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TRAFFIC ENGINEERING

340 - 680 The Boulevard, Ivanhoe
Banyule Planning Scheme Amendment C107

Transport Impact Assessment to Planning Panels Victoria

210317PAN001C-F.docx

24 June 2021

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DOCUMENT INFORMATION

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Prepared by	Madeleine Fletcher-Kennedy	**Reviewed by**	Ross Hill
Signature		**Signature**	

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1 PLANNING PANELS VICTORIA GUIDE TO EXPERT EVIDENCE

In accordance with the Planning Panels Victoria, Guide to Expert Evidence, my qualifications, experience and expertise to provide my opinions on this matter are summarised below:

Name:	Ross Brendan Hill
Address:	56 Down Street Collingwood Victoria 3066
Professional Qualifications:	Bachelor of Engineering (Civil), RMIT University 1996
Professional Registration:	VicRoads Accredited Senior Road Safety Auditor
Professional Experience:	Director, **one**mile**grid**, 2014 – present Associate, Cardno, 2007 – 2014 Associate, Grogan Richards, 2005 – 2007 Senior Traffic Engineer, Grogan Richards, 1997 – 2005 Traffic Engineer, City of Monash, 1996 - 1997
Areas of Expertise:	Car parking and traffic engineering design and compliance. Traffic advice and assessment of land use and development proposals to local and state planning authorities, government agencies, corporations and developers for a variety of projects including low, medium & high density residential, commercial, retail, industrial, institutional, service orientated and mixed-use projects. Preparation and presentation of expert evidence before VCAT and Planning Panels.
Expertise to Prepare this Report:	My professional qualifications, training and experience over a number of years on all forms of development qualifies me to comment on the car parking and traffic implications of the proposal.
Relationship to the Applicant:	I do not have any private or business relationship with the applicant.
Instructions:	I have been requested by PE Law to provide my expert opinions in relation to the car parking and traffic implications of the proposal.

Facts, Matters, and Assumptions Relied Upon:	Banyule Planning Scheme Transport Impact Assessment prepared by **one**mile**grid** (31 May 2016) Agenda of Ordinary Meeting of Council – 1 March 2021 Banyule Planning Scheme Incorporated Document – Treetop Adventure Park Yarra Flats Park Revised Concept Plan 2013 Revised plans for the administration buildings, ropes and wire course (15 June 2021) TreeTops Operation Management Statement June 2021
Identity of Persons Undertaking the Work:	Ross Hill, Director **one**mile**grid** (BE Civil) Assisted by: Madeleine Fletcher-Kennedy, Project Engineer **one**mile**grid** (BE Civil)

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Tribunal.

_____

Ross Hill
Director – Senior Traffic Engineer
onemile**grid**

2 INTRODUCTION

My name is Ross Hill, and I am Director at **one**mile**grid** where I practise as a traffic engineer.

I have been requested by the applicant to undertake an assessment of the proposed outdoor recreation facility at 340 - 680 The Boulevard, Ivanhoe and present expert evidence on the traffic and parking implications of the proposed Banyule Planning Scheme Amendment C107 to Planning Panels Victoria.

I have previously prepared a Transport Impact Assessment for the proposed outdoor recreation facility on behalf of my firm, as contained in **one**mile**grid** report dated 31 May 2016.

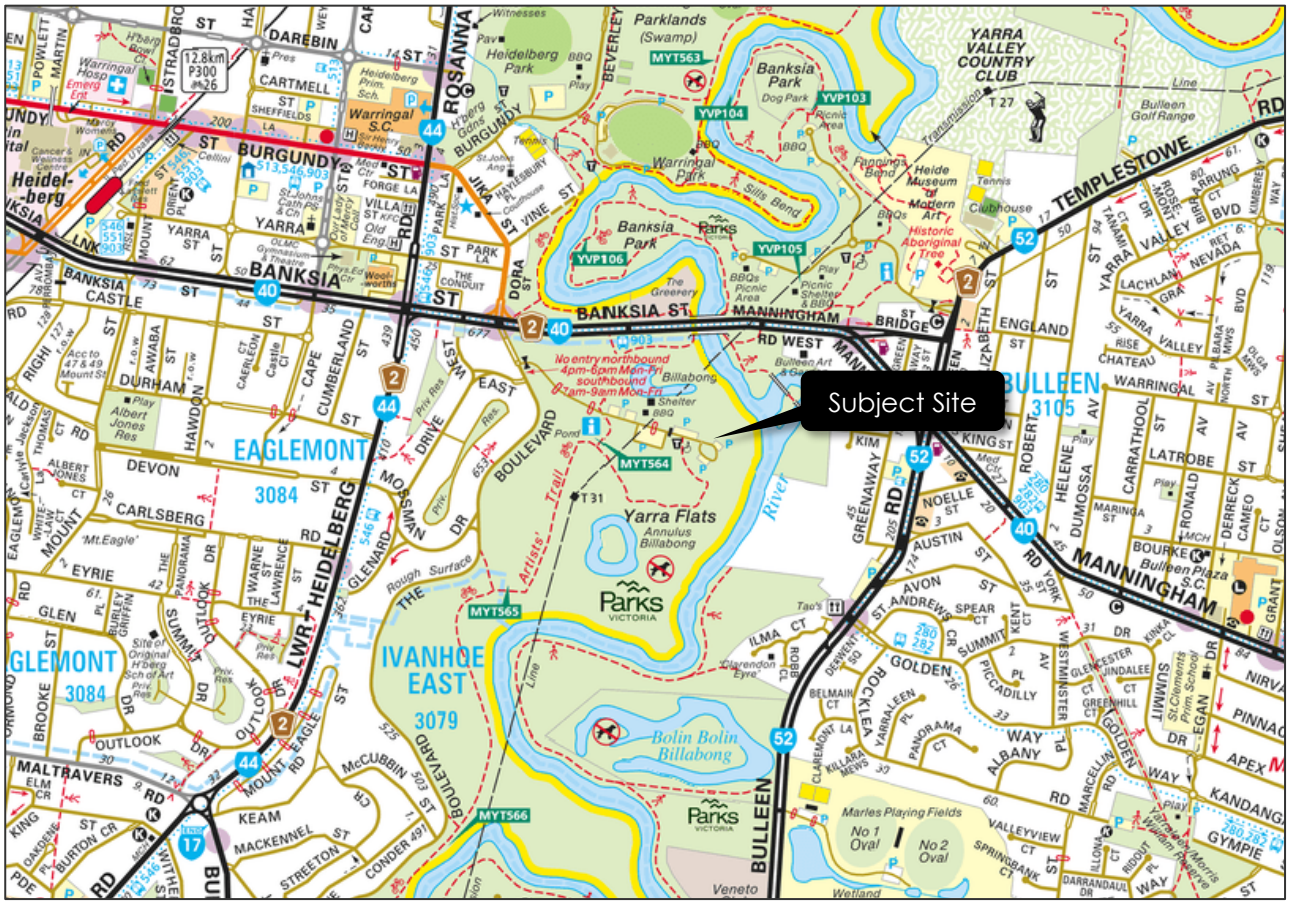
In the course of preparing this report on the proposal, I have inspected the site and its environs, reviewed collected data and assessed the traffic and parking implications of the proposal.

3 EXISTING CONDITIONS

3.1 Site Location

The subject site is located on the western side of the Yarra River, bounded by Banksia Street to the north and The Boulevard to the west as shown in Figure 1. The site is addressed as 340 - 680 The Boulevard, Ivanhoe.

Figure 1 Site Location



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The site is currently occupied by parkland, owned and managed by Parks Victoria. Access to the site is provided from The Boulevard, and its signalised intersection with Banksia Street to the north-west.

Land use in the immediate vicinity of the site is varied in nature, with largely residential uses to the west of The Boulevard, and retail and commercial uses within the Heidelberg Activity Centre to the north-west.

Site access is provided via the Yarra Flats Entry Road, with parking provided along the access road, as well as in a number of at-grade car parks located directly off the access road.

An aerial view of the subject site is provided in Figure 2.

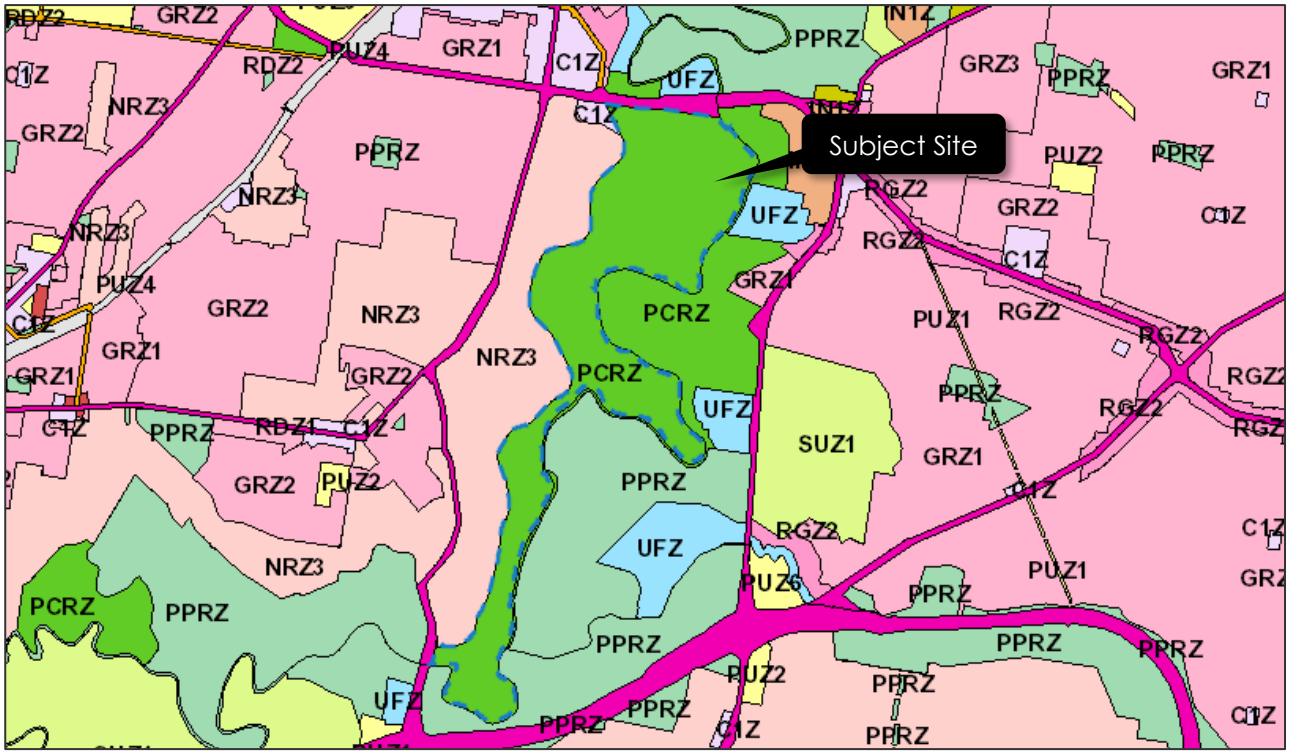
Figure 2 Site Context (2 May 2021)

Copyright Nearmap

3.2 Planning Zones and Overlays

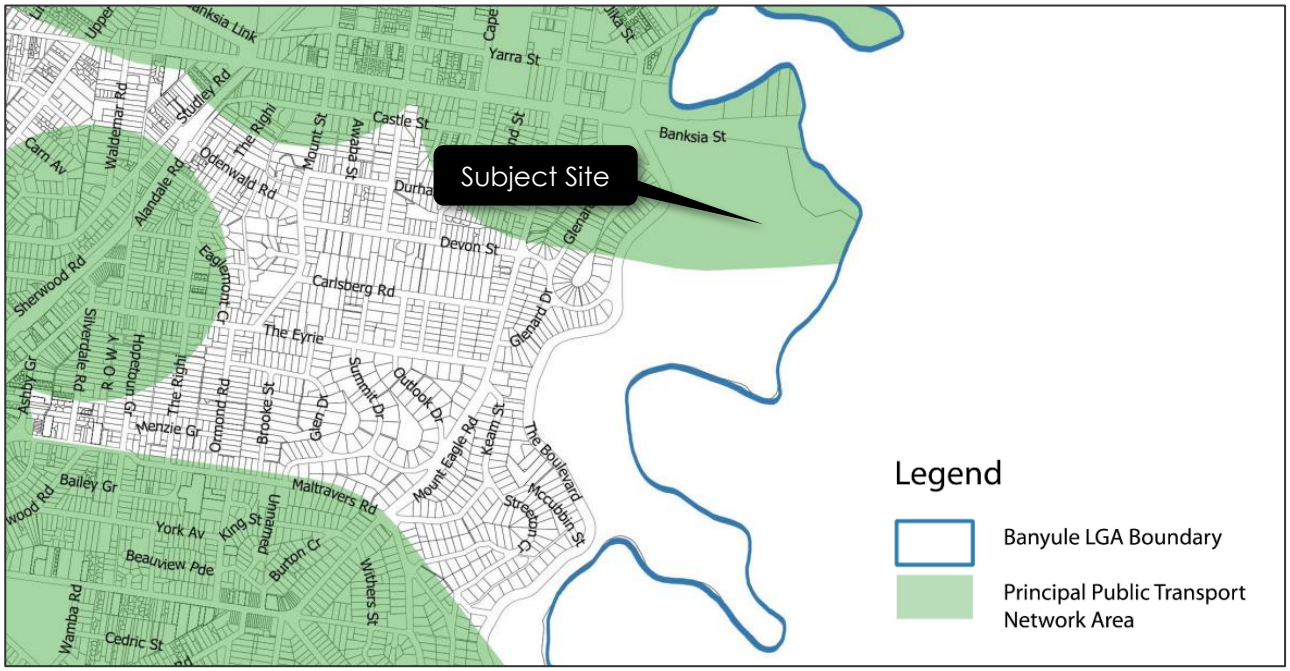
It is shown in Figure 3 that the site is located within a Public Conservation and Resource Zone (PCRZ). Additionally, the site abuts Banksia Street, which is within a Road Zone (RDZ).

Figure 3 Planning Scheme Zones



The site falls within the Principal Public Transport Network Area, as shown in Figure 4.

Figure 4 Principal Public Transport Network Area Map



3.3 Road Network

3.3.1 Banksia Street

Banksia Street is a primary arterial road aligned generally east-west between Heidelberg Road and Bridge Street, continuing to the west and east as Bell Street and Manningham Road respectively.

At the frontage of the site, Banksia Street provides three traffic lanes in each direction, separated by a landscaped central median. No kerbside parking is permitted along Banksia Street in the vicinity of the site.

The intersection of The Boulevard and Banksia Street is controlled by a signalised intersection, with Dora Street forming the northern leg of the four-way intersection.

A 60km/h speed limit applies to Banksia Street in the vicinity of the site.

3.3.2 The Boulevard

The Boulevard is a local road aligned largely north-south between Burke Road North and Banksia Street.

At the site entrance, it provides for two-way traffic, with No Stopping restrictions generally on both sides, though with two 2-hour time restricted parking spaces on the eastern verge. Further south, parking is permitted along the eastern side, with the roadway narrowing further and the surface conditions deteriorating.

Restrictions are imposed on The Boulevard to the south of the site access, with no entry permitted southbound between 7:00AM-9:00AM Monday-Friday.

The cross-section of The Boulevard at the frontage of the site is shown in Figure 5.

Figure 5 The Boulevard, looking south across the site access

3.3.3 Yarra Flats Entry Road

The subject site and surrounding parklands are accessed by a two-way access road extending south-east from The Boulevard.

The access road accommodates two-way travel within a pavement of approximately 7 metres width, with two road humps installed to manage vehicle speeds.

Access to and from the park area is controlled with a gate that closes between 6:00am and 6:00pm.

The cross-section of the Yarra Flats Entry Road at the frontage of the site is shown in Figure 5.

Figure 6 Yarra Flats Entry Road, looking west from the car parking area

3.4 Traffic Volumes

Traffic volume surveys were undertaken by Trans Traffic Survey on behalf of my firm at the intersection of Banksia Street, The Boulevard and Dora Street, on the following periods:

- Friday 7 May 2021, between 7:00am and 9:00am;
- Friday 7 May 2021, between 3:30pm and 6:30pm; and
- Saturday 8 May 2021, between 11:30am and 4:00pm.

The peak hour results of the surveys are shown in Figure 7 and Figure 8.

Figure 7 Existing Traffic Volumes – Friday 7 May 2021

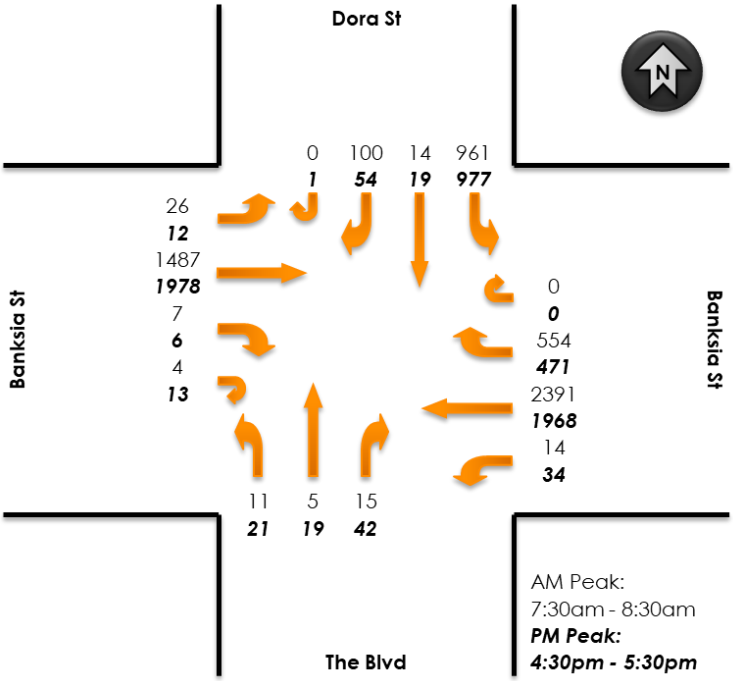
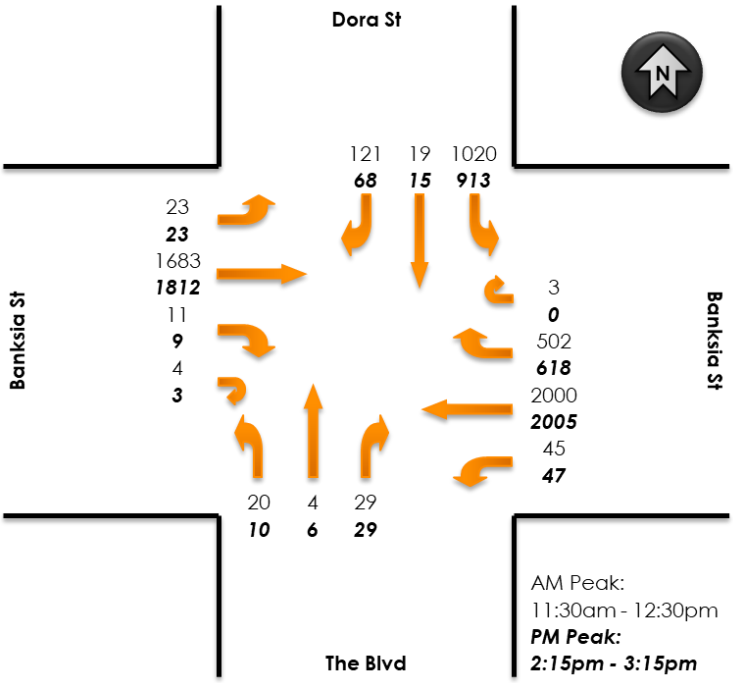


Figure 8 Existing Traffic Volumes – Saturday 8 May 2021

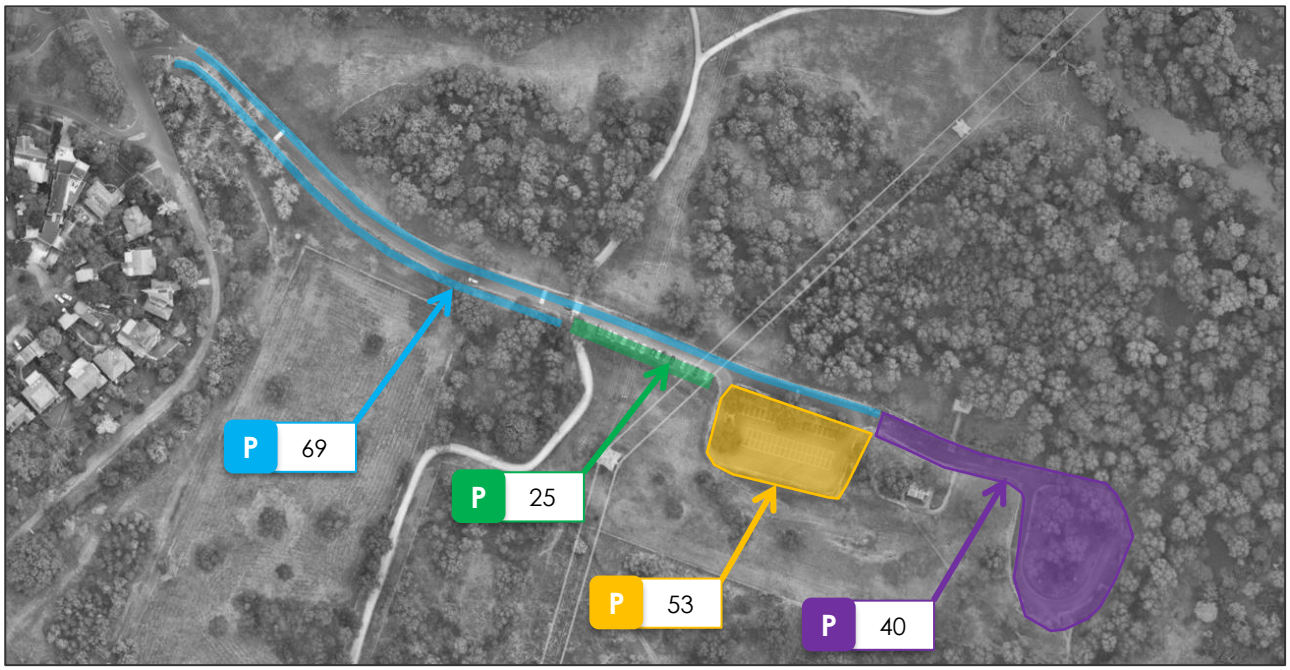


3.5 Car Parking

The subject site is serviced by a number of public car parking areas, located on and accessed from the internal access road. The parking has been split up into four zones, which together contain a total of 187 spaces, as shown in Figure 9. It is noted that the 40 parking spaces shown in the purple area are unable to be accessed, with large rocks placed to prevent vehicle entry, located at the western end.

Additionally, the 69 spaces marked in blue are informal parallel parking spaces which may potentially be utilised, as there are no parking restrictions preventing their use. Regardless, for the following analysis, these parallel parking spaces will be ignored.

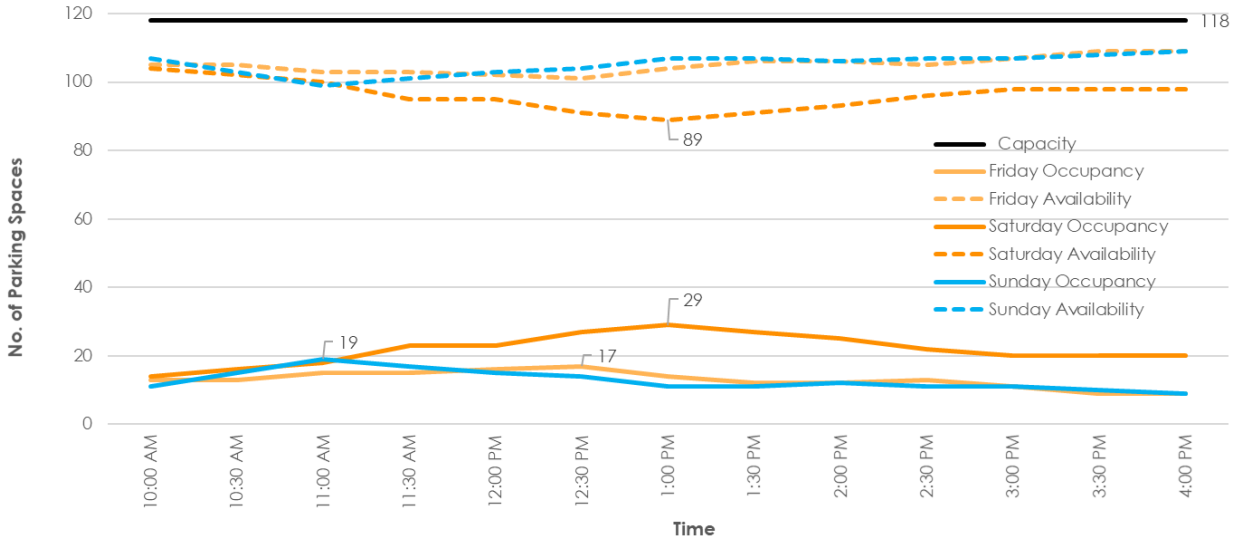
Figure 9 Car Parking Locations



In order to establish the existing parking conditions at the site, I commissioned parking occupancy surveys of the on-site car parks, between 10:00AM and 4:00PM on Friday, Saturday and Sunday the 7th to 9th May 2021. The weather during the surveys was mild and sunny.

On the Friday, peak occupancy occurred at 12:30pm when 17 spaces were occupied. On the Saturday, peak occupancy occurred at 1:00pm when 29 spaces were occupied while on the Sunday, peak occupancy occurred at 11:00am when 19 spaces were occupied. During these respective peak periods, no less than 89 spaces remained vacant.

Figure 10 Parking Occupancy Profile

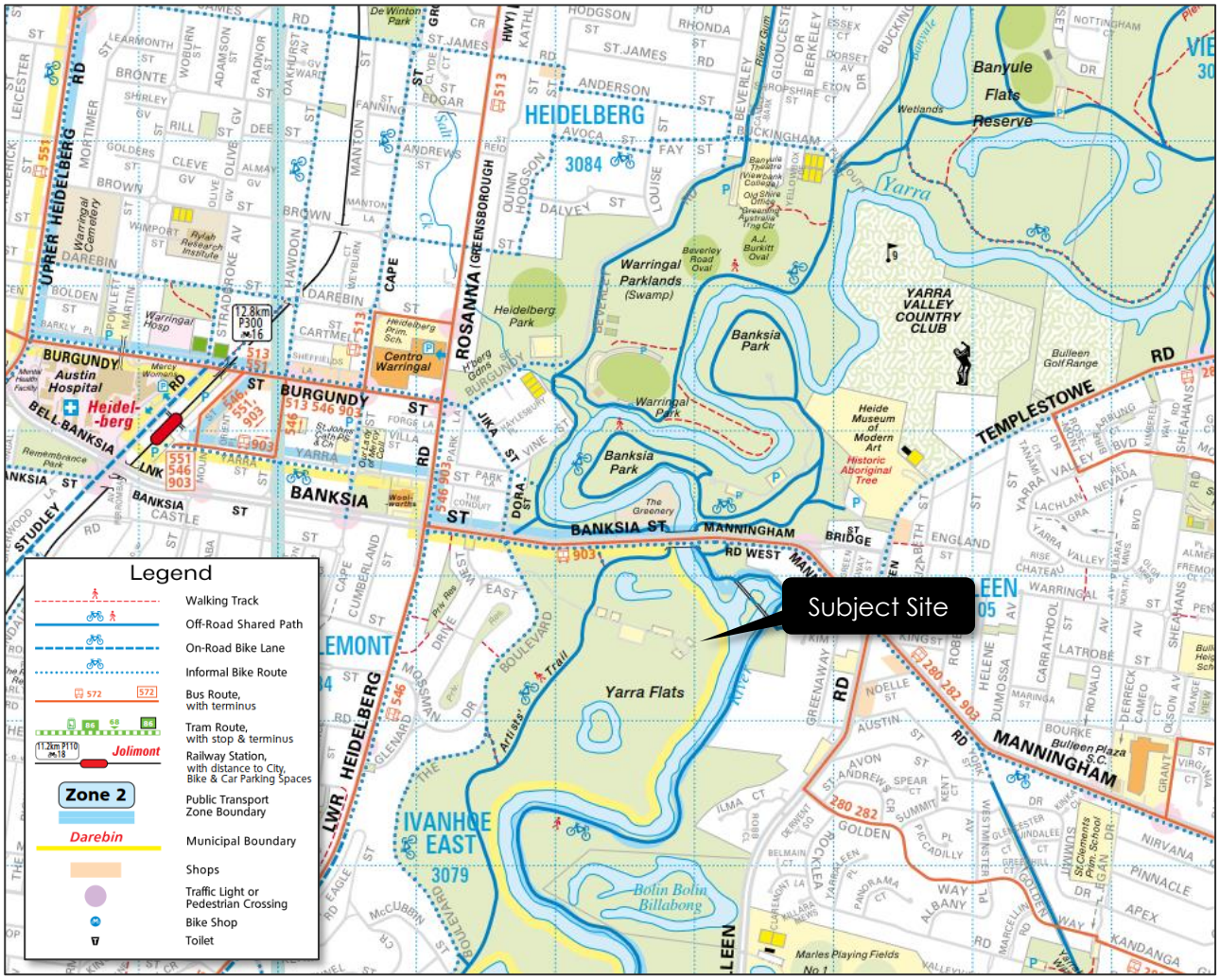


3.6 Sustainable Transport

3.6.1 General

An extract of the TravelSmart Map for the City of Banyule is shown in Figure 11, highlighting the public transport, bicycle and pedestrian facilities in the area.

Figure 11 TravelSmart Map



3.6.2 Public Transport

The site has good public transport accessibility, with multiple transport routes servicing the vicinity of the site, including a Smartbus Route on Banksia Street. The full public transport provision in the vicinity of the site is shown in Figure 12 and detailed in Table 1.

Figure 12 Public Transport Provision

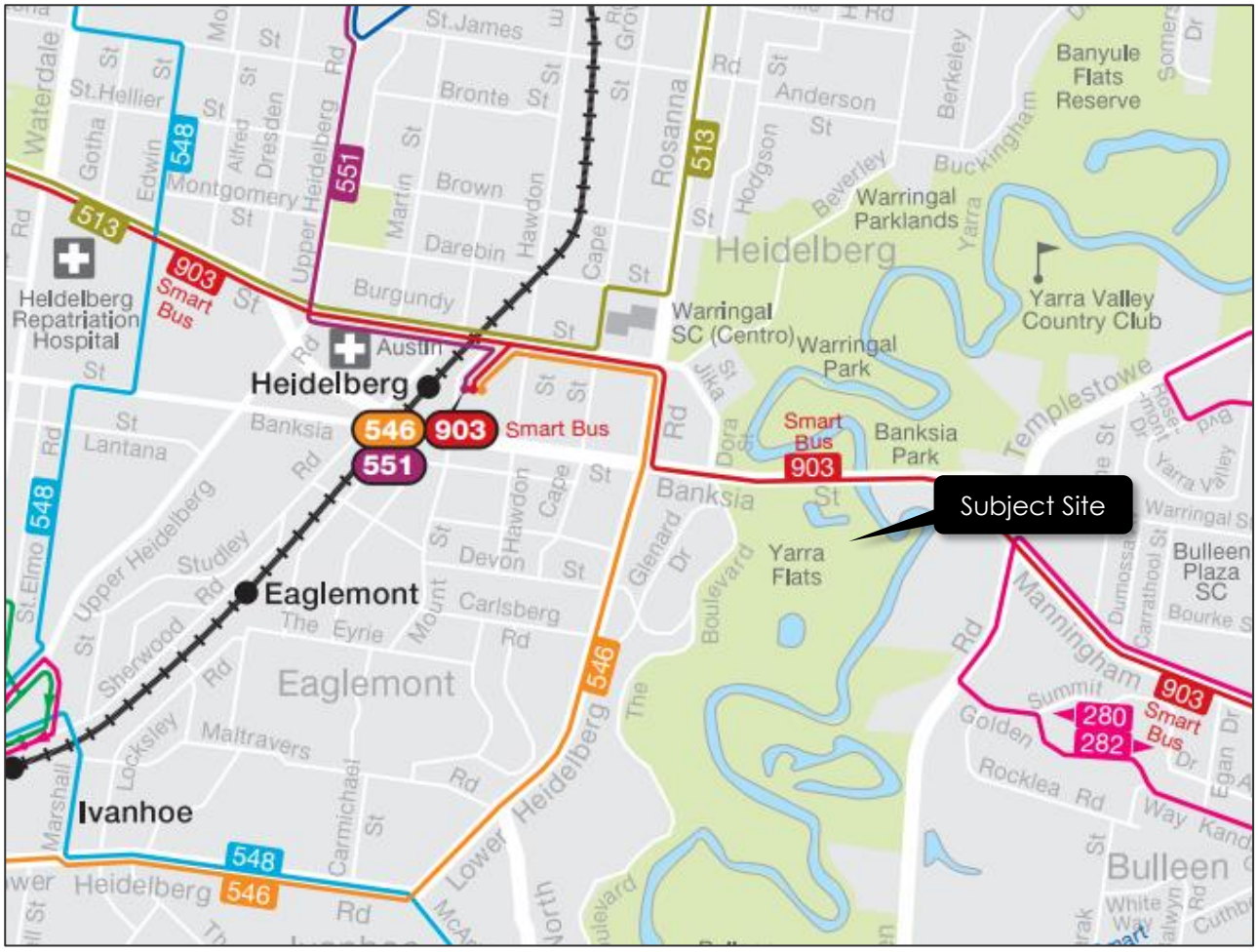


Table 1 Public Transport Provision

Mode	Route No.	Route Description	Nearest Stop/Station
Train		Hurstbridge Line	Heidelberg Station
Bus	546	Heidelberg Station – Melbourne Uni - Queen Victoria Market via Clifton Hill and Carlton	Lower Heidelberg Rd / Banksia St
	903	Altona - Mordialloc (SMARTBUS Service)	Dora Street

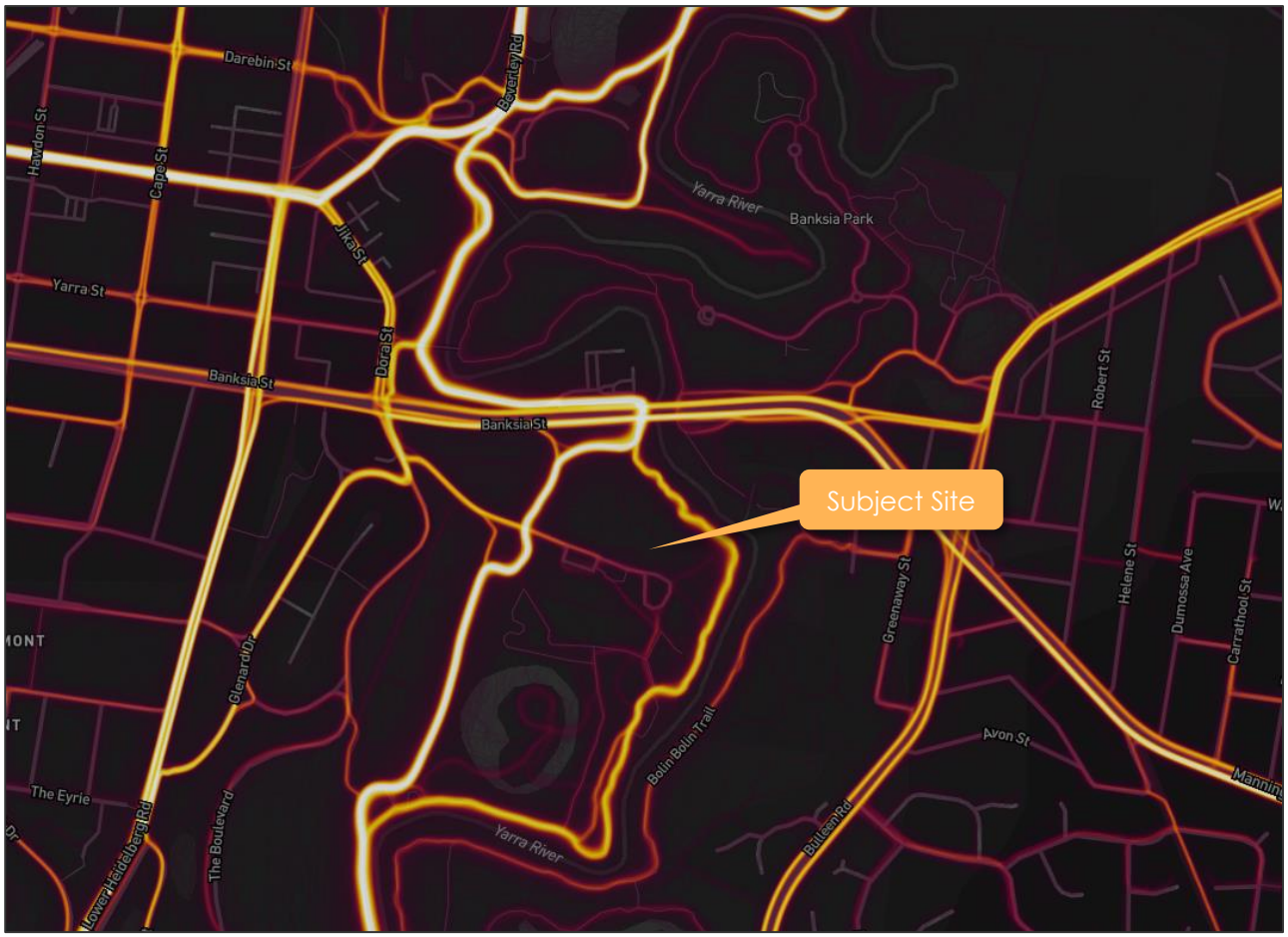
3.6.3 Bicycle Facilities

Strava is a social network and training tool for cyclists, runners and swimmers. Users record their physical activity using a dedicated GPS device or utilise the mobile app, and upload the file to their profile.

Strava anonymised this information and makes it available through their "Global Heatmap" tool, showing aggregated all public activities over the last two years across the world.

A view of the cycling heatmap in proximity to the study area is provided below in Figure 13. Routes of higher usage are brighter in colour.

Figure 13 Strava Cycling Heatmap



As shown above, primary routes in and out of the study area comprise:

- Main Yarra Trail;
- Manning Road; and
- Bulleen Road.

It is noted that this information includes all cycling activities recorded on the platform, inclusive of weekend trips, and all trips throughout the day. Additionally, the data is skewed towards sports cyclists, given that the bulk of commuter and recreational cyclists will not be tracking their rides.

4 DEVELOPMENT PROPOSAL

It is proposed to develop part of the site and allow use as an outdoor recreation facility, accommodating a TreeTop Adventure Park high-ropes course.

The adventure park is described by the operator as a "*unique eco-tourism experience in the tree tops where participants slide down flying foxes and move from tree to tree on suspension bridges*". The facility will provide eight courses of varying difficulties, with ropes courses extending throughout the canopy trees within the parkland.

The use will operate 7 days a week throughout the year, but is expected to be busiest on weekends and school and public holidays. During the week, visitations would largely comprise school groups.

The courses will have a combined capacity for 65 visitors, and will require between 2 and 2.5 hours for completion, with start times appropriately staggered between groups. In total, up to 100 visitors are expected on-site at any one time. The use will require up to eight staff.

It is proposed to utilise the existing car parking areas on-site to accommodate visitor and staff parking demands.

5 LOADING

Clause 65 (Decision Guidelines) of the Banyule Planning Scheme identifies that "*Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate: The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts.*"

In relation to the proposed development, loading facilities will only be required for occasional deliveries, which will likely be undertaken in small vans or utility vehicles, and therefore may utilise the existing on-site parking within the park.

The provision for loading is therefore considered appropriate for the proposed use.

6 BICYCLE PARKING

The bicycle parking requirements for the subject site are identified in Clause 52.34 of the Banyule Planning Scheme. The Planning Scheme does not specifically refer to parking requirements for Outdoor Recreation Facility uses, therefore no bicycle parking is required.

Notwithstanding the above, noting the location of the site in proximity to numerous bicycle routes and with the intention of supporting sustainable transport modes, it is recommended that some formal bicycle parking (in the order of 5 spaces) be provided for the use.

Regardless of any formal bicycle parking provisions, there are considerable opportunities for bicycle parking in the surrounding area to accommodate any bicycle parking demand generated.

7 CAR PARKING

7.1 Statutory Car Parking Requirements

The proposed use is most appropriately classified within Clause 74 of the Planning Scheme under the "outdoor recreation facility" land-use, which is nested under the broader classification of "Minor sports and recreation facility" use, which is further nested under the broader land-use classification of "Leisure and recreation".

No specific parking provisions are detailed within Clause 52.06 of the Banyule Planning Scheme for any of the above land-use classifications. In such cases, Clause 52.06-6 of the Planning Scheme states that:

> *'Where a use of land is not specified in Table 1 or where a car parking requirement is not specified for the use in another provision of the planning scheme or in a schedule to the Parking Overlay, before a new use commences or the floor area or site area of an existing use is increased, car parking spaces must be provided to the satisfaction of the responsible authority.'*

As such, the provision of parking is to the satisfaction of the responsible authority.

No additional car parking is proposed to be provided on-site, with the facility relying instead on the existing parking provided on-site.

In light of the above, and in order to determine if sufficient parking is available for the use, an empirical assessment of the car parking demands generated by the land use has been conducted, with consideration given to:

- The likelihood of multi-purpose trips within the locality which are likely to be combined with a trip to the land in connection with the proposed use.
- The variation of car parking demand likely to be generated by the proposed use over time.
- The short-stay and long-stay car parking demand likely to be generated by the proposed use.
- The availability of public transport in the locality of the land.
- The convenience of pedestrian and cyclist access to the land.
- The provision of bicycle parking and end of trip facilities for cyclists in the locality of the land.
- The anticipated car ownership rates of likely or proposed visitors to or employees of the land.
- Any empirical assessment or case study.

7.2 Car Parking Demand Assessment

The facility operator (TreeTop Adventures Holdings) operates similar facilities in NSW at the Ourimbah State Forest, Western Sydney Parklands and Blue Gum Hills Regional Park of a comparable size and operation to the proposed use, in comparable suburban locations.

Parking studies undertaken by others at these facilities have identified typical occupancies of 3.5 visitors per vehicle, with these locations having notably inferior connections to public transport links.

This is generally consistent with my observations of similar facilities in Victoria, where the majority of patronage consists of family of friendship groups, rather than individuals or couples.

Assuming that the same driver ratio (0.29 spaces per visitor) applies to visitors of the proposed development, we can expect the use to generate demand for 29 visitor parking spaces when operating at capacity.

During non-peak periods, parking demands are expected to be much lower, with school groups forming the majority of patronage. It is expected that groups would largely be transported to the site in buses and any parking demands largely attributable to staff only.

For the purposes of this assessment, I have assumed that all eight staff required during peak operation will drive to the site. In reality, it is anticipated that a proportion of staff during peak times will ride, catch public transport, or be dropped off and picked up by a car driver, given my observations that some staff will likely be under 18 years of age.

For the purposes of comparison, the Place of Assembly land use contained within the Planning Scheme identifies a parking requirement for 0.3 spaces per patron, equivalent to 30 spaces for the proposed peak of 100 patrons.

7.3 Review of Car Parking Provision

From the above, I expect the use to generate peak parking demands for a total of up to 37 parking spaces, comprising 29 spaces for visitors and eight spaces for staff.

As noted previously, it is proposed to rely on the existing car parking provided on-site and provide no additional parking for the use.

Clause 52.06-6 of the Banyule Planning Scheme indicates that a permit may be granted to reduce the number of parking spaces provided below the likely demand (including to zero), in consideration of a number of factors including:

- The Car Parking Demand Assessment.
- The availability of alternative car parking in the locality of the land, including:
  - Efficiencies gained from the consolidation of shared car parking spaces.
  - Public car parks intended to serve the land.
  - On street parking in non residential zones.
  - Streets in residential zones specifically managed for non-residential parking.
- Access to or provision of alternative transport modes to and from the land.
- Any other relevant consideration.

7.3.1 Availability of Alternative Car Parking

Parking surveys undertaken on-site identified no fewer than 101, 89 and 99 vacant spaces within the existing public parking areas, on each the Friday, Saturday and Sunday respectively. This is consistent with a review I have undertaken of historical aerial photography of the Yarra Flats parking areas, which demonstrates limited parking usage.

This supply of parking will be more than sufficient to accommodate demands generated by the use, estimated at a peak of 37 spaces with in the order of 52 - 64 spaces expected to remain available for other visitors to the park.

Furthermore, it is noted that the currently closed parking area contains approximately 40 spaces, and it is expected that the parking demand generated by the proposed facility will not exceed the parking supply within the currently closed parking area, therefore there will be no negative impact on the availability of parking in the area.

Additionally, the availability of car parking suggests that should lesser car occupancy rates be experienced at this site (and a greater parking demand results), there will remain considerable excess parking in the immediate area to ensure that existing park users will not experience any difficulty in finding parking in the area.

7.3.2 Alternative Modes of Transport

As indicated in Section 3.6.2, the site has good access to Public Transport, with Heidelberg Railway Station located less than 2km from the site, and Smartbus services along Banksia Street.

In addition, the site is well-located with respect to on-road and off-road bicycle and shared-user trails, with the Main Yarra Trail passing to the immediate west of the site, and multiple recreational trails in the area.

The provision of these transport alternatives will ensure that visitors and staff have realistic means to travel to the site by means other than private vehicles.

7.3.3 Adequacy of Proposed Car Parking Provision

It is expected that the existing supply of car parking in the immediate vicinity of the site is appropriate for the proposed development, considering the following:

- Parking surveys undertaken within the on-site car park identified more than sufficient capacity to accommodate the projected levels of parking demand;
- It is expected that the parking demand generated by the proposed facility will not exceed the parking supply within the currently closed parking area, therefore there will be no negative impact on the availability of parking in the area;
- Should lesser car occupancy rates be experienced at this site, there will remain considerable excess parking in the immediate area to ensure that existing park users will not experience any difficulty in finding parking in the area; and
- The site is located in close proximity to train, bus, bicycle and pedestrian routes, ensuring that there are access options for visitors and employees without parking on-site.

Furthermore, it is expected that there will remain considerable available parking should usage of the surrounding parklands increase as a result of improvements to the facilities and in the area, such as those proposed in the Yarra Flats Park Revised Concept Plan.

8 TRAFFIC

8.1 Traffic Generation

As noted previously, the course is expected to attract up to 100 visitors and will require between 2 and 2.5 hours for completion. Assuming the 29 car spaces associated with visitors turn over once every two hours, the use is expected to generate in the order of 30 movements (15 inbound and 15 outbound movements) per hour during the peak periods. This will only occur between approximately 11:00am and 3:00pm, when visitors from the earliest bookings start to leave, and visitors for the later bookings are arriving. Outside these times, traffic volumes will be reduced, with visitors arriving or departing only.

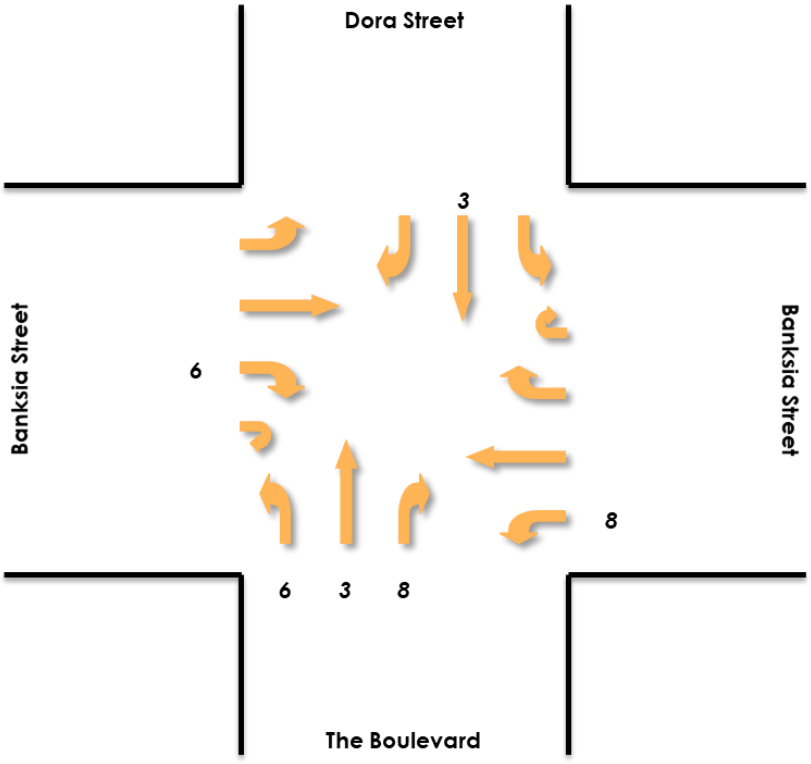
Regardless, even at peak times, this is considered to be a minimal volume in traffic engineering terms, equivalent to approximately one additional vehicle trip every 2 minutes at peak periods.

All traffic to and from the site is likely to approach from the north and utilise the signalised intersection between The Boulevard and Banksia Street. Based on the existing distribution of traffic at the intersection, it is anticipated that the generated volumes will be distributed as below:

- 50% directed to/from the east;
- 35% directed to/from the west; and
- 15% directed to/from the north.

Based on the above, the following traffic volumes are expected to be generated by the proposed development at the intersection of The Boulevard and Banksia Street.

Figure 14 Generated Peak Traffic Volumes



**Volumes have been rounded up.*

As shown above, peak turning movements of up to 8 vehicle trips per hour are expected for any one movement.

8.2 Traffic Impact

The expected peak traffic generation of the proposal represents a minor increase to traffic along the northern section of The Boulevard, and onto Banksia Street or Dora Street via the signalised intersection. This section of The Boulevard, and the signalised intersection are expected to easily accommodate the additional traffic volumes, with a minimal or negligible impact.

In relation to the traffic signals, with traffic signal cycle times at the intersection of Banksia Street and The Boulevard expected to range from between 90 seconds and 120 seconds at peak times, the proposal represents, on average, less than one additional vehicle movement at the intersection each signal cycle. This minimal increase in traffic is expected to be readily accommodated without contributing to any meaningful increase in queues or delays within the intersection. Considering the magnitude of the existing peak hour traffic volumes at the intersection, the additional traffic is expected to be indiscernible.

Furthermore, the peak traffic volumes are only expected to occur between 11:00am and 3:00pm, and will therefore not coincide with the weekday on-road peak periods. The impact during the weekday commuter peak periods will therefore be negligible.

Regardless of the above, I have undertaken intersection analysis using SIDRA at the Banksia Street intersection to confirm that the expected traffic volumes can be easily accommodated. For the purposes of a conservative analysis, I have applied the peak generated volumes to all peak periods.

The SIDRA Intersection software package has been developed to provide information on the capacity of an intersection with regard to a number of parameters. Those parameters considered relevant are, Degree of Saturation (DoS), 95th Percentile Queue, and Average Delay as described below.

Table 2 SIDRA Intersection Parameters

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Degree of Saturation (DoS)</td><td>The DoS represents the ratio of the traffic volume making a particular movement compared to the maximum capacity for that particular movement. The value of the DoS has a corresponding rating depending on the ratio as shown below.
<table>
<tr><th>Degree of Saturation</th><th>Rating</th></tr>
<tr><td>Up to 0.60</td><td>Excellent</td></tr>
<tr><td>0.61 – 0.70</td><td>Very Good</td></tr>
<tr><td>0.71 – 0.80</td><td>Good</td></tr>
<tr><td>0.81 – 0.90</td><td>Fair</td></tr>
<tr><td>0.91 – 1.00</td><td>Poor</td></tr>
<tr><td>Above 1.00</td><td>Very Poor</td></tr>
</table>
It is noted that whilst the range of 0.91 – 1.00 is rated as ‘poor’, it is acceptable for critical movements at an intersection to be operating within this range during high peak periods, reflecting actual conditions in a significant number of suburban signalised intersections.</td></tr>
<tr><td>Average Delay (seconds)</td><td>Average delay is the time delay that can be expected for all vehicles undertaking a particular movement in seconds.</td></tr>
<tr><td>95th Percentile (95%ile) Queue</td><td>95%ile queue represents the maximum queue length in metres that can be expected in 95% of observed queue lengths in the peak hour</td></tr>
</table>

The results of the analysis are provided in Table 3.

Table 3 The Boulevard / Banksia Street / Dora Street – Existing/Future Conditions

Approach	DoS		Avg. Delay (sec)		Queue (m)	
	Existing	Future	Existing	Future	Existing	Future
Friday AM Peak						
The Boulevard	0.159	0.271	43.7	45.6	9.4	15.1
Banksia Street	0.759	0.748	19.5	18.4	200	195.7
Dora Street	0.742	0.733	32.3	32.2	134.7	133.8
Banksia Street	0.701	0.722	24.2	25.4	142.2	145.8
Friday PM Peak						
The Boulevard	0.563	0.584	49.5	48.5	27.7	33.1
Banksia Street	0.67	0.702	16.4	17.2	134.5	139.5
Dora Street	0.837	0.845	60.2	61.5	165.8	168.5
Banksia Street	0.836	0.837	29	29.2	221.3	222.4
Saturday AM Peak						
The Boulevard	0.26	0.305	43.8	43	16.2	21.3
Banksia Street	0.718	0.718	19.1	19.8	156	161.3
Dora Street	0.808	0.8	39.9	39.3	158.8	157.2
Banksia Street	0.792	0.817	28.2	30.7	179.5	188.4
Saturday PM Peak						
The Boulevard	0.316	0.496	48.3	50.5	14.7	21
Banksia Street	0.805	0.805	22.1	19.8	169.6	153.7
Dora Street	0.74	0.767	35.2	37.8	129.3	135.8
Banksia Street	0.807	0.788	27.7	25.7	194.6	187.2

As shown above, the traffic generated by the proposed development has a very minimal impact on the queues and delays during each peak hour. As can be expected, some additional queues can be expected on The Boulevard, though due to the minimal change in volumes, the results are variable.

In view of the foregoing, the existing road network is expected to easily accommodate the additional traffic generated by the proposed use.

9 RESPONSE TO OBJECTIONS

9.1 Parking Provision

As outlined in the previous sections, I have projected the peak car parking demand generated by the use and undertaken updated car parking surveys within the Yarra Flats on-site parking area.

Based on the existing surveyed parking demands and on-site availability, I have no concern about the availability of parking in the area, and believe that the existing redeveloped car parking areas will continue to provide significant car parking for use by visitors to the park, without the requirement to provide additional car parking. In this regard, the car park is not expected to fill and overflow into the neighbouring streets, and accordingly, no trees will be cleared to accommodate the car parking demands.

Furthermore, it is noted that Council's Traffic and Transport Team concluded the following in relation to car parking provision, as noted in the response to submissions within the Ordinary Meeting of Council Agenda dated 1 March 2021:

"*The existing car parks will be used and the closed area re-opened which provides 127 car spaces. The supply of parking is considered to be more than sufficient to accommodate demand generated by the use, estimated to peak at 37 spaces. Trees will not be removed as no new parking is required.*

It is noted the 41 spaces current closed for public use will be refurbished by Ecoline [TreeTop Adventures Holdings] *and will be the primary parking available for the TreeTops visitors and team members.*

Whilst parking is not anticipated to overspill into the surrounding residential network, in the instance that this does occur, parking on residential streets can be managed through Council's On-Street Parking Management Framework. If warrants are met, parking restrictions can be installed with residents receiving parking permits in line with Council's Residential Parking Permit Policy."

The conclusions of Council's Traffic and Transport Team noted above support my conclusions in relation to the adequacy of car parking.

With regard to bicycle parking, it is recommended that at least 5 bicycle parking spaces be provided in close proximity to the administration building. Whilst I expect this to be sufficient to accommodate the likely bicycle parking demands, it is recommended that the bicycle demands are monitored, and additional bicycle parking provided should an increased demand eventuate. There is clearly sufficient space in the surrounding area to accommodate further bicycle parking if required, therefore it is considered appropriate to manage bicycle parking on an as-needs basis.

It is understood that some larger groups (including school groups) may arrive at the site via mini bus or school bus. To ensure that buses can be accommodated by the proposed development, it is recommended that specific bus parking and/or pick-up/drop-off facilities be provided in the vicinity. Swept path diagrams have been prepared by my firm, as attached in Appendix B, which demonstrate that a large bus can be accommodated within the existing road network, with potential bus parking locations also shown attached.

9.2 Traffic Impacts

I have projected the level of traffic to be generated by the proposed developed, undertaken updated traffic counts and analysed the traffic impacts in the previous sections.

The Boulevard to the south of the Yarra Flats Entry Road is not expected to experience any notable increase to the existing traffic, with all traffic typically directed to and from the intersection of the Boulevard and Banksia Street. In this regard, the impacts of the proposed development are expected to be realised as minimal increases to the existing queues and delays at the intersection of The Boulevard and Banksia Street.

In view of the foregoing, I am comfortable that this traffic will be easily accommodated within the surrounding road network without any notable impacts to the existing traffic conditions.

Council's Traffic and Transport Team has previously reviewed the proposed development, and provided the following comments in relation to traffic generation:

"*All traffic to and from the site is likely to approach from the north and utilise the signalised intersection between The Boulevard and Banksia Street. Banksia Street is a major regional arterial road directly abutting the site and is readily capable of accommodating the modest increase in traffic anticipated from the facility without contributing to any meaningful increase in queues or delays within the intersection.*

The proposal represents only a moderate increase to traffic volumes along the northern section of The Boulevard only. Noting the wide road provided in this location, it is not expected that the proposal will have any considerable impact on the operation of the local road network."

10 CONCLUSIONS

It is proposed to allow use of the site for an outdoor recreation facility, accommodating a TreeTop Adventure Park high-ropes course.

Considering the analysis presented above, it is concluded that:

- The provision for loading is considered appropriate for the proposed use;
- It is recommended that some formal bicycle parking (in the order of 5 spaces) be provided for the use, though bicycle parking demands should be monitored, and additional bicycle parking provided should an increased demand eventuate;
- To ensure that buses can be accommodated by the proposed development, it is recommended that specific bus parking and/or pick-up/drop-off facilities be provided in the vicinity;
- It is expected that the existing supply of car parking in the immediate vicinity of the site is appropriate for the proposed development, considering the following:
  - Parking surveys undertaken within the on-site car park identified more than sufficient capacity to accommodate the projected levels of parking demand;
  - It is expected that the parking demand generated by the proposed facility will not exceed the parking supply within the currently closed parking area, therefore there will be no negative impact on the availability of parking in the area;
  - Should lesser car occupancy rates be experienced at this site, there will remain considerable excess parking in the immediate area to ensure that existing park users will not experience any difficulty in finding parking in the area; and
  - The site is located in close proximity to train, bus, bicycle and pedestrian routes, ensuring that there are access options for visitors and employees without parking on-site.
- The existing road network is expected to easily accommodate the additional traffic generated by the proposed use.

Appendix A Car Parking Survey Results

Car Parking Occupancy

(v2.8): 19-Apr-21

Project Details

Project Number:	15178
Project Name:	Tree Tops

Survey Details

Location:	Ivanhoe			**Melway Ref:**		**Survey Start:**	10:00:00 AM
Suburb:	Ivanhoe	**State:**		**Survey Date:**	Fri 7/05/2021	**Survey Interval:**	0:30:00
Comments:				**Weather:**		**GPS:**	-37.762169, 145.074

Parking Survey Results

Area	Street	Section	Side	Restriction 1		Supply	Parking Occupancy																						Avg	Max.
				Type	Times		10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM	6:00 PM	6:30 PM	7:00 PM	7:30 PM	8:00 PM	8:30 PM		
	Yarra Flats Entry Rd	From The Blvd To End	N	Unrestricted		41	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
			S	Unrestricted		28	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
	Western Carpark			Unrestricted		23	7	7	8	8	8	9	8	7	6	6	5	5	5										6.8	9
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
	Middle Carpark			Unrestricted		51	5	5	6	6	7	7	6	5	6	7	6	4	4										5.7	7
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
	Eastern Carpark			Unrestricted		38	1	1	1	1	1	1	0	0	0	0	0	0	0										0.5	1
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
																													0	0
Total Occupied Spaces						187	13	13	15	15	16	17	14	12	12	13	11	9	9										13	17
Max. Occupancy						17	#N/A	#N/A	#N/A	#N/A	#N/A	17	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Available Spaces							174	174	172	172	171	170	173	175	175	174	176	178	178										174	170
Min. Available						170	#N/A	#N/A	#N/A	#N/A	#N/A	170	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Capacity							187	187	187	187	187	187	187	187	187	187	187	187	187										187	187
Utilisation							7%	7%	8%	8%	9%	9%	7%	6%	6%	7%	6%	5%	5%										7%	9%

Car Parking Occupancy

(v2.8): 19-Apr-21

Project Details

Project Number:	15178
Project Name:	Tree Tops

Survey Details

Location:	Ivanhoe			**Melway Ref:**		**Survey Start:**	10:00:00 AM
Suburb:	Ivanhoe	**State:**		**Survey Date:**	Sat 8/05/2021	**Survey Interval:**	0:30:00
Comments:				**Weather:**		**GPS:**	-37.762169, 145.074

Parking Survey Results

Area	Street	Section	Side	Restriction 1		Supply	Parking Occupancy																										Avg	Max.
				Type	Times		10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM	6:00 PM	6:30 PM	7:00 PM	7:30 PM	8:00 PM	8:30 PM								
	Yarra Flats Entry Rd	From The Blvd To End	N	Unrestricted		41	0	0	0	0	0	0	0	0	0	0	0	0	0														0	0
			S	Unrestricted		28	0	0	0	0	0	0	0	0	0	0	0	0	0														0	0
	Western Carpark			Unrestricted		23	8	9	12	16	16	17	18	16	14	11	9	9	9														12.6	18
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0														0	0
	Middle Carpark			Unrestricted		51	6	7	6	7	7	10	11	11	11	11	11	11	11														9.2	11
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0														0	0
	Eastern Carpark			Unrestricted		38	0	0	0	0	0	0	0	0	0	0	0	0	0														0	0
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0														0	0
																																	0	0
Total Occupied Spaces						187	14	16	18	23	23	27	29	27	25	22	20	20	20														21.8	29
Max. Occupancy						29	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	29	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A						
Available Spaces							173	171	169	164	164	160	158	160	162	165	167	167	167														165.2	158
Min. Available						158	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	158	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A						
Capacity							187	187	187	187	187	187	187	187	187	187	187	187	187														187	187
Utilisation							7%	9%	10%	12%	12%	14%	16%	14%	13%	12%	11%	11%	11%														12%	16%

Project Details

Project Number:	15178
Project Name:	Tree Tops

Survey Details

Location:	Ivanhoe			***Melway Ref:***		***Survey Start:***	10:00:00 AM
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Parking Survey Results

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				Type	Times		10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM	6:00 PM	6:30 PM	7:00 PM	7:30 PM	8:00 PM	8:30 PM		
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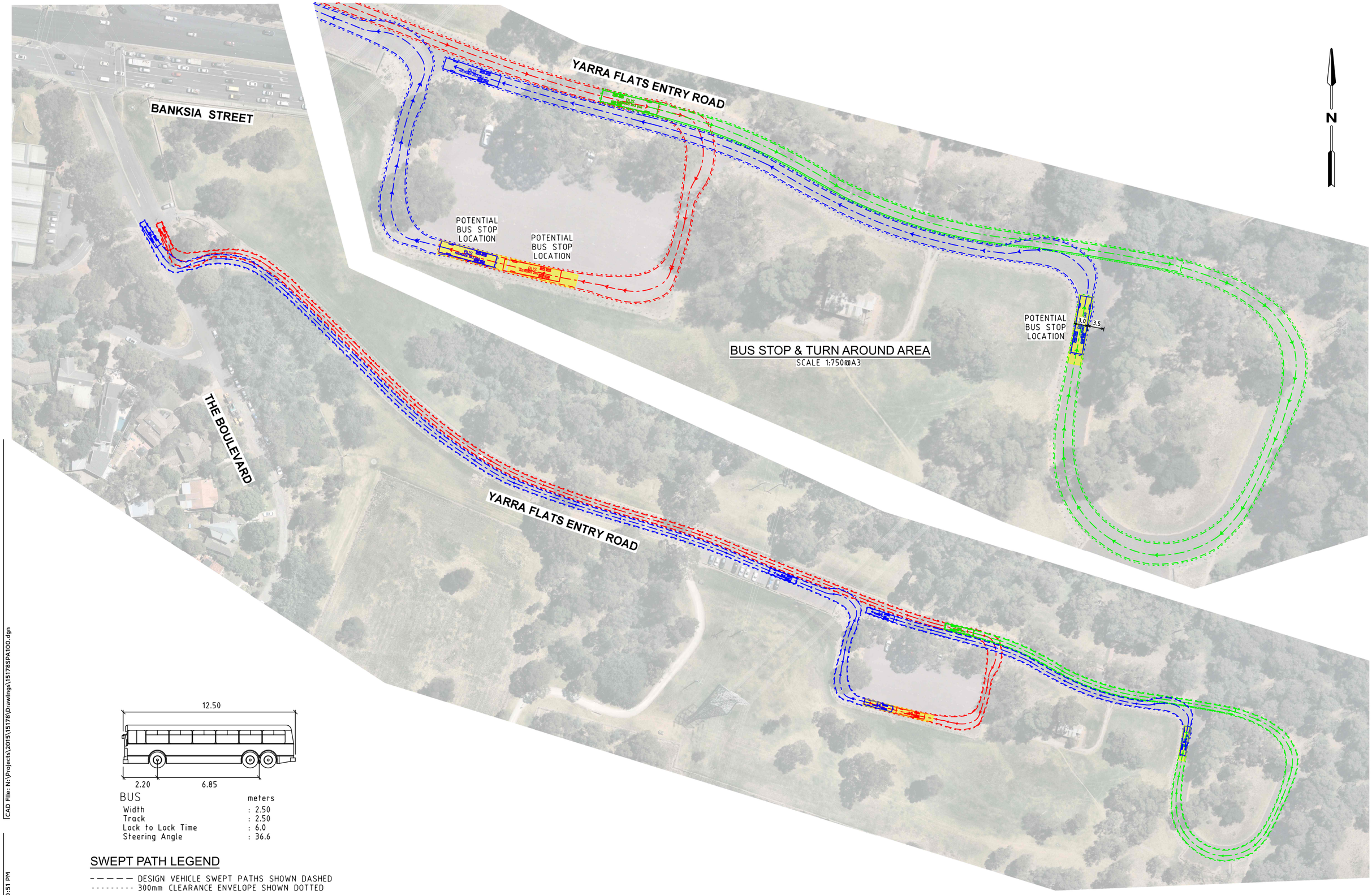
			S	Unrestricted		28	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
	Western Carpark			Unrestricted		23	5	6	8	7	5	5	4	4	3	3	4	4	4										4.8	8
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
	Middle Carpark			Unrestricted		51	6	9	11	10	10	9	7	6	7	6	6	5	5										7.5	11
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
	Eastern Carpark			Unrestricted		38	0	0	0	0	0	0	0	1	2	2	1	1	0										0.5	2
				Disable		2	0	0	0	0	0	0	0	0	0	0	0	0	0										0	0
																													0	0
Total Occupied Spaces						187	11	15	19	17	15	14	11	11	12	11	11	10	9										12.8	21
Max. Occupancy						19	#N/A	#N/A	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Available Spaces							176	172	168	170	172	173	176	176	175	176	176	177	178										174.2	166
Min. Available						168	#N/A	#N/A	168	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Capacity							187	187	187	187	187	187	187	187	187	187	187	187	187										187	187
Utilisation							6%	8%	10%	9%	8%	7%	6%	6%	6%	6%	6%	5%	5%										7%	10%

Appendix B Swept Path Diagram



BUS STOP & TURN AROUND AREA
SCALE 1:750@A3

BUS	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

SWEPT PATH LEGEND

– – – – – DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
--------- 300mm CLEARANCE ENVELOPE SHOWN DOTTED

CAD File: N:\Projects\2015\15178\Drawings\15178SPA100.dgn

Date Plotted: 16-06-2021 3:10:51 PM

Aerial Photography
Aerial photography provided by Nearmap

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Scale
1:1500 @ A3
0 7.5 15 30

Drawing Title
TREETOP ADVENTURE PROJECT
SITE ACCESS - 12.5m BUS
SWEPT PATH ANALYSIS

Designed	Approved	Melway Ref
TCW	RBH	32 B5

Project Number	Drawing Number	Revision
15178	SPA100	B