunday 27 November 2022 weekend parking analysis results:

- The total parking demand in Henley Marine Drive (between Norman St and Arthur St) was observed to exceed 85% of the theoretical capacity. It was observed that the parking occupancy exceeds 100% due to vehicles parking close together.
- Not all parking areas in the study area experienced high parking occupancy. Arthur Street, Minnesota Avenue and Connecticut Avenue have occupancy levels below 60%.
- The results show that the peak parking demand is along Henley Marine Drive (between Norman St and Arthur Street) at 9am which is the closest location to Timbrell Park. The parking demands at Henley Marine Drive start to decrease after 11 am.



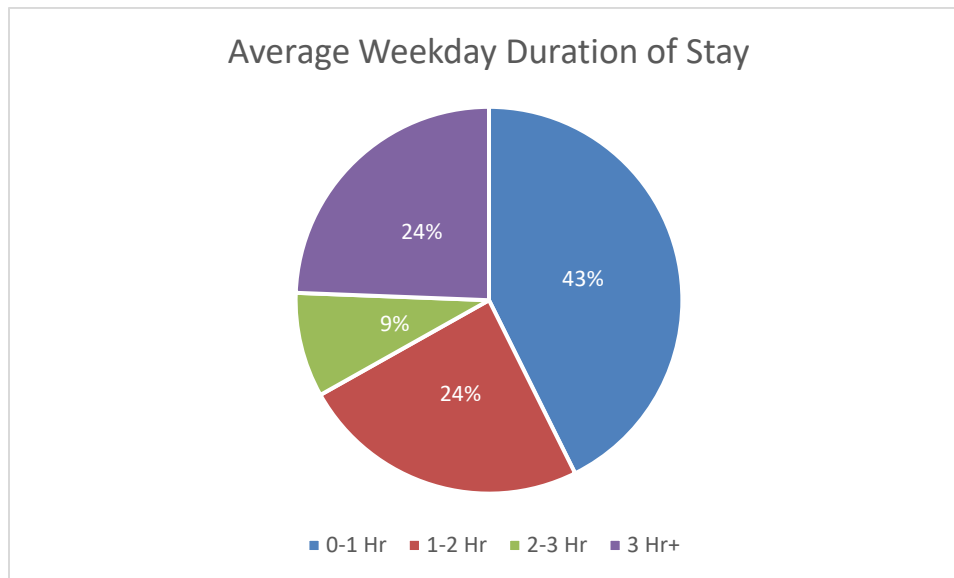
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3.11 PARKING DURATION OF STAY

A parking duration survey was undertaken in the Study Area on Monday 21 November 2022 and Tuesday 22 November 2022 between 5pm – 9pm, and on Saturday 26 November 2022 and Sunday 27 November 2022 between 9am – 5pm. Parking duration data was captured for all on-street parking.

The duration of stay data has been analysed to provide insights into the amount of time that vehicles are parked on each street. The percentages for the overall parking durations of all vehicles parked across the Study Area are depicted in **Figure 29** and **Figure 30** for an average weekday and average weekend respectively.

Figure 29 Average Weekday Duration of Stay



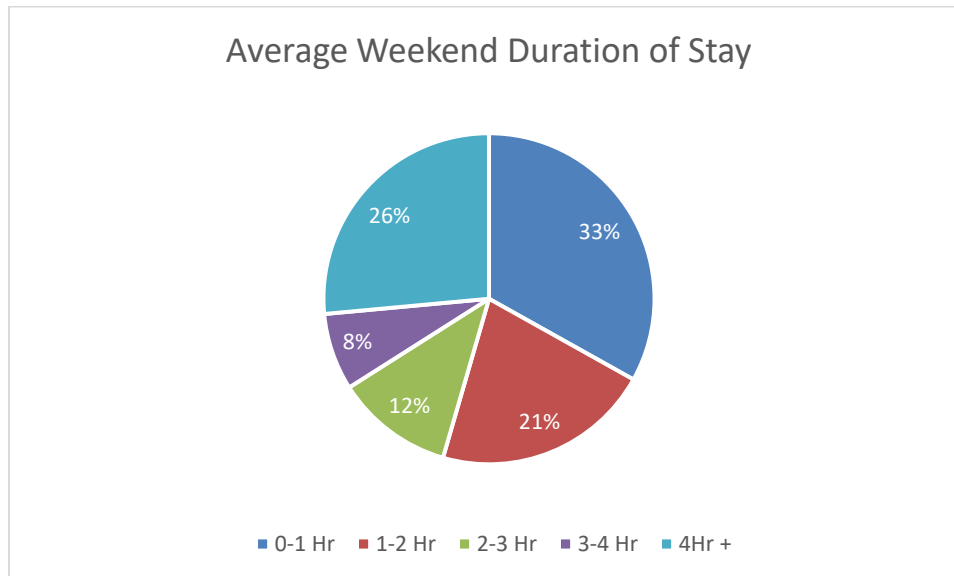
For both of the surveyed weekdays, the predominant duration of stay for cars parked was 1 hour or less.



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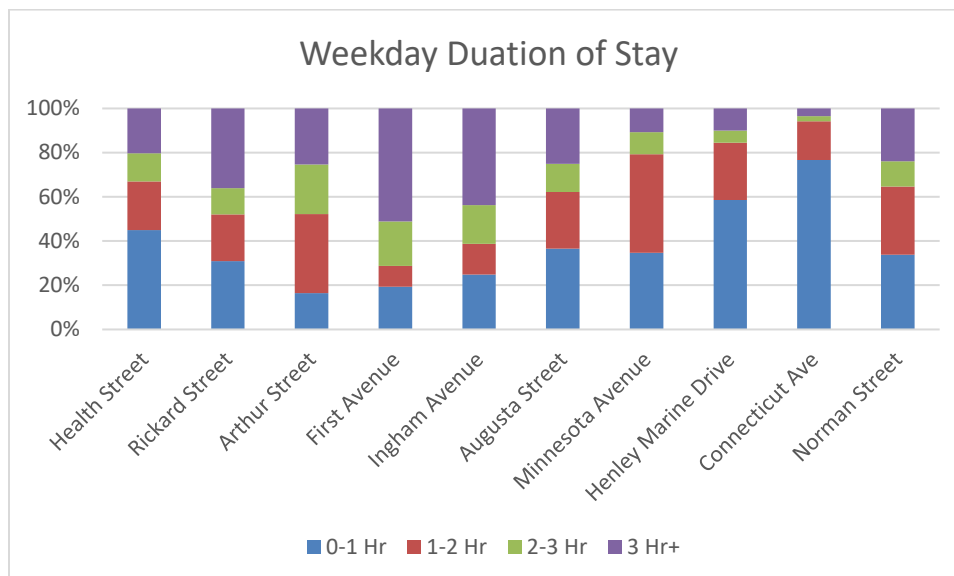
Figure 30 Average Weekend Duration of Stay



For weekends, the predominant duration of stay for cars parked was 1 hour or less. However, when compared to the weekday, increases are seen for the duration of stay for more than three hours from 24% to 34%.

A breakdown of the parking duration of stay for each street is summarised in **Figure 31** and **Figure 32** for the average weekday and weekend respectively.

Figure 31 Parking Duration (Street by Street – Weekday)

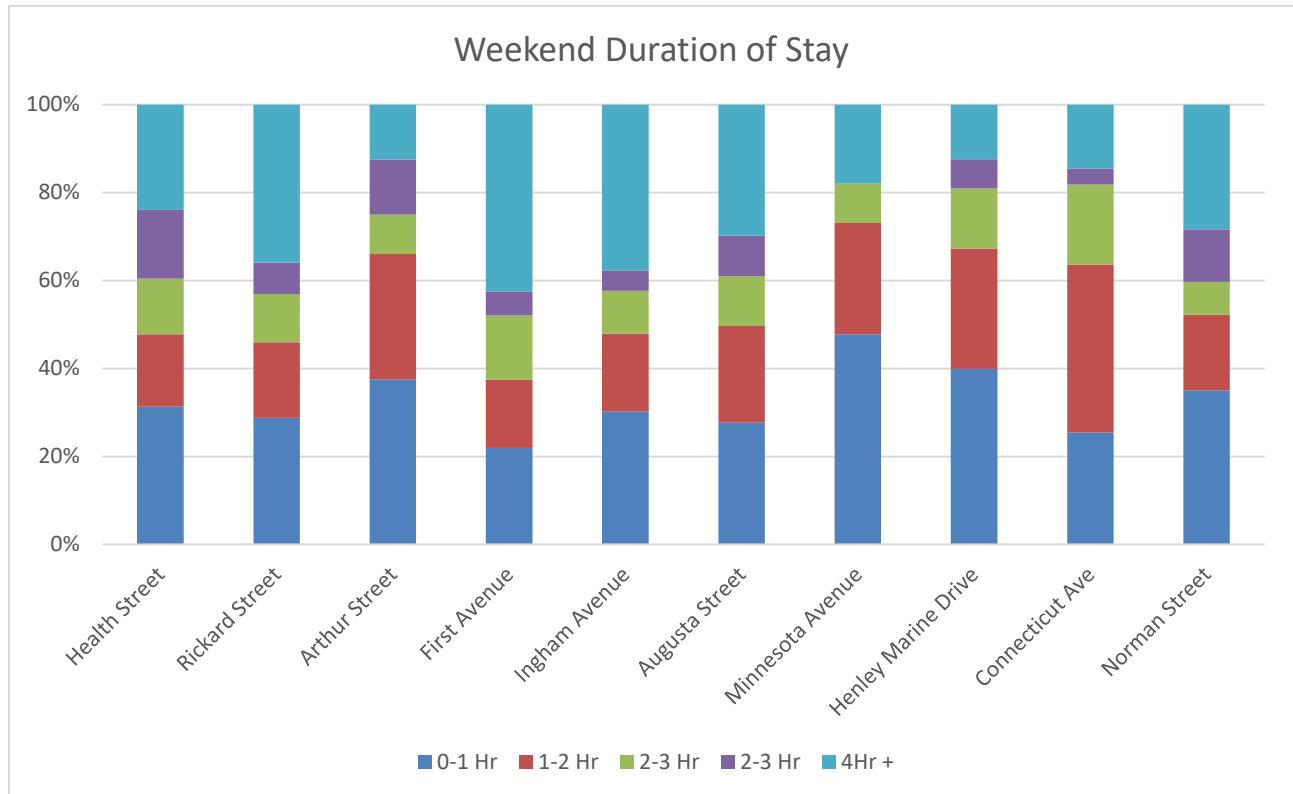


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The duration of stay for Henley Marine Drive on weekdays is primarily short term with almost 60% of the vehicles parking for 1 hour or less.

Figure 32 Parking Duration (Street by Street – Weekend)



When compared to the weekday, increases are seen for the duration of stay along Henley Marine Drive.



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4.0 SITE VISIT OBSERVATIONS

A site visit was undertaken on Tuesday 22 November 2022. The purpose was to observe transport-related infrastructure and behaviour on-site and surrounding the park.

4.1 PEDESTRIANS AND RELATED INFRASTRUCTURE

Pedestrian sightlines are restricted on Henley Marine Drive due to parked vehicles. It was observed that vehicles park across the pram ramp on Henley Marine Drive, restricting pedestrian movements (see **Figure 33**). The pedestrians that are crossing midblock are doing so by filtering between kerbside parking on Henley Marine Drive. The horizontal curve along Henley Marine Drive also restricts sight lines to pedestrians.

Figure 33 Parking Across Kerb Ramps



A high volume of pedestrians and cyclists were observed crossing Timbrell Drive between Timbrell Park and the Bay Run. Considering the high volume of traffic, the existing refuge across Timbrell Drive, as shown in **Figure 34**, seemed insufficient for cyclists and pedestrians.



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Figure 34 Timbrell Drive Pedestrian Refuge



There were limited bike parking facilities and usage noted around the park. **Figure 35** shows the bike rack provided outside Livvi's Place, however, there was no utilisation of bike racks observed.



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Figure 35 Bike Racks Outside Livvi's Place



4.2 PARKING

The mobility parking space on the southern side of Henley Marine Drive midway between Heath Street and Timbrell Drive is not line marked and its width does not meet the current standard (**Figure 36**). To provide orderly parking, it is desirable to mark the mobility parking spaces which will also discourage illegal parking in the mobility parking area.



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Figure 36 Henley Marine Drive Mobility Parking



Similarly, faded line marking on Henley Marine Drive between Augusta Street and Heath Street makes it difficult to observe existing lane configurations or right of way and is a safety hazard affecting all road users (**Figure 37**).



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Figure 37 Faded Line Marking Henley Marine Drive



5.0 ISSUES AND OPPORTUNITIES

An assessment of the transport challenges and opportunities facing Timbrell Park based on the information presented in the preceding sections is shown in **Table 17**.

Table 17 Transport Challenges and Opportunities

No.	Issue	Opportunities/Considerations
Pedestrian		
P1	<p>There are no crossing facilities provided on Henley Marine Drive between Timbrell Drive and Ramsay Road apart from a recently installed refuge island on Henley Marine Drive near Heath Street.</p> <p>Henley Marine Drive/ Augusta Street and Minnesota Avenue are unsafe for pedestrians crossing from the park to the other side of the road. Poor visibility occurs in both directions due to parked cars blocking sightlines.</p>	<p>Provide raised pedestrian crossing facilities at the following locations:</p> <ul style="list-style-type: none"> Provision of raised pedestrian crossing for pedestrians crossing over Henley Marine Drive to Timbrell Park at Augusta Street. <p>Based on the existing survey of pedestrian movements, the data suggests that the pedestrian demand crossing Henley Marine Drive midblock near Minnesota Avenue/Augusta Street is up to 23 ped/h.</p> <p>Overall, the result shows there is a desire line crossing Henley Marine Drive at this location. Also, during Stantec's site visit on Tuesday 22 November, this pedestrian demand was verified.</p> <ul style="list-style-type: none"> Provision of pedestrian crossing facility at Henley Marine Drive midblock near Ingham Avenue. <p>Based on the existing survey of pedestrian movements, the data suggests that the pedestrian demand crossing Henley Marine Drive midblock near Ingham Avenue is up to 29 ped/h.</p>
P2	<p>The track around Timbrell Park has safety risks (low level). The track is approximately 2.5m wide which is the minimum width for a shared path but is further narrowed by overgrowing grass. The track lacks sufficient signage and line marking for a shared path.</p>	<ul style="list-style-type: none"> Undertake regular edging of grass alongside the path and consider further path widening. Install appropriate signage and line marking.
P3	<p>Lack of pedestrian and cyclist crossing on Timbrell Drive which is a major walking and cycle route. Considering the high volume of traffic, the refuge across Timbrell Drive for cyclists and pedestrians is inadequate for safety.</p>	<ul style="list-style-type: none"> A formalised pedestrian crossing is being investigated by Council as part of the Concord to Bay Run Cycleway.
P4	<p>The existing pedestrian refuges at the intersection of Henley Marine Drive and Heath Street are effective at assisting pedestrians in safely crossing the road and reducing vehicle speeds. Existing landscaping in Timbrell Park does, however, obstruct direct pedestrian access between the sports fields and the</p>	<ul style="list-style-type: none"> Formalise a footpath through the landscaping in alignment with the existing pedestrian refuge on Henley Marine Drive



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No.	Issue	Opportunities/Considerations
	refuge on Henley Marine Drive, making use of the refuge inconvenient.	
Road Network		
R1	<p>Speeding occurs at the following road sections:</p> <ul style="list-style-type: none"> The 85th percentile speed on ATC 1 Ingham Avenue (between Connecticut Avenue and Henley Marine Drive) is 55.7km/h. The 85th percentile speed on ATC 5 (Henley Marine Drive between Minnesota Avenue and Norman Street) is 52.8km/h. 	<ul style="list-style-type: none"> Provide speed cushions/speed humps to slow down cars at Ingham Avenue and Henley Marine Drive. Increase patrols by law enforcement to enforce speed limits.
R2	<p>Lack of 'No Stopping' signage at:</p> <ul style="list-style-type: none"> Henley Marine Drive/ Connecticut Avenue/ Norman Street. Henley Marine Drive/ Ingham Avenue. Henley Marine Drive/ Timbrell Drive. <p>This could result in parked vehicles blocking sight lines and turning manoeuvres.</p>	<ul style="list-style-type: none"> Install "No Stopping" signs to prohibit parking within 10m of intersections, where high parking demand means illegal parking is likely to otherwise occur.
Car Parking		
PA1	The mobility parking space in Henley Marine Drive is not line marked and its width does not meet current standards. Illegal parking can occur in the disabled parking area.	<ul style="list-style-type: none"> The mobility parking space should be upgraded to meet current standards and line marked which will discourage Illegal parking.
PA2	No mobility parking spaces are provided near the amenities building in Timbrell Park.	<ul style="list-style-type: none"> Provide new mobility parking space near the amenities building.
PA3	The width of the mobility parking spaces adjoining Livvi's Place does not meet current standards.	<ul style="list-style-type: none"> Upgrade the mobility parking spaces adjoining Livvi's Place to meet current standards.
PA4	High on-street parking demand occurs around the perimeter of Timbrell Park, resulting in vehicles obstructing driveways, illegally parking near intersections, etc.	<ul style="list-style-type: none"> Provide angled parking along Henley Marine Drive.
Active Transport		
AT1	There is limited bike parking facilities and usage. Bike racks are provided outside Livvi's Place, however, there was no utilisation of bike racks observed.	<ul style="list-style-type: none"> Encourage and promote active transport such as cycling. Provide more bicycle parking, especially alongside the Timbrell Park amenities building. It is noted that the Timbrell Park amenities upgrade will provide improved bicycle facilities including a bicycle repair station.



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No.	Issue	Opportunities/Considerations
Public Transport		
PT1	There is limited direct accessibility by public transport and a lack of covered pedestrian areas, particularly if there is inclement weather and people are waiting to enter or leave via public transport.	<ul style="list-style-type: none">• At the bus stops near the intersection of Henley Marine Drive and Arthur Street, provide concrete boarding points including tactile indicators to meet accessibility standards.• Review bus stop utilisation and site constraints to determine if bus shelters are suitable.



6.0 RECOMMENDATIONS

The proposed recommendations are summarised in **Table 18**.

Table 18 Proposed Recommendations

No	Opportunities/Considerations
Pedestrian	
P1	Provide raised pedestrian crossing facilities at the following locations: <ul style="list-style-type: none"> Henley Marine Drive to Timbrell Park at Augusta Street. Henley Marine Drive midblock near Ingham Avenue.
P2	Undertake regular edging of grass alongside the path along Timbrell Park and consider further path widening. Install appropriate signage and line marking.
P3	Investigate providing a formalised pedestrian crossing across Timbrell Drive to replace the existing refuge as part of the Concord to Bay Run Cycleway.
P4	Formalise a footpath through the landscaping in alignment with the existing pedestrian refuge on Henley Marine Drive.
Road Network	
R1	Provide speed cushions/speed humps to slow down cars at Ingham Avenue and Henley Marine Drive. Increase patrols by law enforcement to enforce speed limits.
R2	Install "No Stopping" signs to prohibit parking within 10m of an intersection at the following intersections: <ul style="list-style-type: none"> Henley Marine Drive/ Connecticut Avenue/ Norman Street Henley Marine Drive/ Ingham Avenue Henley Marine Drive/ Timbrell Drive
Parking	
PA1	The mobility parking space on Henley Marine Drive should be upgraded to meet current standards and line marked which will discourage illegal parking.
PA2	Provide new mobility parking space near the amenities building.
PA3	Upgrade the mobility parking spaces adjoining Livvi's Place to meet current standards.
PA4	Provide angled parking along Henley Marine Drive.
Active Transport	
AT1	Encourage and promote active transport such as cycling. Provide more bicycle parking, especially alongside the Timbrell Park amenities building.
Public Transport	
PT1	Provide concrete boarding points including tactile indicators to meet accessibility standards at the bus stops near the intersection of Henley Marine Drive and Arthur Street. Review bus stop utilisation and site constraints to determine if bus shelters are suitable.

The proposed recommendations are shown in **Figure 38**. The concept plan for the proposed recommendations is provided in **Appendix B**.



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Figure 38 Proposed Recommendations



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APPENDIX A

Tube Count Analysis



Appendix A TUBE COUNT ANALYSIS



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Appendix A Tube Count Analysis
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ATC1: Ingham Avenue between Connecticut Avenue and Henley Marine Drive

Hourly graphs of the daily traffic volume profiles for Ingham Avenue between Connecticut Avenue and Henley Marine Drive were produced. These are illustrated in **Figure 39** and **Figure 40** below.

Figure 39 ATC1 Average Weekday

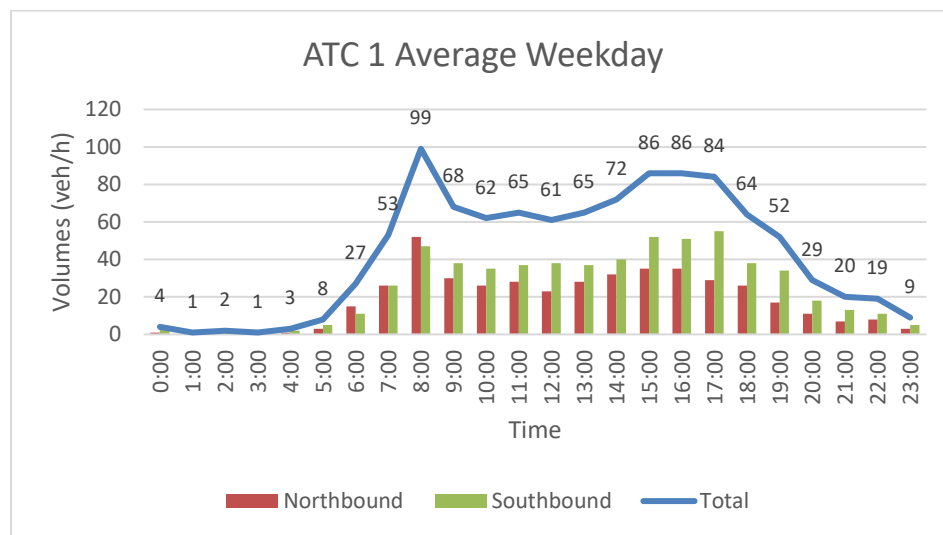


Figure 39 shows that the typical traffic peaks for the weekday occur at 8am in the morning and 3pm in the afternoon. The peak hour traffic volume is 99 veh/h in the AM peak and 86 veh/h in the PM peak.

Figure 40 ATC1 Average Weekend

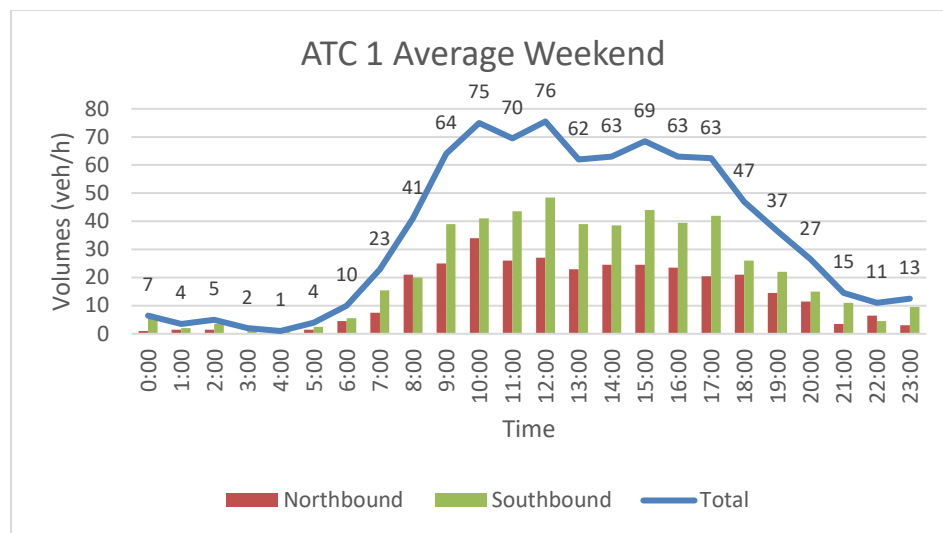


Figure 40 shows that the weekend traffic peak occurs slightly later than the typical weekday AM peak with 75 veh/h at 10am.



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ATC2: Henley Marine Drive between Ingham Avenue and Connecticut Avenue

Hourly graphs of the daily traffic volume profiles for Henley Marine Drive between Ingham Avenue and Connecticut Avenue were produced. These are illustrated in **Figure 41** and **Figure 42** below.

Figure 41 ATC 2 Average Weekday

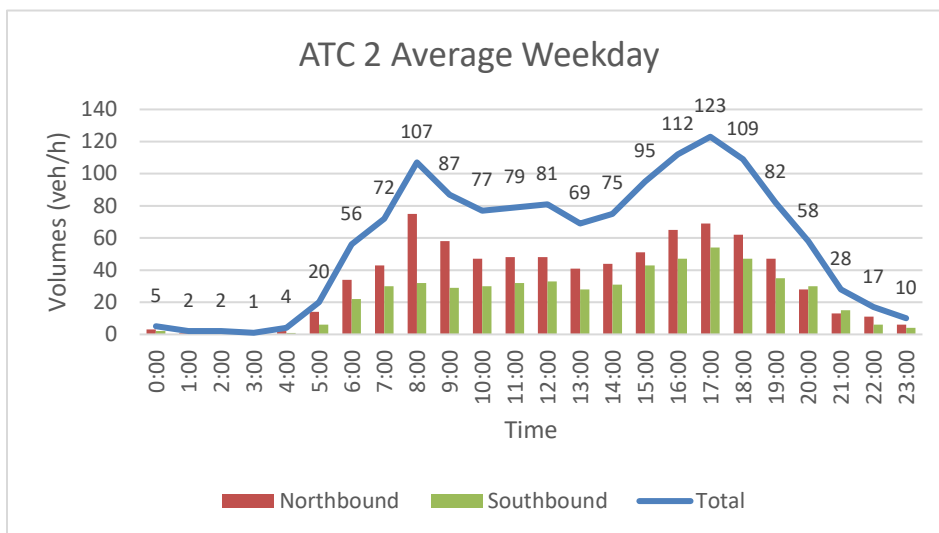


Figure 41 shows that the typical traffic peaks for the weekday occur at 8am in the morning and 5pm in the afternoon. The peak hour traffic volume is 107 veh/h in the AM peak and 123 veh/h in the PM peak.

Figure 42 ATC 2 Average Weekend

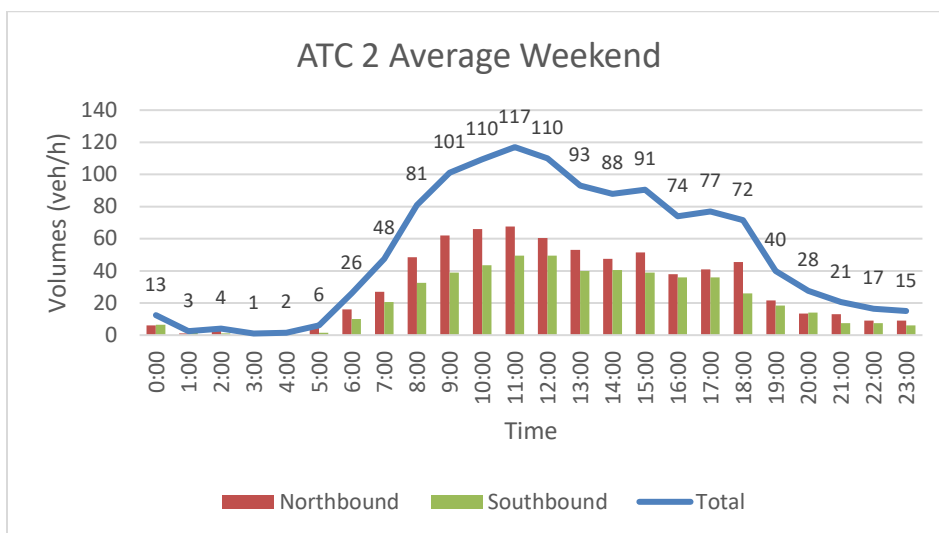


Figure 42 shows that the weekend traffic peak occurs later than the typical weekday AM peak with 117 veh/h at 11am.



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ATC3: Connecticut Avenue between Ingham Avenue and Henley Marine Drive

Hourly graphs of the daily traffic volume profiles for Connecticut Avenue between Ingham Avenue and Henley Marine Drive were produced. These are illustrated in **Figure 43** and **Figure 44** below.

Figure 43 ATC 3 Average Weekday

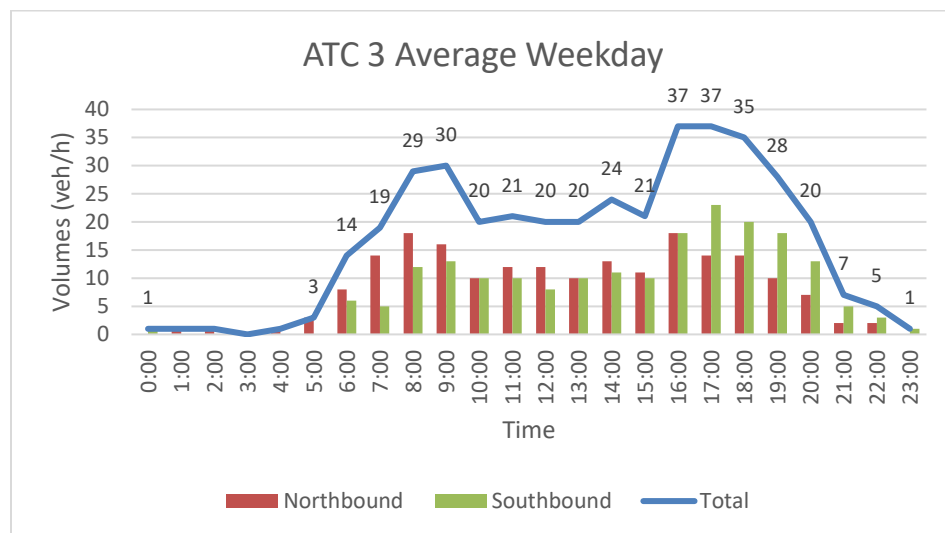


Figure 43 shows that the typical traffic peaks for the weekday occur at 9am in the morning and 4pm in the afternoon. The peak hour traffic volume is 30 veh/h in the AM peak and 37 veh/h in the PM peak.

Figure 44 ATC 3 Average Weekend

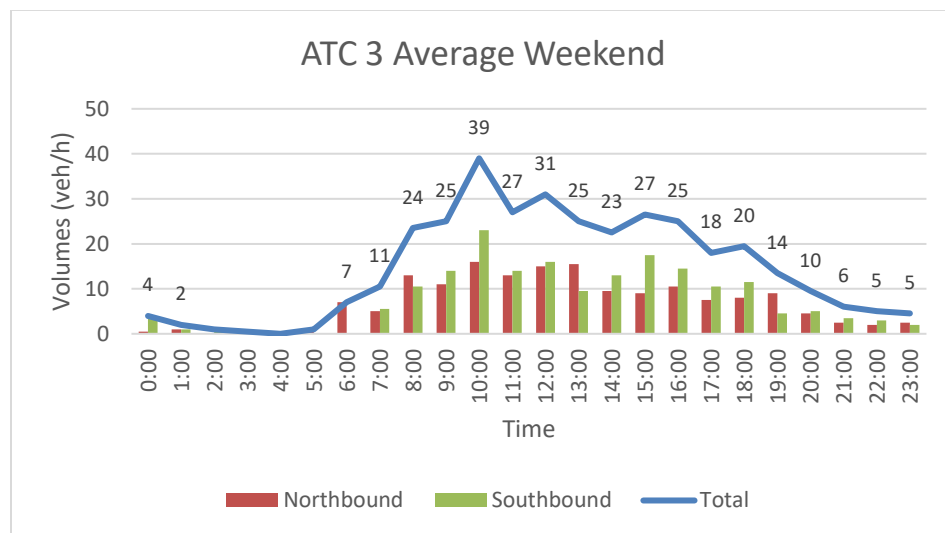


Figure 44 shows that the weekend traffic peak occurs slightly later than the typical weekday AM peak with 39 veh/h at 10am.



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ATC4: Norman Street between Minnesota Avenue and Henley Marine Drive

Hourly graphs of the daily traffic volume profiles for Norman Street between Minnesota Avenue and Henley Marine Drive were produced. These are illustrated in **Figure 45** and **Figure 46** below.

Figure 45 ATC 4 Average Weekday

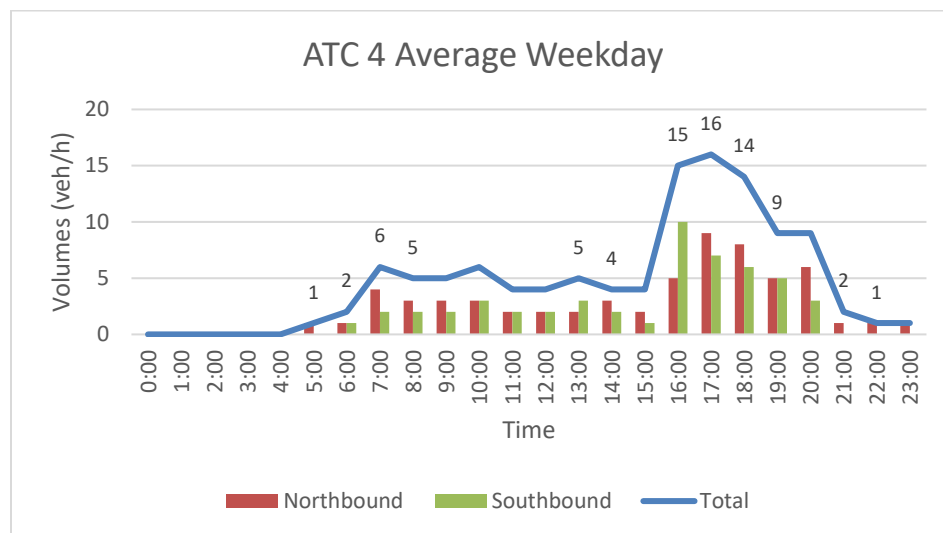


Figure 45 shows that the typical traffic peaks for the weekday occur at 7am in the morning and 5pm in the afternoon. The peak hour traffic volume is 6 veh/h in the AM peak and 16 veh/h in the PM peak.

Figure 46 ATC 4 Average Weekend

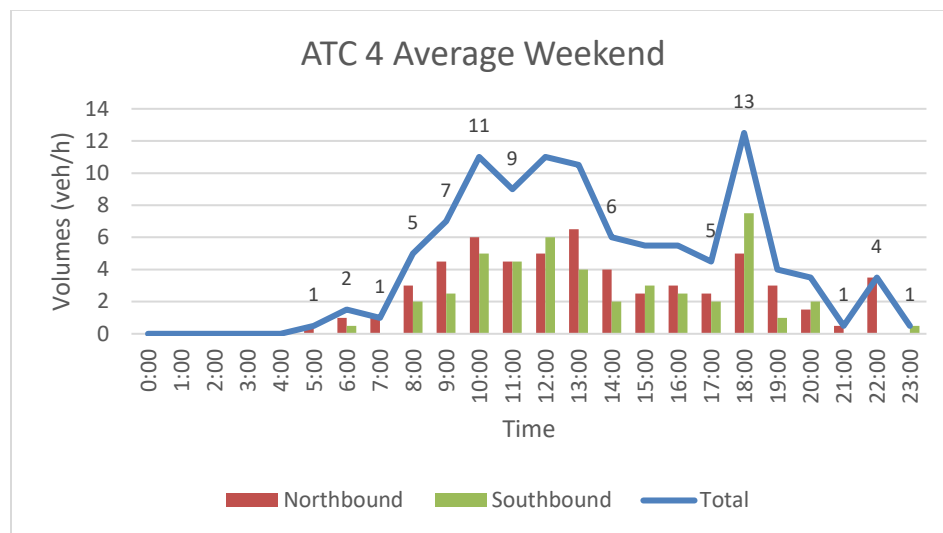


Figure 46 shows that the weekend traffic peak occurs slightly later than the typical weekday AM peak with 11 veh/h at 10am. A further peak of 13 veh/h occurs at 6pm.



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ATC5: Henley Marine Drive between Norman Street and Minnesota Avenue

Hourly graphs of the daily traffic volume profiles for Henley Marine Drive between Norman Street and Minnesota Avenue were produced. These are illustrated in **Figure 47** and **Figure 48** below.

Figure 47 ATC 5 Average Weekday

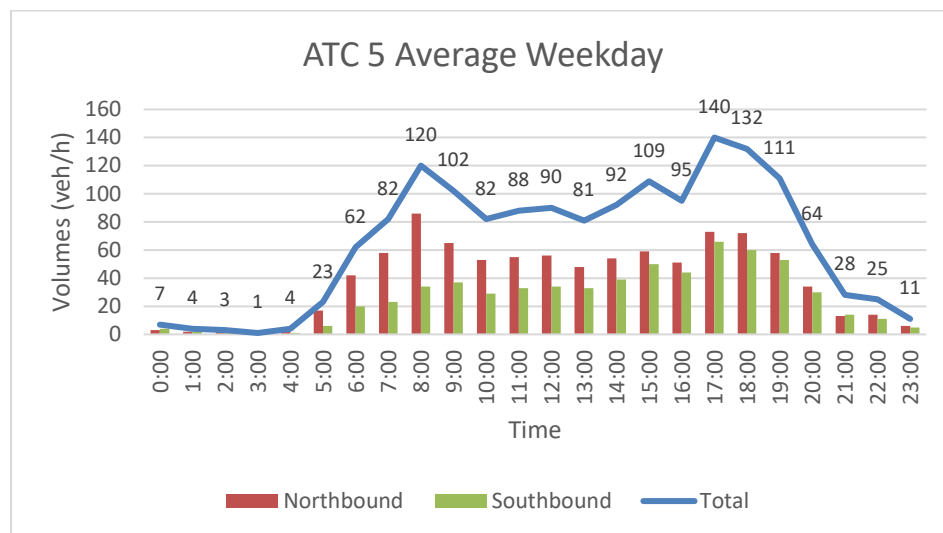


Figure 47 shows that the typical traffic peaks for the weekday occur at 8am in the morning and 5pm in the afternoon. The peak hour traffic volume is 120 veh/h in the AM peak and 140 veh/h in the PM peak.

Figure 48 ATC 5 Average Weekend

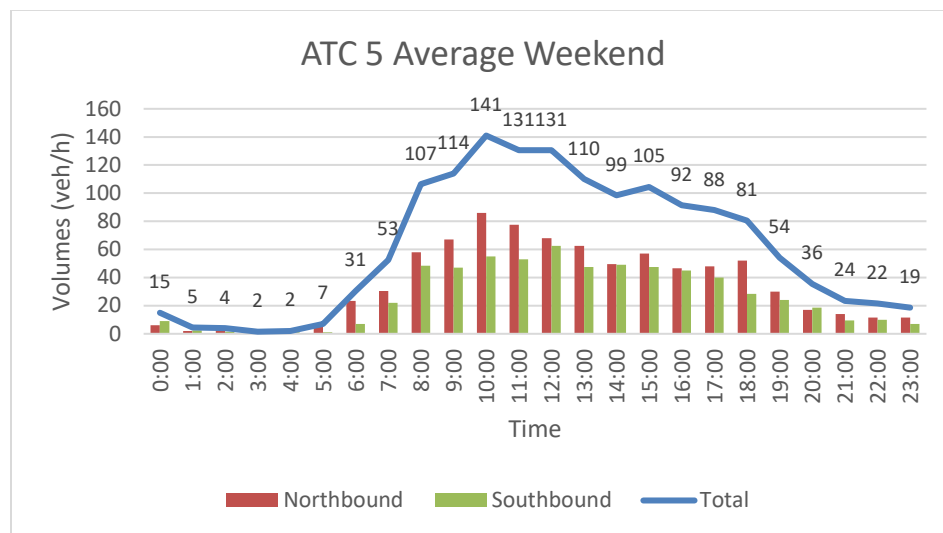


Figure 48 shows that the weekend traffic peak occurs slightly later than the typical weekday AM peak with 141 veh/h at 10am.



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Appendix A Tube Count Analysis
September 7, 2023

ATC 6 Minnesota Ave between Norman Street and Henley Marine Drive

Hourly graphs of the daily traffic volume profiles for Minnesota Avenue between Norman Street and Henley Marine Drive were produced. These are illustrated in **Figure 49** and **Figure 50** below.

Figure 49 ATC 6 Average Weekday

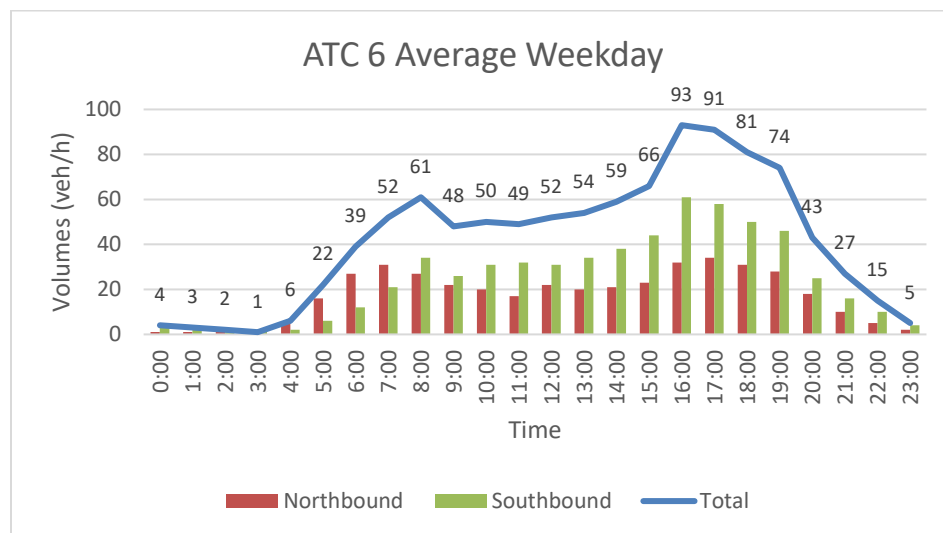


Figure 49 shows that the typical traffic peaks for the weekday occur at 8am in the morning and 4pm in the afternoon. The peak hour traffic volume is 61 veh/h in the AM peak and 93 veh/h in the PM peak.

Figure 50 ATC 6 Average Weekend

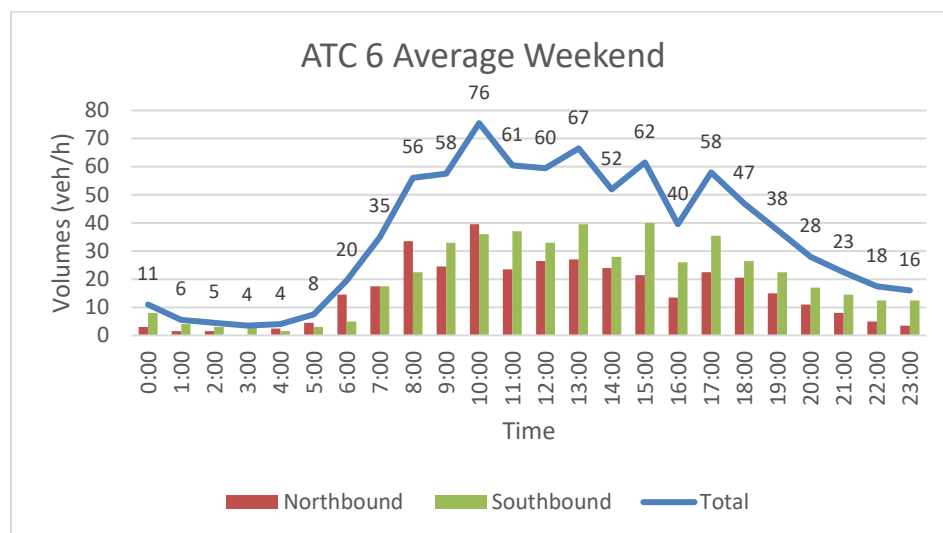


Figure 50 shows that the weekend traffic peak occurs slightly later than the typical weekday AM peak with 76 veh/h at 10am.



TIMBRELL PARK - TRAFFIC, PARKING AND PEDESTRIAN STUDY

Appendix A Tube Count Analysis
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ATC 7 Augusta Street between Rickard Street and Henley Marine Drive

Hourly graphs of the daily traffic volume profiles for Augusta Street between Rickard Street and Henley Marine Drive were produced. These are illustrated in **Figure 51** and **Figure 52** below.

Figure 51 ATC 7 Average Weekday

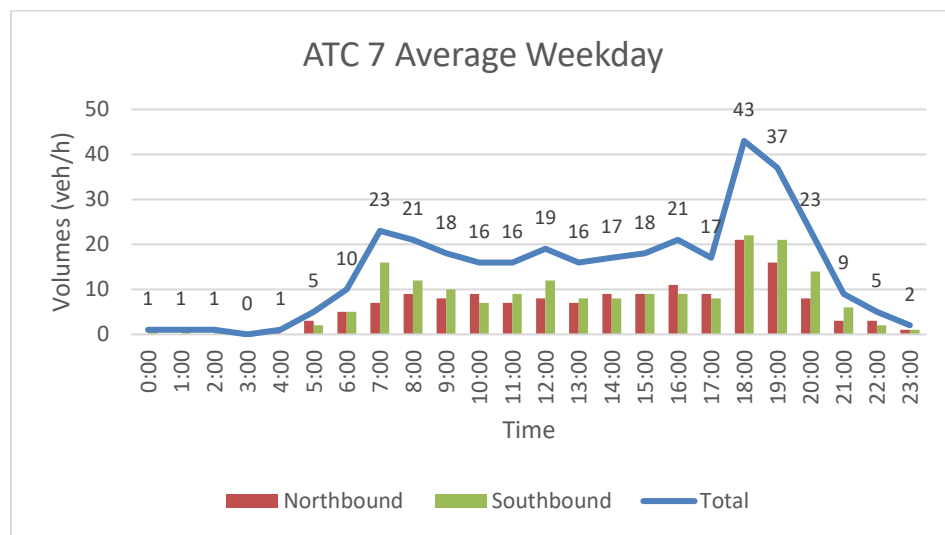


Figure 51 shows that the typical traffic peaks for the weekday occur at 7am in the morning and 6pm in the afternoon. The peak hour traffic volume is 23 veh/h in the AM peak and 43 veh/h in the PM peak.

Figure 52 ATC 7 Average Weekend

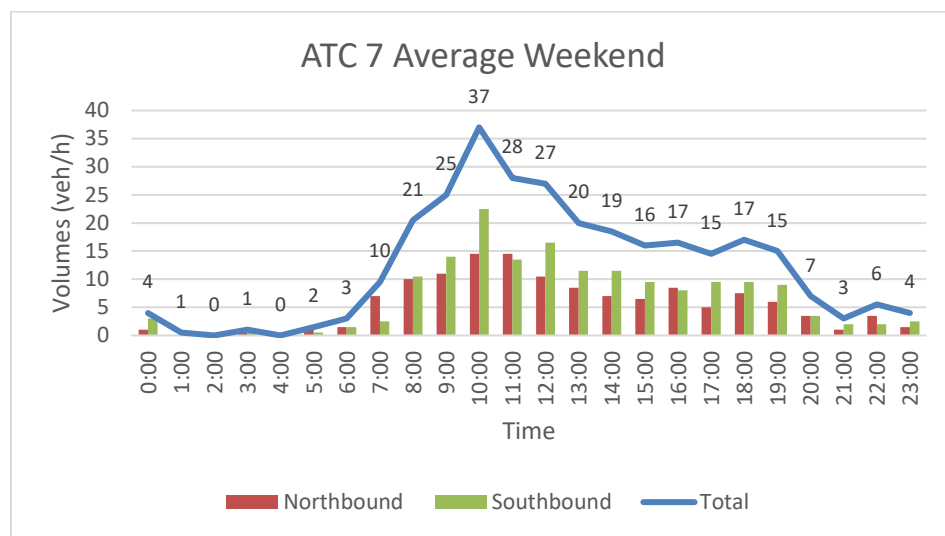


Figure 52 shows that the weekend traffic peak occurs slightly later than the typical weekday AM peak with 37 veh/h at 10am.



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Appendix A Tube Count Analysis
September 7, 2023

ATC 8 Henley Marine Drive between Augusta Street and Heath Street

Hourly graphs of the daily traffic volume profiles for Henley Marine Drive between Augusta Street and Heath Street were produced. These are illustrated in **Figure 53** and **Figure 54** below.

Figure 53 ATC 8 Average Weekday

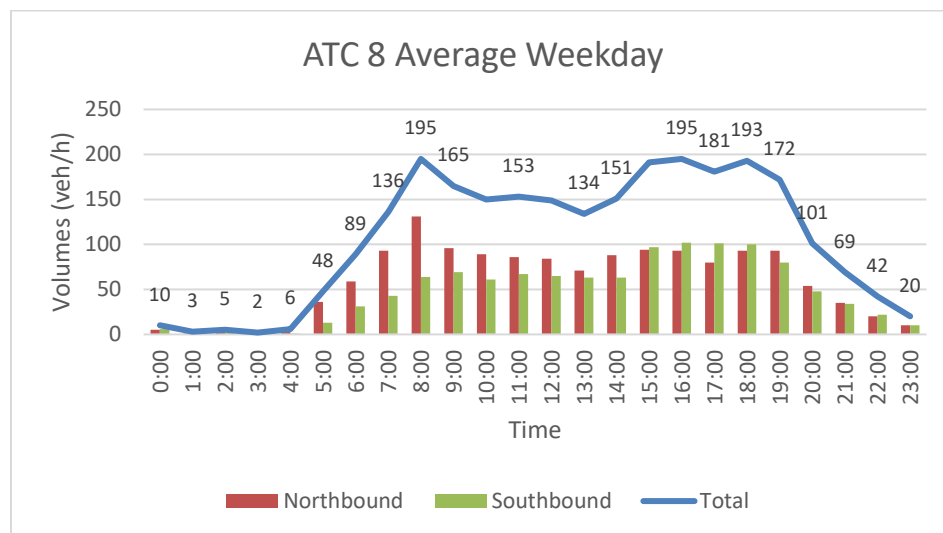


Figure 53 shows that the typical traffic peaks for the weekday occur at 8am in the morning and 4pm in the afternoon. The peak hour traffic volume is 195 veh/h in the AM peak and 195 veh/h in the PM peak.

Figure 54 ATC 8 Average Weekend

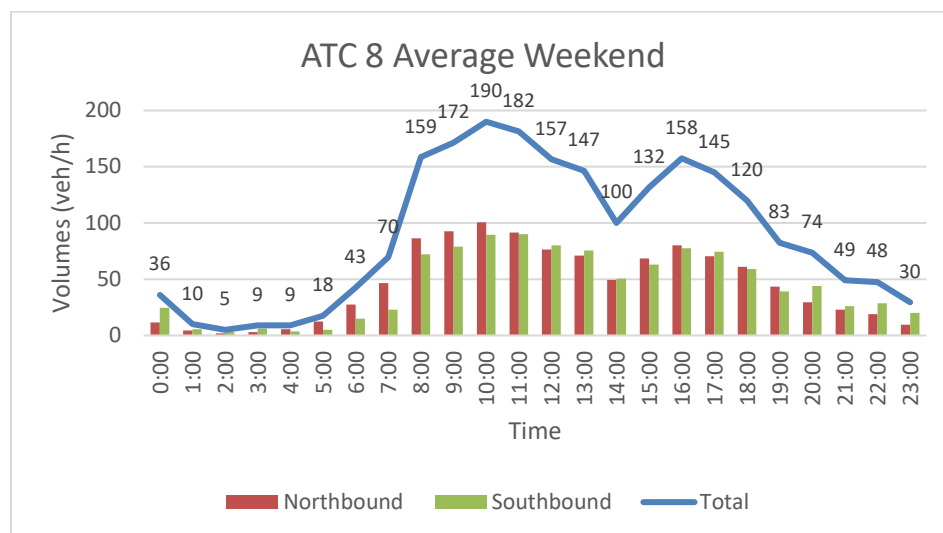


Figure 54 shows that the weekend traffic peak occurs slightly later than the typical weekday AM peak with 190 veh/h at 10am.



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Appendix A Tube Count Analysis
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ATC 9 Heath Street between Rickard Street and Henley Marine Drive

Hourly graphs of the daily traffic volume profiles for Heath Street between Rickard Street and Henley Marine Drive were produced. These are illustrated in **Figure 55** and **Figure 56** below.

Figure 55 ATC 9 Average Weekday

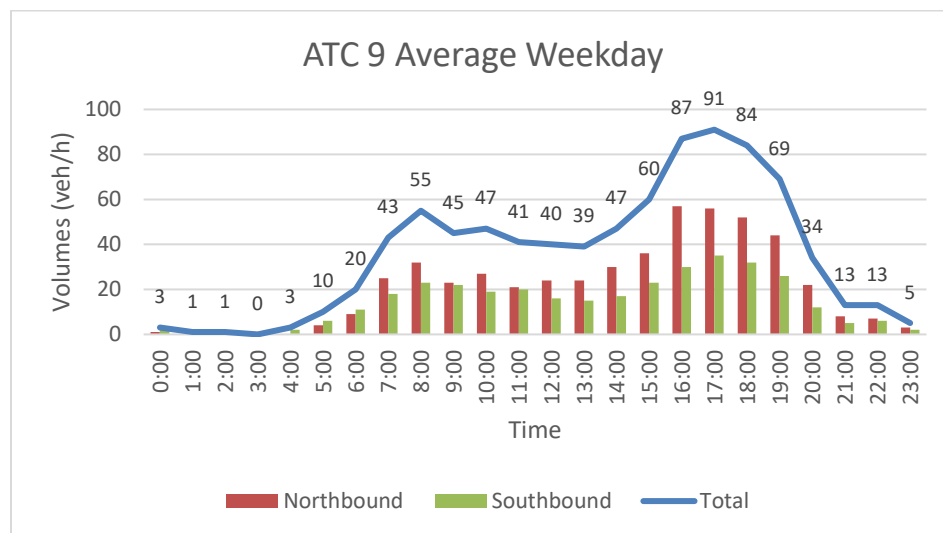


Figure 55 shows that the typical traffic peaks for the weekday occur at 8am in the morning and 5pm in the afternoon. The peak hour traffic volume is 55 veh/h in the AM peak and 91 veh/h in the PM peak.

Figure 56 ATC 9 Average Weekend

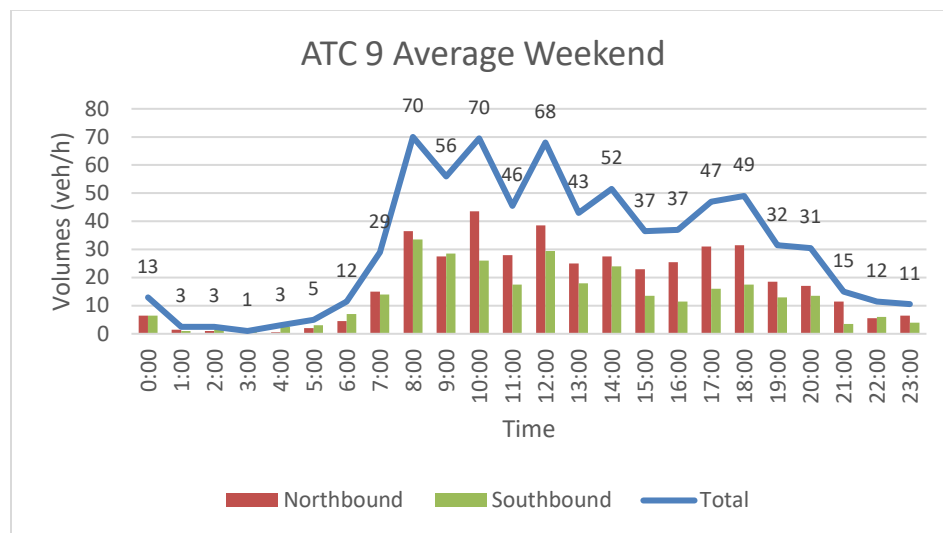


Figure 56 shows that the weekend traffic peak occurs at the same time as the weekday AM peak with 70 veh/h at 8am.



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Appendix A Tube Count Analysis
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ATC 10 First Avenue between Arthur Street and Heath Street

Hourly graphs of the daily traffic volume profiles for First Avenue between Arthur Street and Heath Street were produced. These are illustrated in **Figure 57** and **Figure 58** below.

Figure 57 ATC 10 Average Weekday

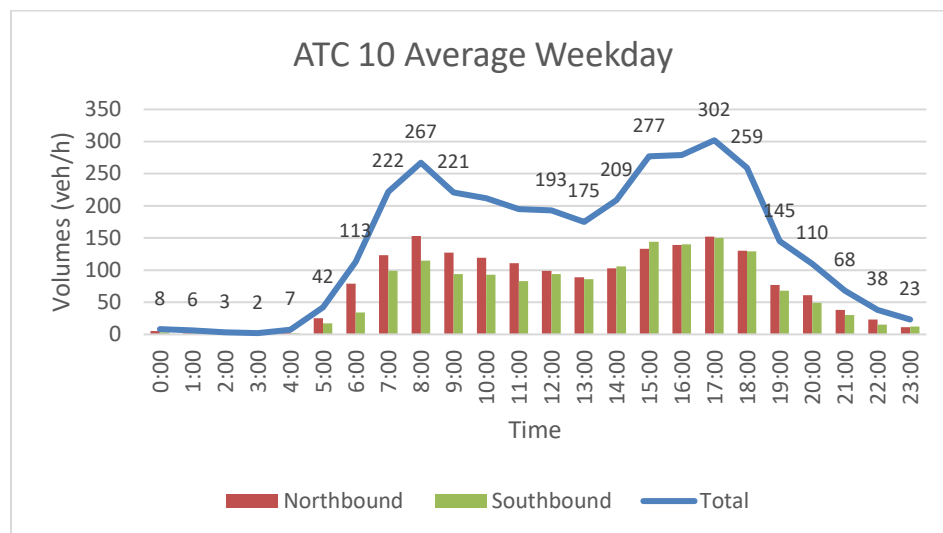


Figure 57 shows that the typical traffic peaks for the weekday occur at 8am in the morning and 5pm in the afternoon. The peak hour traffic volume is 267 veh/h in the AM peak and 302 veh/h in the PM peak.

Figure 58 ATC 10 Average Weekend

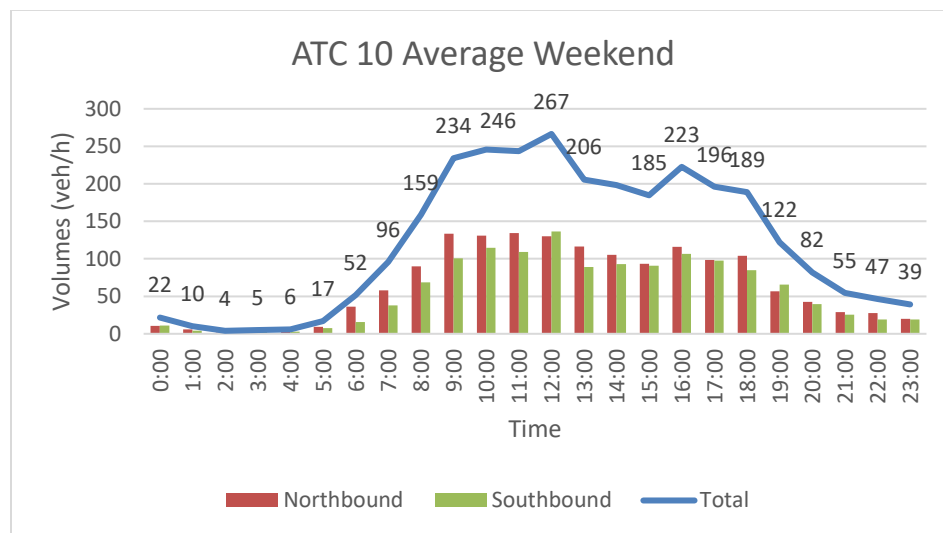


Figure 58 shows that the weekend traffic peak occurs later than the typical weekday AM peak with 267 veh/h at 12pm.



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Appendix A Tube Count Analysis
September 7, 2023

ATC 11 Arthur Street between Rickard Street and First Avenue

Hourly graphs of the daily traffic volume profiles for Arthur Street between Rickard Street and First Avenue were produced. These are illustrated in **Figure 59** and **Figure 60** below.

Figure 59 ATC 11 Average Weekday

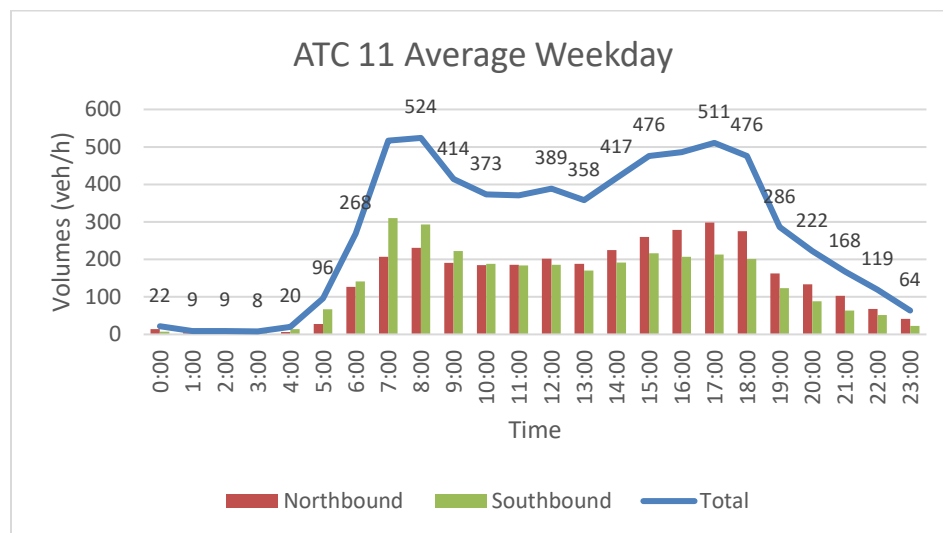


Figure 59 shows that the typical traffic peaks for the weekday occur at 8am in the morning and 5pm in the afternoon. The peak hour traffic volume is 524 veh/h in the AM peak and 511 veh/h in the PM peak.

Figure 60 ATC 11 Average Weekend

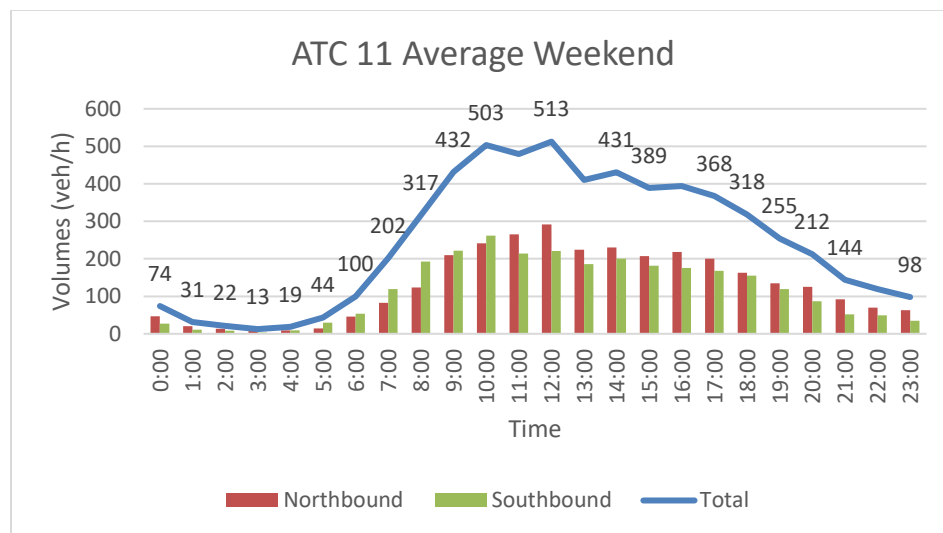


Figure 60 shows that the weekend traffic peak occurs later than the typical weekday AM peak with 513 veh/h at 12pm.



APPENDIX B

Concept Plans



Appendix B CONCEPT PLANS



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AERIAL IMAGERY FROM NEARMAP
DATED 10.04.2021



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE
APPROXIMATE ONLY AND THEIR EXACT POSITION
SHOULD BE PROVEN ON SITE. NO GUARANTEE IS
GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED
W.XIE

APPROVED BY
S.MANTON

DESIGN CHECK
S.SHARMA

DATE ISSUED
18 AUGUST 2023

SCALE
A3 0 10 20 40 1:2000

CAD FILE NO.
304100260-01-P3.DWG

TIMBRELL PARK, FIVE DOCK

OVERVIEW PLAN

DRAWING NO. 304100260-01-01

SHEET 01 OF 06

ISSUE P3



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DESIGNED
W.XIE

APPROVED BY
S.MANTON

DESIGN CHECK
S.SHARMA

DATE ISSUED
18 AUGUST 2023

SCALE
A3 0 2 4 6 8 1:400

CAD FILE NO.
304100260-01-P3.DWG

**TIMBRELL PARK, FIVE DOCK
HENLEY MARINE DRIVE
ON-STREET PARKING
CONCEPT LAYOUT**

DRAWING NO. 304100260-01-02

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ISSUE P3



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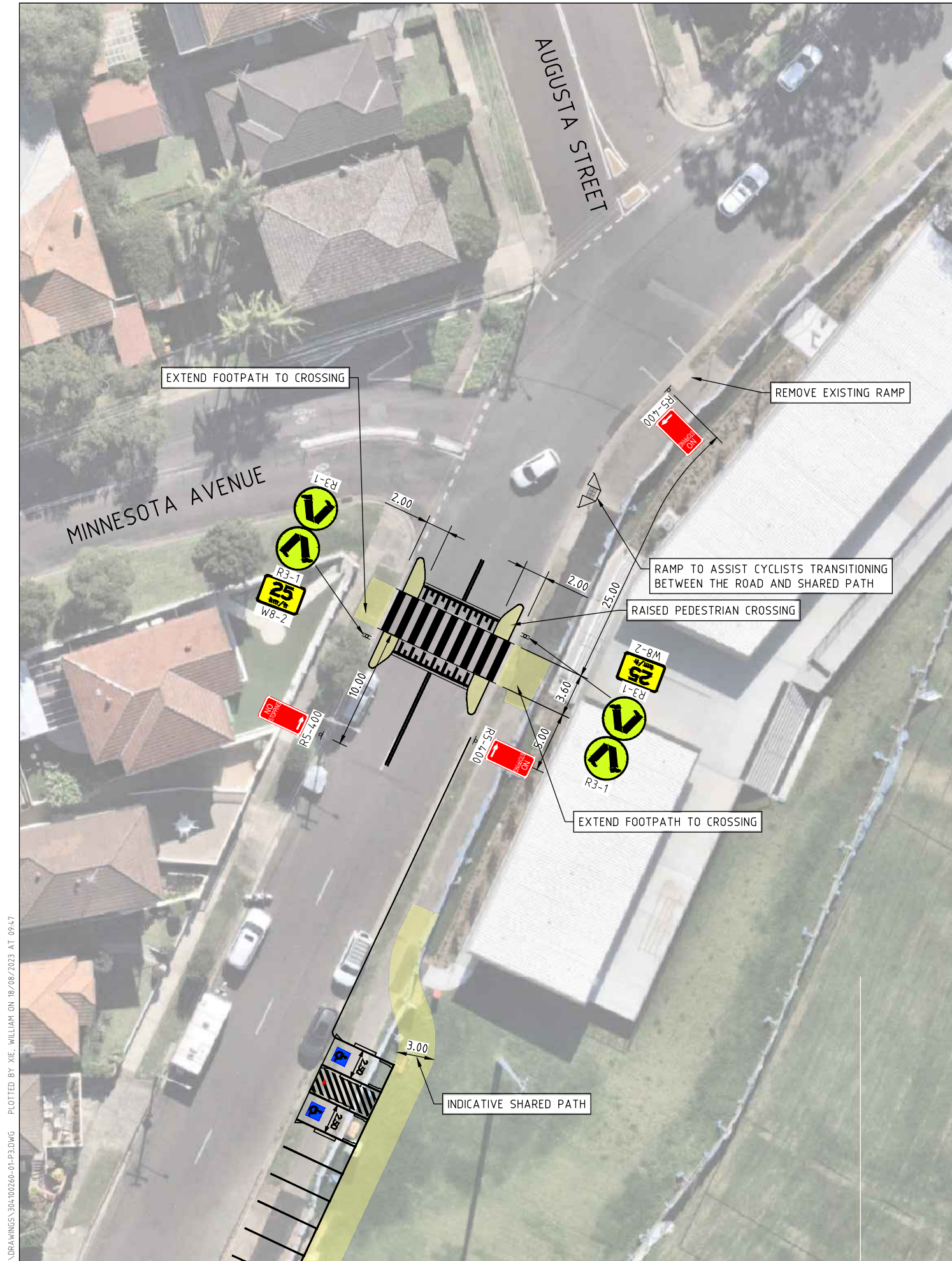
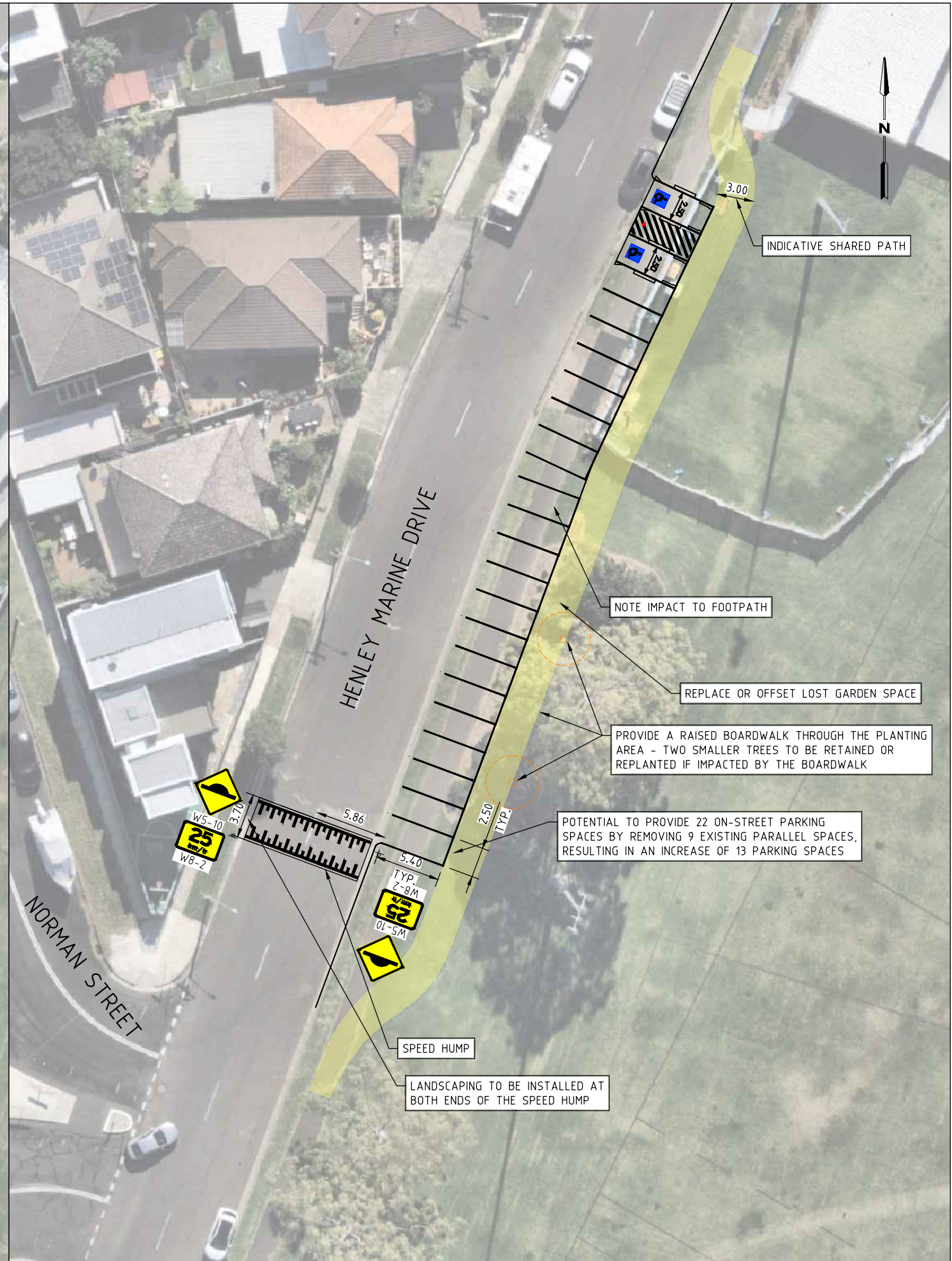
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**TIMBRELL PARK, FIVE DOCK
HENLEY MARINE DRIVE
ON-STREET PARKING
CONCEPT LAYOUT**

DRAWING NO. 304100260-01-03 SHEET 03 OF 06 ISSUE P3



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DESIGNED
W.XIE

APPROVED BY
S.MANTON

DESIGN CHECK
S.SHARMA

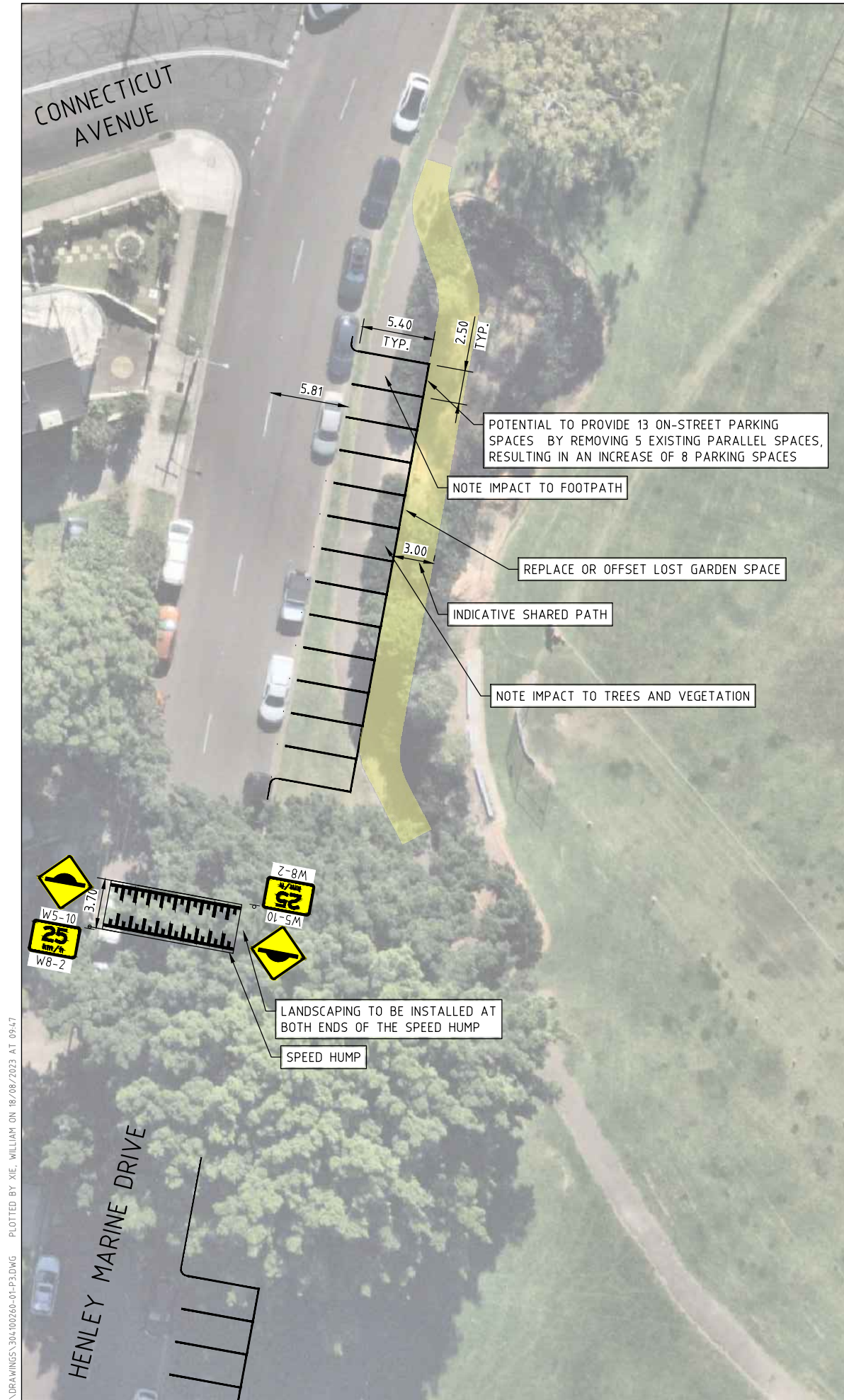
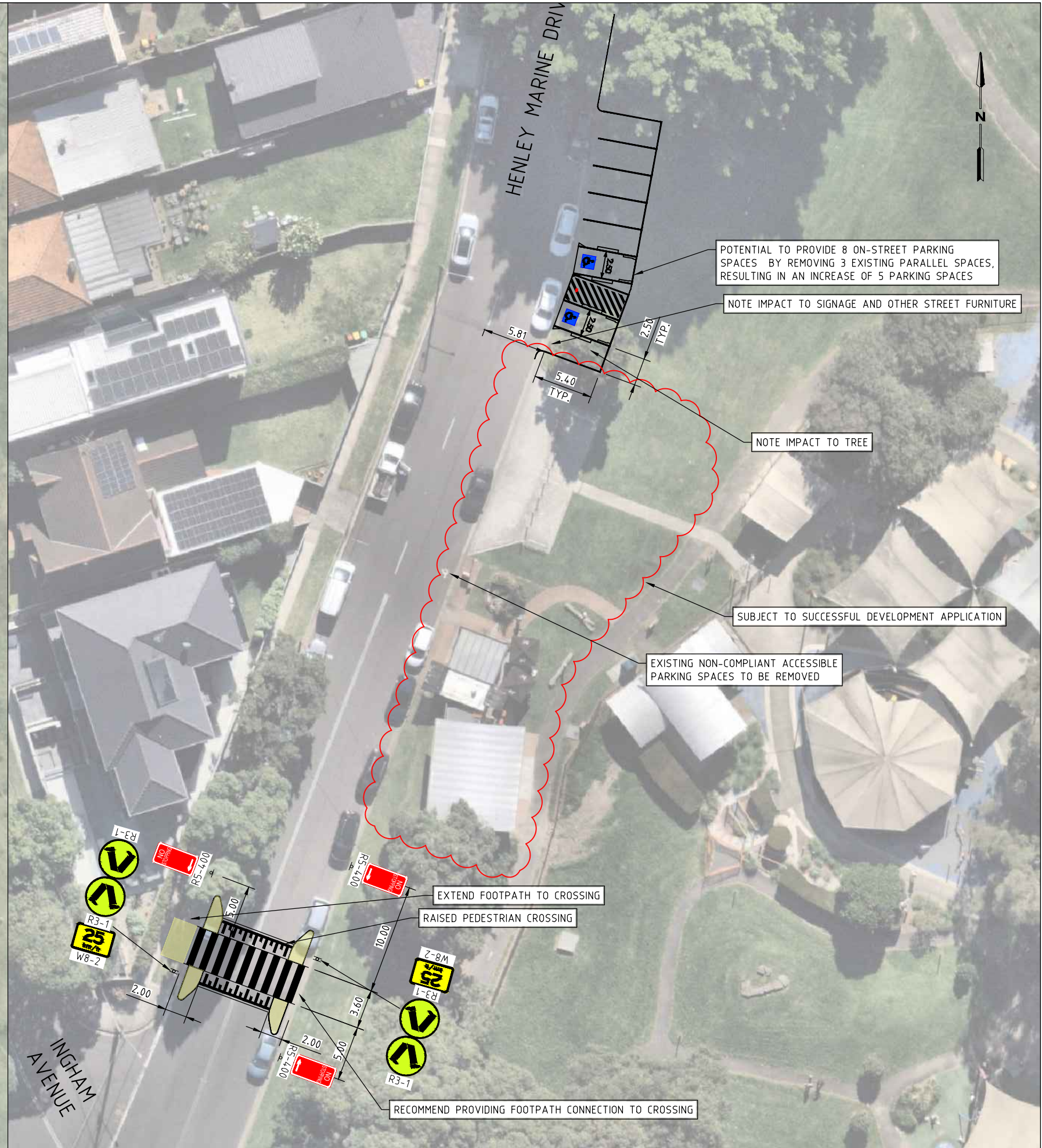
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TIMBRELL PARK, FIVE DOCK
HENLEY MARINE DRIVE
ON-STREET PARKING
CONCEPT LAYOUT

DRAWING NO. 304100260-01-04 SHEET 04 OF 06 ISSUE P3



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W.XIE

APPROVED BY
S.MANTON

DESIGN CHECK
S.SHARMA

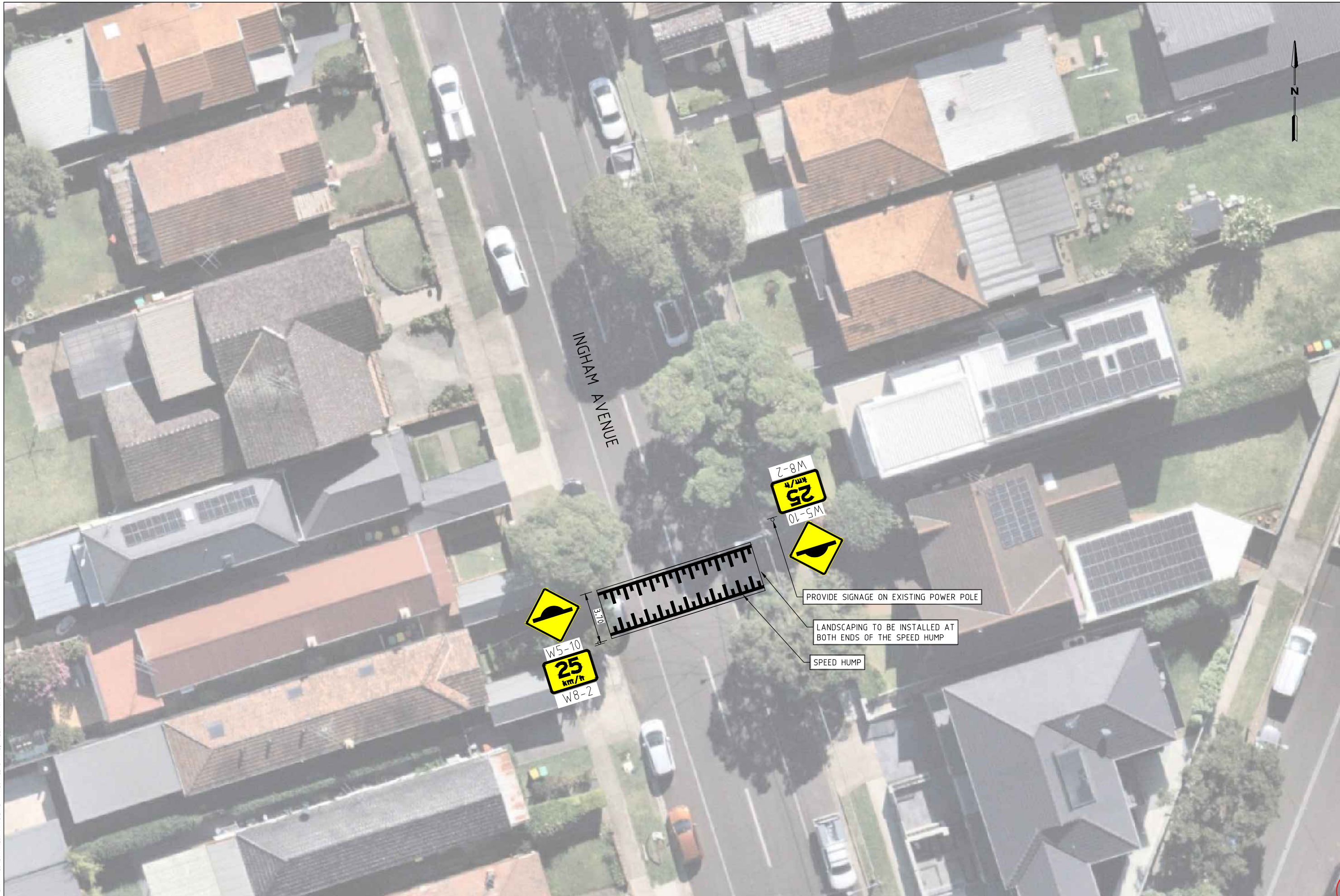
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TIMBRELL PARK, FIVE DOCK
HENLEY MARINE DRIVE
ON-STREET PARKING
CONCEPT LAYOUT

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DESIGNED
W.XIE

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S.MANTON

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DATE ISSUED
18 AUGUST 2023

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A3 0 1.25 2.5 5 1:250

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TIMBRELL PARK, FIVE DOCK
INGHAM AVENUE
SPEED HUMP
CONCEPT LAYOUT

DRAWING NO. 304100260-01-06

SHEET 06 OF 06

ISSUE P3