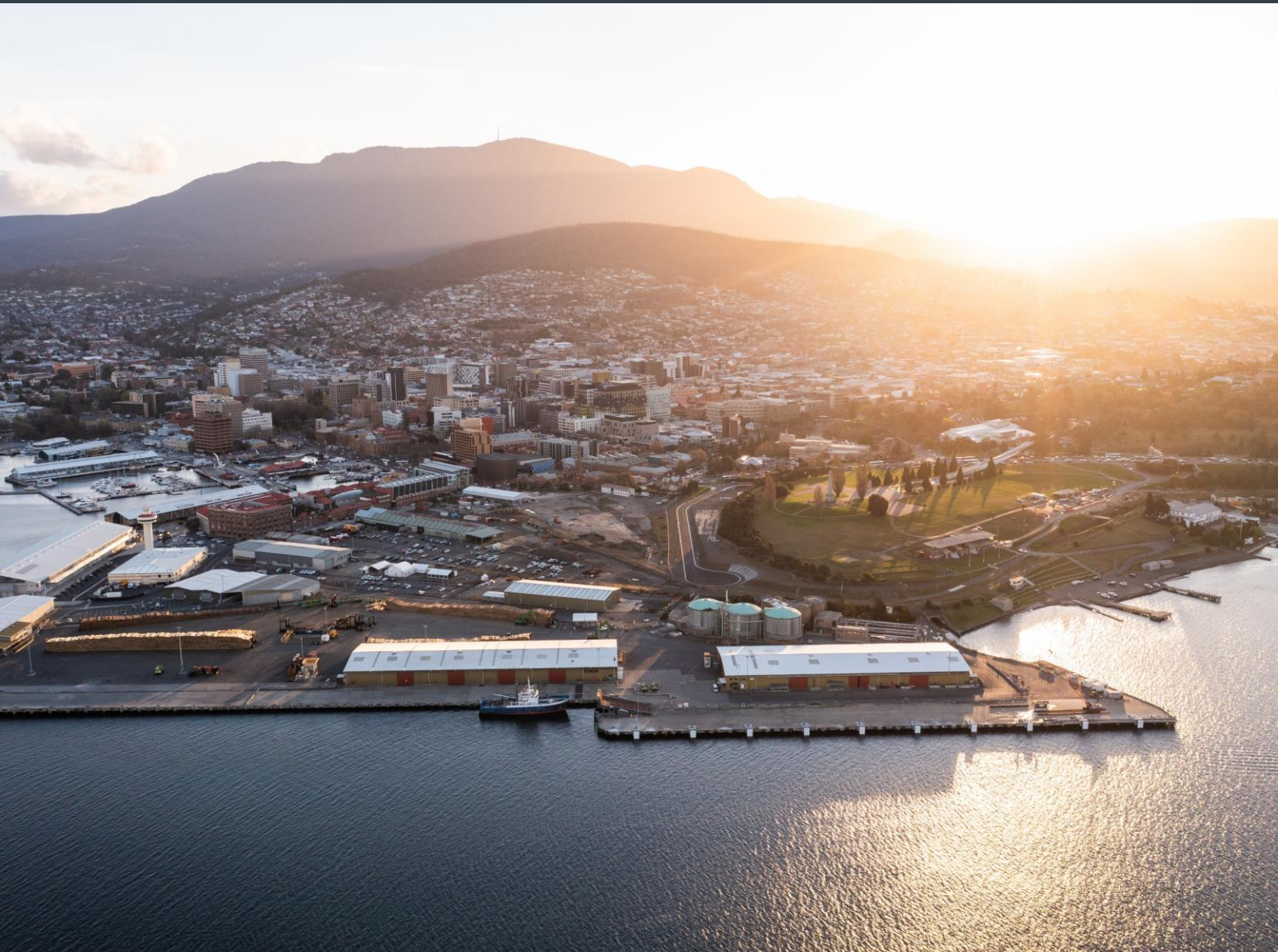


Macquarie Point Development Corporation

August 2024

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Macquarie Point Multipurpose Stadium Transport Study



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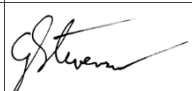
Level 11, 567 Collins St
Melbourne VIC 3000

Tel: +61 3 9861 1111

Fax: +61 3 9861 1144

wsp.com

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	Name	Date	Signature
Prepared by:	LS	29 August 2024	
Reviewed by:	GS	29 August 2024	
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WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Glossary

ABS	Australian Bureau of Statistics
Access Study	Macquarie Point Precinct Event Transport Access Study. The previous stage of transport planning work conducted in 2023.
Active transport	The Department of State Growth defines active transport as “Trips undertaken on foot, using a wheelchair, pram, skateboard, roller blades or mobility aid, riding a bike or micromobility device such as an e-bike, scooter, cargo bike or trike.”
Bus Plaza	Event bus dedicated pick up and set down area. Short term public parking outside of event timings.
Capacity	The maximum number of ticketed patrons to the Stadium.
CBD	Central Business District
Concert mode	The event mode which allows for patrons to occupy the field of play during the event, thereby increasing capacity.
Event Closure	Temporary closure of roads adjacent to the stadium to facilitate Events.
External Concourse	The hardstand area immediately surrounding the perimeter of the stadium.
GHUTDM	Greater Hobart Urban Travel Demand Model
ITas	Infrastructure Tasmania
Journey to work	“Information on the methods of travel used by Australians to get to work on Census day Tuesday, 10 August 2021” (Australian Bureau of Statistics)
LOS	Level of service.
Macquarie Point Precinct ("Mac Point")	The area within the Macquarie Point Site subject to the master plan.
Macquarie Point Development Corporation ("MPDC" or "Corporation")	The government agency established to deliver the redevelopment of Macquarie Point Site.
Macquarie Point Multipurpose Stadium ("Stadium")	The proposed new Multipurpose Stadium to be constructed at Macquarie Point.
Macquarie Point Site ("Site")	The titled land owned by Macquarie Point Development Corporation.
MPDC	Macquarie Point Development Corporation
Occupancy	The maximum number of occupants allowed under the Building Permit. These include patrons and ancillary staff
Plaza	The activated areas linking the precinct to the Stadium
POSS	Project of State Significance
Private car trips	Refers to self-drive and pick up/drop off private vehicle trips

SA2	Statistical area level 2 - Populations of between 3,000 and 25,000 (10,000 is average), sometimes aligning with suburbs.
SA3	Statistical area level 3 - Designed as having populations of between 30,000 and 130,000 but may have more or less in some circumstances.
Service access	Access to areas required to services to maintain operations to the Stadium
Service road	Internal access road for vehicular movement within the footprint of the Stadium
State Growth	Department of State Growth
TEU	Twenty foot equivalent (shipping container) units
TPC	Tasmanian Planning Commission
Transport Study	This study prepared for the Project of State Significance (POSS) planning application
UTas	University of Tasmania

Executive summary

Introduction

The Macquarie Point Multipurpose Stadium Transport Study (Transport Study) is tasked with estimating demands and considering a range of options as the basis for a feasible Transport Implementation Plan for the Macquarie Point Multipurpose Stadium and precinct. This report builds upon the Macquarie Point Precinct Event Transport Access Study (2023) (Access Study) and outlines various options and components for event transport and day to day access for the stadium in building up the transport implementation plan. The levels of effort required from each component of the plan need to be tested and agreed between transport stakeholders before selecting the right plan for the wide variety of possible event scenarios and overlapping activities in the surrounding area (e.g. the Hobart CBD and the Port of Hobart). The balance of components may shift depending on the event type, the day of the week, time of day, weather forecasts, crowd capacities and overlap of nearby events and activities.

Further to purely selecting the correct operational response to meet the expected demands, a balance also needs to be found to ensure that the transport management task is shared across agencies and modes in a coordinated way, so that one agency or team is not over-burdened to the point that it creates a risk for delivery which may lead to undesirable outcomes. This will only be achieved through adopting a collaborative approach to planning commencing as soon as practicable.

Of the transport options and components presented and discussed in this study, some are committed and funded, some have previously been identified prior to the precinct planning and some are new. Many will be the responsibility of the broader stakeholder group, while others will be part of the Macquarie Point Precinct masterplan.

The Transport Implementation Plan as presented in this study does not describe the only way the event transport management can be achieved for the stadium. The final event operational Transport Management Plan for the multipurpose stadium (along with supporting operational plans and traffic management plans), will be agreed through collaborative planning between Macquarie Point Development Corporation, Department of State Growth, City of Hobart, TasPorts and Stadiums Tas over the coming years in line with the detailed design and construction of the stadium and precinct.

Project of State Significance Guidelines

The proposed multipurpose stadium at Macquarie Point has been declared a Project of State Significance (POSS) under the State Policies and Projects Act 1993. An integrated assessment of the project is required to address and respond to the Tasmanian Planning Commission Guidelines set out specifically for Macquarie Point Multipurpose Stadium.

The guidelines “provide a framework to be followed” and “are not rigid criteria for the assessment of the proposed project” and reporting can be “presented in a way that does not directly follow the structure of the guideline” (Tasmanian Planning Commission, 2024). The Guidelines for Movement (the Transport Study) cover the following areas:

- Travel scenarios and management options
- Traffic, freight and transport routes
- Access: mass/public transport, car use and parking
- Pedestrian/cycling movement.

The guidelines provide a comprehensive list of considerations for the Transport Study yet allow for investigations, subject matter expertise from other stadium projects to be considered and applied and collaboration with stakeholders to deliver a Transport Report and Implementation Plan that is tailored to the local environment, context and meets stakeholder needs.

Transport Study methodology

An origins study was undertaken that considered population, access to transport modes as well as uptake of Tasmania Devils club memberships. The origins study was based on a spectator capacity of 31,500 which is the higher demand scenario of the two capacities proposed (the other being 24,500). The origins study sets the foundation for demands across the various modes and directly influences the suggested provision of new infrastructure, services and processes. Components of the origins study were also used to build up demands for transport sensitivity testing done for 40,000 capacity scenarios.

The origin – demand matrices prepared as part of the origins study then informed the transport modelling, pedestrian modelling, active transport assessments, parking assessments, event bus (park and ride) route and fleet planning and a local area transport and traffic plan.

Transport modelling was conducted using the Greater Hobart Urban Travel Demand Model (GHUTDM). Given the strategic nature of the project, the need to understand traffic and public transport trips from across the Hobart area to the CBD, the GHUTDM was seen as the best fit. Additional mesoscopic and microscopic modelling is discussed in section 8.

Static pedestrian modelling was undertaken to inform pedestrian levels of service using Fruin standards. This considered widths of existing footpaths and other walking routes for stadium egress and has identified constraint points, and areas of opportunity and areas potentially requiring operational management for larger events.

For the purposes of the strategic transport modelling and crowd modelling, stadium capacities do not include stadium workforce as they typically travel before and after peak spectator movements. However, employment on the precinct is included in the strategic model and therefore workforce travel is captured in the background demand.

Active transport assessments were conducted collaboratively with stakeholders to best understand the state of the Active Transport network in 2029. Alternative routes have been identified for event days to reduce conflict points of cyclists and scooter users amongst large crowds.

Parking analysis included investigations into current supply on weekdays, weekday evenings and weekends to understand what sort of capacity might be available for stadium patrons. This included engagement with, and data received from City of Hobart.

Event bus assessments have identified four park and ride routes that seek to build on the existing public bus network and the proposed rapid bus network. Some initial estimates for bus fleet are provided to provide early indications of fleet and driver needs. Park and ride sites have been identified but further feasibility, design assessments and engagement with property owners will be required to confirm their locations.

The local area transport and traffic plan attempts to consolidate relevant modes of transport, road closures, management and interventions required in the local area to run stadium events.

The Macquarie Point Multipurpose Stadium capacities referred to in this study are spectator capacities. They are:

- 24,500 (seated and standing)
- 31,500 (seated, standing and on the pitch)
- 40,000 as a sensitivity test (seated, standing and on the pitch).

The location

The CBD location significantly contributes to what can be a sustainable event travel plan. The location assists by its proximity to existing public transport services and car parking as well as bars and restaurants that will assist by flattening the spectator egress profile. However, the location does also complicate the road network as the nearby network is physically constrained, and at peak times is reaching capacity.

Four major arterial roads all connect in the vicinity of the Macquarie Point precinct (Tasman Highway, Brooker Highway and Davey and Macquarie Streets). The capacity limitations are discussed in section 5.3. The capacity limitations result

in a need for mode shift for stadium travel choices to mitigate impacts to background traffic and delays in reaching the stadium. However, there are no embedded travel behaviours for Macquarie Point so there is an opportunity to start positively from day one.

How people will need to travel

The planned transport mode splits for event travel to the multipurpose stadium identified in this Transport Study are as follows:

- 22 per cent walking trips
 - 3 per cent cycling and micromobility trips
 - 31 per cent bus trips including new event bus services, the proposed rapid bus routes and public buses
 - 2 per cent ferry trips taking advantage of new ferry wharves and services along the Derwent
 - 2 per cent private coach and charter bus trips
 - 10 per cent taxi and ride share trips
 - 30 per cent pick up / drop off and self-drive trips (park and walk) with parking in the CBD.
-

Essential supporting projects

Of the supporting projects that are either funded, proposed or have been identified by this Transport Study, the critical supporting projects are:

- 1 Northern Access Road for Port and stadium access.
- 2 An event bus plaza for efficient and high frequency bus services.
- 3 Enhancements to surrounding pedestrian pathways to reduce trip hazards and improve pedestrian levels of service and safety.

Other projects have also been identified and are discussed in section 8.

It should be noted that currently no capital funding has been committed for these identified projects that will be necessary to support the stadium and wider Macquarie Point precinct development. The future rollout of rapid bus services is likely to be delivered in stages, with a majority of the rollout to occur after the proposed opening of the stadium development. Event bus services would be required to support more trips until rapid bus is in service.

Essential supporting processes

The critical supporting processes to support the multipurpose stadium are:

- Standing up a multi-agency transport working group to meet regularly, understand operational gaps and workshop solutions and refine the implementation.
- Feasibility testing of the supporting projects and identifying alternative solutions if they can't be achieved.
- An event travel behaviour campaign, with the Tasmania Devils and Hobart Hurricanes as the face of the campaign, to:
 - Drive sustainable transport modes choices
 - Help people travel to the stadium in a timely manner
 - Keep the background transport network running.

A stand-alone 'glossy' executive summary is also provided in Appendix A.

1 Project background

1.1 Study purpose

The purpose of this study is to:

- Plan for movement and transport related demands by assessing impacts and solutions for transport options to, from and within Macquarie Point to the multipurpose stadium on event and non-event days.
- Provide information to support engagement with the community in relation to transport planning, issues management and outcomes.
- Address the Tasmanian Planning Commission's (TPC) Guidelines for the Macquarie Point Multipurpose Stadium Project of State Significance (POSS), specifically those related to movement.

With regards to the POSS, the overarching requirements and where their responses can be found are shown in Table 1.1.

Table 1.1 POSS requirements

POSS requirements	Response
A technical and expert report in response to the transport component of the Guidelines.	This report and supporting documents and appendices.
Create a best practise model using available data that considers the Site at its full development potential, and an event-based traffic model of the Greater Hobart Area.	Use of the Greater Hobart Urban Travel Demand Model with additional demands loaded in for day-to-day precinct activity (employees etc) and the stadium (see section 5).
Project transport volumes created by multipurpose stadium use at Macquarie Point by mode.	Analysis using the Greater Hobart Urban Travel Demand Model (see section 5).
Analysis volumes under agreed scenarios.	
Create a need and impact assessment of specific transport, infrastructure and other interventions solutions.	The need has been assessed through an Origins Study for people travelling to the Macquarie Point Precinct (see section 4). The impact is detailed in section 5. Transport interventions and solutions are addressed in sections 6 (31,500 scenario), section 7 (day-to-day scenario) and section 8.1 (supporting projects and infrastructure).

1.2 Stadium capacities

The Macquarie Point Multipurpose Stadium capacities referred to in this study are spectator capacities. They are:

- 24,500 (seated and standing)
- 31,500 (seated, standing and on the pitch)
- 40,000 as a sensitivity test (seated, standing and on the pitch).

These varying capacities represent the multipurpose nature of the stadium to accommodate uses beyond sporting events. Sensitivity tests in traffic modelling and pedestrian modelling for a 40,000 capacity have been investigated to inform a possible stadium expansion.

1.3 Green Star assessment

The study must consider the contribution of the transport plan to the Green Star – Communities v1.1, as the precinct will be assessed under this Green Star framework. A sustainably focused transport plan contributes to communities that are healthy and resilient, and three points are available if a ‘people-focused hierarchy’ is adopted. That is, prioritising safe and attractive active transport connections over other modes. The hierarchy is shown in Figure 1.1.

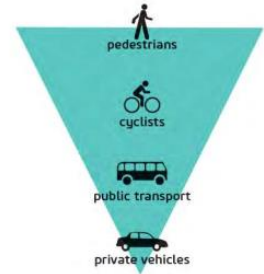


Figure 1.1 Green Star people-focused hierarchy

1.4 Previous access study

The Macquarie Point Precinct Event Transport Access Study (Access Study) was prepared in 2023. The study represented the initial planning to develop target transport mode shares for Macquarie Point Stadium access on event days, and outlined the likely demands and spatial requirements of each mode of transport. Event transport concepts and recommendations were built upon existing precinct, city and state planning policy and strategies developed by various transport stakeholders.

The intent of the Access Study was to:

- Collaboratively develop guiding principles to help shape a future precinct transport plan
- To understand the transport supply in Hobart for modes such as public bus and parking
- Establish a realistic but ambitious sustainable transport mode share
- And to document future projects (either funded or unfunded) that would support the sustainable mode shares.

The executive summary from this previous Access Study is included in Appendix B.

1.4.1 Objectives and guiding principles

Guiding principles were developed for Macquarie Point Multipurpose Stadium Transport Implementation Plan during the Access Study in 2023. They are shown in Figure 1.2. As addressed in the Access Study and outlined further in this Transport study (see section 8.2), the Multipurpose Stadium Transport Implementation Plan requires ongoing coordination, planning and testing between responsible agencies and stakeholders prior to the first stadium event, and into the future to refine the plan as travel behaviours and new technologies and approaches emerge.

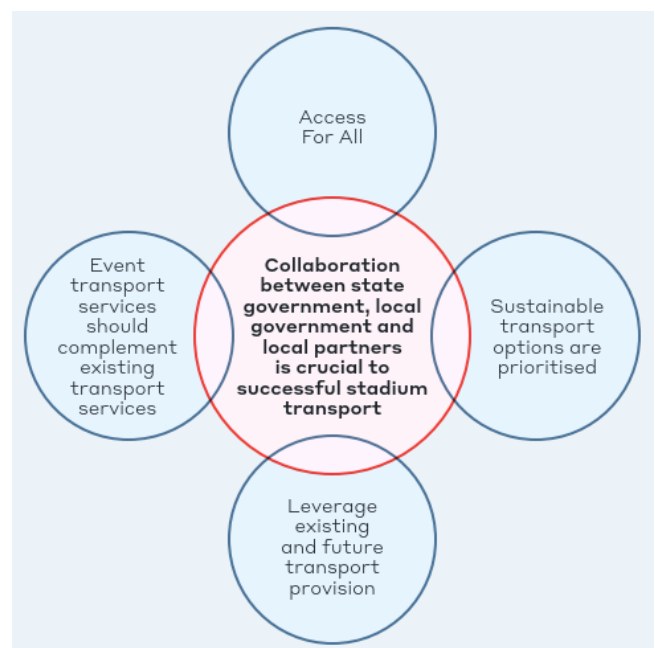


Figure 1.2 Transport guiding principles

1.4.2 Success factors at existing stadiums

For a stadium to be considered world-class from a transport perspective and achieve non-car mode shares of greater than 50 per cent, a plan based on a variety of transport options must be implemented. The Access Study looked at stadium benchmarking and common success factors at existing stadiums in achieving this. Some common success factors were:

- A multi-modal approach is critical
- Services are high quality and frequent
- Buses provide operational flexibility
- Traffic and transport modes are separated where possible for legibility and safety
- Locating transport nodes to all points of the compass can assist with dispersing the peak pedestrian flows around a stadium and precinct and reducing the risk of a single point of failure
- Parking is restricted to those willing to pay a premium through corporate support or membership
- Infrastructure supports business as usual and event needs, without the additional overlay of extensive on-the-ground-staff and/or law enforcement
- Self-driving is actively discouraged by prioritising active transport and public transport in stadium apps and website information. Stadium apps are user friendly and show all transport options
- Active transport links are obvious to the user, safe and accessible
- Public transport fares/tickets are included in event tickets.

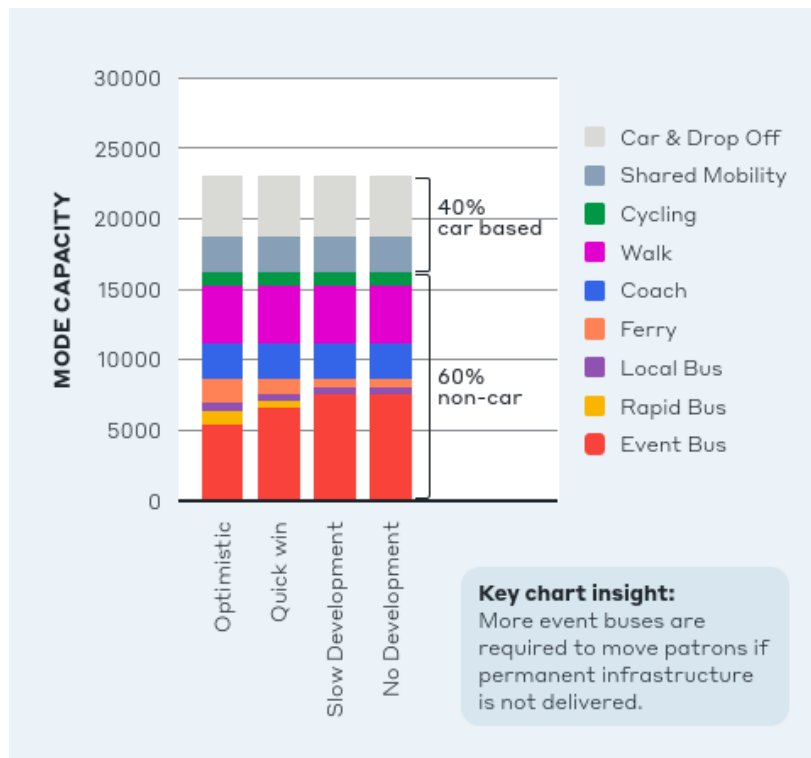
Exemplar stadium transport plans typically design for the vast majority of spectators to arrive by public transport or active transport modes. As shown in Table 1.2, major stadia in Australia and globally plan for around 80-85 per cent of spectators to arrive via public and active transport modes, so with the right transport options, a weighting to public transport and active transport is more than achievable.

Macquarie Point Multipurpose stadium is centrally located and well connected to the current local bus and future rapid bus routes, ferry services, active transport corridors for walking and cycling and the road network. As noted in the Strategic Business Case, (Tasmanian Government) the location encourages ‘more sustainable transport options’ than is possible at Tasmania’s current stadiums at Bellerive and Launceston. Leveraging the strengths of the central location is important for developing the transport plan.

Table 1.2 Summary of mode share outcomes at example stadia

Event Transport Mode Share Outcomes			
Mode	Accor Stadium Sydney (83,500)	Suncorp Stadium Brisbane (52,200)	Emirates Stadium London (60,355)
Rail	43%	48%	73%
Bus	17%	24%	5%
Coach	9%	5%	2%
Walk / cycle	1%	1%	6%
Taxi/Ride share	6%	2%	1%
Total non-car	76%	80%	87%
Car / Motorbike/ Truck	24%	20%	13%

1.4.3 Mode share targets



Through discussion with MPDC and state and local stakeholders during the Access Study, the approach to transport mode share targets was agreed to acknowledge existing travel behaviours while also providing the means to achieve a suitable scenario for the Hobart context and allow for growth in sustainable travel.

The non-car mode share was established at 60 per cent (see Figure 1.3). This means in the opening year of 2029, 60 per cent of spectators will primarily walk, cycle or use public transport to travel to and from the stadium. A stretch target of 70 per cent was set for future years with additional non-car transport options.

Figure 1.3 Access study mode shares

2 Collaboration and data received

This Transport Implementation Plan has been developed through a collaborative process with MPDC and key stakeholders. Stakeholders include the Department of State Growth, City of Hobart, TasPorts, Stadiums Tas and stadium / precinct designers Cox Architecture. Collaboration topics have included:

- The approximate split of spectators distributing from the stadium to access their preferred mode of transport.
- The northeast area of the precinct where the bus plaza accommodates the underground access to the stadium service road and the Northern Access Road while integrating into the stadium surrounds.
- Access for the mobility impaired.
- High level security arrangements for stadium vehicle access and precinct crowd movement.
- The northwest area of the precinct with respect to pedestrian movement and how that may be influenced by the positioning of the Goods Shed.
- The Evans Street frontage and the underground vehicle route returning to ground level at Evans Street.
- The methodology for transport modelling.
- Active transport links
- Future projects.
- Proposed implementation plan measures such as event buses.
- Port access integration with the bus plaza.

The various types of data received and reviewed are shown in Table 2.1.

Table 2.1 Reference material

Material	Reviewed	Integrated
Reports		
Central Hobart Report – Movement Analysis, (Urbis, 2022)	✓	✓
Civic and Cultural Precinct - Movement Analysis (Urbis, 2022)	✓	✓
East Derwent Highway Upgrade, Development Application Report (Jacobs, 2020)	✓	
Dark Mofo 2023 Traffic Management Plan (GHD, 2023)	✓	
Dark Mofo 2023 Fire Management Plan Dark Park	✓	
Dark Mofo 2023 Emergency Evacuation Plan Dark Park (Dark Lab 2023)	✓	
Port of Hobart freight summary (2023)	✓	✓
Green Star Communities v1.1, sustainable transport and movement chapter.	✓	✓
Hobart Transport Strategy 2024 (City of Hobart 2024)	✓	✓
Southern Campus Transformation, Preliminary Urban Design Framework (University of Tasmania, 2021)	✓	✓
Proposed Master Development Plan, Traffic and Transport Assessment (SALT, 2022)	✓	✓
Hobart Transport Vision (Department of State Growth, 2018)	✓	✓
Keeping Hobart Moving (draft) (Department of State Growth, 2023)	✓	✓
Hobart Rapid Bus Service (WSP, 2023)	✓	✓

Material	Reviewed	Integrated
Data		
Tasmania Devils membership data by postcode as of 17 May 2024	✓	✓
Greater Hobart Urban Travel Demand Model and associated traffic data (2024)	✓	✓
Estimated precinct employment data (MPDC, 2024)	✓	✓
Port of Hobart Evans Street freight trips (2017)	✓	✓
TasPorts Commodity Data for 2016/2017 and average data	✓	✓
Site survey (2020)	✓	✓
City of Hobart live parking dashboards (https://www.hobartcity.com.au)	✓	✓
TasPorts high and low traffic management plans	✓	✓
Drawings and sketches:		
Northern Access Road and stadium footprint, (Department of State Growth, 2023)	✓	✓
TasPorts Northern Access Road Concepts (x2) (Burbury Consulting, 2024)	✓	✓
Precinct concepts (Cox Architecture, 14 June 2024)	✓	✓
Draft Urban Design Framework POSS Report (Cox Architecture, 27 June 2024)	✓	✓

3 Project of State Significance

The Project of State Significance guidelines were finalised and issued on 16 February 2024. These Guidelines document the issues to be understood to support the planning approvals process. To track the guidelines, a summary register with consolidated responses is provided here in Table 3.1 and the full Movement Guidelines and responses are included in Appendix C.

Table 3.1 POSS guidelines and responses

No.	Item	Response
Travel scenarios and management options		
6.1.1	The reports are to provide a transport assessment that provides evidence and information on a range of potential travel demand scenarios and travel demand management measures to be implemented and extended/adapted over time to achieve acceptable outcomes for stadium users and the broader transport/movement network.	The reports provide a transport assessment with scenarios that incorporate different mode splits and venue capacities, to test different travel demand preferences and different uses of the stadium. The results give insights into the travel demand management task. The reports highlight event travel behaviour campaign measures to be further developed, which will achieve acceptable outcomes for stadium users and the broader transport/movement network.
Traffic, freight and transport routes		
6.2.1	The reports are to discuss how the use of the stadium relates to and affects...function of roads in the locality;... current and estimated traffic volumes and level of service of roads;... periods of congestion on roads in the locality of the stadium.	The strategic modelling considered 2030 road network volume / capacity as well as public transport capacity. The strategic modelling provided outputs on the effect of the stadium on the transport network. Sensitivity testing was also done on model year 2050.
6.2.2	The reports are to assess the road network changes/improvements and the other management interventions required to maintain the function, level of service and safety of major roads and the broader network.	The strategic modelling considered 2030 road network volume / capacity as well as public transport capacity. The project has focused on increasing use of non-car mode share to maintain the function, level of service and safety of major roads and the broader network.
Access: mass/public transport, car use and parking		
6.3.1	The reports are to discuss and provide information on issues, effects and user preferences associated with people choosing to use mass/public transport rather than cars (private cars/ride share) to travel to the stadium/locality for events.	The strategic modelling found that in the tested scenarios increased numbers of private vehicles stretch the Tasman Highway beyond capacity. This is also reflected in the 2030 base case model without stadium demands. A coordinated, multi-agency, event travel behaviour campaign to encourage public transport trips is required.
Pedestrian/cycling movement		
6.4.1	The reports are to discuss the characteristics of the use of the stadium and associated pedestrian, cycling and other non-motorised movement. The reports are to discuss and present information on the origins/destinations.... The associated planning, infrastructure provision and management issues are to be discussed, ... and consider factors such as time of day and other conditions.	Sustainable modes are prioritised in the transport strategy and the Implementation Plan. This aligns to the approach of the Access Study and the Green Star rating assessment. The reports discuss issues and opportunities regarding active transport and the Macquarie Point Multipurpose Stadium precinct development.

4 Origins study

4.1 Purpose

The Origins Study proportions transport mode shares for Macquarie Point Multipurpose Stadium journeys by potential event patron origin location. Building upon the Access Study, the Origins Study (see Appendix D) provides insights into the origins of people's travel and the mode of transport they may use to access the stadium. The Origins Study considered existing travel patterns, existing and planned public transport provision, existing car parking supply and availability to estimate origin - mode matrices. These initial outcomes were then compared to Tasmania Devils AFL Club membership data, provided as number of members by postcode. The origin - mode matrices were then adjusted to reflect the spatial spread of higher or lower membership data across areas.

The Origins Study assists in quantifying the potential demand for event transport to and from the stadium from various parts of the Greater Hobart area.

4.2 Data and method

The Origins Study used the modal splits developed in the Access Study, and then proportioned trips by origin. ABS statistical areas (ABS SA2 and SA3) to define the origin of demand for event transport. Journey to Work data from the 2021 Census for various modes was used to proportion event transport demand across the Greater Hobart Area. The task also used other sources of data including the Hobart Household Travel Survey and Tasmania Devils AFL Club membership data to verify and sense check outputs. The GHUTDM model data was also reviewed for the forecast year.

4.3 Scenario

For the purposes of the Origin Study, Day 1 scenarios were considered with the base target for Non-Car mode share (Capacity 24,500 60 per cent Day 1 and Special 31,500 crowd 60 per cent non-car Day 1). These scenarios represent an opening event at the stadium with minimal proposed transport network upgrades.

4.4 Membership data

The AFL Tasmania Devils Football Club was launched in March 2024, with the commencement of sales of club memberships. Club membership data (191,764 members as of May 2024) was reviewed for this study to understand the origins of membership by postcode, as a basis for origins of people who may be likely to attend events at Macquarie Point. Devils membership data was seen as a suitable proxy for cricket and concerts and directly relevant for AFL. Tasmanian postcodes were linked to an SA3 to normalise the spatial distribution between membership and census data. Membership data was assessed to understand spatial patterns or hotspots/centres for members. This assisted in enhancing the transport assumptions by origins for matches when compared to the general population patterns from the Census.

Membership data shows that more than half of members are Tasmanian (54 per cent). The largest proportion of membership is from the Hobart SA3s, making up 53 per cent of all Tasmanian memberships. Membership is highest in Hobart – North East, where almost 1 in 3 people are members (18,257 members from a population of 59,161, 31 per cent). This indicates a higher concentration of members in this part of Hobart. Additionally, membership is lower in Hobart-North West than the general population proportion (around 1 in 8 people are members).

Following the assessment of the Tasmania Devils membership origin data, adjustments were made to the proportions of travel to reflect that more demand may come from origins in Hobart – North East. The proportion of event bus was altered to provide further event-specific services to Hobart North-East.

Before the detailed and coordinated transport plan and traffic management plans are developed, a comparison of membership postcode data for the Hurricanes and Devils could be considered if available. This would identify if any postcodes have seen a marked increase in memberships requiring adjustments to the mode share and transport provision.

4.5 Events – Origins by mode - overall summary (updated following membership data)

An overall summary of trip origin estimates by SA3 is shown in Table 4.1 and Table 4.2 for a Special Event 31,500 Day 1.

The tables show that:

- Walking trips are forecast to contribute 22 per cent of the stadium transport task, with the majority of origins from within the Hobart-Inner SA3. This speaks to the CBD location near to hotels and accommodation and not just Hobart Inner residents.
- Cycling and micromobility trips are forecast to contribute 3 per cent of the stadium transport task, with the majority from within the Hobart-Inner SA3.
- Bus trips are forecast to contribute 30 per cent of the stadium transport task, with the majority utilising event bus services. Bus trips are proportioned fairly evenly from Hobart-North West, Hobart – North East and Hobart-South and West. A smaller proportion is expected from Hobart Inner, as there will likely be a lower reliance on bus and a higher proportion of walk and micromobility trips from Hobart Inner origins.
- Ferry trips are forecast to contribute 2 per cent of the stadium transport task, mostly from within the Hobart-North East SA3.
- Coach trips are forecast to contribute 2 per cent of the stadium transport task and are expected to have origins outside of the Hobart SA3s.
- Private vehicle trips are forecast to contribute 30 per cent of the stadium transport task, with the largest proportions from Hobart-North West and Hobart-North East SA3 origins. Outer SA3s are more reliant on private vehicle, as there are less transport options available.
- Taxi/ride share trips are forecast to contribute 10 per cent of the stadium transport task, with the majority from Hobart Inner SA3 origins.

Table 4.1 Overall trip origins distributed by mode (31.5k crowd 60% non-car Day 1) – percentages (considering membership data)

SA3 – trip origin	Walk	Cycle/ micro mob.	PT Rapid bus	PT Local Bus	PT Event Bus	PT - Ferry	Private vehicle - CORP	Private vehicle – park and walk	Private vehicle – drop off	Coach	taxi / ride share	Total
Hobart Inner	21.4%	2.7%	0.8%	0.9%	0.0%	0.2%	0.5%	2.6%	1.2%	0.0%	6.7%	37.2%
Hobart - North West	0.2%	0.3%	0.8%	0.8%	6.9%	0.2%	0.4%	4.1%	2.0%	0.0%	2.1%	17.8%
Hobart - North East	0.2%	0.3%	0.8%	0.9%	9.3%	1.9%	0.5%	5.2%	2.4%	0.0%	1.0%	22.4%
Hobart - South and West	0.2%	0.0%	0.8%	0.5%	5.4%	0.0%	0.3%	3.4%	1.6%	0.0%	0.2%	12.4%
Brighton	0.0%	0.0%	0.0%	0.1%	1.5%	0.0%	0.1%	1.2%	0.6%	0.0%	0.0%	3.4%
Sorell - Dodges Ferry	0.0%	0.0%	0.0%	0.1%	1.5%	0.0%	0.1%	1.2%	0.6%	0.0%	0.2%	3.6%
Outside of model area	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	1.7%	0.0%	3.0%
Total by mode	22.0%	3.3%	3.2%	3.3%	24.5%	2.3%	2.0%	19.1%	8.4%	1.7%	10.1%	100%

Table 4.2 Overall trip origins distributed by mode (31.5k crowd 60 per cent non-car Day 1)- patron numbers (considering membership data)

SA3 – trip origin	Walk	Cycle/ micro mob.	PT Rapid bus	PT Local Bus	PT Event Bus	PT - Ferry	Private vehicle - CORP	Private vehicle – park and walk	Private vehicle – drop off	Coach	taxi / ride share	Total
Hobart Inner	6,744	860	252	293	0	74	161	827	391	0	2,122	11,724
Hobart - North West	76	103	252	252	2,164	74	128	1,299	615	0	650	5,612
Hobart - North East	48	87	252	288	2,937	589	160	1,630	772	0	303	7,067
Hobart - South and West	48	0	252	171	1,700	0	106	1,073	508	0	58	3,916
Brighton	0	0	0	26	464	0	37	375	177	0	0	1,079
Sorell - Dodges Ferry	0	0	0	21	464	0	38	386	183	0	58	1,149
Outside of model area	0	0	0	0	0	0	0	429	0	525	0	954
Total by mode	6,917	1,050	1,008	1,050	7,729	736	630	6,019	2,646	525	3,190	31,500

Figure 4.1 shows the origin percentages for people attending the multipurpose stadium in an event scenario.

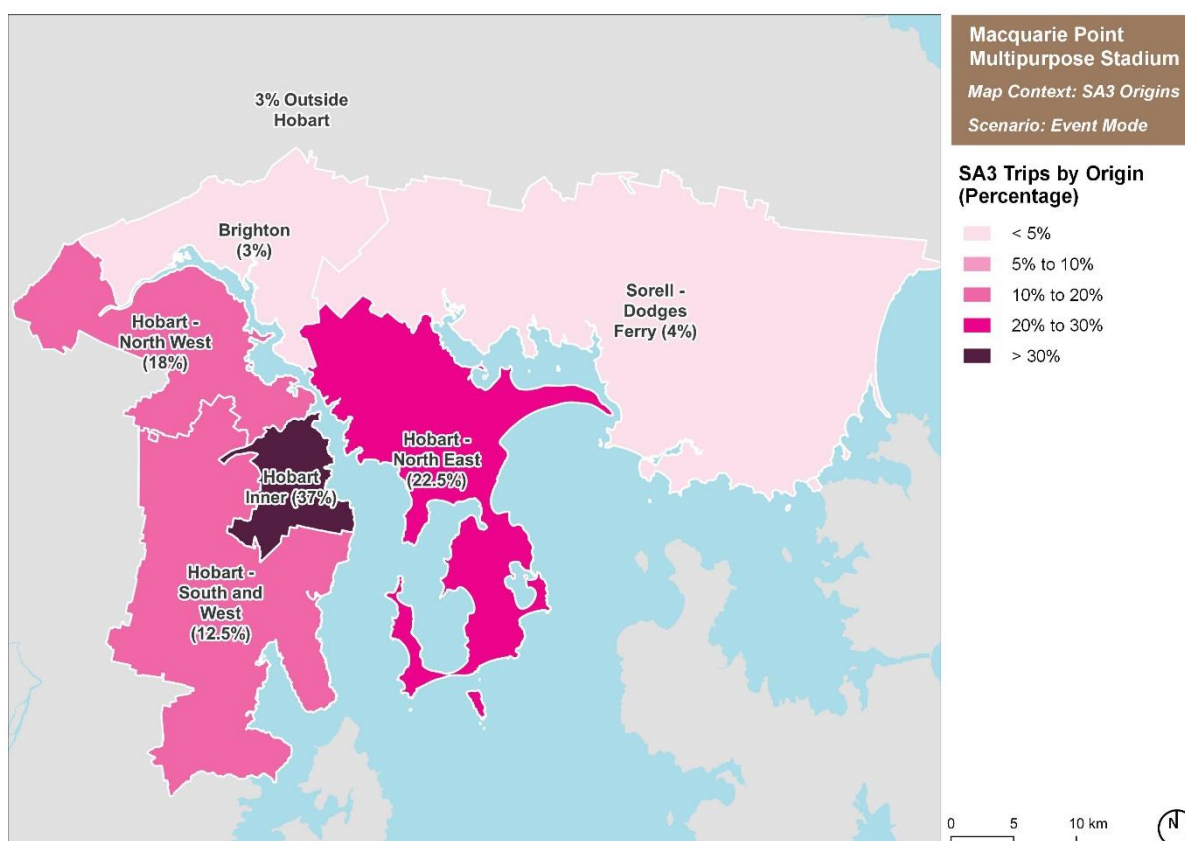


Figure 4.1 Origins by percentage

4.6 Conclusion

While the Origins Study identifies where people are likely to travel from, a coordinated event travel behaviour campaign is required to encourage the necessary mode shift to support a multi-modal, sustainable and accessible event transport plan. The transport stakeholders, or future Transport Working Group for the stadium, should establish roles and responsibilities for the travel behaviour campaign, however, global and domestic best practice shows that travel behaviour messaging from a club (for sporting events), in this case the Tasmania Devils or the Hobart Hurricanes, is the most successful way to drive the necessary sustainable travel behaviours, with planning led by government agencies, transport providers and the future stadium operators. In the case of concerts, promoters may need to adopt or promote the campaign that has been developed by the lead transport agency.

Travel behaviour change for commuters may also be required where events overlap with commuter peaks, however, this should be assessed on a case by case basis. The intention should not be to encourage workers to work from home on any and all event days as this would be detrimental to the CBD economy.

5 The Port, traffic and transport modelling

5.1 Port operations

The Macquarie Point precinct is strategically located on the edge of the Hobart CBD and adjacent to the Port of Hobart. This working port is a significant contributor to both the local, Tasmanian and Australian economy through its role as the country's gateway to the Antarctic territories, its export of bulk commodities and its role as a cruise terminal. TasPorts also have tenants of car parking spaces and commercial properties and lease the Mac02 events venue for functions and events.

TasPorts is the responsible entity for the Port of Hobart. The Port of Hobart area is shown in Figure 5.1 and encompasses key areas required as part of the stadium transport plan including Hunter Street and the waterfront. Day to day function of the precinct (most days of the year without stadium events) has less impact, if any impact, on TasPorts land.



Source: TasPorts (<https://tasports.com.au/hobart-port-information>, June 2024)

Figure 5.1 TasPorts area of responsibility

TasPorts have identified that there are increases in use and change in use for some aspects of port operations. These include the Antarctic Division, cruise ships, cargo ships and log vessels. Landside operations for these vessels is often intense over multiple days and can be a 24 hour operation with supporting vehicle access required. The key commodity volumes and operations of the Port of Hobart are outlined in Table 5.1.

Table 5.1 Summary of port operations

Commodity	Volume (maximum)	Vehicle types	Vehicle movements	Operation
Antarctic	12,500 tonnes pa	Semi-trailer (15t)	1,660 per annum	Steady flow
Veneer	50,000 tonnes pa	Semi-trailer (25t)	4,000 per annum	4 ships per year
Fertiliser	240,000 tonnes pa	Truck & Dog trailer (35t)	13,720 per annum	6 ships per year
Calcite	45,000 tonnes pa	Truck & Dog trailer (35t)	2,580 per annum	3 ships per year
Bulk zinc	80,000 tonnes pa	Semi-trailer (25t)	6,400 per annum	4 ships per year
Containers	8,000 TEU pa	Mixed incl. B-Double	16,000 per annum	Every 2 weeks
Bulk Logs	150,000 tonnes pa	Semi-trailer B-Double (30t)	10,000 per annum	6 ships per year
Skretting	52,000 tonnes pa	Semi-trailer (25t)	4,800 per annum	Every 6 weeks
Other cargo	15,000 tonnes pa	Semi-trailer (15t)	2,000 per annum	Steady flow

Source: TasPorts (June 2024)

According to data provided by Department of State Growth (May 2024), in the order of 200,000 tonnes (2022/2023 FY) pass through the Macquarie Wharves annually, including around 3,000 twenty-foot equivalent units (TEUs). An estimated 70 per cent of freight traffic is comprised of exports while the reminder 30 per cent are imported products and a significant 75 per cent of products through the Port are non-containerised. As a result, an estimated 7,000 annual laden truck movements involving a combination of single prime mover semi-trailers (19m), B-doubles (21-26m) and truck and dog trailers combinations (19-25m) would be expected to travel to and from these wharves annually.

Through engagement with TasPorts, it has been identified that freight and commodities can fluctuate significantly between seasons and years. The freight and commodities data outlined here should be taken as a guide and could be higher during stadium construction and/or stadium operations years.

Much of the freight through the area is based around the Port of Hobart, in particular Macquarie Wharves 1-6 accessed via Evans Street and the future Northern Access Road and to a lesser extent the adjacent Princes Wharves 1 & 2 accessed via Castray Esplanade.

The establishment of the Northern Access Road as the priority point of access to the Port of Hobart for most road based freight movements will need to be carefully coordinated with stadium construction and event operations to ensure continuity of port operations. There will be an ongoing vehicle access requirement to the port via Evans Street, particularly for cruise terminal operations and access to port controlled areas beyond the secured port zone.

5.1.1 Northern Access Road

The establishment of the Northern Access Road will transform access to and from the Port of Hobart by providing direct access to and from the Tasman Highway to the north of the Port. This will relieve pressure on the existing Evans Street gateway which can require navigation of the Hobart CBD road network as an access route. This route will remain for general traffic access to the port as well as oversized vehicles which are constrained by the height of the McVilly Drive interchange and the short on ramps.

This area must be integrated with other precinct uses and users as the Northern Access Road is also essential for stadium access including access to the precinct car parking, underground stadium parking and access (deliveries etc) and the event bus plaza.

Proposals for the Northern Access Road and integration into any stadium access should prioritise Port access. This includes priority access into and out of the Port, such that Port traffic is not delayed by event buses or other stadium traffic. It is understood that design concepts are being progressed for this new road link with priority access given to the Port, however, consideration should be given to stadium traffic so that event buses can operate efficiently. The importance of this efficiency increases as the stadium capacity increases. Furthermore, success of a multi-modal and

sustainably focused transport plan requires transport customers to have positive experiences as they travel to and from the stadium. A smooth and quick egress is often the best measure of a successful event transport plan.

Technology solutions could be investigated to achieve priority freight access on the Northern Access Road.

5.1.2 *Evans Street*

Evans Street is the road based gateway to the Cruise Terminal, MACq 01 Hotel, the UTas campus and other waterfront areas, businesses and tenants. Evans Street is also required for ongoing access for over-height freight and commodity vehicles which currently cannot pass under the McVilly Drive interchange at the Tasman Highway. There is an opportunity for more heavy vehicles to access the Port via the Northern Access Road if the interchange could be redesigned to accommodate over height vehicles and be provided with lengthened acceleration and deceleration lanes. However, we note this would need to suit operations at the Port and wharves, and not all port vehicles are 'freight' vehicles and servicing and operational vehicles will continue to use Evans Street regardless of a redesigned interchange.

Evans Street will continue to play a critical role for access to the cruise terminal and the Port, however, the Northern Access Road will become the primary access point for Macquarie Wharves 1-6. This will reduce the heavy vehicle demand on Evans Street but will not eliminate it. In 2017, 4,219 heavy vehicle trips (source: Port of Hobart, Evans Street 2017) used Evans Street for port access. Removing a proportion of these trips from Evans Street will allow opportunity for reallocation streetscaping, bicycle lanes and integration into the multipurpose stadium precinct design.

5.1.2.1 *Cruise terminal and supporting landside operations*

Up to 155,200 cruise passengers on 93 vessels are scheduled to pass through the Port of Hobart during the 2024/25 cruise season which operates between late October and late April.

The Port of Hobart can accommodate two cruise vessels concurrently up to a maximum length of 349m. Macquarie Wharf No. 2/3 is the primary cruise ship berth in Hobart and is home to the Macquarie Wharf No. 2 Cruise Terminal. Additional cruise ships are accommodated at the adjacent multiuser berth at Macquarie Wharf No. 4/5. Vessels of varying sizes from 72 passengers to 4,905 passengers visit the port and berth at the following wharves:

- Macquarie 2-3 – 228 pax to 4,905 pax
- Macquarie 4-5 – 72 pax to 3,080 pax
- Macquarie 6 - 72 pax
- Zone C – 120 pax
- Princes 1 – 72 pax.

On arrival, shore excursion coaches are staged alongside the cruise ships at berth and passengers can access additional visitor services via a short walk to the Macquarie Wharf No. 2 Cruise Terminal. The shore excursion vehicles currently access the cruise terminal via Evans Street. Drivers entering the secure port do not require a port access pass but need to have completed the general and Port of Hobart inductions, as well as being on the vessel security list. The public is welcomed to access the Macquarie Wharf No. 2 Cruise Terminal. Access to the wharf-side of the building is restricted.

Cruise schedule and sporting fixtures

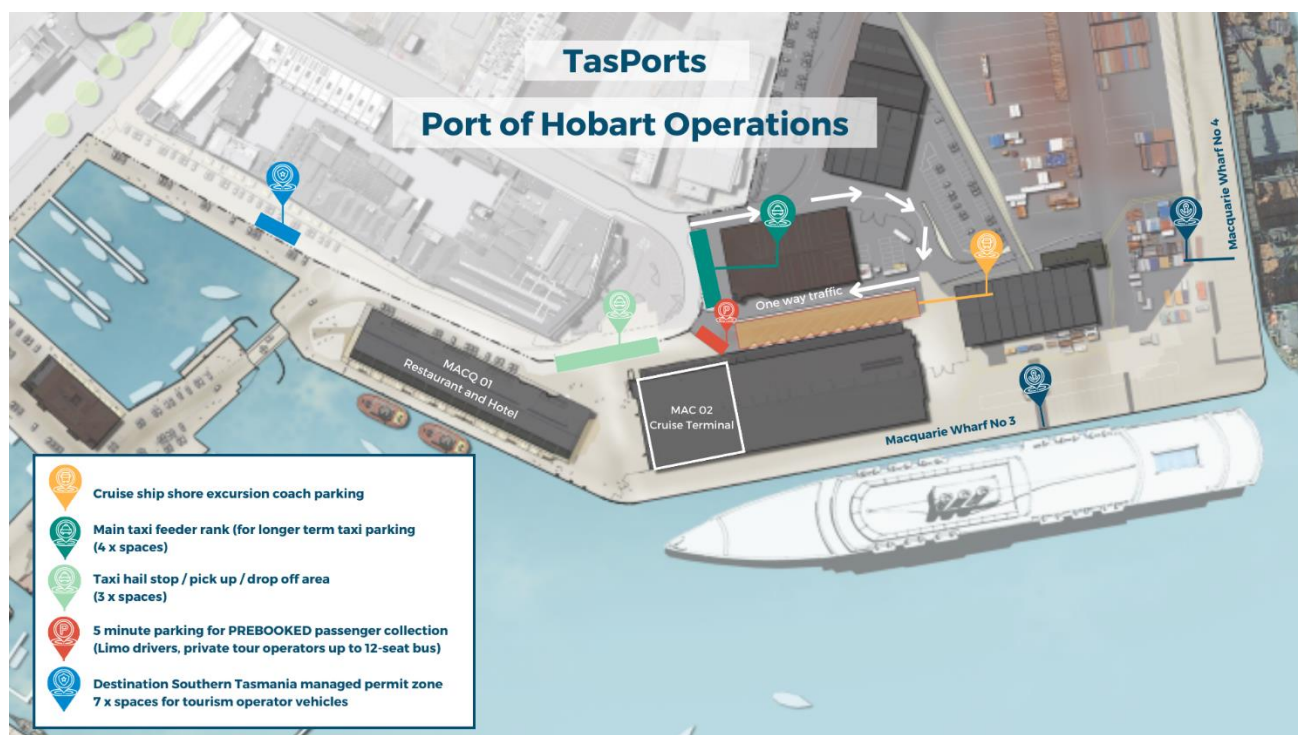
A review of both the cruise schedule for 2024/25 and the competition schedules for the AFL 2024 season (March to September) and the 2023-24 BBL cricket season (December to January) indicates that a worst case scenario of six events could potentially overlap whereby a cruise ship has not departed at least 2 hours before a sporting event commencing. Two matches would be BBL cricket whereby the match commences consistently at 7:15pm for the prime time national broadcast. The remaining four AFL matches which would start at 7:30pm on a weeknight (Thursday or Friday two matches) or multiple time slots on a weekend (two matches).

The worst case scenario would be the Ovation of the Seas (4,905 pax) which is scheduled to depart on a Thursday night in March at 8pm. The average departure time for the 93 cruises is 5:40pm and the majority occur on a weekday. The AFL may provide opportunity to request preferential home game weekends or days of the week to mitigate critical overlaps

like this. This should be taken up with the AFL, particularly for early season matches which overlap with cruises for 3 weeks. TasPorts have advised that the cruise schedule is known two years in advance and also that the cruise season tends to be starting earlier and extending longer as its popularity increases. This early knowledge provides a great opportunity to integrate the known cruise days into the stadium operations and transport plan.

While the match day and cruise ship overlaps appear to be manageable, engagement with TasPorts has identified the frequency and nature of landside port operations that take place in the days pre and post a cruise ship being in port. These activities are as essential for the cruise ships as the shore excursion coaches are. For this reason, the previously identified cruise terminal coach parking area (shown in orange in Figure 5.2) is not proposed as private charter coach parking for stadium events.

It is also acknowledged that MAC 02 operates as venue space outside of the summer cruise season with a standard capacity of 1,100 persons including staff and up to 3,000 with a temporary permit.



Source: TasPorts website (June 2024)

Figure 5.2 Port of Hobart Cruise Ship terminal transport operations

5.1.3 Waterfront and Hunter Street

The Hobart waterfront, Hunter Street and Sullivans Cove, play an important role in the operation of the cruise terminal when passenger ships visit the city between late October to late April. It becomes the gateway to the city for the thousands of visitors and the changing face of the Macquarie Point precinct provides an opportunity to further enhance its historic place value established over 200 years.

TasPorts has tenants with statutory level access for their parking along Franklin Wharf area. Of note, MACq 01 will need to be able to accept hotel guests arriving and departing at any and all times.

Other tenants include Mures, Kings Pier Marina and other businesses along Hunter Street and Franklin Wharf.

5.1.3.1 Existing traffic management plans

TasPorts reduce the movement of vehicle traffic at the Port of Hobart on cruise ship visit days during the cruise season with either a 'high level' or 'low level' traffic management plan. Both plans provide an area with access to permitted vehicles only from Hunter Street, across the dock and bridges to Argyle Street. Permit holders and service vehicles continue to have controlled access, by way of traffic controllers. Permits are required to be clearly displayed to ensure

access. To assist with ongoing traffic management in the area, pedestrian flow is monitored continuously, and the area is re-opened to vehicle traffic when it is safe to do so.

Under the high level plan a pair of boom gates are also set up to provide a dedicated pedestrian crossing between the southern end of the cruise terminal (northern end of MACq 01) and the footpath on the western side of Hunter Street. A crossing from the footpath to the closure area is managed by traffic controllers.

When developing traffic management plans to support stadium events the TasPorts plans should be considered as a baseline as they address the current needs of the Port and its cruise customers and have considered the access needs of the public, tourists and tenants. Permit holders are allowed access when the high and low level plans are in place and there is no financial loss (i.e. parking is retained) as a result of the traffic management plans implemented by TasPorts. Plans are available from TasPorts.

Future traffic management plans will need to support cruise ship needs, TasPorts tenants, the working port and stadium crowds and should be developed in consultation with TasPorts.

5.1.3.2 Pedestrian safety

Currently there are some trip hazards such as wheel stops and kerbs as well as signposts and other street furniture along Hunter Street and around the waterfront. Some works to support pedestrian safety and reduce trip hazards have been identified in section 8. Working waterfronts and ports, by their nature, are not risk free. The water presents a hazard and it is noted that while some fencing has been installed and additional fencing sections are proposed, it is not feasible or practical to fence the entire waterfront while maintaining its intended purpose. Any wharf edges for further fencing should be worked through with TasPorts.

The precinct pedestrian modelling identified poor levels of service along the Davey Street footpath during event egress as people disperse into the CBD and to Salamanca. Vehicles attempting to exit onto Davey Street or Franklin Wharf (area shown in Figure 5.3) will likely need to be held for up to 30 mins post event until peak crowds reduce. This should be reviewed and refined through the future traffic management plan process.

Pedestrian safety should be an ongoing focus in planning for crowd movements. It is another reason in support of the proposed Collins Street Active Transport Bridge in that a dedicated, grade separated, link into the CBD is available without passing along the waterfront therefore balancing pedestrian access to the Hobart CBD.

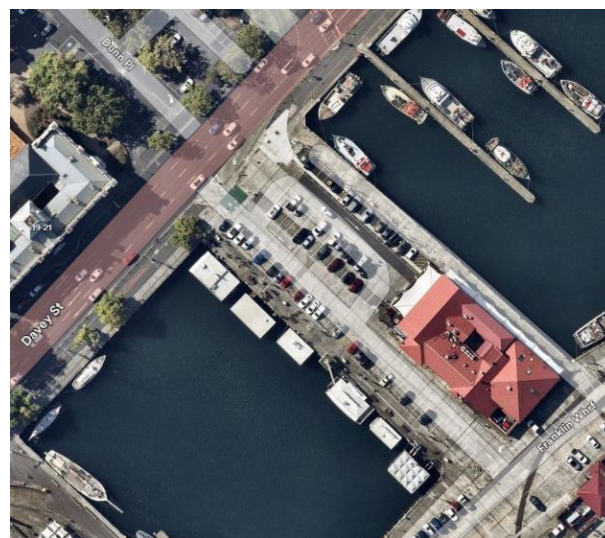


Figure 5.3 Mures at the Waterfront

5.2 Roads, intersections and freight

The Macquarie Point multipurpose stadium site is located immediately east of the Hobart CBD and is bounded by the Tasman Highway and Davey Street to the west, Regatta Grounds and Queens Domain to the north, Macquarie Point Wharf to the east and Evans Street to the south.

Regionally, key major routes to the site include the Brooker Highway/Brooker Avenue to the north west of the site, Tasman Highway to the north east, Southern Outlet to the south and Sandy Bay Road to the south east.

The Davey Street and Macquarie Street couplet (operating as a one-way pair) provide access to and from the site south of the Hobart CBD with Evans Street, Hunter Street and Macquarie Point Access Road each provide local access to the current site.

5.2.1 Regional road network and existing traffic demands

Key routes in the regional road network are shown in Figure 5.4, and discussed in the following section.

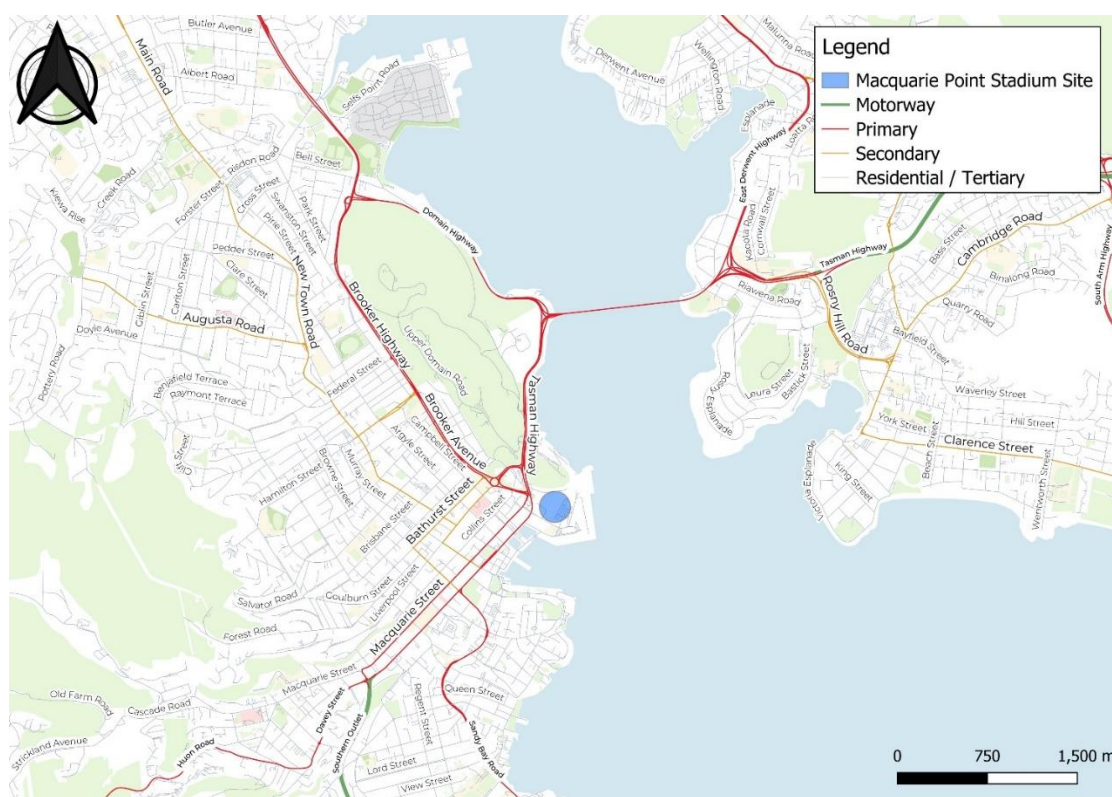


Figure 5.4 Regional road network

Annual Average Daily Traffic (AADT) Volumes (where available) on the surrounding road network are shown in Figure 5.5. Traffic demands on the key routes into and out of Hobart generally show an AM peak demand between 7am and 9am, and a PM peak demand between 3pm and 6pm, followed by a steep decrease in demand from around 6pm following the conclusion of the commuter peak.



Source: *Tasmaniatrafficdata*
<https://tasmaniatrafficdata.drakewell.com/publicmultinodemap.asp>

Figure 5.5 Annual Average Daily Traffic Volumes (AADT)

The Tasman Highway (at the Tasman Bridge) exhibits the expected inbound AM and outbound PM peak traffic peaks. Inbound (westbound) traffic peaks at around 4,000 vehicles per hour at between approximately 7am and 9am while outbound traffic peaks at a similar level between approximately 4pm and 6pm before dropping sharply. Throughout the day, volumes are around 2,500 vehicles per hour in each direction. During the weekends, traffic in each direction tends to peak at midday with around 4,000 vehicles per hour with a steady decline to 3,000 vehicles per hour at 5pm with a sharper decline to around 1,500 vehicles per hour at 7pm.

A traffic and freight memo is included in Appendix E.

5.3 Transport modelling

Strategic modelling using the Greater Hobart Urban Travel Demand Model (GHUTDM) has been undertaken. This model was selected as it is established, is used regularly for strategic planning purposes in Hobart, allows for testing of both traffic and public transport, has coverage of the Greater Hobart area and would allow for various demand scenarios to be loaded in following the results of the Origins Study.

The full modelling report is included in Appendix F and summarised in the following section.

5.3.1 Methodology

The strategic modelling methodology (shown in Figure 5.6) is outlined in the below steps:

- 1 Develop the Base Case 2030 GHUTDM model to obtain the typical PM peak demand matrices.
- 2 Incorporate event travel demand matrices for each scenario. Event travel demand matrices will be derived using findings from the Origins Study (see Origins Study memo).
- 3 Assign combined 2030 PM peak travel demand matrices to the road network.
- 4 Assess the road network performance by assessing metrics including volume to capacity ratios (V/C) and comparing against typical non-event day.

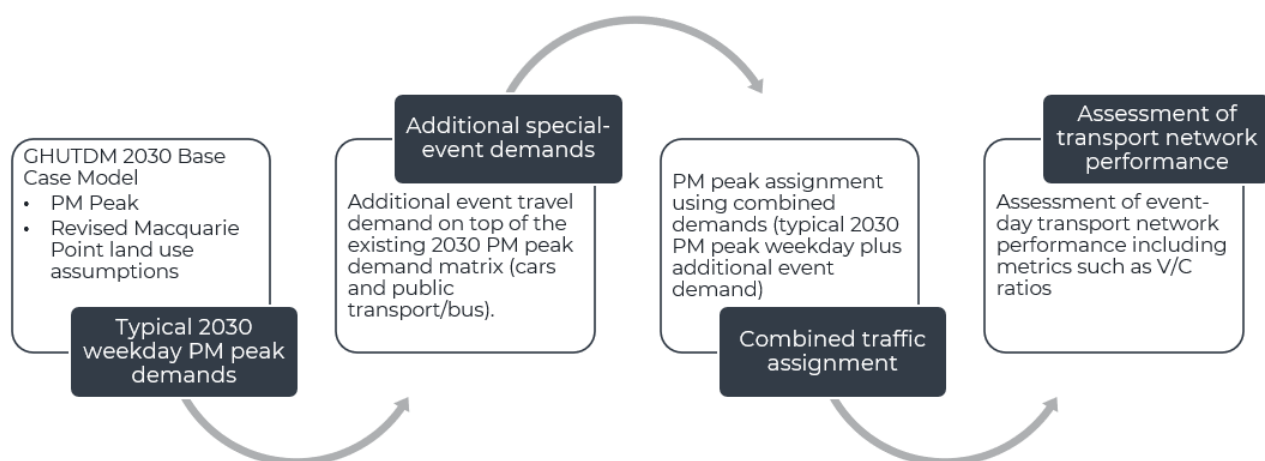


Figure 5.6 Modelling methodology

5.3.2 Modelling assumptions

The key assumptions adopted for the strategic modelling are shown in Table 5.2.

Table 5.2 Strategic modelling assumptions

Assumption	Description
Model year	Year 2030 has been adopted as the model forecast year given it is a standard reference case forecast year in the GHUTDM and it is after the proposed Macquarie Point Stadium opening in 2029.
Land use	The strategic modelling adopts the 2030 MetroPlan reference case land use assumptions except for the Macquarie Point Stadium zone. To reflect the latest land use assumptions for the Macquarie Point Precinct, the existing land use for the zone in the 2030 Base Case, and all subsequent event scenarios, has been updated to have a residential population of 200 and a total of 1,400 jobs.
Time period	The strategic modelling has been undertaken on the GHUTDM PM peak (16:00 – 18:00) period. Superimposing the additional event demand onto the PM peak demand is considered to provide a conservative demand scenario as typical inbound spectator travel for weekday events would occur later than the PM peak for a 7:30pm match. Superimposing the additional event demand onto the AM peak demands was considered unrealistic.
Public transport network	The 2030 reference case public transport network has been adopted in this analysis. The reference case network includes the public bus network and does not include the existing ferry service or the proposed rapid bus services, event buses or additional ferry services. For the purposes of scenario modelling and identifying areas of constraint or opportunity, all the public event-day trips (public bus, rapid bus, event bus and ferry) are loaded onto the public bus network.
Destination zones	Event-day private vehicle trips have been distributed across zones in Macquarie Point, Hobart CBD and the surrounding fringe to reflect the dispersed parking availability in the city. Event-day public transport trips have a destination to the Macquarie Point Stadium zone.

5.3.3 Scenarios and results

The various scenarios developed to address the POSS Guidelines and their results are shown in Table 5.3.

Table 5.3 Transport modelling scenarios and results

Scenario	Results
Base Case	The Base Case land use assumptions adds additional employment and household residents to the Macquarie Point Precinct compared to the Reference Case. The land use changes do not create significant changes to the typical weekday traffic patterns compared to the Reference Case. In the 2030 Base Case, forecast demands in the AM and PM peak periods are expected to create congestion on the key road links into the Hobart CBD including the Tasman Highway, Brooker Highway and Southern Outlet. These key corridors are approaching or at capacity, exhibiting a V/C greater than 0.9, with the Tasman Bridge, sections of the Brooker Highway and Macquarie and Davey Streets are expected to exceed capacity ($V/C > 1.0$) in both the peak periods without event demands. As a result, the Hobart road network may be susceptible to traffic incidents and significant spikes in demand.
Scenario 1: Seated sell out, 24,500 capacity, 40% private vehicle	Over 1,300 vehicles over the Tasman Bridge, 900 vehicles on the Brooker Highway, and 600 vehicles on the Southern Outlet are generated by event demands. As a result, the Tasman Bridge is expected to be operating over capacity and the Brooker Highway is approaching capacity. This reinforces the need for an event travel behaviour campaign. In comparison to the 2030 Base Case AM peak period, the inbound routes are less congested. As the Tasman Bridge becomes congested and exceeds capacity, some vehicles travelling from the eastern to northern suburbs divert north to the Bowen Bridge.
Scenario 2: Seated sell out, 24,500 capacity, increased private vehicle to 60% (as a proxy for bad weather or a lack of travel demand management)	The additional traffic in this scenario is expected to cause the Tasman Highway and Brooker Highway become more congested on approach to the CBD. This is reflected in increases in V/C ratio compared to Scenario 1. Over 2,000 vehicles are generated by event demands on the Tasman Bridge. A coordinated, multi-agency, event travel behaviour campaign to encourage public transport trips (so that the 60% private vehicle mode share doesn't occur) is essential.
Scenario 3: Concert mode sell out, 31,500 capacity, 40% private vehicle	The higher stadium capacity adds to the traffic volumes on the already constrained corridors of the Tasman Highway and Brooker Highway. Despite this, the expected level of congestion on inbound routes is expected to be less than the Base Case AM peak period. The resultant V/C ratios on the Brooker Highway, Tasman Highway and Southern Outlet are all lower than the respective inbound routes in the AM Base Case. Sections of Macquarie Street exceed capacity ($V/C > 1.0$) due to event traffic. Under the Base Case assumptions these sections already exceed a V/C of 0.9.
Scenario 4: Concert mode sell out, 31,500 capacity, increased private vehicle to 60% (as a proxy for bad weather or a lack of travel demand management)	Increased numbers of private vehicles cause the Tasman Highway west of the Tasman Bridge to exceed capacity ($V/C > 1.0$). The extent of queuing may be better assessed using mesoscopic or microsimulation modelling. Despite the increased private vehicle mode share, the resultant V/C ratios on the Brooker Highway and Southern Outlet inbound direction are lower than in the Base Case AM peak.

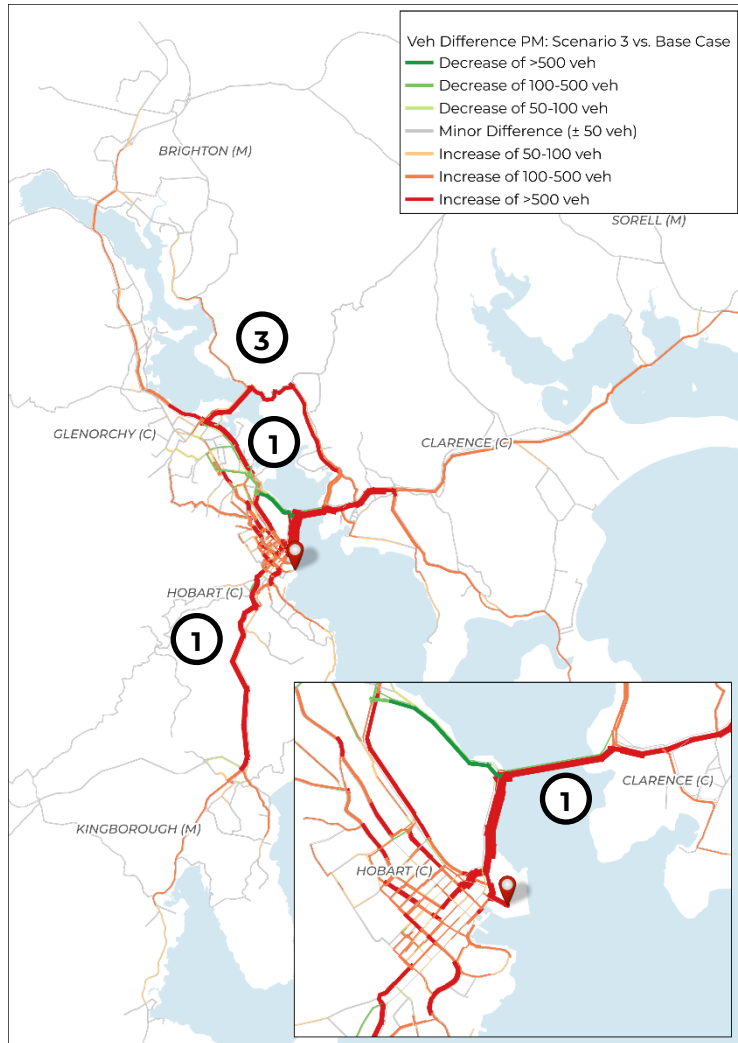


Figure 5.7 Vehicle Volume Difference (PM 2-hr): Scenario 3 vs. Base

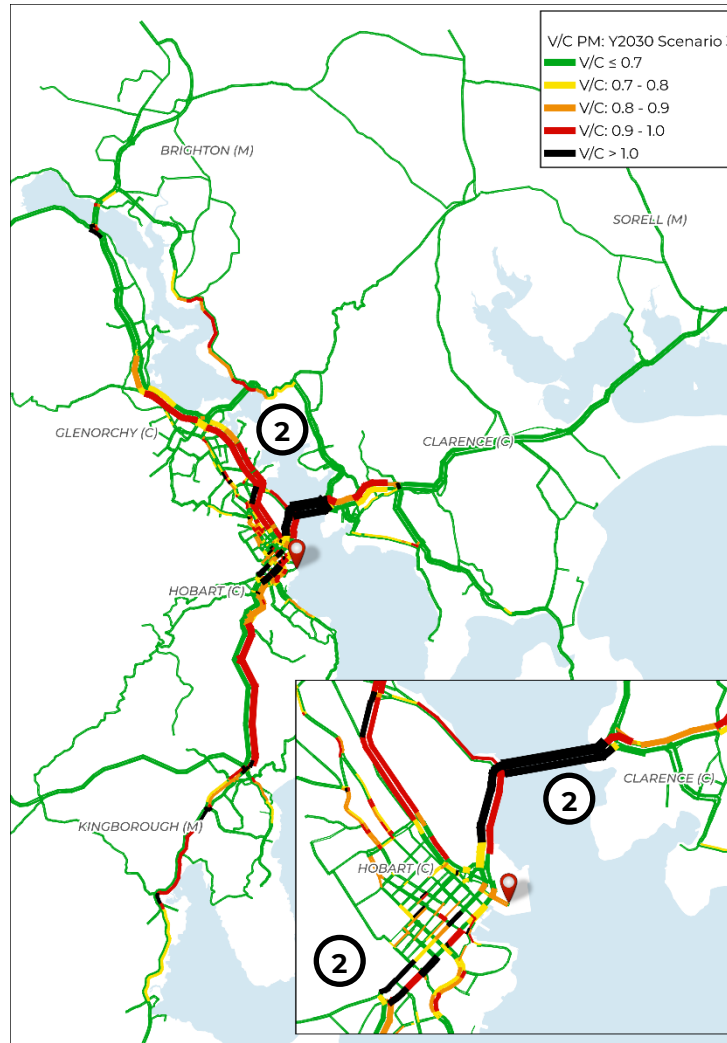


Figure 5.8 2030 Scenario 3 (31,500) V/C ratio

- 1 On top of typical PM peak demands, event demands add inbound traffic volumes on Hobart's key corridors, particularly the Tasman Highway, Brooker Highway and the Southern Outlet.
- 2 The Tasman Bridge exceeds capacity in the inbound direction due to event demands, whilst the Brooker Highway is approaching capacity. Macquarie Street is the constraint point for vehicles travelling from the south.
- 3 As the Tasman Bridge becomes congested and exceeds capacity, vehicles travelling from the eastern to northern suburbs divert north to the Bowen Bridge.

5.3.3.1 Travel times to Macquarie Point

The travel time comparisons across key corridors to Macquarie Point are shown in Table 5.4. Travel times under the event demands modelled on the PM peak are predicted to be lower than the same route for a typical AM period except for the Tasman Highway route in Scenario 4 (which increases stadium capacity and the percentage of private vehicle travel). The Tasman Highway is the most susceptible to changes in travel time from increased traffic volumes. The Tasman Highway is operating at near capacity in the 2030 PM Base Case and additional traffic causes it to exceed capacity.

Table 5.4 Modelled travel time (to the nearest minute)

Travel time route	2030 AM Base Case	2030 PM Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Tasman Highway – Rosny Hill Road to Brooker Avenue	11	4	7	10	8	14
Southern Outlet / Macquarie Street – Olinda Grove to Brooker Avenue	14	8	10	11	10	11
Brooker Highway – Elwick Road to Davey Street	15	9	11	12	12	13

5.3.3.2 Background trip travel times

A travel time comparison has been conducted across three of Hobart's key corridors, shown in Figure 5.9. The modelled travel times on these corridors for the 2030 Base Case and event demand scenarios are shown in Table 5.5.



In the 2030 AM peak base case (without the stadium), the journey from the Tasman Bridge to the Brooker Highway (blue line) is expected to take eight minutes. If the same trip was undertaken in the 2030 PM peak with the stadium demands included (as spectators are travelling to an event), the trip is estimated to take six to 10 minutes depending on the scenario.

In the case of the trip from the Tasman Bridge to the Southern Outlet (red line) past Macquarie Point, the travel time worsens slightly for all scenarios compared to the base (no stadium). Some of this time increase is expected to be mitigated through an event travel behaviour campaign.

The Southern Outlet to the Brooker Highway (purple line) travel time in the 2030 AM peak (without stadium) is estimated to be 16 minutes. The travel time remains largely unchanged for the same journey undertaken in the PM peak with stadium demands included.

If the same trip was undertaken in the 2030 PM peak with the stadium demands included (as spectators are travelling to an event), the trip is estimated to take approximately the same time for all scenarios.

Figure 5.9 Background travel time routes

Table 5.5 Background trip travel times (to the nearest minute)

Travel time route	Direction	2030 AM Base Case	2030 PM Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Tasman Bridge – Brooker Highway	Westbound	8	3	6	8	7	10
	Eastbound	5	8	7	7	7	6
Tasman Bridge – Southern Outlet	Southbound	14	13	16	19	17	22
	Northbound	19	17	18	18	18	19
Southern Outlet – Brooker Highway	Southbound	11	14	15	16	15	16
	Northbound	16	13	15	16	15	16

5.3.3.3 Travel speed assessment

Travel speeds have been looked at for three locations on the network; the Tasman Bridge, the Southern Outlet south of Proctors Road and the Brooker Highway south of Risdon Road. The travel speed assessment compares the posted speed limits with travel speeds in the model. Results are shown in Table 5.6.

Table 5.6 Travel speeds (km/h)

Travel speed location (inbound)	Posted Speed	2030 AM Base Case	2030 PM Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Tasman Highway – Tasman Bridge	70	11	47	17	11	14	9
Southern Outlet – south of Proctors Road	100	30	87	85	84	85	83
Brooker Highway – south of Risdon Road	80	20	38	25	24	24	23

5.3.4 Constraints and challenges

Key constraints and challenges identified in the modelling include:

- Due to the nature of Hobart’s geography, there are limited routes for inbound trips into Macquarie Point and the CBD. The key corridors of the Tasman Highway and Brooker Highway are expected to exhibit congestion as eventgoers converge on these routes during event ingress. Modelled V/C is greater than 0.9 on the Brooker Highway and greater than 1.0 on the Tasman Bridge in the inbound direction on approach to the CBD under all event demand scenarios. It is noted that the modelling takes a conservative approach by superimposing the total event demand with typical weekday traffic in the PM (16:00-18:00) peak period. In reality, it is expected that event traffic will be spread over a longer period and background traffic is expected to reduce significantly after 18:00.

- The Reference Case public transport network has limited inbound services during the PM period and a higher number of outbound services to address the needs of commuter travel. As a result loading many inbound event demand public transport trips causes some major public transport corridors on Main Road / New Town Road and the Southern Outlet to exceed capacity. This helps identify areas of focus for the Implementation Plan
- The Tasman Highway is the only route from the east and is expected to be congested with vehicle traffic under event ingress. Public transport options including event buses, public buses and rapid bus are likely to experience delays

5.3.5 Opportunities

Key opportunities arising from the modelling outcomes include:

- Targeted public transport interventions can be made to reduce overcrowding on corridors such as Main Road / New Town Road and the Southern Outlet. This may include event buses operating along these corridors to provide sufficient capacity to meet the forecast demands.
- Congestion on the Tasman Bridge suggests this should be a focus point for event specific transport services. Alternatives to private car trips including event buses should be considered. The expanded ferry network will assist.
- Reconfiguring the tidal flow lane on the Tasman Bridge after the PM peak period has passed (e.g. after 6pm) to add extra capacity to inbound lanes on event days. This maintains the additional outbound capacity for the peak outbound traffic in the PM as well as providing additional inbound capacity for event ingress immediately prior to events. However, we note the operational switch over of the tidal flow lane is a lengthy process.
- In the event ingress scenarios, the modelling shows that the Bowen Bridge and East Derwent Highway becomes the preferred route for trips between the northern and eastern suburbs. Communications and variable messaging on event days can be used to make drivers aware of the alternate route to reduce traffic volumes on the Tasman Highway and Brooker Highway.
- Operate event bus services on proposed rapid bus transit corridors. Bus priority measures as part of the rapid bus project, such as separated transit lanes and bus priority signals will help improve travel times for public bus, rapid bus and event bus services increasing the attractiveness of public transport options.
- Park and Ride locations can be used in conjunction with event buses. Eventgoers can access event buses by parking their cars at these locations, as well as access via drop off, cycle or walk.
- Removing the surface (at-grade) pedestrian and cycling movements across the critical intersections adjacent to the Macquarie Point precinct allowing the reallocation of signal phases and green time.

5.3.6 Additional network tests

Additional scenario testing has been undertaken to understand the traffic impact from an increase in maximum stadium capacity to 40,000 and to understand traffic volumes during the operating life of the stadium. These scenarios are:

- 2030: 40,000 capacity stadium
- 2050: 24,500 capacity stadium.

The first scenario is a sensitivity test based on a special event scenario with 40,000 capacity (Day 1). Like the 31,500 event, this represents the maximum venue capacity for events which use the playing surface for additional seating or standing e.g. concerts. In this case, the configuration of seating/standing in the grand stands plus seating on the pitch allows for a 40,000-maximum capacity. It is noted this is expected to be an infrequent scenario, occurring for only 1-2 events a year where the grand stand capacity has increased.

The transport origins by mode were increased to 40,000 total by:

- Using bus numbers from the 60 per cent non-car Day 1 scenario (as per origin study tables)
- Increasing coach from 525 to 1,000 people

- Increasing private vehicle numbers for the remainder (higher amount of private vehicle parking, drop off, and taxis).

Walk, cycle, ferry and within stadium parking for corporates were not changed.

The resulting scenario has a non-car mode share of 46 per cent, which does not meet the Base Target non-car mode share of 60 per cent. Further transport network upgrades (public bus, rapid bus, expansion of the ferry network, and walking and cycling improvements) would be needed to improve the non-car mode share for the large-scale scenario of 40,000 maximum capacity.

The second scenario is a year 2050 scenario with a 24,500 capacity stadium. 2050 has been selected as it is the latest standard reference case forecast year in the GHUTDM, however, the operating life of the stadium will be beyond 2050.

Year 2050 and a capacity of 24,500 have been assessed to provide an understanding of the network constraints that increased background traffic (population and employment growth to 2050) would have on the different capacities already assessed.

This approach has been undertaken so as to not repeat modelling plots showing the same constraint points across the network in 2050 with 24,500, 31,500 and 40,000.

The volume difference results in Figure 5.10 can effectively be added on to any of the previously assessed 2030 scenarios to give a representation of traffic volumes for any 2050 crowd capacity scenario.

Strategic modelling results on the additional network tests are presented below.

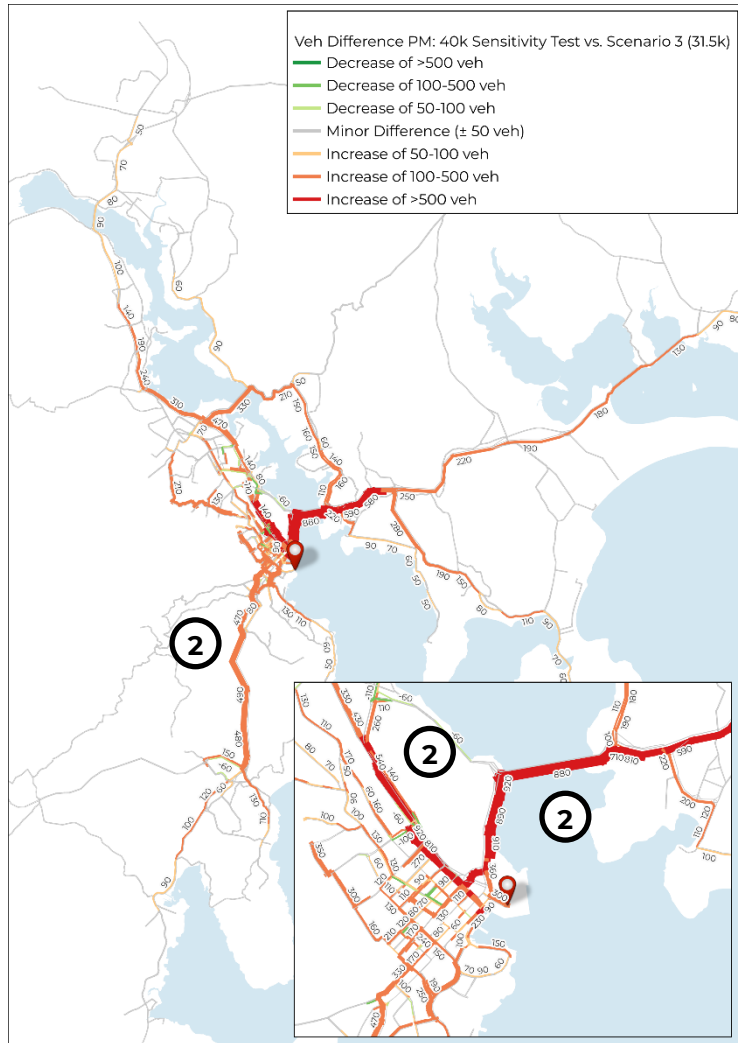


Figure 5.10 Vehicle Volume Difference (PM 2-hr): 40k capacity vs. Scenario 3 (31.5k capacity)

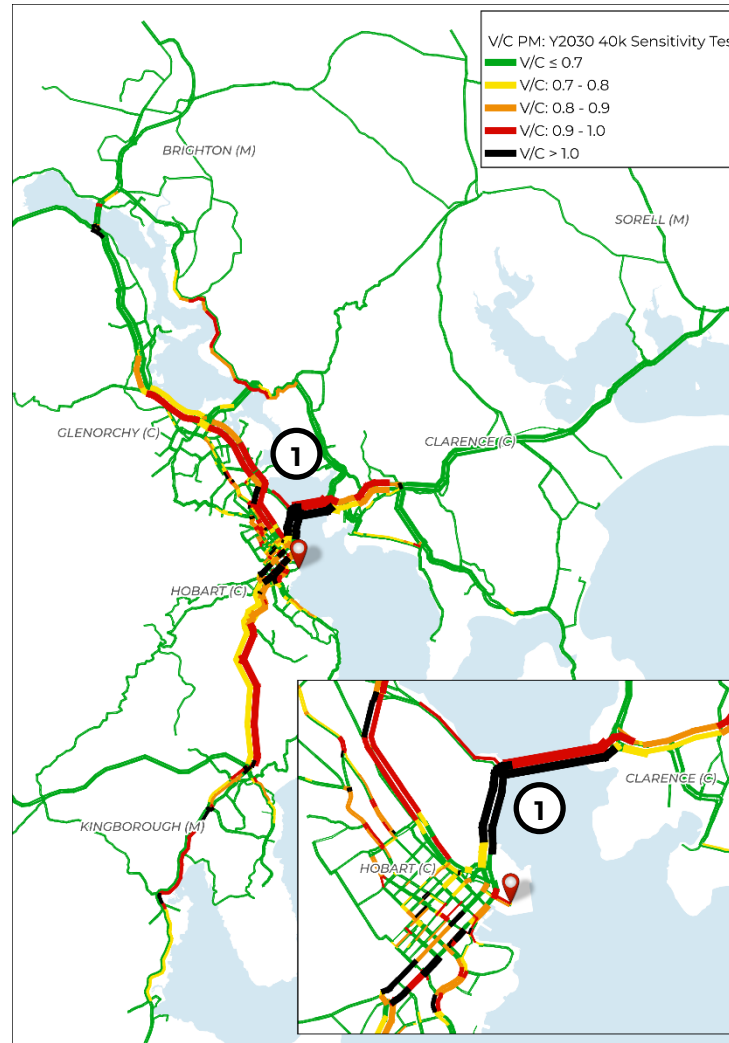


Figure 5.11 2030 PM 40,000 capacity sensitivity test V/C

- 1 The increased stadium capacity results in higher volumes on the key links, particularly the Tasman Highway and Brooker Highway. In the inbound direction the Tasman Highway is expected to exceed capacity west of the Tasman Bridge and the Brooker Highway is at capacity from Derwent Park Road into the city centre.
- 2 Comparing against the 31,500 stadium capacity in Scenario 3, the Tasman Bridge, Brooker Highway and Southern Outlet are expected to carry over 800, 500 and 400 vehicles, respectively.

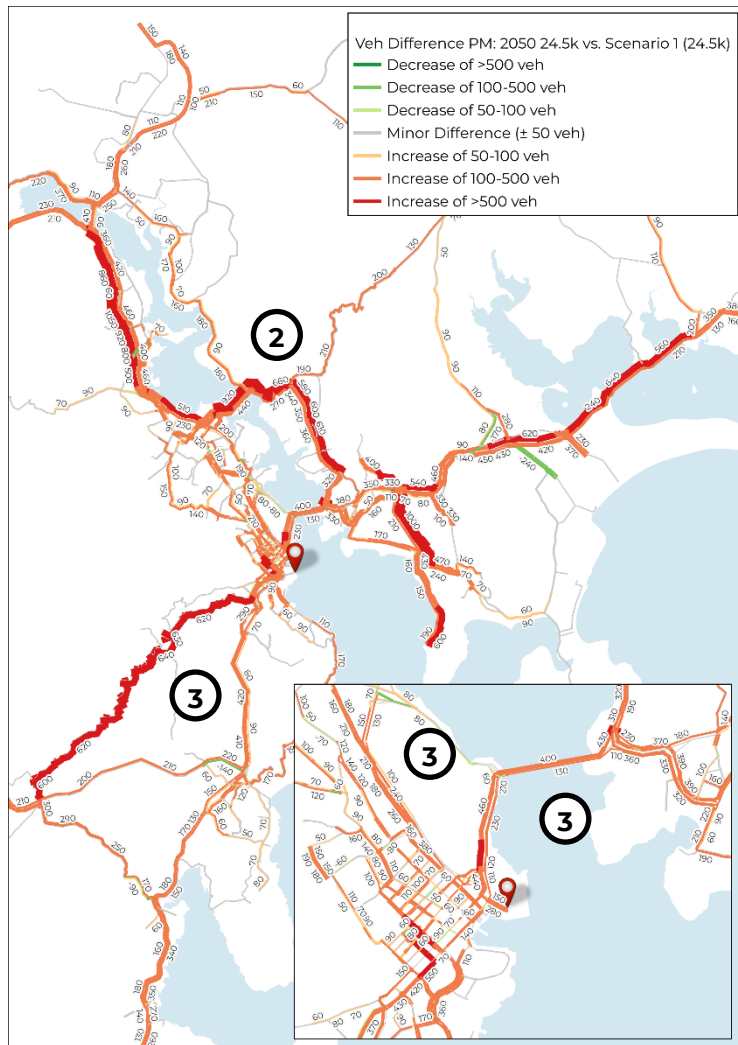


Figure 5.12 Vehicle Volume Difference (PM 2-hr): 2050 24.5k capacity vs. Scenario 1 (24.5k capacity)

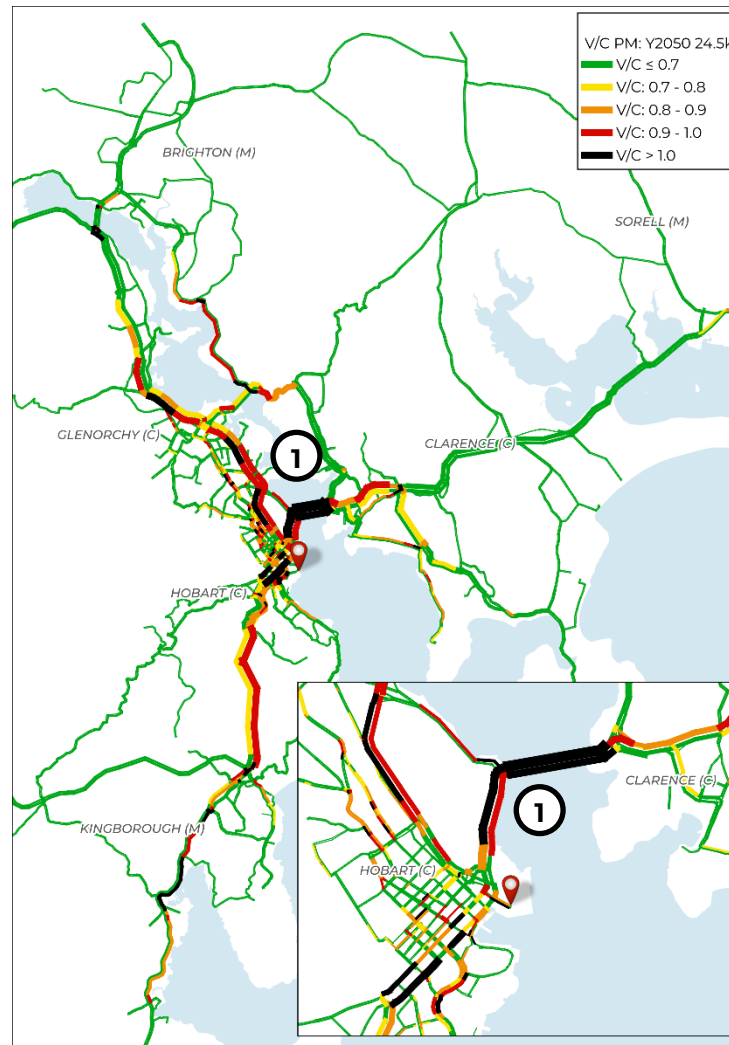


Figure 5.13 2050 PM 24.5k capacity V/C

- 1 In the 2050 scenario, the Tasman Highway and Brooker Highway are expected to be near or over capacity. Similar to 2030, the addition of event demands to Macquarie Point would cause the Tasman Bridge to exceed capacity.
- 2 The East Derwent Highway and Bowen Bridge are expected to observe considerable increase in traffic volumes in both directions as the Tasman Bridge and Brooker Highway are congested.
- 3 The Tasman Highway in the inbound direction is expected to carry approximately 200 additional vehicles and the Southern Outlet carries over 400 additional vehicles. Traffic volumes are expected to increase across all routes in the northern corridor including the Brooker Highway, Letitia Street, Argyle Steet and Main Road.

5.4 Precinct Pedestrian Modelling

Static pedestrian modelling has been undertaken for the precinct to evaluate pedestrian Level of Service (LOS) along key corridors and footpaths across the Macquarie Point Precinct and the Hobart CBD and waterfront. The assessment uses the Fruin pedestrian levels of service, and a LOS D has been considered acceptable for event crowd conditions. The precinct pedestrian modelling is different and separate to the stadium pedestrian modelling done in support of the stadium design process.

A static model has been developed in Microsoft Excel whereby walking routes are assigned widths based on aerial imagery measurements, along with numbers of pedestrians over a peak 15-minute period post-event. Pre-event is not modelled as ingress typically takes place over a longer period of time, flattening the arrival profile and placing less demand on infrastructure. Crowd peaks are seen post-event when the majority of spectators leave in a short period of time. Typically it takes a spectator five minutes to move through the stadium and a further 10 minutes to clear the immediate precinct in free-flow conditions for a stadium of this scale.

The pedestrian modelling has not considered emergency evacuation, concourse widths etc as they are captured in the stadium pedestrian modelling and influenced by the configuration, ongoing design development and emergency evacuation scenario planning.

Two operational scenarios have been modelled, without the Collins Street Active Transport Bridge (between Davey Street and Collins Street) (Figure 5.14) and with the proposed bridge (Figure 5.15). Both scenarios have been assessed at 31,500 capacity and 40,000 capacity. Results for the 31,500 capacity are summarised in the following two sections and the complete pedestrian modelling report is provided in Appendix G.

5.4.1 Without bridge scenario key points

- 1 Although LOS E is shown in this location, it should be noted that eight 50-seater event buses (400 people) are planned to leave the bus plaza every five minutes. This would significantly reduce the number of people in this area across the post event egress period. Dedicated queuing space has been incorporated significantly improving LOS in the area.
- 2 This walking route sees the highest demands with over 10,000 people walking from Evans Street to Hunter Street. 20m of open space for pedestrians in this area (referred to as Pocket Park in the Southern Campus Transformation plan), is an important component of the event transport strategy, however, the full Pocket Park masterplan is not required, simply an area clear of pedestrian obstructions such as parking, signage and kerbs. A short term road closure is required for Evans Street and Hunter Street to create the pedestrian space required.

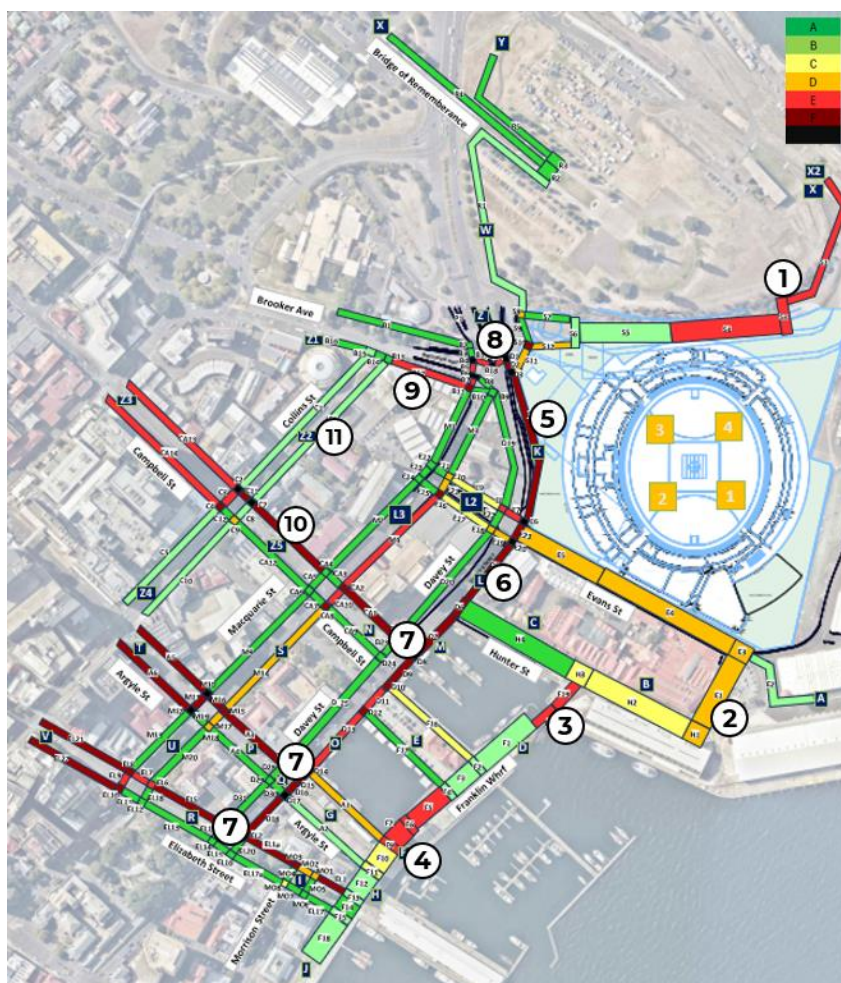


Figure 5.14 Model without Collins Street bridge

- 3 LOS E is seen on the narrow Victoria Dock swing bridge. The model assumes the full width of 8m+ is available to pedestrians (no traffic, short term closure to traffic). Some queueing can be expected to tail back to Hunter Street. The bridge should remain in a fixed position during events to prevent spectators queuing in this area which would occur if the bridge was in motion to allow vessels through to the dock. Police boats in the Victoria Dock should also seek an alternative docking area during events.
- 4 Prior to the Constitution Dock bridge, target LOS D can be achieved if the event road closures/ no parking restrictions are extended to this area. However, the bridge will remain a constraint point (LOS E) due to the physical constraints of the bridge itself. The bridge should remain in fixed position during events to prevent spectators queuing in this area which would occur if the bridge was in motion to allow vessels through to the dock.

It is noted that points 3 and 4 refer to TasPorts land and ongoing discussions will be needed with TasPorts with respect to this recommendation.

- 5 The eastern side footpath of Davey Street is at LOS F with the event crowd alone. Cyclists using this shared path (i.e. rolling down the hill towards the city at speed) would worsen the results and increase safety concerns unless a dismount zone is implemented. It is assumed spectators would occupy the full width of the shared path during events. The footpath is narrow and the verge in places is constrained by established trees. Towards Brooker Avenue the footpath deviates to run immediately beside the carriageway. Under the modelled scenario there are significant safety risks to pedestrians spilling onto the road and a resulting increased potential for traffic delays from safety incidents. Fencing along the footpath edge in this area could reduce the safety risk but would not improve LOS. To

reach LOS D the shared path would require an additional 6.8m of width, or for spectators to use the parallel pathway on the western external concourse of the stadium.

- 6** Davey Street between Evans Street and Hunter Street is one of the highest risks in the modelled area. High volumes of pedestrians have a building on one side and live traffic on the other side. This path is also a popular cycling route. To reach LOS D in this area the existing 4m footpath would require an additional 6.2m. (i.e. the existing parking bays plus a traffic lane).
- 7** The high demands on the eastern side footpath of Davey Street will eventually need to cross Davey Street to access CBD amenities, car parks, the bus interchange and taxis etc. The pedestrian crossings at Campbell, Argyle and Elizabeth are critical to this task. There is a risk that crowds (thinking there is safety in numbers) will ignore pedestrian signals and continue streaming across Davey when they shouldn't. This will impact the efficient operation of Davey Street and the critical route through the CBD.
- 8** A large proportion of demands in this scenario are pushed along Davey Street to the crossings noted in #7, however, there will be demands exiting the stadium from the northwest section and attempting to cross Davey Street and then across Brooker Avenue (assuming most are heading in the direction of the inner city). Both Davey Street and Brooker Avenue crossings are LOS E (with crossing waiting areas exceeding LOS F) and introduce large volumes of people crossing two of the most critical routes in Hobart.
- 9** Over 1,600 people are expected to use this footpath along the Brooker Avenue. The footpath is narrow and constrained by trees. This results in LOS E and the potential for crowds spilling into the kerbside lane of the road, reducing road capacity as event buses and other traffic are moving through the area. Fencing along the footpath edge in this area could reduce the safety risk but would not improve the LOS. Pedestrian flows on this link would be influenced on the phasing of pedestrian signals crossing Davey Street upstream therefore regulating flow.
- 10** Campbell Street continues to experience LOS F as pedestrians continue on the same side footpath further into the CBD (based on modelled demands). There is the opportunity for crowds to split off west along Macquarie Street which may go some way to balancing out demands at a more acceptable LOS for both links.
- 11** Despite being an attractive link directly to the Elizabeth Street bus interchange, nearby taxi rank and restaurants and bars, Collins Street has a very comfortable LOS B as demands are low for this link as the crossing of Davey Street and the Brooker Avenue act as a constraint / deterrent for using this route. Collins Street could do more to disperse crowds into the CBD and Inner Hobart if people are given the opportunity to access it.

5.4.2 With bridge scenario key points

- 1 No change to #1 in this scenario
- 2 No change to #2 in this scenario
- 3 No change to #3 in this scenario
- 4 No change to #4 in this scenario
- 5 These sections Elizabeth Street and Argyle Street are an obvious link from the waterfront to the CBD bus interchange and taxi rank. However they suffer from narrow footpaths with trees, signposts and parking meters. LOS E and F are shown under the current pedestrian distributions.
- 6 At 6m wide with a peak 15 min demand of 8,500+ people, the proposed Collins Street active travel bridge experiences short term LOS F. Implementing a “stop and hold” pulsing of spectators across this bridge to reduce the LoS is considered acceptable when considering costs and spatial constraints of a larger bridge. A 7.3m width would be required to achieve LOS E. Moreover, by shifting these pedestrian demands away from road level, the nearby at grade pedestrian links and crossings on Davey Street and Brooker Avenue perform between LOS A and B. This implies reduced risk of pedestrians spilling onto the carriageway and ultimately better traffic flow than otherwise might be observed.

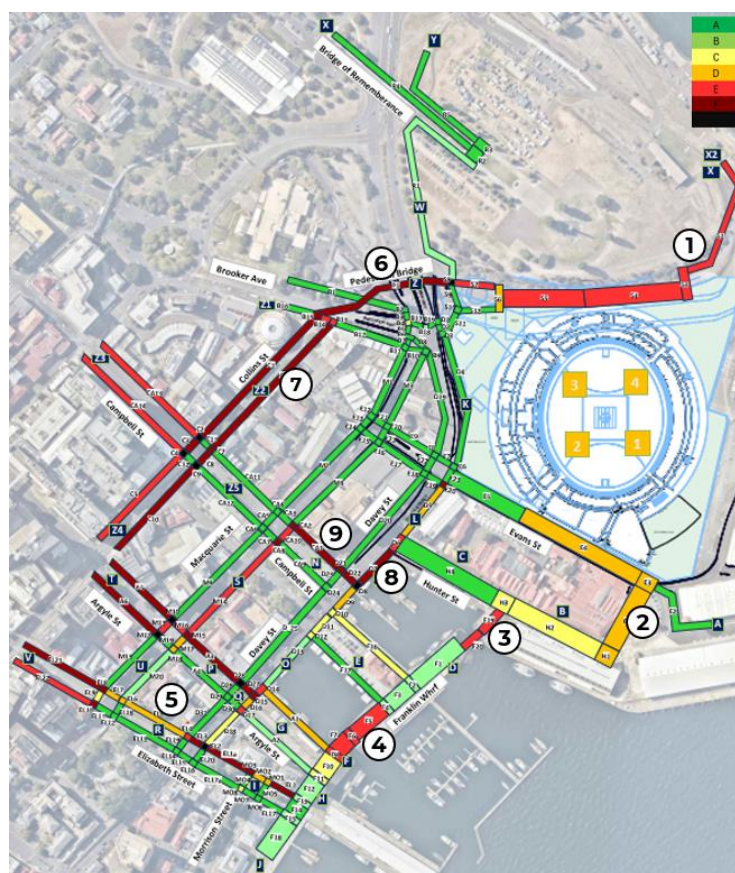


Figure 5.15 Model with Collins Street bridge

- 7 The Collins Street LOS F reflects attractiveness of the direct link from the Collins Street bridge to the bus interchange, nearby taxi rank, parking and shops and restaurants. Demands have been applied to the existing footpath widths only, hence LOS F. Note, the Collins Street Bridge route to Elizabeth Street avoids up to three signalised interections (compared to via Davey Street) and would therefore become the desired route for spectators exiting via the north of the site (despite the need to double back slightly on Elizabeth to access the Hobart Interchange).
- 8 Davey Street between Evans Street and Campbell Street is LOS E and F with the crossing waiting area exceeding LOS F. Footpaths are narrower than would be ideal for the expected demands this close to the stadium. The section approaching Campbell Street (LOS F) has been modelled with the footpath only, however, there is parking on Victoria Dock that if removed for events would provide another 2.5m, reducing the LOS to E. Note, removing this parking without the Collins Street bridge does not have the same effect (LOS remains at LOS F) due to the demands on Davey Street without the bridge in place.
- 9 This section of Campbell Street is showing high demands and LOS F. Pedestrians only have one crossing at the Davey Street end which results in high numbers of people using the eastern side of Campbell Street only. However, people may see crowding at the pedestrian crossing and choose to continue to Argyle Street before making their way into the heart of the CBD.

5.4.3 Outcomes

The results are shown again side by side in Figure 5.16 and Figure 5.17 with sensitivity tests shown for 23,000 (Figure 5.18) and 40,000 (Figure 5.19) without the Collins Street bridge.

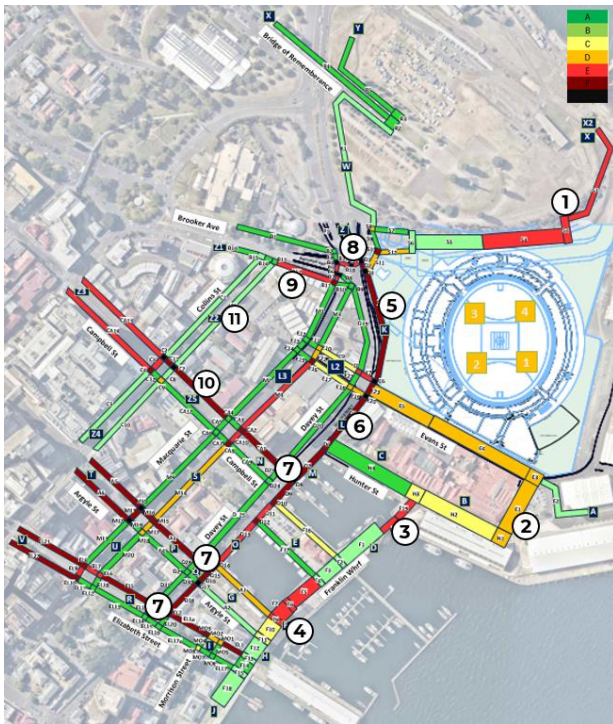


Figure 5.16 Without bridge, 31,500 capacity

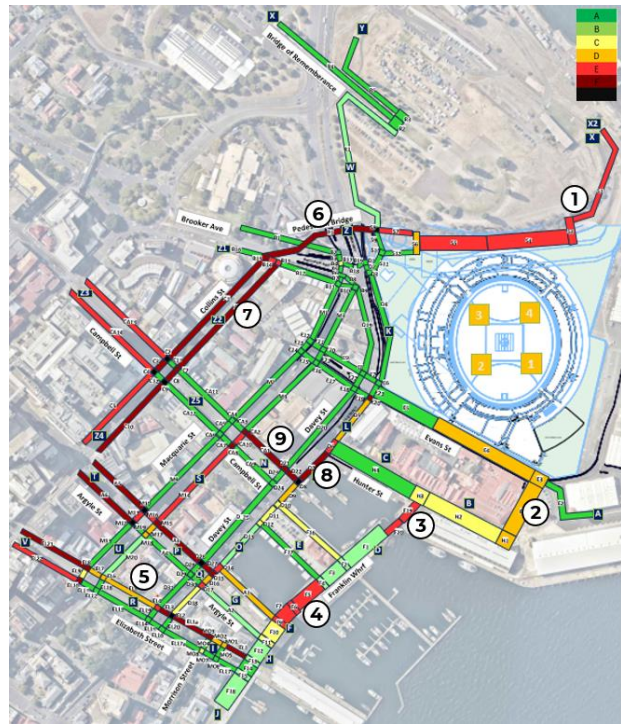


Figure 5.17 With bridge, 31,500 capacity

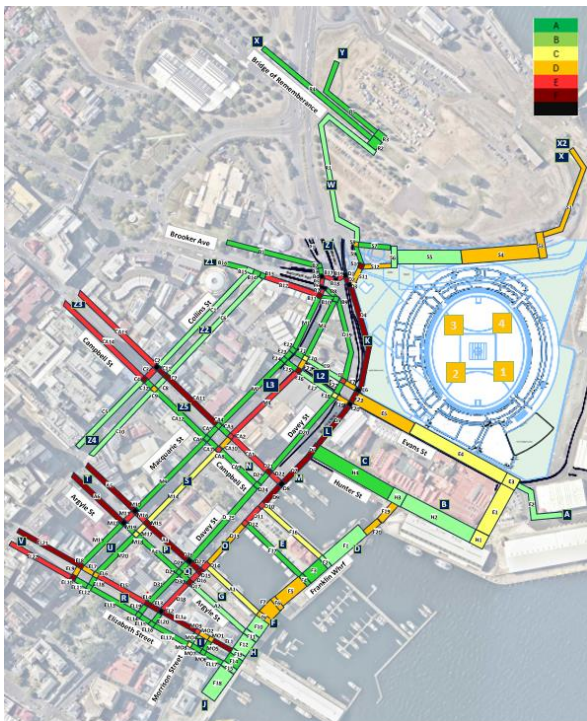


Figure 5.18 Without bridge, 24,500 capacity (sensitivity test)

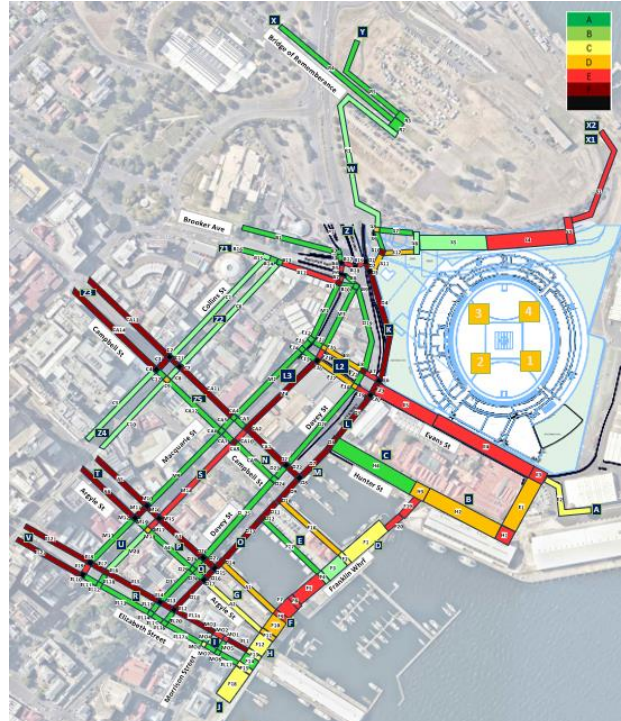


Figure 5.19 Without bridge, 40,000 capacity (sensitivity test)

As would be expected, the demand of 31,500 pedestrians over a 15-minute period causes poor levels of service in multiple areas around the precinct, however this will not be the typical event crowd scenario. Testing here has been done on the worst case scenario which can be accommodated with operational planning focused on the distribution of spectators across the four egress quadrants.

Rapid sensitivity testing for a 24,500 capacity without bridge shows improved LOS in the immediate vicinity of the stadium, with the exception of the Davey Street footpath. In reality, people will walk on either side of the shared path and may distribute north/south around the western concourse of the stadium and not on Davey Street. This capacity of 24,500, which represents the upper scale of typical events, shows good levels of service around the stadium where crowd peaks are most likely during egress. Contrary to this the rapid sensitivity testing for a 40,000 capacity without bridge shows LOS E near to the stadium on Evans Street.

The pedestrian modelling highlights the difficulty in safely and comfortably accommodating pedestrian demands without at least one grade separated crossing of Davey Street or without pedestrianising two of the three lanes for event peaks (which may be achievable for events where egress takes place later in the evening). Davey Street is a known critical element of the Hobart traffic network, and delays or reduced capacity causes effects through the inner city, Southern Outlet and across the Tasman Bridge. It will also impact the operation of public transport.

Further recommendations to support an efficient and safe pedestrian network include:

- A public realm and active travel plan be developed with collaboration from the landowners, businesses, State Growth, TasPorts and the City of Hobart.
- As is typical for stadium events, measures to slow down egress from the stadium can be investigated in due course such as post event entertainment.
- In both scenarios, the Victoria Dock Bridge and Constitution Dock bridges should remain in a fixed position and not allow vessels through post event to ensure spectators are not forced to wait while the bridges are in motion. It is noted that these areas are under TasPorts ownership/management and TasPol will need to be engaged to ensure their police boat/s are out of dock.

5.5 Active Transport Network

5.5.1 Pedestrians

The proposed Southern Campus Transformation – UTas Centre for the Arts Hunter Street pedestrian passage is a welcome addition to pedestrian connectivity in the surrounding precinct if it were to go ahead (see Figure 5.20). Inclusion of this passage reduces the barrier created by the Hunter/Evans Street buildings but is not a requirement for the stadium or precinct.

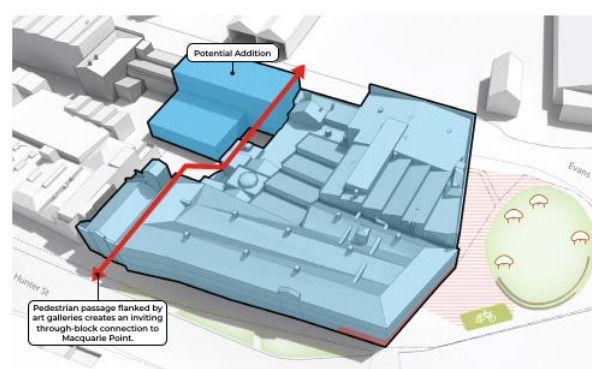


Figure 5.20 Hunter Street passage



Figure 5.21 Hunter Street Pocket Park

The Southern Campus Transformation also includes the Hunter Street Pocket Park (see Figure 5.21). If the Pocket Park cannot be implemented in its entirety, it is essential that the area is clear of parking for events and there are no trip hazards or obstructions in the area that may be difficult to see or navigate in large crowds.

5.5.2 Cycling

Cycling infrastructure provision in Hobart is very limited and without improvement only highly confident riders will choose to ride, increasing pressure on other transport options. Currently, within a 20-minute ride of the stadium, approximately 1,800 residents are estimated to be confident to ride in mixed traffic environments. There are an estimated 18,000 additional residents with low to medium levels of confidence living within the 20-minute cycling catchment. Better infrastructure will encourage more people to choose to cycle (and other micromobility devices). This is shown in Figure 5.22.

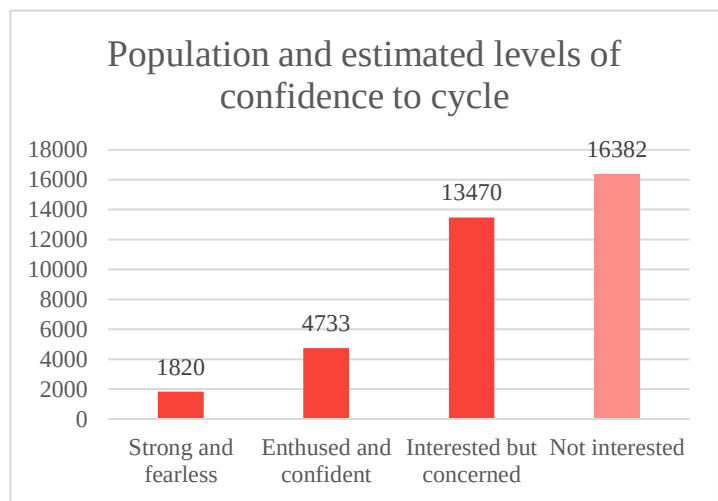


Figure 5.22 Estimated resident cycling confidence within a 20-minute ride of the site

Recognising the need for safe cycling infrastructure, the City of Hobart and Department of State Growth have endorsed the following projects which will improve key connections to the stadium:

- Argyle and Campbell Street bicycle lanes (under construction)
- Collins Street protected bicycle lanes (Molle to Murray Street concept plan approved, delivery expected early 2025)
- Tasman Bridge path upgrade
- Augusta Road bicycle lanes
- Sandy Bay Road and Battery Point pathway.

The potential for cycling trips to, from and within the precinct is further described in Appendix H.

5.5.3 Off road cycling connections

5.5.3.1 Intercity Cycleway

The Intercity Cycleway provides a direct, off-road route connecting directly from the north-west of Hobart to the precinct and stadium. To maximise the uptake of cycle trips using this route, upgrades are needed including safer crossings, safe connections to the Intercity Cycleway, improved lighting and other measures to increase personal security during dark hours, especially for women.

5.5.3.2 Collins Street Active Transport Bridge

As identified in the Access Study and through the pedestrian modelling discussed in section 5.3.6, a walking and cycling bridge connecting the precinct to Collins Street is proposed. However, the feasibility of this proposal has not been assessed and the project is not currently funded.

The benefits of this proposal are significant and include:

- A significant redistribution of pedestrian flows away from the waterfront towards the CBD (reducing conflicts on the waterfront share path/parking areas on Davey Street)
- Reducing delay to public transport, freight and general traffic on Macquarie and Davey Streets
- Providing access to proposed Rapid Bus stops.

The full benefits of the bridge are contingent upon the delivery of changes to Collins Street identified in the City of Hobart *Central Hobart Plan*. The southern end of Collins Street offers potential for activation through considered private investment and improvements to the street design including footpath capacity. The existing traffic configuration in Collins Street will need to be reviewed to enable the installation of the proposed bridge.

The current bridge concept suggests a partial (at least) closure of Collins Street for the southern bridge landing, providing space for a circular ramp to reach the elevation required.

Supporting active transport projects are outlined further in Section 8.1.

5.6 Event bus park and ride

Nationally, Australian stadiums generate significant mode shares to event bus and form an important part of achieving a sustainable transport plan. Event bus will be a vital part of achieving a non-car mode share for the Macquarie Point Multipurpose Stadium.

A dedicated event bus service would operate before and after the conclusion of the event. Event bus would run on four routes, generally following proposed rapid bus routes to bolster services to Hobart's most populous areas. Event bus would have limited stop locations, to allow for express route services to the stadium.

Park and Ride facilities at the ends of event bus routes will allow passengers to drive private vehicles from areas beyond the immediate catchment and then board the event service. Park and Ride facilities would include existing or in-development state Park and Ride facilities, as well as new infrastructure at key locations. Passengers could also board event bus services at pick up locations from key centres to service residential centres (no park and ride facility).

As the existing Park and Ride facilities are also used by commuters on weekdays, further planning would be required to establish the available capacity for event parking patrons. Similarly, other nominated Park and Ride locations that have other uses (such as MyState Arena at Wilkinsons Point) would need further consideration to maintain priority for those uses and define when event parking may be available. All sites will need to be planned with accessibility considerations in mind.

An event travel behaviour campaign should encourage walk up or drop off/pick up at the Park and Ride locations, as demand for the bus services is expected to be greater than the available car parking.

At a mode share of 25 per cent, around 7,730 patrons would use the event bus service (for a 31,500 event). At 60 passengers per bus, this equates to 129 bus loads. Further investigation is required for the detail of the bus operation, including potential for short, shuttle trips to some destinations that would allow multiple trips from the same bus. It is noted that driver availability and fleet capacity are not studied in this stage of the project. Funding and commercial arrangements are limited to suggestions for integrated ticketing, noted in section 6.11 and 8.2.

All event bus fleet and drivers would be in addition to regular Rapid and local bus services.

5.7 Parking

Existing usage of off-street car parking has been estimated from benchmarking information provided by the City of Hobart within the CBD metered parking boundary. This suggests that there is significant existing availability at the times of day coinciding with likely events, including, weekday evenings, weekend daytime and weekend evenings.

Current occupancy rates for these times are in the order of 10 per cent, suggesting that sufficient parking supply is available to accommodate stadium needs, providing private vehicle modes can be restrained and suitable alternative transport provided.

If the study was to start with parking supply for which to build other mode shares around, this would result in most people electing to drive, impacting background trips and freight and leading to a particularly poor sustainability outcome for what will soon be the newest stadium in Australia. The transport study, therefore, has specifically not started with parking supply as the benchmark.

The City of Hobart have further confirmed that there is ample parking across the Hobart CBD, Queens Domain area and Glebe to accommodate stadium demands, particularly as most events will occur outside of the Monday to Friday commuter periods. However, Queens Domain and Glebe are not recommended to support stadium parking. With respect to Glebe, the existing restrictions do not impede event usage since parking is permitted for any of the identified event periods. Effective management will likely involve extending the timing restrictions into the evening (8am-8pm) including Saturday and Sunday. Existing residential parking permits can be retained, potentially with the addition of residential visitor permits.

In terms of the Queens Domain, there is likely to be a requirement to stage event buses or coaches for the event departure period on selected roads within the Domain as well as maintaining access to the existing sporting facilities which are likely to coincide with weekend events at the stadium.

There are almost 4,000 public and publicly accessible parking spaces located in large-scale facilities (multi-deck and at-grade) within the Hobart CBD. Many of these car parks have restricted hours of operation, reflecting a lack of demand outside of standard daytime periods.

There is additional supply of off-street employee parking that are almost exclusively used during office hours. They have the potential for ad-hoc use on weekends and for evening events.

The demand for parking is expected to greatly exceed supply in the immediate vicinity of the stadium. While sufficient parking is available in the broader CBD area, the financial and time costs associated with formal parking provision will induce drivers to park informally, or in locations that may interfere with public transport, cycling and pedestrian movements leading to safety issues. A comprehensive and consistent regime of enforcement will be necessary to ensure that parking behaviour is maintained in a safe manner consistent with the intentions of the plan.

Existing CBD activity is expected to extend into the evening as a result of Stadium events, however, these parking stays are included in the calculated demand and so do not 'conflict' with event parking

A memo summarising the parking situation is included in Appendix J.

5.8 Construction traffic management

The construction of the stadium will create construction traffic and can be expected to result in an increase in construction vehicles travelling to, from and within the stadium precinct. The volume of traffic generated is dependent on factors such as the construction method used and material volumes required, location of material and equipment suppliers.

Further planning will be undertaken for the management of traffic during this time. The construction traffic management plan may include assessments and plans for:

- Construction traffic impact on peak traffic periods

- Light vehicle volumes for workforce on the site
- Delivery of heavy vehicles and machinery and other equipment needed for construction
- Delivery of construction materials
- Movement of spoil from earthworks
- Access routes to site
- Local access arrangements
- Management of impacts.

6 Transport plan – 31,500 capacity

The following section outlines mode by mode components and options of the transport plan for a capacity of 31,500. As noted in the Introduction, depending on the event type, expected capacity and time of day or day of the week, variations to this proposed plan will be required.

The mode by mode plans build upon the understanding, constraints and opportunities identified in section 5.

The overarching transport strategy, as identified in the Access Study and reinforced in the Green Star Community terms of reference for the precinct, is to prioritise people-focused and sustainable transport modes. With this in mind, although there is ample parking in the CBD to prioritise the self-drive mode, this does not align with a sustainable approach, nor does it reflect best practice for new stadia around Australia or globally. Therefore, sustainable modes and public transport are prioritised in the plan with the remainder going to self-drive and car options (as outlined in the Origins Study in section 4).

Planning here has been done for 31,500 as it is the highest opening year capacity and therefore, if the transport network can accommodate this capacity it can accommodate lower capacities also.

Future planning should consider scaled back plans for lower crowd numbers such as 0 – 15,000, 15,000 – 24,500 (typical event) and 24,500 + and the larger scale 40,000 which represents a future stadium upgrade in concert mode.

6.1 Pedestrians

Safe and comfortable pedestrian access for stadium events is fundamental to the success of the project. Walking is the most space efficient of all transport modes and serves part of every trip to the multipurpose stadium. Providing an enjoyable experience for patrons accessing the stadium is a key contributor to the success and reputation of the new stadium.

Pedestrian movement around a stadium requires careful planning to ensure:

- Separation from vehicle movements
- The efficient loading and unloading of the stadium during events
- The safe and efficient transfer of patrons between the stadium and transport nodes
- The minimisation of impact on traffic flow particularly bus access
- The integration of the stadium with adjacent communities
- Safety along the waters' edge at the waterfront.

Evans Street (east of Davey Street), Hunter Street and across the waterfront will be closed to general traffic during event times for crowd safety. Event traffic management is dependent upon the Northern Access Road and McVilly interchange being delivered to reduce port traffic volumes on Evans Street, as well providing safe walking and cycling grade separation across the Northern Access Road. Without this complementary project (see section 8.1) port access for over height vehicles will be interrupted during peak event times.

Clearing the Hunter Street / UTas area of trip hazards, wheel stops and sign posts is an essential supporting project.

The Collins Street Active Transport Bridge is considered a high priority supporting project for the stadium.

An additional crossing leg could be considered at the Davey Street and Campbell Street intersection to provide another alternative for people heading into the CBD.

Further from the stadium, pedestrian movements across Victoria Dock Bridge will require further consideration to ensure safe access to and from Salamanca. This may include operational changes for vessels which require access during event access periods when the bridge will need to remain in the lowered position.

6.2 Cycling

As outlined in section 5.5, the active travel network has been built up collaboratively with the City of Hobart and the Department of State Growth. The network maps with suggested detours to avoid crowded areas during events are shown Figure 6.1 and Figure 6.2.



Figure 6.1 2029 active transport network map, with event detours



Figure 6.2 2029 active transport local network map, with event detours

The cycling and micromobility routes through the precinct will be disrupted for intermittent periods for patron entry and exit. Conflict between people riding and walking is a safety concern for high-attendance events and will need to be managed in a considered way. Recommended access changes during these times include:

- Dismount requirements on:
 - From the junction of the intercity cycleway on the northern access road
 - The path adjacent event bus plaza
 - The east-west path on the north side of the stadium as identified in Figure 6.2.
 - The eastern external concourse and waterfront cycle route
 - Davey Street south of the Bridge of Remembrance to Argyle Street (including the proposed Collins Street bridge)
- Dismount requirements are typically undesirable for cyclists with low compliance however this is considered essential for safety when pedestrian numbers are in such high volumes during event periods
- A no-ride zone for shared micromobility services with dedicated parking/pick-up areas (e.g. e-scooters).

These restriction on bicycle access through the precinct will be kept to a minimum duration (similar to temporary road closures), only to be applied for short periods where crowd volumes create unsafe pedestrian congestion. To promote event access by bicycle, the following measures will be implemented:

- A preferred diversion route to be promoted for intercity cycleway to CBD trips, via the Bridge of Remembrance and Rose Garden Bridge
- Dedicated shared micromobility hubs established at key locations to provide a safe and attractive transport options for patron trips to and from the stadium

- Promotion of cycling as a preferred method of access to the stadium, with areas to lock bicycles provided as part of the precinct design.

Permanent outdoor bicycle parking locations for event attendees are to include:

- At the eastern end of Evans Street, in proximity to the southern entrance
- Near the landing of the proposed Collins Street pedestrian bridge, within the precinct on the eastern side of Davey Street
- On Hunter Street through a conversion of on-street car parking

For high-attendance events, temporary and secure bike parking could be provided at the Cenotaph, near the Bridge of Remembrance. This can be provided using temporary fencing, crowd control barriers or other systems. Additional temporary secure bike parking to be considered by closely monitoring demand during high-attendance events to ensure that cycling is an attractive and convenient transport option.

The recommended provision of outdoor bicycle parking has been determined based on demand thresholds and is outlined in Table 6.1. Within this provision facilities for cargo bikes and privately owned e-scooters is to be provided.

Table 6.1 Recommended provision of outdoor bicycle parking

Number of patrons	Estimated bicycle trips (as per Origins study)	Permanent outdoor bike hoops	Temporary bike parking estimated requirement
15,000	310	120	Not required
23,000	475	As above	Provision for approx. 200 bicycles
Full capacity (31,500)	650	As above	Provision for approx. 400 bicycles

Note that changes in micromobility and electric bicycle uptake may influence the provision and diversity of parking options required by the stadium opening date. The provision will need to be reviewed accordingly. Informal bicycle parking on available street poles tends to occur when provision is inadequate or inconveniently located.

Secure off-street bicycle parking and end of trip facilities are to be provided within the precinct across development sites.

6.3 Public bus

Hobart has an existing bus network (operated by Metro Tasmania, Tassielink and the Kinetic Group) that will be leveraged for spectator transport.

The Hobart City Interchange, located along Elizabeth Street adjacent to Franklin Square, is approximately 600m from the stadium and provides connections to 116 different bus services. As part of this, the Macquarie Point Precinct is connected to both of Hobart's Turn Up and Go bus corridors connecting Rosny Park Interchange, Shoreline Central, Metro Springfield Interchange and Glenorchy Interchange. Routes and frequencies are shown in Table 6.2. There may be a case to extend services later than 7pm or increase frequencies on weekends depending on event times.

Table 6.2 Turn Up and GO Route Information

Turn Up and GO corridor	Routes Included	Monday to Friday (7am – 7pm)	Saturdays (7am – 7pm)	Sundays (7am – 7pm)
Hobart to Glenorchy via Moonah	500 - 522	Every 10 mins	Every 20 mins	Every 30 mins
Hobart to Shoreline Central via Rosny Park	601, 614, 615, 624, 625, 634, 646	Every 10 mins	Every 20 mins	Every 30 mins
Hobart southern services to Kingston (shown for completeness)	407 - 417, X08, 500, 709 - 719, X710	Variable	Variable	Variable

Kinetic operates services to/from Sorrell/Dodges Ferry and New Norfolk and Tassielink operates services to Richmond/Campania and Huon Valley.

Hobart's bus network is mapped in Figure 6.3 and Figure 6.4 (note this does not included the Intercity services).

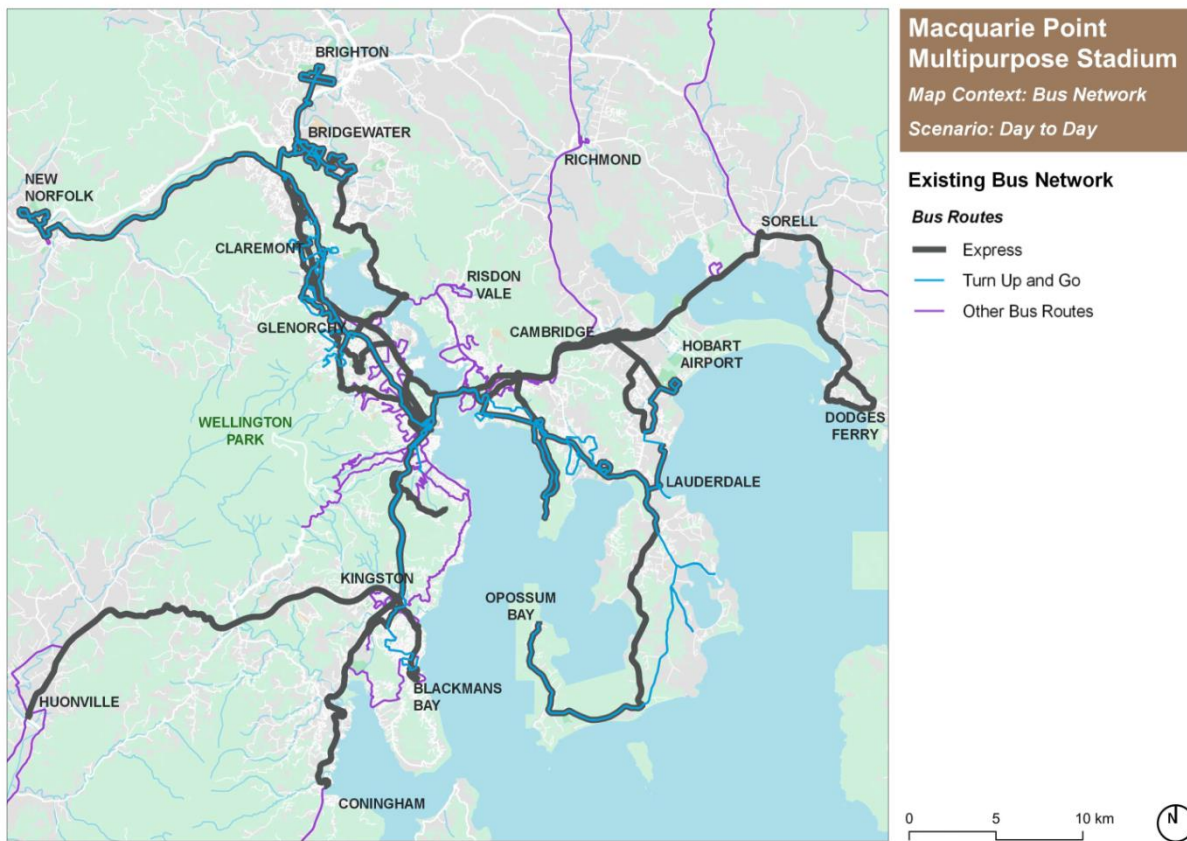


Figure 6.3 Local bus routes (network wide)

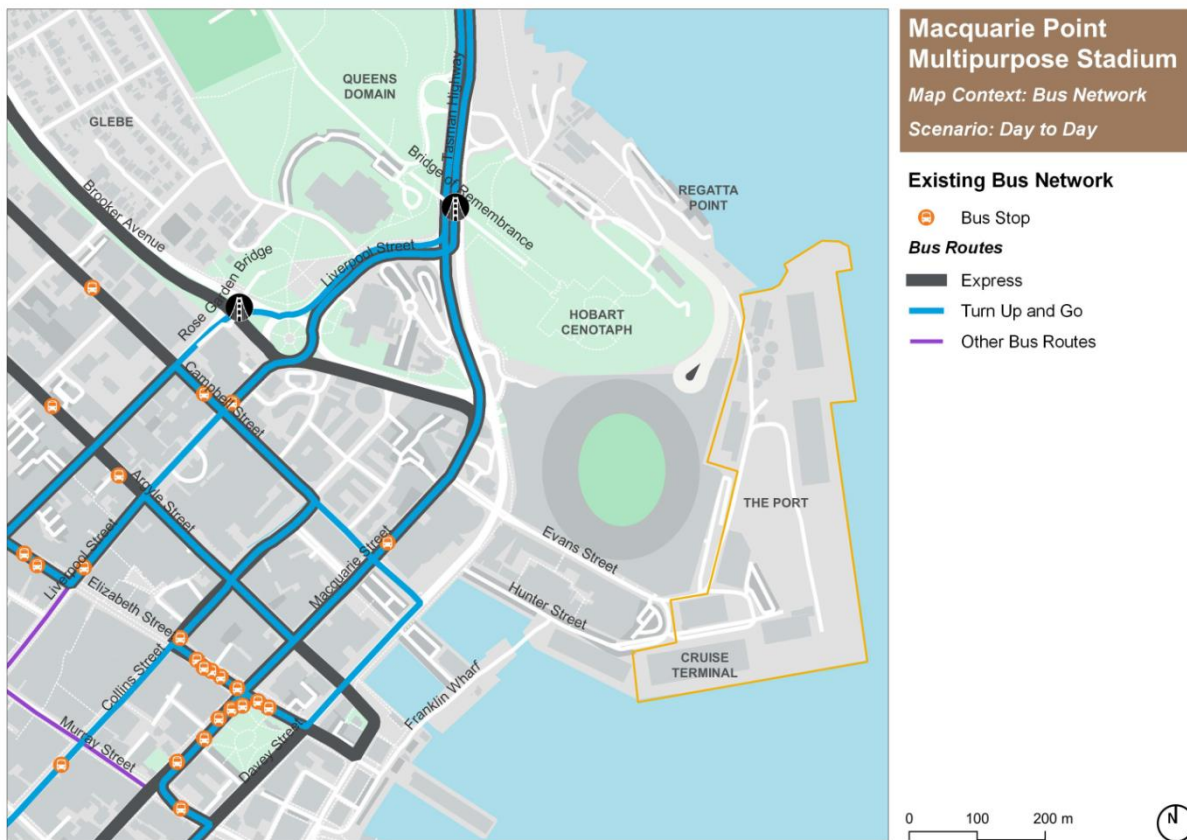


Figure 6.4 Local bus routes and stops near Macquarie Point

6.4 Proposed rapid bus

Proposed Rapid Bus services are in planning phase for Hobart and would provide frequent and more direct services between the Hobart CBD, Glenorchy, Kingston and Rosny Park via corridors from the north, east and south. Rapid Bus would be a supplementary travel mode during ingress and egress for Macquarie Point multipurpose stadium. The Rapid Bus initiative is assumed to have Stage 1 services in place for stadium opening, to the north, east and south.

Access to proposed Rapid Bus stops on Brooker Avenue and Davey Street would be contingent on the proposed Collins Street active transport bridge.

If the proposed rapid bus network is not in place by stadium opening, rapid bus patronage (target mode share) would shift either to local bus or to event bus. It is noted that event bus relies on rapid bus corridors on some parts of the routes (see section 6.3), and that without transit lanes and bus priority, event bus would operate on the general traffic network. Overall, the proposed rapid bus network will be an important factor in achieving desired mode share targets for the stadium.

The Rapid Bus concept mapping is shown in Figure 6.5.

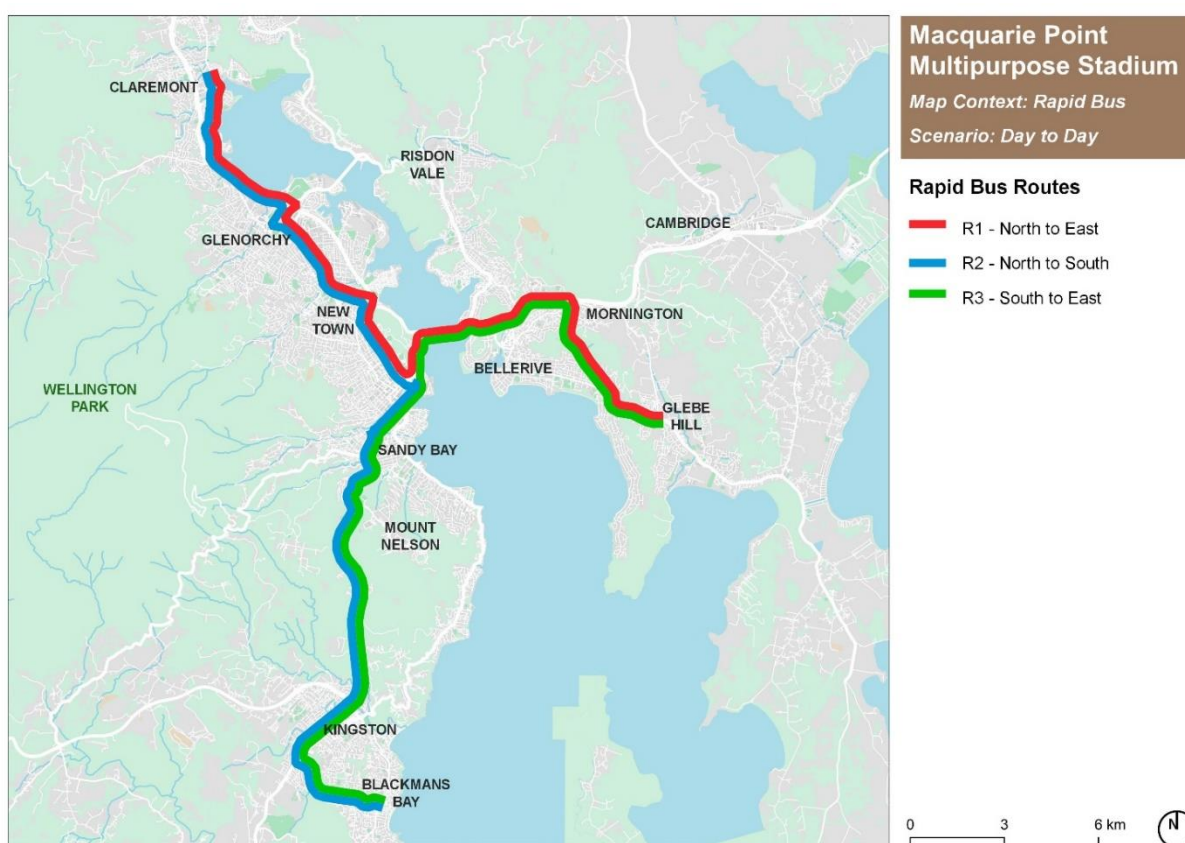


Figure 6.5 Proposed Rapid Bus concept network

6.5 Event bus / park and ride

Event bus would provide specific services for events and would take the majority of event patrons to and from the stadium. Event bus would run on four routes, partially following proposed rapid bus routes to bolster services to Hobart's most populous areas. Park and Ride facilities at the ends of event bus routes would allow passengers to drive from areas beyond the immediate catchment and then board the event service. This has been suggested in place of event bus routes going further afield, requiring more drivers and fleet. Park and Ride facilities would include existing state Park and Ride facilities, as well as new infrastructure at key locations. Passengers could also board event bus services at pick up

locations from key centres to service residential centres (no park and ride facility). The event bus routes developed are as follows:

- North: Claremont (State PnR), Wilkinsons Point (PnR)
- South: Kingston, Huntingdale (State PnR)
- East: Rokeby (State PnR)
- North East: Geilston Bay Recreation Area (PnR).

The event bus network is shown in Figure 6.6 and Figure 6.7.

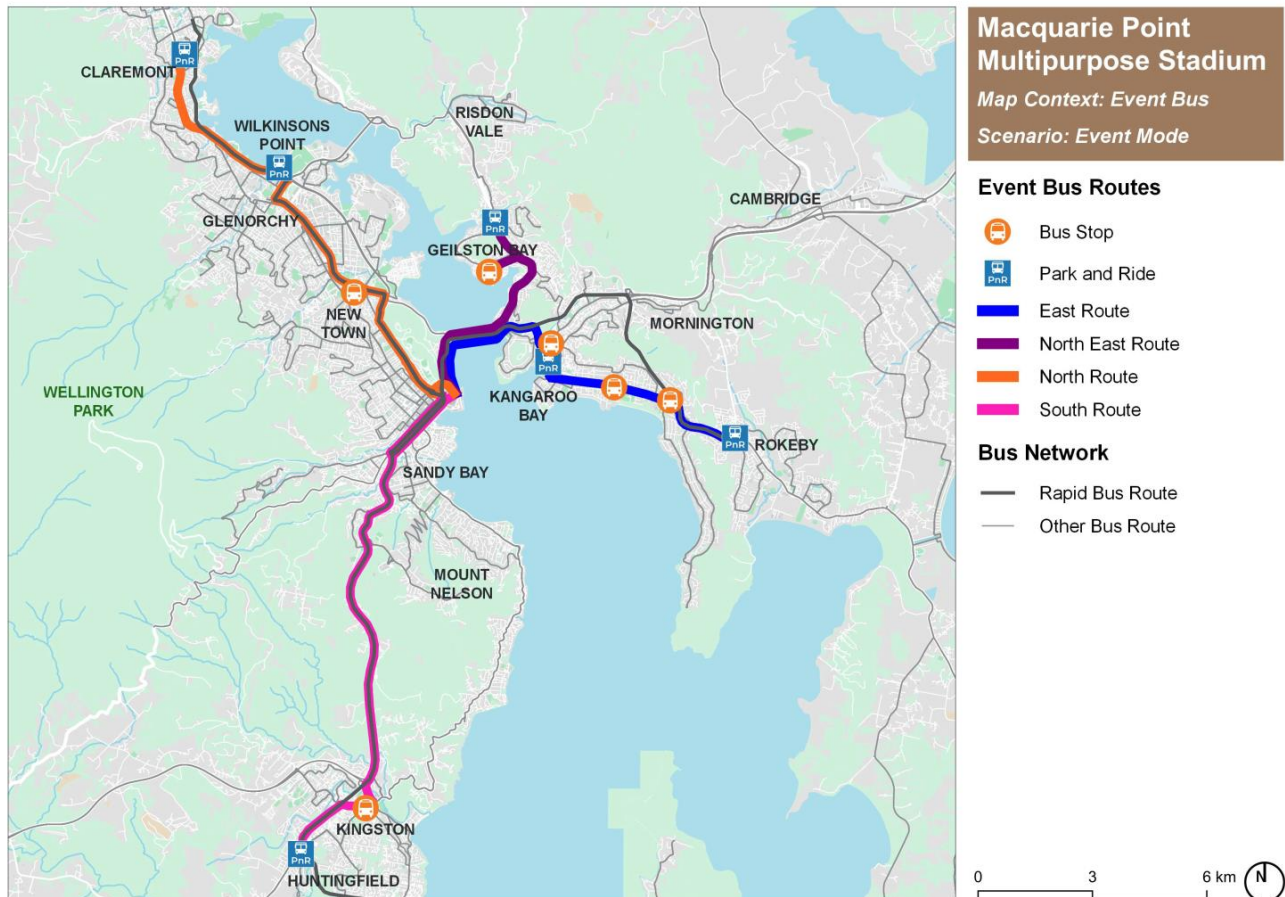


Figure 6.6 Event bus concept network

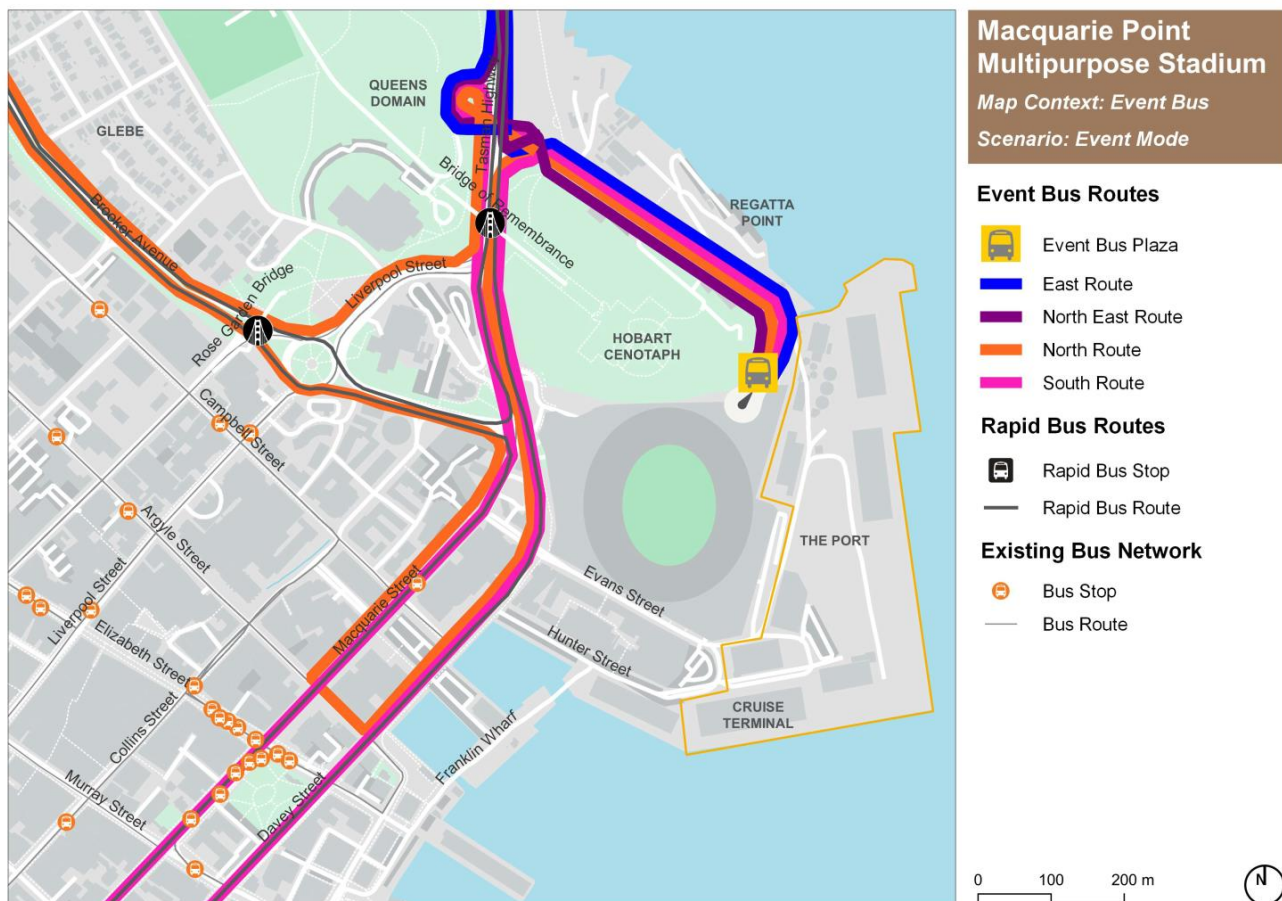


Figure 6.7 Event bus concept local network

6.5.1 Event bus plaza

At the stadium precinct, event bus would drop off and pick up from the event bus plaza. The event bus plaza is an essential element to the overall transport solution. The location of the event bus plaza has been driven by areas of available space and suitable vehicle access away from large crowds. The northeast corner of the site is the most suitable as pedestrian volumes are proposed to be relatively low in the Regatta Point area, the area is less constrained by the stadium, roads and buildings, and access is supported by the Northern Access Road. Therefore, the Northern Access Road is possibly the most essential supporting project for the multipurpose stadium transport solution.

The event bus plaza will require a remote bus staging area (bus layover) for event buses on departure. This staging location should be within 1-2 kilometres of the stadium for reliable call-up operations. There are potential opportunities for bus layover for the one hour before the end of events on the roads within the Queen's Domain. This would require access to amenities for bus drivers on event days. This operation requires further investigation during the detailed planning of the event bus network.

Design requirements include:

- Starting the event bus plaza from the proposed turning circle and extending it northeast towards Regatta Point.
- As much permeability for pedestrian purposes on a typical day as possible, including width between the bus stops and cliff for shared path purposes and becoming part of the AAA cycling network.
- Bus stops that can revert to car parking bays on a typical day.
- Lane widths at 3.5m minimum. Lane widths greater than this have been provided to accommodate swept paths on the curve
- One inbound lane that dives down under the plaza for the stadium Service Road access

- Three outbound lanes including the bus parking lane (3.0m), bus manoeuvring lane (3.5m) and a through lane (3.5m)
- At least 9.5m of shared pedestrian width for bus stand queueing, pedestrian pathways to bus stands further along towards Regatta Point and access to the Regatta Point ferry wharf
- Integration to the Port Road with detailed design and integration of the Port Road to be designed by others
- Access to a new proposed carpark access
- One mobility drop off bay with straight kerbs
- 10x 14.5m bus bays
- Turnaround opportunity for a 26m B-Double
- Consideration required to be given to the following items:
 - Embankment of trees and cliff edge along the north-west side of the bus mall.
 - Opportunity for development along the south and southeast of the proposed bus mall.

The concept design for this space is shown in Figure 6.8. The full drawing set including swept paths is included in Appendix I.

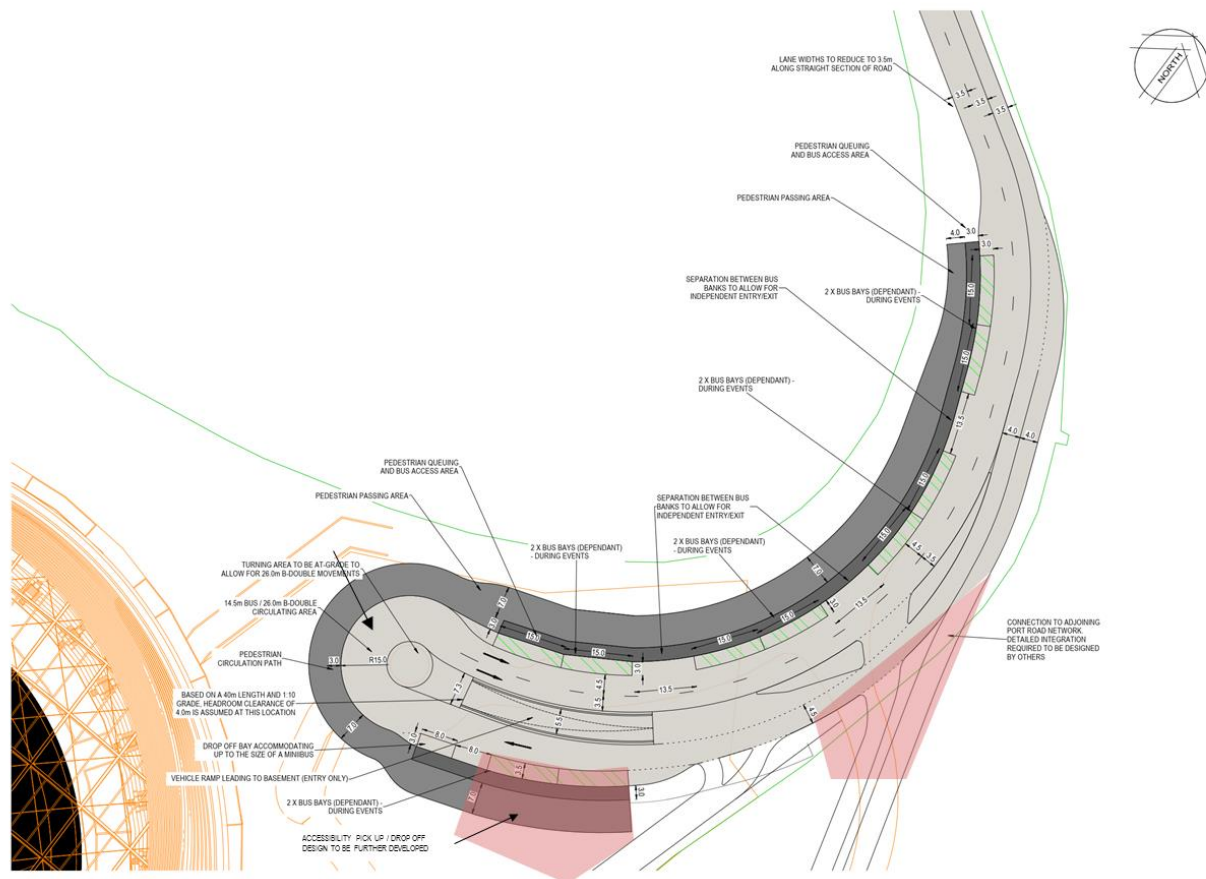


Figure 6.8 Concept event bus plaza

6.5.1.1 Straightened bus bays for accessibility pick up / drop off

The bus plaza location is somewhat fixed and curves around the Cenotaph headland. This leads to curved kerbs which are not ideal for universal access. With this in mind a straightened bus stop was investigated. Locations considered were one paired stop on the northern side (first bays after the u-turn) and the two bays approaching the u-turn on the southern side (see Figure 6.9).

The proposal to have straight kerb accessibility bays at the first two bus stops in the plaza aligns to operational needs, whereby it will be best for any accessible pick-ups to happen first before moving on to the main pick up area. This allows time and space for these pick-ups to happen away from crowded areas.

At this stage the preferred transport solution is to straighten the kerb edges on the southern side. This will be refined as part of the ongoing masterplan process.

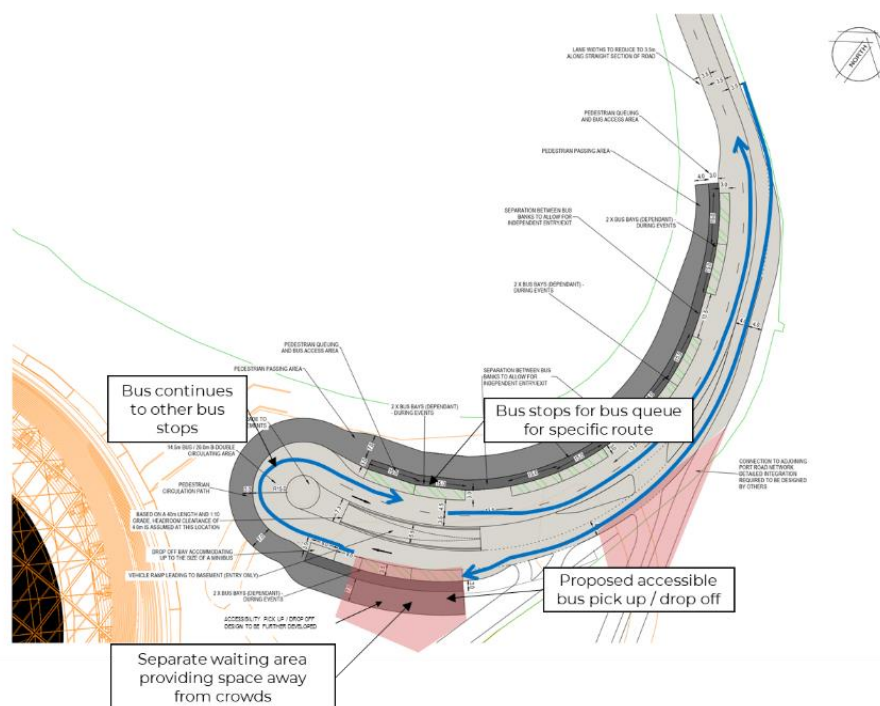


Figure 6.9 Concept accessibility operation

6.6 Ferry

The Brooke Street Pier to Bellerive ferry trial has proven successful and has been extended. This cross river service will be complemented by an expanded ferry network by 2026 with three new wharves committed for Wilkinsons Point, Lindisfarne and Sandy Bay.

In addition to these three new wharves by 2026, the Regatta Point wharf is included in the draft ferry Masterplan but the timing for this wharf is not confirmed. The Regatta Point location will assist in dispersing a portion of the crowd away from the CBD and waterfront as they walk north to the Regatta Point wharf. Grade separation of pedestrians/cyclists across the Northern Access Road should be considered as part of the Northern Access Road design.

The network connectivity (i.e. the order of stops or direct services) has not been confirmed as yet and this may influence ferry capacity. The ferry mode share will also be influenced by the vessel type and operating model for the expanded network, all of which are yet to be determined. As such the ferry mode share is assumed as relatively low compared to other public transport modes but could be increased in the future as operational aspects are determined. Network planning is underway by the Department of State Growth.

Future planning should consider the ferry network planning as it will directly influence the distribution and volume of spectators to either CBD ferry wharves such as the Brooke Street Pier or the Regatta Point wharf.

The ferry wharves are shown in Figure 6.10 and Figure 6.11.

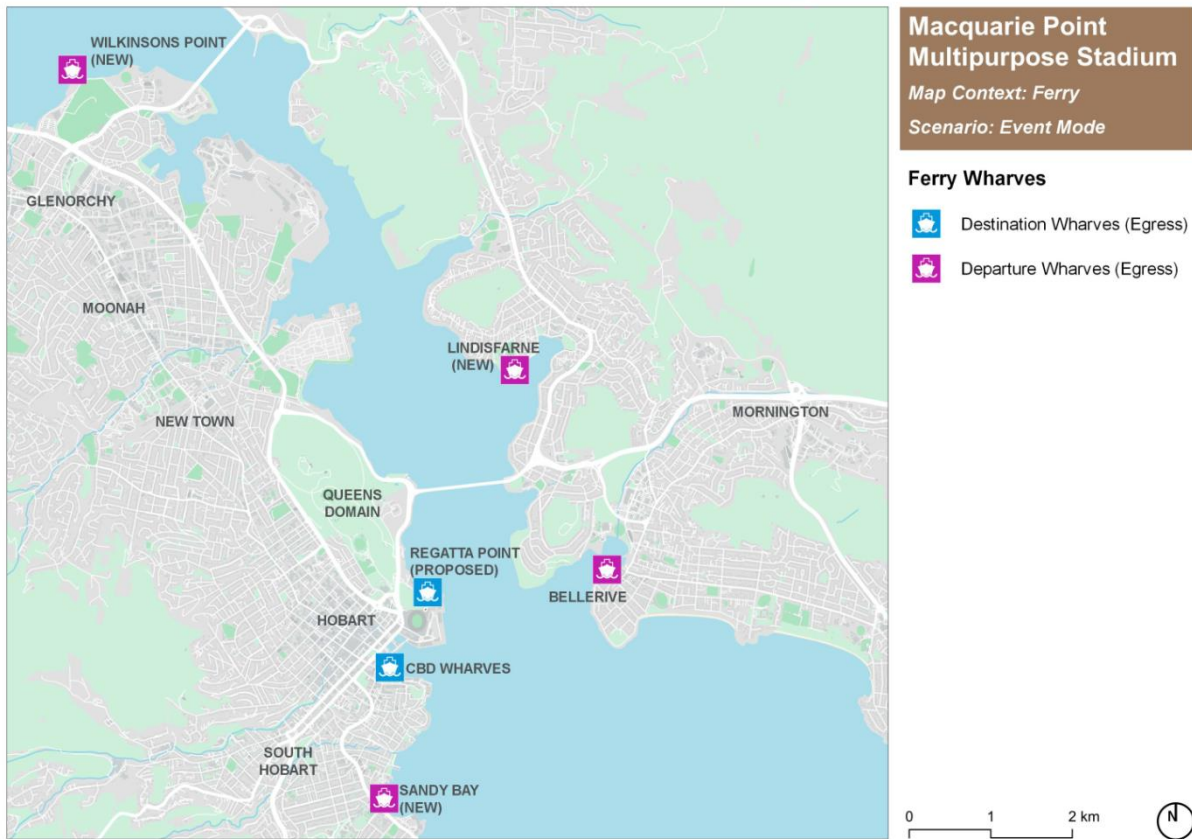


Figure 6.10 Network wide ferry wharves



Figure 6.11 Local ferry wharves and pedestrian connections

6.7 Coach

Coaches will play a role in connecting regional Tasmania to the stadium, and provide an opportunity for private charter for groups, sporting clubs and communities to experience events at the stadium.

The number of spectators arriving by coach to a stadium in Australia is based upon the following factors:

- The geographical location of the visiting team
- The number of home team supporters from regional areas
- The ease of regional transport to the stadium (as a competing mode to coach)
- The number of coach parking spaces provided
- The need, cost and requirement to book a coach parking space
- The promotion of coach parking to established groups (members, travel packages etc).

Due to the isolated nature of Hobart compared to the east coast AFL clubs, out of town travel will likely be limited to spectators of the home Tasmania Devils and Hobart Hurricanes teams. There is dedicated coach parking at the adjacent Cruise Terminal, however, it is understood that due to year round port operations and the secure boundary this will not be suitable for coach parking for stadium events.

Generally with private coach services, the best practice and clearest messaging for customers is to have coaches drop off and pick up in the same location, and ideally parked there for the duration of the event. There are two options identified for this mode:

- 1 Drop off, parking and pickup in Queens Domain with a walking route via the Bridge of Remembrance.
- 2 Private coach trips are made to Park and Rides and customers transfer to event buses for the remainder of their journey.

It is noted that the Queens Domain hosts its own events and at times would clash with additional coach parking/drop off. Further refinement of this process is required in future stages of planning and coordination.

6.8 Taxi / Shared mobility

Taxi and ride share will be accessed from the Hobart CBD, a short walk from the stadium precinct. There are existing taxi ranks on Collins Street (near the corner of Elizabeth Street), and near Salamanca on Castray Esplanade and Morrison Street.

Dedicated areas for public access to taxi and ride share will not be provided within the stadium precinct. Kerb space around the immediate stadium precinct will need to be managed to exclude drop off/pick up with the exception of mobility impaired patrons. Access for mobility impaired patrons would be through a traffic control point at the western end of Evans Street at Davey Street. Kerb space can be managed with regulatory signage, or technologies such as geofencing.

The taxi rank on Davey Street outside the Grand Chancellor Hotel is proposed to not be in use during events, given the narrow footpath widths and post-event crowds in the area. A new kerbside taxi rank has not yet been proposed, however it is noted that this may be a requirement.

6.9 Car Parking / Drop-off

Approximately 22 per cent of trips are anticipated to result in a parking trip-end with a destination at the stadium (neglecting park and ride to public transport trip chains and pick-up/drop-off trips). Of these, only 300 vehicles are anticipated to be accommodated within the immediate stadium surrounds, representing corporate and member parking

only. All other parking would be provided by public and publicly accessible facilities within a reasonable walking catchment of the stadium (nominally 1.2km).

There is an ample supply of parking within the Hobart CBD, sufficient to accommodate the target driving mode share. The availability of parking is expected to vary depending on the day of the week and time of day, but would broadly comprise the following:

- **Large-scale commercial car parks:** comprising almost 4,000 parking bays and including both fully public and publicly accessible private spaces. These facilities are largely vacant during weekday and weekend evenings and would therefore be available for event parking as an extension of current operation.

Occupancy of these car parks for other CBD uses is likely to be higher during the weekend midday period. While some capacity would be available based on current usage, there may be a need to source additional consolidated car parking options.

- **Off-street employee car parks:** there are a number of small- to mid-sized car parks that cater specifically to employees (via a voucher or leasing arrangement). Adapting these car parks to accommodate event needs can address concerns regarding weekend use of commercial car parking impacting CBD retail.
- **Off-street private car parks:** where event attendees is provided to employees in the form of private on-site facilities, this will be used for a portion of event attendees with existing parking rights. In particular, employees are expected to extend their stay in the CBD for weekday evening events. Some use of these bays on the weekend is also likely.

Parking locations are shown in Figure 6.12.

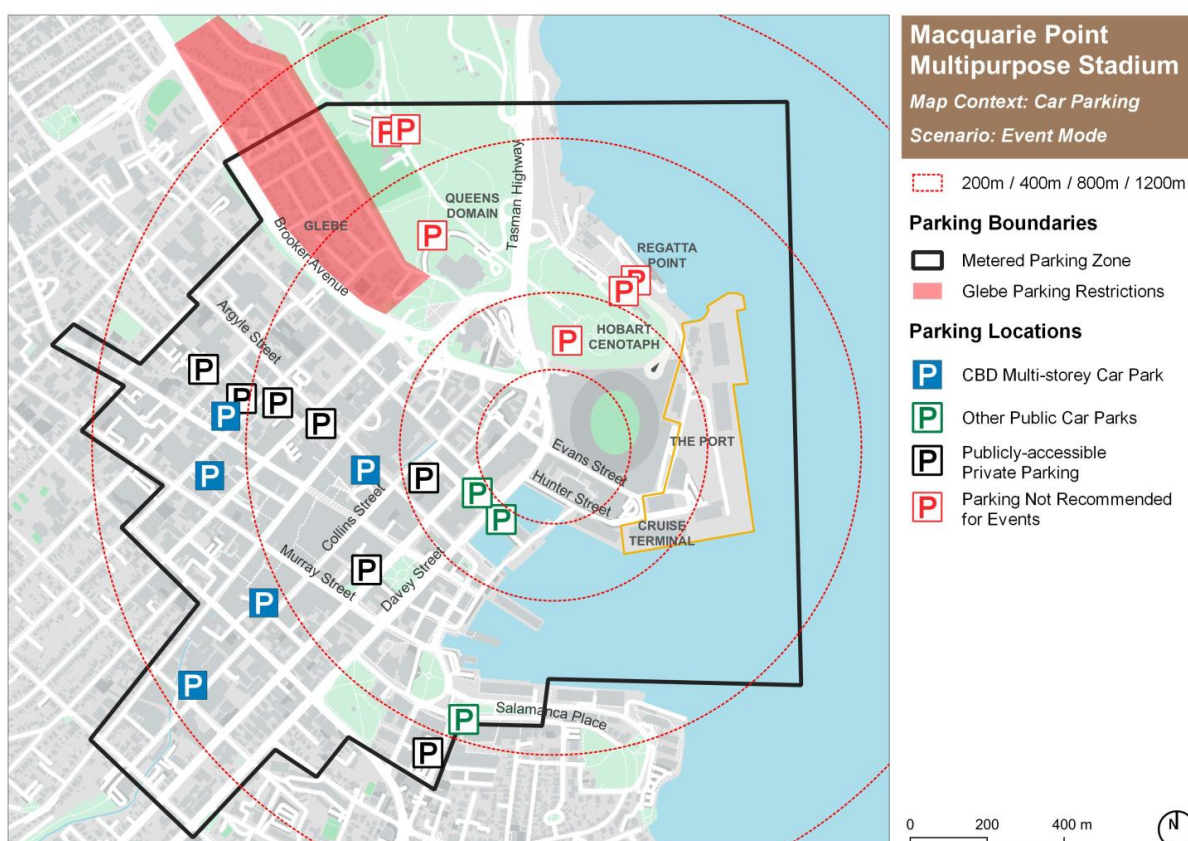


Figure 6.12 Local parking

6.10 Local area transport and access plan

Event traffic management measures are put in place around stadia to facilitate priority access for public transport vehicles over private vehicles, facilitate car park entry and exit, restrict access for vehicles in to areas of high pedestrian activity and facilitate secure perimeters around a stadium. Some stadia in Australia that require road closures for safe and efficient transport operations include Queensland Country Bank Stadium in Townsville, the Melbourne Cricket Ground, Suncorp Stadium in Brisbane and Adelaide Oval. Measures that can be used to manage traffic and access are defined as follows:

- **Managed intersections:** Traffic control by police or traffic controllers for the safe movement of crowds before and after events.
- **Road closure / No on-street parking:** No access by vehicles during peak event times, with a preference for no on-street parking during the road closure. Requires a wider parking scheme and kerbside signage changes.
- **Impacted Private Access:** Short term impacts to residential, businesses and commercial properties in the affected areas.
- **Permitted Vehicles Only:** Access granted to vehicles displaying the correct permit.

Measures for traffic management are mapped on the local area transport and access plan in Figure 6.13.

6.10.1 *Northern Access Road*

The Northern Access Road is proposed to be access controlled for permitted vehicles only for 180 minutes pre-event and 30 minutes post-event. Permitted vehicles would include:

- TasPorts traffic
- Event buses
- Those permitted to park within the stadium (players, officials, operations, corporate etc)
- People with existing parking spaces within the precinct
- Disability group drop off in the event bus plaza.

This arrangement requires future planning and design of a vehicle inspection/rejection point on the Northern Access Road, done in a way so as to not slow down or impede TasPorts traffic and event buses in particular.

Under the event scenario, pedestrians moving between the Regatta Point ferry wharf and the stadium will conflict with Northern Access Road traffic if not properly managed. This may lead to safety risks and inefficiencies for TasPorts and event buses. Grade separation for pedestrians and active travel is highly recommended as part of the Northern Access Road design.

6.10.2 *Evans Street*

Evans Street is proposed to be closed to traffic temporarily except for mobility impaired drop off, which has been earmarked for the western end of Evans Street between the stadium and Davey Street. The Evans Street road closure would be for 60 minutes pre-event and 30 minutes post-event.

Access in and out of parking garages on Evans Street may be facilitated under traffic control but needs to be investigated through the traffic management plan. Engagement would be required between TasPorts, MPDC and tenants to refine their access and delivery arrangements.

It is noted that with the current height restrictions at the McVilly Drive interchange that Evans Street is required for over height vehicles in access the port. This would be unavailable at these times.

While this closure may appear onerous as presented in Figure 6.13, it is worth noting that there are approximately 12-14 home games in the regular AFL season which will take place between Thursday evening to Sunday afternoon over the

winter AFL season. It is also assumed one Tasmania Devils home game would be played in Launceston. The 2023-24 Big Bash League season was made up of 10 regular season matches. The Hurricanes had six home games across the entire season.

TasPorts have confirmed that if there are overlaps with cruise ships in port and stadium events, there is the potential for coaches for shore trips to come and go via the Northern Access Road.

6.10.3 Hunter Street and waterfront

As a continuation of the pedestrianised zone of Evans Street (required for the peak crowds), Hunter Street is proposed to be pedestrianised from Davey Street and over the bridges to Constitution Dock with access to permitted vehicles only. Constitution Dock bridge is proposed as a road closure. This closure would be for 60 minutes pre-event and 30 minutes post-event, however, there will be days where waterfront road closures are already in place for cruise ships in port. Traffic management plans (and their ownership/responsibility) will need to accommodate both purposes in this scenario.

The road closures and permitted vehicles only restriction will impact MACq 01 and other tenants across the waterfront. Access to and from MACq 01 will be required and some car park and other leases have statutory level access. This needs to be worked through with MPDC, TasPorts and MACq 01 as part of ongoing planning and engagement.

Access arrangements for Evans Street and Hunter Street will be influenced by the need for crowd safety and the need for access to properties, residences and businesses.

6.10.4 Event day local area transport and access plan

A concept local area transport and access plan is shown in Figure 6.13. This plan intends to document road closures, changes to access, traffic control points (i.e. Evans Street) in the surrounding area. It does not intend to show access priorities to and from the Port, for example, which are shown in the DSG Northern Access Road concept design. The plan serves as the basis for future detailed traffic management plans.



6.11 Travel Demand Management

The transport options discussed in section 6.1 to 6.10 have been demonstrated to provide the capacity to meet the sustainable target of 60 per cent non-car mode share. However, without a coordinated event travel behaviour campaign to support the transport offerings it is likely that the self-drive mode share will be greater than hoped which will directly impact the performance of the Hobart traffic network. In turn, this will colour the view of spectators and non-spectators of the stadium and the suitability of the transport plan. The success of the stadium relies on the transport plan selected for each event scenario working effectively.

The POSS Guidelines ask for assessment of increased car mode shares due to poor weather or night time events, but perhaps the most likely scenarios leading to increased car mode share is a lack of promotion of the available transport options and delays in delivery of the new transport services. A coordinated effort is required to ensure high-quality public transport services are available for the first events in 2029 and that people know about these services.

Considerations for an event travel behaviour campaign include:

- Encouraging event patrons and background transport network users to re-time, re-route, re-mode and reduce their trips.
- The sports clubs/promoters of events should be the encouragers and ‘face’ of the travel behaviour change campaign and each event-specific messaging. Overseas and local studies have shown that spectators best respond when their clubs promote travel options. The travel behaviour change measures should be investigated and planned by the suitable authority though.
- An integrated ticketing program is recommended. Integrated ticketing bundles event travel with event tickets, typically triggered when a crowd capacity threshold is expected to be exceeded. Integrated ticketing should include all public transport options and funding options should be explored.
- Wrapped buses that promote the event bus services and which are selected as part of the event bus fleet on event days.
- Event bus routes included into the future statewide journey planning tool and other journey planning tools for event days.
- Travel advice in the media and on variable message signs advising of potential delays, re-timing journeys, re-mode and re-think the need to travel.
- Concurrent events at the Federation Concert Hall (capacity 1,100), Theatre Royal (capacity 698) and Queens Domain and cruises. Any overlap should be considered carefully in event by event planning, however, the range of pedestrian modelling and transport modelling scenarios in this study includes investigations for 31,500 people which would generally cover a stadium event and other concurrent events also.

7 Transport plan – day-to-day

Much of the infrastructure and many of the processes outlined in section 6 also complement the day to day transport plan for people travelling to, through and from Macquarie Point. The day to day scenario discussed here is not impacted by crowds and event buses so the precinct can return to a shared space for the community, employees working on site and people attending for business and other activities.

7.1 Pedestrians

Pedestrian access to the precinct would benefit from improved connectivity on Evans Street and the waterfront as the precinct will support business events on non-match days.

Planning for pedestrians will be a key element of the Macquarie Point precinct plan and open space elements, landscaping and adjacent development sites. Key coordination with UTas master plan and the TasPorts commercial precinct will be essential to achieve a seamless public domain in one of Hobart's greatest assets being Sullivan's Cove.

7.2 Cycling

The cycle route along the eastern perimeter of the stadium will provide significant benefits for Hobart's cycling network. This will provide an improved connection between the Intercity Cycleway and the waterfront. The elevation profile of this alignment is favourable compared to the existing shared path along Tasman Highway / Davey Street and will attract a majority of existing trips, as well as serving new riders. Reducing the volume of people riding on Tasman Highway / Davey Street path will improve pedestrian safety and comfort.

The potential Collins Street walking and cycling bridge would significantly increase the attractiveness of cycling as a transport option for trips to, from and through the precinct. The bridge would provide for off-road cycling trips from the Intercity Cycleway into the CBD, where the City of Hobart has endorsed plans for safer connected bicycle lanes the length of Collins Street, connecting to the existing Hobart Rivulet path. Once completed, this corridor would extend approximately 17 kilometres from Claremont to South Hobart.

To the east, the direct connection to an upgraded Tasman Bridge path would also connect to this route, realising the vision established in the Greater Hobart Cycling Plan (2022), which has been endorsed by the Tasmanian Government and four Greater Hobart urban councils (i.e. City of Hobart, Clarence City Council, Glenorchy City Council and Kingborough Council) and Draft Keeping Hobart Moving (2023).

The day-to-day network maps are shown in Figure 7.1 and Figure 7.2.

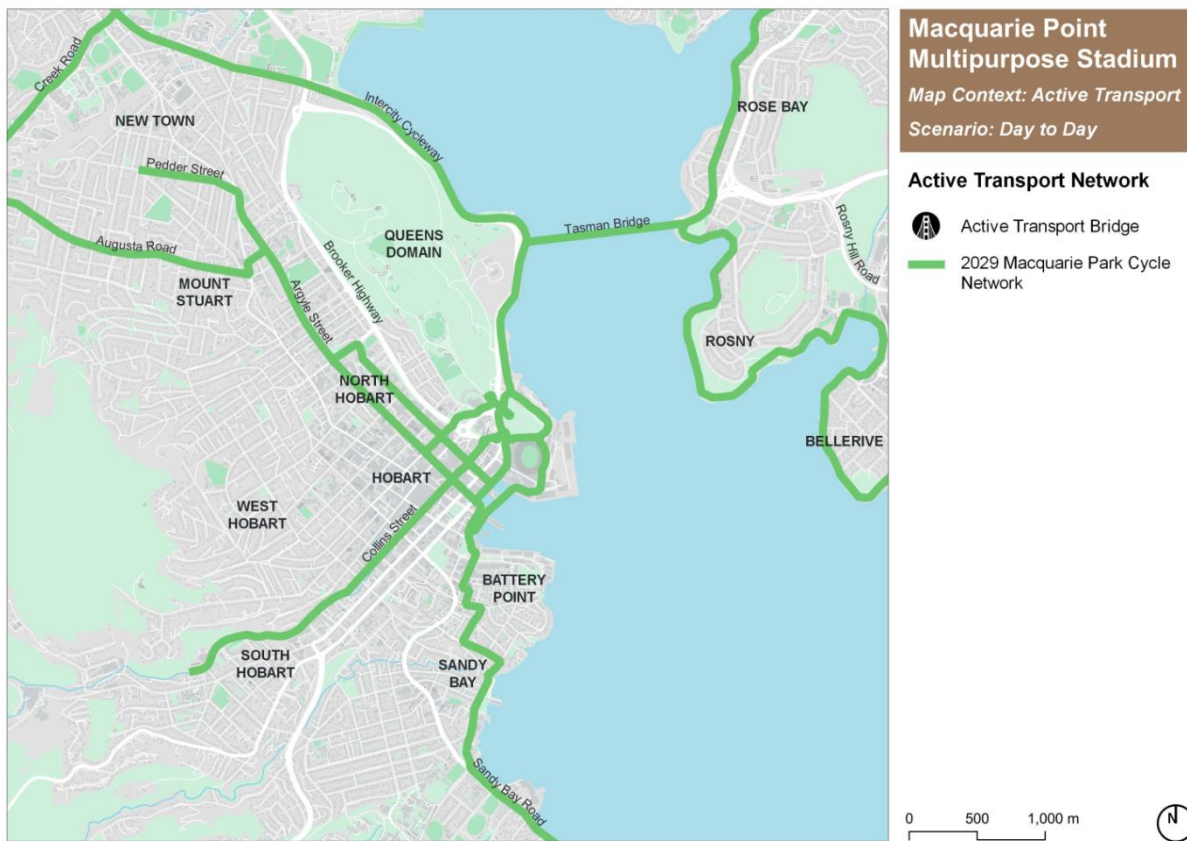


Figure 7.1 2029 Day-to-day active transport network



Figure 7.2 2029 Day-to-day local area active transport network

7.3 Public bus

The public bus network will be unchanged to that outlined in section 6.3.

7.4 Rapid bus

The rapid bus network will be unchanged to that outlined in section 6.4.

7.5 Event bus plaza

There is opportunity to provide two sets of line marking for the event bus plaza. One set would be for buses as shown in section 6.5.1. The other would be parallel car parking bays for day to day use. The current arrangement would provide approximately 27 car parking spaces for short term parking for the mixed use areas of the precinct and the stadium.

7.6 Ferry

The ferry wharves will be unchanged to that outlined in section 6.6.

7.7 Coach

Should coach provision be required in the day-to-day scenario the stadium operators may be able to make available the event bus plaza for coach parking. This would require changes to the proposed kerbside allocation or sectioning off parts of the plaza in advance of coach arrivals. The bus plaza is shown in section 6.5.1.

7.8 Taxi / Shared mobility

A kerbside taxi zone is proposed for Evans Street outside the stadium. This should be considered in a future planning and design study of Evans Street. The taxi zone is not proposed to replace the existing rank at the Grand Chancellor but to simply provide space for taxi pick up and drop off.

7.9 Local area transport and access plan

7.9.1 *Car parking / pick up / drop-off*

Pick-ups and drop offs would take place on Evans Street or in the short term parking at the Event Bus plaza via the Northern Access Road.

On site parking will be accessed from the Northern Access Road, where the on-street parking in the event bus plaza can be used or parking under the stadium or other buildings in the precinct can be accessed. Parking will be available on Evans Street also.

7.9.2 *TasPorts and freight vehicles*

The primary access point for TasPorts vehicles and freight is to be the Northern Access Road. This will significantly reduce the number of trips on Evans Street as discussed in section 5.1. Evans Street is still required for over-sized vehicles though. The day-to-day scenario will see Evans Street as the 'front door' to the stadium while also accommodating heavy vehicles for port access.

All cruise terminal access remains as Evans Street.

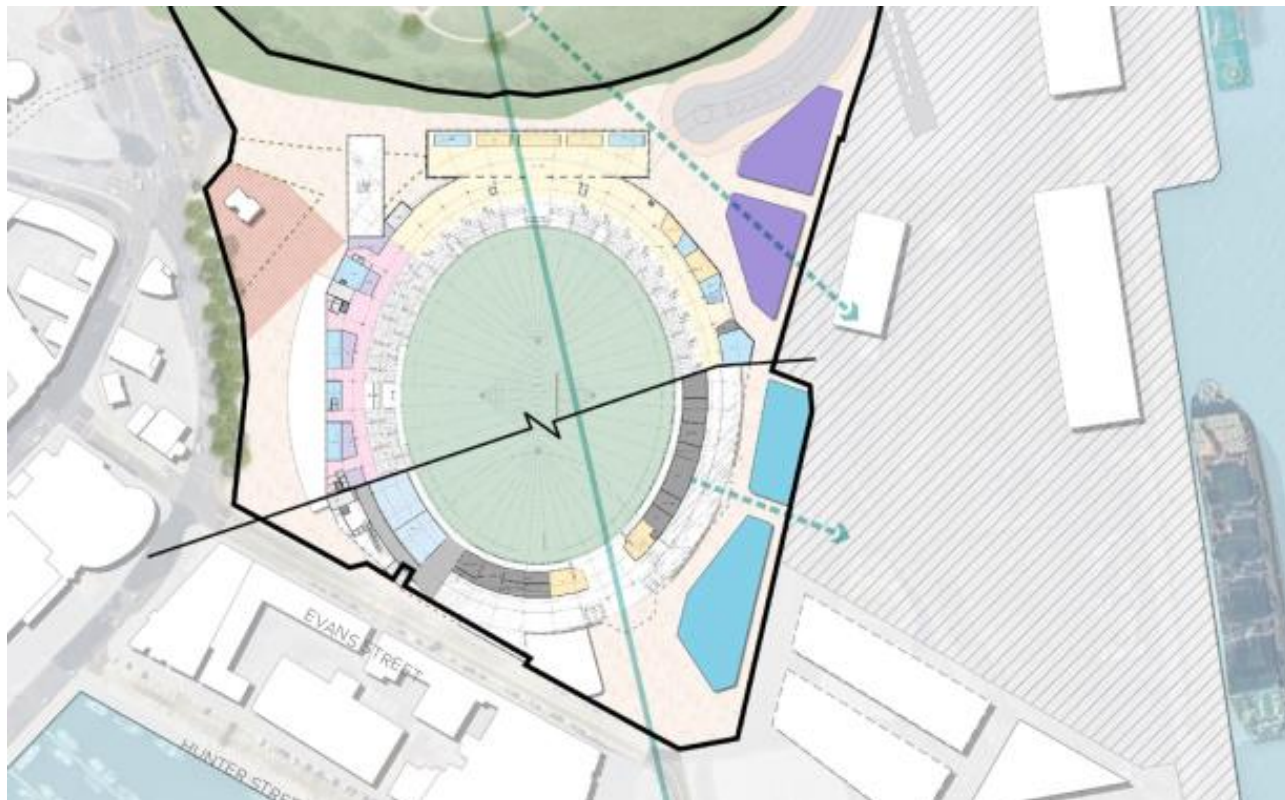
7.9.3 Hunter Street and the waterfront

No access changes are proposed for TasPorts tenants under the day to day scenario.

7.9.4 Proposed uses on the precinct

There are mixed-use areas in the south and east of the precinct including restaurants, cafes, hotels, medical facilities, and commercial office. The north east will see the proposed Antarctic facilities zone. These are shown in Figure 7.3.

Vehicle access will be via the Northern Access Road.



Source: Cox (Mac Point Draft Urban Design Framework PoSS Report)

Figure 7.3 Other uses

The day to day local area transport and access plan is shown in Figure 7.4.



Figure 7.4 Day-to-day local area transport and access plan

8 Projects and next steps

8.1 Supporting and enabling projects

The Transport Study has considered future projects that are necessary for the success of the precinct. These projects are required to integrate existing uses of the Port and cruise terminal with the new uses proposed to be introduced to the precinct, as well as to integrate the precinct into the city. Projects have been prioritised for their importance to the overall transport task according to the definitions in Table 8.1. Note the assessment is focused on managing the precinct transport task, and lower ranking projects may provide a variety of broader benefits for Greater Hobart. The status of each project's development and funding is also identified in Table 8.2.

Many of the projects identified are unfunded yet are essential to the success of the stadium and precinct. Independent cost estimates have been completed based upon initial high-level project scoping. The cost estimates and full details of the project assumptions are provided in Appendix K.

Table 8.1 Project prioritisation

PRIORITY	DEFINITION
Essential	Supports the overall transport task for the stadium. These projects will provide capacity or enhance safety (or both) for either spectators or the background transport network.
High	If not provided, temporary overlay or on-the-ground management may be needed for each event to maintain acceptable performance levels.
Medium	These projects will contribute to improved safety and network performance outcomes. If not provided, the transport network will remain functional and adequate for the capacity scenario, but operational performance and user experience may be negatively impacted.
Low	These projects would improve the perception of the transport offering and contribute to improved visitor experiences.

Projects are shown in Table 8.2

Table 8.2 Supporting and enabling projects

Project / Process	Purpose	Current Status	Impact without	Priority	Indicative scope	COST Estimate \$m
Northern Access Road	Heavy vehicle access route from the Tasman Highway to the Port, Cruise Terminal, Event Bus plaza and stadium back of house.	Previous scope identified in Hobart City Deal (Australian, Tasmanian and local governments). Unfunded.	Increased freight traffic on Evans Street, impacting amenity and placemaking opportunities and leading to more opportunities for safety impacts between heavy vehicles and pedestrians. High safety risk. Stadium access would need to be via Macquarie Point Road necessitating a redesign of the stadium precinct and further impacting the Tasman Highway / Brooker Avenue / Davey Street intersection.	Essential	Construction of approximately 800m long new full-depth pavement for Northern Access Road and Macquarie Point Road. 1,600m of new shared user path as well as the construction of retaining walls, a pedestrian bridge, an overpass and an underpass. Macquarie Point Development Corporation will continue to work with the State Government on how this road can best be delivered.	33.9
Event bus plaza	Dedicated event bus zone for stadium events to transport up to 8,000 people. Short term parking in day-to-day scenarios.	Identified in 2023 Mac Point Draft Precinct Plan	Results in a need for a kerbside bus plaza on CBD streets, where traffic volumes are high and footpath capacity is low. Would impact CBD road network capacity. Likely mode shift to private car trips, increasing network congestion. High risk pedestrian crowding if additional bus movements were relocated.	Essential	As per concept design in Appendix I.	11.15
Reconfigure Hunter Street car parking (eliminate pedestrian impediments from cruise terminal to Davey Street)	Increase footpath capacity near Davey Street.	No plans or funding identified.	Reduced capacity for crowd to disperse due to footpath obstacles. Would push more people via Davey Street footpaths which will already be at or exceeding capacity. This may impact through traffic capacity. Trip hazards contribute to poor visitor experience.	Essential	Remove curbs to mitigate trip hazard. Footpath upgrade. Public space opportunity.	0.3

Project / Process	Purpose	Current Status	Impact without	Priority	Indicative scope	COST Estimate \$m
Event travel behaviour campaign	Encourage mode shift to public and active transport options.	Identified Unfunded	Increased likelihood that people will choose to drive, impacting public transport, general traffic and freight across the network.	Essential	Event travel behaviour campaign To be led by Tasmanian Government, in partnership with the Tasmania Devils and Hobart Hurricanes. Integrated Ticketing where public transport is included in match tickets (cost structure to be determined).	0.2 – 0.5
Macquarie Street and Davey Street bus priority measures	Provide bus priority to encourage mode shift.	Funded and being implemented.	Buses will be delayed with general traffic when congestion occurs. Mode shift targets may not be achieved. Increased operational costs if additional buses are required.	High	Targeted removal of parking on kerbside lanes. Targeted provision of bicycle lanes. Extended clear ways. Extended turn lanes.	Funded
Davey Street footpath expansion between Evans Street and Hunter Street	Provide for crowd pedestrian flows.	Identified by this study. Unfunded.	Pedestrians spill onto roadway, conflict with traffic and buses, safety risk.	High	Project area approx. 150m2. Remove 5min parking bays. Provide kerb and channel, new asphalt footpath Relocate existing trees to new kerb alignment to increase effective width.	0.28
Local bus network reviews	Increases frequency and improve journey times	Ongoing	Reduces acceptance of local bus as mode to stadium, impacting traffic congestion, pressure on other parts of network.	High	Timetable and stop reviews.	0.1 – 0.3
Fleet requirements study for buses and ferries	To understand fleet requirements for different event scenarios/time of day etc.	No plans or funding identified.	Lack of buses and ferries to deliver transport plan (potentially, to be investigated).	High	Capacity and gap analysis for fleet and drivers.	0.1 – 0.3

Project / Process	Purpose	Current Status	Impact without	Priority	Indicative scope	COST Estimate \$m
Collins Street Active Transport Bridge	Grade separated link from the northwest corner of the precinct to Collins Street, with mid bridge access to Brooker Avenue. Provides benefit for legacy day to day use and events.	Identified in 2023 Mac Point Draft Precinct Plan. Unfunded.	5,000+ people crossing Davey Street at grade and impacting background network capacity and event buses. Major delays for freight, public transport and general traffic on Davey, Macquarie, Brooker and Tasman Hwy during event times. Lack of connectivity to Collins Street active transport corridor. High safety risks with pedestrian overcrowding, spilling onto Davey Street during event times. Poor integration of the site with the central city. Poor access to proposed Rapid Bus stops Reduced day-to-day activation of the precinct impacting economic viability of commercial sites. Increased pedestrian and cyclist conflict during both events and day-to-day. Poor access to existing CBD parking supply. Non-heritage tree removal required on Davey Street to provide expanded shared path to manage crowd volumes.	High	Total span approx. 200m. Minimum width of path 6m. Approximate height clearance 7.8m. 3 lifts (each end and midway for Rapid Bus access). 3x spiral ramps with approximately 12m radius. Value engineering and rationalisation of ramps, stairs and elevators may reduce scope and cost.	44 – 56.5
Rapid Bus	Increases frequency and improve journey times for Rapid Bus. Event bus to use part of corridor.	Northern Suburbs Transit Corridor - City Deal (Australian and Tasmanian Governments) Southern and Eastern corridors - Status to be determined.	Increased journey time for buses including event bus, reducing efficiency of service. Mode share target may not be achieved.	High	State Government project.	Refer to Greater Hobart Rapid Bus Network Strategic Business Case (DSG, underway)

Project / Process	Purpose	Current Status	Impact without	Priority	Indicative scope	COST Estimate \$m
Hunter Street parking restrictions	Clear space for crowds in close proximity to stadium, where crowds will be most densely populated.	No plans or funding identified.	Parked cars will impact pedestrian capacity and may cause safety issues.	High	Minimum and critical requirement is for car parking restrictions during event times to provide space for crowds to disperse.	0 – 0.15 p.a.
New Southern Campus Transformation – UTas Centre for the Arts Hunter Street Pocket Park	Landscaping and placemaking for the campus. Allows for stadium crowds to disperse from the southeast corner of the stadium, reducing potential conflict on Davey Street.	Considered as part of Stage 2 of the New Southern Campus Transformation masterplan commencing in 2021/2022.	The current arrangement with car parking, kerbs and signage does not provide the clear space to accommodate the required number of spectators at a safe or suitable level of service (Fruin level of service D). More pedestrians would be directed towards Davey Street which is severely constrained Reduced cycling mode share during events and particularly day-to-day.	Medium	Project area approx. 4500m2. convert car parking area to new open space. Landscaping, trees and subsoils. Paving and footpath. Associated drainage.	2.05
Collins Street redesign (Collins Street Vision)	Increase footpath capacity, increase cycling comfort, improve public realm	Identified action in the City of Hobart Central Hobart Plan and a priority cycle route in the Growth Greater Hobart Cycling Plan	Potential to negatively impacting the walk and active transport mode shares for events leading to increased traffic. Narrow footpaths between the Site and CBD parking relative to event demands which may result in people walking on the roadway. Reduced pedestrian and cycle network connectivity to and through the precinct, reducing activation of the site during non-event times.	Medium	Project area approx. 13,000m2. Protected bicycle lanes from Brooker to Murray Street. Footpath expansions from Brooker to Elizabeth Street. Street trees and subsoils. Naturalisation of Hobart rivulet. Associated drainage. Profile and re-sheet carriageway. Traffic signal reviews and plans.	11.5

Project / Process	Purpose	Current Status	Impact without	Priority	Indicative scope	COST Estimate \$m
Greenfield Park and Ride	Provide park and ride facility for event bus services.	Selected projects being progressed, additional opportunities.	Increased driving to Hobart CBD, adding to congestion issues.	Medium	Asphalt carparking for 200 no. bays (assuming approx. 4,700m ² . Bus bays and shelters. Public toilets . Secure bicycle parking. Associated footpaths, lighting and landscaping.	3.9
Brownfield Park and Ride	Provide park and ride facility for event bus services.	Selected projects being progressed, additional opportunities.	Increased driving to Hobart CBD, adding to congestion issues.	Medium	Asphalt carparking for 200 no. bays (assuming approx. 4,700m ² . Bus bays and shelters. Public toilets. Secure bicycle parking. Associated footpaths, lighting and landscaping.	3.8
Central and uplifted Transit Centre	Improved amenity for buses and passenger safety and comfort in the CBD.	Identified, not funded.	Bus network may not be optimised or integrated as best it could. May not support necessary mode shift.	Low	Integration of bus services into an interchange or nearby facilities.	136
Evans Street redesign, from Davey Street to Hunter Street	Street has direct interface with the precinct along the southern site boundary	No plans or funding identified	Accessibility barriers between proposed DDA parking bays and the stadium. Road safety issues due to a wide street and heavy vehicle traffic. Heavy vehicle movements are poorly managed through a high pedestrian zone and cycle priority route. Poor pedestrian provision and narrow footpath widths.	Low	New expanded footpaths. New trees and subsoil. Road surfacing suitable for both regular road closures and heavy vehicle access. Changes to levels and drainage subject to design. DDA bays and associated kerbs/ramps.	5.7
Civic and Cultural precinct public realm masterplan	Integrate the stadium precinct with streets connecting the waterfront and the central city.	Area identified in Central Hobart Plan. No funding identified.	Poor spectator experience. Increased operational costs such as traffic management.	Low	Area encompasses the Waterfront to Collins Street. Project should consider tree planting, street furniture, signage, vegetation species, kerb extensions, flush pavements, speed zoning, outdoor dining opportunities and restrictions.	54.6

Project / Process	Purpose	Current Status	Impact without	Priority	Indicative scope	COST Estimate \$m
Tasman Bridge Pathways Upgrade	Support increased walking and cycling to/from Eastern Shore.	Funded by Australian and Tasmanian Government.	Small reduction in walking and riding from Northeast to events and day-to-day.	Low	State Government project.	130 committed funding

The cost range for the event travel behaviour campaign depends on the extent of engagement with employers and the necessary marketing and communications spend (creative time, billboards, radio, TV, social media, print ad spend).

Hunter Street parking changes is 0 if parking is displaced to off street car parks or up to 0.15 as a total loss of revenue for 16 events p.a. exceeding capacity of 10,000.

8.2 Supporting and enabling processes and planning

In addition to the proposed infrastructure upgrades, stakeholders and agencies will need to identify projects, programs and processes that will also contribute to the success of the transport implementation plan.

The following tasks could be considered before the first stadium event, and it may be beneficial doing some before the POSS hearings. These are noted in Table 8.3

Table 8.3 Supporting and enabling processes

Process / Task	Benefit	Before Final Masterplan	Before first stadium event
Multi-agency transport working group	Coordination across agencies to prepare for the first and ongoing events and factoring in concurrent events and activities such as cruise ships, port access and other local events. Operational roles and responsibilities agreed, resources scheduled, gaps identified and mitigated, business continuity plans prepared.	No – mobilise if planning approval granted.	Yes
Transport readiness planning	Scenario based multi-agency desktop exercises to understand transport operational requirements, identify ownership, mitigations and operational management. The first of these should be done prior to any POSS hearings as it will strengthen the knowledge and understanding of operational roles and responsibilities.	Yes	Yes
Turn up and Go	There may be a case to increase frequencies on weekends and weekday nights depending on event times.	No	Yes
Coach and private charter booking process to reserve coach parking	Certainty around coach arrivals and space required.	No	Yes
Refinement of CBD parking availability	Provides ability to work with COH and private operators on parking supply, and potentially provide pre-booking to inform transport planning and provision of bus services.	No	Yes
Changes to traffic management centre operations	Late night and weekend events are outside of current operating hours, therefore consideration should be given to future staffing and operational responses.	Yes (in principle agreement)	Yes
Ferry network planning	Specific event ferry timetables/routes to best leverage fleet capacity and wharf locations.	Yes (indicative ferry network plan to support confirmed wharves)	Yes
Mesosopic modelling	Modelling with scenarios including with and without cases for transit lanes for the north, east and south. Note that modelling event situations with large demand spikes over a short period of time can be challenging.	No	Yes

Process / Task	Benefit	Before Final Masterplan	Before first stadium event
Event travel behaviour campaign	Key component of the transport plan. Advising and informing people how to re-time, re-route, re-mode and reduce their trips.	No	Yes
Microsimulation traffic and pedestrian modelling -	Modelling to better understand the interactions of traffic, crowds, buses and the inclusion of the proposed Collins Street Active Transport bridge in and around the precinct. Note that modelling event situations with large demand spikes over a short period of time can be challenging.	No	Yes
Detailed Transport Implementation Plans including traffic management plan/s and integration with TasPol	Plans at various thresholds (0 – 5,000, 5,001 – 15,000, 15,000 – 24,500, 24,500+ etc), times of day and week, and incorporating the public transport services available at the time, so that agencies can deploy the right resources for the right situation. Scenario planning should consider cruise ships in port, which is known two years in advance. Ownership of the planning to be determined before this can progress.	No (but agreement of thresholds would be appropriate)	Yes
Collins Street Active Transport Bridge feasibility study	Initially focused on spatial feasibility and integration with footpaths, roadways, properties and proposed rapid bus stops. If not feasible, additional planning required to bolster at grade pedestrian links.	Yes Yes, if required	Yes Yes
Confirmation of the ability to restrict parking (for event days) and pedestrian obstructions at the Hunter Street Pocket Park.	Confirms ability to route pedestrians via waterfront and Hunter Street. If not feasible, additional planning to redistribute pedestrians away from the stadium during egress.	Yes	Yes
Event bus park and ride location feasibility studies, including engagement with land owners and concept and detailed designs for bus stop, parking or access improvements.	Identifies sites that might require more complex investigations early, so that timeframes are met for first event	No	Yes
Event permit processes that trigger approvals and resource planning by relevant agencies	Provides opportunity for responsible parties to assess the transport need and confirm ability to respond and support with fleet, drivers and other resources.	No	Yes

9 Monitoring and reporting

The performance of the Macquarie Point multipurpose stadium transport plan will vary depending on the time and scale of the event. Various crowd sizes, audience profiles and event times and days will all influence the operation of the event.

Understanding the core performance of the transport plan and the unique variations of events will be critical to ensuring the plans remain agile to meet the desired mode share targets and realise the economic benefits to the city and the state. It is strongly recommended that the transport plan remained consistent however monitoring and reporting will inform the difference supply for different events and the likely origins e.g. difference for AFL, cricket, concerts.

The core key elements of the stadium transport plan that should be measured leveraging emerging camera and sensor technologies are shown below:

Event details:

- Day, time, duration, weather
- Event operator (team, artist)
- Attendance
- Ticket data by seating category by postcodes

Patronage by route and vehicle on:

- Event bus
- Rapid Bus
- Local bus
- Ferry
- Coach parking bookings

Operation of road network:

- Journey time on key corridors for public transport
- Number of incidents
- Emergency services response times
- Volumes on key corridors

Spectator clearance time from the event:

- Duration of road closures
- Duration and extent of geo fencing
- Duration of supplementation of services on regular transport routes
- Business and residential feedback

Walking and cycling:

- Bicycle and scooter parking
- Corridor flows for pedestrians and cyclists at key “gate lines”
- Duration of active traffic management

Parking:

- Stadium parking occupancy
- Mobility impaired parking / drop-off requests
- Park and ride occupancy
- City centre car park occupancy / duration of stay
- Infringement notices issued during event period within 1.5km

10 Limitations

This Report is provided by WSP Australia Pty Limited (WSP) for Macquarie Point Development Corporation (Client) in response to specific instructions from the Client and in accordance with WSP's proposal dated 28/02/2024 and agreement with the Client received 08/05/2024 (Agreement).

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Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (*Conclusions*) are based in whole or in part on information provided by the Client and other parties identified in the report (*Information*), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report.

Reporting and supporting documentation has been prepared by Graeme Stevenson, Luke Southam, Sarah Lowe, Alex Gu and Oscar Hayes as well as other engineers and transport planners from WSP. CVs are included in Appendix L.

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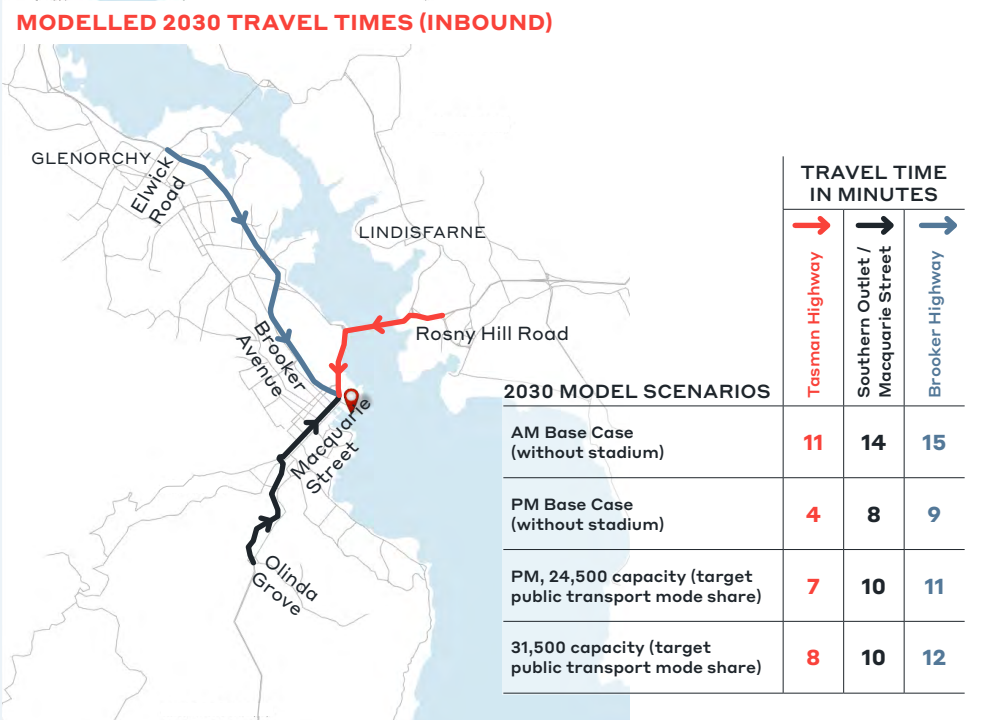
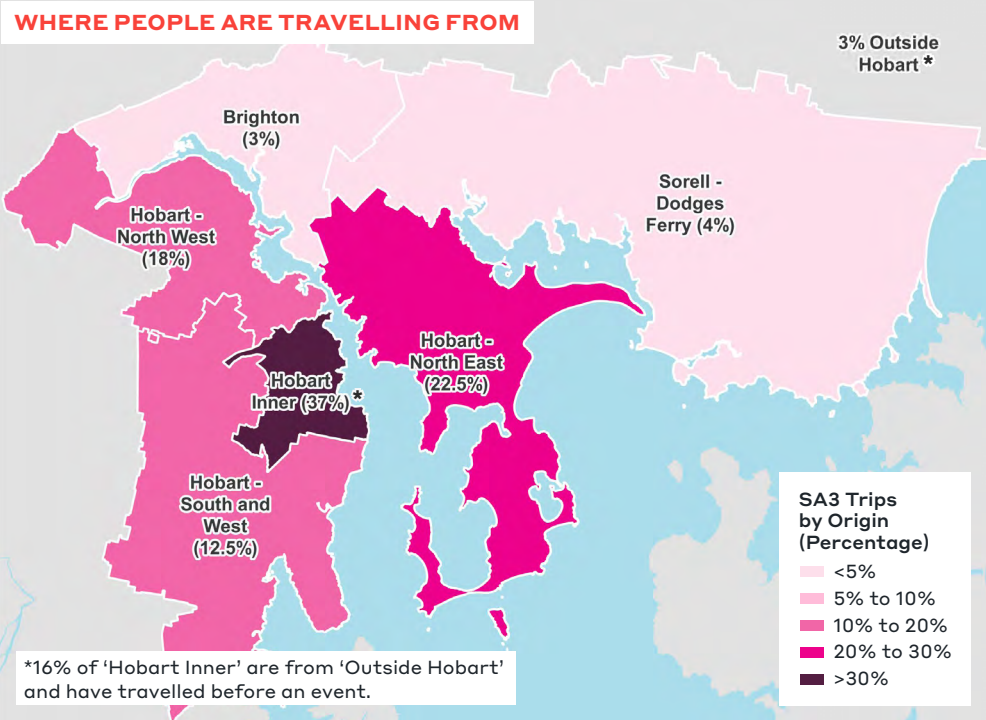
Appendix A

Transport Study Executive Summary



Macquarie Point Multipurpose Stadium Transport Study

Implementation Plan



HOW PEOPLE WILL NEED TO TRAVEL



31% BUS

(includes public bus, rapid bus and park and ride sites with event bus services direct to the stadium)



30%

PICK UP/DROP OFF AND SELF-DRIVE
(leverages existing parking in the CBD)



22% WALKING

(includes residents and visitors staying in CBD hotels and with family and friends)



10% TAXI AND RIDE SHARE

(may include local trips and airport arrivals)



3% CYCLING AND MICROMOBILITY

(includes scooter hire)



2%

PRIVATE COACH AND CHARTER BUS

(may include trips from regional Tasmania and airport connections)



2% FERRY

(includes existing and expanded services)

BENEFITS OF A CBD LOCATION

- Close to shopping, bars, restaurants and entertainment to help flatten ingress and egress profiles.
- Close to existing active transport links, bus stops, ferry wharf and CBD parking.
- Leverages proposed rapid bus routes and stops, new active transport links, expanded ferry network.
- The precinct allows for a dedicated on-site event bus plaza.

SUPPORTING MEASURES REQUIRED



A travel behaviour campaign with the Tasmania Devils and Hobart Hurricanes as the face of the campaign.



Coordinated planning between agencies and transport providers.



A range of projects to improve the experience of spectator travel and its efficiency.

EXECUTIVE SUMMARY

Local Area Transport and Traffic Plan

Event scenario

- ACTIVE TRANSPORT**
 - Active Transport Bridge
 - Permanent Bike and Scooter Hoops
 - Temporary Secure Event Bike and Scooter Parking
 - Shared-mobility Hub
 - 2029 Cycle Network
 - Encourage Diversion
 - Dismount During Events
- BUS**
 - Event Bus Plaza
 - Hobart City Bus Mall
 - Event Bus Routes
- FERRY**
 - Ferry Wharf
 - Pedestrian Route to Ferry
- PARKING**
 - Public Parking
 - Permit Parking Only
 - Glebe Parking Restrictions
- LOCAL AND MANAGED ACCESS**
 - Port Access
 - Premium / Corporate Parking, Teams and Officials, Deliveries Access
 - Disability Drop Off / Pick Up
 - Vehicle Permit Check (Indicative)
 - Managed Intersection
 - Road Closure / No On-street Parking
 - Impacted Private Access
 - Permitted Vehicles Only



Appendix B

Access Study Executive Summary



Macquarie Point Precinct – Event Transport Access Study

EXECUTIVE SUMMARY

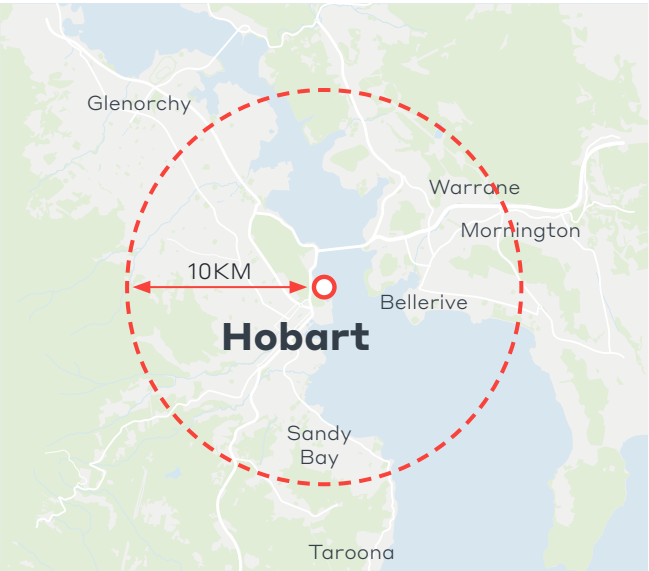
PURPOSE OF THE EVENT TRANSPORT ACCESS STUDY

This report presents initial planning to develop target transport mode shares for Macquarie Point Stadium access, and the likely demands and spatial requirements of each mode of transport. Transport concepts and recommendations have built upon precinct, city and state planning policy and strategies.

An understanding of available transport modes and their likely capacity will influence people's anticipated transport mode choice for travel to and from Macquarie Point Stadium. This is required to inform spatial planning for the stadium which is the main intent of this study.

LOCATION

The location on the edge of Hobart's CBD presents a unique opportunity for the precinct and associated transport access plan to support economic development, leverage existing transport assets and act as a catalyst for uplifting transport infrastructure and services. This will provide more sustainable transport choices and opportunity for the city.



STUDY METHOD

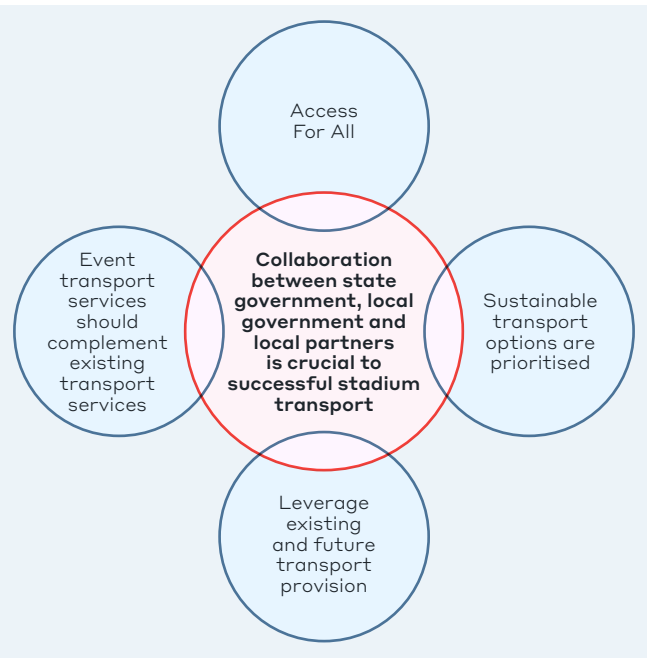
There are two ways transport mode shares can be estimated:

1. A "Vision and Validate" approach to provide the means to achieve the targeted mode shares.
2. Anchoring to existing travel behaviours and existing network capacity.

Through discussion with Macquarie Point Development Corporation and state and local stakeholders we blended these two approaches by acknowledging existing travel behaviours and providing the means to achieve a suitable scenario for the Hobart context and allow for growth in sustainable travel.

GUIDING PRINCIPLES FOR TRANSPORT AT MACQUARIE POINT

Guiding principles were developed with stakeholders to focus thinking towards positive outcomes for spectators and the city.



TRANSPORT RECOMMENDATIONS



Rapid Bus

The highest capacity public transport initiative that will serve as the backbone for travel to and from the Hobart CBD and the Macquarie Point Precinct.



Walking and cycling

Making walking and cycling safe and attractive with separated walking and cycling routes via the waterfront, within the Hobart CBD and a shared active travel to Rapid Bus stops and Collins Street.



Buses and coaches

An on-site event bus hub and event bus network, local bus timetable uplift and on-site coach parking for clubs and groups.



Ferry

Upgrades to Brooke Street Wharf, a new Regatta Point wharf and an expanded ferry network with event timetable uplift.



Road network

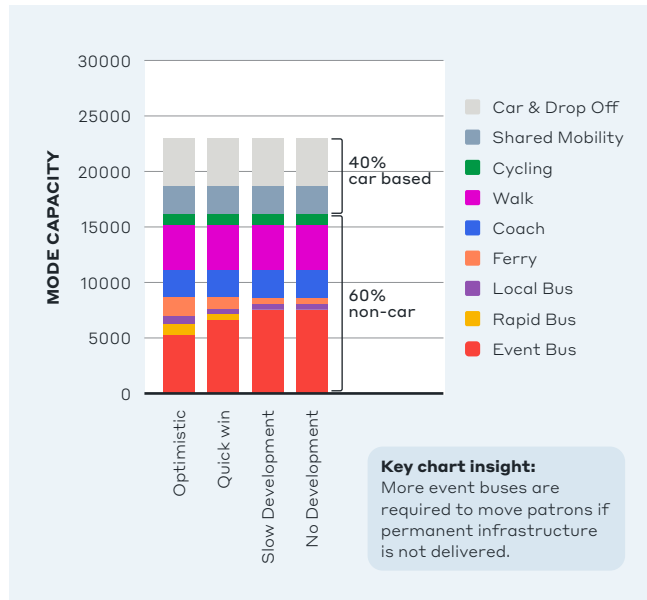
An event traffic management zone around the stadium will address the needs of local residents and businesses, improve safety for spectators walking and cycling and keep critical roads moving. A new Northern Access Road will keep the Port operating at all times and support event bus priority access over general traffic to the stadium.



Travel Demand Management

Reducing stress on the road network, encouraging sustainable travel behaviours and reducing impacts to local business and residents through a public communications strategy coordinated through event organisers, transport providers, the new club and government agencies.

MODE SHARE FOR INFRASTRUCTURE SCENARIOS



The non-car transport mode share target is 60%.

The stretch target will be 70%.

This means in the opening year of 2029 60% of spectators will primarily walk, cycle or use public transport to travel to and from the stadium with a view to increase this to 70% in future years with additional non-car transport options. This reflects the CBD location of the stadium and the capacity of existing and planned transport infrastructure and services.

To achieve target transport mode shares, parking will be restricted in the immediate vicinity of the stadium, and travel by public transport should be integrated with event tickets.

Delivery of the planned transport infrastructure and service improvements for Rapid Bus, ferry, walking and cycling is estimated to reduce event bus requirements by up to 40%.



TRANSPORT MODES

- Dispersed pedestrian movement to various modes.
- No new public car parking is required due to the significant amount of parking within walking distance throughout the Hobart CBD.
- Use of existing coach parking spaces in the Cruise Terminal with additional spaces within walking distance for capacity and special events.
- Incident management, a real time driver messaging system and coordinated traffic signals will keep the city moving. An event traffic management plan with restricted traffic immediately around the stadium will be established.
- Wharf established at Regatta Point and additional wharf faces at Brooke Street.
- Bicycle parking linking to improved cycling routes
- Rapid Bus stops on Brooker Highway / Tasman Highway, connected into pedestrian and cycle access bridge, an event bus hub located to the northeast of the stadium including associated passenger and driver facilities and bus staging area on the approach road to the stadium.
- Taxis/ride share to utilise existing kerbside space located throughout the Hobart CBD.

Appendix C

POSS Guidelines





Project of State Significance Movement Guidelines

CLAUSE NO.	REQUIREMENT	SECTION / APPENDIX / DESCRIPTION
6.1	Travel scenarios and management options	
6.1.1	The reports are to provide a transport assessment that provides evidence and information on a range of potential travel demand scenarios and travel demand management measures to be implemented and extended/adapted over time to achieve acceptable outcomes for stadium users and the broader transport/movement network. The purpose of the transport assessment is to provide information on the range of strategies and measures that may be required under different demand scenarios to: • enable visitors and Tasmanians using the stadium to have an easy, safe, amenable, reliable and convenient door to door travel experience; • support and encourage active transport; • minimise the risk of local and regional traffic disturbance before, during and after events; and • manage to an acceptable level any adverse effects to local businesses and residents from traffic, crowds and parking.	The reports assess a number of feasible transport options, some of which may make up the final suite of event transport plans in time for the first events in 2029. A range of scenarios and capacities are tested to provide an understanding of impacts, and possible management or infrastructure mitigations are proposed. The plan presents a variety of options that can be implemented and refined over time to best suit stakeholders and the public. The plan does not intend to preclude other transport solutions being put forward. N/A Multi-modal transport options are built into the plan to provide a range of options, however, some areas will be better suited to particular modes than others. 5.3, 5.4, 6.1, 6.2, 7.1 and 7.2 The plan is designed to spread the load across various modes of the Hobart transport network, with a view to minimising traffic disturbance. The plan is designed to spread the load across various modes of the Hobart transport network, with a view to minimising traffic disturbance. Summary in 6.1.
6.1.2	The reports are to provide an overall framework supported by suitable models and assessment methods that: • enable a range of possible travel demand scenarios to be understood from the perspective of the users and the overall transport network; • enable assessment of the effectiveness of a range of possible solutions including capacity creation, network management and behavioural change;	N/A 4 and 5.2 5.2 and 6.1

Level 11, 567 Collins St
Melbourne VIC 3000

Tel: +61 3 9861 1111
Fax: +61 3 9861 1144
www.wsp.com

	• underpin a proposed suite of travel demand measures that can be implemented prior to the stadium commencing operation, as well as extended and adapted over the life of the stadium; • achieve acceptable public safety outcomes for users of the stadium and all other transport network users; and • are informed by consideration of relevant transport plans and strategies, at a local and regional level, identified in section 2, including Keeping Hobart Moving - Transport Solutions for Our Future (draft) State of Tasmania Oct 2023 and The Greater Hobart Cycle Plan.	6.1 5.3 Appendix H and previous Access Study
6.1.3	In preparing the reports, specific consideration is to be given to: • modelling and assessing a range of transport planning scenarios including: - o a high proportion of users travelling to the stadium by car from outer ring areas of greater Hobart and other regions; - o a high proportion/P10 use of private cars to travel to the stadium/locality/area; and - o a high proportion/P10 pedestrian movement between the stadium and the Princes Wharf 1/Salamanca Place area; • travel demand preferences related to local weather events, the time of day/night events are being held, the age profile of event spectators; • the range of uses and activities proposed, which may include major events at different scales, conferences, exhibitions as well as daily activities; • the higher and lower levels of confidence associated with anticipated mode share changes resulting from travel demand measures; • assessing travel preferences, management measures and outcomes from a: - o whole of Hobart's inner/waterfront precinct perspective; and - o whole of local/regional transport network perspective; • providing an acceptable level of resilience in the transport network across transport services to enable atypical travel/movement circumstances to be managed; • establishing systems that enable travel outcomes to be monitored and evaluated over the lifetime of the stadium and for travel demand measures to be adapted and extend overtime; and • where the proposed use includes the potential for events to be held during or overlapping with peak weekday/weekend travel patterns, the options and strategies are to assess this period as a base scenario.	N/A N/A 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.3 4 and 5.2 5.2.2 9 5.2
6.2	Traffic, freight and transport routes	N/A

6.2.1	The reports are to discuss how the use of the stadium relates to and affects: • the land transport task and function of roads in the locality and broader area as well as the operation of the Port of Hobart; • the current and estimated (with/without the proposed project) traffic volumes and levels of services of roads in the area and specifically the risk of and timeframes associated with periods of saturation and congestion; and • periods of congestion/saturation on roads in the locality of the stadium as well as the broader road network effects.	N/A 5.1 5.2 5.2
6.2.2	The reports are to assess the road network changes/improvements and the other management interventions required to maintain the function, level of service and safety of major roads and the broader network.	5, 6, 7 and 8
6.2.3	In preparing the reports, specific consideration is to be given to: • estimated changes in traffic volumes and characteristics over the operating life of the stadium; • continued access to the Port of Hobart via Evans Street and any new proposed freight access route; • the heavy vehicle volume and types associated with transport to/from the Port of Hobart and any effect vehicles accessing the Tasman Highway or Brooker Highway has for congestion and the risk of crashes; • the proposed and likely timeframes associated with events at the stadium and how the transport task associated with these timeframes relates to current and forecast traffic on the road network; • the traffic characteristics and specific events that currently, or are forecast to, lead to low level of service on the road network and how this relates to the transport tasks scenarios or traffic related events during use of the stadium; • the potential for and effects of traffic congestion resulting from use of the stadium on the provision of emergency services in Hobart area; and • the history of vehicle crashes in the locality and the need to avoid and otherwise minimise the number and severity of crashes, where possible.	N/A 5 6.10 and 7.10 5.1 5.2 5.1 MPDC will be working directly with TasFire, Ambulance and Police to share traffic impacts and stadium access routes and to inform of potential areas of congestion. Congestion will likely be at its peak 15-30mins post-event. 5.1
6.2.4	The reports are to provide plans, maps and graphs that show: • the function and characteristics of the land transport network both generally and during periods of low level of service, and how these characteristics change under a range of transport scenarios or traffic related risks associated with the stadium; • the characteristics of the land transport freight task and proposed network associated with the Port of Hobart and how these changes affect the broader network;	N/A 5.2, 6.10 and 7.10 5.2, 6.10 and 7.10

	- the land transport task and characteristics associated with proposed mass transit services and how this may affect the broader transport network; and - the location and type of proposed road network change/improvement and management interventions.	5.2, 5.5, 6.3, 6.4 and 6.5 5.3 and 8
6.3	Access: mass/public transport, car use and parking	N/A
6.3.1	The reports are to discuss and provide information on issues, effects and user preferences associated with people choosing to use mass/public transport rather than cars (private cars/ride share) to travel to the stadium/locality for events. Based on this, the reports are to provide evidence based strategies for: - achieving a planned mass/public transport versus car mode share; and - managing the provision and use of car parking in the broader area to achieve transport outcomes.	N/A 4 and 5.2 5.6, 6.9 and 7.9
6.3.2	The reports are to provide an assessment of the issues and options associated with people accessing the stadium/locality and outline: - the maximum extent, location and design of mass/public transport services and infrastructure (including park and ride) required to achieve planned usage levels with a high degree of confidence; - strategies to achieve the majority of people accessing the stadium/locality by mass/public transport services; - strategies to manage the capacity and use of metered, multistorey, off-street and on-street car parking and how this will be managed around events; and - strategies for the provision of drop off/pick up areas generally, and arrangements and infrastructure for people with specific access needs. Where the proposed use includes the potential for events to be held during or overlapping with peak weekday/weekend travel patterns, the options and strategies are to assess this period as a base scenario.	N/A N/A 5, 6 and 7 6.11 5.6 6.9 and 7.9 5.2
6.3.3	In preparing the reports, specific consideration is to be given to: - the alignment of public/mass transport and parking strategies with the information and outcomes of related travel demand management and transport assessment processes; - the need to ensure plans and redesign for mass/public transport fit with the need to provide pedestrians with safe, amenable, convenient pathways and platforms; - the capacity of the existing mass/public transport system; and	N/A 6 5.3 4 and 5.2

	the capacity for plans and strategies for mass/public transport movement to be altered or extended based on experience and evaluation.	6
6.3.4	The reports are to provide maps, plans and graphics that describe and show: - the home catchments, key transport routes, modes and vehicle numbers associated with people travelling to/from the stadium/locality; - the mass/public transport (coaches, buses, ferries) fleet, capacity and key routes during peak movement periods; - the potential and planned capacity for car parking (metered, multi-storey, off-street and on-street) to be used around event periods within a 30 minute walking distance of the stadium; and - the detailed design of: - mass/public transport infrastructure to be used during peak periods; and - infrastructure/arrangements for general drop off/pick up locations and for people with specific access needs.	N/A 4 and 5.2 5.2 5.6 N/A 6.5.1 6.10 and 7.10
6.4	Pedestrian/cycling movement	N/A
6.4.1	The reports are to discuss the characteristics of the use of the stadium and associated pedestrian, cycling and other non-motorised movement. The reports are to discuss and present information on the origins/destinations, paths, volumes and networks associated with pedestrian and cycle movement. The associated planning, infrastructure provision and management issues are to be discussed, with consideration given to how these issues change depending on factors such as time of day, prevailing weather conditions and the age and composition of users.	4, 5.2, 5.3, 5.4, 6.1, 6.2, 7.1, 7.2 and 8.
6.4.2	The reports are to assess: - the physical connections and improvements and management arrangements with surrounding land and road owners, required for pedestrians and cyclists to have safe, visible, amenable, direct and convenient routes when moving to and from the stadium and surrounding area; - the pedestrian network and standing/queuing area requirements associated with peak use of mass transport services; - a range of pedestrian movement scenarios including the peak movement of people to initial destinations in the Salamanca and central city areas; - the level of security of proposed bicycle parking infrastructure and number of bicycle bays to be accommodated; and - pedestrian/cycle conflict and crash risks and interventions.	N/A 5.3 5.3 5.3 6.2 6.2
6.4.3	In preparing the reports, specific consideration is to be given to:	N/A

	• maintaining the function and traffic flow of major arterial roads in the area during periods of high pedestrian use; • the need for plans and management of pedestrian networks to where possible avoid and otherwise minimise the likelihood of near misses or crashes between vehicles and pedestrians/cyclists, and to minimise pedestrian/cyclist conflicts; • any effect periods of high pedestrian use have on operation of wharf and port activities, tourist activities, parking and cycle paths in and around Sullivans Cove; • a range of potential techniques to manage flow, volume and direction of pedestrian movement before and after events; • the integration of pedestrian and cycling routes within the landscape and built form proposal; • the potential for risky/antisocial behaviour before and after events and the effect this has on movement and safety; • whether there is an opportunity to create a pedestrian route between Evans and Hunter Streets on Crown land used by the University of Tasmania; and • physical restrictions and pinch/congestion points such as pedestrians waiting to cross at controlled intersections and the shared pedestrian and cycleway on Davey Street/Tasman Highway.	5.3.2 5.3.2, 6.2, 6.10 6.10 5.3 6.2 and 7.2. Refer to precinct designs. Refer to MPDC and TasPol discussions. 5.3. 5.4.1 5.3
6.4.4	Without limiting the content of the reports, the reports are to provide plans, maps and graphs that show: • peak pedestrian movement networks, origins/destinations, preferred desire lines, volumes, level of service/comfort and congestion/risk locations; • linkages between existing and proposed infrastructure; • proposed infrastructure improvements and management interventions; and • volumes and timeframes associated with peak pedestrian activity in the area.	N/A 4 and 5.3. 5.4, Appendix H 8 5.3.

Appendix D

Origins study





Memo

To: Macquarie Point Development Corporation (MPDC)
From: WSP (Transport)
Subject: Macquarie Point Stadium – Origins Study
Our ref: PS206346-WSP-MEL-PAM-MEM-001 RevE
Date: 21 June 2024

1. Executive summary

This Origins Study presents an assessment to facilitate the proportioning of transport mode shares for Macquarie Point Stadium journeys by potential event patron origin location. Building on the previous Access Study completed by WSP in 2023, this memo provides insights into the origins of people's travel and the mode of transport they may use. The Origins Study has considered existing travel patterns, existing and planned public transport provision, existing car parking supply and availability to estimate origin - destination matrices. These initial outcomes were then compared to Tasmania Devils AFL Club membership data, provided as number of members by postcode. The origin - destination matrices were then adjusted to reflect higher or lower membership data across areas.

While the Origins Study identifies where people are likely to travel from, a coordinated event travel behaviour campaign is required to encourage the necessary mode shift to support a multi-modal, sustainable and accessible transport plan. Global and domestic best practice shows that travel behaviour messaging from the club, in this case the Tasmania Devils or the Hobart Hurricanes, is the best way to drive the necessary sustainable travel behaviours, along with coordinated support from government agencies, transport providers and the future stadium operators.

For stadium access on event days, the study has found that:

- The CBD location allows the transport plan to leverage existing and planned transport infrastructure and networks, including proposed high frequency bus routes and existing CBD parking.
- The CBD location also represents a central location within Greater Hobart that allows a roughly equal proportion of residents to access the stadium from all directions and relative distances e.g. unlike a suburban location in the North (MyState Bank Area) or East (Blundstone Arena).
- For a weekday event, the stadium transport plan benefits from the CBD location as a proportion of event attendees will already be nearby at their places of work or study.
- The mode share for walking for short trips in Greater Hobart is notably high among Australian capital cities. Active transport trips have the highest proportion in Hobart-Inner. Walking trips are forecast to contribute 22% of the stadium transport task, with the majority from within the Hobart-Inner SA3.
- Bus trips are forecast to contribute 31% of the stadium transport task, with the majority being event bus services.
- Ferry trips are forecast to contribute 2% of the stadium transport task, the majority from within the Hobart-North East SA3.
- Coach trips are forecast to contribute 2% of the stadium transport task, and are expected to have origins outside of the Hobart SA3s (with further detail on origins to be confirmed).
- Private vehicle trips are forecast to contribute 30% of the stadium transport task, with the largest proportions from Hobart-North West and Hobart-North East SA3 origins. The proportion of people travelling by car increases in SA3 further away from the CBD.
- Taxi/ride share trips are forecast to contribute 10% of the stadium transport task, with the majority from Hobart Inner SA3 origins.

- Whether reviewing the results of the Origins Study on a region by region basis, or from a mode by mode basis, there will be instances where the mode shares appear out of proportion to how transport currently operates in Greater Hobart at the moment. The provision of new and enhanced transport services and networks is only half the challenge (the carrot), with travel demand management and travel behaviour change campaigns the remaining element (stick) required to deliver a consistently successful event transport operation.

Stadium access on typical non-event days is also addressed but is not the primary focus of the Origins Study.

2. Introduction

Macquarie Point Stadium is progressing through the Project of State Significance (PoSS) planning framework. As part of the Transport Study, Focus Area 1 requires an Origins Study. The Origins Study considers all modes of transport, working from the findings of the Macquarie Point Precinct – Event Transport Access Study (access study) completed by WSP in 2023 as a base for total numbers and transport mode splits.

The Origins Study is a critical component of the project to assist in quantifying the potential demand for event transport to and from the stadium from various parts of the Greater Hobart area. This will provide an event lens on which to analyse the data within the existing Greater Hobart Urban Travel Demand Model (GHUDTM). The origin study also considers trips to the stadium on a day-to-day basis, for people working at the stadium or attending conferences and functions, outside of event days.

The brief requires clear groups to be defined when referring to origin areas. This Origins Study has used Australian Bureau of Statistics (ABS) statistical areas (SA2 [suburb level detail] and SA3 [district level detail]) to define the origin of demand for proposed event transport. Future stages of the project such as the Implementation Plan will consider a specific suburb by suburb approach for clear messaging to customers and spectators.

3. Access study modal splits

The Access Study was undertaken by WSP in 2023. The Access Study presented initial planning to develop target transport modal splits for stadium access, and the demands and spatial requirements for each mode of transport, building upon and in coordination with both precinct and wider city and state planning policy and strategy. This modal split was developed in collaboration with Macquarie Point Development Corporation (MPDC), the Department of State Growth (State Growth) and the City of Hobart. The splits considered best practice comparable Australian stadiums, local knowledge and context and the aspirations for a sustainable travel plan.

For the purpose of stadium planning, the following transport mode shares were established:

- Base Target – non-car mode share of 60%
- Stretch Target – non-car mode share of 70%.

Three different event scenarios were used:

- Regular event – 15,000 spectators - represents the average crowd for domestic teams (AFL, Cricket)
- Capacity event – 23,000 spectators (*now updated to 24,500*) – represents the proposed seated capacity of the stadium
- Special event – 30,000 spectators (*now updated to 31,500*) – represents the maximum venue capacity for events which use the playing surface for additional seating or standing e.g. concerts. It is noted this is expected to be an infrequent scenario, occurring for only 1-2 events a year.

A summary of preliminary mode share estimates by event size and mode share target is shown in **Attachment A**. These preliminary mode share estimates have been adopted for the purposes of this next stage on analysis.

4. Data review

The Origins Study has used ABS statistical areas (ABS SA2 and SA3) to define the origin of demand for event transport. Journey to Work data from the 2021 Census was used to proportion event transport demand across the Greater Hobart Area. The task also used other sources of data including the Hobart Household Travel Survey and Tasmania Devils AFL Club membership data to verify and sense check outputs, alongside the modal splits developed in the access study. The GHUTDM model data was also reviewed for the forecast year.

4.1 GHUTDM data

Transport modelling to be undertaken using the GHUTDM will be based on 2030 network conditions and land use forecasts summarised in Table 4.1. 2030 has been considered as an appropriate model forecast year given that it is a standard reference case forecast year in GHUTDM and Macquarie Point Stadium is planned to open in 2029. In this, the GHUTDM has been used to identify likely Day 1 event day constraints and hotspots in the transport network (Day 1 being the first major event held at the stadium). This excludes test events in the lead up to Day 1. These are the Tasman Bridge, Brooker Highway, Domain Highway and Southern Outlet.

Table 4.1 2030 Population and employment assumptions in the GHUTDM (MetroPlan Scenario)

SA3 ZONES	2030 POPULATION	2030 EMPLOYMENT
Hobart - Inner	60,553	68,384
Hobart - North West ¹	52,991	25,896
Hobart - North East	60,692	20,941
Hobart - South and West ¹	38,930	10,803
Brighton	20,869	3,959
Sorell – Dodges Ferry	17,800	3,716

¹ Note the GHUTDM does not include the entire Hobart – North West and Sorell – Dodges Ferry SA3 areas (see Figure 3.1). The figures shown above for these SA3s represent the population and employment numbers in the available model zones.

4.2 ABS data (SA3)

ABS data from the 2021 Census was reviewed at the Statistical Area 3 (SA3) level. The SA3 areas are shown in Figure 4.1. The map also shows the area covered by the GHUTDM, which will be the focus of this study. Origin trips may also come from other SA3s not covered by the GHUTDM (for example, Huon-Bruny Island; Central Highlands (Tas); Launceston), and these trips have been grouped as being from ‘outside of study area’.

For the purposes of the Origins Study, SA3 zones are useful for indicating the origin direction from Central Hobart. The Hobart SA2, which covers Macquarie Point, Hobart CBD, Battery Point and North Hobart, has been used as a proxy destination for the stadium when reviewing 2021 Census Journey to Work data (JTW).

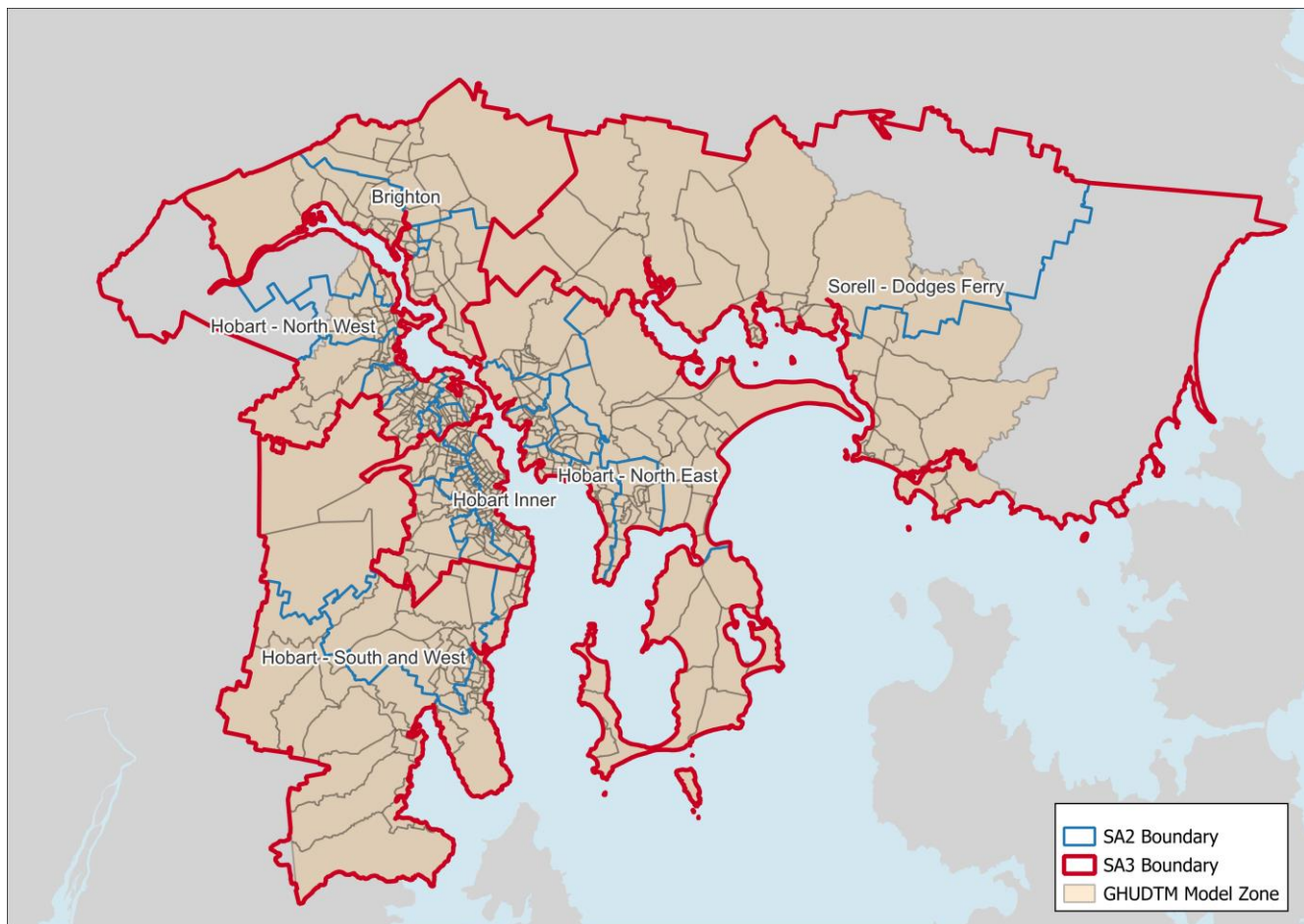


Figure 4.1 SA3 areas (red outline) over the GHUDTM area (blue)

The 2021 census statistics are shown in Table 4.2, showing the population, median weekly household income, and average number of motor vehicles per dwelling.

Table 4.2 2021 Census: People statistics

SA3 ZONES	PEOPLE	MALE	FEMALE	MEDIAN AGE	MEDIAN WEEKLY HOUSEHOLD INCOME	AVERAGE NUMBER OF MOTOR VEHICLES PER DWELLING
Hobart - Inner	55,163	48.7%	51.3%	37	\$1,840	1.7
Hobart - North West	58,008	49.3%	50.7%	37	\$1,309	1.8
Hobart - North East	59,161	48.7%	51.3%	40	\$1,601	2
Hobart - South and West	36,641	48.2%	51.8%	40	\$1,715	2
Brighton	19,589	48.6%	51.4%	35	\$1,365	2.1
Sorrel - Dodges Ferry	18,515	49.2%	50.8%	43	\$1,408	2.1

Table 4.3 shows the proportion of people travelling from each SA3 to work in the Hobart SA2, by mode. It shows that the proportion of people travelling by car increases in SA3 further away from the centre, and that active transport trips have the highest proportion in Hobart-Inner. It also shows that the largest proportion of trips comes from Hobart-Inner SA3 (11,032 people, which is 35% of all JTW trips to Hobart SA2).

Table 4.3 2021 Census: People commuting to Hobart SA2

SA3 ZONES	PEOPLE COMMUTING TO HOBART - SA2	PROPORTION BY CAR	PROPORTION BY PUBLIC TRANSPORT	PROPORTION BY ACTIVE TRANSPORT
Hobart - Inner	11,032 (35%)	53%	12%	35%
Hobart - North West	5,868 (19%)	78%	19%	3%
Hobart - North East	7,170 (23%)	80%	18%	2%
Hobart - South and West	4,647 (15%)	82%	16%	2%
Brighton	1,445 (5%)	92%	8%	0%
Sorrel - Dodges Ferry	1,462 (5%)	93%	6%	0%
Total / average	31,624	72%	15%	13%

2021 Census: SA3 (Usual Residence - UR) and SA2 (Place of Work - POW) by 1-digit level MTWP Method of Travel to Work

5. Event - Origins by mode

For the purposes of the origin study, Day 1 scenarios were considered with the base target for Non-Car mode share (Special 31.5K crowd 60% non-car Day 1). These scenarios represent an opening event with minimal proposed transport network upgrades. Each mode is detailed in the following sections, with tables shown for the Special 31.5k crowd 60% non-car Day 1 scenario.

5.1 Walking

The Access Study defined pure walk trips (i.e. not involving any other transport mode) as:

- Walk visitor – this is likely to be a trip from accommodation or a place of work within 1.5 kilometres of the Macquarie Point precinct. The origins are most likely to be a hotel or spectators staying with friends or family within this catchment.
- Walk resident – this is likely to be a trip from a dwelling or student accommodation within 1.5 kilometres of the Macquarie Point precinct.

Across the event scenarios, **walk visitors** were initially estimated to contribute between 17-18% of the transport task (patron numbers of 4,000 people for Capacity event and 5,000 people for Special event). **Walk residents** were expected to take up around 1% of the transport task (patron numbers averaging approximately 100 people in either scenario).

Assuming all walk trips are within a 1.5-kilometre walk (15-minute walk) from the stadium, all walk trips would have an origin within the CBD and the Hobart SA2 area. However, 2021 Census data indicates that there is journey to work trips by walking for distances greater than 1.5km, which extends a proportion of trips into the wider Hobart-Inner SA3 and into neighbouring SA3s. Walk trips have been proportioned accordingly in Table 5.1.

Similarly, the Greater Hobart Travel Survey shows that across all trips, walking represents 41.6% of all trips up to 2.5km, and maintains mode share of 4.8% of all trips between 2.5-4.9km in distance. The mode share of walking for short trips in Hobart is notably high among Australian capital cities and is a positive for the stadium transport plan.

Considering the access study, and investigations into Census data and the Hobart Travel Survey, the walk residents is likely to be a higher proportion of the overall transport task than previously estimated in the Access Study. Along with rebalancing a proportion of visitors who may use other modes like micromobility or taxi/ride share, the overall walk proportion has been increased to 22%.

For a Friday night event at the stadium, a proportion of walk trips are likely to be people who are employed in the CBD, who walk to the event after work. This may further increase the number of walk trips from the CBD overall. For the purposes of the origin study, the walk patron numbers outlined may be conservative, and the effect of worker-to-stadium walk trips will be considered further through the next stages of this project.

Table 5.1 Walk trip origins (31.5k crowd 60% non-car Day 1)

TRAVEL MODE	ORIGIN DIRECTION	SA3%	SA3 NUMBER	SA3 LOCATIONS	SA2 LOCATIONS
Walk	Central	97.5%	6,744	Hobart - Inner	Hobart, Lenah Valley-Mount Stewart, West Hobart, New Town, Sandy Bay, Mount Nelson-Dynnyrne, South Hobart-Fern Tree
	North	1.1%	76	Hobart – North West	Derwent Park-Lutana, Moonah, West Moonah, Glenorchy
	East	0.7%	48	Hobart – North East	Bellerive-Rosny, Howrah-Tranmere
	South	0.7%	48	Hobart – South and West	Taroona – Bonnet Hill, Kingston-Huntingfield
Walk trips total			6,917	(22% of Task)	

Walking trips are forecast to contribute 22% of the stadium transport task, with the majority from within the Hobart-Inner SA3.

5.2 Cycling and micromobility

The Access Study included key considerations of cycling, e-bikes and e-scooters.

For the Capacity and Special Event scenarios, cycle/micromobility users were initially estimated to take up between 3-4% of the transport task (patron numbers around 1,000 people in total, in each event scenario).

The initial estimate was based on 40% of trips being within 1.5km distance of the stadium, and 60% of cycle trips being within 5km distance of the stadium.

ABS data shows that for journey to work to Hobart- Inner SA3, for cycle trips less than 5km, 9% are within 0-1.5km and 91% are within 1.5-5km of their destination. A similar split was found by assessing journey to work data from each SA3 to the Hobart SA2, with 8% of cycle trips coming from Hobart (SA2), 64% from other Hobart-Inner locations, 15% from Hobart-North West and 13% from Hobart -North East.

For an event scenario however, there are likely to be more shared micromobility trips for the area up to 1.5km, and this type of trip is not captured in the JTW data. Shared e-scooter trip data from RideReport on Sunday 19 June 2022 (Dark Mofo 2022, previous event at Macquarie Point) showed that 400 micromobility trips occurred within Central Hobart between 6-7pm, indicating the proportion from the access study appears to be reasonable. This time of day was the peak period for shared e-scooters, with the trip volume limited by the size of the shared e-scooter fleet. Census JTW proportions were used to estimate the splits across the SA3s outside of Hobart SA2 (Table 5.2).

Table 5.2 Cycling and micromobility trip origins (31.5k crowd 60% non-car Day 1)

TRAVEL MODE	%	ORIGIN DIRECTION	SA3 %	SA3 NUMBER	SA3 LOCATIONS	SA2 LOCATIONS	
Cycle/E-scooter (up to 1.5km)	40%	CBD/Central Hobart	40%	400	Hobart – Inner	Hobart	
Cycle (up to 5km)	60%	Inner suburbs	42%	460		Hobart, Lenah Valley-Mount Stewart, West Hobart, New Town, Sandy Bay, Mount Nelson-Dynnyrne, South Hobart-Fern Tree	
		North	10%	103		Hobart - North West	Derwent Park-Lutana, Moonah, West Moonah
		East	8%	87		Hobart-North East	Bellerive-Rosny, Lindisfarne-Rose Bay
Cycling and micromobility trips total				1,050	(3% of Task)		

Cycling and micromobility trips are forecast to contribute 3% of the stadium transport task, with the majority from within the Hobart-Inner SA3.

5.3 Public transport

5.3.1 Bus

The Access Study considered:

Rapid bus – fast and direct services to and from locations such as the Hobart CBD, Glenorchy, Kingston and Rosny Park via corridors from the north, east and south, as through services. Rapid bus was considered to be the ‘backbone’ for ingress and egress of events.

Local bus – existing bus network that will be leveraged for events, noting typically during events, additional services would be required. It is noted that the ability for this may be constrained by bus fleet being focused on the outbound PM journey.

Event bus – specific services for events (including Park and Ride shuttles) taking the majority of passengers, in addition to rapid bus and local bus services.

Initial estimates from the Access Study were as follows:

Rapid bus – For Day 1 scenarios, rapid bus was initially estimated to take up 1% of the total transport task (patron numbers of 160 people on Day 1 for either Capacity or Special events). This may increase over time as additional routes are implemented. This assumption has been updated to patron numbers of 1,008 people, to account for two-hour ingress and rapid bus corridors in three directions.

Local bus – For Day 1 scenarios, local bus was initially estimated to take up 2% of the total transport task (patron numbers of 500 people on Day 1 for either Capacity or Special events). This assumption has been updated to patron numbers of 1,050 people, on review of the network capacity from the GHUDTM.

Event bus – For Day 1 scenarios, event bus was initially estimated to take up between 25-27% of the transport task (patron numbers of 5,850 people on Day 1 for Capacity and 8,150 people for Special event scenarios).

The Origins Study has considered rapid bus and local bus origin proportions. These have been based on the coverage of the respective networks. Proportions are split evenly for centre, north, south and east for Rapid Bus. Proportions for local bus are based on Census JTW by bus.

Event bus origins have been suggested based on:

- SA3 proportions of JTW to Hobart SA2 by bus for the major demand areas (see Table 5.3)
- Providing specific event services associated with Park and Ride facilities that mitigate known areas / links of traffic congestion, such as the Tasman Bridge.
- Providing specific event services from major origins within the Greater Hobart area that will duplicate/bolster rapid bus corridors. This also included considering the locations of Tasmanian State League (TSL) clubs (assuming greater demand may come from these local areas, to be verified with membership data). There are TSL clubs in Clarence, Glenorchy, North Hobart and Kingston (on rapid bus corridors).
- Providing park and ride options to outer Hobart SA3s that have limited transport options (Brighton, Sorrell – Dodges Ferry).

The Implementation Plan stage of this project will consider actual locations for event bus and park and ride facilities.

Bus trips are forecast to contribute 30% of the stadium transport task, with the majority being event bus services. Bus trips are proportioned fairly evenly from Hobart-North West, Hobart – North East and Hobart-South and West (around 2,200 trips from each). A smaller proportion is expected from Hobart Inner as there will likely be a lower reliance on bus and a higher proportion of walk and micromobility trips from Hobart Inner origins.

Event bus services will rely on the availability of space for the event bus plaza in the Macquarie Point precinct.

Table 5.3 ABS 2021 Census – Travel from SA3 Origins to SA2 Hobart, distribution of bus (method of travel for journey to work)

ORIGIN - SA3	DESTINATION – SA2	% OF PT BUS TRIPS
Hobart Inner	Hobart	28%
Hobart - North West	Hobart	24%
Hobart - North East	Hobart	27%
Hobart - South and West	Hobart	16%
Brighton	Hobart	2%
Sorell - Dodges Ferry	Hobart	2%

The split of the bus mode share by origin is shown in Table 5.4.

Table 5.4 Bus trip origins (31.5k 60% Day 1)

TRAVEL MODE	% OF PT BUS	ORIGIN DIRECTION	SA3 %	SA3 NUMBER	SA3 LOCATIONS	SA2 LOCATIONS
Rapid bus	10%	Central	2.6%	252	Hobart - Inner	Hobart, South Hobart-Ferntree, New Town
		North	2.6%	252	Hobart – North West	Glenorchy, Moonah, Derwent Park-Lutana
		East	2.6%	252	Hobart – North East	Bellerive- Rosny, Lindisfarne-Rose Bay, Mornington-Warrane
		South	2.6%	252	Hobart – South and West	Kingston – Huntingfield, Mt Nelson-Dynnyrne
Rapid bus trip total				1008	(3% of Task)	
Local bus	11%	Central	3.0%	293	Hobart - Inner	Hobart, Lenah Valley-Mount Stewart, West Hobart, New Town, Sandy Bay, Mount Nelson-Dynnyrne, South Hobart- Fern Tree
		North	2.6%	252	Hobart – North West	Glenorchy, Moonah, Derwent Park-Lutana, New Town, Montrose-Rosetta, Claremont, Austins Ferry-Granton
		East	2.9%	288	Hobart – North East	Bellerive- Rosny, Mornington-Warrane, Howrah-Tranmere, Rokeby, Risdon Vale, Cambridge
		South	1.7%	171	Hobart – South and West	Kingston - Huntingfield, Taroona-Bonnet Hill, Kingston Beach-Blackmans Bay
		North	0.3%	26	Brighton	Bridgewater-Gadgebrook
		East	0.2%	21	Sorrel – Dodges Ferry	Sorrel-Richmond
Local bus trip total				1,050	(2% of Task)	
Event bus	79%	North	30%	2,319	Hobart – North West	Claremont, Glenorchy, Moonah, Derwent Park-Lutana, New Town
		East	29%	2,241	Hobart – North East	Bellerive- Rosny, Howrah-Tranmere
		South	29%	2,241	Hobart – South and West	Kingston - Huntingfield
		North	6%	464	Brighton	Bridgewater-Gadgebrook
		East	6%	464	Sorrel – Dodges Ferry	Sorrel-Richmond
Event bus trip total				7,729	(26% of Task)	
Bus trip total by origin (Rapid + Local + Event)			5.6%	545	Hobart - Inner	
			28.8%	2,822	Hobart – North West	
			28.4%	2,781	Hobart – North East	
			27%	2,665	Hobart – South and West	
			5%	490	Brighton	
			5%	485	Sorrel – Dodges Ferry	
Bus trip total				9,787	(31% of Task)	

5.3.2 Ferry

The Access Study considered:

Precinct Ferry –the existing single ferry service between Bellerive and Brooke Street wharf, as well as proposed Ferry network expansion (Stage 1 and Stage 2).

Event Ferry – opportunity for dedicated event ferry uplift by using additional vessels.

Precinct ferry was initially estimated to carry 1% of the transport task (321 patrons), and event ferry was expected to carry a further 1% of the transport task (380 patrons). For Day 1 scenarios for the origin study, the ferry network expansion was assumed to provide services to the south (Sandy Bay) and the north (Wilkinsons Point in Glenorchy), with the same total transport task for events (2%). As ferry services has potential to carry more people, particularly after events, this may be adjusted if the ferry services are expected to carry more people by Day 1. Table 5.5 considers the Day 1 scenario.

Table 5.5 Ferry trip origins (31.5k crowd 60% non-car Day 1)

TRAVEL MODE	PERCENTAGE	ORIGIN DIRECTION	SA3%	SA3 NUMBER	SA3 LOCATIONS	SA2 LOCATIONS
Precinct Ferry	Precinct 46% + Event 54% Combined total 100%	East	80%	294	Hobart – North East	Bellerive – Rosny
				294		Lindisfarne – Rose Bay
Event Ferry		South	10%	74	Hobart Inner	Sandy Bay
		North	10%	74	Hobart – North West	Glenorchy
Ferry trip total				736	(2% of Task)	

Ferry trips are forecast to contribute 2% of the stadium transport task, mostly from within the Hobart-North East SA3.

5.3.3 Coach

The Access Study considered that coach will play an important role in connecting Regional Tasmania to the stadium and more. Coaches provide an opportunity for private charter for groups, sporting clubs and communities to experience events at the stadium.

The access study initially estimated between 1,500-2,500 patrons may arrive via coach in Day 1 scenarios, accounting for 7-8% of the overall transport task. This estimate has been revised to 525 patrons via coach for this origin study.

Regionally, there are Tasmanian Football League clubs in Launceston and North Launceston. Coaches could also come from other regional towns, such as Devonport and Burnie, although the longer distances will limit coach travel direct to the event from north west Tasmania. Coaches may also come from other regions such as the south-west (Huon-Bruny Island) or south-east coast.

Proportionally, most coaches could be expected to come in from origins to the north (M1) to central Hobart.

Table 5.6 considers the Day 1 scenario for coach travel.

Table 5.6 Coach trip origins (31.5k crowd 60% non-car Day 1)

TRAVEL MODE	ORIGIN DIRECTION	NUMBER	LOCATIONS
Coach	North (external to study area)	525	Regional - Launceston
			Regional – Burnie, Devonport
			Regional - other
	South (external to study area)		Regional – Huon-Bruny Island
	East (external to study area)		Regional – South East Coast
Coach trip total		525	(2% of Task)

Coach trips are forecast to contribute 2% of the stadium transport task, and are expected to have origins outside of the Hobart SA3s (to be confirmed).

5.4 Private vehicle

While the overall stadium transport plan is focused on a sustainable outcome, with 60% of trips ‘non-car’, it is acknowledged that there is extensive parking in the Hobart CBD within walking distance of Macquarie Point. The transport plan assumes this will be taken up and the mode share for private vehicle reflects this.

The Access Study considered planning for parking and for drop off/pick up trips. The initial estimates from the access study were:

Corporate/Member parking - Across the event scenarios, corporate/member parking was initially estimated to take up between 2% of the total transport task (patron numbers of 600 based upon 300 car spaces in the precinct at 2 persons / car across the scenarios).

Park and Walk - Across the event scenarios, park and walk was initially estimated to take up between 19-22% of the transport task (5,130 patrons for Capacity event and 5,732 patrons for Special event).

Drop off /Pick up – Across the event scenarios, drop off/pick up was initially estimated to take up between 5-8% of the transport task (patron numbers of 1,050 patrons for Capacity event and 2,520 patrons for Special event).

It is estimated that private vehicle trips will generally be proportional to JTW by private vehicle for corporate/member parking and for Park and Walk trips. However there is expected to be less Park and Walk trips and Drop off/pickup trips from Hobart Inner origins. Hobart Inner SA3 populations are within a ‘short-trip’ distance that is more likely to be an active transport trip or taxi/ride share trip, rather than a private vehicle trip on an event day, given constraints on parking availability in the Hobart CBD. Proportions for Drop off/pick up trips were adjusted to reflect this. Table 5.7 shows the estimates for parking and private vehicle mode shares.

Table 5.7 Private vehicle trip origins (patron numbers, car numbers) (31.5k crowd 60% non-car Day 1)

TRAVEL MODE	% (TRIPS)	ORIGIN DIRECTION	SA3 %	NUMBER OF PATRONS	NUMBER OF CAR TRIPS	SA3 LOCATIONS	SA2
Corporate/ Member	7%	Central	2%	161	77	Hobart Inner	Distribute as per ABS JTW 2021
		North West	1%	128	61	Hobart – North West	
		North East	2%	160	76	Hobart – North East	
		South West	1%	106	50	Hobart – South and West	
		North	0.4%	37	18	Brighton	
		North East	0.4%	38	18	Sorell – Dodges Ferry	
Corporate/Member patron trips (2.1 people per car)				630	300	2% of Task	
Park and Walk	65%	Central	9%	827	276	Hobart Inner	
		North West	14%	1,299	433	Hobart – North West	
		North East	18%	1,630	543	Hobart – North East	
		South West	12%	1,073	358	Hobart – South and West	
		North	4%	375	125	Brighton	
		North East	4%	386	129	Sorell – Dodges Ferry	
		Outside study area	5%	429	143	Huon Valley, Central Highlands, Launceston, Meander Valley	
Park and Walk patron trips (3 people per car)				6,019	2,006	(19% of Task)	
Drop off/pickup	28%	Central	4%	391	196	Hobart Inner	
		North	7%	615	308	Hobart – North West	
		East	8%	772	386	Hobart – North East	
		South	5%	508	254	Hobart – South and West	
		North	2%	177	89	Brighton	
		East	2%	183	91	Sorell – Dodges Ferry	
Drop off/pickup patron trips (2 people per car)				2,646	1,323	(8% of Task)	
Private vehicle patron trips by origin			15%	1,380	548	Hobart Inner	
			22%	2,042	801	Hobart – North West	
			28%	2,562	1,006	Hobart – North East	
			18%	1,686	662	Hobart – South and West	
			6%	589	231	Brighton	
			7%	606	238	Sorell – Dodges Ferry	
			5%	429	143	Outside of study area	
Total private vehicle patron trips				9,295	3,629	(30% of Task)	

Private vehicle trips are forecast to contribute 30% of the stadium transport task, with the largest proportions from Hobart-North West and Hobart-North East SA3 origins.

5.4.1 Destination Parking

Approximately 22% of trips are anticipated to result in a parking trip-end with a destination at the Stadium (neglecting park and ride to public transport trip chains and pick-up/drop-off trips). Of these, only 300 are anticipated to be accommodated within the immediate Stadium surrounds, representing corporate and member parking only. All other parking would be provided by public and publicly accessible facilities within a reasonable walking catchment of the Stadium (nominally 1km).

It is noted that parking located in reasonably close proximity to the Stadium may not be appropriate for destination parking for a range of reasons. In particular:

- **Residential zones (Glebe):** due to the impact on residential amenity, parking management and enforcement measures will be necessary to exclude event patrons from parking in these areas.
- **Cenotaph / Lower Domain:** this area is expected to be required for event bus movement and layover, and so would not be available for event parking.
- **Upper Domain:** due to the impact on concurrent recreation uses, parking management and enforcement measures will be necessary to limit the impact of event parking on existing function.
- **Short-stay on-street (metered) parking in the Hobart CBD:** this parking supply is considered valuable to support CBD function, and modifications to existing restrictions is anticipated to maintain its current use.
- **Macquarie Point:** parking in the immediate vicinity of the Stadium and to the south-west will need to be sequestered to maintain safe and effective pedestrian access to and from the Stadium.

There is an ample supply of parking within the Hobart CBD, sufficient to accommodate the target driving mode share. The availability of parking is expected to vary depending on the day of the week and time of day, but would broadly comprise the following:

- **Large-scale commercial car parks:** comprising almost 4,000 parking bays, and including both fully public and publicly-accessible private spaces. These facilities are largely vacant during weekday and weekend evenings, and would therefore be available for event parking as an extension of current operation.

Occupancy of these car parks for other CBD uses is likely to be higher during the weekend midday period. While some capacity would be available based on current usage, there may be a need to source additional consolidated car parking options.

- **Off-street employee car parks:** there are a number of small- to mid-sized car parks that cater specifically to employees (via a voucher or leasing arrangement). Adapting these car parks to accommodate event needs can address concerns regarding weekend use of commercial car parking impacting CBD retail.
- **Off-street private car parks:** where event attendees is provided to employees in the form of private on-site facilities, this will be used for a portion of event attendees with existing parking rights. In particular, employees are expected to extend their stay in the CBD for weekday evening events. Some use of these bays on the weekend is also likely.

5.5 Taxi / Ride share

The Access Study considered demand and capacity of taxi and ride share services in mode share to the stadium. Taxi / ride share was initially estimated to be 10-11% of the transport task (2,418 patrons for a Capacity event and 3,038 patrons for a Special event).

ABS JTW data for taxi/ride share was used to proportion the origins of shared mobility trips to the stadium for an event as shown in Table 5.7.

Table 5.8 Shared mobility trip origins (patron numbers) (31.5k crowd 60% non-car Day 1)

TRAVEL MODE	ORIGIN DIRECTION	SA3 %	SA3 NUMBER	SA3 LOCATIONS	SA2 LOCATIONS
Shared mobility	Central	67%	2,122	Hobart Inner	Distribute as per ABS JTW 2021
	North	20%	650	Hobart - North West	
	East	10%	303	Hobart - North East	
	South	2%	58	Hobart - South and West	
	North	0%	0	Brighton	
	East	2%	58	Sorell - Dodges Ferry	
Total shared mobility patron trips (two people per car)			3,190	10% of Task	

Taxi/ride share trips are forecast to contribute 10% of the stadium transport task, with the majority from Hobart Inner SA3 origins.



5.6 Events – Origins by mode - overall summary

An overall summary of trip origin estimates by SA3 is shown in Table 5.9 and Table 5.10, for a Special Event 31.5k Day 1.

Table 5.9 Overall trip origins distributed by mode (31.5k crowd 60% non-car Day 1) - percentages

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT RAPID BUS	PT LOCAL BUS	PT EVENT BUS	PT FERRY	PRIVATE VEHICLE - CORP	PRIVATE VEHICLE – PARK AND WALK	PRIVATE VEHICLE – DROP OFF	COACH	TAXI / RIDE SHARE	TOTAL
Hobart Inner	21.4%	2.7%	0.8%	0.9%		0.2%	0.5%	2.6%	1.2%	0.0%	6.7%	37.2%
Hobart - North West	0.2%	0.3%	0.8%	0.8%	7.4%	0.2%	0.4%	4.1%	2.0%	0.0%	2.1%	18.3%
Hobart - North East	0.2%	0.3%	0.8%	0.9%	7.1%	1.9%	0.5%	5.2%	2.4%	0.0%	1.0%	20.2%
Hobart - South and West	0.2%	0.0%	0.8%	0.5%	7.1%	0.0%	0.3%	3.4%	1.6%	0.0%	0.2%	14.1%
Brighton	0.0%	0.0%	0.0%	0.1%	1.5%	0.0%	0.1%	1.2%	0.6%	0.0%	0.0%	3.4%
Sorell - Dodges Ferry	0.0%	0.0%	0.0%	0.1%	1.5%	0.0%	0.1%	1.2%	0.6%	0.0%	0.2%	3.6%
Outside of model area								1.4%		1.7%		3.0%
Total by mode	22.0%	3.3%	3.2%	3.3%	24.5%	2.3%	2.0%	19.1%	8.4%	1.7%	10.1%	100%

Cell shading indicating size of origin demand relative to overall trip demand

Table 5.10 Overall trip origins distributed by mode (31.5k crowd 60% non-car Day 1) - patron numbers

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT RAPID BUS	PT LOCAL BUS	PT EVENT BUS	PT - FERRY	PRIVATE VEHICLE - CORP	PRIVATE VEHICLE – PARK AND WALK	PRIVATE VEHICLE – DROP OFF	COACH	TAXI / RIDE SHARE	TOTAL
Hobart Inner	6,744	860	252	293	0	74	161	827	391	0	2,122	11,724
Hobart - North West	76	103	252	252	2,319	74	128	1,299	615	0	650	5,767
Hobart - North East	48	87	252	288	2,241	589	160	1,630	772	0	303	6,371
Hobart - South and West	48	0	252	171	2,241	0	106	1,073	508	0	58	4,457
Brighton	0	0	0	26	464	0	37	375	177	0	0	1,079
Sorell - Dodges Ferry	0	0	0	21	464	0	38	386	183	0	58	1,149
Outside of model area								429		525		954
Total by mode	6,917	1,050	1,008	1,050	7,729	736	630	6,019	2,646	525	3,190	31,500

Cell shading indicating size of origin demand relative to overall trip demand

Figure 5.1 illustrates the estimated primary mode of travel to the stadium from each SA3. For Hobart Inner, walk trips are largest proportion of trips. Bus and private vehicle have similar proportion of trips for the SA3 of Hobart – North West, Hobart – North East and Hobart – South and West. The SA3s at the greatest distance, Brighton and Sorrell – Dodges Ferry, largely rely on private vehicle for travel to the stadium. Trips from outside of the study area are primarily by coach, with a further proportion by private vehicle.

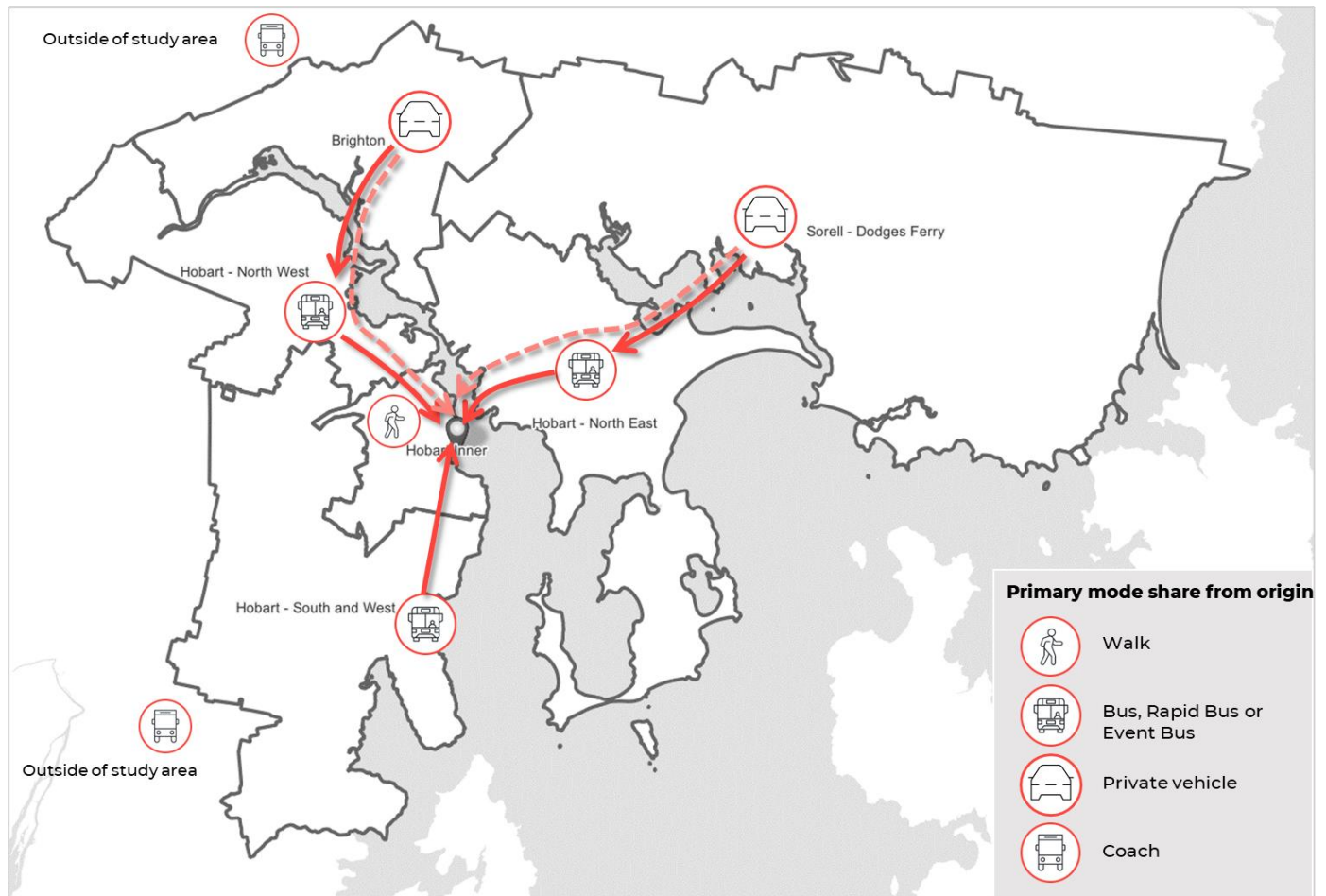


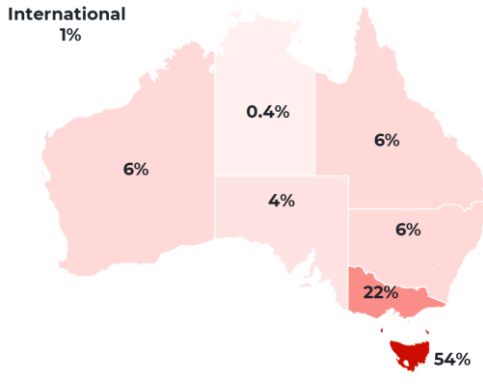
Figure 5.1 Primary mode of travel from each SA3 to Macquarie Stadium

5.7 Club membership data

The AFL Tasmania Devils Football Club was launched in March 2024, with the commencement of sales of club memberships. Club membership data (191,764 members as of May 2024) was reviewed for this study to understand the origins of membership by postcode, as a basis for origins of people who may attend games at Macquarie Point. Membership data was assessed to understand spatial patterns or hotspots/centres for members. This will assist in enhancing the transport assumptions by origins for events when compared to the general population patterns from the Census.

Membership data shows that more than half of members are Tasmanian (54%), with 22% of members from Victoria. There is an equal spread of members across the other states (6% from QLD, WA and NSW/ACT), while 1% of members are from international origins. Table 5.11 summarises membership numbers by origin.

Table 5.11 Tasmania Devils membership by origin

ORIGIN STATE/TERRITORY	NUMBER OF MEMBERS	%	
TAS	102,999	54%	
VIC	42,186	22%	
QLD	12,415	6%	
WA	11,652	6%	
NSW/ACT	11,326	6%	
SA	7,992	4%	
INTERNATIONAL	2,440	1%	
NT	754	0.4%	
Grand Total	191,764		

Tasmanian postcodes were linked to an SA3 to normalise the spatial distribution between membership and census data. Some postcodes cover large areas (such as 7030, which covers Central Highlands but also covers Brighton), giving less accuracy to the exact location of the member, but they were generally assumed to be from the larger populated areas within the postcode area.

The largest proportion of membership by SA3 is from the Hobart SA3s, making up 53% of all Tasmanian memberships. Hobart – North East has the largest proportion within Hobart SA3s, (18,257 or 18% of all Tasmanian memberships).

In regional areas there are a large number of memberships in Launceston (14,836) and Devonport (11,270). Membership by region is summarised in Table 5.12.

Table 5.12 Tasmania Devils membership by origin (Tasmania)

ORIGIN SA3	NUMBER OF MEMBERS (TAS)	%
Burnie - Ulverstone	4,546	4%
Devonport	11,270	11%
Huon - Bruny Island	3,605	4%
Launceston	14,836	14%
Meander Valley - West Tamar	2,256	2%
North East	5,123	5%
South East Coast	2,453	2%
West Coast	5,996	6%
Central Highlands (Tas.) (and Brighton)	4,368	4%
Hobart - North East	18,257	18%
Hobart - North West	8,675	8%
Hobart - South and West	7,576	7%
Hobart Inner	10,558	10%
Sorell - Dodges Ferry	4,630	4%
Hobart SA3s Total	54,064	53%

Figure 5.2 shows a comparison of memberships by Hobart SA3, compared to the overall Hobart population (from 2021 Census). The figure shows that membership is highest in Hobart – North East, where 31% of the population are members (18,257 members from a population of 59,161; almost 1 in 3 people are members). This indicates a higher concentration of members in this part of Hobart. Additionally, membership is lower in Hobart-North West than the general population proportion (around 1 in 8 people are members).

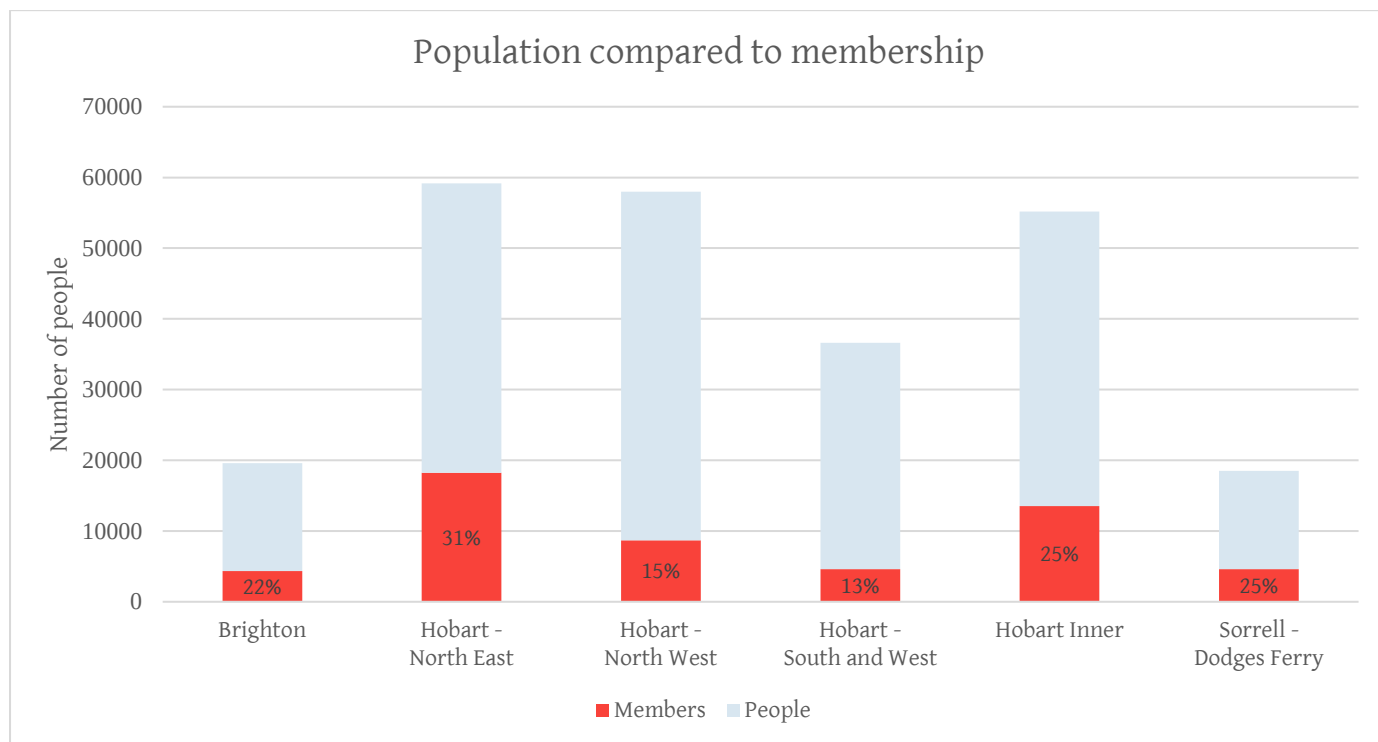


Figure 5.2 Census population compared to Devils membership

5.8 Updates to the origin summary

Following the assessment of the Tasmania Devils membership origin data, adjustments were made to the proportions of travel to reflect that more demand may come from origins in Hobart – North East. The proportion of event bus was altered to provide further event-specific services to Hobart North-East.

5.9 Events – Origins by mode - overall summary (updated following membership data)

An overall summary of trip origin estimates by SA3 is shown in Table 5.9 and Table 5.10, for a Special Event 31.5k Day 1.

Table 5.13 Overall trip origins distributed by mode (31.5k crowd 60% non-car Day 1) – percentages (considering membership data)

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT RAPID BUS	PT LOCAL BUS	PT EVENT BUS	PT - FERRY	PRIVATE VEHICLE - CORP	PRIVATE VEHICLE – PARK AND WALK	PRIVATE VEHICLE – DROP OFF	COACH	TAXI / RIDE SHARE	TOTAL
Hobart Inner	21.4%	2.7%	0.8%	0.9%		0.2%	0.5%	2.6%	1.2%	0.0%	6.7%	37.2%
Hobart - North West	0.2%	0.3%	0.8%	0.8%	6.9%	0.2%	0.4%	4.1%	2.0%	0.0%	2.1%	17.8%
Hobart - North East	0.2%	0.3%	0.8%	0.9%	9.3%	1.9%	0.5%	5.2%	2.4%	0.0%	1.0%	22.4%
Hobart - South and West	0.2%	0.0%	0.8%	0.5%	5.4%	0.0%	0.3%	3.4%	1.6%	0.0%	0.2%	12.4%
Brighton	0.0%	0.0%	0.0%	0.1%	1.5%	0.0%	0.1%	1.2%	0.6%	0.0%	0.0%	3.4%
Sorell - Dodges Ferry	0.0%	0.0%	0.0%	0.1%	1.5%	0.0%	0.1%	1.2%	0.6%	0.0%	0.2%	3.6%
Outside of model area								1.4%		1.7%		3.0%
Total by mode	22.0%	3.3%	3.2%	3.3%	24.5%	2.3%	2.0%	19.1%	8.4%	1.7%	10.1%	100%

Cell shading indicating size of origin demand relative to overall trip demand

Table 5.14 Overall trip origins distributed by mode (31.5k crowd 60% non-car Day 1)- patron numbers (considering membership data)

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT RAPID BUS	PT LOCAL BUS	PT EVENT BUS	PT - FERRY	PRIVATE VEHICLE - CORP	PRIVATE VEHICLE – PARK AND WALK	PRIVATE VEHICLE – DROP OFF	COACH	TAXI / RIDE SHARE	TOTAL
Hobart Inner	6,744	860	252	293	0	74	161	827	391	0	2,122	11,724
Hobart - North West	76	103	252	252	2,164	74	128	1,299	615	0	650	5,612
Hobart - North East	48	87	252	288	2,937	589	160	1,630	772	0	303	7,067
Hobart - South and West	48	0	252	171	1,700	0	106	1,073	508	0	58	3,916
Brighton	0	0	0	26	464	0	37	375	177	0	0	1,079
Sorell - Dodges Ferry	0	0	0	21	464	0	38	386	183	0	58	1,149
Outside of model area								429		525		954
Total by mode	6,917	1,050	1,008	1,050	7,729	736	630	6,019	2,646	525	3,190	31,500

Cell shading indicating size of origin demand relative to overall trip demand

6. Day-to-Day – Origins by mode

Once in operation, the Macquarie Point precinct will accommodate people who work and visit on a day-to-day basis (conferences etc). Day-to-day workers (non-match days) to the site are likely to have the same origin patterns as other workers to the Hobart SA2 with the same proportions as shown in Table 4.3. Based on 1,000 workers on site in the precinct, a summary of trip origin estimates by SA3 is shown in Table 6.1 and Table 6.2.

The tables highlight that based on Hobart JTW patterns, more than 70% of employees would drive to work in the precinct. However this will be influenced by the availability of parking either on-site at the stadium precinct or in the Hobart CBD area and new public transport options such as rapid bus and new ferry routes.

Table 6.1 Day-to-day trip origins (employment) - percentages

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT - BUS	PT - FERRY	PRIVATE VEHICLE	TAXI / RIDE SHARE	TOTAL
Hobart Inner	10.5%	1.8%	3.6%	0.0%	18.4%	0.5%	34.8%
Hobart - North West	0.1%	0.4%	3.3%	0.0%	14.6%	0.1%	18.6%
Hobart - North East	0.1%	0.3%	3.6%	0.4%	18.3%	0.1%	22.7%
Hobart - South and West	0.1%	0.2%	2.4%	0.0%	12.0%	0.0%	14.7%
Brighton	0.0%	0.0%	0.3%	0.0%	4.2%	0.0%	4.6%
Sorell - Dodges Ferry	0.0%	0.0%	0.3%	0.0%	4.3%	0.0%	4.6%
Total by mode	10.7%	2.8%	13.5%	0.4%	71.9%	0.7%	

Table 6.2 Day-to-day trip origins (employment) - numbers

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT - BUS	PT - FERRY	PRIVATE VEHICLE	TAXI / RIDE SHARE	TOTAL
Hobart Inner	105	18	36	0	184	5	348
Hobart - North West	1	4	33	0	146	1	186
Hobart - North East	1	3	36	4	183	1	227
Hobart - South and West	1	2	24	0	120	0	147
Brighton	0	0	3	0	42	0	46
Sorell - Dodges Ferry	0	0	3	0	43	0	46
Total by mode	107	28	135	4	719	7	1,000

Visitors to the stadium (non-match days, for conferences or functions) will have different origin patterns depending on the proportion of attendees that are local, and the proportion that stay in accommodation.

For local-based functions, visitors are likely to have the same origin patterns as employees (see Table 5.1 and Table 5.2). A conference that draws 50% interstate visitors that stay in CBD accommodation may change the proportions to include more short-trip behaviour such as walking, e-scooter and taxi trips, as shown in Table 6.3 and Table 6.4.

Table 6.3 Day-to-day trip origins (conference visitors) - percentages

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT - BUS	PT - FERRY	PRIVATE VEHICLE	TAXI / RIDE SHARE	TOTAL
Hobart Inner	45.2%	3.4%	1.8%	0.0%	9.2%	7.7%	67.4%
Hobart - North West	0.1%	0.2%	1.7%	0.0%	7.3%	0.1%	9.3%
Hobart - North East	0.0%	0.2%	1.8%	0.2%	9.2%	0.0%	11.3%
Hobart - South and West	0.0%	0.1%	1.2%	0.0%	6.0%	0.0%	7.4%
Brighton	0.0%	0.0%	0.2%	0.0%	2.1%	0.0%	2.3%
Sorell - Dodges Ferry	0.0%	0.0%	0.1%	0.0%	2.2%	0.0%	2.3%
Total by mode	45.4%	3.9%	6.7%	0.2%	36.0%	7.9%	

Table 6.4 Day-to-day trip origins (conference visitors) - numbers

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT - BUS	PT - FERRY	PRIVATE VEHICLE	TAXI / RIDE SHARE	TOTAL
Hobart Inner	452	34	18	0	92	77	674
Hobart - North West	1	2	17	0	73	1	93
Hobart - North East	0	2	18	2	92	0	113
Hobart - South and West	0	1	12	0	60	0	74
Brighton	0	0	2	0	21	0	23
Sorell - Dodges Ferry	0	0	1	0	22	0	23
Total by mode	454	39	67	2	360	79	1,000

7. Submissions – summary review

The Draft Guidelines – Macquarie Point Multipurpose Stadium Project of State Significance (draft guidelines) were published on 4 December 2023. The Commission invited comments on the draft guidelines, to be made by 8 January 2024. Comments were received from individuals, community groups, organisations and government agencies.

For the purposes of the transport planning for the stadium, the Summary of Comments on Draft Guidelines report (16 February 2024) was reviewed, focusing on comments regarding section 6.0 Movement, and changes made in response to the comments. The Final Guidelines were released on 16 February 2024. A summary of the comments is shown in Appendix B.

8. Following tasks

The Origins Study Memo and, in particular, the origin distributions outlined in Table 5.9 provided an input to the development of event scenarios to be modelled in the GHUTDM. As the GHUTDM includes 505 model zones, the distribution of event-trips from the SA3 level was disaggregated to the SA2 level, and then to the GHUTDM zone level based on zonal population.

This event-day demand were superimposed against background traffic and modelled in the GHUTDM to understand the impacts of event-day demands on the future transport network in Hobart. Further details on the modelling process and demand scenarios are documented in the Modelling Methodology memo (PS206346-PAM-MEL-MEM-002).

Modelling results may indicate congestion or limited capacity with respect to some routes and mode choices. This may influence mode share and mode choice for some of the identified travel regions and the mode shares and travel recommendations will be adjusted to mitigate the congestion or capacity issues.



Appendix A Macquarie Point Stadium – Preliminary summary mode share estimates by event size and mode share target

Table 7.2 Macquarie Point Stadium - Preliminary summary mode share estimates by event size and mode share target

Event Size	Target	Public Transport		Non-Car		Car		Total	
	Mode Share	Patrons	% of Task	Patrons	% of Task	Patrons	% of Task	Patrons	% of Task
Regular 15K	60% Day 1	5,911	39%	8,928	60%	6,072	40%	15,000	100%
Regular 15K	70% Day 1	7,361	49%	10,459	70%	4,541	30%	15,000	100%
Regular 15K	60% Ultimate	5,924	39%	8,928	60%	6,072	40%	15,000	100%
Regular 15K	70% Ultimate	7,374	49%	10,459	70%	4,541	30%	15,000	100%
Capacity 23K	60% Day 1	8,711	38%	13,802	60%	9,198	40%	23,000	100%
Capacity 23K	70% Day 1	11,141	48%	16,160	70%	6,840	30%	23,000	100%
Capacity 23K	60% Ultimate	8,704	38%	13,802	60%	9,198	40%	23,000	100%
Capacity 23K	70% Ultimate	11,124	48%	16,160	70%	6,840	30%	23,000	100%
Special 30K	60% Day 1	12,011	40%	18,110	60%	11,890	40%	30,000	100%
Special 30K	70% Day 1	14,761	49%	20,862	70%	9,138	30%	30,000	100%
Special 30K	60% Ultimate	12,014	40%	18,110	60%	11,890	40%	30,000	100%
Special 30K	70% Ultimate	14,774	49%	20,862	70%	9,138	30%	30,000	100%

Notes

Public Transport – Event Bus, Rapid Bus, Local Bus, Ferry, Event Ferry, Coach

Non-car mode share - Event Bus, Rapid Bus, Local Bus, Ferry, Event Ferry, Coach Walking, Cycling

Car mode share – Parking, Park and Walk, Drop-off / Pick-Up, Ride Share, Taxi

Day 1 – Opening event with minimal proposed transport network upgrades (Rapid Bus, Ferry, Cycling)

Ultimate - Event with all proposed transport network upgrades implemented (Rapid Bus, Ferry, Cycling)

Preliminary strategic estimates for planning and stakeholder discussion purposes only.

Appendix B Draft Guidelines – comments review

The Draft Guidelines – Macquarie Point Multipurpose Stadium Project of State Significance (draft guidelines) were published on 4 December 2023. The Commission invited comments on the draft guidelines, to be made by 8 January 2024. Comments were received from individuals, community groups, organisations and government agencies.

For the purposes of the transport planning for the stadium, the Summary of Comments on Draft Guidelines report (16 February 2024) was reviewed, focusing on comments regarding section 6.0 Movement, and changes made in response to the comments.

We note the summary of issues mentions comments were made regarding:

- that the guidelines should contain principles that outline what specific transport outcomes are to be achieved. This included stating what scenarios are to be modelled and ensuring all activities at the site are considered.
- concerns about the broader impacts to pedestrian, cycling and vehicle traffic across the region, including the northern freight route, and the need for assessments to consider the existing transport systems and infrastructure only unless further systems are proposed as part of the project.
- The need for secure bicycle parking facilities with end-of-trip facilities and infrastructure that caters for all abilities.

We also note the changes to the guidelines made in response to comments. The draft guidelines were modified to:

- include a requirement that the modelling and assessment of transport demand and management options considers the range of uses and activities proposed
- require that the modelling and assessment of transport demand and management options is informed by relevant transport plans and strategies, at a local and regional level.
- require that specific consideration is given to develop strategies that promote mass/public transport services as the intended mode of transport to the stadium and locality.
- include a requirement for plans to show the linkages between existing and proposed pedestrian and cycling infrastructure.
- The Commission made a number of other modifications to the draft guidelines in response to comments, including:
 - requiring that specific consideration is to be given to continued access to the Port of Hobart via Evans Street and any new proposed freight access route
 - including a requirement that specific consideration is given to the capacity of the existing mass/public transport system
 - including a requirement that the reports are to assess the level of security and number of bays for bicycle parking infrastructure
 - including a requirement that any new pedestrian and cycling infrastructure is informed by the Greater Hobart Cycle Plan.

The above requirements are noted and will be considered in the transport study.

Appendix C Scenario 40,000 capacity

A further scenario was added as a sensitivity test, based on a special event scenario with 40,000 capacity (Day 1). Like the 31,500 event, this represents the maximum venue capacity for events which use the playing surface for additional seating or standing e.g. concerts. In this case, the configuration of seating allows for a 40,000-maximum capacity. It is noted this is expected to be an infrequent scenario, occurring for only 1-2 events a year.

The transport origins by mode were increased to 40,000 total by:

- using Bus numbers from the 60% non-car Day 1 scenario (as per origin study tables)
- increasing Coach from 525 to 1,000 people
- increasing Private vehicle numbers for the remainder (higher amount of PV parking, PV drop off, and taxi).

Walk, Cycle, Ferry and PV Corporate modes were not changed.

The resulting origins by mode are shown in Table C.1 and Table C.2.

The resulting scenario has a non-car mode share of 46%, which does not meet the Base Target non-car mode share (60%). Further implementation of government transport network upgrades (Rapid Bus network, expansion of the ferry network, and walking and cycling improvements) would be needed to improve the non-car mode share, for all scenarios but particularly for the large scale scenario of 40,000 maximum capacity.

C.1.1 Events – Origins by mode - overall summary (updated following membership data)

An overall summary of trip origin estimates by SA3 is shown in Table C.1 and Table C.2, for a Special Event 40k Day 1.

Table C.1 Overall trip origins distributed by mode (40k crowd Day 1) – percentages

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT RAPID BUS	PT LOCAL BUS	PT EVENT BUS	PT - FERRY	PRIVATE VEHICLE - CORP	PRIVATE VEHICLE – PARK AND WALK	PRIVATE VEHICLE – DROP OFF	COACH	TAXI / RIDE SHARE	TOTAL
Hobart Inner	16.9%	2.1%	0.6%	0.7%	0.0%	0.2%	0.4%	3.4%	1.7%	0.0%	9.1%	35.1%
Hobart - North West	0.2%	0.3%	0.6%	0.6%	5.4%	0.2%	0.3%	5.3%	2.7%	0.0%	2.8%	18.4%
Hobart - North East	0.1%	0.2%	0.6%	0.7%	7.3%	1.5%	0.4%	6.6%	3.4%	0.0%	1.3%	22.2%
Hobart - South and West	0.1%	0.0%	0.6%	0.4%	4.3%	0.0%	0.3%	4.4%	2.2%	0.0%	0.2%	12.5%
Brighton	0.0%	0.0%	0.0%	0.1%	1.2%	0.0%	0.1%	1.5%	0.8%	0.0%	0.0%	3.6%
Sorell - Dodges Ferry	0.0%	0.0%	0.0%	0.1%	1.2%	0.0%	0.1%	1.6%	0.8%	0.0%	0.2%	3.9%
Outside of model area								1.7%		3%		4.2%
Total by mode	17.3%	2.6%	2.5%	2.6%	19.3%	1.8%	1.6%	24.5%	11.6%	2.5%	13.7%	100%

Cell shading indicating size of origin demand relative to overall trip demand

Table C.2 Overall trip origins distributed by mode (40k crowd 60% Day 1)- patron numbers

SA3 – TRIP ORIGIN	WALK	CYCLE/ MICRO MOB.	PT RAPID BUS	PT LOCAL BUS	PT EVENT BUS	PT - FERRY	PRIVATE VEHICLE - CORP	PRIVATE VEHICLE – PARK AND WALK	PRIVATE VEHICLE – DROP OFF	COACH	TAXI / RIDE SHARE	TOTAL
Hobart Inner	6,744	860	252	293	0	74	161	1,345	684	0	3,632	14,045
Hobart - North West	76	103	252	252	2,164	74	128	2,114	1,076	0	1,112	7,350
Hobart - North East	48	87	252	288	2,937	589	160	2,652	1,349	0	519	8,882
Hobart - South and West	48	0	252	171	1,700	0	106	1,745	888	0	99	5,010
Brighton	0	0	0	26	464	0	37	610	310	0	0	1,446
Sorell - Dodges Ferry	0	0	0	21	464	0	38	628	319	0	99	1,569
Outside of model area								698		1,000		1,698
Total by mode	6,917	1,050	1,008	1,050	7,729	736	630	9,792	4,627	1,000	5,461	40,000

Cell shading indicating size of origin demand relative to overall trip demand

Appendix E

Traffic and Freight memo





Memo

To: Macquarie Point Development Corporation
From: WSP
Subject: **Traffic network considerations for the Macquarie Point Multipurpose Stadium Transport Study**
Our ref: App E - PS206346-WSP-MEL-PAM-MEM-002-RevB-Traffic
Date: 24 June 2024

1. Transport network

1.1 Location

The Macquarie Point Multipurpose Stadium site is located immediately east of the Hobart CBD and is bounded by the Tasman Highway and Davey Street to the west, Regatta Grounds and Queens Domain to the north, Macquarie Point Wharf to the east and Evans Street to the south.

Regionally, key major routes to the site include the Brooker Highway/Brooker Avenue to the north west of the site, Tasman Highway to the north east, Southern Outlet to the south and Sandy Bay Road to the south east.

The Davey Street and Macquarie Street couplet (operating as a one-way pair) provide access to and from the site south of the Hobart CBD with Evans Street, Hunter Street and Macquarie Point Access Road each provide local access to the stadium site.

1.2 Regional road network

Key routes in the regional road network are shown in Figure 1.1, and discussed below.

Level 11, 567 Collins St
Melbourne VIC 3000

Tel: +61 3 9861 1111
Fax: +61 3 9861 1144
www.wsp.com

WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

WSP Pty Limited ABN 80 078 004 798



Figure 1.1 Regional road network

1.2.1 Brooker Highway/Brooker Ave (National Highway 1)

Forms part of the National Highway 1 and the main artery between the CBD and the northern suburbs. It runs north from the Cenotaph as a 4 lane (2 in each direction) dual carriageway, connecting to the Domain Highway north of Queens Domain. A posted speed of 80 km/h is present on most of the length, reducing to 60 km/h around the Railway Roundabout at Liverpool Street.

1.2.2 Tasman Highway (A3) and Tasman Bridge

Provides the primary crossing of the River Derwent, connecting the eastern suburbs of Hobart and Hobart Airport with the CBD where it terminates and Macquarie Street and Davey Street adjacent to the Cenotaph. The Tasman Highway is a four lane (2 in each direction) dual carriageway except on the Tasman Bridge which has additional bi-directional peak lane and no median strip. A variable speed limit is in place between Liverpool Street and the Cambridge Road interchange, with a permanent speed limit of 110 km/h in place further east.

1.2.3 Southern Outlet (A6)

The Southern Outlet forms at the southern end of Macquarie St and Davey St southwest of the CBD and runs south of the Hobart CBD to Kingston. It forms a four lane (two in each direction) dual carriageway and runs at a posted speed of 100 km/h with an 80 km/h section near the northern end between Davey St and Olinda Grove.

1.2.4 Domain Highway (B36)

Domain Highway links Brooker Highway with the Tasman Highway and Tasman Bridge along the eastern perimeter Queens Domain and the Botanical Gardens. A single lane is provided in each direction, with a speed limit of 70 km/h.

1.2.5 Sandy Bay Rd (B68)

Sandy Bay Road links suburbs along the western bank of the River Derwent with Hobart CBD. Running between the Channel Highway at Kingston and Harrington Street in the CBD, four lanes (two in each direction) are provided between Hobart CBD and Sandy Bay, dropping to two lanes (one in each direction) further south, with a posted speed of 50 km/h.

1.3 Local Surrounding Roads

Key routes in the local road network are shown in Figure 1.2, and discussed below.

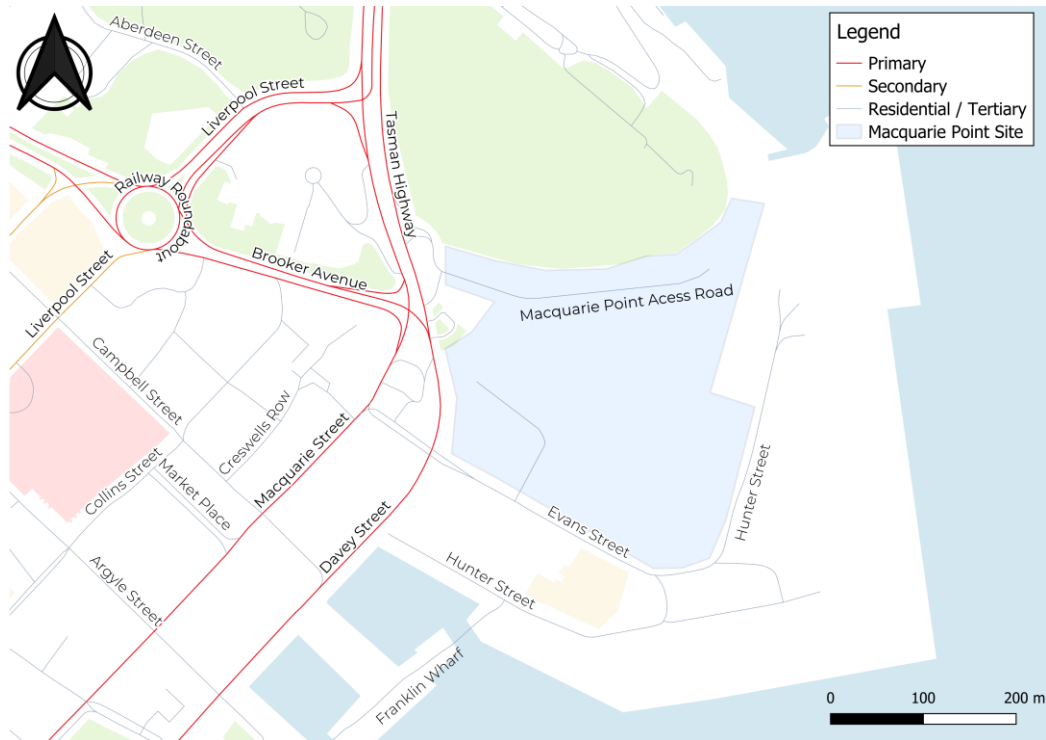


Figure 1.2 Local road network

1.3.1 Macquarie Street and Davey Street (A6)

Macquarie Street and Davey Street run along the southern end of the Hobart CBD between Brooker Avenue and the Tasman Highway and the Southern Outlet (A5) and Huon Rd (B64) at a posted speed of 50 km/h.

Davey Street runs one-way south-westbound and is comprised of three travel lanes with ancillary and shared turning lanes on the approach to intersections. Past Evans Street, Davey Street widens to four travel lanes with kerbside parking.

Macquarie Street runs one-way north-eastbound and is comprised of four travel lanes although it reduces to three lanes north of Evans Street, similarly to Davey Street. Kerbside parking is located on both sides of the road in locations where the road is wide enough to provide space.

1.3.2 Evans Street

Evans Street provides an important freight access link for the Port area. Roughly 15 m wide, Evans Street runs northeast southwest and connects Macquarie St and Davey St near Tasman Hwy/Brooker Ave intersection, with businesses on Macquarie Point and Hunter Street with access to the wharves. It provides two-way traffic flow (one lane in each direction) at a posted speed of 50 km/h with kerbside parking on both sides of the road.

1.3.3 Hunter Street

Hunter Street links Franklin Wharf with Evans Street and the Macquarie Wharves. It is a two-way road (one lane in each direction), with a 30km/h speed limit which connects to a parking area just south of the Macquarie Point site and is roughly 8m wide.

1.3.4 Macquarie Point Access Road

Macquarie Point Access Road extends from the Tasman Highway/Davey Street/Macquarie Street intersection, running along the northern perimeter of the Macquarie Point site, to a cul-de-sac at its eastern end and the eastern boundary of the site. The road is currently marked as closed with signage and bollards immediately east of the Tasman Highway/Davey Street/Macquarie Street intersection.

1.4 Existing traffic demands

Annual Average Daily Traffic (AADT) Volumes (where available) on the surrounding road network are shown in

Figure 1.3 with typical daily profiles at locations on the Brooker Highway, Tasman Highway and Southern Outlet shown in Figure 1.4 to Figure 1.6. Traffic demands on these three key routes into and out of Hobart generally show an AM peak demand between 7am and 9am, and a PM peak demand between 3pm and 6pm, followed by a steep decrease in demand from around 6pm following the conclusion of the commuter peak.



Figure 1.3 Annual Average Daily Traffic Volumes

Source: Tasmania Traffic Data (<https://tasmaniatrafficdata.drakewell.com/publicmultinodemap.asp>)

The Tasman Highway (at the Tasman Bridge) exhibits the expected inbound AM and outbound PM peak traffic peaks. Inbound (westbound) traffic peaks at around 4,000 vehicles per hour at between approximately 7am and 9am while outbound traffic peaks at a similar level between approximately 4pm and 6pm before dropping sharply. Throughout the day, volumes

are around 2,500 vehicles per hour in each direction. During the weekends, traffic in each direction tends to peak at midday with around 4,000 vehicles per hour with a steady decline to 3,000 vehicles per hour at 5pm with a sharper decline to around 1,500 vehicles per hour at 7pm.

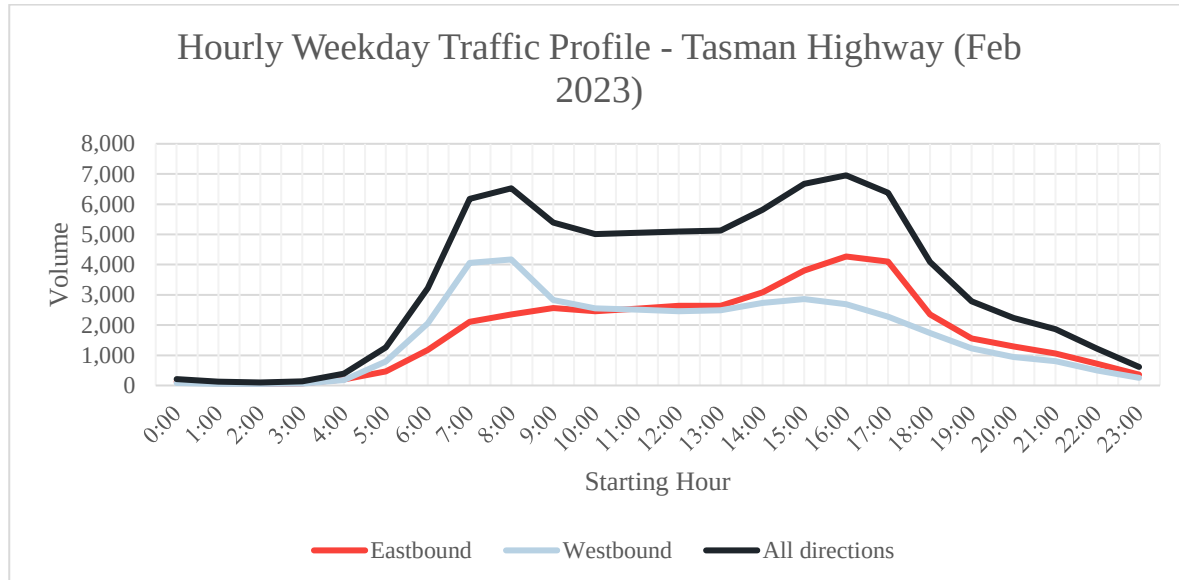


Figure 1.4 East end of Tasman Bridge daily traffic profile

Brooker Highway exhibits a less pronounced AM and PM peak and a more consistent traffic demand profile across the day. Inbound (southbound) is the peak direction in the AM peak at around 2,500 vehicles per hour between 7 am and 9am. Traffic volumes are relatively constant at around 2,000 vehicles per hour in both directions throughout the middle of the day before increasing to around 2,500 in both directions in the PM peak.

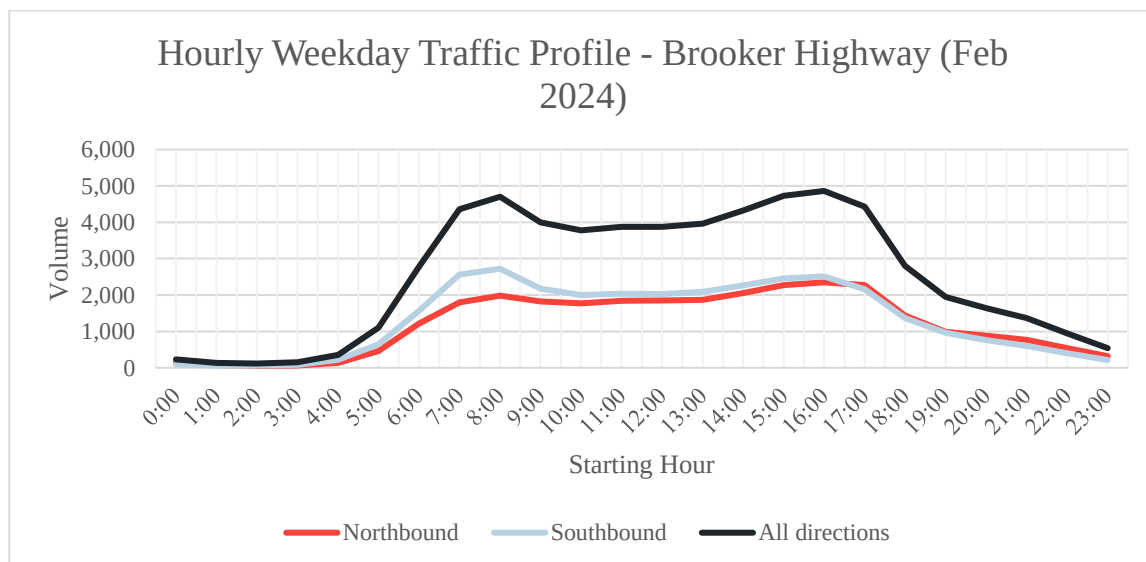


Figure 1.5 Brooker Highway north of junction with Domain Highway daily traffic profile

Southern Outlet has a pronounced AM peak demand in the inbound (northbound) direction and PM peak demand in the outbound (southbound) direction. Inbound volumes peak at around 3,000 vehicles per hour between around 7am and 8am with outbound volumes peaking at just over 2,500 vehicles per hour in the PM peak. Through the middle of the day, traffic volumes drop to around 1,500 vehicles per hour in each direction.

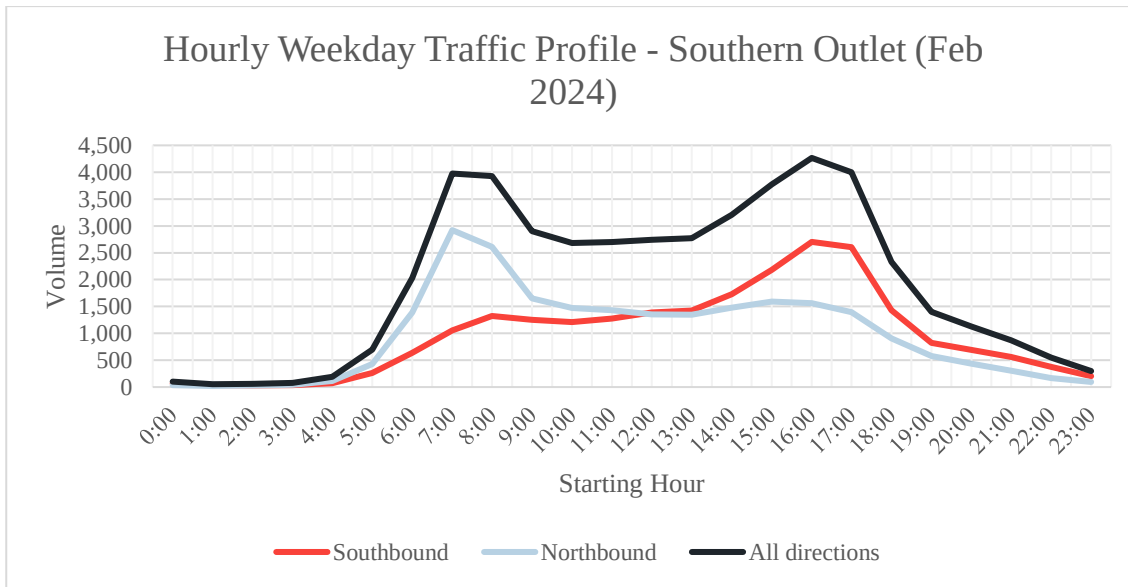


Figure 1.6 Southern Outlet south of Olinda Grove daily traffic profile

Source: Tasmania Traffic Data (<https://tasmaniatraffickdata.drakewell.com/publicmultinodemap.asp>)

1.5 Freight Network

The Port of Hobart act as key hubs for Antarctic exploration research vessel, freight shipments (primarily bulk log export) and as a cruise terminal. Much of the freight through the area is based around the Port of Hobart, in particular Macquarie Wharves 1-6 accessed via Evans St on and to a lesser extend the adjacent Princes Wharves 1 & 2 accessed via Castray Esplanade.

According to data provided by Department of State Growth (May 2024), in the order of 200,000 tonnes (2022/2023 FY) pass through the Macquarie Wharves annually, including around 3,000 twenty-foot equivalent units (TEUs). An estimated 70% of freight traffic is comprised of exports while the reminder 30% are imported products and a significant 75% of products through the Port are non-containerised. As a result, an estimated 7000 laden truck movements involving a combination of single PM-semi trailers (19m), B-doubles (21-26m) and truck and dog trailers combinations (19-25m) would be expected to travel to and from these wharves annually.

The approved B-Double routes around the site are shown in Figure 1.7 below and incorporate the major road routes discussed above, as well as Evans Street and Hunter Street which provides access and egress to the Macquarie Wharf and surrounding facilities. Much of the freight through the area is based around the Port of Hobart, in particular Macquarie Wharves 1-6 accessed via Evans St on and to a lesser extend the adjacent Princes Wharves 1 & 2

Heavy vehicle proportions on key routes surrounding the site are shown in Figure 1.8.

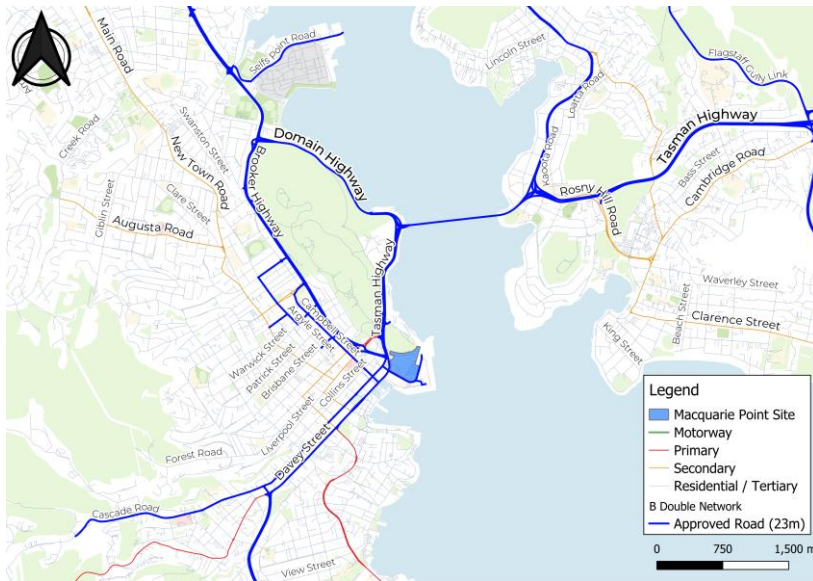


Figure 1.7 Approved B-Double Routes

Source:

<https://maps.stategrowth.tas.gov.au/portal/apps/webappviewer/index.html?id=560488eb2c364eb180027f7b9c61df3a>



Figure 1.8 Heavy vehicle proportion of total traffic

Source: Tasmania Traffic Data (<https://tasmaniatraffictdata.drakewell.com/publicmultinodemap.asp>)

1.6 Surrounding transport projects

The following transport network upgrades surrounding the site are expected to be completed in the near future as part of the Hobart City Deal.

Transit lane connector between Davey St and Macquarie Street:

- Will see the construction of an extra lane to improve traffic flow from the Southern Outlet between Davey and Macquarie Streets
- Connects to a new peak hour clearway on Macquarie Street.
- Expected completion mid 2024.

Davey St and Macquarie Street bus improvements:

- Bus stop improvements, removal of parking to improve bus access, cycling improvement and installation of new walking connections.
- Designs include connecting the Southern Outlet Transit Lane to a new peak time clearway along Macquarie Street.
- Construction planned for early 2025.

Southern Outlet Transit Lane:

- Transit lane is proposed to operate northbound between Olinda Grove and Macquarie Street for vehicles carrying three or more people as well as buses, taxis, motorbikes and emergency vehicles.
- Will complement Kingsborough Park and Ride facilities and bus improvements on Macquarie Street.
- Construction planned for early 2025.

Appendix F

Transport modelling report



Macquarie Point Multipurpose Stadium Transport Study

Strategic Modelling Results

Question today
Imagine tomorrow
Create for the future

Macquarie Point Multipurpose Stadium
Transport Study – Strategic Modelling Results

Level 11, 567 Collins St
Melbourne VIC 3000

Tel: +61 3 9861 1111
Fax: +61 3 9861 1144
wsp.com

Rev	Date	Details
A	17/06/2024	First issue
B	28/06/2024	Final issue

	Initials	Date
Prepared by:	JD	28/06/2024
Reviewed by:	AG	28/06/2024
Approved by:	GS	28/06/2024

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Executive summary

Macquarie Point Stadium is progressing through the Project of State Significance (PoSS) planning approvals framework. As part of planning gateways, an assessment is required to address the guidelines outlined in the PoSS framework, including those relating to the performance of the transport network (referred to as the Movement Guidelines).

Strategic transport modelling using the existing Greater Hobart Urban Travel Demand Model (GHUTDM) has been undertaken to support this process. This has involved superimposing event-day demands on to typical weekday PM vehicle and public transport demands in the 2030 model year.

The following strategic modelling scenarios were undertaken for a forecast horizon of 2030:

- Base Case
- Scenario 1: Seated sell out, 24,500 capacity, 40% private
- Scenario 2: Seated sell out, 24,500 capacity, increased private vehicle to 60%
- Scenario 3: Concert sell out, 31,500 capacity, 40% private vehicle
- Scenario 4: Concert sell out, 31,500 capacity, increased private vehicle to 60%

Two additional network tests were conducted to understand the changes in traffic from an increase in maximum stadium capacity throughout the operating life of the stadium:

- 2030 40,000 capacity stadium
- 2050 24,500 capacity stadium

Executive summary

Key findings of the strategic modelling include:

- The 2030 Base Case (without event demands) is already quite congested on road links including the Tasman Bridge, Brooker Highway and Southern Outlet in the inbound direction for the AM peak and in the outbound direction for the PM peak.
- Event demand adds traffic in the inbound direction in the PM peak inducing congestion in key corridors, particularly the Tasman Highway, Brooker Highway and Macquarie Street.
- The typical weekday PM peak period with event demands volume over capacity (V/C) ratios in the inbound direction are better or comparable to the typical weekday AM peak period .
- In Scenario 1 and Scenario 3 with 60% non-car mode split, the existing public transport network is unable to support the demand. Overcrowding is exhibited along the key public transport corridors such as New Town Road and the Southern Outlet. Additional services and event buses will be needed to achieve the target mode share.
- In 2050, typical non-event traffic is expected to continue growing. Combined with the event demands, the Tasman Highway is still expected to be over capacity and the Brooker Highway is at capacity. The Bowen Bridge and East Derwent Highway observe a considerable increase in traffic volumes in both directions.

Introduction

Macquarie Point Stadium is progressing through the Project of State Significance (PoSS) planning approvals framework. As part of planning gateways, an assessment is required to address the guidelines outlined in the PoSS framework, including those relating to the performance of the transport network (referred to as the Movement Guidelines).

Strategic transport modelling using the existing Greater Hobart Urban Travel Demand Model (GHUTDM) has been undertaken to support this process. This has involved superimposing event-day demands on to typical weekday PM vehicle and public transport demands in the 2030 model year.

The purpose of this report is to detail the strategic modelling outcomes that form part of the transport network assessment for the Macquarie Point Stadium.

Strategic transport using the existing GHUTDM has been selected for this assessment as it more clearly addresses the POSS guidelines with respect to:

- Covering the Greater Hobart area and not just the CBD
- Identifying network wide traffic and public transport constraints
- Meeting POSS submission timelines while still providing useful network insights across all of Hobart (calibration/validation is not needed which may have impacted timelines)
- Allowing for testing of various scenarios to assess different event-day capacity and mode shares.
- Typically performing better when event demands are loaded in as opposed to when large event demand spikes are loaded into mesoscopic models.

Methodology

Central to the transport modelling approach is the use of the GHUTDM for this study. The GHUTDM incorporates the latest plans on land use and transport network for Greater Hobart by the Tasmanian Government and represents typical weekday traffic and public transport during peak and off-peak periods.

As the GHUTDM represents typical travel conditions and does not predict additional demand associated with special events, a bespoke modelling approach is required.

The strategic modelling methodology (shown in Figure 1) is outlined in the below steps:

1. Develop the Base Case 2030 GHUTDM model to obtain the typical PM peak demand matrices.
2. Incorporate event travel demand matrices for each scenario. Event travel demand matrices will be derived using findings from the Origins Study (see Origins Study memo).
3. Assign combined 2030 PM peak travel demand matrices to the road network.
4. Assess the road network performance by assessing metrics including V/C ratios and comparing against typical non-event day.

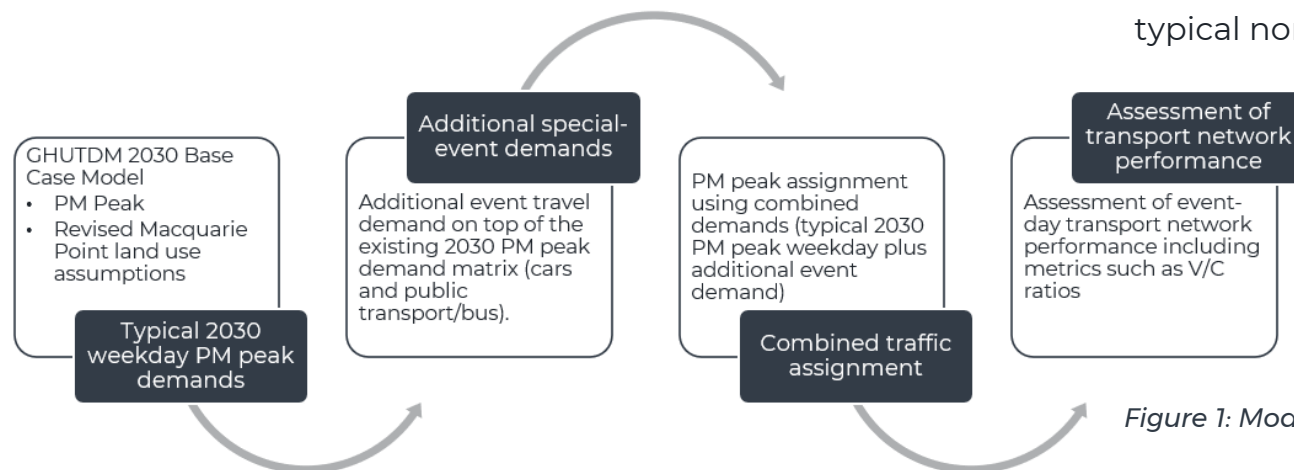


Figure 1: Modelling methodology flow

Scenarios

Scenarios have been developed to represent a range of different purposes for which the Macquarie Point Stadium will be used. The scenarios incorporate different levels of mode split to address PoSS Movement Guidelines relating to changing travel demand preferences.

The scenarios include typical day-to-day demands (employees in the precinct), sporting event capacity, concert capacity and varying private vehicle and public transport mode splits.

The following strategic modelling scenarios were undertaken for a forecast horizon of 2030:

- Base Case
- Scenario 1: Seated sell out, 24,500 capacity, 40% private vehicle
- Scenario 2: Seated sell out, 24,500 capacity, increased private vehicle to 60%
- Scenario 3: Concert sell out, 31,500 capacity, 40% private vehicle
- Scenario 4: Concert sell out, 31,500 capacity, increased private vehicle to 60%

Assumptions

This section details key assumptions used in the strategic modelling. This includes an overview of the selected model year and time period for the assessment, land use, public transport and event demand destination assumptions.

Model year

The year 2030 has been considered as an appropriate model forecast year given that it is:

- a standard reference case forecast year in the GHUTDM (the others being 2040 and 2050); and
- Macquarie Point Stadium is planned to open in 2029. Developing new land use inputs and demand matrices for the 2029 opening year would not be time or cost efficient.

Land use assumptions

The GHUTDM incorporates the future land use assumptions for Greater Hobart endorsed by the Tasmanian Government. Under the Hobart MetroPlan, the 2030 Reference Case GHUTDM model has existing population and employment assumptions for the Macquarie Point Precinct.

To reflect the latest land use assumptions under the Macquarie Point Stadium Master Plan, the model assumptions for the zone which the Macquarie Point Precinct encompasses has been updated.

The revised 2030 Base Case assumes the following:

- Population: 200
- Employment: 1,400

These values replace the existing figures for the Macquarie Point Precinct zone.

Assumptions

Time period and traffic counts

The strategic modelling has been undertaken on the GHUTDM PM peak (16:00 – 18:00) period. The PM peak in the model represents a typical weekday PM peak period. Superimposing the additional event demand with the PM peak demand is considered to provide a conservative demand scenario given that, in general, inbound spectator travel for weekday events such as the AFL would generally occur later than the PM peak for a 7:30pm match.

To understand the traffic profile over the peak period, analysis of Department of State Growth traffic counts for the following sites and time periods has been undertaken:

- Tasman Highway 100m E Of Tasman Bridge East Abutment (February 2023)
- Brooker Hwy 715m S of Risdon Rd (February 2024)
- Southern Outlet 1860m S Of Olinda Grove (February 2024)

Locations are shown in Figure 2.



Figure 2: Traffic count locations

Assumptions

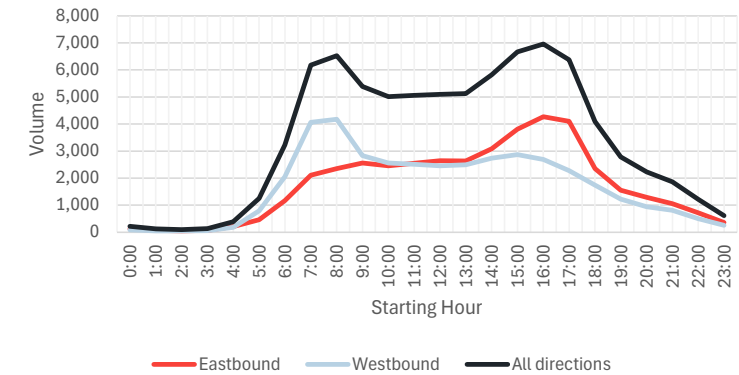
Traffic counts

The traffic counts at the three sites show that the PM peak hour occurs between 16:00 – 17:00 on Hobart’s three main corridors.

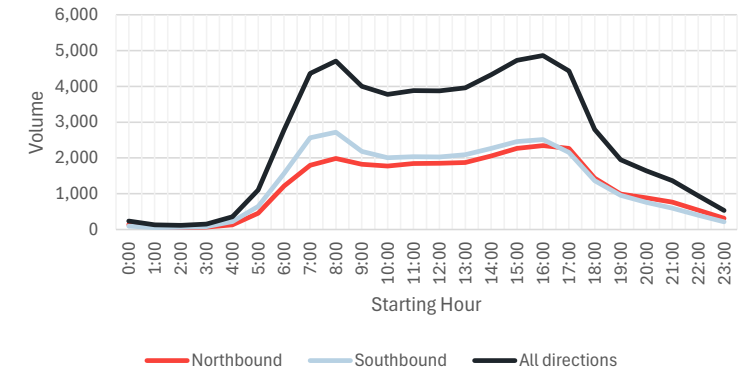
In the hour immediately following the modelled PM period (18:00 – 19:00) the traffic volumes are near half of the peak hour volume.

Assuming a typical event time of 7:30pm, it is anticipated that many event ingress trips will occur after the PM peak hour.

Hourly Traffic Profile - Tasman Highway (Feb 2023)



Hourly Traffic Profile - Brooker Highway (Feb 2024)



Hourly Traffic Profile - Southern Outlet (Feb 2024)

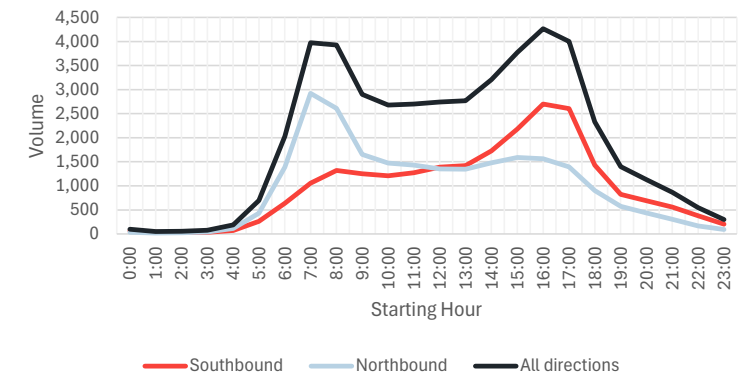


Figure 3: Hourly traffic profiles (source: Department of State Growth traffic counts)

Public transport network

The 2030 reference case public transport network has been adopted in this analysis. The reference case network includes the public bus network and does not include the existing ferry service or the proposed rapid bus services, event buses or additional ferry services (see Figure 4).

For the purposes of scenario modelling and identifying areas of constraint or opportunity, all the public event-day trips (public bus, rapid bus, event bus and ferry) are loaded onto the public bus network.

The scenario modelling results will provide an understanding of how the public transport network performs under event-day demands. This will provide insight for developing public transport interventions and strategies to achieve target mode shares for the Macquarie Point Stadium.

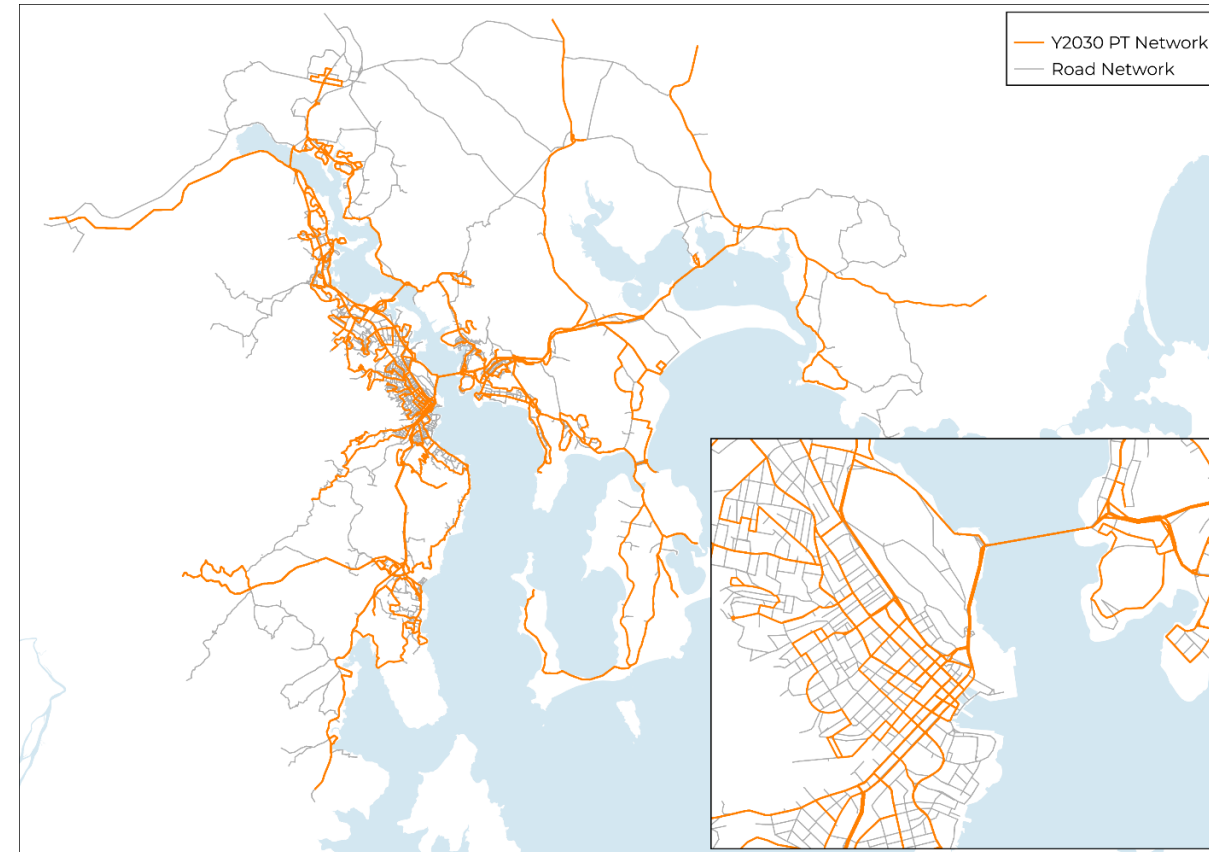


Figure 4: The 2030 public transport network in the GHUTDM

Destination zones

To develop event-day travel demand matrices, trips must be distributed to specified destination zones.

Event-day private vehicle trips have been distributed across zones in Macquarie Point, Hobart CBD and the surrounding fringe (see Figure 5). This reflects the dispersion of available parking across the city, given there will be limited on-site parking at the Macquarie Point Stadium.

Event-day public transport trips have a destination to zone 15 where the Macquarie Point Stadium will be located.

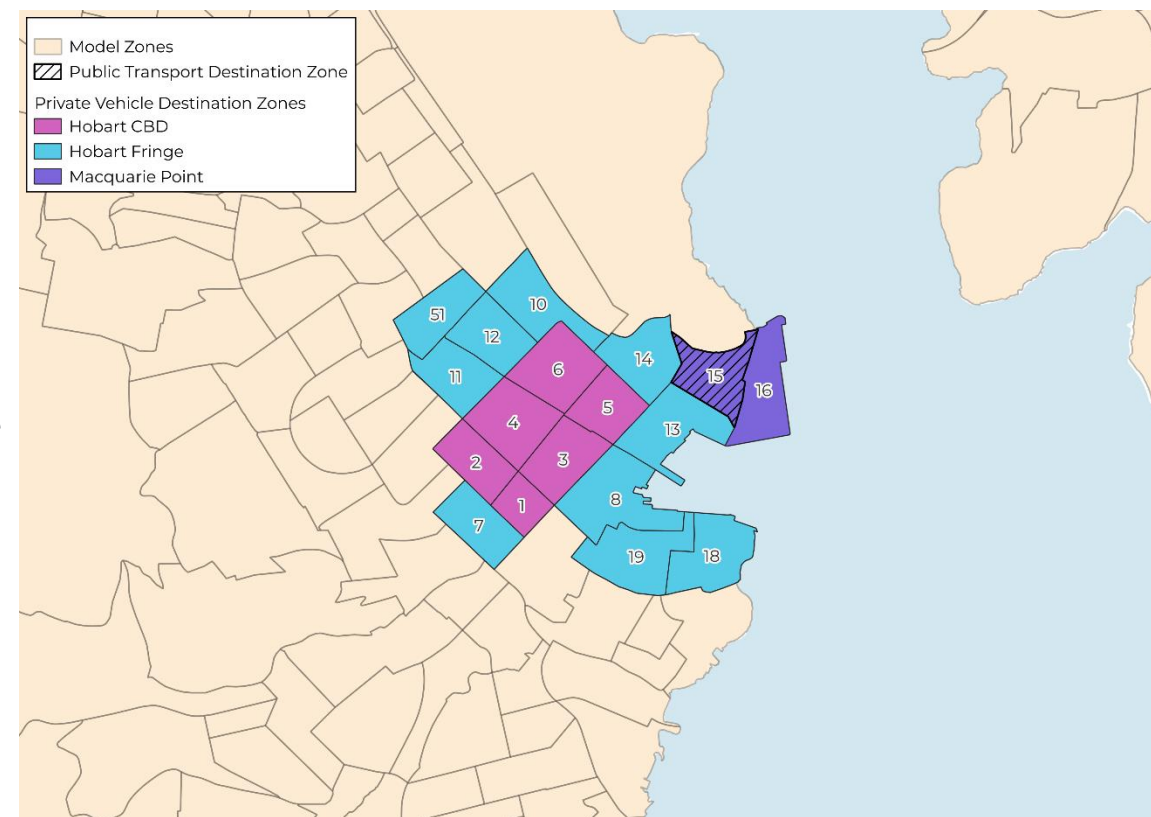


Figure 5: Event demand trip destination zones

Results

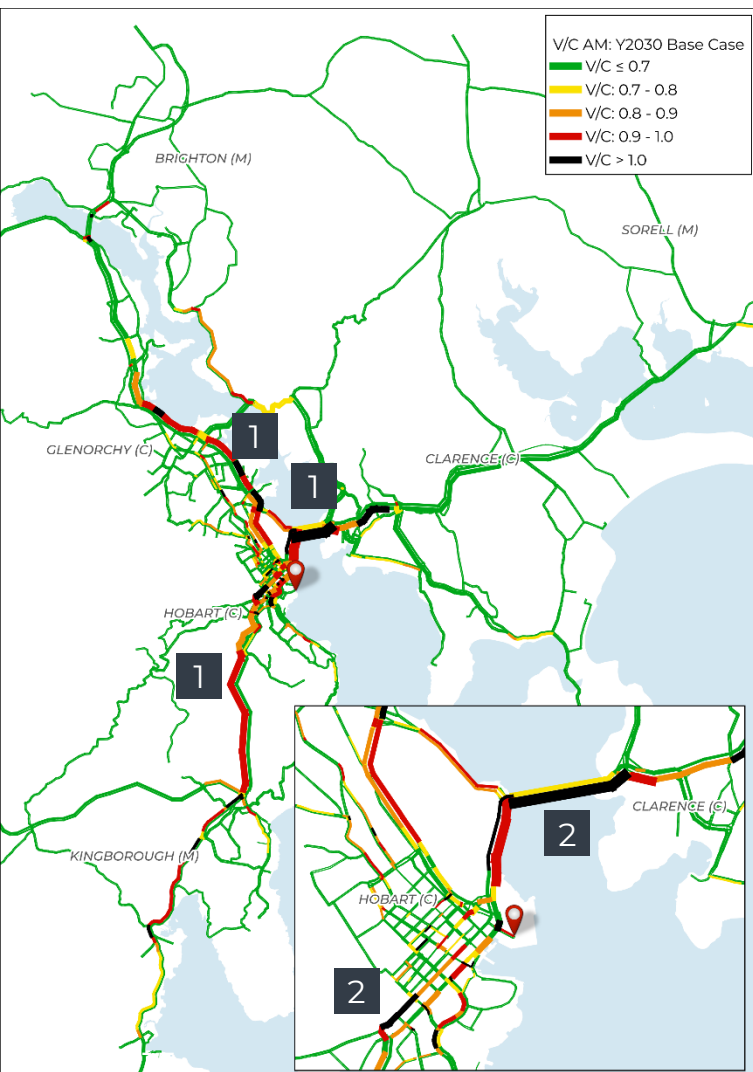
This section presents the strategic modelling results for the Base Case and four event-day scenarios.

The following outputs are presented for the scenarios:

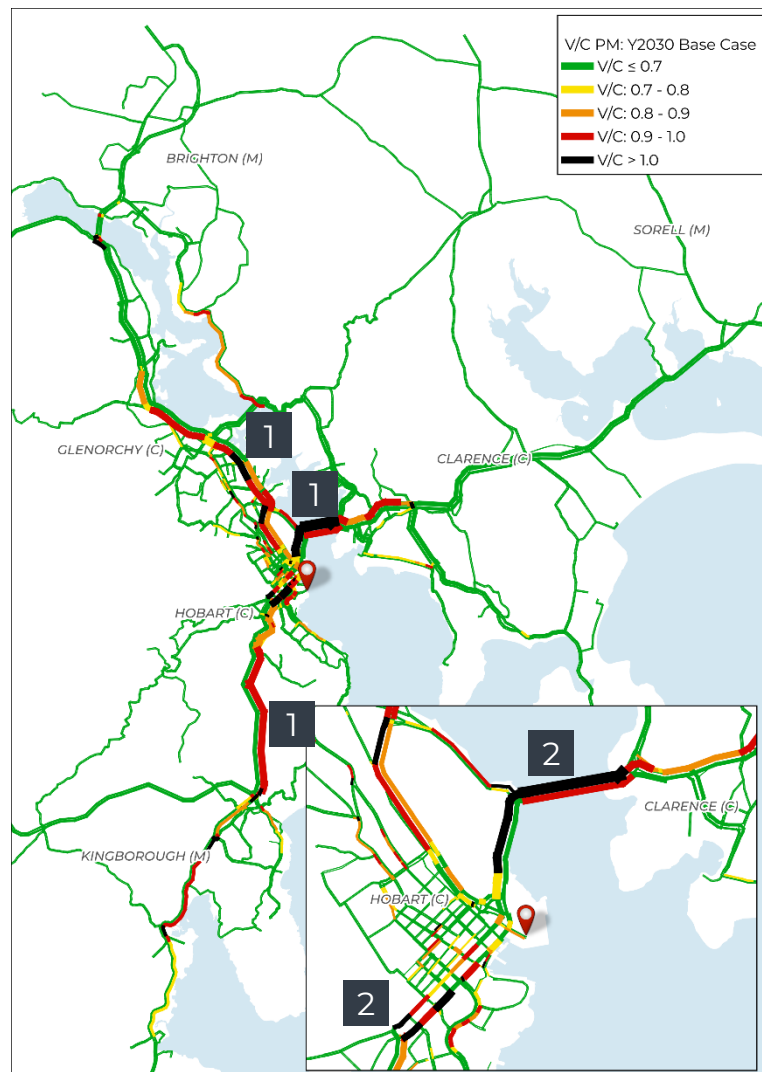
- 2030 Base Case
 - AM and PM traffic volume over capacity (V/C) ratio
 - AM and PM traffic volume difference compared against the 2030 MetroPlan Reference Case
- 2030 Event-day – Scenarios 1 to 4
 - PM vehicle volume difference compared against the Base Case
 - PM traffic V/C ratio
 - PM traffic volumes – total vehicles and event demand only
 - Hotspots caused by event demand
 - PM PT passenger load difference compared against the Base Case
 - PM PT volume over crush capacity ratio



2030 Base Case



2030 Base Case V/C – AM (7-9AM)



2030 Base Case V/C – PM (4-6PM)

Insights and issues

1

In the 2030 Base Case, forecast demands in the AM and PM peak periods are expected to create congestion on the key road links into the Hobart CBD including the Tasman Highway, Brooker Highway and Southern Outlet. These key corridors are approaching or at capacity exhibiting a V/C greater than 0.9.

2

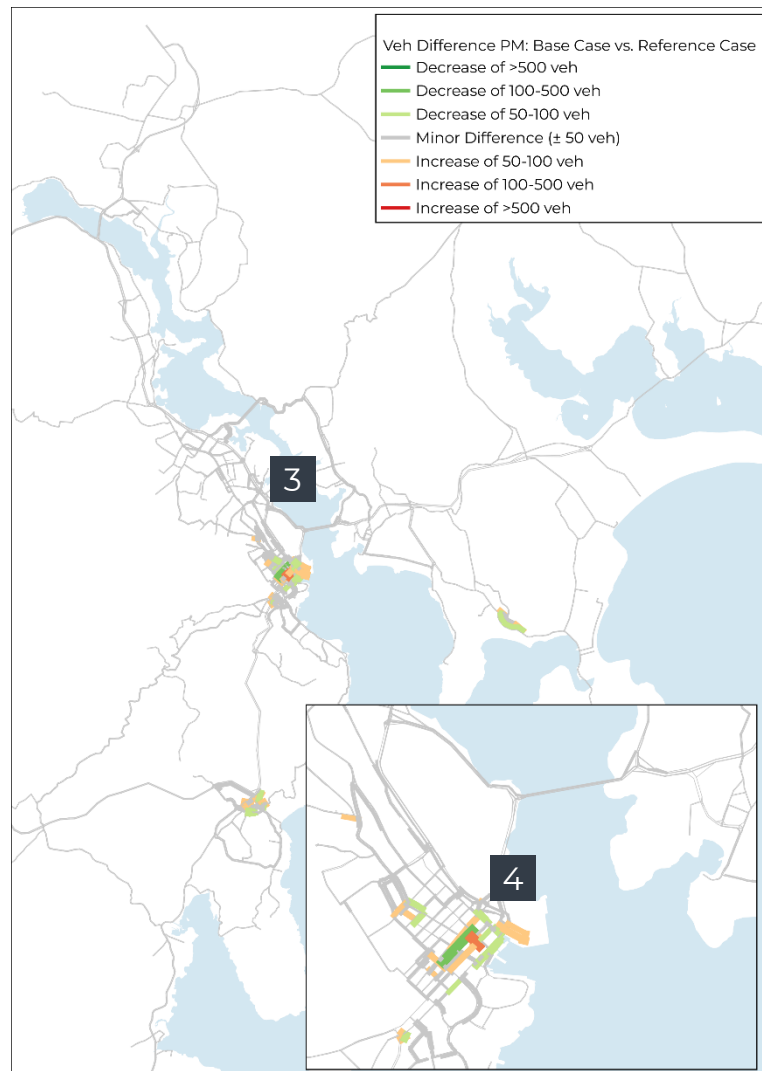
The Tasman Bridge, sections of the Brooker Highway and Macquarie and Davey Streets are expected to exceed capacity ($V/C > 1.0$) in both the peak periods. As a result, the Hobart road network may be susceptible to traffic incidents and significant spikes in demand.



2030 Base Case



Vehicle Volume Difference (AM 2-hr): Base Case vs. Reference Case



Vehicle Volume Difference (PM 2-hr): Base Case vs. Reference Case

Insights and issues

3

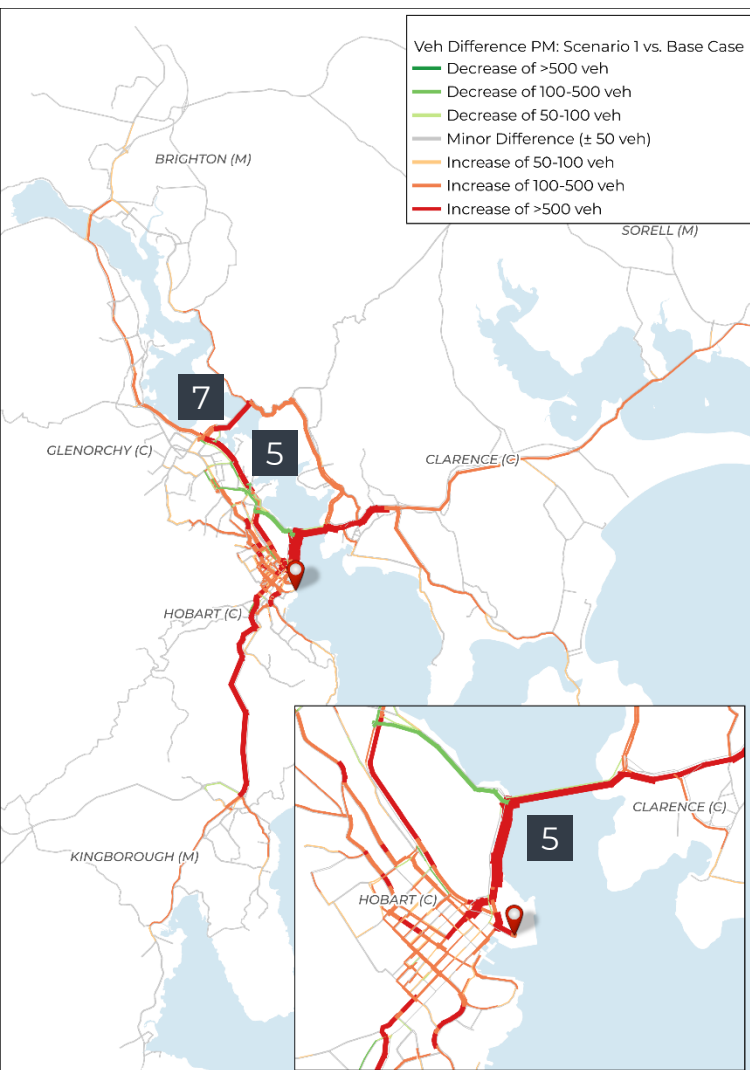
The Base Case land use assumptions adds some additional employment and household residents to the Macquarie Point Precinct compared to the Reference Case. Across the majority of the road network there are minor differences in vehicle volumes in the AM and PM peaks caused by the change in land use assumptions.

4

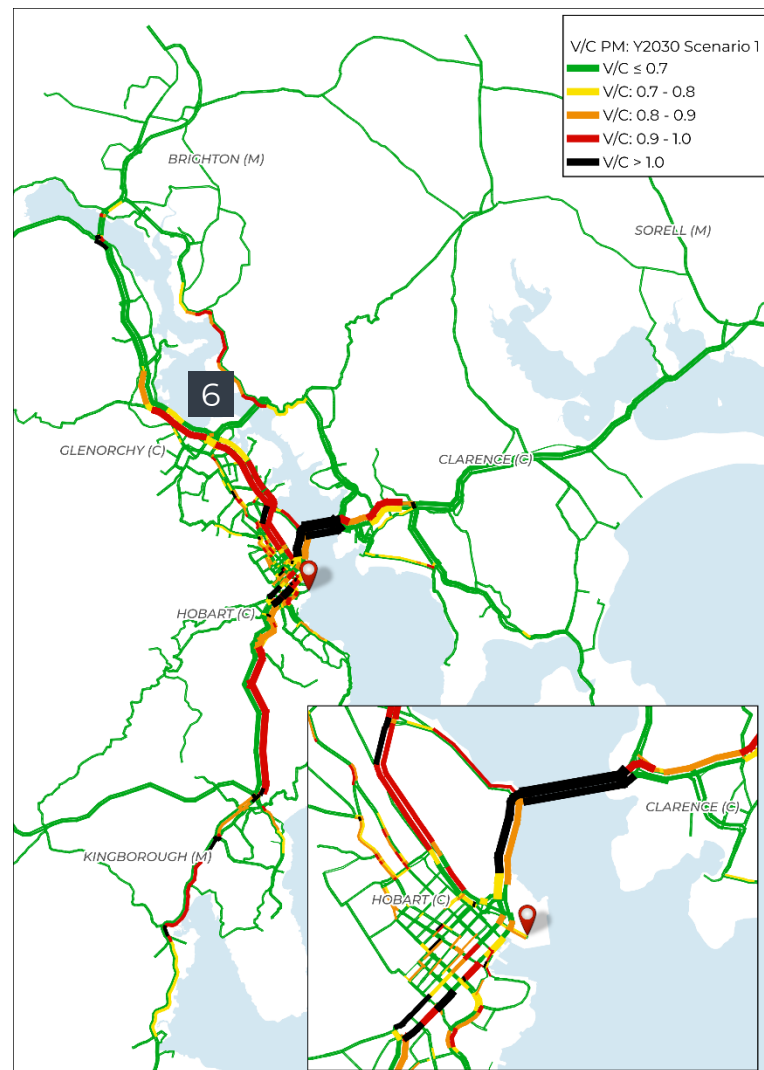
Volume differences are evident across the Macquarie Point and CBD area. The observed differences are not significant and the change in land use assumptions does not greatly impact the typical day travel patterns in Hobart.



1) Seated sell out, 24,500 capacity, 40% private vehicle



Vehicle Volume Difference (PM 2-hr): Scenario 1 vs. Base



2030 PM Scenario 1 V/C

Insights and issues

5

Event demands add inbound traffic volumes on Hobart's key corridors, particularly the Tasman Highway, Brooker Highway and the Southern Outlet.

6

In comparison to the 2030 Base Case AM peak period, the inbound routes are less congested. The Southern Outlet appears to have sufficient capacity to cater for game day demands at 40% private vehicle mode share. In the 2030 Base AM the Brooker Highway also exhibits more congestion up to Rosetta, whilst in this scenario the Brooker Highway becomes constrained at Derwent Park Road.

7

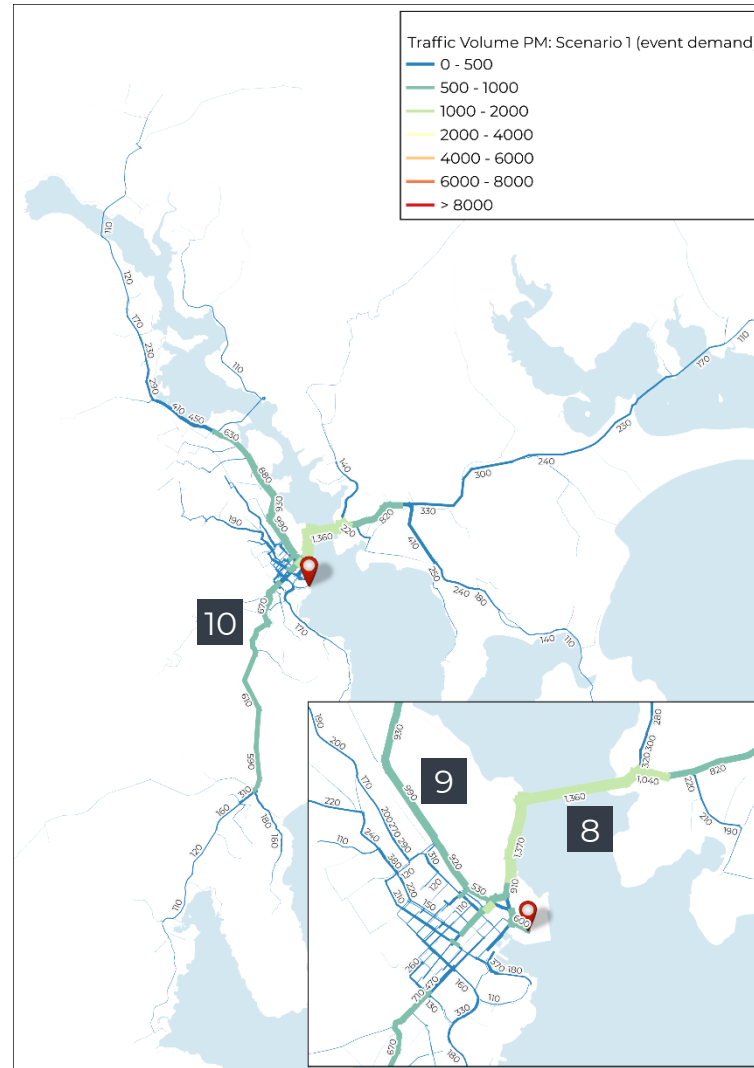
As the Tasman Bridge becomes congested and exceeds capacity, some vehicles travelling from the eastern to northern suburbs divert north to the Bowen Bridge.



1) Seated sell out, 24,500 capacity, 40% private vehicle



Total Vehicle Volume (PM 2-hr): Scenario 1



Event Demand Volume (PM 2-hr): Scenario 1

Insights and issues

8

The Tasman Highway carries over 6,400 vehicles in the inbound direction, with over 1,300 vehicles generated by event demands.

9

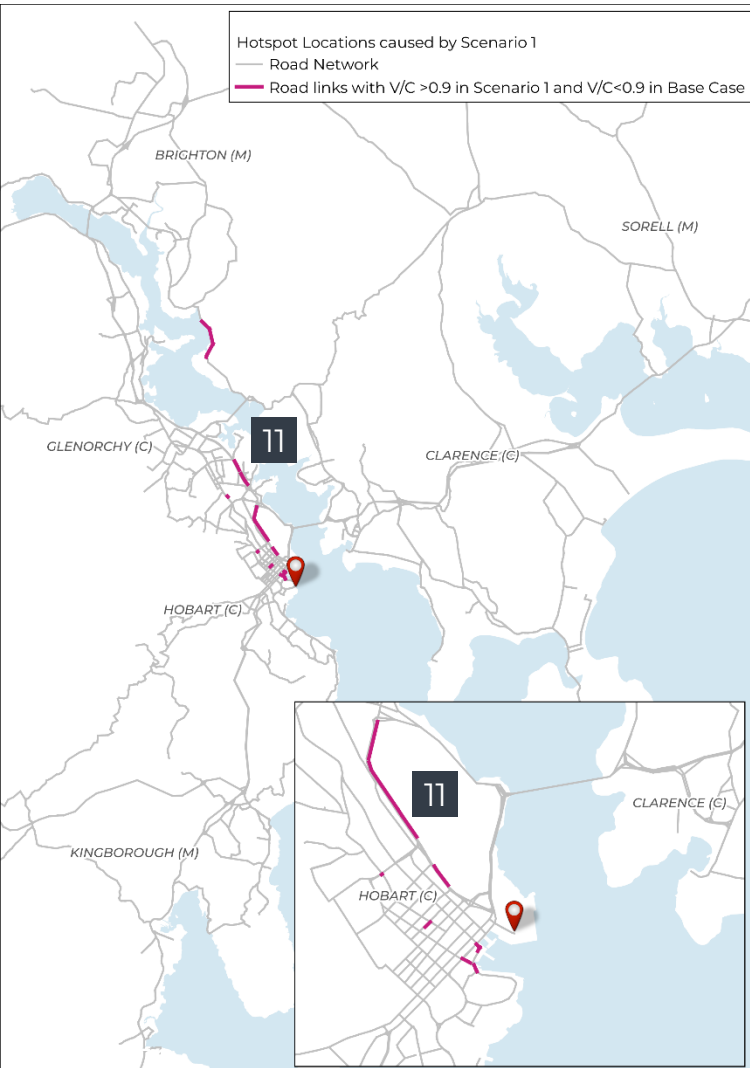
The Brooker Highway carries over 4,200 vehicles in the inbound direction, with over 900 vehicles generated by event demands.

10

The Southern Outlet is expected to carry approximately 4,000 vehicles in the inbound direction, with over 600 vehicles generated by event demands.



1) Seated sell out, 24,500 capacity, 40% private vehicle



Links with $V/C > 0.9$ caused by event demand



Links with $V/C > 1.0$ caused by event demand

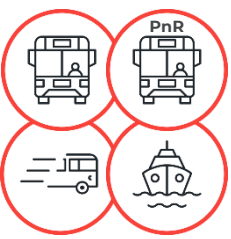
Insights and issues

11

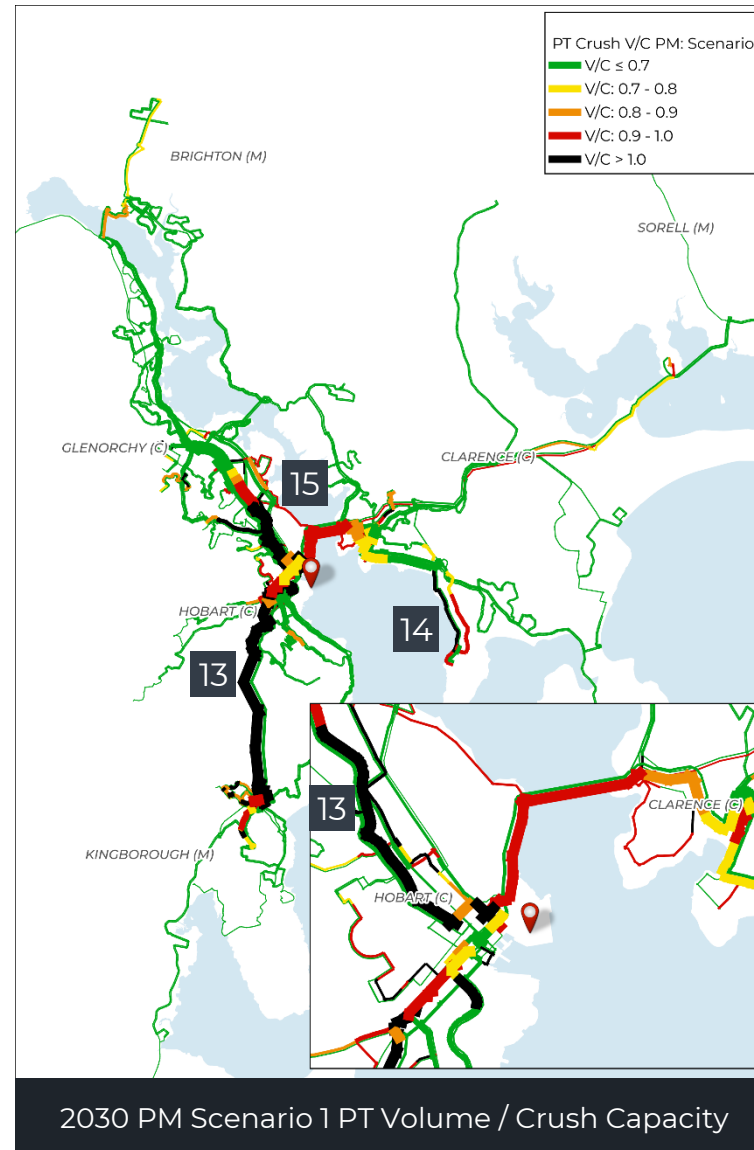
The left plot shows the links where the V/C exceeds 0.9 due to event demands. Notably, the Brooker Highway inbound direction is approaching capacity and exhibits a V/C greater than 0.9 induced by event traffic. It is anticipated that a considerable proportion of event ingress may occur after the typical peak hour of 16:00-17:00 and the congestion impacts from event demands may be lesser than presented.

12

Under Scenario 1 demands, the Tasman Bridge in the inbound direction tips over capacity. Under the Base Case assumptions, the link already exceeds a V/C of 0.9.



1) Seated sell out, 24,500 capacity, 40% private vehicle



Insights and issues

13

Due to a lower number of inbound services in the PM peak, the influx in inbound trips created by event demands causes bus lines operating along New Town Road and the Southern Outlet to exceed capacity ($V/C > 1.0$). This suggests supporting public transport services are required on these corridors.

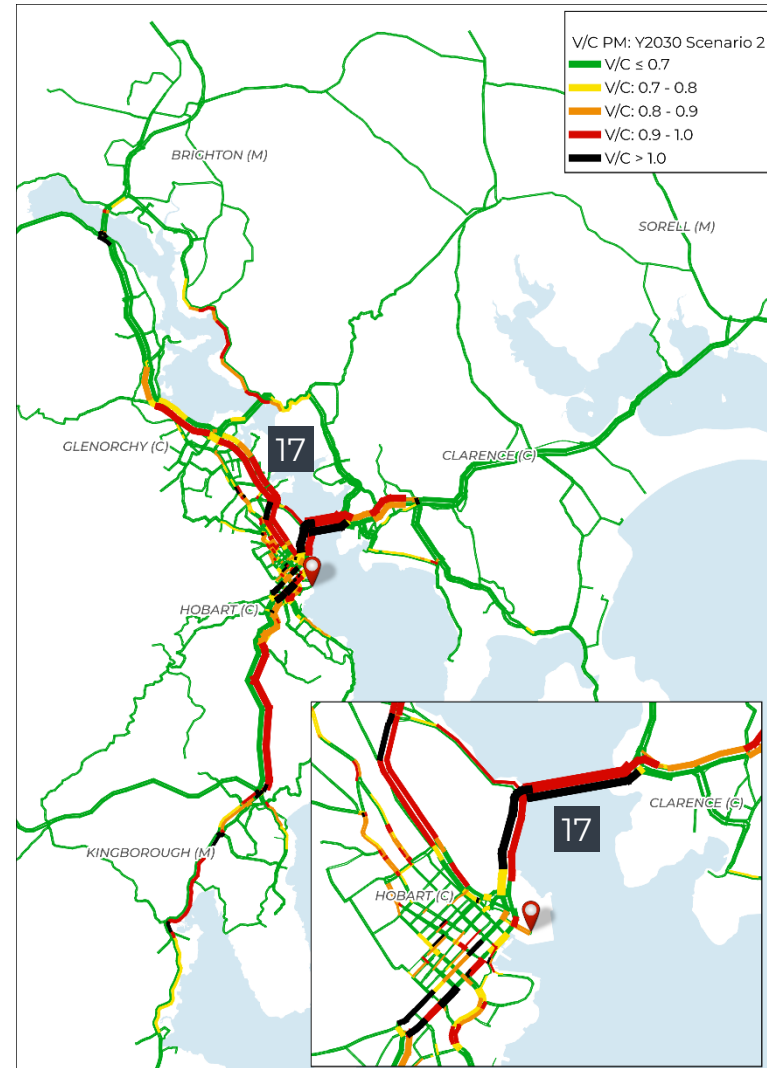
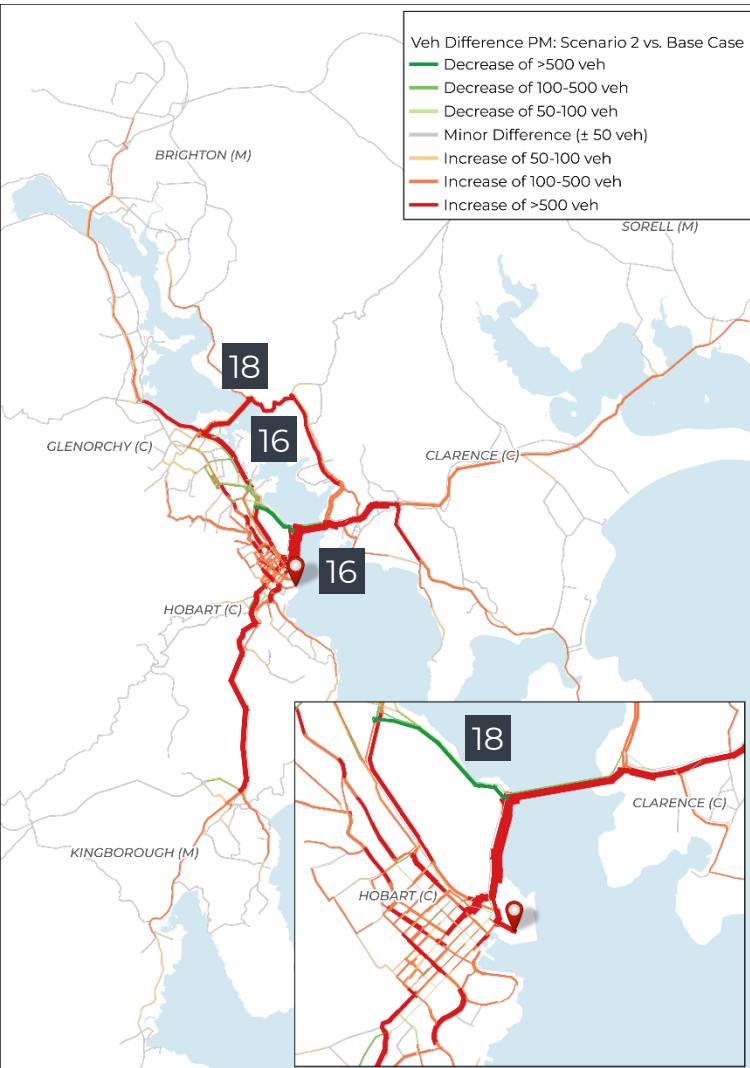
14

Several local services are also observed to be operating over capacity such as in Howrah and Tranmere.

15

Brooker Highway bus services appear to be operating with some excess capacity. However, this corridor is expected to experience congestion during event ingress.

2) Seated sell out, 24,500 capacity, increased private vehicle to 60%



Insights and issues

16 An increase in private vehicle mode share will further increase the traffic volume on the key inbound routes on the Tasman Highway, Brooker Highway and Southern Outlet.

17 The additional traffic is expected to cause the Tasman Highway and Brooker Highway become more congested on approach to the CBD. This is reflected in increases in V/C ratio compared to Scenario 1. A coordinated, multi-agency, travel demand management campaign to encourage public transport trips is critical.

18 As the Tasman Bridge inbound becomes more congested due to increased event demand, crossing the Bowen Bridge becomes the preferred route for vehicles travelling from the eastern to northern suburbs. This is shown by the increase in volumes on the East Derwent Highway and reduction along the Domain Highway.

Vehicle Volume Difference (PM 2-hr): Scenario 2 vs. Base

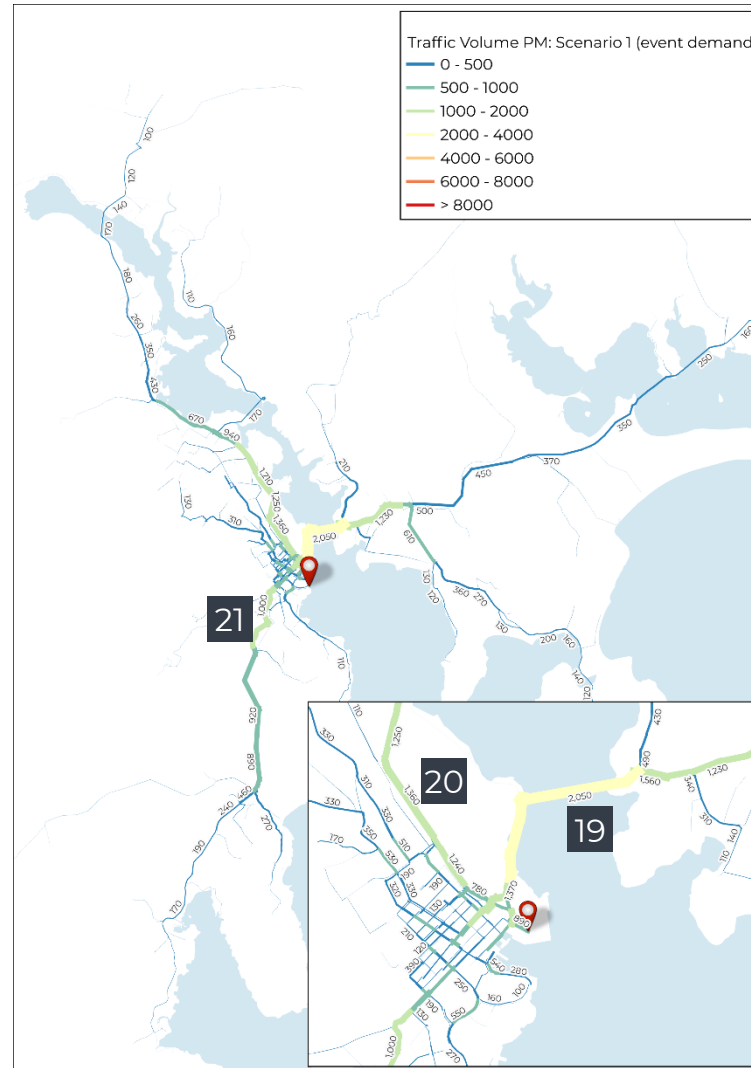
2030 PM Scenario 2 V/C



2) Seated sell out, 24,500 capacity, increased private vehicle to 60%



Total Vehicle Volume (PM 2-hr): Scenario 2



Event Demand Volume (PM 2-hr): Scenario 2

Insights and issues

19

The Tasman Highway carries over 6,900 vehicles in the inbound direction, with over 2,000 vehicles generated by event demands.

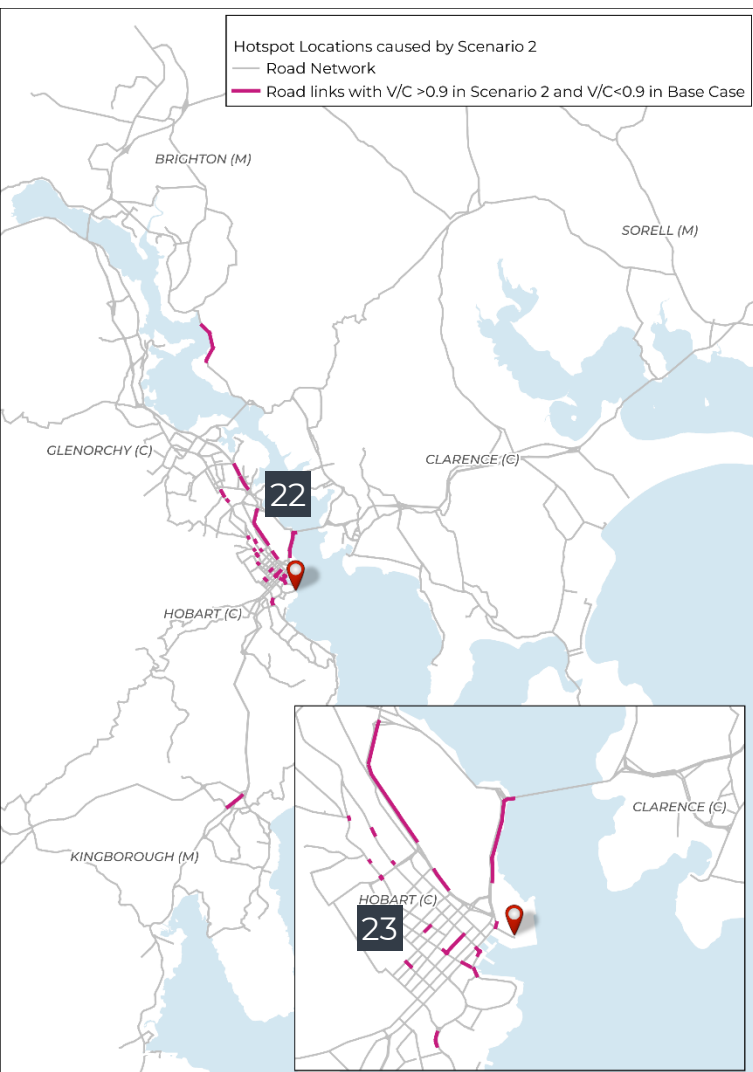
20

The Brooker Highway is expected to carry over 4,300 vehicles in the inbound direction, with over 1,300 vehicles generated by event demands.

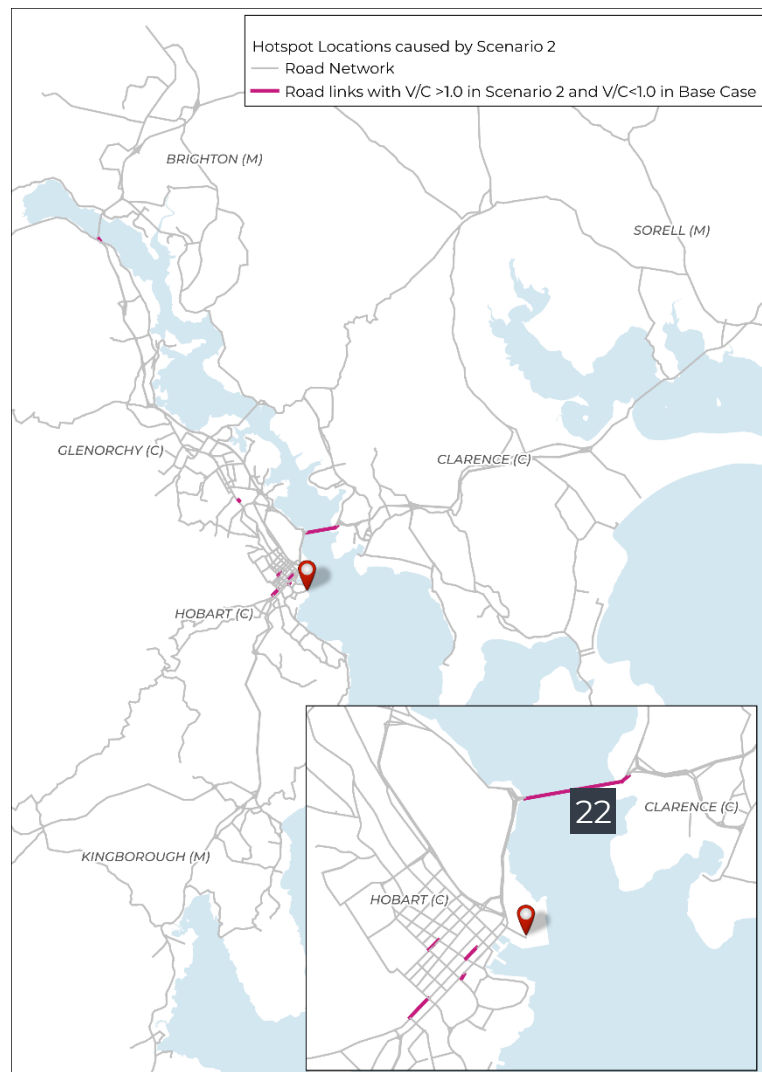
21

The Southern Outlet is expected to carry over 4,100 vehicles in the inbound direction, with approximately 1,000 vehicles generated by event demands.

2) Seated sell out, 24,500 capacity, increased private vehicle to 60%



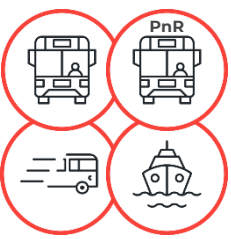
Links with V/C > 0.9 caused by event demand



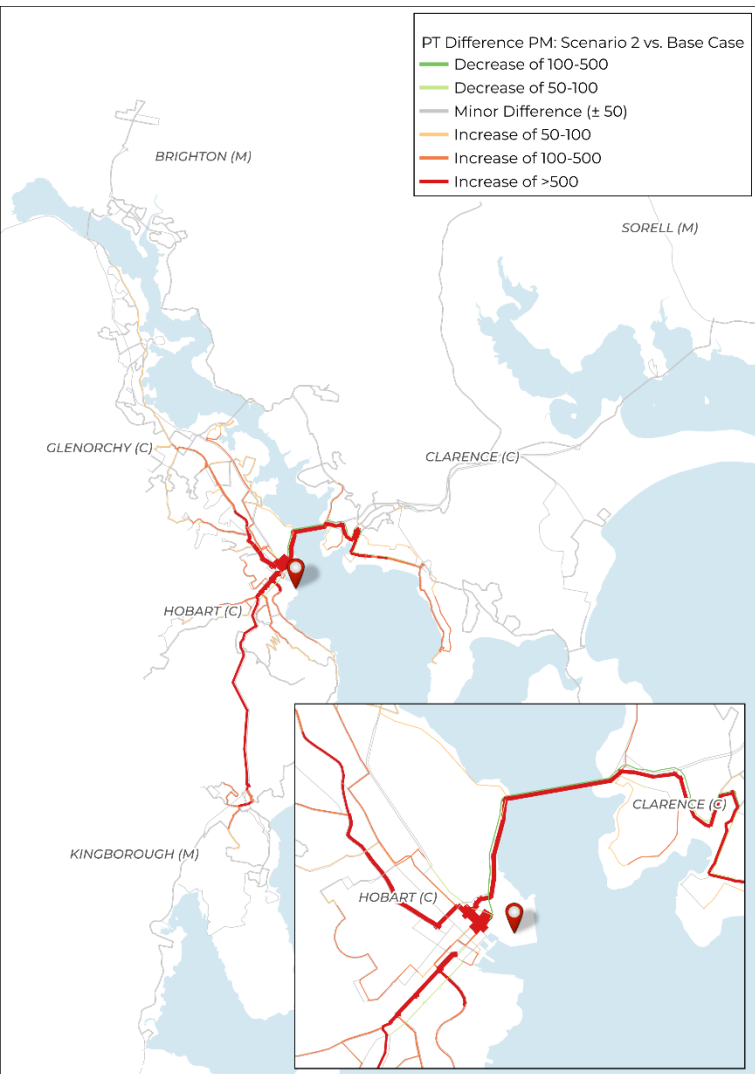
Links with V/C > 1.0 caused by event demand

Insights and issues

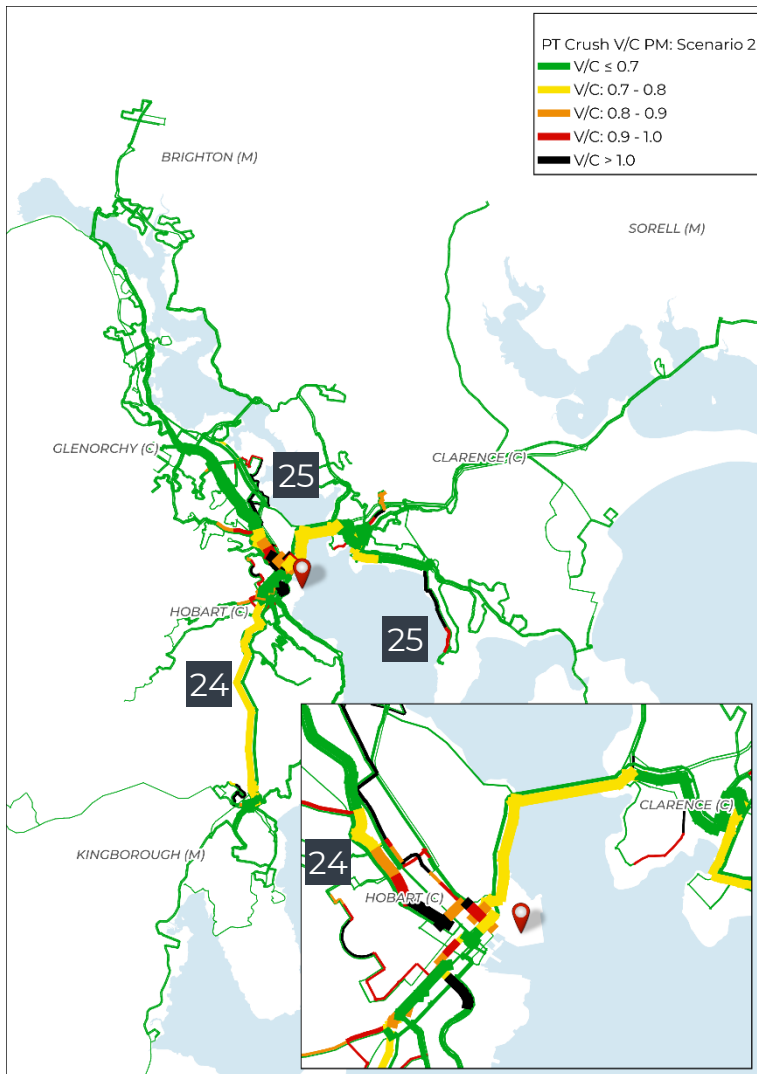
- 22 Event demand driven hotspots are observed in the inner city, particularly on the Tasman Highway and Brooker Highway corridors.
- 23 The increased car demand into the CBD and surroundings results in a number of streets in the inner city with a V/C exceeding 0.9 when compared to Scenario 1.



2) Seated sell out, 24,500 capacity, increased private vehicle to 60%



PT Volume Difference (PM 2-hr): Scenario 2 vs. Base



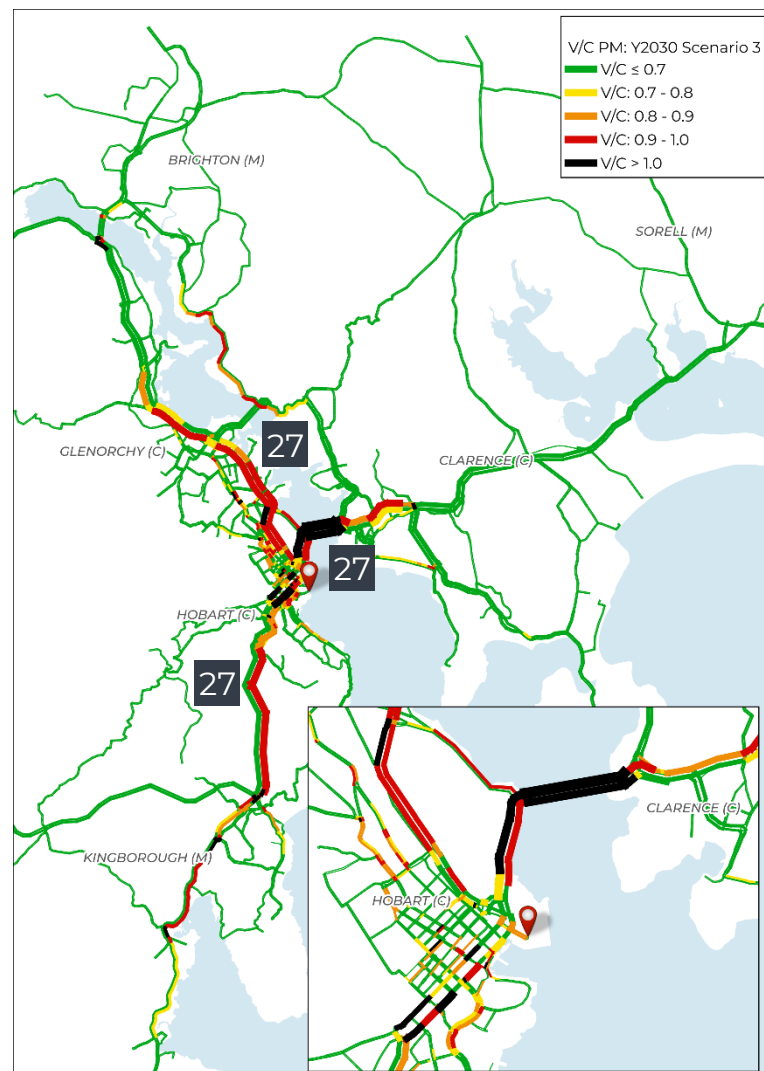
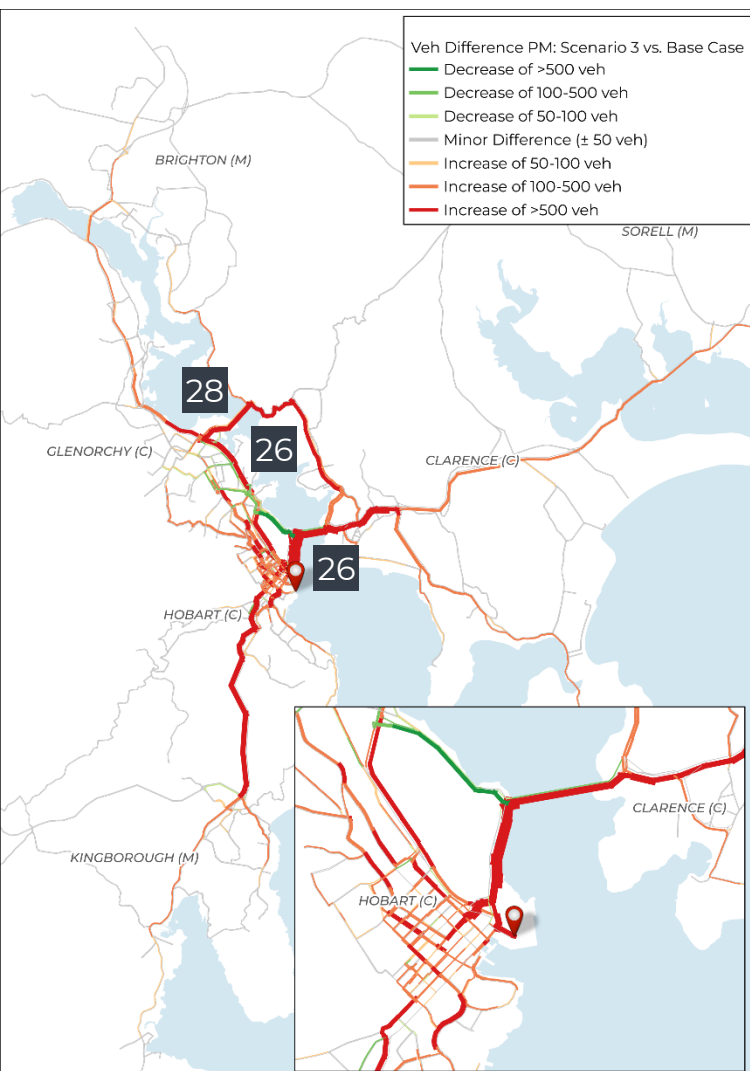
2030 PM Scenario 2 PT Volume / Crush Capacity

Insights and issues

- 24 The higher private vehicle mode share in this scenario results in lower public transport patronage. As a result, the over-capacity public transport corridors of New Town Road and the Southern Outlet corridors operate within capacity. However, the public transport V/C on Elizabeth Street on approach to the CBD remains greater than 1.
- 25 Some services on local bus corridors remain constrained under the lower public transport event demands.



3) Concert sell out, 31,500 capacity, 40% private vehicle



Insights and issues

26

The increased capacity results in more vehicles on the road. This adds to the traffic volumes on the already constrained corridors of the Tasman Highway and Brooker Highway.

27

Despite this, the expected level of congestion on inbound routes is expected to be less than the Base Case AM peak period. The resultant V/C ratios on the Brooker Highway, Tasman Highway and Southern Outlet are all lower than the respective inbound routes in the AM Base Case.

28

As the Tasman Bridge becomes congested and exceeds capacity, vehicles travelling from the eastern to northern suburbs divert north to the Bowen Bridge.

Vehicle Volume Difference (PM 2-hr): Scenario 3 vs. Base

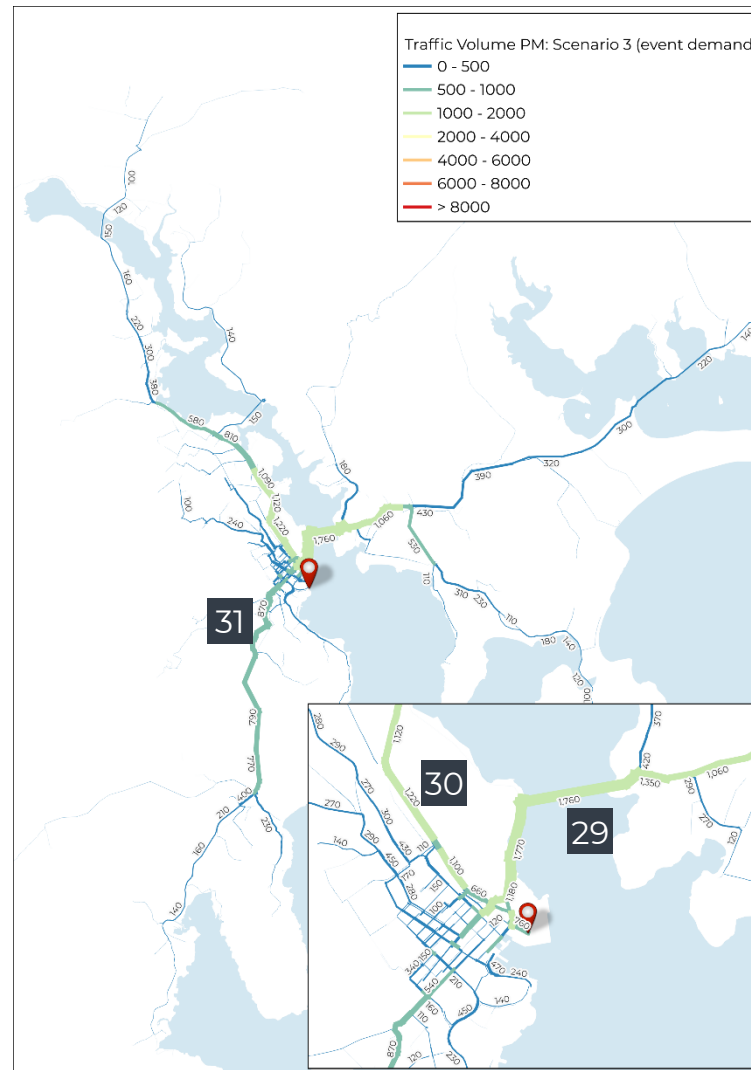
2030 PM Scenario 3 V/C



3) Concert sell out, 31,500 capacity, 40% private vehicle



Total Vehicle Volume (PM 2-hr): Scenario 3



Event Demand Volume (PM 2-hr): Scenario 3

Insights and issues

29

The Tasman Highway carries over 6,700 vehicles in the inbound direction, with over 1,700 vehicles generated by event demands.

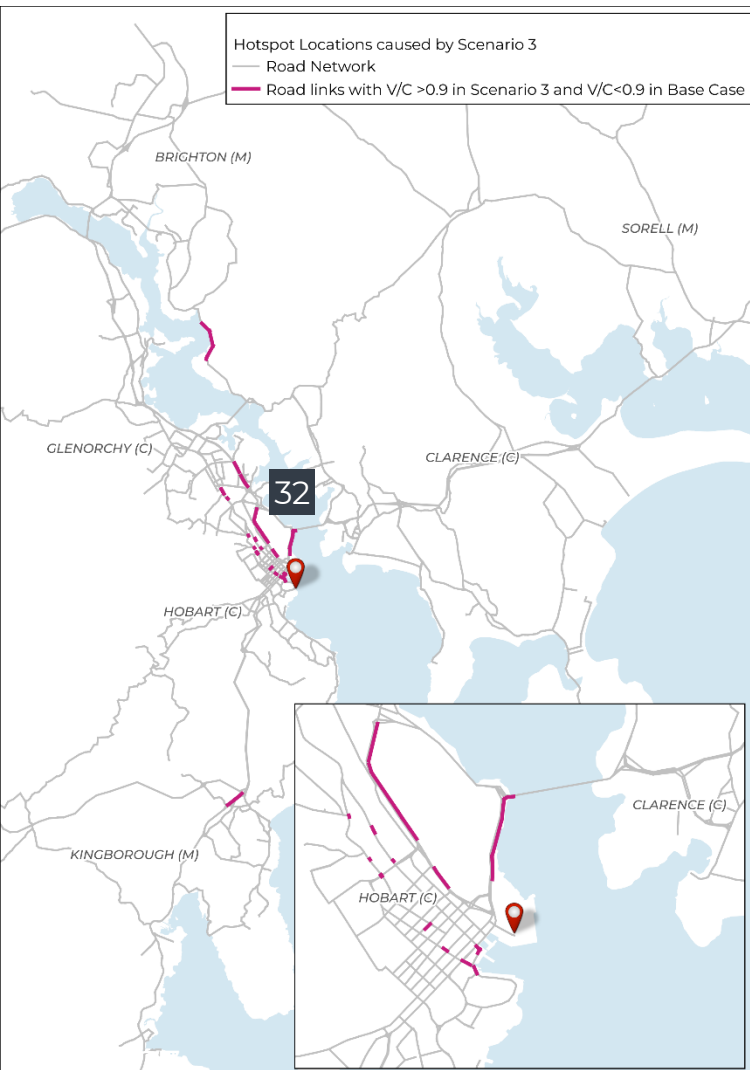
30

The Brooker Highway is expected to carry over 4,300 vehicles in the inbound direction, with over 1,200 vehicles generated by event demands.

31

The Southern Outlet is expected to carry over 4,100 vehicles in the inbound direction, with over 800 vehicles generated by event demands.

3) Concert sell out, 31,500 capacity, 40% private vehicle



Links with $V/C > 0.9$ caused by event demand



Links with $V/C > 1.0$ caused by event demand

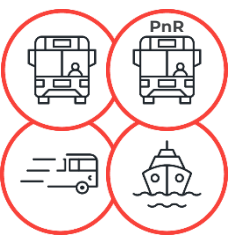
Insights and issues

32

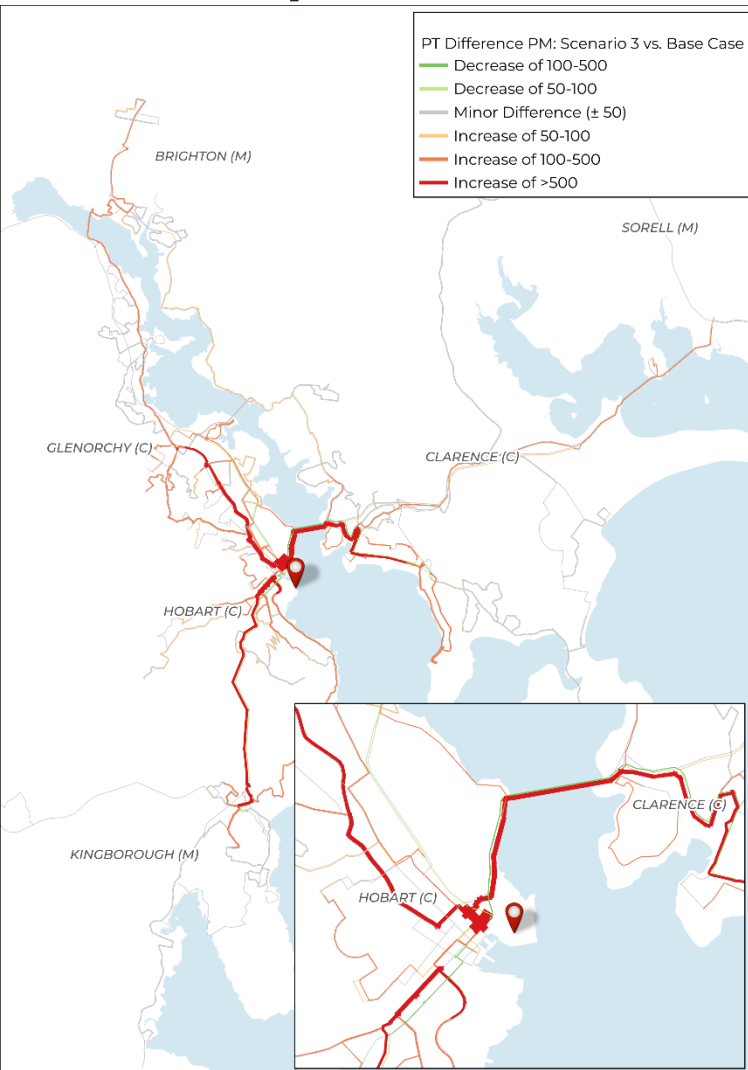
The Tasman Highway and Brooker Highway are the two main corridors that exhibit congestion induced by event demand.

33

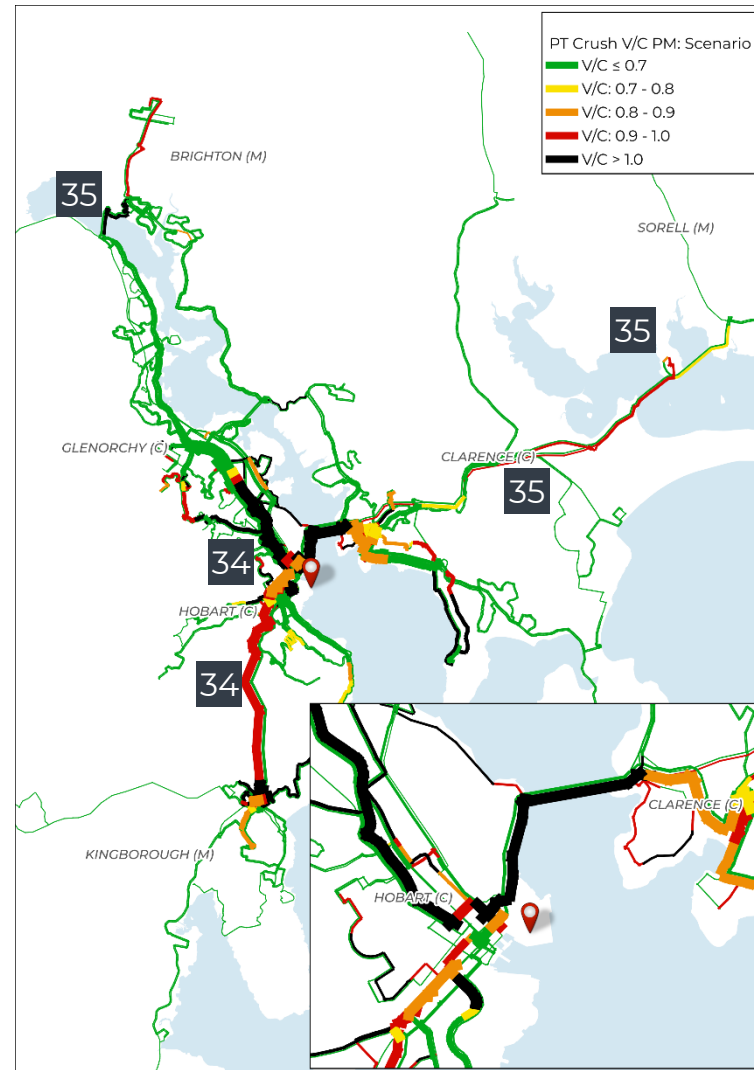
Sections of Macquarie Street exceed capacity ($V/C > 1.0$) due to event traffic. Under the Base Case assumptions these sections already exceed a V/C of 0.9.



3) Concert sell out, 31,500 capacity, 40% private vehicle



PT Volume Difference (PM 2-hr): Scenario 3 vs. Base



2030 PM Scenario 3 PT Volume / Crush Capacity

Insights and issues

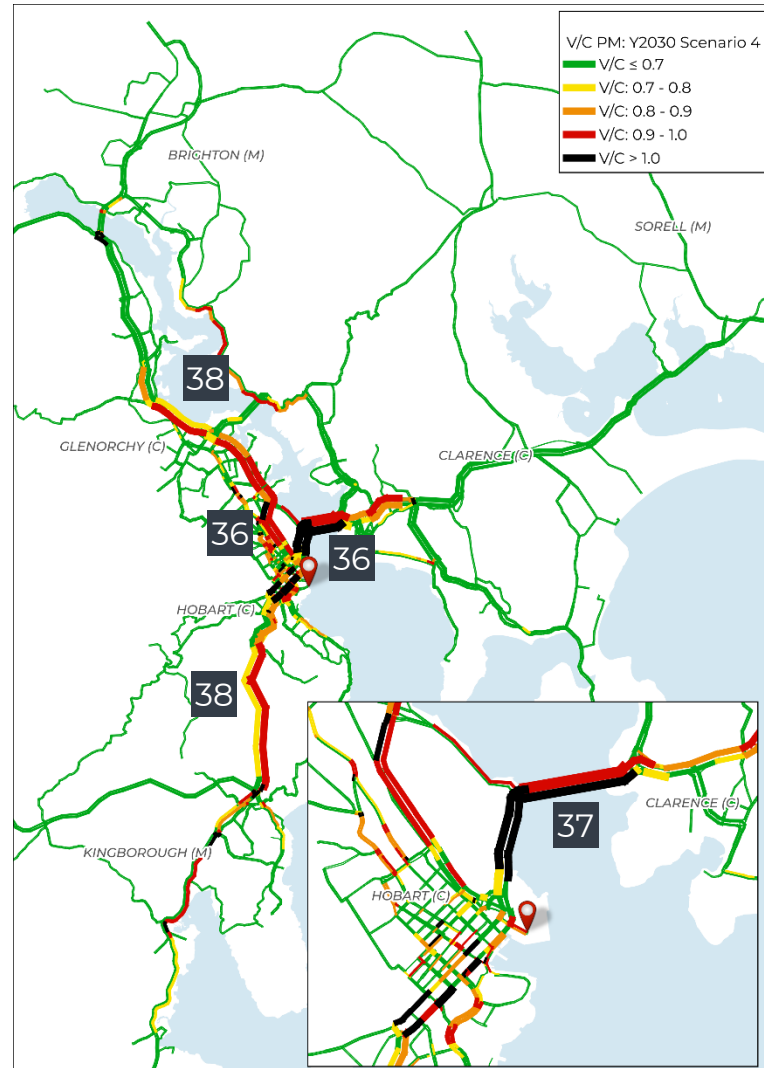
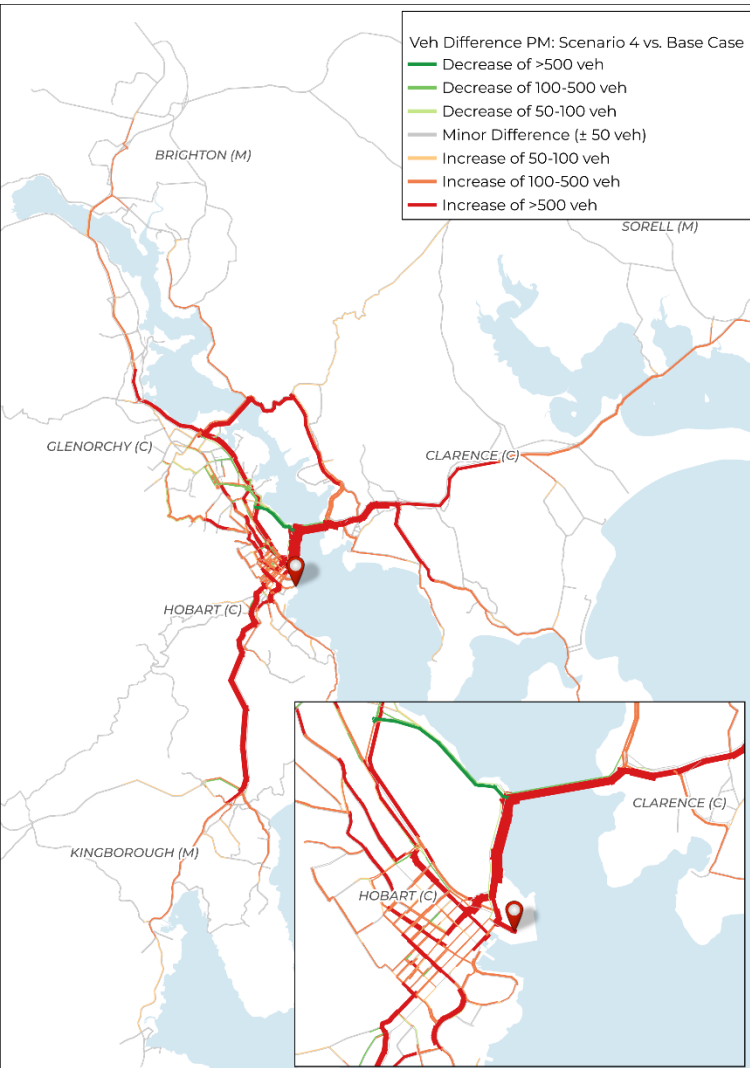
34

Similar to Scenario 1, concert demand creates overcrowding on routes along New Town Road and the Southern Outlet.

35

The higher event capacity and demand results in some outer suburb services to exceed capacity, including services in Brighton, Midway Point and Cambridge.

4) Concert sell out, 31,500 capacity, increased private vehicle to 60%



Insights and issues

- 36 The higher private vehicle mode share results in higher volumes on the key links, particularly the Tasman Highway and Brooker Highway. Some inner-city routes such as New Town Road and Argyle Street are close to exceeding capacity.
- 37 Increased numbers of private vehicles result in the Tasman Highway exceeding capacity west of the Tasman Bridge.
- 38 Despite the increased private vehicle mode share, the resultant V/C ratios on the Brooker Highway and Southern Outlet inbound direction are lower than in the Base Case AM peak.

Vehicle Volume Difference (PM 2-hr): Scenario 4 vs. Base

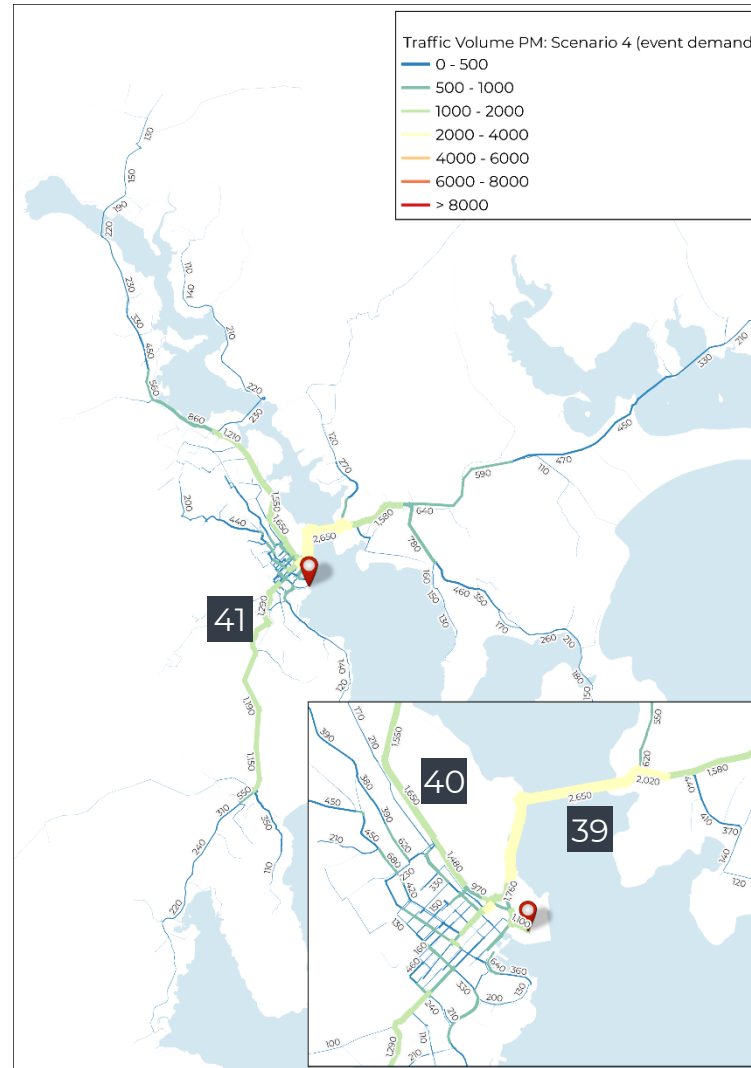
2030 PM Scenario 4 V/C



4) Concert sell out, 31,500 capacity, increased private vehicle to 60%



Total Vehicle Volume (PM 2-hr): Scenario 4



Event Demand Volume (PM 2-hr): Scenario 4

Insights and issues

39

The Tasman Highway carries over 7,400 vehicles in the inbound direction, with over 2,600 vehicles generated by event demands.

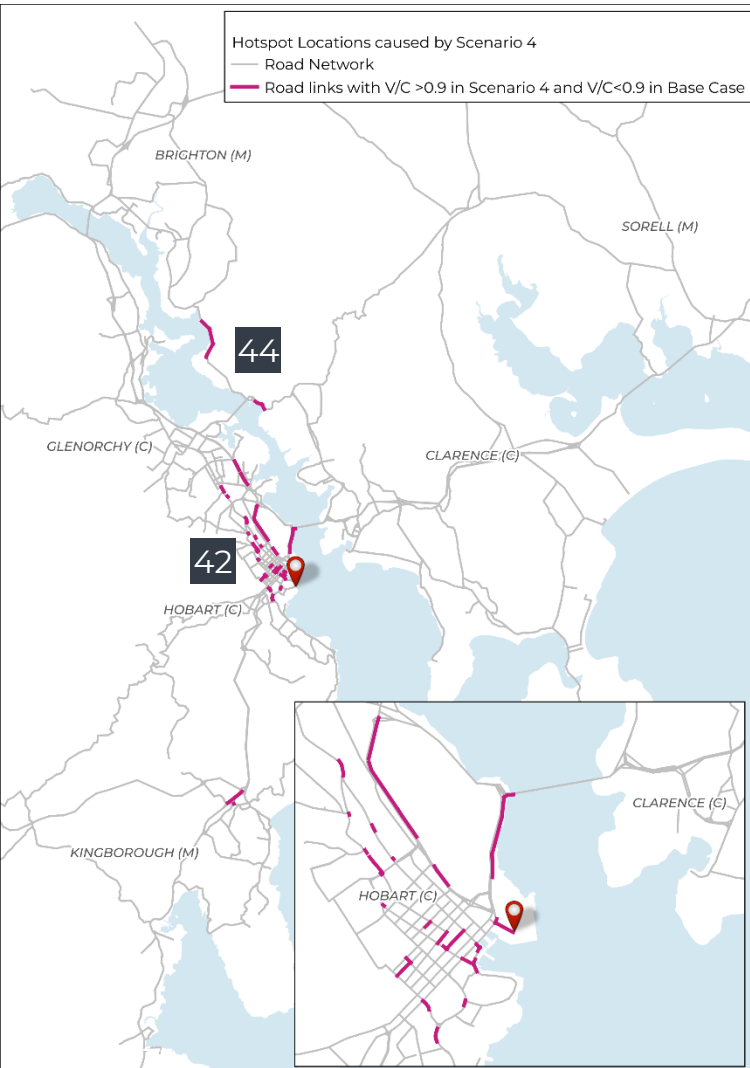
40

The Brooker Highway is expected to carry over 4,400 vehicles in the inbound direction, with over 1,600 vehicles generated by event demands.

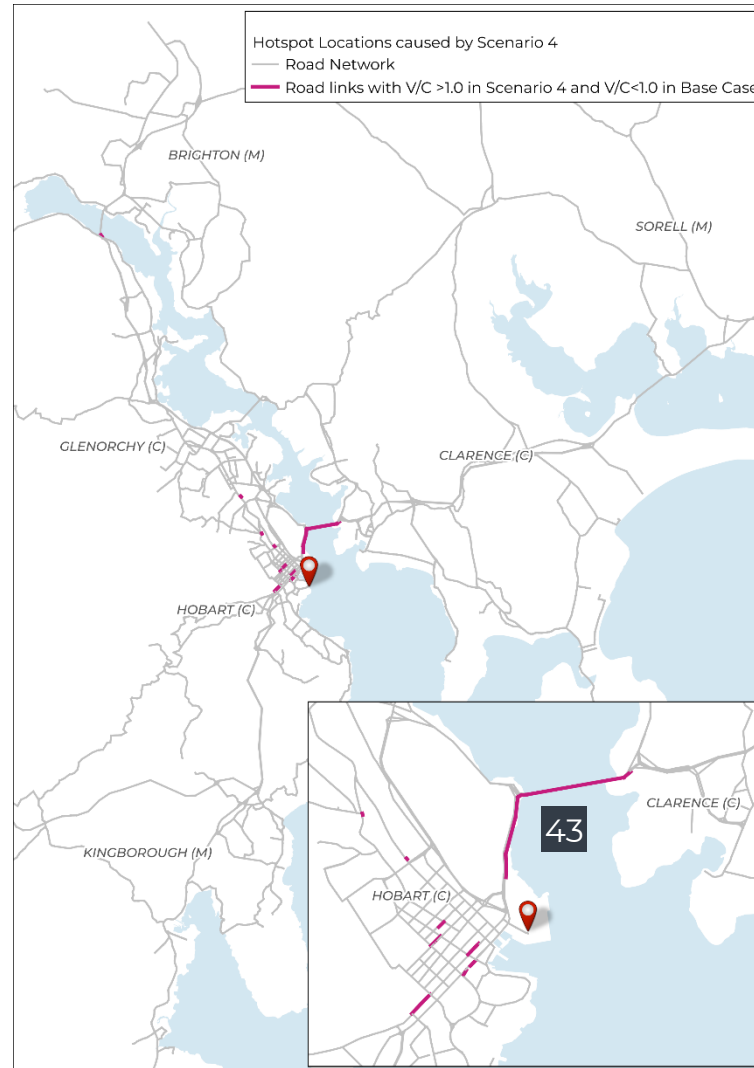
41

The Southern Outlet is expected to carry over 4,500 vehicles in the inbound direction, with over 1,200 vehicles generated by event demands.

4) Concert sell out, 31,500 capacity, increased private vehicle to 60%



Links with $V/C > 0.9$ caused by event demand



Links with $V/C > 1.0$ caused by event demand

Insights and issues

42

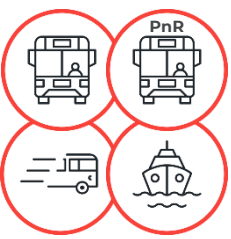
Under Scenario 4 demands, the Brooker Highway and inner northern streets exhibit some congestion.

43

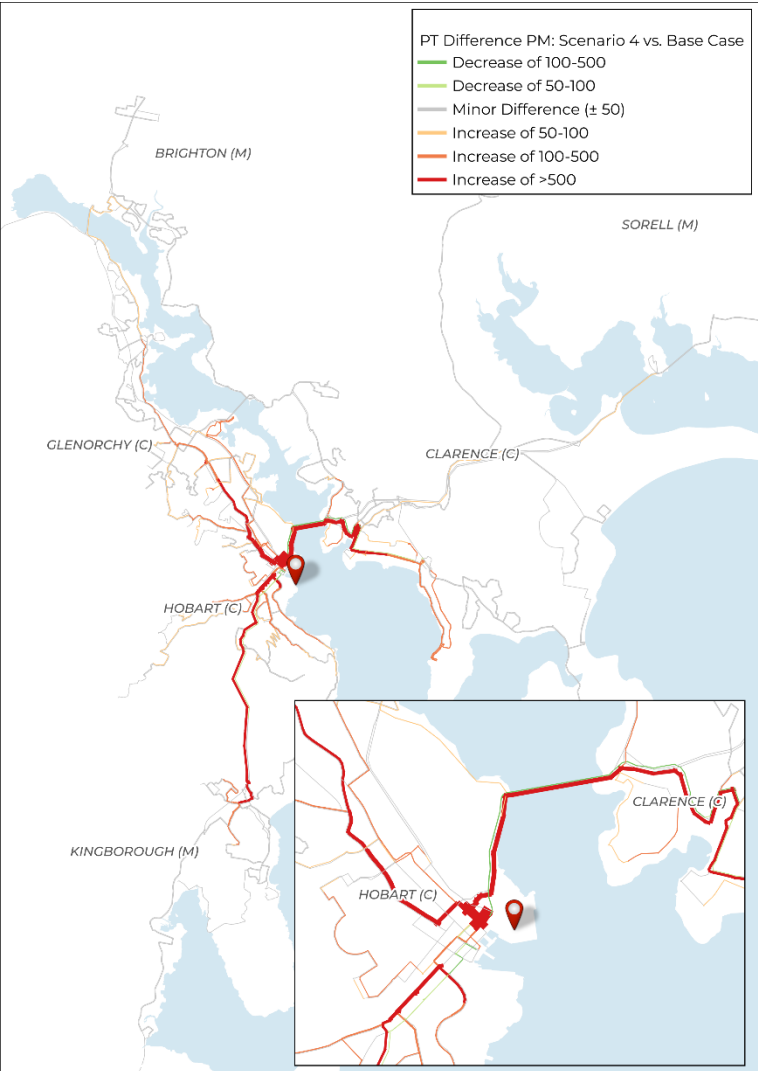
Event demands cause the Tasman Highway west of the Tasman Bridge to exceed capacity ($V/C > 1.0$).

44

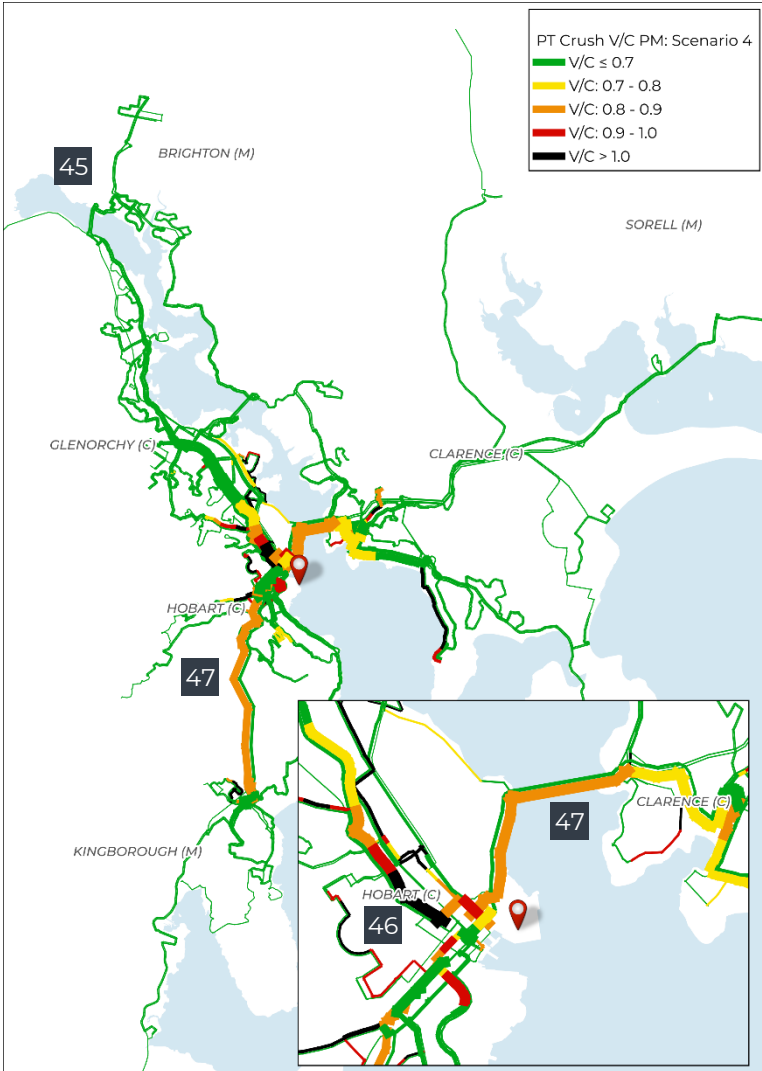
Some links in the north-east become congested as a result of vehicles rerouting to avoid event driven traffic in central Hobart.



4) Concert sell out, 31,500 capacity, increased private vehicle to 60%



PT Volume Difference (PM 2-hr): Scenario 4 vs. Base



2030 PM Scenario 4 PT Volume / Crush Capacity

Insights and issues

- 45 With the lower public transport mode share, bus services in outer Hobart, such as Brighton, no longer exceed capacity.
- 46 Within the inner city, the bus corridor on Elizabeth Street is still expected to exceed crush capacity approaching the CBD.
- 47 Bus services along the Southern Outlet and Tasman Highway may have some excess capacity with the lower PT demands in this scenario.

Travel times

A travel time comparison has been conducted across Hobart's key corridors to Macquarie Point (see Figure 6). The modelled travel times on these routes for the 2030 Base Case and event demand scenarios are shown in Table 1.

Travel times under the event demands are predicted to be lower than the AM period across all routes and scenarios except for the Tasman Highway route in Scenario 4.

The Tasman Highway is the most susceptible to changes in travel time due to the increasing traffic volumes. The Tasman Highway is operating at near capacity in the 2030 PM Base Case and additional traffic caused by event demand causes it to become congested and exceed capacity.

Table 1: Modelled travel time (minutes)

Travel time route	2030 AM Base Case	2030 PM Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Tasman Highway – Rosny Hill Road to Brooker Avenue	11.00	4.15	7.02	10.14	8.48	13.93
Southern Outlet / Macquarie Street – Olinda Grove to Brooker Avenue	14.13	8.34	9.94	10.73	10.33	11.40
Brooker Highway – Elwick Road to Davey Street	15.35	9.24	11.30	12.29	11.91	13.18

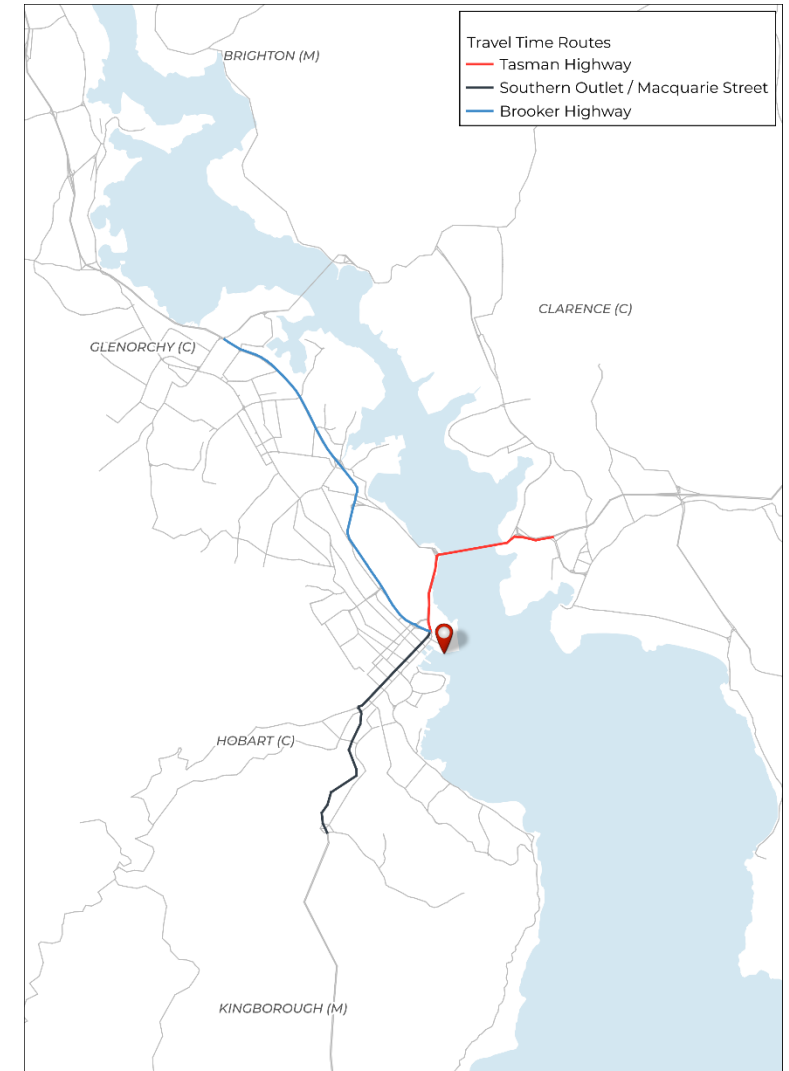


Figure 6: Travel time routes

Additional network tests

In addition to the presented 2030 Base Case and event demand scenarios, additional network tests have been undertaken to understand the traffic impact from an increase in maximum stadium capacity and to understand traffic volumes during the operating life of the stadium.

The following two additional scenarios have been conducted:

- 2030 40,000 capacity stadium
- 2050 24,500 capacity stadium
 - 2050 has been selected as it is the latest standard reference case forecast year in the GHUTDM. The operating life of the stadium is expected to exceed 2050.

Assumptions

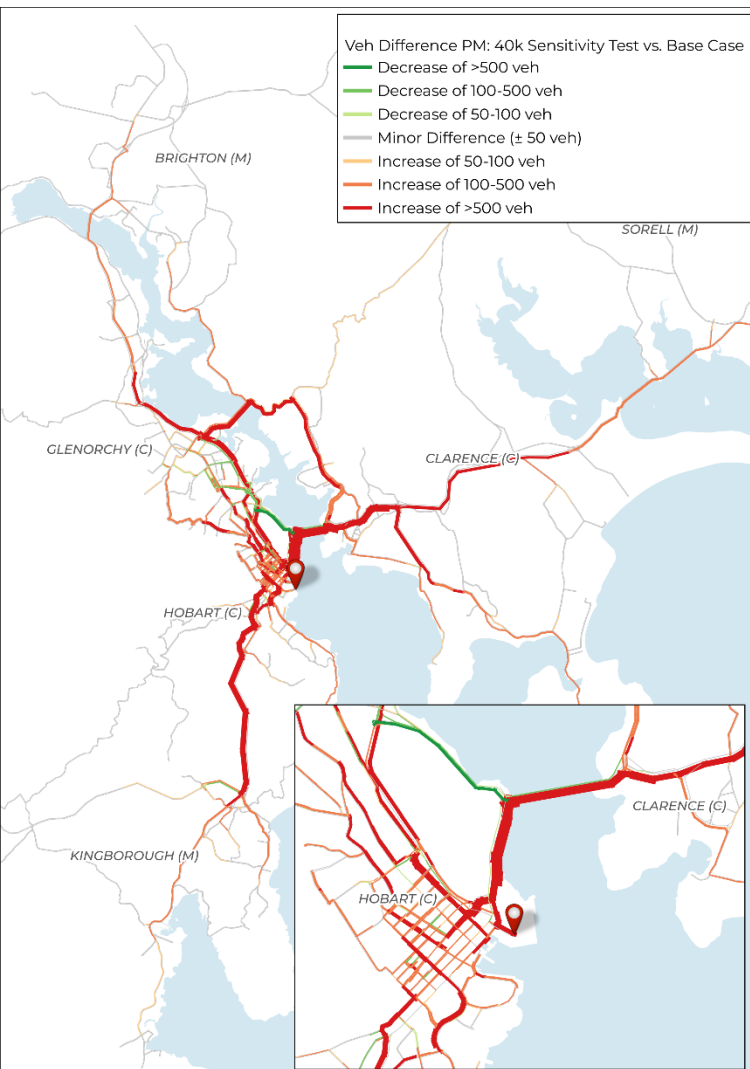
For the 40,000 capacity scenario, event demand PT trips have been capped at the 31,500 capacity, 60% non-car mode share level. PT outputs for this scenario have not been reported and are represented by Scenario 3 PT results.

2050 land use assumptions for the Macquarie Point zone have been derived by applying the growth proportion between the 2050 and 2030 MetroPlan Reference Case scenarios for population and employment onto the 2030 Base Case assumptions.

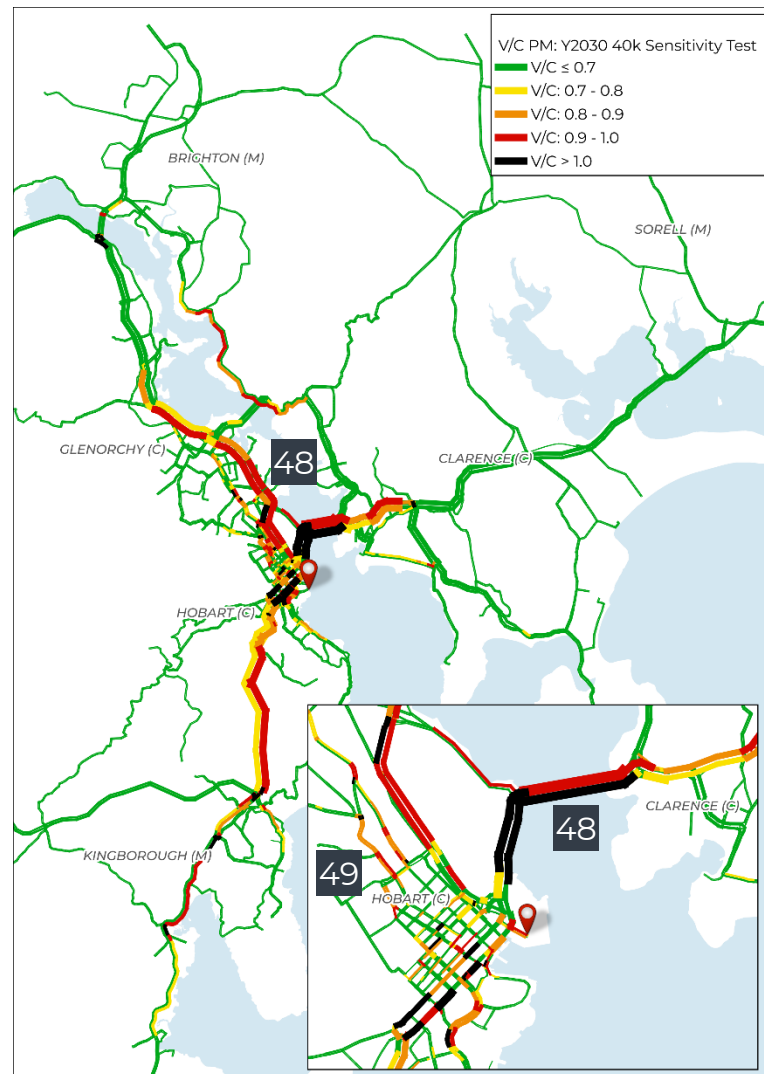
The volume difference between the 2050 24,500 capacity stadium test and 2030 Scenario 1 represents the changes in typical traffic demands over time around the stadium. As observed in the 2030 event modelling, the background traffic does not drastically change across different stadium capacity assumptions. This test reflects the differences in typical traffic demands expected across all event capacity scenarios.



2030 40,000 capacity stadium



Vehicle Volume Difference (PM 2-hr): 40,000 capacity sensitivity test vs. Base



2030 PM 40,000 capacity sensitivity test V/C

Insights and issues

48

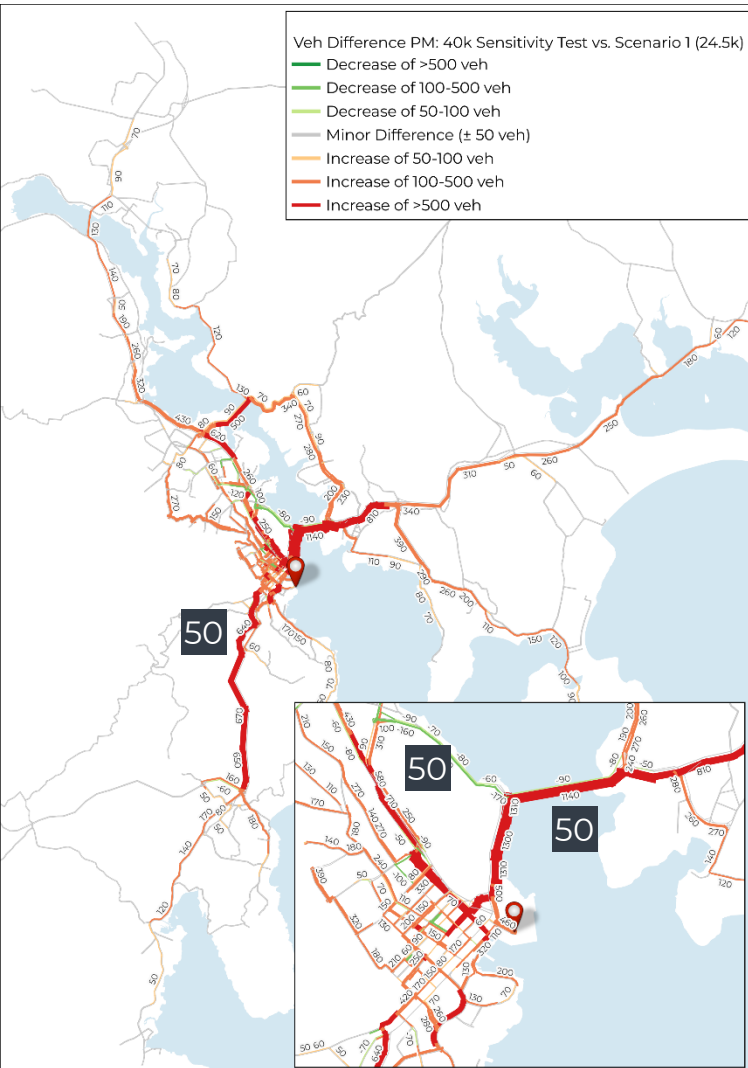
The increased stadium capacity results in higher volumes on the key links, particularly the Tasman Highway and Brooker Highway. In the inbound direction the Tasman Highway is expected to exceed capacity west of the Tasman Bridge and the Brooker Highway is at capacity from Derwent Park Road into the city centre.

49

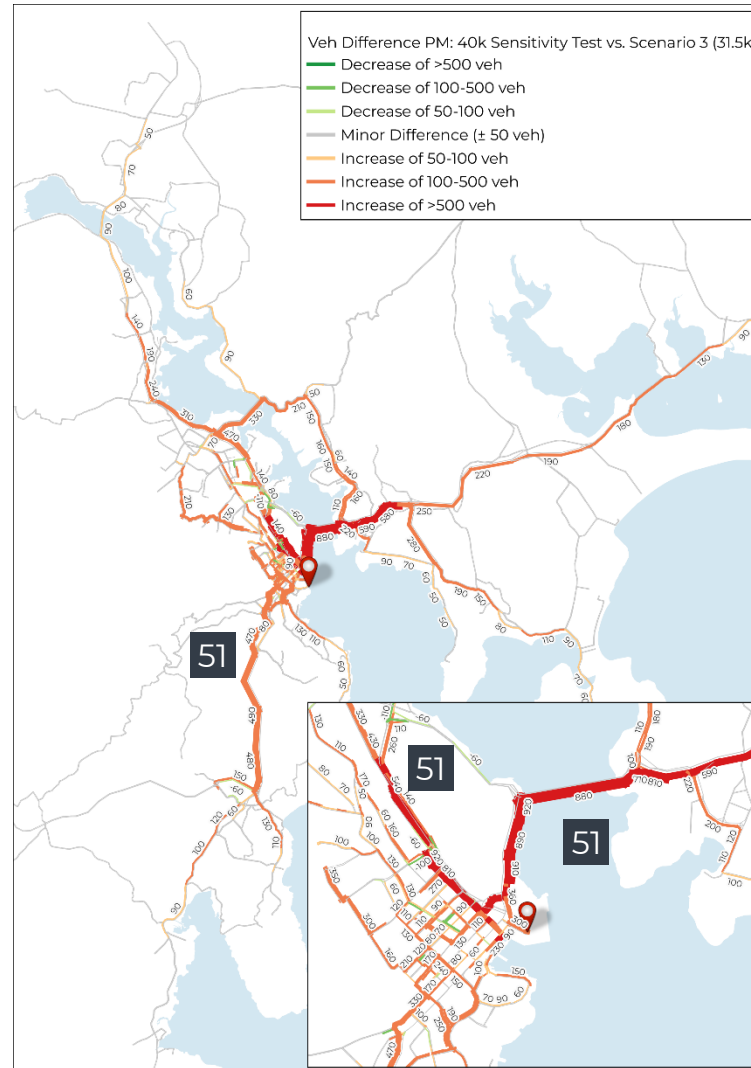
Routes into the CBD from the northern suburbs, including Elizabeth Street and Argyle Street, as well as Sandy Bay Road from the south are approaching capacity under the higher stadium demands.



2030 40,000 capacity stadium



Vehicle Volume Difference (PM 2-hr): 40k capacity vs. Scenario 1 (24.5k capacity)



Vehicle Volume Difference (PM 2-hr): 40k capacity vs. Scenario 3 (31.5k capacity)

Insights and issues

50

Comparing against the 24,500 stadium capacity in Scenario 1, the Tasman Bridge, Brooker Highway and Southern Outlet are expected to carry over 1,100, 700 and 600 vehicles, respectively.

51

Comparing against the 31,500 stadium capacity in Scenario 3, the Tasman Bridge, Brooker Highway and Southern Outlet are expected to carry over 800, 500 and 400 vehicles, respectively.

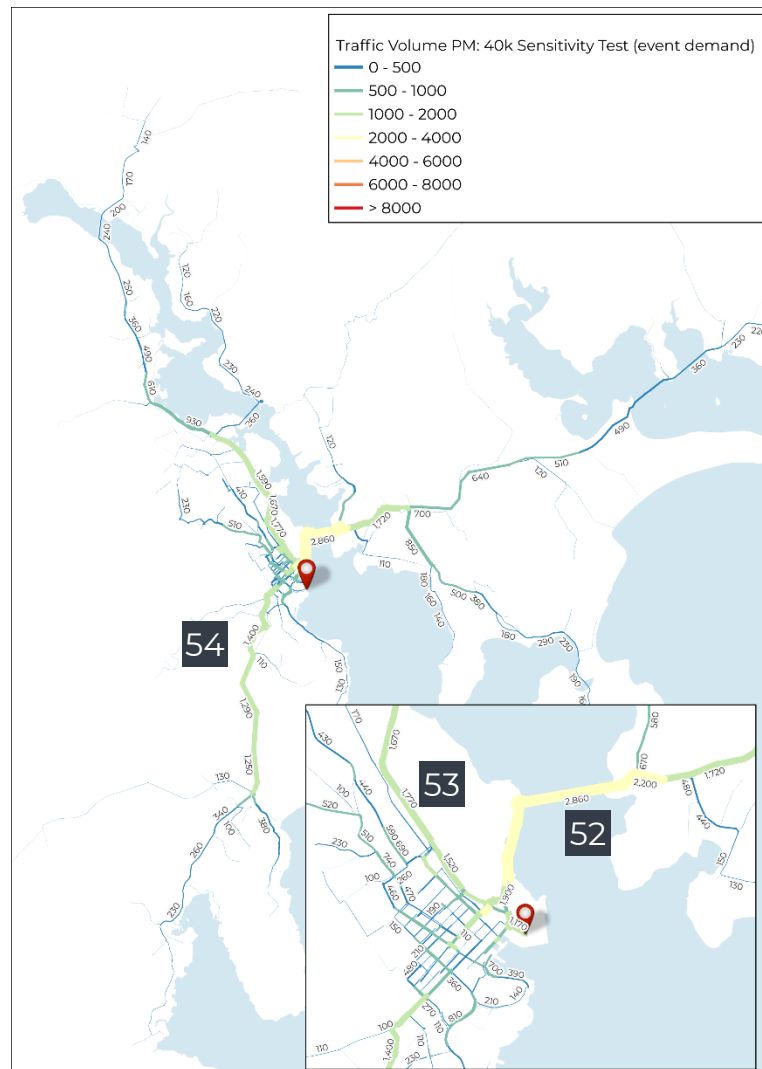


2030 40,000 capacity stadium



57

Total Vehicle Volume (PM 2-hr): 40,000 capacity



Event Demand Volume (PM 2-hr): 40,000 capacity

Insights and issues

52

The Tasman Highway is carries over 7,600 vehicles in the inbound direction, with over 2,800 vehicles generated by event demands.

53

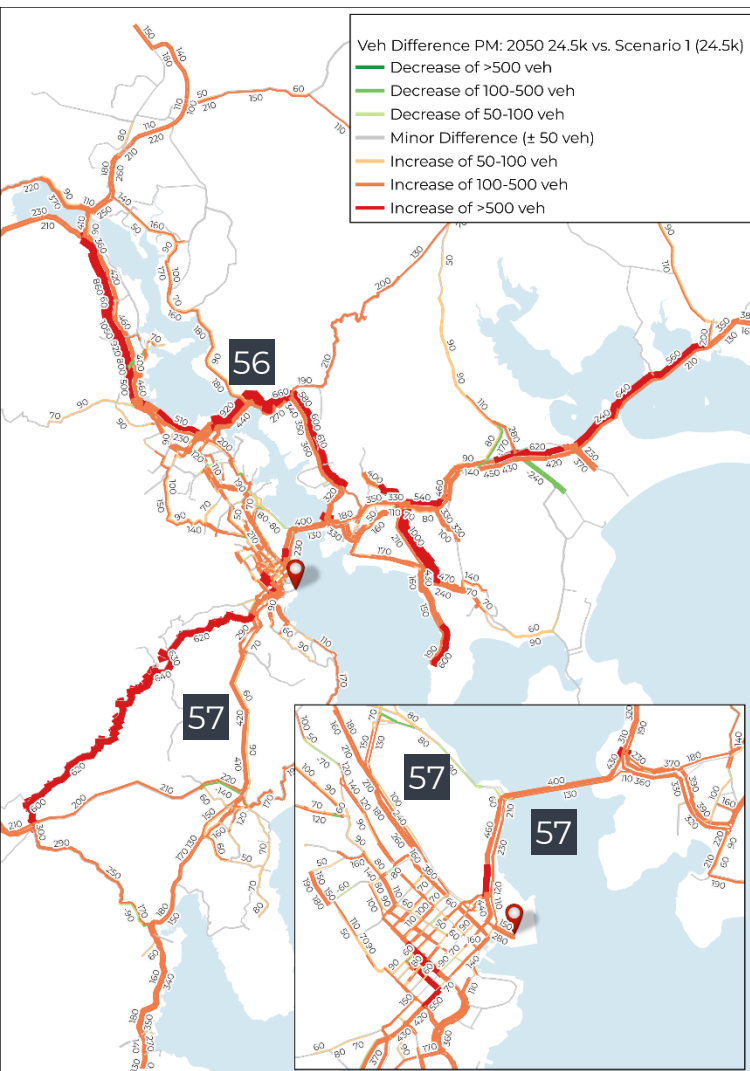
The Brooker Highway is expected to carry over 4,500 vehicles in the inbound direction, with over 1,700 vehicles generated by event demands.

54

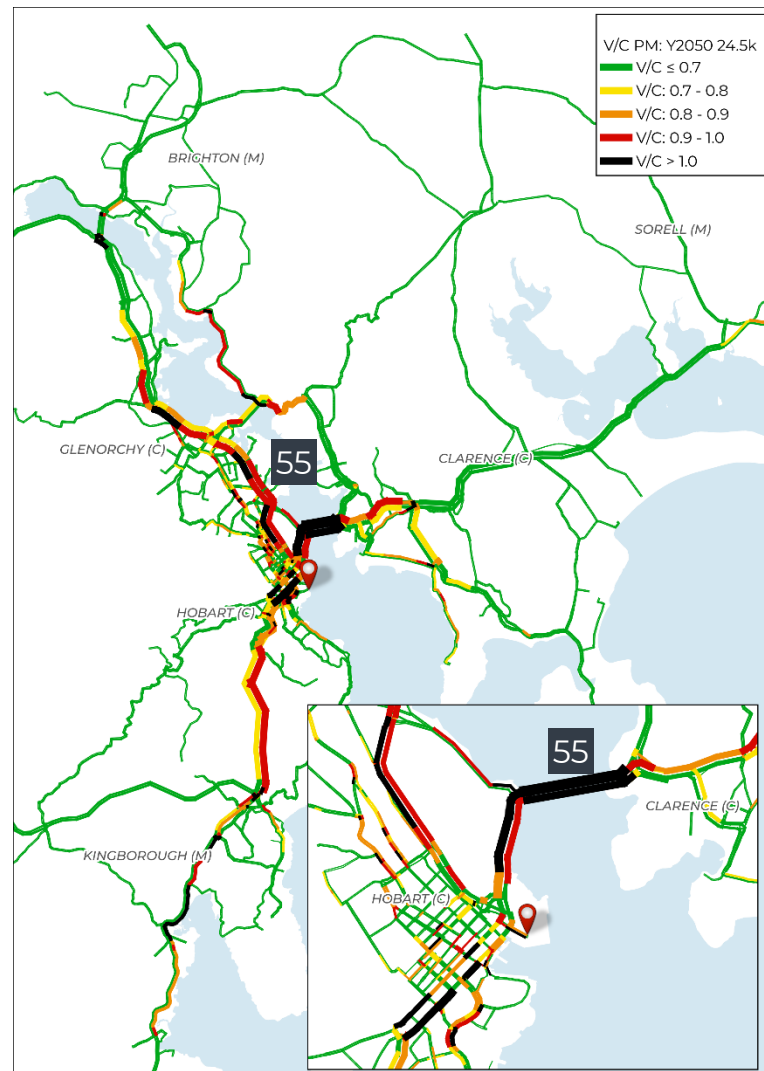
The Southern Outlet is expected to carry over 4,600 vehicles in the inbound direction, with over 1,400 vehicles generated by event demands.



2050 24,500 capacity stadium



Vehicle Volume Difference (PM 2-hr): 2050 Base Case vs. 2030 Base Case



2050 Base Case PM V/C

Insights and issues

55

In the 2050 scenario, the Tasman Highway and Brooker Highway are expected to be near or over capacity. Similar to 2030, the addition of event demands to Macquarie Point would cause the Tasman Bridge to exceed capacity.

56

The East Derwent Highway and Bowen Bridge are expected to observe considerable increase in traffic volumes in both directions as the Tasman Bridge and Brooker Highway are congested.

57

The Tasman Highway in the inbound direction is expected to carry approximately 200 additional vehicles and the Southern Outlet carries over 400 additional vehicles. Traffic volumes are expected to increase across all routes in the northern corridor including the Brooker Highway, Letitia Street, Argyle Street and Main Road.

Constraints and challenges

1. Due to the nature of Hobart's geography, there are limited routes for inbound trips into Macquarie Point and the CBD. The key corridors of the Tasman Highway and Brooker Highway are expected to exhibit congestion as eventgoers converge on these routes during event ingress. Modelled V/C is greater than 0.9 on the Brooker Highway and greater than 1.0 on the Tasman Bridge in the inbound direction on approach to the CBD under all event demand scenarios. It is noted that the modelling takes a conservative approach by superimposing the total event demand with typical weekday traffic in the PM (16:00-18:00) peak period. In reality, it is expected that event traffic will be spread over a longer period and background traffic is expected to reduce significantly after 18:00.
2. The Reference Case PT network has limited inbound services during the PM period and a higher number of outbound services to address the needs of commuter travel. As a result (and as can be expected with only using existing public transport network) loading many inbound event demand PT trips causes some major PT corridors on Main Road / New Town Road and the Southern Outlet to exceed capacity. This helps identify areas of focus for the Implementation Plan
3. The Tasman Highway is the only route from the east and is expected to be congested with vehicle traffic under event ingress. Public transport options including event buses, public buses and rapid bus will experience delays if bus priority is not provided.

Opportunities

1. Targeted public transport interventions can be made to reduce overcrowding on corridors such as Main Road / New Town Road and the Southern Outlet. This may include event buses along these corridors to provide sufficient capacity to meet the forecast demands.
2. Congestion on the Tasman Bridge suggests this should be a focus point for event specific transport services. Alternatives to private car trips including event buses and ferries should be considered.
3. Reconfiguring the tidal flow lane on the Tasman Bridge after the PM peak period has passed (e.g. after 6pm) to add extra capacity to inbound lanes on event days. This maintains the additional outbound capacity for the peak outbound traffic in the PM as well as providing additional inbound capacity for event ingress immediately prior to events.
4. In the event ingress scenarios, the modelling shows that the Bowen Bridge and East Derwent Highway becomes the preferred route for trips between the northern and eastern suburbs. Communications and variable messaging on event days can be used to make drivers aware of the alternate route to reduce traffic volumes on the Tasman Highway and Brooker Highway.
5. Operate event bus services on proposed rapid bus transit corridors. Bus priority measures as part of the rapid bus project, such as separated transit lanes and bus priority signals will help improve travel times for public bus, rapid bus and event bus services increasing the attractiveness of public transport options.
6. Park and Ride locations can be used in conjunction with event buses. Eventgoers can access event buses by parking their cars at these locations, as well as access via drop off, cycle or walk.

Limitations

It is important to note that model forecasts are estimates of future travel behaviours and traffic patterns. The GHUTDM is a strategic level model and is subject to limitations when modelling short term traffic spikes caused by events.

Some key limitations and assumptions of strategic modelling are:

- ***Uncertainties around travel behaviour:*** Future travel behaviours are difficult to predict, events may create changes in behaviour including mode choice, departure time or route changes. Deviations to existing travel behaviour will impact traffic forecast outcomes.
- ***Travel demand management and communications are not modelled:*** Event specific travel demand management strategies and public communications are not factored into the strategic model, however, these will be critical elements of the event transport solution. These strategies may alter existing travel behaviour that is captured in the model.
- ***Intersections are not modelled:*** The GHUTDM does not model individual intersections in traffic assignment. Traffic assignment occurs at the link level and does not consider delays at individual intersections. As such, the model will not completely capture the impacts at intersections and may present limitations when assessing localised impacts.

Conclusion

To support the PoSS framework, strategic modelling using the GHUTDM was undertaken. The modelling approach involved superimposing event-day demands on a typical weekday PM vehicle and public transport demands.

Key findings of the strategic modelling include:

- The 2030 Base Case (without event demands) is already quite congested on road links including the Tasman Bridge, Brooker Highway and Southern Outlet in the inbound direction for the AM peak and in the outbound direction for the PM peak.
- Event demand adds traffic in the inbound direction inducing congestion in key corridors, particularly the Tasman Highway, Brooker Highway and Macquarie Street causing the Tasman Bridge to exceed capacity and the Brooker Highway approaches capacity.
- Although the event-day demands create constraints on the network, the V/C ratios exhibited on the inbound routes during event ingress are better or comparable to the typical weekday AM peak period.
- In Scenario 1 and Scenario 3 with 60% non-car mode split, the existing public transport network is unable to support the demand with overcrowding exhibited along the key public transport corridors such as Main Road / New Town Road and the Southern Outlet. Additional services and event buses will be needed to achieve the target mode share.
- In 2050, typical non-event traffic is expected to continue growing. Combined with the event demands, the Tasman Highway is still expected to be over capacity and the Brooker Highway is at capacity.
- The modelled scenarios have identified constraint points on the network. Alternatives to private car trips will be required to alleviate these constraints and over-capacity corridors. The provision of alternative services must be supported by a travel demand management campaign to inform the public of these services, and why they are being made available. Simply providing the services alone may not create the necessary mode shift to address the constraints identified.

Appendix G

Pedestrian modelling memo





Memo

To: Macquarie Point Development Corporation
From: WSP
Subject: **Macquarie Point Multipurpose Stadium Transport Study – Pedestrian Modelling**
Our ref: PS206346-PAM-MEM-003-RevB-Final Pedestrian modelling
Date: 24 June 2024

Executive summary

Static pedestrian modelling has been undertaken to evaluate pedestrian Level of Service (LOS) along key corridors and footpaths across the Macquarie Point Precinct and the Hobart CBD and waterfront. The assessment uses the Fruin levels of service, and a LOS D has been considered acceptable for event crowd conditions.

The static model has been developed in Microsoft Excel whereby walking routes are assigned widths based on aerial imagery measurements, along with numbers of pedestrians (spectators) over a peak 15-minute period post-event. Assigned widths from aerial imagery has also been checked in person for any critical constraints not shown in the imagery. Modelling has been done on the post-event egress where crowd numbers peak when the majority of spectators leave in a short period of time.

The static model assumes all spectators are on the network within 15-minutes. Impacts shown in the static modelling would not all occur at the same time, but would more likely be staged across the network over the 15-minute period. This provides a conservative assessment.

The static model assesses static desire lines that are determined in prior planning, based on experienced judgement and local conditions. The model does not account for variances in route choice beyond the initial desire line. The stadium design and the location of the stadium relative to the CBD encourages the majority of spectators to use Evans Street as their initial egress route. This has been reflected in pedestrian distributions used in this modelling.

Four scenarios have been modelled:

- i) 31,500 spectators without the Collins Street active travel bridge
- ii) 31,500 spectators with the Collins Street active travel bridge.
- iii) 40,000 spectators without the Collins Street active travel bridge
- iv) 40,000 spectators with the Collins Street active travel bridge.

Distribution of demands are adjusted to acknowledge the different route choices available with and without the bridge.

The 31,500 spectator scenarios account for the total capacity under a concert scenario. The 40,000 spectator scenarios account for a potential future upgrade to the stadium. Thus, both 31,500 and 40,000 spectator scenarios provide for a highly conservative analysis (maximum demand during the peak post-event period).

Level 12, 900 Ann Street
Fortitude Valley QLD 4006
GPO Box 2907
Brisbane QLD 4001

Tel: +61 7 3854 6200
Fax: +61 7 3854 6500
www.wsp.com

WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

Section 1.1 and 1.2 highlight key points for the 31,500 spectator scenarios only. Results from the 40,000 spectator scenarios show the same impacted areas as for the 31,500 spectator scenarios but with poorer performing LOS, as would be expected. Results for the 40,000 scenarios are shown in Appendix B and Appendix C.

1.1 Without bridge scenario key points

1. Although LOS E is shown in this location, it should be noted that eight 50-seater event buses (400 people) are planned to leave the bus plaza every five minutes. This would significantly reduce the number of people in this area across the post event egress period. Dedicated queuing space has been incorporated significantly improving LOS in the area.
2. This walking route sees the highest demands with over 10,000 people walking from Evans Street to Hunter Street. 20m of open space for pedestrians in this area (referred to as Pocket Park in the Southern Campus Transformation plan), is a critical component of the event transport strategy, however, the full Pocket Park masterplan is not required, simply an area clear of pedestrian obstructions such as parking, signage and kerbs. A short term road closure is required for Evans Street and Hunter Street to create the pedestrian space required.

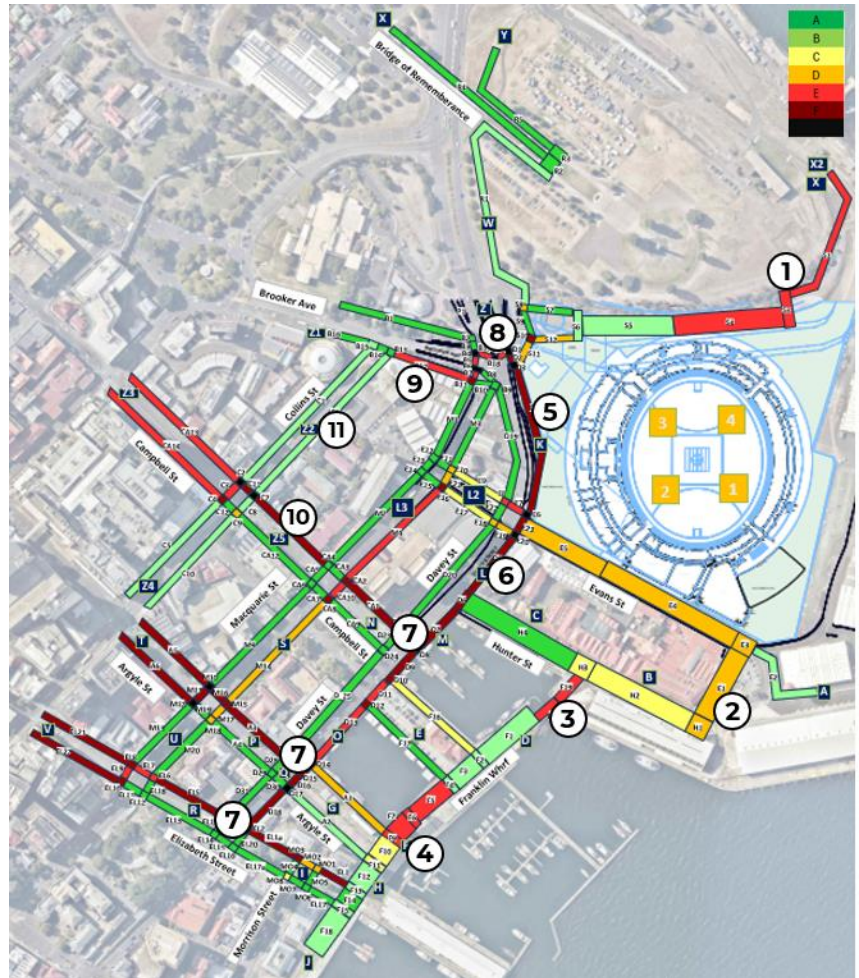


Figure 2.1 Model with Collins Street bridge

3. LOS E is seen on the narrow Victoria Dock swing bridge. The model assumes the full width of 8m+ is available to pedestrians (no traffic, short term closure to traffic). Some queueing can be expected to tail back to Hunter Street. The bridge should remain in fixed position during events to prevent spectators queuing in this area which would occur if the bridge was in motion to allow vessels through to the dock. Police boats in the Victoria Dock should also seek an alternative docking area during events.
4. Prior to the Constitution Dock bridge, target LOS D can be achieved if the event road closures/ no parking restrictions are extended to this area. However, the bridge will remain a constraint point (LOS E) due to the physical constraints of the bridge itself. The bridge should remain in fixed position during events to prevent spectators queuing in this area which would occur if the bridge was in motion to allow vessels through to the dock.

It is noted that points 3 and 4 refer to TasPorts land and ongoing discussions will be needed with TasPorts with respect to this recommendation.

5. The eastern side footpath of Davey Street is at LOS F with the event crowd alone. Cyclists using this shared path (i.e. rolling down the hill towards the city at speed) would worsen the results and increase safety concerns unless a dismount zone is implemented. It is assumed spectators would occupy the full width of the shared path during events. The footpath is narrow and the verge in places is constrained by established trees. Towards Brooker Avenue the footpath deviates to run immediately beside the carriageway. Under the modelled scenario there are significant safety risks to pedestrians

spilling onto the road and a resulting increased potential for traffic delays from safety incidents. Fencing along the footpath edge in this area could reduce the safety risk but would not improve LOS. To reach LOS D the shared path would require an additional 6.8m of width, or for spectators to use the parallel pathway on the western external concourse of the stadium.

6. Davey Street between Evans Street and Hunter Street is one of the highest risks in the modelled area. High volumes of pedestrians have a building on one side and live traffic on the other side. This path is also a popular cycling route. To reach LOS D in this area the existing 4m footpath would require an additional 6.2m. (i.e. the existing parking bays plus a traffic lane).
7. The high demands on the eastern side footpath of Davey Street will eventually need to cross Davey Street to access CBD amenities, car parks, the bus interchange and taxis etc. The pedestrian crossings at Campbell Street, Argyle Street and Elizabeth Street are critical to this task. There is a risk that crowds (thinking there is safety in numbers) will ignore pedestrian signals and continue streaming across Davey when they shouldn't. This will impact the efficient operation of Davey Street and the critical route through the CBD.
8. A large proportion of demands in this scenario are pushed along Davey Street to the crossings noted in #7, however, there will be demands exiting the stadium from the northwest section and attempting to cross Davey Street and then across Brooker Avenue (assuming most are heading in the direction of the inner city). Both Davey Street and Brooker Avenue crossings are LOS E (with crossing waiting areas exceeding LOS F) and introduce large volumes of people crossing two of the most critical routes in Hobart.
9. Over 1,600 people are expected to use this footpath along the Brooker Avenue. The footpath is narrow and constrained by trees. This results in LOS E and the potential for crowds spilling into the kerbside lane of the road, reducing road capacity as event buses and other traffic are moving through the area. Fencing along the footpath edge in this area could reduce the safety risk but would not improve the LOS. Pedestrian flows on this link would be influenced on the phasing of pedestrian signals crossing Davey Street upstream therefore regulating flow.
10. Campbell Street continues to experience LOS F as pedestrians continue on the same side footpath further into the CBD (based on modelled demands). There is the opportunity for crowds to split off west along Macquarie Street which may go some way to balancing out demands at a more acceptable LOS for both links.
11. Despite being an attractive link directly to the Elizabeth Street bus interchange, nearby taxi rank and restaurants and bars, Collins Street has a very comfortable LOS B as demands are low for this link as the crossing of Davey Street and the Brooker Avenue act as a constraint / deterrent for using this route. Collins Street could do more to disperse crowds into the CBD and Inner Hobart if people are given the opportunity to access it.

1.2 With bridge scenario key points

- 1 No change to #1 in this scenario
- 2 No change to #2 in this scenario
- 3 No change to #3 in this scenario
- 4 No change to #4 in this scenario
- 5 These sections Elizabeth Street and Argyle Street are an obvious link from the waterfront to the CBD bus interchange and taxi rank. However they suffer from narrow footpaths with trees, signposts and parking meters. LOS E and F are shown under the current pedestrian distributions.
- 6 At 6m wide with a peak 15 min demand of 8,500+ people, the proposed Collins Street active travel bridge experiences short term LOS F. Implementing a “stop and hold” pulsing of spectators across this bridge to reduce the LoS is considered acceptable when considering costs and spatial constraints of a larger bridge. A 7.3m width would be required to achieve LOS E. Moreover, by shifting these pedestrian demands away from road level, the nearby at grade pedestrian links and crossings on Davey Street and Brooker Avenue perform between LOS A and B. This implies reduced risk of pedestrians spilling onto the carriageway and ultimately better traffic flow than otherwise might be observed

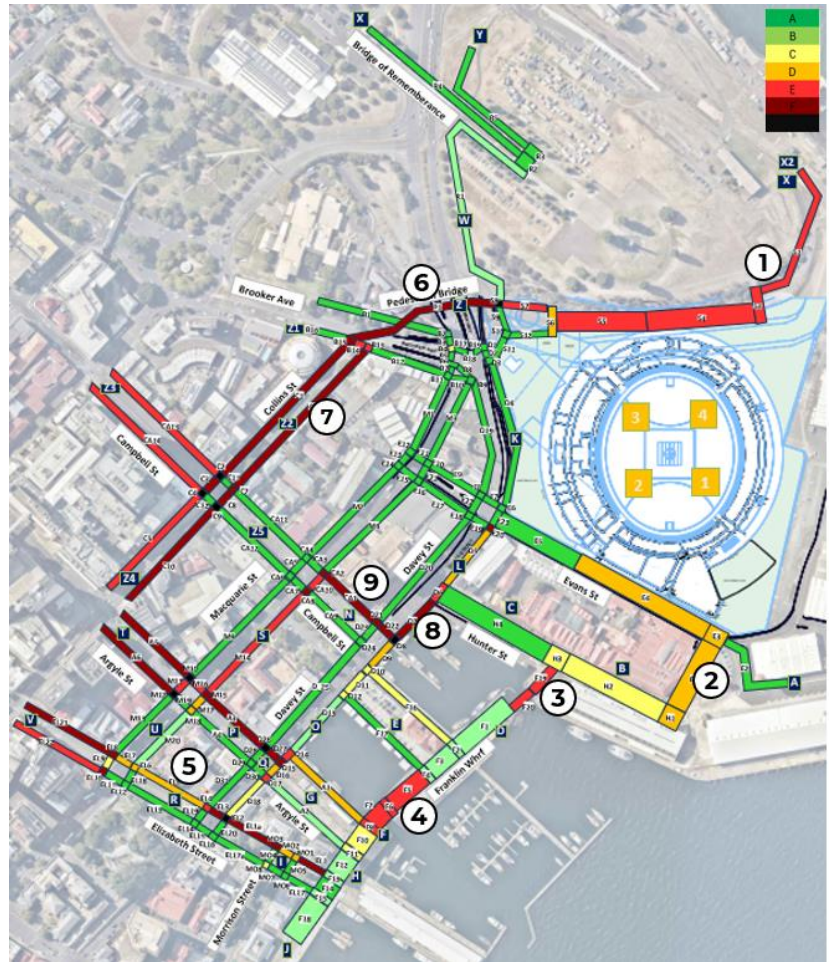


Figure 2.2 Model with Collins Street bridge

- 7 The Collins Street LOS F reflects attractiveness of the direct link from the Collins Street bridge to the bus interchange, nearby taxi rank, parking and shops and restaurants. Demands have been applied to the existing footpath widths only, hence LOS F. Note, the Collins Street Bridge route to Elizabeth Street avoids up to three signalised intersections (compared to via Davey Street) and would therefore become the desired route for spectators exiting via the north of the site (despite the need to double back slightly on Elizabeth to access the Hobart Interchange).
- 8 Davey Street between Evans Street and Campbell Street is LOS E and F with the crossing waiting area exceeding LOS F. Footpaths are narrower than would be ideal for the expected demands this close to the stadium. The section approaching Campbell Street (LOS F) has been modelled with the footpath only, however, there is parking on Victoria Dock that if removed for events would provide another 2.5m, reducing the LOS to E. Note, removing this parking without the Collins Street bridge does not have the same effect (LOS remains at LOS F) due to the demands on Davey Street without the bridge in place.
- 9 This section of Campbell Street is showing high demands and LOS F. Pedestrians only have one crossing at the Davey Street end which results in high numbers of people using the eastern side of Campbell Street only. However, people may see crowding at the pedestrian crossing and choose to continue to Argyle Street before making their way into the heart of the CBD.

2. Introduction

The Macquarie Point Multipurpose Stadium Static Pedestrian Modelling study area extends further than the Macquarie Point precinct. To understand pedestrian Level of Service (LOS) as crowds dissipate through the CBD and surrounding area, the study area has been extended from the stadium precinct to the Bridge of Remembrance to the north, Macquarie Wharf to the east, Constitution Dock to the south (leading to Salamanca), and Hobart CBD to the west.

The study focuses on the post-event period as peak pedestrian demands are seen over a short period of time post event (egress) and not over the longer, drawn-out pre-event (ingress) period. The pedestrian network of walkways (including bridges and crossings) and crossing waiting areas within the study are shown in Figure 2.1.



Figure 2.1 Study area

2.1 Objectives

The objective of the analysis is to evaluate pedestrian LOS surrounding the proposed Macquarie Point stadium during events, and to direct potential adjustments to the design of the pedestrian infrastructure where required to better support safe and efficient pedestrian movement.

2.2 Overview of approach

The static approach is based on first principles analysis. This study evaluates a 15-minute surge demand during an event egress with 31,500 and 40,000 spectators at the stadium. The analysis scenario tests existing pedestrian infrastructure surrounding the stadium, with and without the proposed Collin Street shared bridge as later discussed.

The static model assumes all spectators are on the network within 15mins. This provides a conservative assessment. Moreover, impacts shown in the static modelling would not all occur at the same time but would more likely be staged through the network over the 15-minute period.

Target LOS D, based on Fruin (as discussed further in Section 3.1), has been used to benchmark performance.

3. Methodology

The following methodology, as seen in Figure 3.1 has been used to undertake pedestrian modelling of the pedestrian infrastructure under assessment.

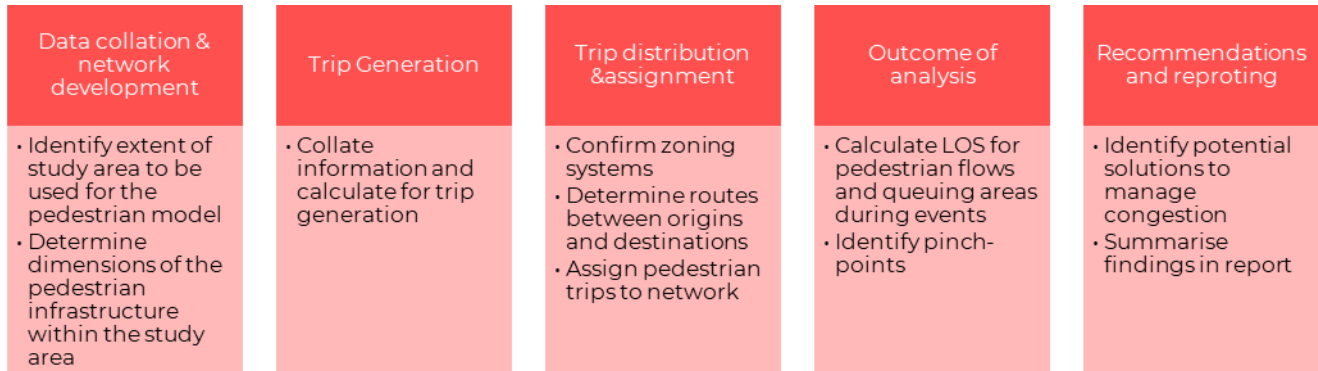


Figure 3.1 Methodology

3.1 Level Of Services (LOS)

Pedestrian flow is measured in pedestrians per meter of clear footway width per minute. This is calculated from data on pedestrian activity and the street environment. The Fruin scale has been used for the purpose of this assessment to set and define pedestrian LOS. Fruin based the LOS thresholds on the ability of pedestrians to move at their desired speed, overtake others, and maintain a comfortable personal space.

The analysis compares projected pedestrian flows by link to the flow capacity of that link. The capacity of a link in terms of pedestrian flow is dependent on the width of the link at its narrowest point and the desired LOS that the link is expected to achieve.

The widths of pedestrian infrastructure within the study area has been measured using Nearmaps to understand the existing useable clear width available. Note, on-site observations were undertaken of the pedestrian network to ensure aerial mapping and street view assessments were still relevant and up to date. No issues were noted.

The useable clear width discounts components of the footway that cannot be used for movement, such as street furniture including benches and trees, the kerb edge, and shop facades and their associated buffers.

Figure 3.2 below provides an example of how useable clear width on a footway section is measured.

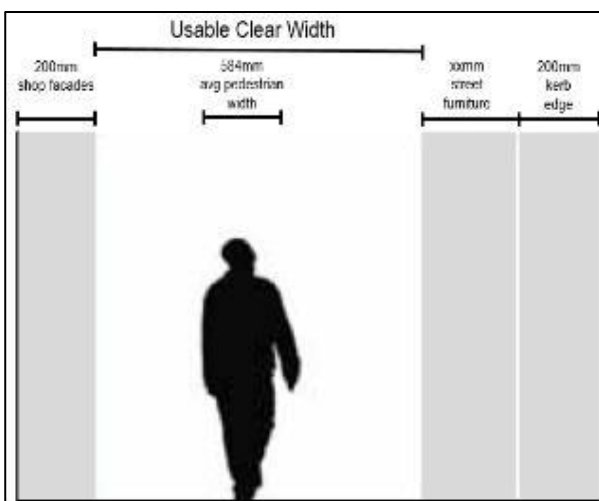


Figure 3.2 Usable clear width on a footway section

3.2 Level Of Service (LOS) Targets

For this assessment, Table 3-1 describes the LOS targets that define ‘acceptable’ performance of pedestrian infrastructure. As shown LOS D is considered acceptable for walkways, crossings and queuing areas in this analysis.

Table 3-1 Target LOS

	WALKWAYS	CROSSINGS	QUEUING AREAS
Target Level of Service (LOS)	D	D	D
Description	The majority of persons would have their normal walking speeds restricted and reduced due to difficulties in bypassing slower moving pedestrians and avoiding conflicts.	People walk in platoons upon green signal. The majority of persons would have their normal walking speeds restricted and reduced due to difficulties in bypassing slower moving pedestrians and avoiding conflicts.	Standing restricted. Circulation through the queuing area by disturbing others within the queue is possible; this density is within the range of personal comfort.

Note, during events pedestrian expectations regarding the level of crowding/ level of service/ level of comfort is lower than compared to walking on the same infrastructure during non-event periods when demands are less and are spread out over one to two hours i.e. morning and evening commuter peaks etc. This is particularly true for after an event when the vast majority of spectators leave a venue on mass.

3.3 Available information

The following information has been used to inform and develop the analysis:

- Google maps/ Google Street (aerial and street imagery)
- Nearmaps (aerial imagery and measurements)
- University of Tasmania (UTAS), Southern Campus Transformation Preliminary Urban Design Framework (May 2021)
- Collins Street Bridge, Macquarie Point Northern Access - Initial Concept Design, Department of State Growth, (August 2023)

3.4 Exclusions

The following items are excluded from the pedestrian analysis:

- The gradient of pedestrian footways and the associated impact to capacity has not been considered within the static analysis.

4. Network

4.1 Existing pedestrian network

The existing pedestrian network in the assessed study area includes footpaths, pedestrian waiting areas and crossings from the site to the Bridge of Remembrance to the north, Macquarie Wharf to the east, Constitution Dock to the south (leading to Salamanca), and Hobart CBD to the west.

4.2 Proposed improvements to the existing pedestrian network – non development related

The following pedestrian infrastructure improvements are proposed near the site but are not part of the stadium development:

- A shared use (pedestrian and cyclist) bridge providing connection from the north-west of site over Davey Street and Brooker Avenue, connecting to Collins Street.
 - This proposed infrastructure improvement has been included as the ‘with bridge’ scenario in this assessment, as further discussed in Section 5.3.
- Public realm creation and footpath widening adjacent to the University of Tasmania building on Evans and Hunter Street.
 - This proposed infrastructure improvement has been included in both the ‘with bridge’ and ‘without bridge’ scenarios in this assessment, as further discussed in Section 5.3.

4.3 Proposed improvements to the existing pedestrian network – development related

The following pedestrian infrastructure improvements are proposed near the site as part of the stadium development.

4.3.1 Proposed temporary improvements during events

During events it is proposed that Evans Street (adjacent the stadium, prior to the intersection with Davey Street) is closed to vehicular traffic to provide an increased access/ egress area for event attendees on Evans Street. The removal of live traffic from this area and the subsequent increased area for spectators to use will improve pedestrian LOS and safety during events. This is also proposed for sections of Franklin Wharf.

4.3.2 Proposed permanent improvements

A pedestrian footpath along the Northern Access Road between the stadium precinct and the Regetta Point Ferry Wharf is proposed.

5. Demand

5.1 Distribution

The demand of 31,500 spectators has been distributed within the study area from the stadium based on surrounding key destinations as shown in Table 5-1.

Table 5-1 Distributions

	Waterfront	Davey Street	Collins Street	Northern Access	Stadium Car Park	TOTAL
Attractor/ Destination	Wharf and Salamanca	CBD	CBD	Ferry/ Stadium Coaches	-	-
%	34%	9%	30%	26%	2%	100%
No. of spectators/ pedestrians	10,471	2,912	9,332	8,159	630	31,500

5.2 Routes

Pedestrian routes have been assigned through the study area based on the most direct routes available. The static model accounts for static desire lines and does not account for variances in route choice beyond the initial desire line. This is a limitation of the nature of static modelling. Where excessive crowding (poor LOS) has been observed, pedestrians have been split onto adjacent infrastructure if the connection to it is direct and convenient.

5.3 Scenarios

The following scenarios have been assessed in the static pedestrian model for 31,500 spectators and 40,000 spectators:

- **Event day without bridge**
 - Does not include the proposed shared use bridge providing connection to Collins Street.
 - Includes public realm creation and footpath widening adjacent to the University of Tasmania
 - Includes the temporary closure of Evans Street to vehicular traffic
 - Includes pedestrian infrastructure improvements to the north of the site
- **Event day with bridge**
 - Includes the proposed shared use bridge providing connection to Collins Street.
 - Includes public realm creation and footpath widening adjacent to the University of Tasmania
 - Includes the temporary closure of Evans Street to vehicular traffic
 - Includes pedestrian infrastructure improvements to the north of the site

Routes vary between scenarios depending on the infrastructure available in each scenario.

5.4 Assumptions

Included below is a list of assumptions relating to the static pedestrian model:

- Background pedestrian demand (non-development) would be low (five pedestrians per link in the study area).
- Spectators would occupy the shared paths when egressing an event and cycling would not be possible.

6. Performance

The LOS has been calculated for all walkways and crossings within the study area, for the ‘with bridge’ and ‘without bridge’ scenarios with 31,500 spectators as shown in Figure 6.1 and Figure 6.2, respectively. The LOS results for both scenarios can be seen in Tabular Format in Appendix A.

The results from the 40,000 spectator scenarios show the same impacted areas as seen with 31,500 spectators, but with poorer performing LOS as would be expected, as shown in Appendix B, with LOS results in tabular format in Appendix C.

6.1 Without Bridge scenario

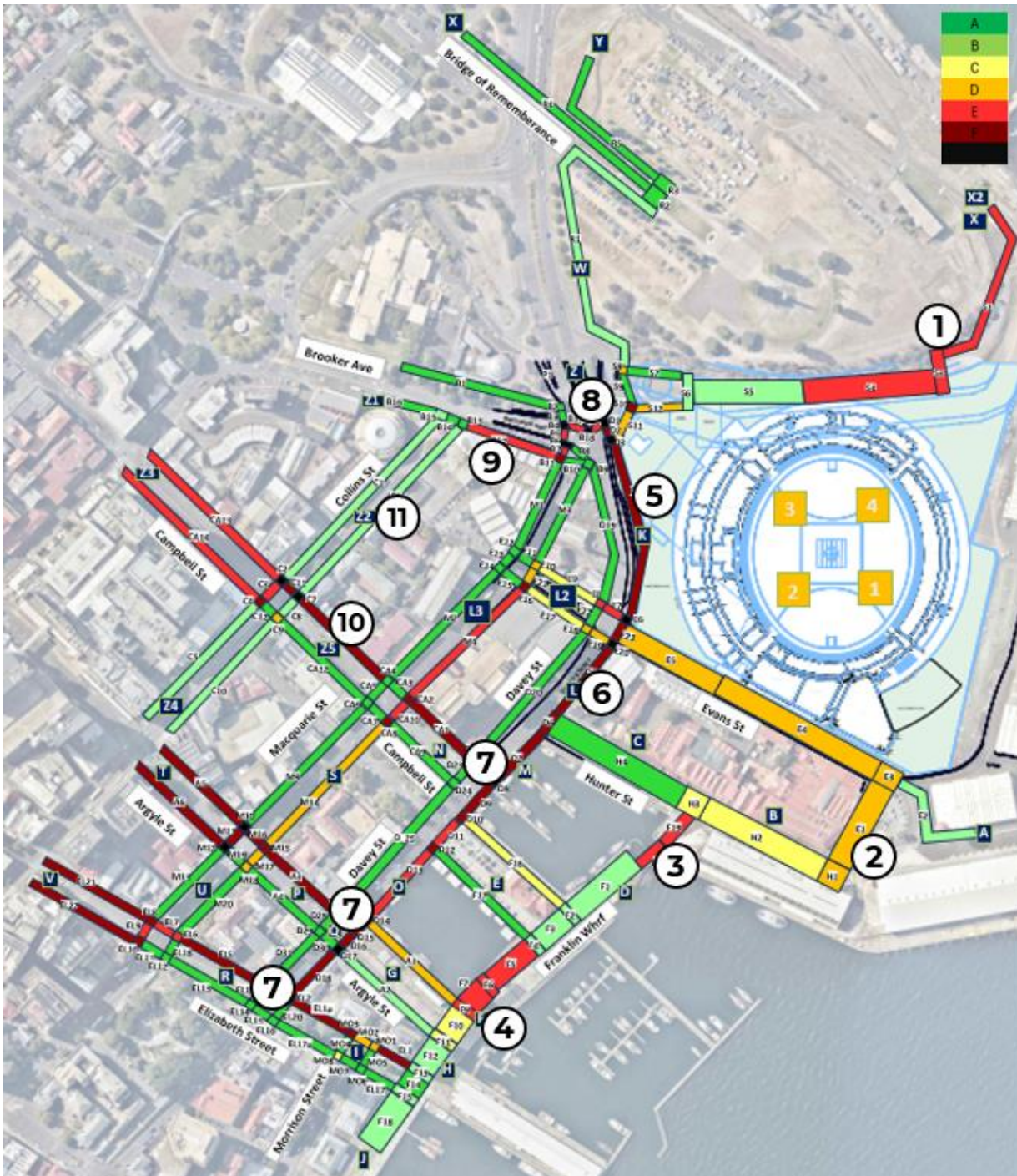


Figure 6.1 Model without Collins Street bridge

1. Although LOS E is shown in this location, it should be noted that eight 50-seater event buses (400 people) are planned to leave the bus plaza every five minutes. This would significantly reduce the number of people in this area across the post event egress period. Dedicated queuing space has been incorporated significantly improving LOS in the area.
2. This walking route sees the highest demands with over 10,000 people walking from Evans Street to Hunter Street. 20m of open space for pedestrians in this area (referred to as Pocket Park in the Southern Campus Transformation plan), is a critical component of the event transport strategy, however, the full Pocket Park masterplan is not required, simply an area clear of pedestrian obstructions such as parking, signage and kerbs. A short term road closure is required for Evans Street and Hunter Street to create the pedestrian space required.
3. LOS E is seen on the narrow Victoria Dock swing bridge. The model assumes the full width of 8m+ is available to pedestrians (no traffic, short term closure to traffic). Some queueing can be expected to tail back to Hunter Street. The bridge should remain in fixed position during events to prevent spectators queueing in this area which would occur if the bridge was in motion to allow vessels through to the dock. Police boats in the Victoria Dock should also seek an alternative docking area during events.
4. Prior to the Constitution Dock bridge, target LOS D can be achieved if the event road closures/ no parking restrictions are extended to this area. However, the bridge will remain a constraint point (LOS E) due to the physical constraints of the bridge itself. The bridge should remain in fixed position during events to prevent spectators queueing in this area which would occur if the bridge was in motion to allow vessels through to the dock.
5. The eastern side footpath of Davey Street is at LOS F with the event crowd alone. Cyclists using this shared path (i.e. rolling down the hill towards the city at speed) would worsen the results and increase safety concerns unless a dismount zone is implemented. It is assumed spectators would occupy the full width of the shared path during events. The footpath is narrow and the verge in places is constrained by established trees. Towards Brooker Avenue the footpath deviates to run immediately beside the carriageway. Under the modelled scenario there are significant safety risks to pedestrians spilling onto the road and a resulting increased potential for traffic delays from safety incidents. Fencing along the footpath edge in this area could reduce the safety risk but would not improve LOS. To reach LOS D the shared path would require an additional 6.8m of width, or for spectators to use the parallel pathway on the western external concourse of the stadium.
6. Davey Street between Evans Street and Hunter Street is one of the highest risks in the modelled area. High volumes of pedestrians have a building on one side and live traffic on the other side. This path is also a popular cycling route. To reach LOS D in this area the existing 4m footpath would require an additional 6.2m. (i.e. the existing parking bays plus a traffic lane).
7. The high demands on the eastern side footpath of Davey Street will eventually need to cross Davey Street to access CBD amenities, car parks, the bus interchange and taxis etc. The pedestrian crossings at Campbell Street, Argyle Street and Elizabeth Street are critical to this task. There is a risk that crowds (thinking there is safety in numbers) will ignore pedestrian signals and continue streaming across Davey Street when they shouldn't. This will impact the efficient operation of Davey Street and the critical route through the CBD.
8. A large proportion of demands in this scenario are pushed along Davey Street to the crossings noted in #7, however, there will be demands exiting the stadium from the northwest section and attempting to cross Davey Street and then across Brooker Avenue (assuming most are heading in the direction of the inner city). Both Davey Street and Brooker Avenue crossings are LOS E (with crossing waiting areas exceeding LOS F) and introduce large volumes of people crossing two of the most critical routes in Hobart.
9. Over 1,600 people are expected to use this footpath along the Brooker Avenue. The footpath is narrow and constrained by trees. This results in LOS E and the potential for crowds spilling into the kerbside lane of the road, reducing road capacity as event buses and other traffic are moving through the area. Fencing along the footpath edge in this area could

reduce the safety risk but would not improve the LOS. Pedestrian flows on this link would be influenced on the phasing of pedestrian signals crossing Davey Street upstream therefore regulating flow.

10. Campbell Street continues to experience LOS F as pedestrians continue on the same side footpath further into the CBD (based on modelled demands). There is the opportunity for crowds to split off west along Macquarie Street which may go some way to balancing out demands at a more acceptable LOS for both links.
11. Despite being an attractive link directly to the Elizabeth Street bus interchange, nearby taxi rank and restaurants and bars, Collins Street has a very comfortable LOS B as demands are low for this link as the crossing of Davey Street and the Brooker Avenue act as a constraint / deterrent for using this route. Collins Street could do more to disperse crowds into the CBD and Inner Hobart if people are given the opportunity to access it.

6.2 With Bridge scenario

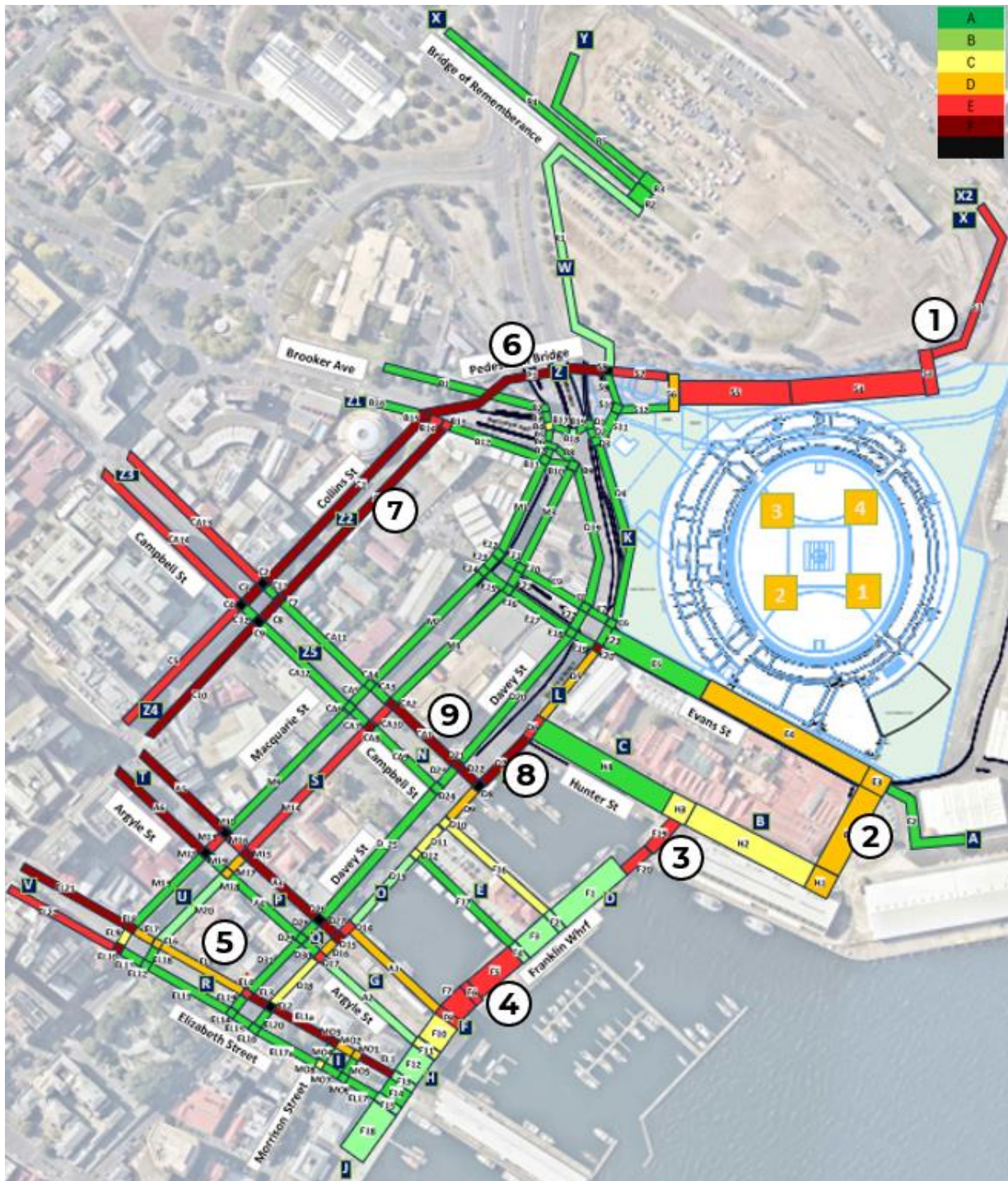


Figure 6.2 Model with Collins Street bridge

- 1 No change to #1 in this scenario
- 2 No change to #2 in this scenario
- 3 No change to #3 in this scenario
- 4 No change to #4 in this scenario
- 5 These sections Elizabeth Street and Argyle Street are an obvious link from the waterfront to the CBD bus interchange and taxi rank. However they suffer from narrow footpaths with trees, signposts and parking meters. LOS E and F are shown under the current pedestrian distributions.

- 6 At 6m wide with a peak 15 min demand of 8,500+ people, the proposed Collins Street active travel bridge experiences short term LOS F. Implementing a “stop and hold” pulsing of spectators across this bridge to reduce the LoS is considered acceptable when considering costs and spatial constraints of a larger bridge. A 7.3m width would be required to achieve LOS E. Moreover, by shifting these pedestrian demands away from road level, the nearby at grade pedestrian links and crossings on Davey Street and Brooker Avenue perform between LOS A and B. This implies reduced risk of pedestrians spilling onto the carriageway and ultimately better traffic flow than otherwise might be observed
- 7 The Collins Street LOS F reflects attractiveness of the direct link from the Collins Street bridge to the bus interchange, nearby taxi rank, parking and shops and restaurants. Demands have been applied to the existing footpath widths only, hence LOS F. Note, the Collins Street Bridge route to Elizabeth Street avoids up to three signalised interections (compared to via Davey Street) and would therefore become the desired route for spectators exiting via the north of the site (despite the need to double back slightly on Elizabeth Street to access the Hobart Interchange).
- 8 Davey Street between Evans Street and Campbell Street is LOS E and F with the crossing waiting area exceeding LOS F. Footpaths are narrower than would be ideal for the expected demands this close to the stadium. The section approaching Campbell Street (LOS F) has been modelled with the footpath only, however, there is parking on Victoria Dock that if removed for events would provide another 2.5m, reducing the LOS to E. Note, removing this parking without the Collins Street bridge does not have the same effect (LOS remains at LOS F) due to the demands on Davey Street without the bridge in place.
- 9 This section of Campbell Street is showing high demands and LOS F. Pedestrians only have one crossing at the Davey Street end which results in high numbers of people using the eastern side of Campbell Street only. However, people may see crowding at the pedestrian crossing and choose to continue to Argyle Street before making their way into the heart of the CBD.

7. Conclusions

As would be expected, the demand of 31,500 pedestrians over a 15-minute period causes poor levels of service in multiple areas around the precinct.

In both the with and without bridge scenarios, it is clear that the urban realm environment outside of the footprint of the Macquarie Point area needs to be significantly uplifted to not only reflect what is anticipated to be the statement architectural treatment of the stadium and surrounding area, but also to accommodate the pedestrian and people movement densities detailed in this study. Specifically, streets in the central and inner north-east sections of the City such as Hunter Street, Evans Street, Collins Street (from Davey Street to Elizabeth Street), and lower Elizabeth Street.

Planned temporary and permanent pedestrian infrastructure improvements in the area allow for acceptable LOS to be achievable in those areas (which would otherwise not be possible) including:

- The closure of Evans Street and sections of Franklin Wharf to vehicle traffic
- Public realm creation and footpath widening adjacent to the University of Tasmania
- Pedestrian infrastructure to the north of the site providing connection to the ferry and stadium coaches

As shown between the without bridge and with bridge scenarios, the proposed pedestrian bridge connecting to Collins Street significantly changes the LOS at and along the Davey Street/ Brooker Avenue intersection. Pedestrian infrastructure in this location without the bridge is at and exceeds LOS F which creates unsafe conditions for pedestrians and would likely create delays to traffic.

Although the proposed bridge operates at LOS F, this is considered acceptable when considering costs and spatial constraints and improvements to pedestrian safety and traffic congestion as noted above.

From a pedestrian impact perspective, the ‘with bridge’ scenario and associated infrastructure is preferred and recommended.

Further recommendations include:

- A public realm and active travel plan be developed in close collaboration with the landowners, current businesses, agencies (including TasPorts and TasWater) and the City of Hobart.
- Measures to slow down egress from the stadium be investigated i.e. post event entertainment etc.
- In both scenarios, the Victoria Dock Bridge and Constitution Dock bridges should remain in a fixed position and not allow vessels through post event to ensure spectators are not forced to wait while the bridges are in motion. It is noted that these areas are under TasPorts ownership/management and TasPol will need to be engaged to ensure their police boat/s are out of dock.
- Extension of the no traffic area on Franklin Wharf and Davey Street to prevent vehicle use and parking during events.



Appendix A 31,500 spectators - LOS tabular results

Without Bridge 31,500 spectators

ID	Type	Width (m)	Clearance (m)	Effective Width (m)	BKGRD	DEV (15 MINS)	15	1	PPMM EVENT	Fruin LOS identifier	Fruin LOS
						DEV (15 MINS)	DEV (1 MIN)	ALL surge		EVENT	EVENT
A 1	Walkway	3.1	0.2	2.9	5	1399	93	98	33.9	4.0	D
A 2	Walkway	5.3	0.4	4.9	5	1399	93	98	20.0	2.0	B
A 3	Walkway	2.6	0.4	2.2	5	6462	431	436	198.1	6.0	F
A 4	Walkway	3.1	0.4	2.7	5	0	0	5	1.9	1.0	A
A 5	Walkway	2.1	0.4	1.7	5	3672	245	250	146.9	6.0	F
A 6	Walkway	2.3	0.4	1.9	5	3672	245	250	131.5	6.0	F
B 1	Walkway	2.6	0.4	2.2	5	0	0	5	2.3	1.0	A
B 10	Pedestrian Crossing	1.5	0	1.5	5	0	0	5	3.3	1.0	A
B 11	Ped crossing queuing area			12.91	5	1640	109	114	0.1	6.0	F
B 12	Walkway	2.3	0.4	1.9	5	1640	109	114	60.2	5.0	E
B 13	Walkway	5	0	5	5	650	43	48	9.7	1.0	A
B 14	Walkway	5	0	5	5	650	43	48	9.7	1.0	A
B 15	Walkway	5	0	5	5	1300	87	92	18.3	2.0	B
B 16	Walkway	1.5	0.4	1.1	5	100	7	12	10.6	1.0	A
B 17	Pedestrian Crossing	1.8	0	1.8	5	1640	109	114	63.5	5.0	E
B 18	Ped crossing queuing area			5.82	5	1640	109	114	0.1	7.0	FALSE
B 19	Pedestrian Crossing	1.5	0	1.5	5	1640	109	114	76.2	5.0	E
B 2	Ped crossing queuing area			22.49	5	0	0	5	4.5	1.0	A
B 3	Pedestrian Crossing	6.3	0	6.3	5	0	0	5	0.8	1.0	A
B 4	Ped crossing queuing area			3.57	5	1640	109	114	0.0	7.0	FALSE
B 5	Pedestrian Crossing	1.8	0	1.8	5	1640	109	114	63.5	5.0	E
B 6	Ped crossing queuing area			10.06	5	1640	109	114	0.1	7.0	FALSE
B 7	Pedestrian Crossing	1.8	0	1.8	5	1640	109	114	63.5	5.0	E
B 8	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 9	Ped crossing queuing area			18.02	5	0	0	5	3.6	1.0	A
C 1	Walkway	3	0.4	2.6	5	650	43	48	18.6	2.0	B
C 10	Walkway	2.5	0.2	2.3	5	488	33	38	16.3	2.0	B
C 11	Pedestrian Crossing	2.82	0	2.82	5	4896	326	331	117.5	6.0	F
C 12	Pedestrian Crossing	2.69	0	2.69	5	0	0	5	1.9	1.0	A
C 2	Ped crossing queuing area			22.9	5	5221	348	353	0.06	7.0	FALSE
C 3	Pedestrian Crossing	3	0	3	5	3098	207	212	70.5	5.0	E
C 4	Ped crossing queuing area			23	5	3098	207	212	0.11	6.0	F
C 5	Walkway	3	0.2	2.8	5	488	33	38	13.4	2.0	B
C 6	Walkway	3	0.2	2.8	5	650	43	48	17.3	2.0	B
C 7	Ped crossing queuing area			32.72	5	5383	359	364	0.1	7.0	FALSE
C 8	Pedestrian Crossing	2.4	0	2.4	5	488	33	38	15.6	2.0	B
C 9	Ped crossing queuing area			14.01	5	488	33	38	0.4	4.0	D
CA 1	Walkway	3	0.2	2.8	5	4308	287	292	104.4	6.0	F
CA 10	Pedestrian Crossing	2.2	0	2.2	5	1762	117	122	55.7	5.0	E
CA 11	Walkway	2.7	0.2	2.5	5	4896	326	331	132.5	6.0	F
CA 12	Walkway	2.6	0.2	2.4	5	0	0	5	2.1	1.0	A
CA 13	Walkway	2.8	0.2	2.6	5	2610	174	179	68.9	5.0	E
CA 14	Walkway	2.8	0.2	2.6	5	2610	174	179	68.9	5.0	E
CA 2	Ped crossing queuing area			45.34	5	4308	287	292	0.2	6.0	F
CA 3	Pedestrian Crossing	2.1	0	2.1	5	0	0	5	2.4	1.0	A
CA 4	Ped crossing queuing area			17	5	0	0	5	3.4	1.0	A
CA 5	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
CA 6	Ped crossing queuing area			19.6	5	0	0	5	3.9	1.0	A
CA 7	Pedestrian Crossing	2.3	0	2.3	5	0	0	5	2.2	1.0	A
CA 8	Ped crossing queuing area			21	5	1762	117	122	0.2	6.0	F
CA 9	Walkway	2.5	0.2	2.3	5	0	0	5	2.2	1.0	A
D 1	Ped crossing queuing area			7.1	5	1640	109	114	0.1	7.0	FALSE
D 10	Walkway	5.8	0.2	5.6	5	7331	489	494	88.2	6.0	F
D 11	Walkway	7.1	0.2	6.9	5	7331	489	494	71.6	5.0	E
D 12	Walkway	5.8	0.2	5.6	5	7331	489	494	88.2	6.0	F
D 13	Walkway	8.5	0.4	8.1	5	7331	489	494	61.0	5.0	E
D 14	Walkway	5.3	0.2	5.1	5	6462	431	436	85.5	6.0	F
D 15	Ped crossing queuing area			47.19	5	6462	431	436	0.11	6.0	F
D 16	Pedestrian Crossing	2.3	0	2.3	5	3665	244	249	108.4	6.0	F
D 17	Ped crossing queuing area			22.17	5	3665	244	249	0.1	7.0	FALSE
D 18	Walkway	3.17	0.2	2.97	5	3665	244	249	84.0	6.0	F
D 19	Walkway	1.3	0.2	1.1	5	0	0	5	4.5	1.0	A
D 2	Pedestrian Crossing	1.3	0	1.3	5	1640	109	114	87.9	6.0	F
D 20	Walkway	3.3	0.2	3.1	5	0	0	5	1.6	1.0	A
D 21	Ped crossing queuing area			31.11	5	4308	287	292	0.11	6.0	F
D 22	Pedestrian Crossing	2.8	0	2.8	5	4308	287	292	104.4	6.0	F
D 23	Pedestrian Crossing	2.8	0	2.8	5	0	0	5	1.8	1.0	A
D 24	Ped crossing queuing area			8.85	5	0	0	5	1.8	1.0	A
D 25	Walkway	3.5	0.4	3.1	5	0	0	5	1.6	1.0	A
D 26	Ped crossing queuing area			12	5	6462	431	436	0.03	7.0	FALSE
D 27	Pedestrian Crossing	2.7	0	2.7	5	6462	431	436	161.4	6.0	F
D 28	Pedestrian Crossing	1.9	0	1.9	5	0	0	5	2.6	1.0	A
D 29	Ped crossing queuing area			10.55	5	0	0	5	2.1	1.0	A
D 3	Ped crossing queuing area			9	5	1640	109	114	0.1	7.0	FALSE
D 30	Pedestrian Crossing	2.2	0	2.2	5	0	0	5	2.3	1.0	A
D 31	Walkway	4.5	0.2	4.3	5	0	0	5	1.2	1.0	A
D 4	Walkway	3	0.4	2.6	5	6805	454	459	176.4	6.0	F
D 5	Walkway	4	0.2	3.8	5	7288	486	491	129.2	6.0	F
D 6	Walkway	6	0.2	5.8	5	9774	652	657	113.2	6.0	F
D 7	Walkway	3.9	0.2	3.7	5	9774	652	657	177.5	6.0	F
D 8	Ped crossing queuing area			16.4	5	4308	287	292	0.06	7.0	FALSE
D 9	Walkway	3.9	0.2	3.7	5	7331	489	494	133.4	6.0	F
E 1	Walkway	20	0.4	19.6	5	9946	663	668	34.1	4.0	D
E 10	Ped crossing queuing area			40.62	5	1175	78	83	0.5	4.0	D
E 11	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A

E 12	Ped crossing queuing area			8.28	5	0	0	5	1.7	1.0	A
E 13	Pedestrian Crossing	3.3	0.2	3.1	5	0	0	5	1.6	1.0	A
E 14	Ped crossing queuing area			7.62	5	0	0	5	1.5	1.0	A
E 15	Pedestrian Crossing	1.9	0	1.9	5	0	0	5	2.6	1.0	A
E 16	Ped crossing queuing area			18.85	5	2349	157	162	0.1	6.0	F
E 17	Walkway	3	0.2	2.8	5	1215	81	86	30.7	3.0	C
E 18	Ped crossing queuing area			44.33	5	1215	81	86	0.5	4.0	D
E 19	Pedestrian Crossing	1.8	0	1.8	5	1215	81	86	47.8	4.0	D
E 2	Walkway	6.4	0.2	6.2	5	1740	116	121	19.5	2.0	B
E 20	Ped crossing queuing area			25.33	5	7288	486	491	0.05	7.0	FALSE
E 21	Pedestrian Crossing	1.7	0	1.7	5	1175	78	83	49.0	4.0	D
E 22	Pedestrian Crossing	1.7	0	1.7	5	0	0	5	2.9	1.0	A
E 23	Pedestrian Crossing	2.2	0	2.2	5	6805	454	459	208.5	6.0	F
E 3	Walkway	19.5	0.4	19.1	5	10471	698	703	36.8	4.0	D
E 4	Walkway	19.5	0.4	19.1	5	10471	698	703	36.8	4.0	D
E 5	Walkway	19.8	0.4	19.4	5	14093	940	945	48.7	4.0	D
E 6	Ped crossing queuing area			34.76	5	8020	535	540	0.1	7.0	FALSE
E 7	Pedestrian Crossing	1.7	0	1.7	5	1215	81	86	50.6	5.0	E
E 8	Ped crossing queuing area			16.25	5	1215	81	86	0.2	5.0	E
E 9	Walkway	3.1	0.2	2.9	5	1215	81	86	29.6	3.0	C
EL 1	Walkway	1	0.4	0.6	5	1399	93	98	163.7	6.0	F
EL 10	Ped crossing queuing area			18.82	5	2972	198	203	0.1	6.0	F
EL 11	Pedestrian Crossing	3	0	3	5	0	0	5	1.7	1.0	A
EL 12	Ped crossing queuing area			27.66	5	0	0	5	5.5	1.0	A
EL 13	Walkway	3	0.4	2.6	5	0	0	5	1.9	1.0	A
EL 14	Ped crossing queuing area			35.58	5	0	0	5	7.1	1.0	A
EL 15	Pedestrian Crossing	3.6	0	3.6	5	0	0	5	1.4	1.0	A
EL 16	Ped crossing queuing area			21.73	5	0	0	5	4.3	1.0	A
EL 17	Walkway	1	0.4	0.6	5	0	0	5	8.3	1.0	A
EL 17a	Walkway	2	0.4	1.6	5	0	0	5	3.1	1.0	A
EL 18	Pedestrian Crossing	2	0	2	5	0	0	5	2.5	1.0	A
EL 19	Pedestrian Crossing	2.4	0	2.4	5	0	0	5	2.1	1.0	A
EL 1a	Walkway	1	0.4	0.6	5	1399	93	98	163.7	6.0	F
EL 2	Ped crossing queuing area			12.47	5	5064	338	343	0.04	7.0	FALSE
EL 20	Pedestrian Crossing	2.1	0	2.1	5	0	0	5	2.4	1.0	A
EL 21	Walkway	1.8	0.4	1.4	5	2972	198	203	145.1	6.0	F
EL 22	Walkway	2.6	0.4	2.2	5	2972	198	203	92.3	6.0	F
EL 3	Pedestrian Crossing	2.2	0	2.2	5	5064	338	343	155.7	6.0	F
EL 4	Ped crossing queuing area			36.24	5	5064	338	343	0.1	6.0	F
EL 5	Walkway	4.2	0.2	4	5	5064	338	343	85.6	6.0	F
EL 6	Ped crossing queuing area			45.1	5	2972	198	203	0.2	5.0	E
EL 7	Pedestrian Crossing	3.2	0	3.2	5	2972	198	203	63.5	5.0	E
EL 8	Ped crossing queuing area			45.69	5	5945	396	401	0.1	6.0	F
EL 9	Pedestrian Crossing	4	0	4	5	2972	198	203	50.8	5.0	E
F 1	Walkway	25	0.5	24.5	5	7459	497	502	20.5	2.0	B
F 10	Walkway	11	0.4	10.6	5	4196	280	285	26.9	3.0	C
F 11	Walkway	11	0.4	10.6	5	4196	280	285	26.9	3.0	C
F 12	Walkway	11	0.4	10.6	5	2797	186	191	18.1	2.0	B
F 13	Walkway	11	0.4	10.6	5	2797	186	191	18.1	2.0	B
F 14	Walkway	11	0.2	10.8	5	1399	93	98	9.1	1.0	A
F 15	Walkway	5.7	0.4	5.3	5	1399	93	98	18.5	2.0	B
F 16	Walkway	4.4	0.4	4	5	1865	124	129	32.3	3.0	C
F 17	Walkway	4	0.4	3.6	5	0	0	5	1.4	1.0	A
F 18	Walkway	5.7	0.4	5.3	5	1399	93	98	18.5	2.0	B
F 19	Walkway	9.3	0.2	9.1	5	7459	497	502	55.2	5.0	E
F 2	Walkway	25	0	25	5	7459	497	502	20.1	2.0	B
F 20	Walkway	9.3	0.4	8.9	5	7459	497	502	56.4	5.0	E
F 3	Walkway	25	0.4	24.6	5	5594	373	378	15.4	2.0	B
F 4	Walkway	25	0.4	24.6	5	5594	373	378	15.4	2.0	B
F 5	Walkway	7	0	7	5	5594	373	378	54.0	5.0	E
F 6	Walkway	7	0	7	5	5594	373	378	54.0	5.0	E
F 7	Walkway	7.5	1.2	6.3	5	5594	373	378	60.0	5.0	E
F 9	Walkway	7.5	0.4	7.1	5	5594	373	378	53.2	5.0	E
H 1	Walkway	17.3	0.2	17.1	5	9946	663	668	39.1	4.0	D
H 2	Walkway	25	0.4	24.6	5	9946	663	668	27.2	3.0	C
H 3	Walkway	25	0.2	24.8	5	9946	663	668	26.9	3.0	C
H 4	Walkway	33	0.2	32.8	5	2486	166	171	5.2	1.0	A
M 1	Walkway	3	0.2	2.8	5	0	0	5	1.8	1.0	A
M 10	Ped crossing queuing area			29.38	5	7343	490	495	0.06	7.0	FALSE
M 11	Pedestrian Crossing	2.8	0	2.8	5	3672	245	250	89.2	6.0	F
M 12	Ped crossing queuing area			11.51	5	3672	245	250	0.0	7.0	FALSE
M 13	Walkway	2.39	0.2	2.19	5	0	0	5	2.3	1.0	A
M 14	Walkway	3.02	0.2	2.82	5	1762	117	122	43.4	4.0	D
M 15	Ped crossing queuing area			27.95	5	3672	245	250	0.1	6.0	F
M 16	Pedestrian Crossing	2.6	0	2.6	5	3672	245	250	96.1	6.0	F
M 17	Pedestrian Crossing	1.8	0	1.8	5	881	59	64	35.4	4.0	D
M 18	Ped crossing queuing area			32.23	5	881	59	64	0.5	4.0	D
M 19	Pedestrian Crossing	2.8	0	2.8	5	0	0	5	1.8	1.0	A
M 2	Walkway	1.4	0.2	1.2	5	0	0	5	4.2	1.0	A
M 20	Walkway	5.51	0.2	5.31	5	881	59	64	12.0	1.0	A
M 3	Walkway	2.4	0.2	2.2	5	80	5	10	4.7	1.0	A
M 4	Walkway	2.5	0.2	2.3	5	2349	157	162	70.3	5.0	E
M 9	Walkway	2.79	0.2	2.59	5	0	0	5	1.9	1.0	A
MO 1	Ped crossing queuing area			27.81	5	1399	93	98	0.3	4.0	D
MO 2	Pedestrian Crossing	2.1	0	2.1	5	1399	93	98	46.8	4.0	D
MO 3	Ped crossing queuing area			16.63	5	1399	93	98	0.2	6.0	F
MO 4	Pedestrian Crossing	2.6	0	2.6	5	0	0	5	1.9	1.0	A

MO 5	Pedestrian Crossing	4.72	0	4.7	5	0	0	5	1.1	1.0	A
MO 6	Ped crossing queuing area			16.09	5	0	0	5	3.2	1.0	A
MO 7	Pedestrian Crossing	2.5	0	2.5	5	0	0	5	2.0	1.0	A
MO 8	Ped crossing queuing area			3.91	5	0	0	5	0.8	3.0	C
P 1	Walkway	6	0.4	5.6	5	0	0	5	0.9	1.0	A
R 1	Walkway	3.5	0.4	3.1	5	887	59	64	20.7	2.0	B
R 2	Walkway	12.13	0.4	11.73	5	0	0	5	0.4	1.0	A
R 3	Walkway	12.14	0.4	11.74	5	0	0	5	0.4	1.0	A
R 4	Walkway	4.06	0.4	3.66	5	0	0	5	1.4	1.0	A
R 5	Walkway	6.1	0.4	5.7	5	0	0	5	0.9	1.0	A
S_1	Walkway	10.5	0.2	10.3	5	8150	543	548	53.2	5.0	E
S_10	Ped crossing queuing area			15.15	5	1640	109	114	0.1	6.0	F
S_11	Walkway	3.5	0.2	3.3	5	1640	109	114	34.6	4.0	D
S_12	Walkway	3.6	0.2	3.4	5	1640	109	114	33.6	4.0	D
S_3	Walkway	10.7	0.4	10.3	5	8150	543	548	53.2	5.0	E
S_4	Walkway	10.7	0.4	10.3	5	8150	543	548	53.2	5.0	E
S_5	Walkway	9.7	0.4	9.3	5	2527	168	173	18.7	2.0	B
S_6	Walkway	13.5	0.4	13.1	5	2527	168	173	13.2	2.0	B
S_7	Walkway	9.1	0.2	8.9	5	887	59	64	7.2	1.0	A
S_8	Ped crossing queuing area			34.43	5	887	59	64	0.54	4.0	D
S_9	Walkway	1.8	0	1.8	5	0	0	5	2.8	1.0	A

Approximated width as it is proposed area

With Bridge 31,500 spectators

ID	Type	Width (m)	Clearance (m)	Effective Width (m)	BKGRD	DEV (15 MINS)	15	1	PPMM EVENT	Fruin LOS identifier EVENT	Fruin LOS EVENT
						DEV (15 MINS)	DEV (1 MIN)	ALL surge			
A 1	Walkway	3.1	0.2	2.9	5	1399	93	98	33.9	4.0	D
A 2	Walkway	5.3	0.4	4.9	5	1399	93	98	20.0	2.0	B
A 3	Walkway	2.6	0.4	2.2	5	4074	272	277	125.7	6.0	F
A 4	Walkway	3.1	0.4	2.7	5	0	0	5	1.9	1.0	A
A 5	Walkway	2.1	0.4	1.7	5	2589	173	178	104.5	6.0	F
A 6	Walkway	2.3	0.4	1.9	5	2589	173	178	93.5	6.0	F
B 1	Walkway	2.6	0.4	2.2	5	0	0	5	2.3	1.0	A
B 10	Pedestrian Crossing	1.5	0	1.5	5	0	0	5	3.3	1.0	A
B 11	Ped crossing queuing area			12.91	5	0	0	5	2.6	1.0	A
B 12	Walkway	2.3	0.4	1.9	5	0	0	5	2.6	1.0	A
B 13	Walkway	5	0	5	5	4013	268	273	54.5	5.0	E
B 14	Walkway	5	0	5	5	4013	268	273	54.5	5.0	E
B 15	Walkway	5	0	5	5	8025	535	540	108.0	6.0	F
B 16	Walkway	1.5	0.4	1.1	5	100	7	12	10.6	1.0	A
B 17	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 18	Ped crossing queuing area			5.82	5	0	0	5	1.2	2.0	B
B 19	Pedestrian Crossing	1.5	0	1.5	5	0	0	5	3.3	1.0	A
B 2	Ped crossing queuing area			22.49	5	0	0	5	4.5	1.0	A
B 3	Pedestrian Crossing	6.3	0	6.3	5	0	0	5	0.8	1.0	A
B 4	Ped crossing queuing area			3.57	5	0	0	5	0.7	3.0	C
B 5	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 6	Ped crossing queuing area			10.06	5	0	0	5	2.0	1.0	A
B 7	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 8	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 9	Ped crossing queuing area			18.02	5	0	0	5	3.6	1.0	A
C 1	Walkway	3	0.4	2.6	5	4013	268	273	104.8	6.0	F
C 10	Walkway	2.5	0.2	2.3	5	3010	201	206	89.4	6.0	F
C 11	Pedestrian Crossing	2.82	0	2.82	5	0	0	5	1.8	1.0	A
C 12	Pedestrian Crossing	2.69	0	2.69	5	0	0	5	1.9	1.0	A
C 2	Ped crossing queuing area			22.9	5	4215	281	286	0.08	7.0	FALSE
C 3	Pedestrian Crossing	3	0	3	5	5117	341	346	115.4	6.0	F
C 4	Ped crossing queuing area			23	5	5117	341	346	0.07	7.0	FALSE
C 5	Walkway	3	0.2	2.8	5	3010	201	206	73.4	5.0	E
C 6	Walkway	3	0.2	2.8	5	4013	268	273	97.3	6.0	F
C 7	Ped crossing queuing area			32.72	5	3010	201	206	0.2	6.0	F
C 8	Pedestrian Crossing	2.4	0	2.4	5	3010	201	206	85.7	6.0	F
C 9	Ped crossing queuing area			14.01	5	3010	201	206	0.1	7.0	FALSE
CA 1	Walkway	3	0.2	2.8	5	4418	295	300	107.0	6.0	F
CA 10	Pedestrian Crossing	2.2	0	2.2	5	2209	147	152	69.2	5.0	E
CA 11	Walkway	2.7	0.2	2.5	5	0	0	5	2.0	1.0	A
CA 12	Walkway	2.6	0.2	2.4	5	0	0	5	2.1	1.0	A
CA 13	Walkway	2.8	0.2	2.6	5	2108	141	146	56.0	5.0	E
CA 14	Walkway	2.8	0.2	2.6	5	2108	141	146	56.0	5.0	E
CA 2	Ped crossing queuing area			45.34	5	4418	295	300	0.2	6.0	F
CA 3	Pedestrian Crossing	2.1	0	2.1	5	0	0	5	2.4	1.0	A
CA 4	Ped crossing queuing area			17	5	0	0	5	3.4	1.0	A
CA 5	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
CA 6	Ped crossing queuing area			19.6	5	0	0	5	3.9	1.0	A
CA 7	Pedestrian Crossing	2.3	0	2.3	5	0	0	5	2.2	1.0	A
CA 8	Ped crossing queuing area			21	5	2209	147	152	0.1	6.0	F
CA 9	Walkway	2.5	0.2	2.3	5	0	0	5	2.2	1.0	A
D 1	Ped crossing queuing area			7.1	5	0	0	5	1.4	1.0	A
D 10	Walkway	5.8	0.2	5.6	5	2553	170	175	31.3	3.0	C
D 11	Walkway	7.1	0.2	6.9	5	2553	170	175	25.4	3.0	C
D 12	Walkway	5.8	0.2	5.6	5	2553	170	175	31.3	3.0	C
D 13	Walkway	8.5	0.4	8.1	5	2553	170	175	21.6	2.0	B
D 14	Walkway	5.3	0.2	5.1	5	4074	272	277	54.2	5.0	E
D 15	Ped crossing queuing area			47.19	5	4074	272	277	0.17	6.0	F
D 16	Pedestrian Crossing	2.3	0	2.3	5	1277	85	90	39.2	4.0	D
D 17	Ped crossing queuing area			22.17	5	1277	85	90	0.2	5.0	E
D 18	Walkway	3.17	0.2	2.97	5	1277	85	90	30.3	3.0	C
D 19	Walkway	1.3	0.2	1.1	5	0	0	5	4.5	1.0	A
D 2	Pedestrian Crossing	1.3	0	1.3	5	0	0	5	3.8	1.0	A
D 20	Walkway	3.3	0.2	3.1	5	0	0	5	1.6	1.0	A
D 21	Ped crossing queuing area			31.11	5	4418	295	300	0.10	6.0	F
D 22	Pedestrian Crossing	2.8	0	2.8	5	4418	295	300	107.0	6.0	F
D 23	Pedestrian Crossing	2.8	0	2.8	5	0	0	5	1.8	1.0	A
D 24	Ped crossing queuing area			8.85	5	0	0	5	1.8	1.0	A
D 25	Walkway	3.5	0.4	3.1	5	0	0	5	1.6	1.0	A
D 26	Ped crossing queuing area			12	5	4074	272	277	0.04	7.0	FALSE
D 27	Pedestrian Crossing	2.7	0	2.7	5	4074	272	277	102.4	6.0	F
D 28	Pedestrian Crossing	1.9	0	1.9	5	0	0	5	2.6	1.0	A
D 29	Ped crossing queuing area			10.55	5	0	0	5	2.1	1.0	A
D 3	Ped crossing queuing area			9	5	0	0	5	1.8	1.0	A
D 30	Pedestrian Crossing	2.2	0	2.2	5	0	0	5	2.3	1.0	A
D 31	Walkway	4.5	0.2	4.3	5	0	0	5	1.2	1.0	A
D 4	Walkway	3	0.4	2.6	5	291	19	24	9.4	1.0	A
D 5	Walkway	4	0.2	3.8	5	2620	175	180	47.3	4.0	D
D 6	Walkway	6	0.2	5.8	5	5107	340	345	59.6	5.0	E
D 7	Walkway	3.9	0.2	3.7	5	5107	340	345	93.4	6.0	F
D 8	Ped crossing queuing area			16.4	5	4418	295	300	0.05	7.0	FALSE
D 9	Walkway	3.9	0.2	3.7	5	2553	170	175	47.4	4.0	D
E 1	Walkway	20	0.4	19.6	5	9946	663	668	34.1	4.0	D
E 10	Ped crossing queuing area			40.62	5	0	0	5	8.1	1.0	A
E 11	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A

E 12	Ped crossing queuing area			8.28	5	0	0	5	1.7	1.0	A
E 13	Pedestrian Crossing	3.3	0.2	3.1	5	0	0	5	1.6	1.0	A
E 14	Ped crossing queuing area			7.62	5	0	0	5	1.5	1.0	A
E 15	Pedestrian Crossing	1.9	0	1.9	5	0	0	5	2.6	1.0	A
E 16	Ped crossing queuing area			18.85	5	0	0	5	3.8	1.0	A
E 17	Walkway	3	0.2	2.8	5	0	0	5	1.8	1.0	A
E 18	Ped crossing queuing area			44.33	5	0	0	5	8.9	1.0	A
E 19	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
E 2	Walkway	6.4	0.2	6.2	5	525	35	40	6.5	1.0	A
E 20	Ped crossing queuing area			25.33	5	2620	175	180	0.14	6.0	F
E 21	Pedestrian Crossing	1.7	0	1.7	5	0	0	5	2.9	1.0	A
E 22	Pedestrian Crossing	1.7	0	1.7	5	0	0	5	2.9	1.0	A
E 23	Pedestrian Crossing	2.2	0	2.2	5	0	0	5	2.3	1.0	A
E 3	Walkway	19.5	0.4	19.1	5	10471	698	703	36.8	4.0	D
E 4	Walkway	19.5	0.4	19.1	5	10471	698	703	36.8	4.0	D
E 5	Walkway	19.8	0.4	19.4	5	2912	194	199	10.3	1.0	A
E 6	Ped crossing queuing area			34.76	5	291	19	24	1.4	1.0	A
E 7	Pedestrian Crossing	1.7	0	1.7	5	0	0	5	2.9	1.0	A
E 8	Ped crossing queuing area			16.25	5	0	0	5	3.3	1.0	A
E 9	Walkway	3.1	0.2	2.9	5	0	0	5	1.7	1.0	A
EL 1	Walkway	1	0.4	0.6	5	1399	93	98	163.7	6.0	F
EL 10	Ped crossing queuing area			18.82	5	1890	126	131	0.1	6.0	F
EL 11	Pedestrian Crossing	3	0	3	5	0	0	5	1.7	1.0	A
EL 12	Ped crossing queuing area			27.66	5	0	0	5	5.5	1.0	A
EL 13	Walkway	3	0.4	2.6	5	0	0	5	1.9	1.0	A
EL 14	Ped crossing queuing area			35.58	5	0	0	5	7.1	1.0	A
EL 15	Pedestrian Crossing	3.6	0	3.6	5	0	0	5	1.4	1.0	A
EL 16	Ped crossing queuing area			21.73	5	0	0	5	4.3	1.0	A
EL 17	Walkway	1	0.4	0.6	5	0	0	5	8.3	1.0	A
EL 17a	Walkway	2	0.4	1.6	5	0	0	5	3.1	1.0	A
EL 18	Pedestrian Crossing	2	0	2	5	0	0	5	2.5	1.0	A
EL 19	Pedestrian Crossing	2.4	0	2.4	5	0	0	5	2.1	1.0	A
EL 1a	Walkway	1	0.4	0.6	5	1399	93	98	163.7	6.0	F
EL 2	Ped crossing queuing area			12.47	5	2675	178	183	0.07	7.0	FALSE
EL 20	Pedestrian Crossing	2.1	0	2.1	5	0	0	5	2.4	1.0	A
EL 21	Walkway	1.8	0.4	1.4	5	1890	126	131	93.6	6.0	F
EL 22	Walkway	2.6	0.4	2.2	5	1890	126	131	59.5	5.0	E
EL 3	Pedestrian Crossing	2.2	0	2.2	5	2675	178	183	83.3	6.0	F
EL 4	Ped crossing queuing area			36.24	5	2675	178	183	0.2	5.0	E
EL 5	Walkway	4.2	0.2	4	5	2675	178	183	45.8	4.0	D
EL 6	Ped crossing queuing area			45.1	5	1890	126	131	0.3	4.0	D
EL 7	Pedestrian Crossing	3.2	0	3.2	5	1890	126	131	40.9	4.0	D
EL 8	Ped crossing queuing area			45.69	5	3780	252	257	0.2	6.0	F
EL 9	Pedestrian Crossing	4	0	4	5	1890	126	131	32.7	3.0	F
F 1	Walkway	25	0.5	24.5	5	7459	497	502	20.5	2.0	B
F 10	Walkway	11	0.4	10.6	5	4196	280	285	26.9	3.0	C
F 11	Walkway	11	0.4	10.6	5	4196	280	285	26.9	3.0	C
F 12	Walkway	11	0.4	10.6	5	2797	186	191	18.1	2.0	B
F 13	Walkway	11	0.4	10.6	5	2797	186	191	18.1	2.0	B
F 14	Walkway	11	0.2	10.8	5	1399	93	98	9.1	1.0	A
F 15	Walkway	5.7	0.4	5.3	5	1399	93	98	18.5	2.0	B
F 16	Walkway	4.4	0.4	4	5	1865	124	129	32.3	3.0	F
F 17	Walkway	4	0.4	3.6	5	0	0	5	1.4	1.0	A
F 18	Walkway	5.7	0.4	5.3	5	1399	93	98	18.5	2.0	B
F 19	Walkway	9.3	0.2	9.1	5	7459	497	502	55.2	5.0	E
F 2	Walkway	25	0	25	5	7459	497	502	20.1	2.0	B
F 20	Walkway	9.3	0.4	8.9	5	7459	497	502	56.4	5.0	E
F 3	Walkway	25	0.4	24.6	5	5594	373	378	15.4	2.0	B
F 4	Walkway	25	0.4	24.6	5	5594	373	378	15.4	2.0	B
F 5	Walkway	7	0	7	5	5594	373	378	54.0	5.0	E
F 6	Walkway	7	0	7	5	5594	373	378	54.0	5.0	E
F 7	Walkway	7.5	1.2	6.3	5	5594	373	378	60.0	5.0	E
F 9	Walkway	7.5	0.4	7.1	5	5594	373	378	53.2	5.0	E
H 1	Walkway	17.3	0.2	17.1	5	9946	663	668	39.1	4.0	D
H 2	Walkway	25	0.4	24.6	5	9946	663	668	27.2	3.0	C
H 3	Walkway	25	0.2	24.8	5	9946	663	668	26.9	3.0	C
H 4	Walkway	33	0.2	32.8	5	2486	166	171	5.2	1.0	A
M 1	Walkway	3	0.2	2.8	5	0	0	5	1.8	1.0	A
M 10	Ped crossing queuing area			29.38	5	5178	345	350	0.08	7.0	FALSE
M 11	Pedestrian Crossing	2.8	0	2.8	5	2589	173	178	63.4	5.0	E
M 12	Ped crossing queuing area			11.51	5	2589	173	178	0.1	7.0	FALSE
M 13	Walkway	2.39	0.2	2.19	5	0	0	5	2.3	1.0	A
M 14	Walkway	3.02	0.2	2.82	5	2209	147	152	54.0	5.0	E
M 15	Ped crossing queuing area			27.95	5	2589	173	178	0.2	6.0	F
M 16	Pedestrian Crossing	2.6	0	2.6	5	2589	173	178	68.3	5.0	E
M 17	Pedestrian Crossing	1.8	0	1.8	5	1105	74	79	43.7	4.0	D
M 18	Ped crossing queuing area			32.23	5	1105	74	79	0.4	4.0	D
M 19	Pedestrian Crossing	2.8	0	2.8	5	0	0	5	1.8	1.0	A
M 2	Walkway	1.4	0.2	1.2	5	0	0	5	4.2	1.0	A
M 20	Walkway	5.51	0.2	5.31	5	1105	74	79	14.8	2.0	B
M 3	Walkway	2.4	0.2	2.2	5	0	0	5	2.3	1.0	A
M 4	Walkway	2.5	0.2	2.3	5	0	0	5	2.2	1.0	A
M 9	Walkway	2.79	0.2	2.59	5	0	0	5	1.9	1.0	A
MO 1	Ped crossing queuing area			27.81	5	1399	93	98	0.3	4.0	D
MO 2	Pedestrian Crossing	2.1	0	2.1	5	1399	93	98	46.8	4.0	D
MO 3	Ped crossing queuing area			16.63	5	1399	93	98	0.2	6.0	F
MO 4	Pedestrian Crossing	2.6	0	2.6	5	0	0	5	1.9	1.0	A

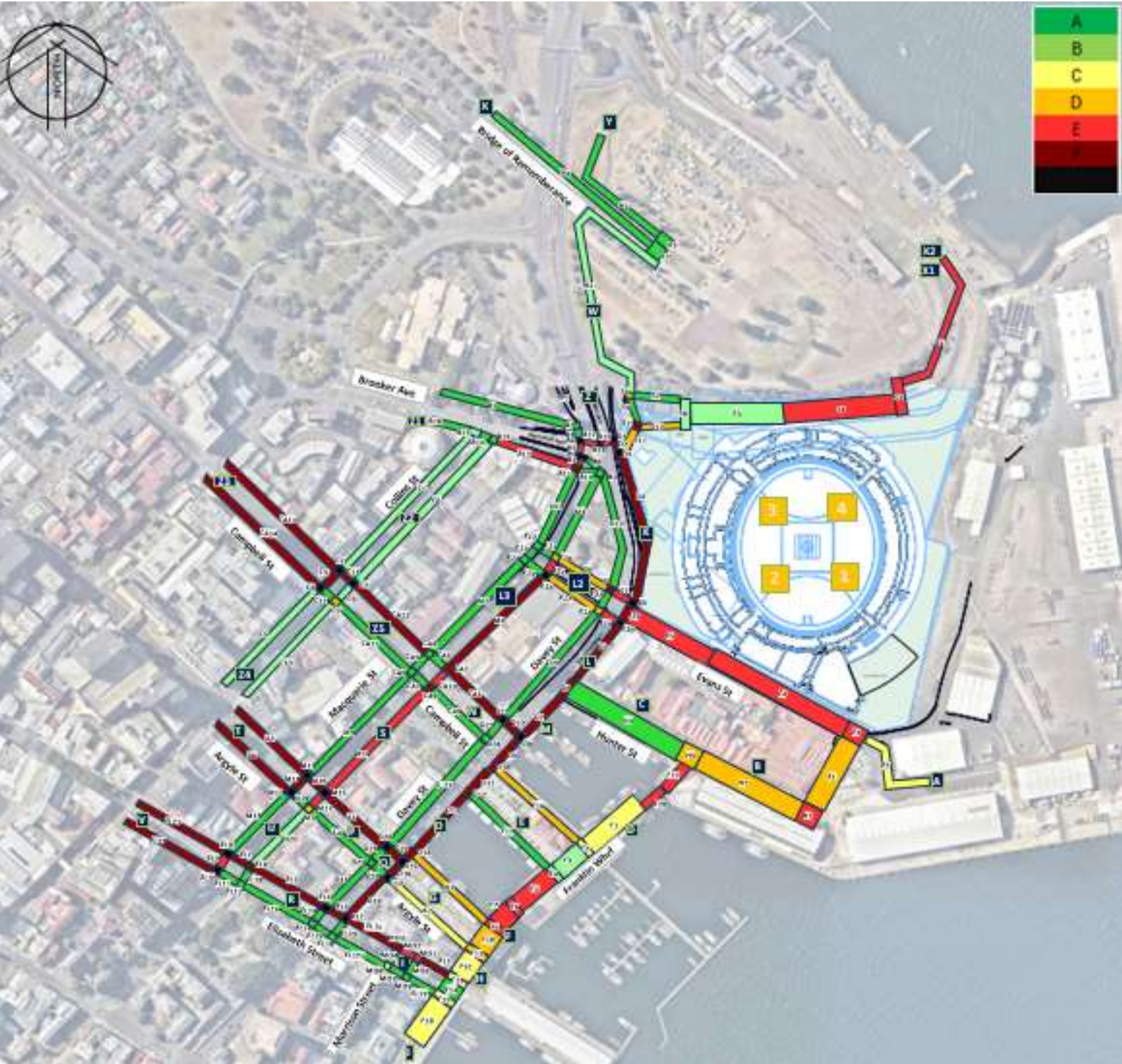
MO 5	Pedestrian Crossing	4.72	0	4.7	5	0	0	5	1.1	1.0	A
MO 6	Ped crossing queuing area			16.09	5	0	0	5	3.2	1.0	A
MO 7	Pedestrian Crossing	2.5	0	2.5	5	0	0	5	2.0	1.0	A
MO 8	Ped crossing queuing area			3.91	5	0	0	5	0.8	3.0	C
P_1	Walkway	6	0.4	5.6	5	8445	563	568	101.4	6.0	F
R_1	Walkway	3.5	0.4	3.1	5	887	59	64	20.7	2.0	B
R_2	Walkway	12.13	0.4	11.73	5	0	0	5	0.4	1.0	A
R_3	Walkway	12.14	0.4	11.74	5	0	0	5	0.4	1.0	A
R_4	Walkway	4.06	0.4	3.66	5	0	0	5	1.4	1.0	A
R_5	Walkway	6.1	0.4	5.7	5	0	0	5	0.9	1.0	A
S_1	Walkway	10.5	0.2	10.3	5	8150	543	548	53.2	5.0	E
S_10	Ped crossing queuing area			15.15	5	0	0	5	3.0	1.0	A
S_11	Walkway	3.5	0.2	3.3	5	0	0	5	1.5	1.0	A
S_12	Walkway	3.6	0.2	3.4	5	0	0	5	1.5	1.0	A
S_3	Walkway	10.7	0.4	10.3	5	8150	543	548	53.2	5.0	E
S_4	Walkway	10.7	0.4	10.3	5	8150	543	548	53.2	5.0	E
S_5	Walkway	9.7	0.4	9.3	5	9332	622	627	67.4	5.0	E
S_6	Walkway	13.5	0.4	13.1	5	9332	622	627	47.9	4.0	D
S_7	Walkway	9.1	0.2	8.9	5	9332	622	627	70.5	5.0	E
S_8	Ped crossing queuing area			34.43	5	9332	622	627	0.05	7.0	FALSE
S_9	Walkway	1.8	0	1.8	5	0	0	5	2.8	1.0	A

Approximated width as it is proposed area

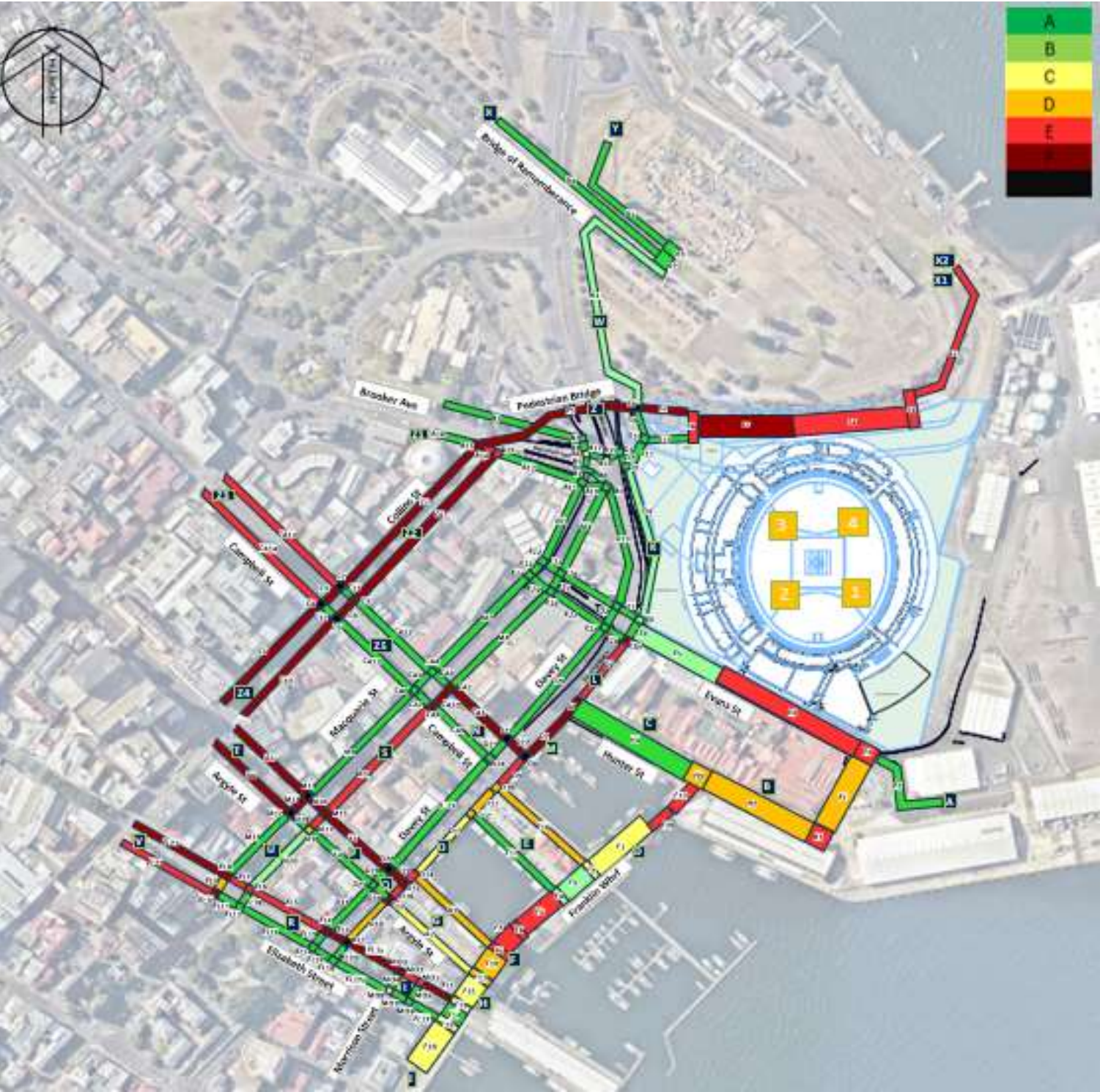


Appendix B 40,000 spectators - Figures

Without Bridge 40,000 spectators



With Bridge 40,000 spectators





Appendix C 40,000 spectators - LOS tabular results

Without Bridge 40,000 spectators

ID	Type	Width (m)	Clearance (m)	Effective Width (m)	BKGRD	DEV (15 MINS)	15	1	PPMM	Fruin	Fruin
						DEV (15 MINS)	DEV (1 MIN)	ALL surge			
									EVENT	LOS identifier	LOS
										EVENT	EVENT
A 1	Walkway	3.1	0.2	2.9	5	1881	125	130	45.0	4.0	D
A 2	Walkway	5.3	0.4	4.9	5	1881	125	130	26.6	3.0	C
A 3	Walkway	2.6	0.4	2.2	5	9040	603	608	276.2	6.0	F
A 4	Walkway	3.1	0.4	2.7	5	0	0	5	1.9	1.0	A
A 5	Walkway	2.1	0.4	1.7	5	5176	345	350	205.9	6.0	F
A 6	Walkway	2.3	0.4	1.9	5	5176	345	350	184.2	6.0	F
B 1	Walkway	2.6	0.4	2.2	5	0	0	5	2.3	1.0	A
B 10	Pedestrian Crossing	1.5	0	1.5	5	0	0	5	3.3	1.0	A
B 11	Ped crossing queuing area			12.91	5	1640	109	114	0.1	6.0	F
B 12	Walkway	2.3	0.4	1.9	5	1640	109	114	60.2	5.0	E
B 13	Walkway	5	0	5	5	650	43	48	9.7	1.0	A
B 14	Walkway	5	0	5	5	650	43	48	9.7	1.0	A
B 15	Walkway	5	0	5	5	1300	87	92	18.3	2.0	B
B 16	Walkway	1.5	0.4	1.1	5	100	7	12	10.6	1.0	A
B 17	Pedestrian Crossing	1.8	0	1.8	5	1640	109	114	63.5	5.0	E
B 18	Ped crossing queuing area			5.82	5	1640	109	114	0.1	7.0	FALSE
B 19	Pedestrian Crossing	1.5	0	1.5	5	1640	109	114	76.2	5.0	E
B 2	Ped crossing queuing area			22.49	5	0	0	5	4.5	1.0	A
B 3	Pedestrian Crossing	6.3	0	6.3	5	0	0	5	0.8	1.0	A
B 4	Ped crossing queuing area			3.57	5	1640	109	114	0.0	7.0	FALSE
B 5	Pedestrian Crossing	1.8	0	1.8	5	1640	109	114	63.5	5.0	E
B 6	Ped crossing queuing area			10.06	5	1640	109	114	0.1	7.0	FALSE
B 7	Pedestrian Crossing	1.8	0	1.8	5	1640	109	114	63.5	5.0	E
B 8	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 9	Ped crossing queuing area			18.02	5	0	0	5	3.6	1.0	A
C 1	Walkway	3	0.4	2.6	5	650	43	48	18.6	2.0	B
C 10	Walkway	2.5	0.2	2.3	5	488	33	38	16.3	2.0	B
C 11	Pedestrian Crossing	2.82	0	2.82	5	6901	460	465	164.9	6.0	F
C 12	Pedestrian Crossing	2.69	0	2.69	5	0	0	5	1.9	1.0	A
C 2	Ped crossing queuing area			22.9	5	7226	482	487	0.05	7.0	FALSE
C 3	Pedestrian Crossing	3	0	3	5	4101	273	278	92.8	6.0	F
C 4	Ped crossing queuing area			23	5	4101	273	278	0.08	7.0	FALSE
C 5	Walkway	3	0.2	2.8	5	488	33	38	13.4	2.0	B
C 6	Walkway	3	0.2	2.8	5	650	43	48	17.3	2.0	B
C 7	Ped crossing queuing area			32.72	5	7389	493	498	0.1	7.0	FALSE
C 8	Pedestrian Crossing	2.4	0	2.4	5	488	33	38	15.6	2.0	B
C 9	Ped crossing queuing area			14.01	5	488	33	38	0.4	4.0	D
CA 1	Walkway	3	0.2	2.8	5	6027	402	407	145.3	6.0	F
CA 10	Pedestrian Crossing	2.2	0	2.2	5	2623	175	180	81.7	5.0	E
CA 11	Walkway	2.7	0.2	2.5	5	6901	460	465	186.0	6.0	F
CA 12	Walkway	2.6	0.2	2.4	5	0	0	5	2.1	1.0	A
CA 13	Walkway	2.8	0.2	2.6	5	3613	241	246	94.6	6.0	F
CA 14	Walkway	2.8	0.2	2.6	5	3613	241	246	94.6	6.0	F
CA 2	Ped crossing queuing area			45.34	5	6027	402	407	0.1	6.0	F
CA 3	Pedestrian Crossing	2.1	0	2.1	5	0	0	5	2.4	1.0	A
CA 4	Ped crossing queuing area			17	5	0	0	5	3.4	1.0	A
CA 5	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
CA 6	Ped crossing queuing area			19.6	5	0	0	5	3.9	1.0	A
CA 7	Pedestrian Crossing	2.3	0	2.3	5	0	0	5	2.2	1.0	A
CA 8	Ped crossing queuing area			21	5	2623	175	180	0.1	6.0	F
CA 9	Walkway	2.5	0.2	2.3	5	0	0	5	2.2	1.0	A
D 1	Ped crossing queuing area			7.1	5	1640	109	114	0.1	7.0	FALSE
D 10	Walkway	5.8	0.2	5.6	5	10556	704	709	126.6	6.0	F
D 11	Walkway	7.1	0.2	6.9	5	10556	704	709	102.7	6.0	F
D 12	Walkway	5.8	0.2	5.6	5	10556	704	709	126.6	6.0	F
D 13	Walkway	8.5	0.4	8.1	5	10556	704	709	87.5	6.0	F
D 14	Walkway	5.3	0.2	5.1	5	9040	603	608	119.2	6.0	F
D 15	Ped crossing queuing area			47.19	5	9040	603	608	0.08	7.0	FALSE
D 16	Pedestrian Crossing	2.3	0	2.3	5	5278	352	357	155.2	6.0	F
D 17	Ped crossing queuing area			22.17	5	5278	352	357	0.1	7.0	FALSE
D 18	Walkway	3.17	0.2	2.97	5	5278	352	357	120.2	6.0	F
D 19	Walkway	1.3	0.2	1.1	5	0	0	5	4.5	1.0	A
D 2	Pedestrian Crossing	1.3	0	1.3	5	1640	109	114	87.9	6.0	F
D 20	Walkway	3.3	0.2	3.1	5	0	0	5	1.6	1.0	A
D 21	Ped crossing queuing area			31.11	5	6027	402	407	0.08	7.0	FALSE
D 22	Pedestrian Crossing	2.8	0	2.8	5	6027	402	407	145.3	6.0	F
D 23	Pedestrian Crossing	2.8	0	2.8	5	0	0	5	1.8	1.0	A
D 24	Ped crossing queuing area			8.85	5	0	0	5	1.8	1.0	A
D 25	Walkway	3.5	0.4	3.1	5	0	0	5	1.6	1.0	A
D 26	Ped crossing queuing area			12	5	9040	603	608	0.02	7.0	FALSE
D 27	Pedestrian Crossing	2.7	0	2.7	5	9040	603	608	225.1	6.0	F
D 28	Pedestrian Crossing	1.9	0	1.9	5	0	0	5	2.6	1.0	A
D 29	Ped crossing queuing area			10.55	5	0	0	5	2.1	1.0	A
D 3	Ped crossing queuing area			9	5	1640	109	114	0.1	7.0	FALSE
D 30	Pedestrian Crossing	2.2	0	2.2	5	0	0	5	2.3	1.0	A
D 31	Walkway	4.5	0.2	4.3	5	0	0	5	1.2	1.0	A
D 4	Walkway	3	0.4	2.6	5	9899	660	665	255.7	6.0	F
D 5	Walkway	4	0.2	3.8	5	10731	715	720	189.6	6.0	F
D 6	Walkway	6	0.2	5.8	5	14075	938	943	162.6	6.0	F
D 7	Walkway	3.9	0.2	3.7	5	14075	938	943	255.0	6.0	F
D 8	Ped crossing queuing area			16.4	5	6027	402	407	0.04	7.0	FALSE
D 9	Walkway	3.9	0.2	3.7	5	10556	704	709	191.6	6.0	F
E 1	Walkway	20	0.4	19.6	5	13376	892	897	45.8	4.0	D
E 10	Ped crossing queuing area			40.62	5	1748	117	122	0.3	4.0	D
E 11	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A

E 12	Ped crossing queuing area			8.28	5	0	0	5	1.7	1.0	A
E 13	Pedestrian Crossing	3.3	0.2	3.1	5	0	0	5	1.6	1.0	A
E 14	Ped crossing queuing area			7.62	5	0	0	5	1.5	1.0	A
E 15	Pedestrian Crossing	1.9	0	1.9	5	0	0	5	2.6	1.0	A
E 16	Ped crossing queuing area			18.85	5	3497	233	238	0.1	7.0	FALSE
E 17	Walkway	3	0.2	2.8	5	1788	119	124	44.4	4.0	D
E 18	Ped crossing queuing area			44.33	5	1788	119	124	0.4	4.0	D
E 19	Pedestrian Crossing	1.8	0	1.8	5	1788	119	124	69.0	5.0	E
E 2	Walkway	6.4	0.2	6.2	5	2788	186	191	30.8	3.0	C
E 20	Ped crossing queuing area			25.33	5	10731	715	720	0.04	7.0	FALSE
E 21	Pedestrian Crossing	1.7	0	1.7	5	1748	117	122	71.5	5.0	E
E 22	Pedestrian Crossing	1.7	0	1.7	5	0	0	5	2.9	1.0	A
E 23	Pedestrian Crossing	2.2	0	2.2	5	9899	660	665	302.2	6.0	F
E 3	Walkway	19.5	0.4	19.1	5	14376	958	963	50.4	5.0	E
E 4	Walkway	19.5	0.4	19.1	5	14376	958	963	50.4	5.0	E
E 5	Walkway	19.8	0.4	19.4	5	20629	1375	1380	71.1	5.0	E
E 6	Ped crossing queuing area			34.76	5	11687	779	784	0.0	7.0	FALSE
E 7	Pedestrian Crossing	1.7	0	1.7	5	1788	119	124	73.1	5.0	E
E 8	Ped crossing queuing area			16.25	5	1788	119	124	0.1	6.0	F
E 9	Walkway	3.1	0.2	2.9	5	1788	119	124	42.8	4.0	D
EL 1	Walkway	1	0.4	0.6	5	1881	125	130	217.3	6.0	F
EL 10	Ped crossing queuing area			18.82	5	4235	282	287	0.1	7.0	FALSE
EL 11	Pedestrian Crossing	3	0	3	5	0	0	5	1.7	1.0	A
EL 12	Ped crossing queuing area			27.66	5	0	0	5	5.5	1.0	A
EL 13	Walkway	3	0.4	2.6	5	0	0	5	1.9	1.0	A
EL 14	Ped crossing queuing area			35.58	5	0	0	5	7.1	1.0	A
EL 15	Pedestrian Crossing	3.6	0	3.6	5	0	0	5	1.4	1.0	A
EL 16	Ped crossing queuing area			21.73	5	0	0	5	4.3	1.0	A
EL 17	Walkway	1	0.4	0.6	5	0	0	5	8.3	1.0	A
EL 17a	Walkway	2	0.4	1.6	5	0	0	5	3.1	1.0	A
EL 18	Pedestrian Crossing	2	0	2	5	0	0	5	2.5	1.0	A
EL 19	Pedestrian Crossing	2.4	0	2.4	5	0	0	5	2.1	1.0	A
EL 1a	Walkway	1	0.4	0.6	5	1881	125	130	217.3	6.0	F
EL 2	Ped crossing queuing area			12.47	5	7159	477	482	0.03	7.0	FALSE
EL 20	Pedestrian Crossing	2.1	0	2.1	5	0	0	5	2.4	1.0	A
EL 21	Walkway	1.8	0.4	1.4	5	4235	282	287	205.2	6.0	F
EL 22	Walkway	2.6	0.4	2.2	5	4235	282	287	130.6	6.0	F
EL 3	Pedestrian Crossing	2.2	0	2.2	5	7159	477	482	219.2	6.0	F
EL 4	Ped crossing queuing area			36.24	5	7159	477	482	0.1	7.0	FALSE
EL 5	Walkway	4.2	0.2	4	5	7159	477	482	120.6	6.0	F
EL 6	Ped crossing queuing area			45.1	5	4235	282	287	0.2	6.0	F
EL 7	Pedestrian Crossing	3.2	0	3.2	5	4235	282	287	89.8	6.0	F
EL 8	Ped crossing queuing area			45.69	5	8470	565	570	0.1	7.0	FALSE
EL 9	Pedestrian Crossing	4	0	4	5	4235	282	287	71.8	5.0	E
F 1	Walkway	25	0.5	24.5	5	10032	669	674	27.5	3.0	C
F 10	Walkway	11	0.4	10.6	5	5643	376	381	36.0	4.0	D
F 11	Walkway	11	0.4	10.6	5	5643	376	381	36.0	4.0	D
F 12	Walkway	11	0.4	10.6	5	3762	251	256	24.1	3.0	C
F 13	Walkway	11	0.4	10.6	5	3762	251	256	24.1	3.0	C
F 14	Walkway	11	0.2	10.8	5	1881	125	130	12.1	1.0	A
F 15	Walkway	5.7	0.4	5.3	5	1881	125	130	24.6	3.0	C
F 16	Walkway	4.4	0.4	4	5	2508	167	172	43.1	4.0	D
F 17	Walkway	4	0.4	3.6	5	0	0	5	1.4	1.0	A
F 18	Walkway	5.7	0.4	5.3	5	1881	125	130	24.6	3.0	C
F 19	Walkway	9.3	0.2	9.1	5	10032	669	674	74.0	5.0	E
F 2	Walkway	25	0	25	5	10032	669	674	27.0	3.0	C
F 20	Walkway	9.3	0.4	8.9	5	10032	669	674	75.7	5.0	E
F 3	Walkway	25	0.4	24.6	5	7524	502	507	20.6	2.0	B
F 4	Walkway	25	0.4	24.6	5	7524	502	507	20.6	2.0	B
F 5	Walkway	7	0	7	5	7524	502	507	72.4	5.0	E
F 6	Walkway	7	0	7	5	7524	502	507	72.4	5.0	E
F 7	Walkway	7.5	1.2	6.3	5	7524	502	507	80.4	5.0	E
F 9	Walkway	7.5	0.4	7.1	5	7524	502	507	71.4	5.0	E
H 1	Walkway	17.3	0.2	17.1	5	13376	892	897	52.4	5.0	E
H 2	Walkway	25	0.4	24.6	5	13376	892	897	36.5	4.0	D
H 3	Walkway	25	0.2	24.8	5	13376	892	897	36.2	4.0	D
H 4	Walkway	33	0.2	32.8	5	3344	223	228	6.9	1.0	A
M 1	Walkway	3	0.2	2.8	5	0	0	5	1.8	1.0	A
M 10	Ped crossing queuing area			29.38	5	10352	690	695	0.04	7.0	FALSE
M 11	Pedestrian Crossing	2.8	0	2.8	5	5176	345	350	125.0	6.0	F
M 12	Ped crossing queuing area			11.51	5	5176	345	350	0.0	7.0	FALSE
M 13	Walkway	2.39	0.2	2.19	5	0	0	5	2.3	1.0	A
M 14	Walkway	3.02	0.2	2.82	5	2623	175	180	63.8	5.0	E
M 15	Ped crossing queuing area			27.95	5	5176	345	350	0.1	7.0	FALSE
M 16	Pedestrian Crossing	2.6	0	2.6	5	5176	345	350	134.6	6.0	F
M 17	Pedestrian Crossing	1.8	0	1.8	5	1311	87	92	51.3	5.0	E
M 18	Ped crossing queuing area			32.23	5	1311	87	92	0.3	4.0	D
M 19	Pedestrian Crossing	2.8	0	2.8	5	0	0	5	1.8	1.0	A
M 2	Walkway	1.4	0.2	1.2	5	0	0	5	4.2	1.0	A
M 20	Walkway	5.51	0.2	5.31	5	1311	87	92	17.4	2.0	B
M 3	Walkway	2.4	0.2	2.2	5	80	5	10	4.7	1.0	A
M 4	Walkway	2.5	0.2	2.3	5	3497	233	238	103.5	6.0	F
M 9	Walkway	2.79	0.2	2.59	5	0	0	5	1.9	1.0	A
MO 1	Ped crossing queuing area			27.81	5	1881	125	130	0.2	5.0	E
MO 2	Pedestrian Crossing	2.1	0	2.1	5	1881	125	130	62.1	5.0	E
MO 3	Ped crossing queuing area			16.63	5	1881	125	130	0.1	6.0	F
MO 4	Pedestrian Crossing	2.6	0	2.6	5	0	0	5	1.9	1.0	A

MO 5	Pedestrian Crossing	4.72	0	4.7	5	0	0	5	1.1	1.0	A
MO 6	Ped crossing queuing area			16.09	5	0	0	5	3.2	1.0	A
MO 7	Pedestrian Crossing	2.5	0	2.5	5	0	0	5	2.0	1.0	A
MO 8	Ped crossing queuing area			3.91	5	0	0	5	0.8	3.0	C
P 1	Walkway	6	0.4	5.6	5	0	0	5	0.9	1.0	A
R 1	Walkway	3.5	0.4	3.1	5	887	59	64	20.7	2.0	B
R 2	Walkway	12.13	0.4	11.73	5	0	0	5	0.4	1.0	A
R 3	Walkway	12.14	0.4	11.74	5	0	0	5	0.4	1.0	A
R 4	Walkway	4.06	0.4	3.66	5	0	0	5	1.4	1.0	A
R 5	Walkway	6.1	0.4	5.7	5	0	0	5	0.9	1.0	A
S_1	Walkway	10.5	0.2	10.3	5	8150	543	548	53.2	5.0	E
S_10	Ped crossing queuing area			15.15	5	1640	109	114	0.1	6.0	F
S_11	Walkway	3.5	0.2	3.3	5	1640	109	114	34.6	4.0	D
S_12	Walkway	3.6	0.2	3.4	5	1640	109	114	33.6	4.0	D
S_3	Walkway	10.7	0.4	10.3	5	8150	543	548	53.2	5.0	E
S_4	Walkway	10.7	0.4	10.3	5	8150	543	548	53.2	5.0	E
S_5	Walkway	9.7	0.4	9.3	5	2527	168	173	18.7	2.0	B
S_6	Walkway	13.5	0.4	13.1	5	2527	168	173	13.2	2.0	B
S_7	Walkway	9.1	0.2	8.9	5	887	59	64	7.2	1.0	A
S_8	Ped crossing queuing area			34.43	5	887	59	64	0.54	4.0	D
S_9	Walkway	1.8	0	1.8	5	0	0	5	2.8	1.0	A

Approximated width as it is proposed area

With Bridge 40,000 spectators

ID	Type	Width (m)	Clearance (m)	Effective Width (m)	BKGRD	DEV (15 MINS)	15	1	PPMM	Fruin	Fruin
						DEV (15 MINS)	DEV (1 MIN)	ALL surge			
									EVENT	LOS identifier	LOS
										EVENT	EVENT
A 1	Walkway	3.1	0.2	2.9	5	1881	125	130	45.0	4.0	D
A 2	Walkway	5.3	0.4	4.9	5	1881	125	130	26.6	3.0	C
A 3	Walkway	2.6	0.4	2.2	5	5590	373	378	171.7	6.0	F
A 4	Walkway	3.1	0.4	2.7	5	0	0	5	1.9	1.0	A
A 5	Walkway	2.1	0.4	1.7	5	3566	238	243	142.8	6.0	F
A 6	Walkway	2.3	0.4	1.9	5	3566	238	243	127.7	6.0	F
B 1	Walkway	2.6	0.4	2.2	5	0	0	5	2.3	1.0	A
B 10	Pedestrian Crossing	1.5	0	1.5	5	0	0	5	3.3	1.0	A
B 11	Ped crossing queuing area			12.91	5	0	0	5	2.6	1.0	A
B 12	Walkway	2.3	0.4	1.9	5	0	0	5	2.6	1.0	A
B 13	Walkway	5	0	5	5	5559	371	376	75.1	5.0	E
B 14	Walkway	5	0	5	5	5559	371	376	75.1	5.0	E
B 15	Walkway	5	0	5	5	11119	741	746	149.2	6.0	F
B 16	Walkway	1.5	0.4	1.1	5	100	7	12	10.6	1.0	A
B 17	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 18	Ped crossing queuing area			5.82	5	0	0	5	1.2	2.0	B
B 19	Pedestrian Crossing	1.5	0	1.5	5	0	0	5	3.3	1.0	A
B 2	Ped crossing queuing area			22.49	5	0	0	5	4.5	1.0	A
B 3	Pedestrian Crossing	6.3	0	6.3	5	0	0	5	0.8	1.0	A
B 4	Ped crossing queuing area			3.57	5	0	0	5	0.7	3.0	C
B 5	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 6	Ped crossing queuing area			10.06	5	0	0	5	2.0	1.0	A
B 7	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 8	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
B 9	Ped crossing queuing area			18.02	5	0	0	5	3.6	1.0	A
C 1	Walkway	3	0.4	2.6	5	5559	371	376	144.5	6.0	F
C 10	Walkway	2.5	0.2	2.3	5	4169	278	283	123.0	6.0	F
C 11	Pedestrian Crossing	2.82	0	2.82	5	0	0	5	1.8	1.0	A
C 12	Pedestrian Crossing	2.69	0	2.69	5	0	0	5	1.9	1.0	A
C 2	Ped crossing queuing area			22.9	5	5862	391	396	0.06	7.0	FALSE
C 3	Pedestrian Crossing	3	0	3	5	7100	473	478	159.5	6.0	F
C 4	Ped crossing queuing area			23	5	7100	473	478	0.05	7.0	FALSE
C 5	Walkway	3	0.2	2.8	5	4169	278	283	101.1	6.0	F
C 6	Walkway	3	0.2	2.8	5	5559	371	376	134.1	6.0	F
C 7	Ped crossing queuing area			32.72	5	4169	278	283	0.1	6.0	F
C 8	Pedestrian Crossing	2.4	0	2.4	5	4169	278	283	117.9	6.0	F
C 9	Ped crossing queuing area			14.01	5	4169	278	283	0.0	7.0	FALSE
CA 1	Walkway	3	0.2	2.8	5	6164	411	416	148.6	6.0	F
CA 10	Pedestrian Crossing	2.2	0	2.2	5	3082	205	210	95.7	6.0	F
CA 11	Walkway	2.7	0.2	2.5	5	0	0	5	2.0	1.0	A
CA 12	Walkway	2.6	0.2	2.4	5	0	0	5	2.1	1.0	A
CA 13	Walkway	2.8	0.2	2.6	5	2931	195	200	77.1	5.0	E
CA 14	Walkway	2.8	0.2	2.6	5	2931	195	200	77.1	5.0	E
CA 2	Ped crossing queuing area			45.34	5	6164	411	416	0.1	6.0	F
CA 3	Pedestrian Crossing	2.1	0	2.1	5	0	0	5	2.4	1.0	A
CA 4	Ped crossing queuing area			17	5	0	0	5	3.4	1.0	A
CA 5	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
CA 6	Ped crossing queuing area			19.6	5	0	0	5	3.9	1.0	A
CA 7	Pedestrian Crossing	2.3	0	2.3	5	0	0	5	2.2	1.0	A
CA 8	Ped crossing queuing area			21	5	3082	205	210	0.1	6.0	F
CA 9	Walkway	2.5	0.2	2.3	5	0	0	5	2.2	1.0	A
D 1	Ped crossing queuing area			7.1	5	0	0	5	1.4	1.0	A
D 10	Walkway	5.8	0.2	5.6	5	3656	244	249	44.4	4.0	D
D 11	Walkway	7.1	0.2	6.9	5	3656	244	249	36.0	4.0	D
D 12	Walkway	5.8	0.2	5.6	5	3656	244	249	44.4	4.0	D
D 13	Walkway	8.5	0.4	8.1	5	3656	244	249	30.7	3.0	C
D 14	Walkway	5.3	0.2	5.1	5	5590	373	378	74.1	5.0	E
D 15	Ped crossing queuing area			47.19	5	5590	373	378	0.12	6.0	F
D 16	Pedestrian Crossing	2.3	0	2.3	5	1828	122	127	55.2	5.0	E
D 17	Ped crossing queuing area			22.17	5	1828	122	127	0.2	6.0	F
D 18	Walkway	3.17	0.2	2.97	5	1828	122	127	42.7	4.0	D
D 19	Walkway	1.3	0.2	1.1	5	0	0	5	4.5	1.0	A
D 2	Pedestrian Crossing	1.3	0	1.3	5	0	0	5	3.8	1.0	A
D 20	Walkway	3.3	0.2	3.1	5	0	0	5	1.6	1.0	A
D 21	Ped crossing queuing area			31.11	5	6164	411	416	0.07	7.0	FALSE
D 22	Pedestrian Crossing	2.8	0	2.8	5	6164	411	416	148.6	6.0	F
D 23	Pedestrian Crossing	2.8	0	2.8	5	0	0	5	1.8	1.0	A
D 24	Ped crossing queuing area			8.85	5	0	0	5	1.8	1.0	A
D 25	Walkway	3.5	0.4	3.1	5	0	0	5	1.6	1.0	A
D 26	Ped crossing queuing area			12	5	5590	373	378	0.03	7.0	FALSE
D 27	Pedestrian Crossing	2.7	0	2.7	5	5590	373	378	139.9	6.0	F
D 28	Pedestrian Crossing	1.9	0	1.9	5	0	0	5	2.6	1.0	A
D 29	Ped crossing queuing area			10.55	5	0	0	5	2.1	1.0	A
D 3	Ped crossing queuing area			9	5	0	0	5	1.8	1.0	A
D 30	Pedestrian Crossing	2.2	0	2.2	5	0	0	5	2.3	1.0	A
D 31	Walkway	4.5	0.2	4.3	5	0	0	5	1.2	1.0	A
D 4	Walkway	3	0.4	2.6	5	441	29	34	13.2	2.0	B
D 5	Walkway	4	0.2	3.8	5	3968	265	270	70.9	5.0	E
D 6	Walkway	6	0.2	5.8	5	7312	487	492	84.9	6.0	F
D 7	Walkway	3.9	0.2	3.7	5	7312	487	492	133.1	6.0	F
D 8	Ped crossing queuing area			16.4	5	6164	411	416	0.04	7.0	FALSE
D 9	Walkway	3.9	0.2	3.7	5	3656	244	249	67.2	5.0	E
E 1	Walkway	20	0.4	19.6	5	13376	892	897	45.8	4.0	D
E 10	Ped crossing queuing area			40.62	5	0	0	5	8.1	1.0	A
E 11	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A

E 12	Ped crossing queuing area			8.28	5	0	0	5	1.7	1.0	A
E 13	Pedestrian Crossing	3.3	0.2	3.1	5	0	0	5	1.6	1.0	A
E 14	Ped crossing queuing area			7.62	5	0	0	5	1.5	1.0	A
E 15	Pedestrian Crossing	1.9	0	1.9	5	0	0	5	2.6	1.0	A
E 16	Ped crossing queuing area			18.85	5	0	0	5	3.8	1.0	A
E 17	Walkway	3	0.2	2.8	5	0	0	5	1.8	1.0	A
E 18	Ped crossing queuing area			44.33	5	0	0	5	8.9	1.0	A
E 19	Pedestrian Crossing	1.8	0	1.8	5	0	0	5	2.8	1.0	A
E 2	Walkway	6.4	0.2	6.2	5	1000	67	72	11.6	1.0	A
E 20	Ped crossing queuing area			25.33	5	3968	265	270	0.09	6.0	F
E 21	Pedestrian Crossing	1.7	0	1.7	5	0	0	5	2.9	1.0	A
E 22	Pedestrian Crossing	1.7	0	1.7	5	0	0	5	2.9	1.0	A
E 23	Pedestrian Crossing	2.2	0	2.2	5	0	0	5	2.3	1.0	A
E 3	Walkway	19.5	0.4	19.1	5	14376	958	963	50.4	5.0	E
E 4	Walkway	19.5	0.4	19.1	5	14376	958	963	50.4	5.0	E
E 5	Walkway	19.8	0.4	19.4	5	4409	294	299	15.4	2.0	B
E 6	Ped crossing queuing area			34.76	5	441	29	34	1.0	2.0	B
E 7	Pedestrian Crossing	1.7	0	1.7	5	0	0	5	2.9	1.0	A
E 8	Ped crossing queuing area			16.25	5	0	0	5	3.3	1.0	A
E 9	Walkway	3.1	0.2	2.9	5	0	0	5	1.7	1.0	A
EL 1	Walkway	1	0.4	0.6	5	1881	125	130	217.3	6.0	F
EL 10	Ped crossing queuing area			18.82	5	2625	175	180	0.1	6.0	F
EL 11	Pedestrian Crossing	3	0	3	5	0	0	5	1.7	1.0	A
EL 12	Ped crossing queuing area			27.66	5	0	0	5	5.5	1.0	A
EL 13	Walkway	3	0.4	2.6	5	0	0	5	1.9	1.0	A
EL 14	Ped crossing queuing area			35.58	5	0	0	5	7.1	1.0	A
EL 15	Pedestrian Crossing	3.6	0	3.6	5	0	0	5	1.4	1.0	A
EL 16	Ped crossing queuing area			21.73	5	0	0	5	4.3	1.0	A
EL 17	Walkway	1	0.4	0.6	5	0	0	5	8.3	1.0	A
EL 17a	Walkway	2	0.4	1.6	5	0	0	5	3.1	1.0	A
EL 18	Pedestrian Crossing	2	0	2	5	0	0	5	2.5	1.0	A
EL 19	Pedestrian Crossing	2.4	0	2.4	5	0	0	5	2.1	1.0	A
EL 1a	Walkway	1	0.4	0.6	5	1881	125	130	217.3	6.0	F
EL 2	Ped crossing queuing area			12.47	5	3709	247	252	0.05	7.0	FALSE
EL 20	Pedestrian Crossing	2.1	0	2.1	5	0	0	5	2.4	1.0	A
EL 21	Walkway	1.8	0.4	1.4	5	2625	175	180	128.6	6.0	F
EL 22	Walkway	2.6	0.4	2.2	5	2625	175	180	81.8	5.0	E
EL 3	Pedestrian Crossing	2.2	0	2.2	5	3709	247	252	114.7	6.0	F
EL 4	Ped crossing queuing area			36.24	5	3709	247	252	0.1	6.0	F
EL 5	Walkway	4.2	0.2	4	5	3709	247	252	63.1	5.0	E
EL 6	Ped crossing queuing area			45.1	5	2625	175	180	0.3	5.0	E
EL 7	Pedestrian Crossing	3.2	0	3.2	5	2625	175	180	56.3	5.0	E
EL 8	Ped crossing queuing area			45.69	5	5250	350	355	0.1	6.0	F
EL 9	Pedestrian Crossing	4	0	4	5	2625	175	180	45.0	4.0	D
F 1	Walkway	25	0.5	24.5	5	10032	669	674	27.5	3.0	C
F 10	Walkway	11	0.4	10.6	5	5643	376	381	36.0	4.0	D
F 11	Walkway	11	0.4	10.6	5	5643	376	381	36.0	4.0	D
F 12	Walkway	11	0.4	10.6	5	3762	251	256	24.1	3.0	C
F 13	Walkway	11	0.4	10.6	5	3762	251	256	24.1	3.0	C
F 14	Walkway	11	0.2	10.8	5	1881	125	130	12.1	1.0	A
F 15	Walkway	5.7	0.4	5.3	5	1881	125	130	24.6	3.0	C
F 16	Walkway	4.4	0.4	4	5	2508	167	172	43.1	4.0	D
F 17	Walkway	4	0.4	3.6	5	0	0	5	1.4	1.0	A
F 18	Walkway	5.7	0.4	5.3	5	1881	125	130	24.6	3.0	C
F 19	Walkway	9.3	0.2	9.1	5	10032	669	674	74.0	5.0	E
F 2	Walkway	25	0	25	5	10032	669	674	27.0	3.0	C
F 20	Walkway	9.3	0.4	8.9	5	10032	669	674	75.7	5.0	E
F 3	Walkway	25	0.4	24.6	5	7524	502	507	20.6	2.0	B
F 4	Walkway	25	0.4	24.6	5	7524	502	507	20.6	2.0	B
F 5	Walkway	7	0	7	5	7524	502	507	72.4	5.0	E
F 6	Walkway	7	0	7	5	7524	502	507	72.4	5.0	E
F 7	Walkway	7.5	1.2	6.3	5	7524	502	507	80.4	5.0	E
F 9	Walkway	7.5	0.4	7.1	5	7524	502	507	71.4	5.0	E
H 1	Walkway	17.3	0.2	17.1	5	13376	892	897	52.4	5.0	E
H 2	Walkway	25	0.4	24.6	5	13376	892	897	36.5	4.0	D
H 3	Walkway	25	0.2	24.8	5	13376	892	897	36.2	4.0	D
H 4	Walkway	33	0.2	32.8	5	3344	223	228	6.9	1.0	A
M 1	Walkway	3	0.2	2.8	5	0	0	5	1.8	1.0	A
M 10	Ped crossing queuing area			29.38	5	7131	475	480	0.06	7.0	FALSE
M 11	Pedestrian Crossing	2.8	0	2.8	5	3566	238	243	86.7	6.0	F
M 12	Ped crossing queuing area			11.51	5	3566	238	243	0.0	7.0	FALSE
M 13	Walkway	2.39	0.2	2.19	5	0	0	5	2.3	1.0	A
M 14	Walkway	3.02	0.2	2.82	5	3082	205	210	74.6	5.0	E
M 15	Ped crossing queuing area			27.95	5	3566	238	243	0.1	6.0	F
M 16	Pedestrian Crossing	2.6	0	2.6	5	3566	238	243	93.3	6.0	F
M 17	Pedestrian Crossing	1.8	0	1.8	5	1541	103	108	59.9	5.0	E
M 18	Ped crossing queuing area			32.23	5	1541	103	108	0.3	4.0	D
M 19	Pedestrian Crossing	2.8	0	2.8	5	0	0	5	1.8	1.0	A
M 2	Walkway	1.4	0.2	1.2	5	0	0	5	4.2	1.0	A
M 20	Walkway	5.51	0.2	5.31	5	1541	103	108	20.3	2.0	B
M 3	Walkway	2.4	0.2	2.2	5	0	0	5	2.3	1.0	A
M 4	Walkway	2.5	0.2	2.3	5	0	0	5	2.2	1.0	A
M 9	Walkway	2.79	0.2	2.59	5	0	0	5	1.9	1.0	A
MO 1	Ped crossing queuing area			27.81	5	1881	125	130	0.2	5.0	E
MO 2	Pedestrian Crossing	2.1	0	2.1	5	1881	125	130	62.1	5.0	E
MO 3	Ped crossing queuing area			16.63	5	1881	125	130	0.1	6.0	F
MO 4	Pedestrian Crossing	2.6	0	2.6	5	0	0	5	1.9	1.0	A

MO 5	Pedestrian Crossing	4.72	0	4.7	5	0	0	5	1.1	1.0	A
MO 6	Ped crossing queuing area			16.09	5	0	0	5	3.2	1.0	A
MO 7	Pedestrian Crossing	2.5	0	2.5	5	0	0	5	2.0	1.0	A
MO 8	Ped crossing queuing area			3.91	5	0	0	5	0.8	3.0	C
P_1	Walkway	6	0.4	5.6	5	11539	769	774	138.3	6.0	F
R_1	Walkway	3.5	0.4	3.1	5	887	59	64	20.7	2.0	B
R_2	Walkway	12.13	0.4	11.73	5	0	0	5	0.4	1.0	A
R_3	Walkway	12.14	0.4	11.74	5	0	0	5	0.4	1.0	A
R_4	Walkway	4.06	0.4	3.66	5	0	0	5	1.4	1.0	A
R_5	Walkway	6.1	0.4	5.7	5	0	0	5	0.9	1.0	A
S_1	Walkway	10.5	0.2	10.3	5	8150	543	548	53.2	5.0	E
S_10	Ped crossing queuing area			15.15	5	0	0	5	3.0	1.0	A
S_11	Walkway	3.5	0.2	3.3	5	0	0	5	1.5	1.0	A
S_12	Walkway	3.6	0.2	3.4	5	0	0	5	1.5	1.0	A
S_3	Walkway	10.7	0.4	10.3	5	8150	543	548	53.2	5.0	E
S_4	Walkway	10.7	0.4	10.3	5	8150	543	548	53.2	5.0	E
S_5	Walkway	9.7	0.4	9.3	5	12426	828	833	89.6	6.0	F
S_6	Walkway	13.5	0.4	13.1	5	12426	828	833	63.6	5.0	E
S_7	Walkway	9.1	0.2	8.9	5	12426	828	833	93.6	6.0	F
S_8	Ped crossing queuing area			34.43	5	12426	828	833	0.04	7.0	FALSE
S_9	Walkway	1.8	0	1.8	5	0	0	5	2.8	1.0	A

Approximated width as it is proposed area

Appendix H

Walking and cycling memo



Memo

To: Macquarie Point Development Corporation

From: WSP

Subject: **Macquarie Point Multipurpose Stadium – Transport Study**
Active Transport workshop findings

Our ref: PS206346-HBA-PAM-MEM-004-RevC-Walking & cycling

Date: 21 June 2024

1. Introduction

A workshop was held on 9 May 2024 to strengthen understanding of issues and opportunities regarding active transport and the Macquarie Point Multipurpose Stadium precinct development. Attendees at the workshop included staff from the Department of State Growth, City of Hobart and Cycling South.

The purpose of this memo is to document the findings of the workshop which will inform active transport planning for the Stadium Project.

2. Policy context

The following key policy documents have direct relevance and influence on the outcomes which Macquarie Point needs to achieve. Importantly, all of these policies are aligned in supporting mode shift towards walking and cycling for transport. Given the central city waterfront location, the stadium design has interface with the walking and cycling networks, projects and policies established.

30-Year Greater Hobart Plan, Greater Hobart Committee, 2022 – a whole-of-city guide to assist the development of transport, housing and employment centres and how they relate to each other in the long term. Supports delivery of the **2050 Vision for Greater Hobart:**

- “We will live in the world’s best small capital city, a city built for people that is connected, friendly and safe.
- Greater Hobart is a thriving and inspiring place to live, where we all work together to make a positive contribution to our extraordinary environment.”

This plan provides strategic advice on sequencing development to support growth and notes that significant policy decisions are required to support more active transport and public transport across Hobart.

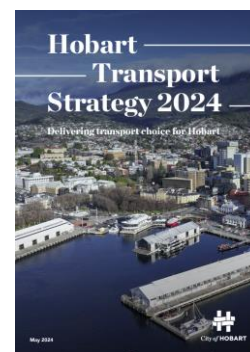


Transport Strategy 2024 (Draft), City of Hobart 2024

The new Transport Strategy centres on providing more choice in how residents, workers and visitors move around Hobart.

Four overarching strategy themes are identified:

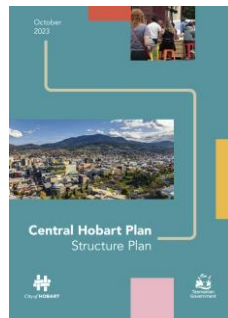
- Encouraging and enabling behaviour change
- Safe and healthy streets for all
- Climate ready transport\
- Emerging trends to enhance our city



Central Hobart Plan, City of Hobart 2023

A structure plan and urban design framework for the central city. Identifies Macquarie Point as a Civic and Cultural precinct bordering (but beyond) the plan area. This plan identifies five goals for the city:

- A captivating and dynamic capital city
- Public spaces that engage and create joy
- Sustainable buildings with character
- Integrated and accessible movement networks
- An investment ready and innovative city



Parking and Kerbside Management Plan (Draft), City of Hobart 2024

Guides management of streets, including kerbside space and off-street parking and supporting decisions related to parking supply and demand management.

Six principles are established:

- Transport Choice
- Reliability and Availability
- Transport User and Customer Experience
- Value of Parking and Kerbside Access
- [Managing] Demand
- Efficiency and Equity

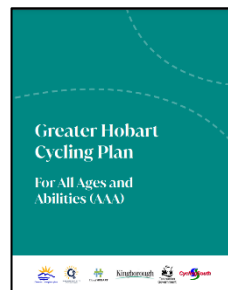


Greater Hobart Cycling Plan

The Greater Hobart Cycling Plan guides planning and investment in an interconnected network of cycling paths across Greater Hobart, encouraging increased use and enhancing active transport options across the region.

The Plan aims to provide infrastructure that is safe, convenient and comfortable for 'All Ages and Abilities' cycling.

Successful transport mode shares (with a positive split to non-car modes) for Macquarie Point will require safe and accessible active transport links to/from the stadium and bicycle parking options within the precinct which can be shared across facilities under typical weekday conditions.

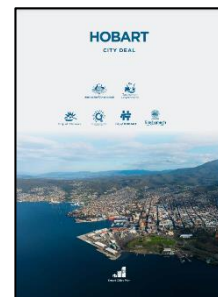


Hobart City Deal

The Hobart City Deal is a 10-year partnership between the Clarence, Glenorchy, Hobart and Kingborough councils, and the Tasmanian and Australian Governments. It provides a framework to guide and encourage further investment in Greater Hobart, plans for future growth and addresses key strategic and infrastructure challenges.

This City Deal will improve accessibility in Greater Hobart, embracing the idea of a 30-minute city, including through the establishment of a reliable, sustainable and cost-effective transport system with a focus on active and public transport.

The City Deal has a direct link to River Derwent ferries and other public transport upgrades which are required to achieve the positive non-car mode splits at Macquarie Point.

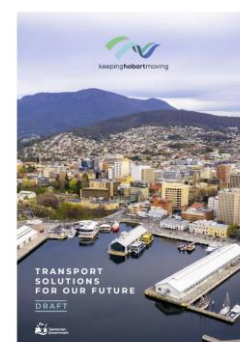


Keeping Hobart Moving (Draft), Department of State Growth 2023

A 10+ year program of projects for Hobart to create a safe, accessible, people-focused and future-ready city that enables economic prosperity and liveability. This includes rapid buses, ferries and cycling projects.

There are three phases of project development and delivery in the plan:

- Phase one (2023 – 2026) begins construction on selected inner-Hobart developments and major growth areas. Significant planning work proceeds for later stages.
- Phase two (2026 – 2029) focuses on significant construction activities, expanding transport infrastructure to suburbs, and improving walking, wheeling, biking, and public transport reliability
- Phase three (2029-2033) sees the completion of a network cycling and public transport options, offering more efficient and flexible travel.



3. Potential for cycling trips

Figure 3.1 presents the 5-minute, 10-minute, 15-minute and 20-minute cycling catchments surrounding the proposed stadium site. This shows that most residents who live within the Hobart local government area could reach the site by bike within 20 minutes if they chose to do so. These catchments assume an average cycling speed of 20km per hour along the existing streets, taking slope into account. However, and importantly, the catchment does not consider whether it feels comfortable or safe to ride on that street.

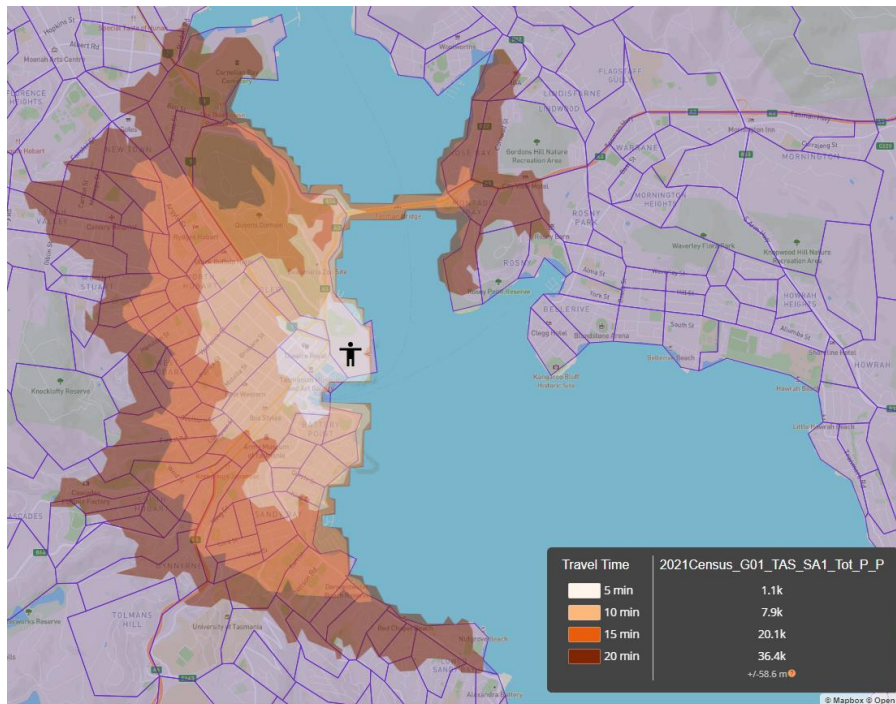


Figure 3.1 Macquarie point stadium cycling catchment.

37 per cent of Tasmanians are interested in cycling for transport but do not feel confident riding with traffic¹ (see Figure 3.2). For these people to consider choosing to cycle, a low stress facility with either physical separation from traffic or a low-speed, low-volume of traffic is required. If these conditions for rider comfort are not met, then only a small portion of riders (referred to as “strong and fearless” riders) are likely to ride. 5 per cent of Tasmanian residents hold this level of confidence to ride in stressful traffic conditions.

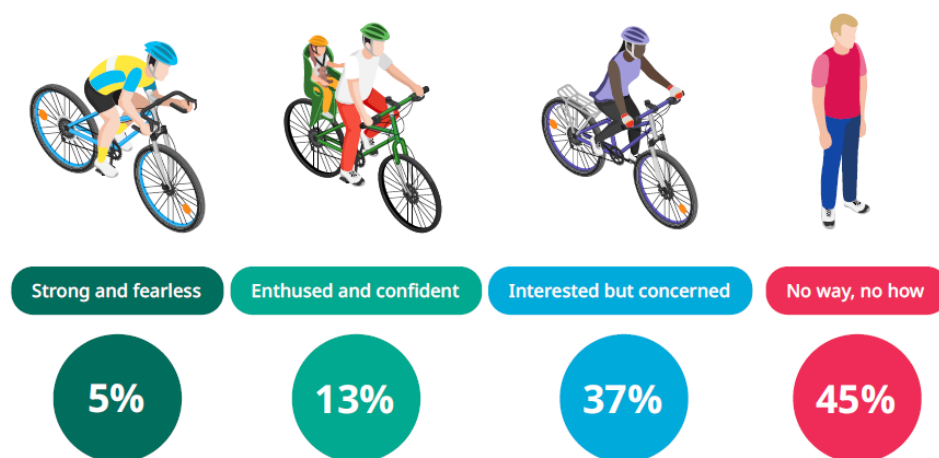


Figure 3.2 Geller typologies of cycling confidence across the Tasmanian population.

¹ CWANZ national cycling survey 2023



Mode share to the stadium precinct will vary by time of day, day of week, weather and many other factors. Excellent connectivity to the cycling network means that there is an excellent opportunity for cycling trips during non-event times. Dark conditions late at night during the colder winter months will reduce the attractiveness of cycling, particularly for lower capacity events when other travel options are convenient.

Table 3.1 shows the residential population who live within the catchments mapped in Figure 3.1, and proportions these numbers to the levels of cycling confidence in Tasmania. That is, how many people will live within the 5-minute, 10-minute, 15-minute and 20-minute cycling catchments of the stadium site, and an estimate of the level of cycling confidence of these residents. This shows that:

- 36,405 residents live within a 20-minute bike ride of the stadium site
- Approximately 1,820 of these residents are confident to ride in busy traffic without any dedicated cycling infrastructure, such as the conditions on streets throughout Hobart today
- With low-quality cycling infrastructure such as painted bike lanes, an additional 4733 ‘enthused and confident’ riders would be within a 20-minutes ride
- If a high-quality cycling network for all ages and abilities connected to the site, then riders who are ‘interested but concerned’ may consider choosing to cycle. This is an additional 13,470 residents tallying to a total of 20,023 potential riders within the 20-minute catchment.

About 45 per cent of residents within the catchment are not interested or are unable to choose to cycle (13,470 residents within a 20-minute ride). These residents will need to be served by other transport modes. However, if high quality cycle routes are connected to safe local streets (with low volumes of low-speed traffic), a significant portion of the ~20,000 residents could choose to ride. Cycling is very time competitive with other modes over this distance, making it an attractive choice with the right infrastructure. Providing this infrastructure would have a significant reduction on traffic congestion during peak period and at event times.

Notably for Hobart, the accelerating uptake of e-bikes extends the catchment area and significantly reduces the barrier presented by topography as well as further extending the distance people will regularly choose to cycle.

Mode share to the stadium precinct will vary by time of day, day of week, weather and many other factors. Excellent connectivity to the cycling network means that there is an excellent opportunity for cycling trips during non-event times. Dark conditions late at night during the colder winter months will reduce the attractiveness of cycling, particularly for lower capacity events when other travel options are convenient.

Table 3.1 ABS census population within cycling catchments and their estimated level of cycling confidence

MINS	RESIDENTS	STRONG AND FEARLESS	ENTHUSED AND CONFIDENT	INTERESTED BUT CONCERNED	NOT INTERESTED
5	1081	54	140	400	486
10	7852	393	1021	2905	3533
15	20063	1003	2608	7423	9028
20	36405	1820	4733	13470	16382

4. Potential for walking (only) trips

Figure 4.1 presents the walking catchment surrounding the proposed stadium site in 5-minute bands up to a 25-minute walk. Analysis using ABS census data shows there are 6,800 residents who live within this area. The area extends across all of Hobart central business district and a large supply of off-street car parking.

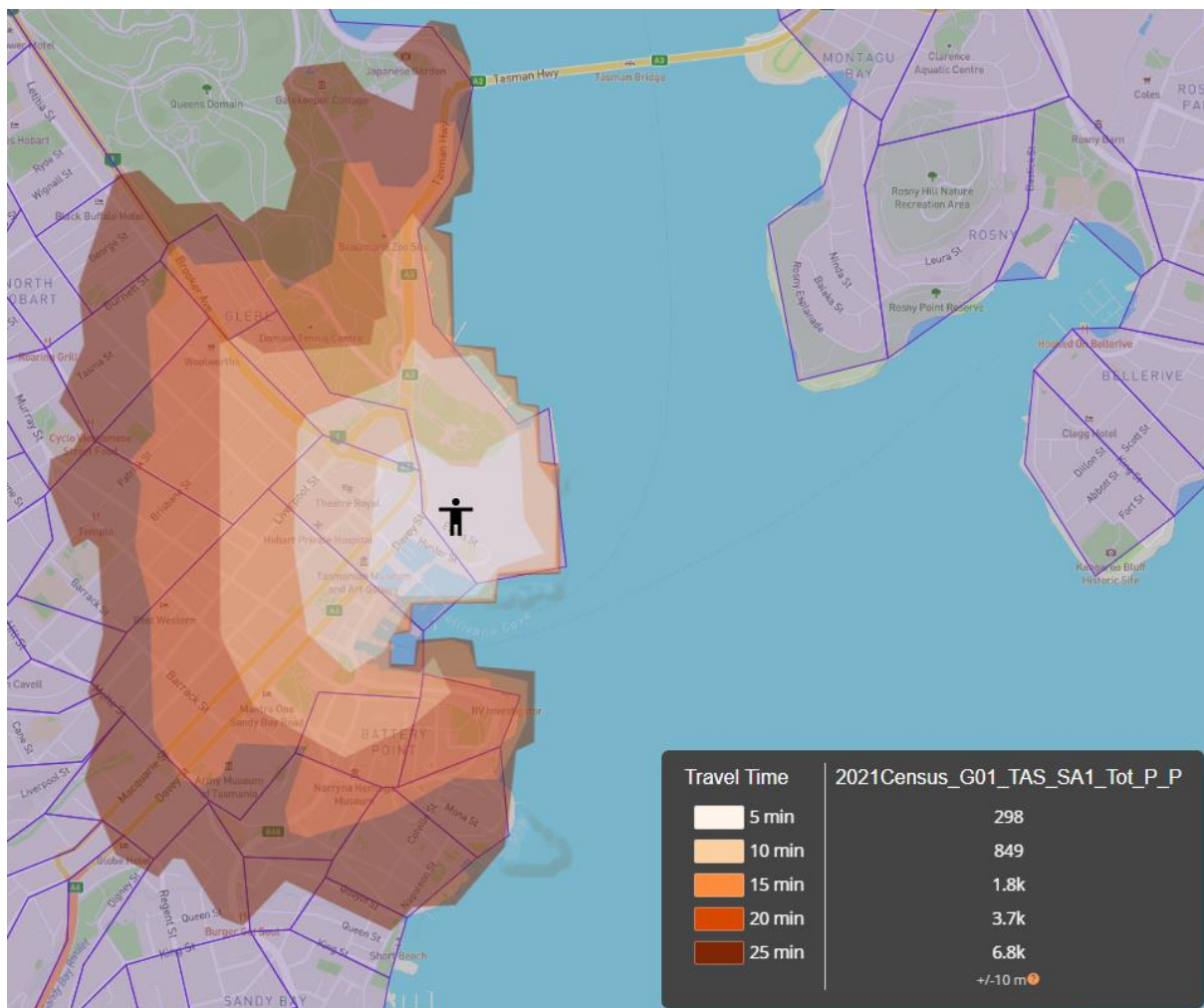


Figure 4.1 Walking catchments in 5-minute bands

To understand the likelihood of residents within this area choosing to walk for trips to the stadium precinct, we can consider how many people in Hobart walk for short trips on a typical day. Hobartians have the highest journey to work mode share of any capital city in Australia. Figure 3 presents mode share by distance.

- Walking is the most popular mode for trips under 1 kilometre in distance serving 64 per cent of trips.
- For distances between 1km to 2.5km, walking serves more than 1 in 5 trips.

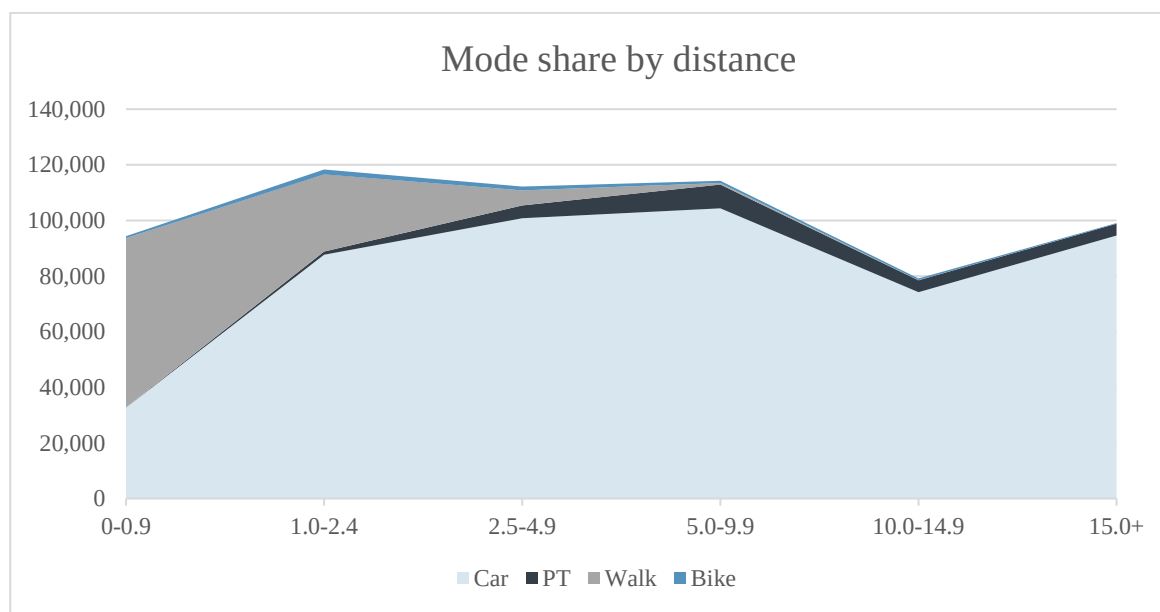


Figure 4.2 Mode share by distance, all daily trips, Greater Hobart Travel Survey 2019

Table 4.1 Mode share by distance and time, Greater Hobart Travel Survey 2019

TRIP DISTANCE (KM)	0-0.9	1.0-2.4	2.5-4.9	5.0-9.9	10.0-14.9
Travel time at 1.5m/s (excluding delays at traffic signals)	Up to 11 mins	Between 11 and 28mins	Between 28mins and 1hr	1-2hrs	2-3hrs
Car	32,700	87,700	100,800	104,400	74,200
PT	100	1,100	4,600	8,500	4,200
Walk	60,800	27,800	5,400	500	100
Bike	700	1,700	1,400	900	600

5. Mon-Friday: Trips through and within the precinct, typical weekday

Figure 5.1 and Table 5.1 describe challenges and opportunities identified through the workshop for the day-to-day scenario. This is considered a typical weekday when people travel through the precinct to reach destinations. There will be trips to and from the precinct at these times but in much smaller numbers and with different mode share than during event times.

Trips through and within the precinct, typical weekday



Figure 5.1 Workshop output for challenges and opportunities, non-event times

Table 5.1 Descriptions of challenges and opportunities identified in Figure 5.1

CHALLENGES	OPPORTUNITIES
1. The alignment of the walking and cycling path on the Eastern external stadium concourse of stadium is indirect with sharp corners and possible pinch points. This may lead to conflicts between pedestrians and cycling commuters.	A. The eastern periphery is a desirable cycling route alignment as it is less steep. Prioritising this alignment as the preferred commuter route through the precinct will reduce pedestrian, cyclist and traffic conflicts on the Davey Street shared path (2), especially if Victoria Dock bridge was used to connect across the waterfront. More people riding bicycles will also help to activate this part of the precinct.
2. Davey and Macquarie Streets create major barrier for connectivity between the site and Hobart CBD, with extreme delays for people waiting at traffic signals to cross the road. The current legibility of the street network guides people walking/riding towards the waterfront and Davey St, rather than towards Collins St, for trips between CBD and Mac Point. This is despite Collins being more direct, as the connection is severed by 7 lanes of heavy traffic.	B. The existing Rose Garden Bridge is a beneficial connection for walking and cycling trips to the northern side of the CBD.

CHALLENGES	OPPORTUNITIES
This location on Davey Street is also a major traffic congestion point with limited additional capacity or resilience. Increased interface with more people walking and riding in this location is a concern.	
3. Collins St (Campbell to Brooker) is not activated or well used as street. This is despite very low through-traffic and a substantial public space. It suffers from limited connectivity to the northeast.	C. Dunn Place car park has potential for more productive uses in the future, and the open space permeability offers benefits for the precinct. A previous design competition was held to consider the future for this site.
4. The design of the proposed bridge including the landing areas will be a complex (Davey Street and Brooker/Collins). Without the bridge there would be very concerning road safety, traffic performance and pedestrian overcrowding issues. The bridge is currently unfunded.	D. The steps up to the Cenotaph provides an alternative and more direct connection from the Davey Street shared path. An area under the Collins Street bridge would be well located for secure cycle parking.
5. McVilly intersection is a major traffic choke point (Davey and Brooker with limited additional capacity. Interactions between motor vehicles and active transport should be avoided, possibly through grade separation.	E. The Bridge of Remembrance provides connectivity between the Domain and the precinct, with numerous benefits such as preventing walking and cycling demand at McVilly intersection underpass.
6. The current shared path alignment on the south side of the Northern access road creates conflict points and operational concerns. People walking and cycling will be drawn to the waterfront, which is severed by the northern access road and heavy vehicles.	
7. City-bound riders travel at fast speeds with a slope of 3-5% on the existing shared path. An increased volume of pedestrians, particularly in the morning peak period will lead to conflicts and possible crashes. There are constraints towards increasing the width of this path including existing trees and the alignment of the Tasman Highway/Davey Street. The current path alignment is poorly designed for pedestrians and cyclists, with narrow width and sharp downhill turns creating conflict.	
8. The bus turning circle and queueing area needs to integrate with a day-to-day walking/cycling connection. Bus conflict points with the shared path in this area will also need to be managed.	
9. The walking and cycling crossing of the Northern Access Road, including the port access gate needs to be carefully designed to manage interactions with vulnerable road users, enhance the experience of	

CHALLENGES	OPPORTUNITIES
visitors, and maintain safe and reliable port access for vehicles.	
10. The traffic signals at Davey and Evans Street signals create lengthy delays for people walking and riding. Excessive delays due to long cycle times at crossings result in lower compliance. Crossing against the lights exposes people walking and riding to conflict with vehicles entering Evans Street.	
11. Port access likely to continue via Evans St (even with Northern Access Road). Potential conflict with active transport will need to be managed. Currently cyclists are requested to dismount when Evans Street is closed for cruise ship arrival. Dismount signage has poor compliance and does not accommodate riders with a disability. Such signage should be avoided through better design. Buses and high volumes of pedestrians in cruise ship dock. Potential conflict with cyclists passing through.	

6. Trips to and from the precinct during an event

Figure 6.1 and Table 6.1 identify challenges and opportunities throughout the precinct area during event times. The scenario being considered represents an evening or weekend event, with specific consideration of periods of access and egress to the venue.

Trips to and from the precinct during an event



Figure 6.1 Workshop output for challenges and opportunities, non-event times

Table 6.1 Descriptions of challenges and opportunities identified in Figure 6.1

CHALLENGES	OPPORTUNITIES
1. A combination of heavy traffic volumes and crowds is of significant concern for road safety and traffic performance.	A. Connections between the proposed Collins Street bridge, Cenotaph Steps and the Bridge of remembrance could be improved.
2. The McVilly interchange has limited capacity (especially at peak times) and has sub-standard geometry. This has implications for increasing use of the northern access road to restrict access into Evans Street during event times for crowd safety.	B. Improving the Davey Street shared path to increase comfort and safety will benefit people walking and riding both during events and at other times.
3. Traffic management will be required for crowds spilling into Davey and Evans intersection.	C. The area at the eastern end of Evans Street, currently providing car parking for the university, is owned by the State. This offers a significant opportunity for a better public realm outcome to integrate the precinct. This space holds potential for a variety of uses which should be further explored. This would be a good location for bicycle parking during events.
4. The Davey Street eastern footpath is narrow and will be under pressure during egress. This is a shared path and a primary route part of the Greater Hobart Cycling Network. A 5min parking bay which also serves the Red Decker tourist bus is currently occupying street space in this location.	D. There is potential for pedestrian connection through the UTAS building. This will need to consider capacity constraints but will improve the permeability of this area.

CHALLENGES	OPPORTUNITIES
5. The pedestrian corridor from the eastern end of Evans Street across the Victoria Dock Bridge requires enhancement to support crowd movements.	E. Public realm improvements along the waterfront will significantly enhance the visitor experience, improve access to ferries and encourage more movement away from the Davey Street alignment. This link also offers potential to serve cycling and micromobility trips.
6. An integrated design of Evans Street required to ensure the precinct integrated with the streetscape. This is likely to have significant costs to design and deliver and is not captured within the project area but is critical to its success.	F. An alternative bicycle route via the Rose Garden Bridge and Bridge of Remembrance could be promoted during event access and egress times to reduce conflict between people riding and event crowds.
7. The current open-air car park at the end of Evans Street is not compatible with redevelopment of the site. The southern stadium entrance will need a seamless connection to the public space in this area which is outside of the project area. Redesign must provide and accessible public space.	
8. The preferred cycling route on the eastern external concourse is likely to require riders to dismount for short periods during event entry and egress periods. An alternative route will need to be provided during these times. Shared e-scooters will need to be managed with geofencing controls during these times to encourage travel to and from the venue but mitigate conflict between crowds and riders.	
9. Secure bicycle parking needs to be provided for event attendees. This needs to include facilities for electric cargo bikes, e-scooters and other micromobility devices.	

7. Cycling network gaps & projects

Figure 7.1 identifies the existing cycling network, noting the current cycle infrastructure provision on streets which serve access to the stadium site.

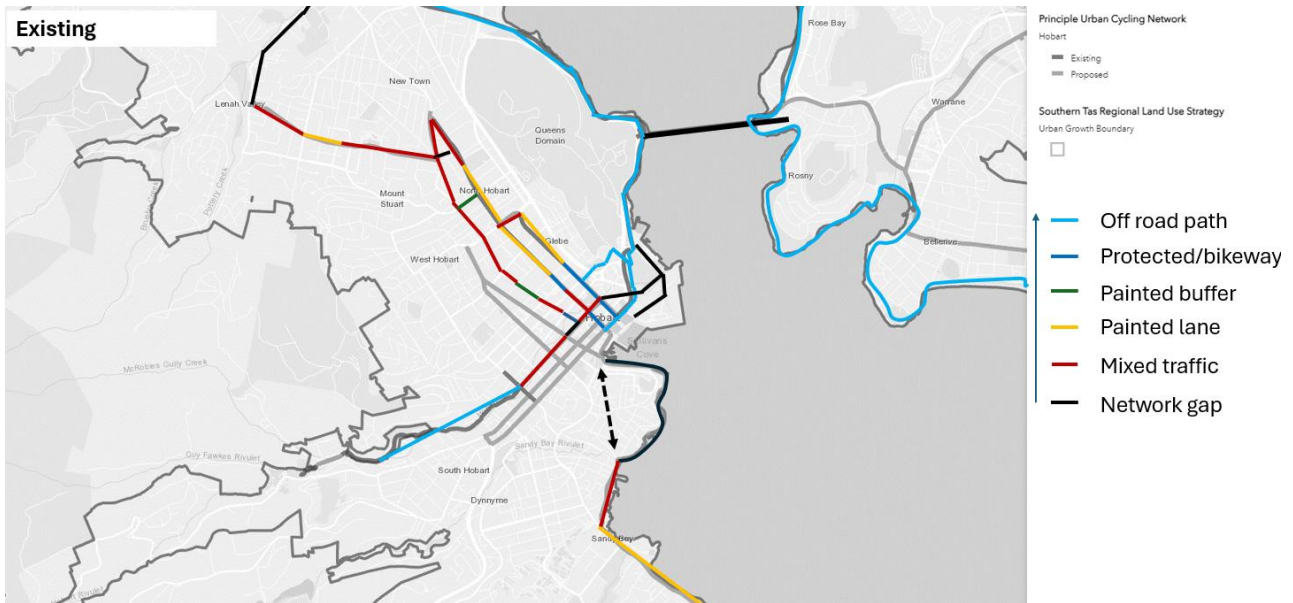


Figure 7.1 Existing cycling treatments on key routes connecting to the stadium site

This highlights that currently there are significant barriers network limitations for less confident riders, and key network gaps which limit the utility of bicycles for transport in Hobart. Key network barriers towards cycle access to and within the stadium precinct include:

- Very narrow paths across the Tasman Bridge
- The one-way segment Collins Street between Murray and Elizabeth Streets, with cycling restrictions on the footpaths in this block
- There is no provision in Battery Point for trips towards Sandy Bay
- The existing painted on-road lanes in Midtown and North Hobart are only suitable for confident riders
- There are currently no routes through the Macquarie point site

Workshop participants were asked to identify planned cycling projects which support improved connectivity to the stadium precinct. In addition, existing plans have been reviewed to assess the extent to which planned projects will improve cycling access to the stadium precinct by 2029. These are shown in Figure 7.2 and the references are outlined in Table 7.1.



Figure 7.2 Planned projects on routes which connect to the site

Table 7.1 Projects and references for cycle network upgrades on routes connecting to the site

NORTH-WEST	NORTH HOBART	NORTH-EAST	CBD AND SOUTH HOBART	BATTERY POINT AND SANDY BAY
Intercity Cycleway upgrades (crossings, lighting) <i>Greater Hobart Cycling Plan</i>	Argyle and Campbell Street protected lanes <i>Central Hobart Plan, Greater Hobart Cycling Plan</i>	Tasman bridge path upgrade <i>Greater Hobart Cycling Plan</i>	Collins Street walking and cycling bridge <i>Macquarie Point Draft Precinct Plan (2023)</i>	Battery Point walkway ‘Coastal trail’ <i>Sandy Bay Neighbourhood Plan</i>
Augusta Road, Lenah Valley <i>Greater Hobart Cycling Plan, Northern Suburbs LAMP</i>	Burnett Street (Argyle to Campbell) <i>North Hobart Neighbourhood Plan</i>	Clarence foreshore trail (resurfacing) <i>Greater Hobart Cycling Plan</i>	Collins St bicycle lanes (Molle to Murray) <i>Central Hobart Plan, Greater Hobart Cycling Plan</i>	De Witt Street, Hampden Road, Finlay Street – Battery Point <i>Battery Point LAMP</i>
Creek Road, New Town <i>Northern Suburbs LAMP</i>	Elizabeth Street bicycle lanes <i>Central Hobart Plan, Greater Hobart Cycling Plan</i>		Hobart Rivulet track, surface & lighting <i>Greater Hobart Cycling Plan</i>	Sandy Bay Road <i>Sandy Bay Neighbourhood Plan, Greater Hobart Cycling Plan</i>

Although the projects planned for delivery by 2029 would significantly improve cycling access to the precinct, there are several locations where existing plans alone will fail to attract and support more people to ride. To support mode shift to cycling for trips to the precinct, additional projects and upgrades are identified in Figure 7.3 below.



Figure 7.3 Upgraded network to maximise Macquarie Point cycling access catchment

The key improvements are described in Table 7.2 below.

Table 7.2 Upgrades to improve cycling mode share, delivered by others

LOCATION	IMPROVEMENT
Argyle and Campbell Street bicycle lanes (Davey to Burnett Street)	Upgrade to continuous, protected bicycle lanes
Argyle Street (Burnett to New Town Road)	Upgrade/provide protected bicycle lanes
Collins Street to east side of Tasman Highway	Provide a shared pedestrian and cycle bridge
Collins Street (Molle to Brooker)	Upgrade to permanent, continuous protected bicycle lanes
Hunter street	Improve cycling connections and network connections

8. Walking and public realm projects

Participants were also asked to identify planned projects to improve the pedestrian network and public realm in proximity to the site. These projects, to be delivered by others, will encourage more people to walk, improve the visitor experience and compliment the stadium development.

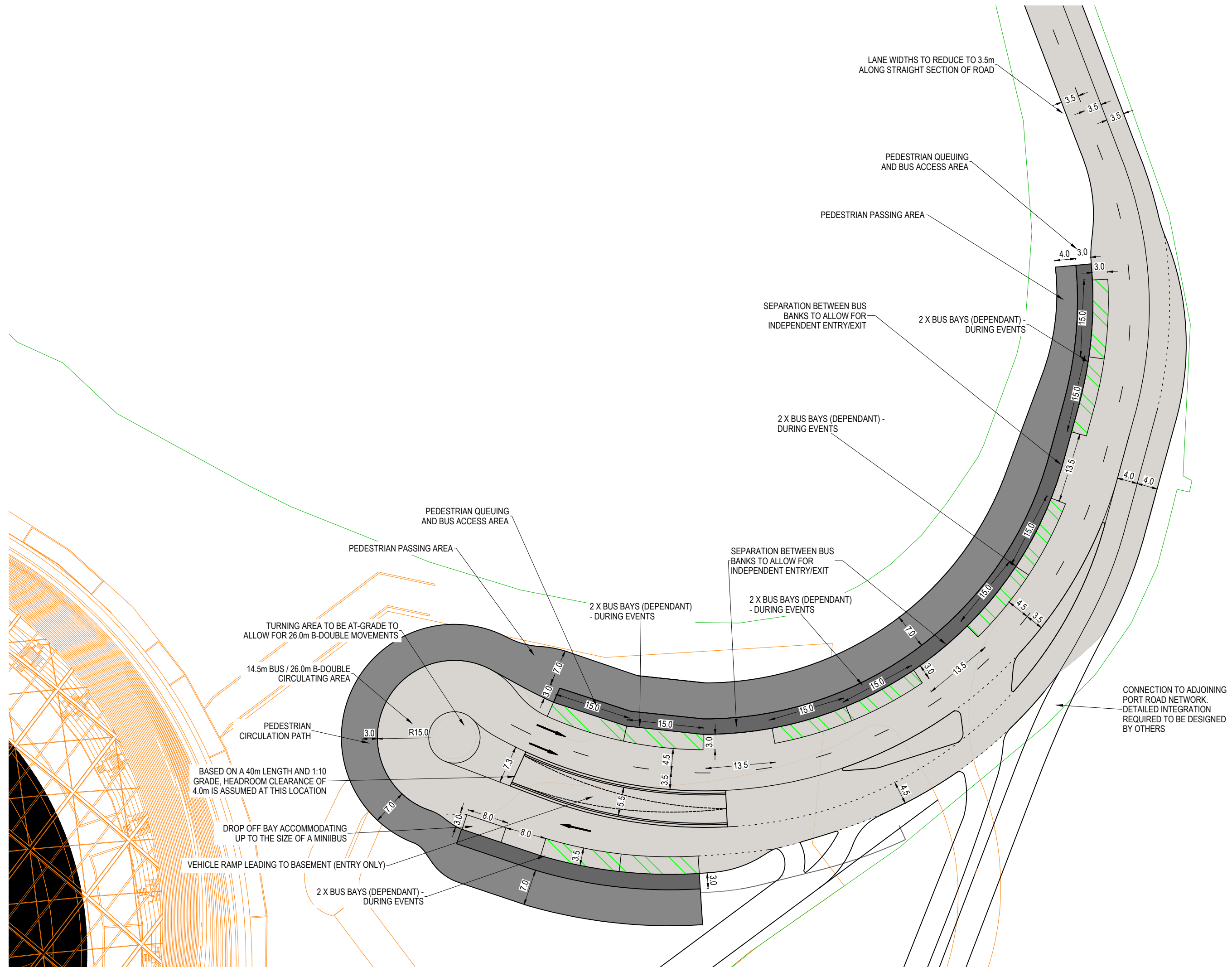
Table 8.1 *Planned projects which support pedestrian connections to the precinct*

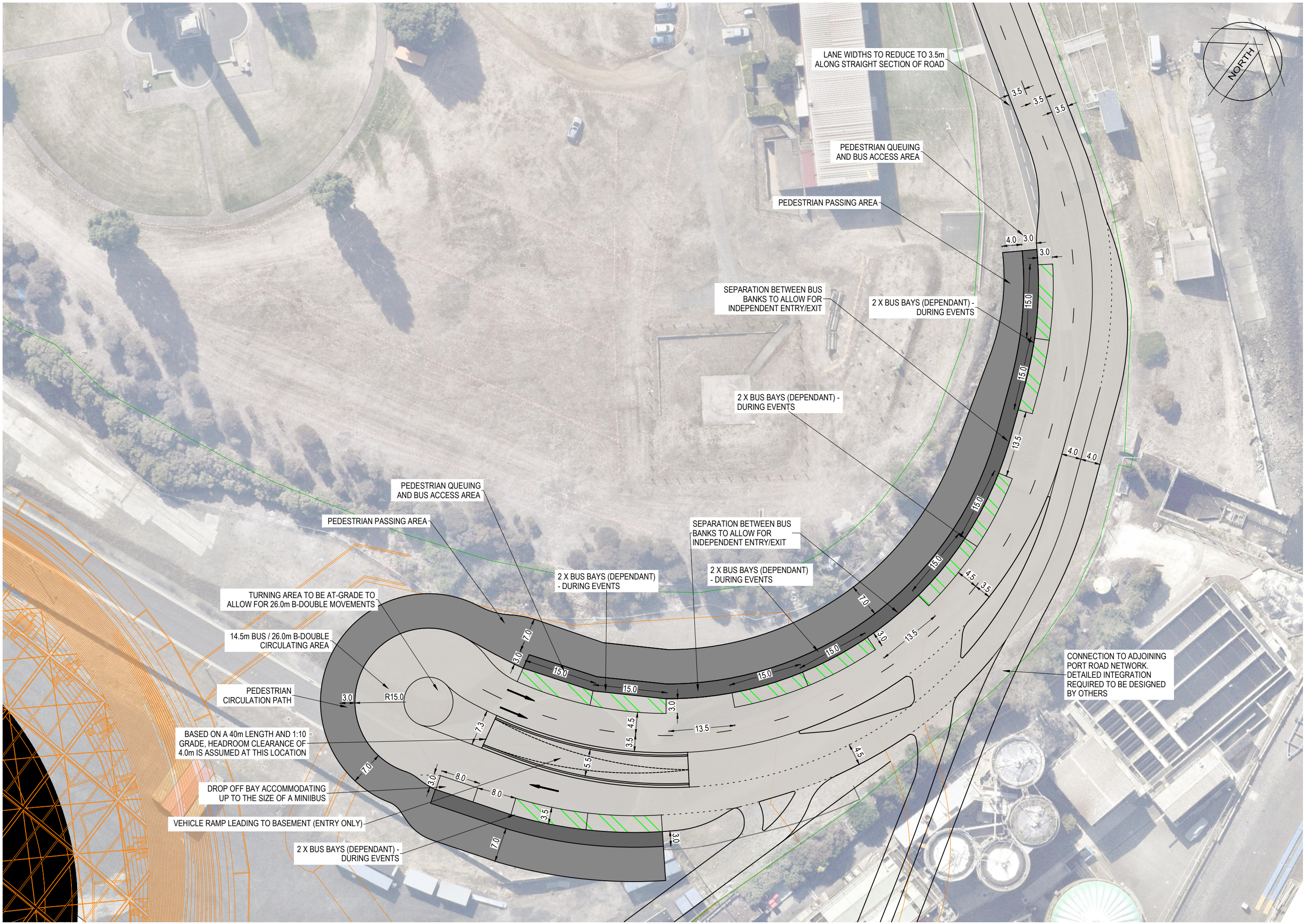
PROJECT	DESCRIPTION	RELEVANCE	BENEFITS
Collins Street Vision <i>Central Hobart Plan</i>	The Central Hobart Plan identifies this as an action to redesign Collins Street introducing more greenery, bicycle lanes, an improved pedestrian environment and new public spaces	Strong alignment with the proposed pedestrian/cycle bridge, improving the connection to the CBD	Attract more pedestrian trips to/from the central city Improve visitor experience Enhance the integration of the stadium with the city
Elizabeth Street Vision <i>Central Hobart Plan</i>	The Central Hobart Plan identifies this as an action to redesign Elizabeth Street, midtown including introducing more greenery, bicycle lanes, an improved pedestrian environment and new public spaces.	As the central spine of Hobart CBD, any improvements to the experience on foot would encourage more pedestrian trips to and from the stadium precinct.	Attract more pedestrian trips to/from the central city Improve visitor experience
Pedestrian underpass to Brook St Pier	An underpass of Davey Street to enhance connection to the Brook Street Pier	This project could reduce pedestrian volumes at traffic signals along Macquarie and Davey Streets	Support some pedestrian trips to/from the central city
UTAS School of Creative Arts building	Potential pedestrian link	New pedestrian link near the south-east corner of the stadium precinct	Improvements to pedestrian permeability in the Evans/Davey block would improve pedestrian

Appendix I

Bus plaza concept designs







LANE WIDTHS TO REDUCE TO 3.5m
ALONG STRAIGHT SECTION OF ROAD

PEDESTRIAN QUEUING
AND BUS ACCESS AREA

PEDESTRIAN PASSING AREA

SEPARATION BETWEEN BUS
BANKS TO ALLOW FOR
INDEPENDENT ENTRY/EXIT

2 X BUS BAYS (DEPENDANT) -
DURING EVENTS

2 X BUS BAYS (DEPENDANT) -
DURING EVENTS

PEDESTRIAN QUEUING
AND BUS ACCESS AREA

PEDESTRIAN PASSING AREA

SEPARATION BETWEEN BUS
BANKS TO ALLOW FOR
INDEPENDENT ENTRY/EXIT

2 X BUS BAYS (DEPENDANT) -
DURING EVENTS

2 X BUS BAYS (DEPENDANT) -
DURING EVENTS

TURNING AREA TO BE AT-GRADE TO
ALLOW FOR 26.0m B-DOUBLE MOVEMENTS

14.5m BUS / 26.0m B-DOUBLE
CIRCULATING AREA

PEDESTRIAN
CIRCULATION PATH

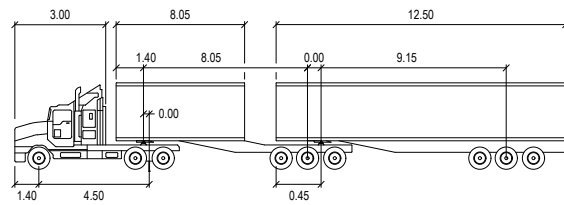
BASED ON A 40m LENGTH AND 1:10
GRADE, HEADROOM CLEARANCE OF
4.0m IS ASSUMED AT THIS LOCATION

DROP OFF BAY ACCOMMODATING
UP TO THE SIZE OF A MINIIBUS

VEHICLE RAMP LEADING TO BASEMENT (ENTRY ONLY)

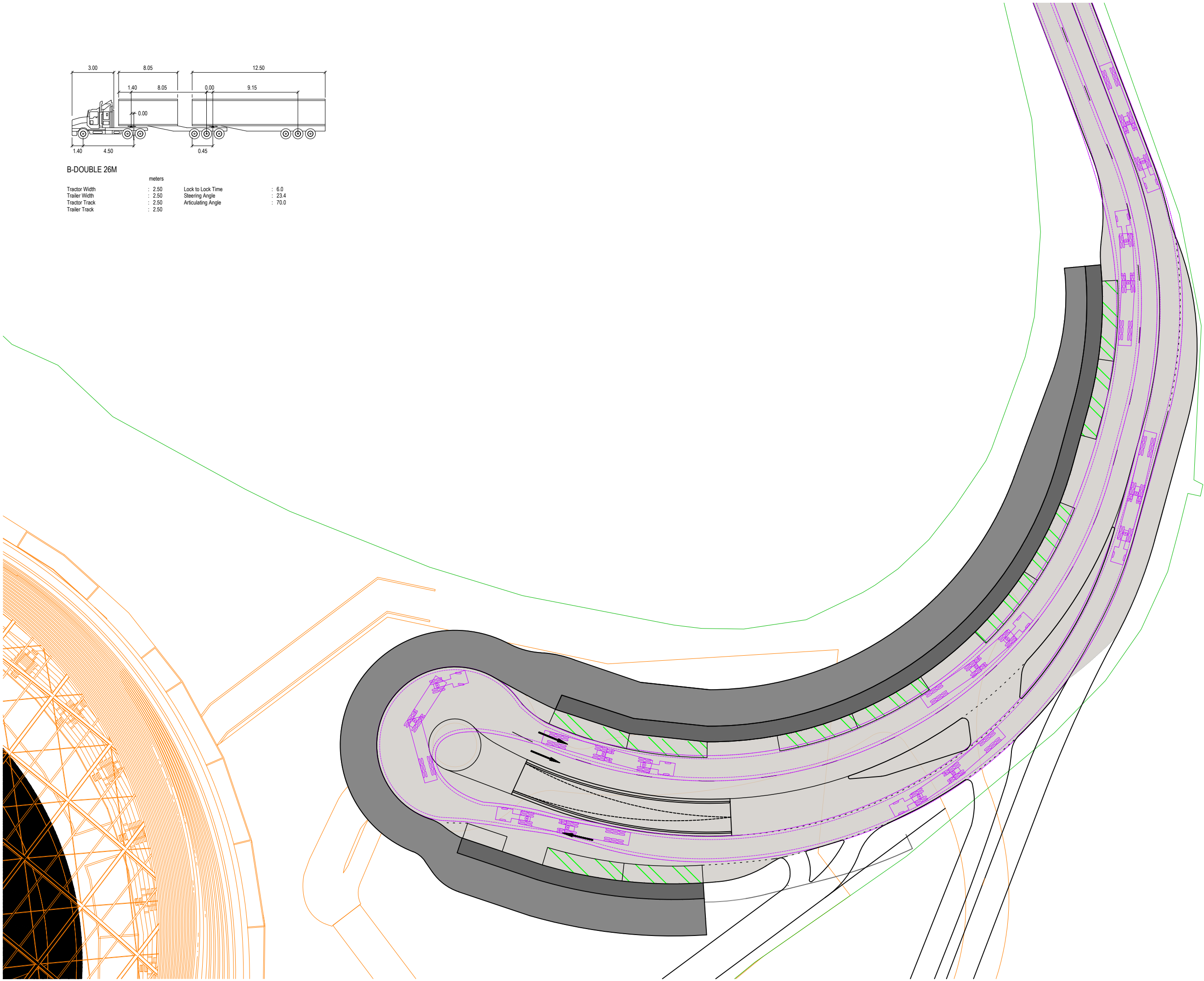
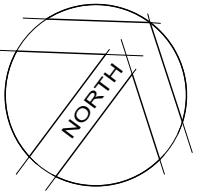
2 X BUS BAYS (DEPENDANT) -
DURING EVENTS

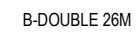
CONNECTION TO ADJOINING
PORT ROAD NETWORK.
DETAILED INTEGRATION
REQUIRED TO BE DESIGNED
BY OTHERS

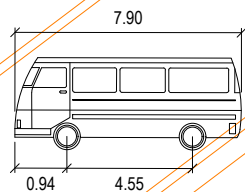


B-DOUBLE 26M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

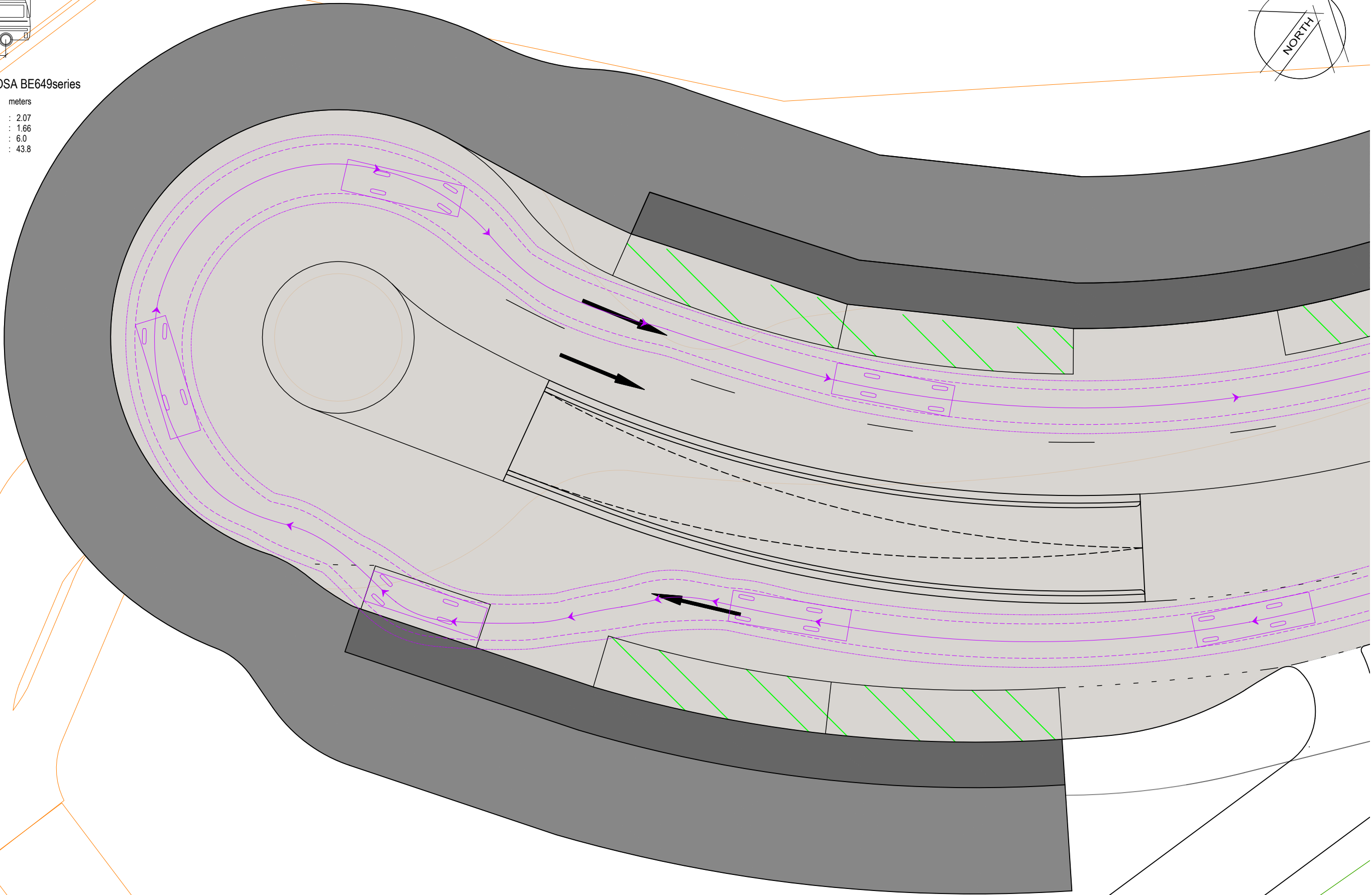
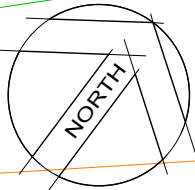


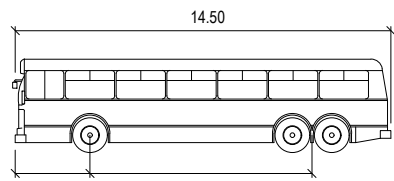




Mitsubishi FUSO ROSA BE649series

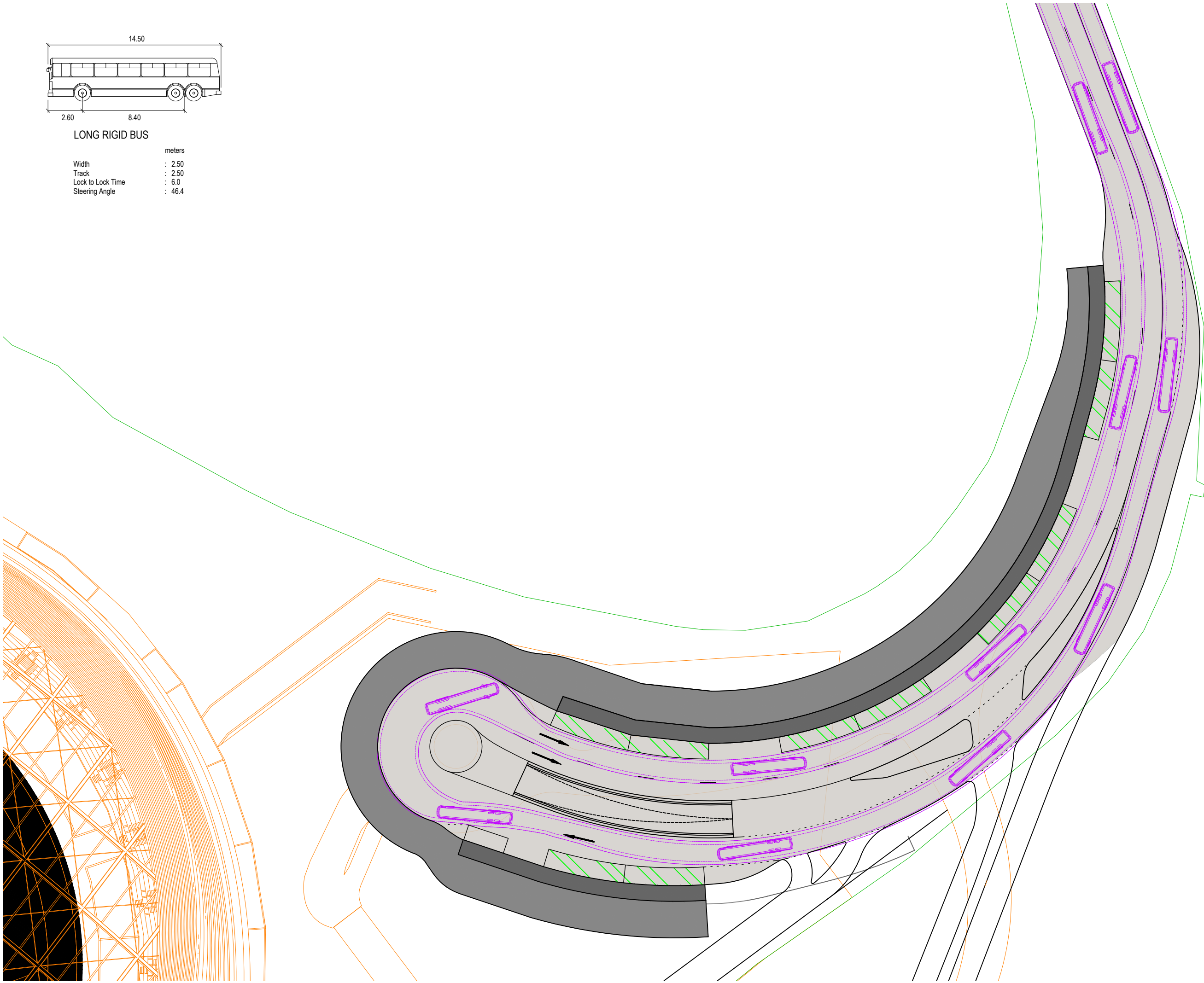
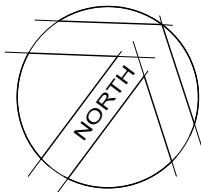
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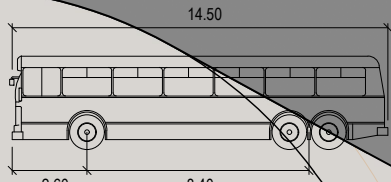




LONG RIGID BUS

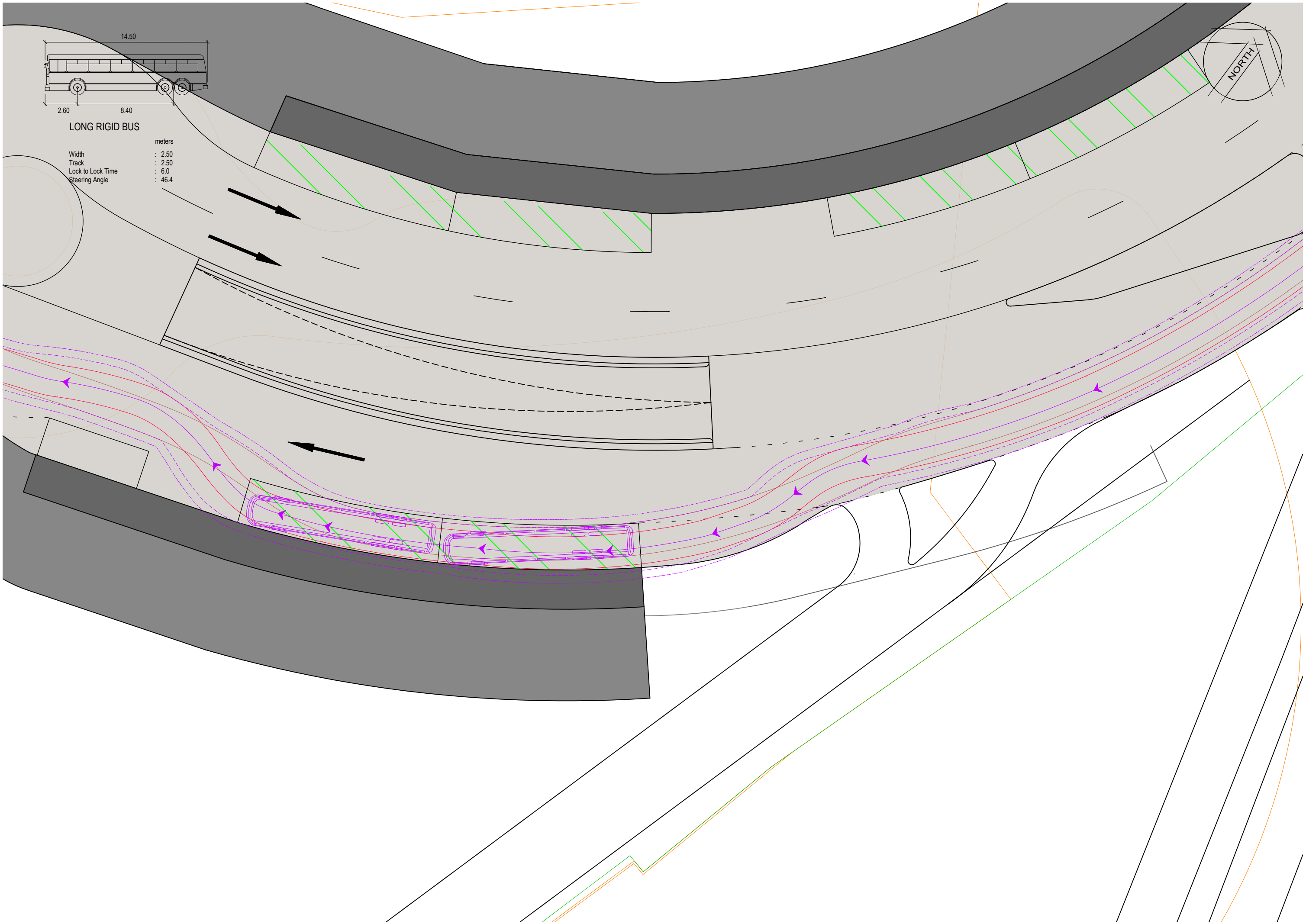
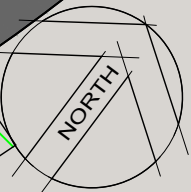
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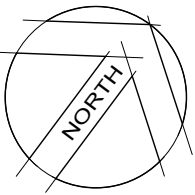
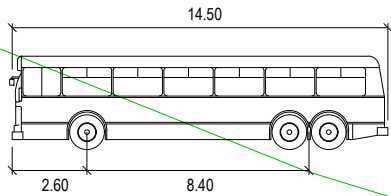




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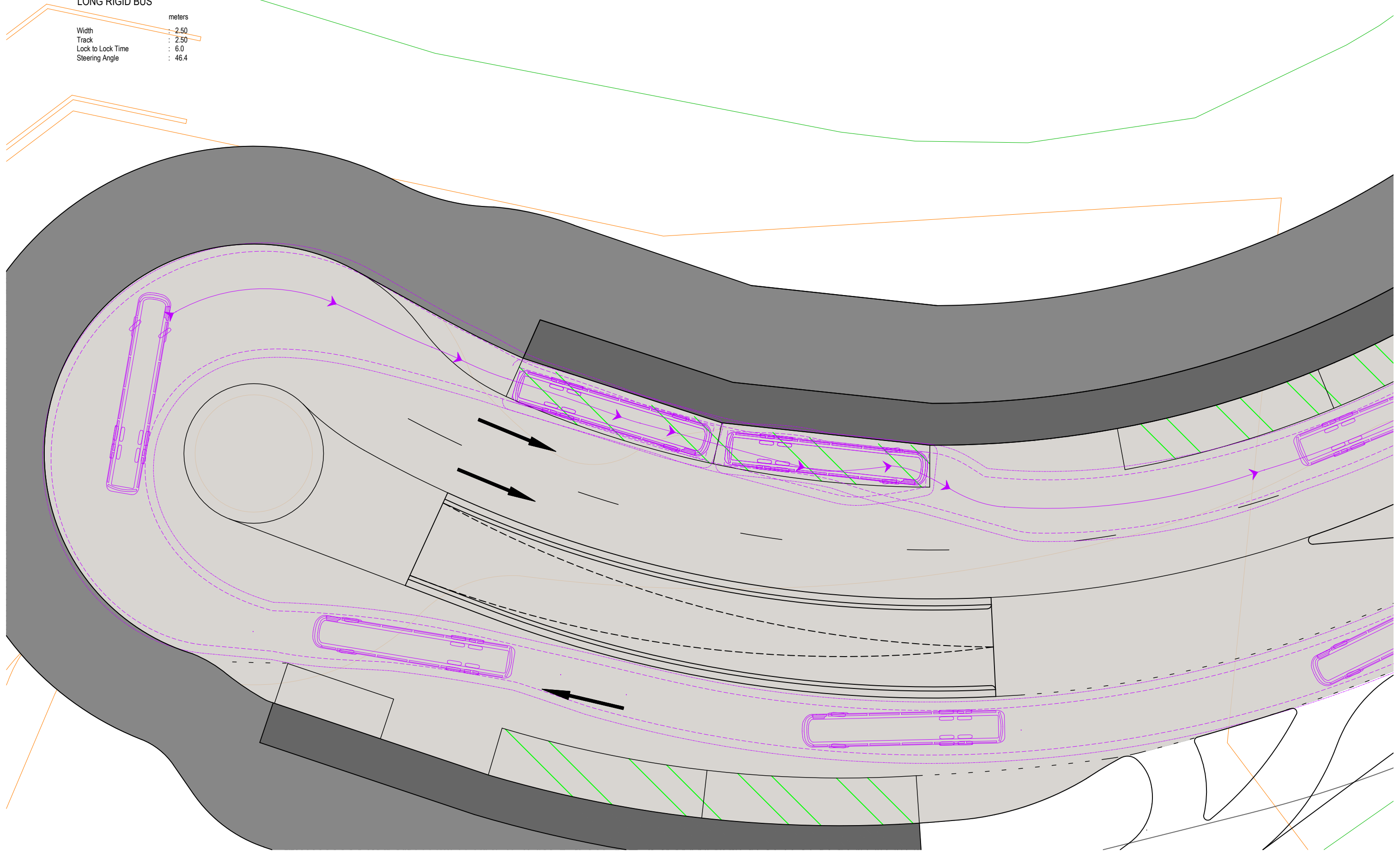
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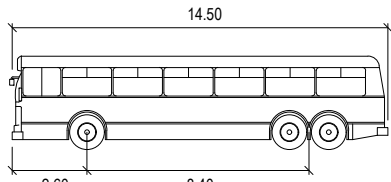




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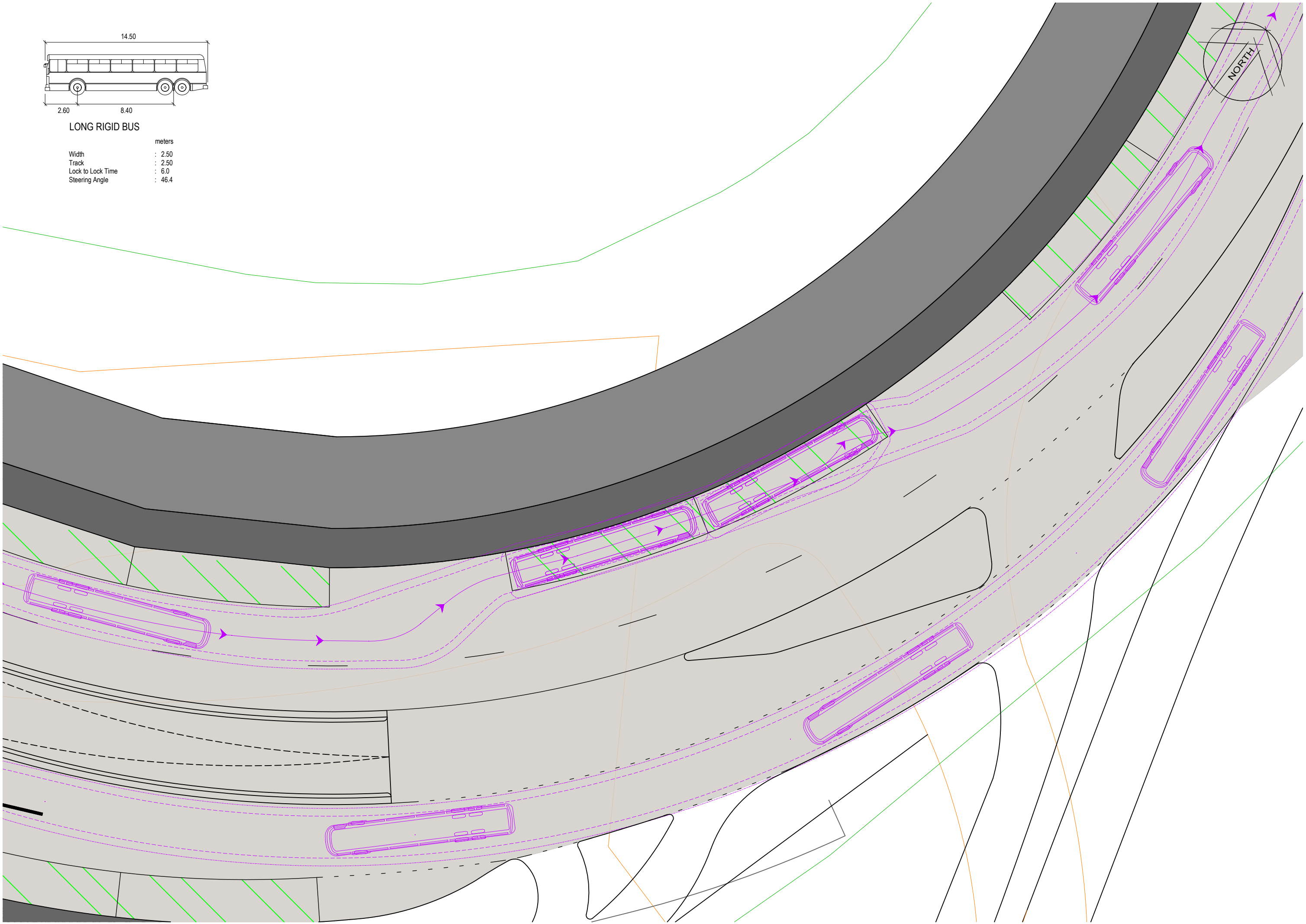
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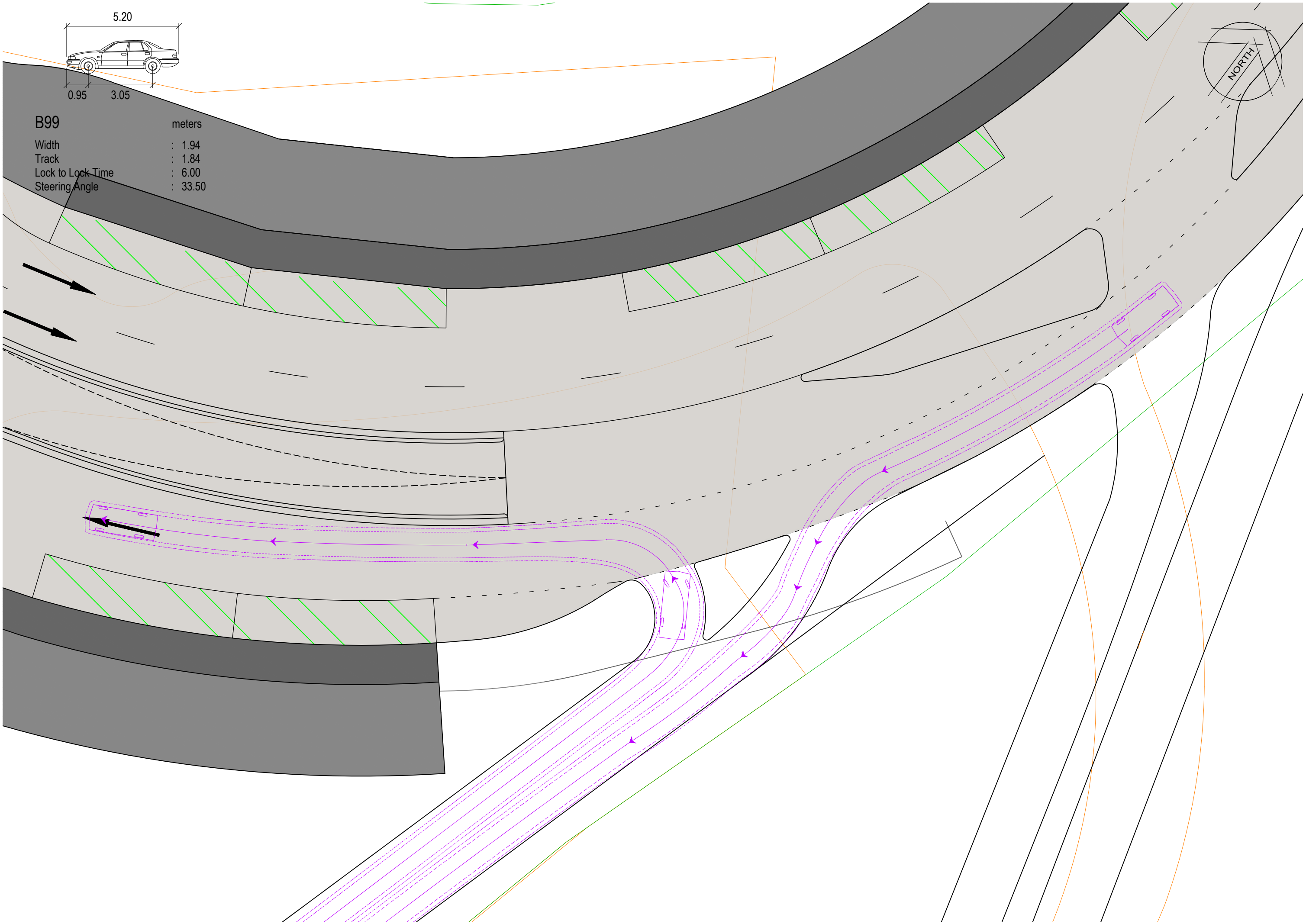




LONG RIGID BUS

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Steering Angle	: 46.4





B99	parameters
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Steering Angle	: 33.50

Appendix J

Parking memo





Memo

To: Macquarie Point Development Corporation
From: Jacob Martin
Subject: Macquarie Point Multipurpose Stadium Transport Study - Parking Considerations
Our ref: PS206346-WSP-PER-PAM-MEM-005-RevB-Parking Memo
Date: 6 June 2024

Introduction

The following Technical Memorandum has been developed to consider the parking data collection and analysis requirements for the proposed Macquarie Point Stadium location.

1. Problem Definition

The proposed Stadium may serve up to 30,000 event attendees, plus staff, event organisers and players. The current design includes a nominal supply of 600 parking bays, intended for use by a specified sub-set of users (corporate guests, members, staff and organisers). For the purposes of the stadium transport study, 300 parking spaces have been assumed as available to corporate guests and members at two people per car.

This means that almost all attendees who arrive by car must be accommodated in existing public and private parking facilities within the local catchment. Noting the location of the precinct, this catchment is expected to comprise most of the Hobart CBD, in addition to on-street and off-street facilities throughout the local residential suburbs.

Demand for event parking can be expected to overlap with many of the existing uses in the area. It is expected that changes to parking management structures will be necessary to protect critical users of these bays. There may also be parking challenges in the form of messaging and availability that the City of Hobart will need to address through other means.

2. Existing Context

Any future event parking demand will be overlaid on existing usage patterns. It is therefore important to understand the existing use of on-street and off-street parking, both to identify potential synergies (which would allow for destination driving trips to the broader stadium surrounds) and conflicts (where Stadium demands might impinge upon current user's access to these facilities).

A nominal 1km catchment area has been assumed for the purpose of preliminary assessment. While it is acknowledged that some event attendees might be willing to walk from more distant parking areas, all publicly-accessible parking within this zone has been considered as part of a potential event parking supply.

Lvl 3, Mia Yellagonga Tower 2, 5 Spring St
Perth WA 6000
PO Box 7181
Cloisters Square WA 6850

Tel: +61 8 9489 9700
Fax: +61 8 9489 9777
www.wsp.com

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

This parking includes the following:

- 1** Recreational zone (c. 900 bays)
 - a** Queens Domain/Cenotaph Park (Regatta Ground) - 160 bays
Access to the lower car park is via a single-lane approach which would be extremely problematic if localised demand exceeds supply and conflicts with proposed ferry service.
 - b** Domain Tennis Centre (TCA south and Tennis Centre) – 180 bays
 - c** Aquatic Centre – 150 bays
 - d** Informal parking (Domain) ~ 200 bays
 - e** Informal parking (Cenotaph) ~ 200 bays
- 2** Suburban/Residential Parking Zone: Glebe (c. 240 bays)
- 3** CBD commercial office/retail:
 - a** Public commercial car parks: Argyle Street (1155 bays), Centrepont (780 bays), Hobart Central (450 bays)
 - b** Metered and voucher employee-focused parking: Dunn Place (100 bays), Salamanca Square (???? bays), Fisherman's Market (160 bays), Hunter Street (180 bays)
 - c** Privately-owned Public Parking: Market Street (1050 bays), Vodafone Central (350 bays), Evans Street (230 bays), Montpelier (200 bays), Trafalgar Place (???? Bays) etc
 - d** On-street parking across the CBD zone:
The 1,000m catchment zone aligns generally to metered on-street spaces within the CBD. For simplicity, the applicable Stadium catchment zone has been aligned to this extent.

A consolidated map of all destination parking to be considered for this project is provided in Figure 2.1.

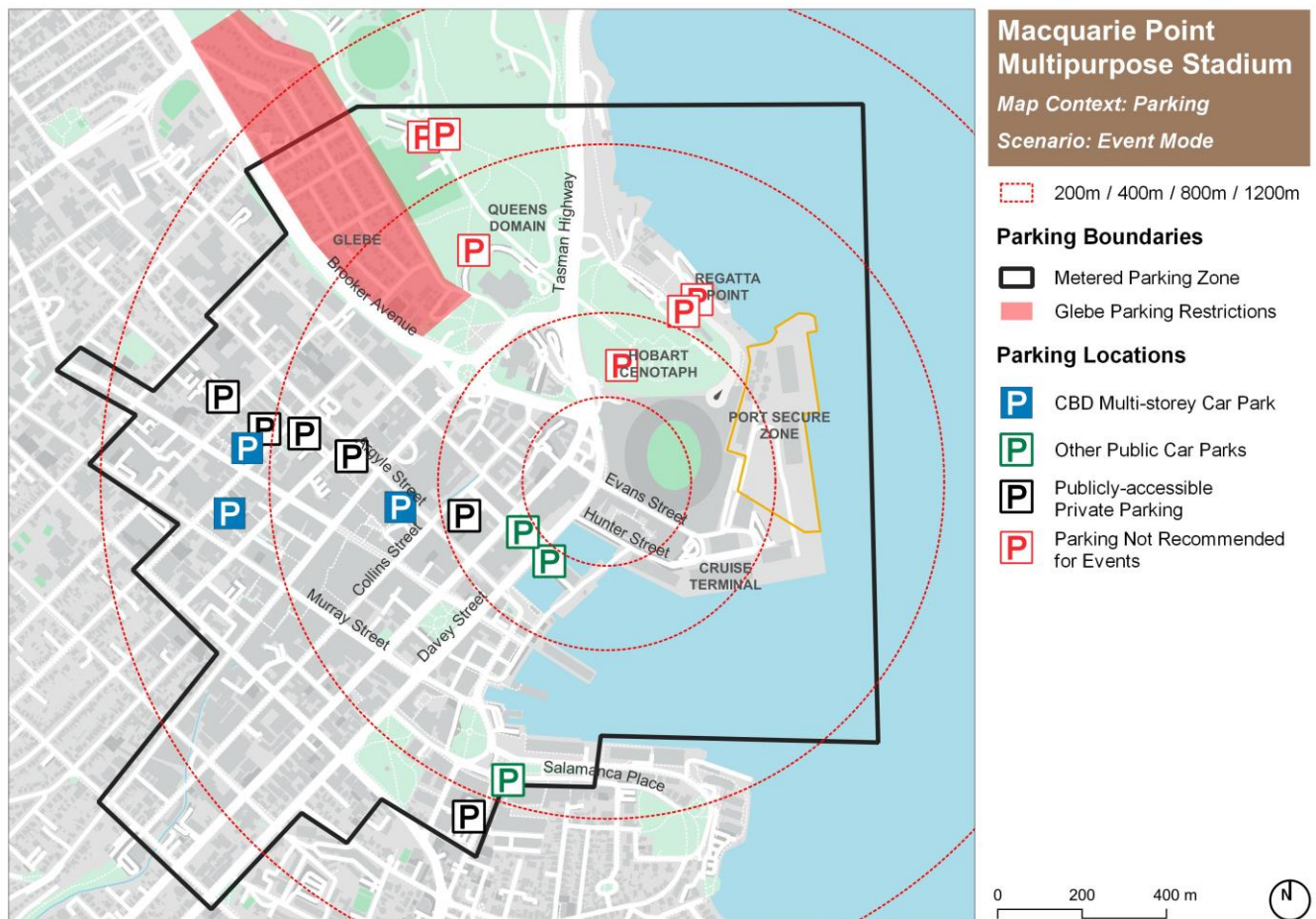


Figure 2.1 Notable parking destinations in the defined walking catchment

The total public and publicly accessible parking supply across this zone is shown in Table 2.1.

Table 2.1 Existing publicly accessible parking supply

	PARKING SUPPLY
On-Street	240 (residential zone) 1,200 (CBD zone)
Off-Street	4,300 bays
Informal	400 bays
Total	~6,000 bays

The existing supply of parking is more than sufficient to accommodate even the peak stadium demand scenario (approximately 2,000 bays under the 31.5k event scenario at 60% non-car mode share), if all bays were made available and had no conflicting use. However, this parking must accommodate the existing needs of the Hobart CBD, which includes a wide range of user groups and requirements that limit the supply that can feasibly be used for event parking.

In addition to this public and publicly accessible supply, there is an unknown provision of fully private parking that can also be leveraged by event attendees – e.g. parking at work, or at a friend's house.

In particular, a common travel pattern is for employees in the Hobart CBD to remain after work and travel to the event venue on foot. The parking solution under these conditions is whatever their standard journey to work requires – park and ride, in allocated office parking or in a public car park. This is much more likely to occur for the identified weekday peak scenario, and could significantly reduce the impacts on peak period transport provision as a result (e.g. public transport and road

network capacity). This behaviour will also tend to reduce the demand for publicly-accessible parking (i.e wherever parking is provided in private facilities).

3. Existing Usage Profiles

Existing usage of off-street car parking has been estimated from benchmarking information provided by the City of Hobart within the designated supply boundary.

This initial datapoint suggests that there is significant existing availability at the times of day coinciding with likely events, including:

- Weekday evening
- Weekend daytime
- Weekend evening

Current occupancy rates for the critical periods are in the order of 10%, suggesting that sufficient parking supply is available to accommodate stadium needs, providing private vehicle modes can be restrained and suitable alternative transport provided.

4. Target Parking Occupancy

Standard best-practice generally assumes that a car parking zone is operating at its practical capacity when it is approximately 90% full. This reflects the basic inefficiencies associated with parking legibility (knowing where the last few available bays are located), turnover, management requirements (allocation or restriction of some bays to serve particular user groups) etc.

This 10% vacancy rate also means that parking is always available if someone needs it, reducing the degree of ‘searching’ behaviour (that can create additional congestion in the network) or illegitimate parking.

However, an event destination operates differently – as a high intensity node for activity where the local demand for parking will (by default) greatly exceed the proximal supply. This means that the parking occupancy can be expected to reach close to 100% in the areas close to the Stadium, reducing in efficiency the further away the car park is. Large-scale public car parks will be more efficient, regardless of distance, due to their prominence and legibility for drivers.

These factors, along with the existing usage profiles for parking, are considered in evaluating a realistic parking capacity for stadium events.

5. Boundary Issues and Impacts

The intensity of demand associated with a stadium event necessarily puts pressure on the existing users of parking in the vicinity. To mitigate these impacts and ensure that Hobart can continue to function before, during and after events, the current usage of parking has been categorised by location and time of day.

5.1 Macquarie Point

Macquarie Point is the site of a variety of activities which generate parking demand on weekdays and weekends. This includes the working Port of Hobart, Goods Shed and Red Square entertainment spaces, University of Tasmania’s School of Creative Arts, plus hotels and food & beverage venues.

Currently, public use of these venues is served by a large at-grade car park, supplemented by on-and at-grade off-street facilities around the heritage buildings on Evans and Hunter Streets.

Parking within the Port will continue to be fully controlled, with a new northern access providing improved connection for workers, visitors and freight vehicles.

Operating times for food & beverage venues overlap with peak demand periods for anticipated stadium events. The proximity of the retained at-grade and on-street parking supply at Macquarie Point to the Stadium creates an issue around

safe vehicular movements, likely creating a need to restrict or limit access. Parking in the area shown in Figure 5.1 will be generally unavailable for event parking.

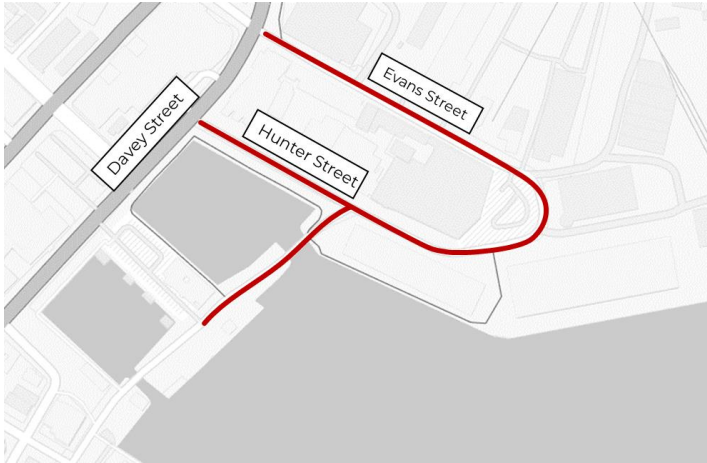


Figure 5.1 *Restricted/ limited access zone*

Management of parking demand across the transition would involve setting a curfew on meters (disallowing parking after a certain cut-off period) for the existing 2P zone, and closing the UTAS voucher car park at the corner of Hunter Street and Evans Street.

This intervention would have a negative impact on access to business operating concurrently with Stadium events, though this is expected to be more than offset by the additional footfall in the vicinity prior to and after events.

5.2 Cenotaph Park / Domain

For Northern and Eastern origins, the existing and retained public provision associated with recreational areas in Cenotaph Park and Queens Domain represent the most convenient parking for the stadium.

A preliminary review of existing supply shows that within this zone there are currently around 900 parking spaces, in a combination of formal and informal at-grade facilities. This includes the lower Regatta Grounds car park on McVilly Drive, which is not considered suitable for intensive event parking due to the constrained access route. This location has also been identified as a future Regatta Point ferry wharf.

The proximity of the Cenotaph Park to the Stadium and the capacity of the road network in this area supports its use as a bus layover zone during events. This would preclude its use for event parking. Event parking demand further along Davies Avenue is likely, overlapping with recreational uses (during weekend midday periods) including the Tennis Centre, Aquatic Centre and club games at TCA Ground. Of these, it is most likely that Stadium events might impact the day-to-day function of the Aquatic Centre. The existing management regime limits parking to 90 minutes in uncontrolled areas, and imposes parking charges (for non-patron parking) in controlled areas. This is less likely to be a deterrent for event attendees – and leaves some room for illegitimate use. Modification of existing management methods may be necessary to ensure that patrons are able to attend the Aquatic Centre on event days.

5.3 Glebe – Residential Area

This residential cell in Glebe (shown in Figure 5.2) is the closest to the Stadium location, and well within the 1000m walking catchment. Approximately 240 on-street parking spaces are located in this area, currently managed through 2-hour limits (8am-6pm) Monday-Friday.



Figure 5.2 Parking in the Glebe residential area (ArcGIS Hub City of Hobart: Parking)

Current usage suggests a high demand for on-street parking by residents, using public space to store surplus vehicles. It seems likely that there would be some demand for event parking along the streets of Glebe, and that this would impact the local amenity for residents.

The existing restrictions do not impede event usage, since parking is permitted for any of the identified event periods. Effective management will likely involve extending the timing restrictions into the evening (8am-8pm) including Saturday and Sunday. Existing residential parking permits can be retained, potentially with the addition of residential visitor permits. Shifting the existing system to an app-based method would allow for more dynamic white-listing of vehicles and temporary/visitor permits allocated to specific households.

It would also allow for standardised signage ‘2P (8am-8pm), Permit Holders Excepted’ to be installed with a much lower event management requirement than alternative (manual) methods.

5.4 CBD – Off-Street Commercial Parking

There are almost 4,000 public and publicly accessible parking spaces located in large-scale facilities (multi-deck and at-grade) within the Hobart CBD. Many of these car parks have restricted hours of operation, reflecting a lack of demand outside of standard daytime periods.

This suggests that parking provision itself is unlikely to constrain driving mode share, as it can be assumed that the hours of operation for these car parks would be adjusted to meet event demands (including after-event activities).

Weekend events will occur both during the daytime and in the evenings. The above observations would apply equally to weekend evening events, but there will be concurrent use of commercial car parks for weekend midday and afternoon event times. The demand profile for short-stay car parking within the walking catchment will be key to understanding whether additional interventions will be required to accommodate the driving mode share for events up to 30,000 attendees, and to mitigate the impact of this demand on key CBD retail and food and beverage uses.

5.5 CBD – Off-Street Employee Parking

While there is no direct impact of event parking on the availability of employee parking spaces, they may represent an opportunity to mitigate the intensity of demand on other public parking spaces.

There are a number of small to mid-sized car parks across Hobart that cater specifically to employees. Using a voucher system or monthly payment basis, these car parks operate almost exclusively during office hours, and therefore have potential for ad-hoc use on weekends.

Some off-street car parks may see use as off-site *residential* overspill parking, managed under a monthly leasing agreement. These are unlikely to provide benefit for event parking.

The primary issue with these car parking areas is around legibility – for them to be used efficiently, event attendees need to know where they are. It would be beneficial for extended on-line mapping to be developed that identifies all specific event parking spaces available across the Centre.

5.6 CBD – On-Street Parking

On-street parking across the CBD zone is managed using a combination of duration restrictions and pricing. Those spaces that are currently limited to 60-120 minutes are unlikely to see significant use for weekend midday events, as the risk of infringement is too high – but afternoon and evening events could be supported.

Current on-street demands vary significantly across the CBD, but in general it is expected that afternoon and evening occupancy drops to relatively low levels, permitting use of these on-street spaces.

Basic parking management theory tends to preference use of off-street parking over on-street bays, allowing for those on-street spaces to be used for casual short-stay needs. The current structure of free parking in the evenings would not be consistent with this; suggesting the introduction of a fee (however nominal).

5.7 Informal and Illegitimate Parking

As described above, the demand for parking is expected to greatly exceed supply in the vicinity of the Stadium. While sufficient parking is available in the broader CBD area, the financial and time costs associated with formal parking provision will induce drivers to park informally and in unsafe locations. A comprehensive and consistent regime of enforcement will be necessary to ensure that parking behaviour is maintained in a safe manner consistent with the intentions of the plan.

5.8 Taxi Ranks

The closest existing taxi ranks to the Stadium site are located at:

- Davey Street (Hotel Grand Chancellor)
- Morrison Street (west of Elizabeth Street)
- Murray Street (north of Davey Street)
- Collins Street (west of Elizabeth Street)
- Liverpool Street (west of Argyle Street).

Of these, the Davey Street location is likely to be too close to the Stadium to operate safely and effectively for the intense activity associated with event taxi function, given the extent of pedestrian activity anticipated in this area at the conclusion of events. The remaining taxi ranks are primarily located in the heart of the CBD, and therefore suffer from poor legibility (with respect to stadium traffic).

It is therefore recommended that an event taxi rank be established outside of the pedestrian cordon along key departure routes (e.g. Argyle Street, Davey Street, Elizabeth Street) to provide a coherent and legible pick-up point.

The dispersed nature of these existing taxi ranks, including the one near Salamanca Markets, will have some benefit for supplemental taxi pick-up following the initial intense release period.

6. Day-to-Day Parking

6.1.1 Macquarie Point

Once in operation, the Macquarie Point precinct will also be used by people who work and visit on a day-to-day basis (conferences etc).

Under the anticipated usage scenario (including conferences), the precinct is expected to generate parking demand in the order of 1,000 bays. Some of this parking demand can be accommodated by the on-site supply, and supplemented by public employee-centred parking in the precinct periphery.

An assessment of available mid-week supply suggests that this additional demand can be accommodated within the existing system. However, it is expected that the demands from employees and visitors to the Macquarie Point precinct will put pressure on the existing on-street supply in the vicinity, particularly along Evans Street and Hunter Street.

This parking is currently provided in a mix of short-stay (Hunter Street) and all-day (some sections of Evans Street).

To facilitate key visitor function within the Precinct, a modified parking regime is recommended that prioritises short-stay (1-2 hour parking) within this core area (application of this form of short-term parking will also assist in event management).

It is understood that some of the existing parking is currently used for commercial and recreational fishing in and around the precinct. While this use is not expected to interact with events, care should be taken to ensure these activities remain viable, including consideration for parking permits (administered via the overarching parking app).

6.1.2 Bus Plaza

The zone designated as the bus plaza will be critical to provide public access to the Stadium for events, but represents an opportunity for effective short-stay parking during day-to-day operations.

To facilitate this use, car park line marking can be provided within the bus zone and restricted to 2 hour parking using '2P (8am-8pm)'.

To ensure event operation, a 'Bus Zone, Event Days' sign may also be used in conjunction, or these bays can be "bagged" with 'Bus Zone' signs on event days.

Appendix K

Cost estimates





MACQUARIE POINT TRANSPORT STRATEGY

TRANSPORT OPTIONS STUDY – STRATEGIC COSTINGS

28 August 2024

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APPENDICES

APPENDIX A	MACQUARIE POINT TRANSPORT OPTIONS COSTING SUMMARY
APPENDIX B	MACQUARIE POINT TRANSPORT OPTIONS COSTING DETAIL

CONTACT

DETAIL	DESCRIPTION
Name of Company/Trading Name	WTP Australia Pty Ltd
ABN	69 605 212 182
Name of Representative	Sian McKenna
Position	National Director
Head Office Address	Level 21, 2 Southbank Boulevard, Southbank Victoria 3006
Telephone	03 9867 3677
Email	smckenna@wtpartnership.com.au

DOCUMENT STATUS	NAME	DATE
DRAFT PREPARED BY	Danielle le Plastrier	21 June 2024
FINAL PREPARED BY	Danielle le Plastrier	28 August 2024
REVIEWED BY	Danielle le Plastrier	28 August 2024
E-SIGNATURE APPROVED	Danielle le Plastrier	28 August 2024

REVISION NO.	REVISION DATE	DRAFT / FINAL
1.0	21 June 2024	Draft
1.1	28 August 2024	Final

1 EXECUTIVE SUMMARY

This Order of Magnitude (OOM) costing advice has been prepared by WTP Australia Pty Ltd (WT) for WSP Australia Pty Limited for the Macquarie Point Stadium transport option study.

The estimate is based on the WSP Project Specifications' Indicative Scoping descriptions and supporting documentation including project concepts, site area markups, and sketches (as detailed in Section 4), and subsequent discussion with the design team to understand required scope considerations for each design intervention.

The table below outlines the cost advice (Excl GST) for each of the options outlined in the WSP priority project list.

Please refer to Appendix A and B respectively for the OOM summary and estimate detail.

MACQUARIE POINT TRANSPORT STRATEGY PRIORITY PROJECTS COSTING	PROJECT COST \$M (EXCL GST)
Northern Access Road (per Jan 2024 estimate)	33.9
Event bus plaza	16.2
<i>Collins Street Active Transport Bridge</i>	
▪ Option 1 - functional design style only	44.0
▪ Option 2 - architectural finish	56.5
Davey Street footpath expansion (between Evans St and Hunter St)	0.3
Southern Campus Transformation – UTAS Pocket Park	2.1
Collins Street redesign (Collins Street Vision)	11.5
Cultural Precinct Uplift (including Collins Street redesign)	54.6
CBD bus lanes	1.8
Evans Street redesign (Davey St to Hunter St)	5.7
Hunter Street car parking reconfiguration	0.3
<i>Park and Ride</i>	
▪ Park and ride - greenfield option	4.0
▪ Park and ride - brownfield option	3.9

The above totals are reflective of total project value costs i.e. direct costs with associated indirect costs such as contractor's design, prelims, and overhead; client development and delivery costs; and contingency allowances. The application of these allowances is detailed in Section 5.

2 PROJECT DEFINITION

Macquarie Point Stadium is a proposed multi-purpose stadium in Hobart, Tasmania, scheduled to begin construction in 2025. Transport infrastructure is required for the stadium during major events. The priority projects identified outlines strategic options to facilitate the safe and efficient movement of crowds during peak periods.

3 SCOPE OF WORKS

Strategic transport options identified comprised the following priority projects:

1. Northern Access Road
2. Event bus plaza
3. Collins Street Active Transport Bridge (options for functional design and architectural finish bridges)
4. Davey Street footpath expansion (between Evans St and Hunter St)
5. Southern Campus Transformation – UTAS Pocket Park
6. Collins Street redesign (Collins Street Vision)
- 6a. Cultural Precinct Uplift including Collins Street redesign
7. CBD bus lanes
8. Evans Street redesign (Davey St to Hunter St)
9. Hunter Street car parking reconfiguration
10. Park and Ride (options provided for both greenfield and brownfields sites)

3.1 NORTHERN ACCESS ROAD

The scope includes the extension and realignment of McVilly Drive, construction of approximately 800m long new full-depth pavement for Northern Access Road and Macquarie Point Road.

Additionally, it involves approximately 1,600m of new shared user path, as well as the construction of retaining walls, a pedestrian bridge, an overpass and an underpass.

Note: Estimate as provided to DSG in January 2024.

3.2 EVENT BUS PLAZA

Event bus plaza based on WSP "Straightening of Southern Bays Scenario". Overall pavement area approx. 8,300m² including 3m wide pedestrian waiting area (652m²); surrounding pedestrian paths/ passing area 7m wide (1,992m²); road pavement (5,650m²); 10 bus bays for use during events (5 no. 2x dependent bus bays). Access to proposed basement carpark access (vehicle ramp leading to basement excluded).

3.3 COLLINS STREET ACTIVE TRANSPORT BRIDGE

Pedestrian bridge across spanning Tasman Highway and Brooker Avenue respectively to facilitate pedestrian access to and from Collins Street precinct.

Total span approximately 200m, minimum width of path 6m, with approximate height clearance of 7.8m. Lifts allowed for at each end including one at central ramp area (i.e. three in total).

Three spiral ramps of approx. 12m radius to allow for cyclist use.

Two options considered: Simple, functional design, and an architectural option based on a design benchmark similar to Bridge of Remembrance.

3.4 DAVEY STREET FOOTPATH EXPANSION

Expansion of footpath to Davey Street between Evans Street and Hunter Street, approximate length 75m, assumed 2m expansion equivalent to project area of 150m².

Allowance for new asphalt footpath, provision of kerb and channel and removal of 5 min parking bays. Relocation of existing trees to new kerb alignment to increase effective width.

3.5 SOUTHERN CAMPUS TRANSFORMATION – UTAS POCKET PARK

Conversion of the UTAS Southern Camps car parking area between Evans Street and Hunter Street to a new open space. Project area approx. 2250m².

Scope includes landscaping, new trees and subsoils, pavements and footpath and associated drainage. Assumption to avoid the roadway.

3.6 COLLINS STREET REDESIGN (COLLINS STREET VISION)

Re-design of Collins Street Precinct. Project area approx. 16,750m², which approximates to a length of 730m of roadway.

Scope includes protected bicycle lanes from Brooker to Murray Street; 1.5m footpath expansions from Brooker to Murray Street; profiling and re-sheeting of carriageway, and associated drainage.

Inclusion of street trees and subsoils, new intersections and signals, new lighting.

Naturalisation of Hobart rivulet excluded from costing advice.

3.6a CULTURAL PRECINCT UPLIFT (INCLUDING COLLINS STREET REDESIGN)

Uplift to City of Hobart proposed cultural precinct. Project area encompasses the streets within the block bordered by Brooker Avenue to the north, Harrington Street to the south, Collins Street to the west, and Davey Street to the east. This area encompasses approximately 4.6KM of roadway.

Scope for this option includes abovementioned Collins Street re-design costs (730m), with further uplift to remaining streets in the nominated area of the proposed precinct (approx. 3.9KM), including street trees and subsoils, new intersections and signals, new lighting, new/revitalised wayfinding, street art/cultural opportunities. Naturalisation of Hobart rivulet excluded from costing advice.

3.7 CBD BUS LANES

Linemarking for 1 No. bus lane on Macquarie Street from Southern Outlet to Murray Street, approximately 1.4km. Scope includes for traffic signal plans and bus signals upgrades.

3.8 EVANS STREET REDESIGN

Re-design of Evans Street between Davey and Hunter Street.

Scope includes footpath expansion of 1.5m, road surfacing suitable for both regular road closures and heavy vehicles, changes to levels and drainage subject to design, DDA bays and associated kerbs/ramps, new trees and subsoils.

3.9 HUNTER STREET CAR PARKING RECONFIGURATION

Minor reconfiguration works to Hunter Street carparking up to Davey Street.

Scope includes removal of kerbs and raised surfaces to mitigate trip hazards during mass crowd movements through the area. No upgrade to footpath assumed. Allowance for patch repair in areas.

3.10 PARK AND RIDE

The WSP Priority Project register nominated the following locations for future possible Park and Ride locations:

- Claremont Park and Ride
- Rokeby Park and Ride
- MyState Arena (Wilkinson Point) Park and Ride
- Kingborough Sports Centre Park and Ride
- Kangaroo Bay Park and Ride
- Geilston Bay Park and Ride

Scope assumptions per park and ride include:

- 200 surfaced parking bays, linemarking
- 2x indented bus bay
- 1x bus shelter, 1 x bus stop
- Public toilets

4 DOCUMENTATION

The Priority Projects is based on scope descriptions and the following documentation developed by WSP:

SCOPING OVERVIEW

- Priority projects register (PS206346-Priority projects indicative scoping-WTP-update)

NORTHERN ACCESS ROAD AND COLLINS STREET BRIDGE

- Initial Concept Design Transport Study General Arrangement prepared by Burbury for DSG (3100A-3-12-1020_TRANSP revB – Northern Access Road including Collins Street Bridge)

EVENT BUS PLAZA

- Straightening of Southern Bays Scenario PS206346-WBASE-007 (19-06-24) and WSP scope detail outline

PARK AND RIDE

- Event Bus / Park and Ride – Rapid initial desktop assessment (Plans and Sketches_PnR rev2)

CULTURAL PRECINCT UPLIFT

- Precinct markup and scope description for Civic and Cultural precinct public realm masterplan (WSP email 23/08/2024 “RE: Hobart project cost”)

5 BASIS OF ESTIMATE

Based upon documentation detailed in Section 4, high-level costing has been prepared using the following approach:

5.1 DIRECT COST DEVELOPMENT

5.1.1 QUANTITY DEVELOPMENT

Quantities and allowances are based on the scope and specifications as outlined in the WSP Priority Projects register and supported by indicative dimensions assumed based on local area constraints and existing site conditions.

5.1.2 PRICING DEVELOPMENT

Rates used in the estimate are based upon benchmarks as well as build up of composite rates and first principles calculations.

Benchmarks have been based upon a range of relevant transport infrastructure projects located in Tasmania and around Australia. Context around the assumptions, inclusions and exclusions associated with our benchmarking is included under the respective sections of this report.

As benchmarks are based upon historical data, pricing indexation has been applied for escalation to June 2024 (with the exception of the Northern Access Road estimate which was provided to DSG in January 2024 – no escalation uplift has been applied).

Direct cost main works values typically exclude project-specific scope that may have a disproportionate impact on the base cost such as traffic management, staging and temporary works, utilities, environmental and cultural / heritage management. As such these are typically calculated for each project scenario and included as additional “non-measurable” allowances.

5.2 INDIRECT COSTS

Indirect Costs assume to cover the day-to-day costs associated with running the overall project and include Contractor’s project management and supervision, staff allowances, mobilisations, demobilisations, insurances, finances, site facilities (including running costs) and other miscellaneous items.

Indirect cost allowances have been made according to typical benchmark ranges based on similar local projects and assume competitively tendered Design & Construct contracts. These have been adjusted for each project scenario.

- Allowance for Contractor Design: 4% - 10% based on complexity of each project
- Allowance for Contractor Preliminaries & Supervision: 15% - 18% based on size and complexity of project (20% for Collins St bridge)
- Allowance for Contractor Overhead & Margin: 10% - 12% based on size and complexity of project (14% for Collins St bridge)

5.3 CLIENT COSTS

An allowance of 8% applied to construction costs has been made for Client management costs during project development and delivery.

5.4 CLIENT CONTINGENCY

An allowance for client contingency is applied to each project costing. These allowances are based on a probabilistic approach based on the nature of each project’s scope.

- Projects considered at the lower risk range have a 5% - 10% contingency allowance applied to the Project Cost subtotal (i.e. Davey St footpath, UTAS Pocket Park, CBD bus lanes, Hunter Street car parking)
- Projects considered at the mid-risk range have a 15% - 18% contingency allowance applied to the Project Cost subtotal (i.e. event bus plaza, Collins Street re-design, Evans Street re-design, Park and Rides).
- Projects considered at the higher risk range have a 30% contingency allowance applied to the Project Cost subtotal (i.e. Collins Street bridge)

5.5 OTHER CONSIDERATIONS

No further ‘market loading’ allowances for local capacity limitations, subcontract volatility and/or possible mainland resourcing have been applied to allow for buoyant market conditions. As detailed in Section 9, these could cause significant uplifts in tender pricing and should be considered as design and programme are developed.

6 ESCALATION

This estimate is priced in real dollars for current day, base date June 2024 with no allowance for further escalation.

Note: with the exception of Northern Access Road estimate which is as per January 2024.

7 ASSUMPTIONS AND INCLUSIONS

7.1 NORTHERN ACCESS ROAD

Assumptions and inclusions as detailed in the estimate as provided to DSG in January 2024.

Note: Costing provided therefore base date January 2024.

7.2 EVENT BUS PLAZA

Assumed key metrics: overall project area approx. 8,300m².

Main works costs

Allowance for bus plaza area as detailed in scope assumption in Section 3.2 including demolition of existing, site prep, pavement layers buildup, linemarking, kerbs etc, lighting with CCTV allowance.

Contamination allowances include assumption of level 2 to 15% of project area to a nominal 400mm depth; similarly level 3 contamination allowed for 15% of project area to a nominal 400mm depth.

\$1M direct cost provisional allowance for connection to Northern Access Rd and adjoining Port Road network - assumed adjustment to existing road, tie-in, street lights, allowance for traffic re-signalisation.

Direct Cost Non-Measurable Allowances include:

- Traffic management and staging and temporary works requirements assume six month works duration to allow for traffic management crew, temp barriers for staging (dependent of timing of Northern Access Road construction works).
- Utilities provisional \$750k direct cost allowance to allow for unquantified relocation/protection works that may be required
- Environmental management and cultural/heritage management - allowance considered for this site, some protection works for trees along northern edge of works area + Regatta grounds.

7.3 COLLINS STREET ACTIVE TRANSPORT BRIDGE

Assumed key metrics: bridge area 1,200m²; 200m length x 6m width.

OPTION 1 - FUNCTIONAL DESIGN STYLE ONLY

Main works costs

Allowance for 6m wide pedestrian bridge as detailed in scope assumption in Section 3.3 including site preparation/ demolition, bridge sub- and superstructure, three spiral ramps, three architectural lifts with clear glazing feature. Simple/functional design benchmark similar to Rose Garden Bridge.

Contamination allowances include assumption of level 2 to 20% of the three ramp/abutment areas to a nominal 400mm depth; similarly level 2 contamination allowed for 20% of the three ramp/abutment areas to a nominal 400mm depth.

Allowance for pedestrian fencing to stop illegal crossing of Brooker and Tasman Highway and associated signage

Direct Cost Non-Measurable Allowances include:

- Traffic management, and staging and temporary works requirements assume 8 month works duration to allow for traffic management crew, temporary barriers for staging - significant allowances due to nature of site across Brooker and Tasman Highway
- Utilities nominal \$2M allowance to allow for unquantified relocation/protection works that may be required
- Environmental management - allowance considers noise attenuation for out of hours working
- Cultural/heritage management - allowance considered for this site for protection works heritage-listed sandstone Royal Engineers building

OPTION 2 - HIGH LEVEL OR ARCHITECTURE LIKE BRIDGE OF REMEMBRANCE

Main works costs

As above however bridge allowances based on architectural design concept benchmark of a similar level to Bridge of Remembrance.

Direct Cost Non-Measurable Allowances include:

As above however traffic management and staging and temporary works requirements assume 10 month works duration.

7.4 DAVEY STREET FOOTPATH EXPANSION

Assumed key metrics: project area 150m²; 75m length x 2m width.

Main works costs

Allowance for 2m expansion of asphalt footpath as detailed in scope assumption in Section 3.4 including demolition of street pavement, site preparation, fill, kerb, drainage, tie-in to existing footpath.

Contamination allowances excluded for this scope.

Allowance for the relocation of existing trees to new kerb alignment to increase effective width - 10 trees assumed.

Direct Cost Non-Measurable Allowances include:

- Traffic management, and staging and temporary works requirements assumed minimal, assume 14 day works duration to allow for traffic management crew, temporary barriers etc.
- Utilities minimal allowance as not expected to encounter utilities with minimal demolition works.
- Environmental management and cultural/heritage management excluded.

7.5 SOUTHERN CAMPUS TRANSFORMATION – UTAS POCKET PARK

Assumed key metrics: project area 2,250m²

Main works costs

Allowance for demolition of existing asphalt surface, site prep, associated drainage. Re-surfacing works allow for new paving to assumed 40% of project area, landscaping to 45% of project area, and 15% of project area for footpaths.

Contamination allowances excluded for this scope.

Allowance for 23. no street trees (assume every 100m²) along with provisional sum allowance for road furniture bike parking, benches, etc..

Direct Cost Non-Measurable Allowances include:

- Traffic management, and staging and temporary works requirements assumed to perimeter along Hunter St, assume 6 weeks works duration to allow for traffic management crew, temporary barriers etc.
- Utilities minimal allowance as not expected to encounter utilities with minimal demo works
- Environmental management and cultural/heritage management excluded.

7.6 COLLINS STREET REDESIGN (COLLINS STREET VISION)

Assumed key metrics: project area 16,750m²; 730m length

Main works costs

Scope as detailed in scope assumption in Section 3.6, allowances considered for:

- 1.5m expansion of asphalt footpath on either side of Collins St approx. 730m long from Brooker to Murray St including demo street pavement, site prep, fill, kerb, drainage, tie-in to existing footpath.
- Two bike lanes each 2m wide to the length of Collins St approx. 730m long from Brooker to Murray St including milling of street pavement, re-sheeting, separator kerbs, drainage, linemarking.
- Re-sheeting allowance to remainder of road area including allowance for patch repairs, linemarking.
- Street trees, allow semi-mature tree every 15m along 730m length x 2 sides - approx. 97 trees
- New intersections and signals - assume resignalisation for 4 major intersections (Campbell, Argyle, Elizabeth, Murray)

- New street lighting, assume single luminaire either side, to full 730m length - 10m spacing
- Contamination allowances excluded for this scope.
- Naturalisation of Hobart rivulet (exclude in costings).
- Traffic signal reviews and plan excluded - assumed included in client development costs

Direct Cost Non-Measurable Allowances include:

- Traffic management, and staging and temporary works requirements assume 10 weeks works duration to allow for traffic management crew, temporary barriers etc.
- Utilities minimal allowance as not expected to encounter utilities with minimal demolition works.
- Environmental management and cultural/heritage management nominal \$85k direct cost allowance each for protection works.

7.6a CULTURAL PRECINCT UPLIFT (INCLUDING COLLINS STREET REDESIGN)

Assumed key metrics: approximately 4.6KM of roadway

Main works costs

Scope as detailed in scope assumption in Section 3.6a, allowances include Collins Street re-design scope (approx. 730m long) and further uplift to remaining roadway of proposed precinct (approx. 3.9KM) including:

- street trees: allow semi-mature tree every 30m along length of remaining street length on one side - approx. 130 trees
- new intersections and signals - assume resignalisation for a further 9 intersections along Davey, Macquarie and Collins including Davey/Brooker
- new street lighting, assume single luminaire either side, to 3.9KM length - 10m spacing
- provisional sum allowance for new/revitalised wayfinding that has a look and feel connection to the stadium \$1.5M assuming integration into existing street fabric
- provisional sum allowance for street art/cultural opportunities is highly dependent on scope - allowance included below is \$1.5M and assumes community/ cultural engagement.
- Contamination allowances excluded for this scope
- Naturalisation of Hobart rivulet (exclude in costings).
- Traffic signal reviews and plan excluded - assumed included in client development costs.

Direct Cost Non-Measurable Allowances include:

- Traffic management, and staging and temporary works requirements assume 60 weeks works duration to allow for traffic management crew, temporary barriers etc.
- Utilities minimal allowance as not expected to encounter utilities with minimal demolition works.
- Environmental management and cultural/heritage management nominal \$500k direct cost allowance each for protection works.

7.7 CBD BUS LANES

Assumed key metrics: project length 1.4km.

Main works costs

Allowance for Macquarie Street bus lane linemarking to 1.4km extent including linemarking to single lane 3.5m wide, allowance for re-sheeting (30% of area) and traffic signal plans and bus signals upgrades \$600k allowance.

Contamination allowances excluded for this scope.

Direct Cost Non-Measurable Allowances include:

- Traffic management and staging and temporary works requirements assumed for safeworking whilst Macquarie St still in use, allowance for traffic management crew, temporary barriers for protection in live environment.
- Utilities minimal allowance as not expected to encounter utilities with no demolition works
- Environmental management and cultural/heritage management excluded.

7.8 EVANS STREET REDESIGN

Assumed key metrics: project area 4,814m²; 260m length

Main works costs

Scope as detailed in scope assumption in Section 3.8, allowances considered for:

- 1.5m expansion of asphalt footpath on either side of Evans St approx. 260m long from Davey to Hunter including demolition of street pavement, site preparation, fill, kerbing, drainage, tie-in to existing footpath
- Road surfacing to remainder of road area including allowance for demolition of asphalt layer, pavement renewal including drainage - assume suitable for both regular road closures and heavy vehicles
- DDA bays and associated kerbs/ramps
- Street trees, allow semi-mature tree every 15m along 260m length x 2 sides - approx. 35 trees
- New street lighting, assume single luminaire either side, to full 260m length - 10m spacing
- Contamination allowances include assumption of level 2 to 15% of project area to a nominal 400mm depth; similarly level 3 contamination allowed for 15% of project area to a nominal 400mm depth.

Direct Cost Non-Measurable Allowances include:

- Traffic management and staging and temporary works requirements assume minimal allowance for traffic management crew, temporary barriers.
- Utilities minimal allowance as not expected to encounter utilities with minimal demolition works.
- Environmental management and cultural/heritage management nominal \$45k allowance each for protection works.

7.9 HUNTER STREET CAR PARKING RECONFIGURATION

Main works costs

Allowance for minor reconfiguration works as detailed in scope assumption in Section 3.9 including removal of kerbs and raised areas, patch repairs comprising demolition of pavement and re-sheet/ re-paving to assumed 20% of project area.

No allowance for expansion of existing kerb however includes to make good where kerbs and raised areas removed.

No allowance for street lighting or re-signalisation works

Contamination allowances excluded for this scope

Direct Cost Non-Measurable Allowances include:

- Traffic management, and staging and temporary works requirements assume minimal allowance for traffic management, temporary barriers.
- Utilities allowance excluded.
- Environmental management and cultural/heritage management excluded.

7.10 PARK AND RIDE

Assumed key metrics: 200 no. parking bays

Allowance for Park and Ride locations as detailed in scope assumptions in Section 3.10.

Main works costs

Allowance for asphalt carparking for 200 no. bays (assuming approx. 4,700m²) including earthworks, site prep, asphalt pavement, kerb, drainage, linemarking and signage, tie-in to existing road, lighting, landscaping etc. Allowances for 2x indented bus bay, 1x bus shelter, 1 x bus stop, Public toilets (1 M 1 F).

Contamination allowances excluded for this scope.

Two indicative, general costing options for Park and Ride provided, with considerations for either a greenfield or brownfield site, with the differences in site preparation assumptions as follows:

- Greenfield site assumes allowance for bulk earthworks - assumed 400mm cut/fill balance
- Brownfield site assumes generally flat/ benched site, some demo allowances for existing surfaces.

Direct Cost Non-Measurable Allowances include:

- Traffic management crew during tie-in work to existing road. Temporary. barriers allowance at existing road interface.
- Utilities excluded as site TBC.
- Environmental management and cultural/heritage management excluded.

8 EXCLUSIONS

The transport options costing advice excludes the following:

- Works as identified for the Macquarie Point stadium project
- Works outside the nominated site boundaries
- Land acquisition
- Adjoining owner issues
- Relocation of unknown, major existing services outside of allowances stated.
- Demolition is generally assumed for pavement areas, no allowance for major demolition works (to buildings, structures etc.)
- Traffic signal reviews and plan excluded - assumed included in client development costs
- Negotiated Contracts (assumes competitive tender)
- Works carried out by third parties prior to commencement
- Costings assume works carried out by selected contractor. Allowance for ad hoc/ ancillary works carried out by Council (e.g. planting of trees) not considered in rates.
- Impacts of delays caused by third parties (i.e. timing of works by asset owners)
- Future design impacts
- Community Stakeholders Requirements
- Local Council contributions
- Income from others / value capture
- Any Non-Construction Development Costs
- Operating Costs
- Financing Costs
- Authority fees & charges
- Legal Costs
- GST

9 LIMITATIONS AND QUALIFICATIONS

The Order of Magnitude (OOM) cost estimates have been developed in support of the strategic assessment of future transport infrastructure options and are based on indicative scoping descriptions and concept sketches only, with limited definition of scope for the projects listed, and is therefore not to be used for any other purpose or distributed to any third party.

The OOM estimates (equivalent to Class 5 estimate with an expected level of accuracy of -40% / + 60%) are indicative and should be used for planning purposes only.

The Tasmanian Construction industry is currently encountering a buoyant construction sector due to the volume of construction work being undertaken or forecast to commence in Tasmania. Based on recent market feedback, we understand that construction prices for some Tasmanian projects are receiving tender prices in the region of 20% over budget. Based on this, this may increase the project cost for construction works (including contingencies). We highlight that loading for buoyant market conditions is currently EXCLUDED from this estimate.

All costs in this report exclude Goods & Services Tax (GST).



APPENDIX A

MACQUARIE POINT TRANSPORT OPTIONS COSTING SUMMARY

Item no.	Project option				Total Project Cost
1	Northern Access Road (per January 2024 estimate)	1	item	\$ 33,900,000	\$ 33,900,000
2	Event bus plaza	8,300	m2	\$ 1,960	\$ 16,200,000
3	Collins Street Active Transport Bridge				
3a	Option 1 - functional design style only	1,200	m2	\$ 36,670	\$ 44,000,000
3b	Option 2 - architectural finish	1,200	m2	\$ 47,090	\$ 56,500,000
4	Davey Street footpath expansion	150	m2	\$ 1,870	\$ 280,000
5	Southern Campus Transformation – UTAS Pocket Park	2,250	m2	\$ 920	\$ 2,050,000
6	Collins Street redesign	16,750	m2	\$ 690	\$ 11,500,000
6a	Cultural Precinct Uplift including Collins Street redesign	4,600	m	\$ 11,870	\$ 54,600,000
7	CBD bus lanes	1,400	m	\$ 1,250	\$ 1,750,000
8	Evans Street redesign	4,814	m2	\$ 1,190	\$ 5,700,000
9	Hunter Street car parking reconfiguration	5,200	m2	\$ 60	\$ 300,000
10	Park and Ride				
10a	Park and ride - greenfield option	200	no.	\$ 20,000	\$ 4,000,000
10b	Park and ride - brownfield option	200	no.	\$ 19,600	\$ 3,920,000



APPENDIX B

MACQUARIE POINT TRANSPORT OPTIONS COSTING DETAIL

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
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Mac Point Transport - Strategic Costings

1 Northern Access Road

Estimate as provided to DSG January 2024.

The scope includes the extension and realignment of McVilly Drive, construction of approximately 800m long new full-depth pavement for Northern Access Road and Macquarie Point Road.

Additionally, it involves approximately 1,600m of new SUP, as well as the construction of retaining walls, a pedestrian bridge, an overpass and an underpass.

Note: Estimate base date January 2024

DIRECT COSTS

ZONE 1 - McVilly Drive and Tasman Highway				3,006,492
ZONE 2 - Northern Access Road				7,992,845
ZONE 3 - Huon Quays Access				1,246,628
ZONE 4 - Tas Port Access				515,842
ZONE 5 - CoH Carpark Access				737,063
ZONE 6 - Macquarie Point Road				2,624,715
ZONE 7 - SUP				2,191,851

SUBTOTAL - DIRECT COST **18,315,436**

INDIRECT COSTS

Allowance for Contractor Design	4 %	18,315,436	732,700
Allowance for Contractor Preliminaries & Supervision	18 %	18,315,436	3,296,800
Allowance for Margin	10 %	21,612,236	2,161,300

SUBTOTAL - INDIRECT COST **6,190,800**

SUBTOTAL - CONSTRUCTION COST **24,506,236**

Client costs

Development & Delivery Phase Costs	8 %	24,506,236	1,960,500
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SUBTOTAL - PROJECT COST excl CONTINGENCY **26,467,000**

Client Contingency	30 %	24,506,236	7,351,900
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TOTAL ESTIMATED PROJECT COST incl CONTINGENCY **33,818,700**

1 TOTAL Northern Access Road **33,900,000**

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
2	Event bus plaza							
	Scope assumptions: Event bus plaza based on WSP "Straightening of Southern Bays Scenario". Overall pavement area approx. 8,300m² including 3m wide pedestrian waiting area (652m²); surrounding pedestrian paths/ passing area 7m wide (1,992m²); road pavement (5,650m²); 10 bus bays for use during events (5 no. 2x dependent bus bays). Access to proposed basement carpark access (vehicle ramp leading to basement excluded). Key metric: 8,300 m² centre line length approx. 250m (from start ped. queueing area to outer pavement edge) Main works costs Rate makes allowance for bus plaza area as detailed in scope assumption including demo of existing, site prep, pavement layers buildup, linemarking, kerbs etc, lighting with CCTV allowance. Contamination allowances include assumption of level 2 to 15% of project area to a nominal 400mm depth; similarly level 3 contamination allowed for 15% of project area to a nominal 400mm depth. \$1M direct cost provisional allowance for connection to Northern Access Rd and adjoining Port Road network - assumed adjustment to existing road, tie-in, street lights, allowance for traffic re-signalisation. Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assume 6 month works duration to allow for traffic management crew, temp barriers for staging (dependent of timing of Northern Access Road construction works). - Utilities nominal allowance to allow for unquantified relocation/protection works that may be required - Environmental management and cultural/heritage management - allowance considered for this site, some protection works for trees along northern edge of works area + Regatta grounds							
	DIRECT COSTS	8,300 m²		1,157		9,600,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	5 %		9,600,000		480,000		
	Allowance for Contractor Preliminaries & Supervision	18 %		9,600,000		1,728,000		
	Allowance for Margin	12 %		11,328,000		1,359,400		
	SUBTOTAL - INDIRECT COST					3,567,400		
	SUBTOTAL - CONSTRUCTION COST						13,167,400	
	Client costs							
	Development & Delivery Phase Costs	8 %		13,167,400		1,053,400		
	SUBTOTAL - PROJECT COST excl CONTINGENCY						14,220,800	
	Client Contingency - allowance considers mid-range risk of works	15 %		13,167,400		1,975,200		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						16,196,000	
2	TOTAL Event bus plaza	8,300 m²			1,952		16,200,000	

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
3a	Collins Street Active Transport Bridge - Option 1							
	Scope assumptions: <i>Pedestrian bridge across spanning Tasman Highway and Brooker Avenue respectively to facilitate pedestrian access to and from Collins Street precinct. Total span approximately 200m, minimum width of path 6m, with approximate height clearance of 7.8m. Lifts allowed for at each end including one at central ramp area (i.e. three in total).</i> <i>Three spiral ramps of approx. 12m radius to allow for cyclist use.</i>							
	Key metric: Bridge area 1,200 m2							
	<u>OPTION 1 - FUNCTIONAL DESIGN STYLE ONLY</u>							
	Main works costs Rate makes allowance for 6m wide pedestrian bridge as detailed in scope assumption incl. site prep/ demo, bridge sub- and superstructure, three spiral ramps, three architectural lifts with clear glazing feature. Simple/functional design benchmark similar to Rose Garden Bridge. Contamination allowances include assumption of level 2 to 20% of the three ramp/abutment areas to a nominal 400mm depth; similarly level 2 contamination allowed for 20% of the three ramp/abutment areas to a nominal 400mm depth. Allowance for pedestrian fencing to stop illegal crossing of Brooker and Tasman Highway and associated signage Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assume 8 month works duration to allow for traffic management crew, temp barriers for staging - significant allowances due to nature of site across Brooker and Tasman Highway - Utilities nominal \$2M allowance to allow for unquantified relocation/protection works that may be required - Environmental management - allowance considers noise attenuation for out of hours working - Cultural/heritage management - allowance considered for this site for protection works heritage-listed sandstone Royal Engineers building							
	DIRECT COSTS	1,200 m2		18,000		21,600,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	10 %		21,600,000		2,160,000		
	Allowance for Contractor Preliminaries & Supervision	20 %		21,600,000		4,320,000		
	Allowance for Margin	14 %		25,920,000		3,628,800		
	SUBTOTAL - INDIRECT COST					10,108,800		
	SUBTOTAL - CONSTRUCTION COST					31,708,800		
	Client costs							
	Development & Delivery Phase Costs	8 %		31,708,800		2,536,800		
	SUBTOTAL - PROJECT COST excl CONTINGENCY					34,245,600		
	Client Contingency - allowance considers higher risk of works	30 %		31,708,800		9,512,700		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY					43,758,300		
3a	TOTAL Collins Street Active Transport Bridge - Option 1	1,200 m2		36,670	36,667		44,000,000	

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
3b	Collins Street Active Transport Bridge - Option 2							
	Scope assumptions: <i>Pedestrian bridge across spanning Tasman Highway and Brooker Avenue respectively to facilitate pedestrian access to and from Collins Street precinct. Total span approximately 200m, minimum width of path 6m, with approximate height clearance of 7.8m. Lifts allowed for at each end including one at central ramp area (i.e. three in total).</i> <i>Three spiral ramps of approx. 12m radius to allow for cyclist use.</i>							
	Key metric: Bridge area <u>1,200 m2</u>							
	<u>OPTION 2 - HIGH LEVEL OR ARCHITECTURE LIKE BRIDGE OF REMEMBRANCE</u>							
	Main works costs Rate makes allowance for 6m wide pedestrian bridge as detailed in scope assumption incl. site prep/ demo, bridge sub- and superstructure, three spiral ramps, three architectural lifts with clear glazing feature. Architectural design concept benchmark of a similar level to Bridge of Remembrance. Contamination allowances include assumption of level 2 to 20% of the three ramp/abutment areas to a nominal 400mm depth; similarly level 2 contamination allowed for 20% of the three ramp/abutment areas to a nominal 400mm depth. Allowance for pedestrian fencing to stop illegal crossing of Brooker and Tasman Highway and associated signage Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assume 10 month works duration to allow for traffic management crew, temp barriers for staging - significant allowances due to nature of site across Brooker and Tasman Highway - Utilities nominal \$2M allowance to allow for unquantified relocation/protection works that may be required - Environmental management - allowance considers noise attenuation for out of hours working - Cultural/heritage management - allowance considered for this site for protection works heritage-listed sandstone Royal Engineers building							
	DIRECT COSTS	1,200 m2		23,167		27,800,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	10 %		27,800,000		2,780,000		
	Allowance for Contractor Preliminaries & Supervision	20 %		27,800,000		5,560,000		
	Allowance for Margin	14 %		33,360,000		4,670,400		
	SUBTOTAL - INDIRECT COST					13,010,400		
	SUBTOTAL - CONSTRUCTION COST						40,810,400	
	Client costs							
	Development & Delivery Phase Costs	8 %		40,810,400		3,264,900		
	SUBTOTAL - PROJECT COST excl CONTINGENCY						44,075,300	
	Client Contingency - allowance considers higher risk of works	30 %		40,810,400		12,243,200		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						56,318,500	
3b	TOTAL Collins Street Active Transport Bridge - Option 2	1,200 m2		47,090	47,083		56,500,000	

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
4	Davey Street footpath expansion between Evans Street and Hunter Street							
	Scope assumptions: Expansion of footpath to Davey Street between Evans Street and Hunter Street, approximate length 75m, assumed 2m expansion equivalent to project area of 150m². Allowance for new asphalt footpath, provision of kerb and channel and removal of 5 min parking bays. Relocation of existing trees to new kerb alignment to increase effective width Key metric: Project area <u>150 m²</u> length 75m Main works costs Allowance for 2m expansion of asphalt footpath as detailed in scope assumption including demolition of street pavement, site preparation, fill, kerb, drainage, tie-in to existing footpath. Contamination allowances excluded for this scope. Allowance for the relocation of existing trees to new kerb alignment to increase effective width - 10 trees assumed. Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assumed minimal, assume 14 day works duration to allow for traffic management crew, temp barriers - Utilities minimal allowance as not expected to encounter utilities with minimal demo works - Environmental management and cultural/heritage management excluded							
	DIRECT COSTS	150 m²		1,200		180,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	4 %		180,000		7,200		
	Allowance for Contractor Preliminaries & Supervision	15 %		180,000		27,000		
	Allowance for Margin	10 %		207,000		20,700		
	SUBTOTAL - INDIRECT COST					54,900		
	SUBTOTAL - CONSTRUCTION COST						234,900	
	Client costs							
	Development & Delivery Phase Costs	8 %		234,900		18,800		
	SUBTOTAL - PROJECT COST excl CONTINGENCY						253,700	
	Client Contingency - allowance considers low risk of works	10 %		234,900		23,500		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						277,200	
4	TOTAL Davey Street footpath expansion	150 m²		1,870				280,000

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
5	Southern Campus Transformation – UTAS Centre for the Arts Hunter Street Pocket Park							
	Scope assumptions: Conversion of the UTAS Southern Camps car parking area between Evans Street and Hunter Street to a new open space. Project area approx. 2250m2. Scope includes landscaping, new trees and subsoils, pavements and footpath and associated drainage. Assumption to avoid the roadway. Key metric: Project area <u>2,250 m2</u> Main works costs Rate makes allowance for demolition of existing asphalt surface, site prep, associated drainage. Re-surfacing works allow for new paving to assumed 40% of project area, landscaping to 45% of project area, and 15% of project area for footpaths. Contamination allowances excluded for this scope. Allowance for 23. no street trees (assume every 100m2) along with provisional sum allowance for road furniture bike parking, benches, etc.. Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assumed to perimeter along Hunter St, assume 6 weeks works duration to allow for traffic management crew, temp barriers - Utilities minimal allowance as not expected to encounter utilities with minimal demo works - Environmental management and cultural/heritage management excluded							
	DIRECT COSTS	2,250 m2		591		1,330,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	4 %		1,330,000		53,200		
	Allowance for Contractor Preliminaries & Supervision	15 %		1,330,000		199,500		
	Allowance for Margin	10 %		1,529,500		153,000		
	SUBTOTAL - INDIRECT COST					405,700		
	SUBTOTAL - CONSTRUCTION COST						1,735,700	
	Client costs							
	Development & Delivery Phase Costs	8 %		1,735,700		138,900		
	SUBTOTAL - PROJECT COST excl CONTINGENCY						1,874,600	
	Client Contingency - allowance considers low risk of works	10 %		1,735,700		173,600		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						2,048,200	
5	TOTAL Southern Campus Transformation – UTAS Pocket Park	2,250 m2		920				2,050,000

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
6	Collins Street redesign (Collins Street Vision)							
	Scope assumptions: <i>Re-design of Collins Street Precinct. Project area approx. 16,750m²</i> <i>Scope includes protected bicycle lanes from Brooker to Murray Street; 1.5m footpath expansions from Brooker to Murray Street; profiling and resheeting of carriageway, and associated drainage.</i> <i>Inclusion of street trees and subsoils, new intersections and signals, new lighting.</i> <i>Naturalisation of Hobart rivulet excluded from costing advice.</i> Key metric: Project area <u>16,750 m²</u> length 730m Main works costs Rate makes allowance for: - 1.5m expansion of asphalt footpath on either side of Collins St approx. 730m long from Brooker to Murray as detailed in scope assumption including demo street pavement, site prep, fill, kerb, drainage, tie-in to existing footpath - 2no. bike lanes each 2m wide to the length of Collins St approx. 730m long from Brooker to Murray as detailed in scope assumption including milling of street pavement, re-sheeting, separator kerbs, drainage, linemarking. - re-sheeting allowance to remainder of road area including allowance for patch repairs, linemarking. - street trees, allow semi-mature tree every 15m along 730m length x 2 sides - approx. 97 trees - new intersections and signals - assume resignalisation for 4 major intersections (Campbell, Argyle, Elizabeth, Murray) - new street lighting, assume single luminaire either side, to full 730m length - 10m spacing Contamination allowances excluded for this scope. Naturalisation of Hobart rivulet (exclude in costings) Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assume 10 weeks works duration to allow for traffic management crew, temp barriers - Utilities minimal allowance as not expected to encounter utilities with minimal demo works - Environmental management and cultural/heritage management nominal \$85k allowance each for protection works							
	DIRECT COSTS	16,750 m²		396		6,630,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	5 %		6,630,000	331,500			
	Allowance for Contractor Preliminaries & Supervision	18 %		6,630,000	1,193,400			
	Allowance for Margin	12 %		7,823,400	938,900			
	SUBTOTAL - INDIRECT COST					2,463,800		
	SUBTOTAL - CONSTRUCTION COST						9,093,800	
	Client costs							
	Development & Delivery Phase Costs	8 %		9,093,800	727,600			
	SUBTOTAL - PROJECT COST excl CONTINGENCY						9,821,400	
	Client Contingency - allowance considers mid-range risk of works	18 %		9,093,800	1,636,900			
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						11,458,300	
6	TOTAL Collins Street redesign	16,750 m²		690			11,500,000	

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
6a	Cultural Precinct Uplift							
	Scope assumptions: <i>Uplift to City of Hobart proposed cultural precinct. Project area encompasses Brooker Avenue in the north to Harrington Street in the south, Collins St to the west and Davey St on the east.</i> <i>Scope includes abovementioned Collins Street redesign + uplift to remaining streets in the nominated area of the proposed precinct (a further ~3.9KM).</i> <i>Note: costs for option 6a include option 6 costs - i.e. not to be added together</i> Key metric: proposed area per City of Hobart Cultural Precinct length 730m + 3,900m = 4.6 KM Main works costs Rate makes allowance for: Collins Street re-design, 730m length (as per above) Remainder of Cultural Precinct (further approx. 3.9KM length of street, i.e. 4,600m total): - street trees: allow semi-mature tree every 30m along length of remaining street length on one side - approx. 130 trees - new intersections and signals - assume resignalisation for a further 9 intersections along Davey, Macquarie and Collins including Davey/Brooker - new street lighting, assume single luminaire either side, to 3.9KM length - 10m spacing - provisional sum allowance for new/revitalised wayfinding that has a look and feel connection to the stadium \$1.5M assuming integration into existing street fabric - provisional sum allowance for street art/cultural opportunities is highly dependent on scope - allowance included below is \$1.5M and assumes community/ cultural engagement. Traffic signal reviews and plan excluded - assumed included in client development costs Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assume 60 weeks works duration to allow for traffic management crew, temp barriers - Utilities minimal allowance as not expected to encounter utilities with minimal demo works - Environmental management and cultural/heritage management nominal \$500k allowance each for protection works							
	DIRECT COSTS	4,600 m		6,867		31,590,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	5 %		31,590,000		1,579,500		
	Allowance for Contractor Preliminaries & Supervision	18 %		31,590,000		5,686,200		
	Allowance for Margin	12 %		37,276,200		4,473,200		
	SUBTOTAL - INDIRECT COST					11,738,900		
	SUBTOTAL - CONSTRUCTION COST					43,328,900		
	Client costs							
	Development & Delivery Phase Costs	8 %		43,328,900		3,466,400		
	SUBTOTAL - PROJECT COST excl CONTINGENCY					46,795,300		
	Client Contingency - allowance considers mid-range risk of works	18 %		43,328,900		7,799,300		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY					54,594,600		
6a	TOTAL Cultural Precinct Uplift	4,600 m		11,870				54,600,000

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
7	CBD bus lanes							
	Scope assumptions: <i>Linemarking for 1 no. bus lane on Macquarie Street from Southern Outlet to Murray Street, approximately 1.4km. Scope includes for traffic signal plans and bus signals upgrades.</i> Key metric: Project length <u>1,400 m</u> Main works costs Rate makes allowance for Macquarie Street bus lane linemarking to extent as detailed in scope assumption, approx. 1,400m including linemarking to single lane 3.5m wide, allowance for re-sheeting (30% of area) and traffic signal plans and bus signals upgrades \$600k allowance. Contamination allowances excluded for this scope Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assumed for safeworking whilst Macquarie St still in use, allowance for traffic management crew, temp barriers for protection in live environment - Utilities minimal allowance as not expected to encounter utilities with no demo works - Environmental management and cultural/heritage management excluded							
	DIRECT COSTS	1,400 m		807		1,130,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	4 %		1,130,000	45,200			
	Allowance for Contractor Preliminaries & Supervision	15 %		1,130,000	169,500			
	Allowance for Margin	10 %		1,299,500	130,000			
	SUBTOTAL - INDIRECT COST					344,700		
	SUBTOTAL - CONSTRUCTION COST						1,474,700	
	Client costs							
	Development & Delivery Phase Costs	8 %		1,474,700	118,000			
	SUBTOTAL - PROJECT COST excl CONTINGENCY						1,592,700	
	Client Contingency - allowance considers low risk of works	10 %		1,474,700	147,500			
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						1,740,200	
7	TOTAL CBD bus lanes	1,400 m		1,250			1,750,000	

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
8	Evans Street redesign from Davey Street to Hunter Street							
	Scope assumptions: <i>Re-design of Evans Street between Davey and Hunter Street.</i> <i>Scope includes footpath expansion of 1.5m, road surfacing suitable for both regular road closures and heavy vehicles, changes to levels and drainage subject to design, DDA bays and associated kerbs/ramps, new trees and subsoils.</i> Key metric: Project area <u>4,814 m2</u> 260m length Main works costs Rate makes allowance for: - 1.5m expansion of asphalt footpath on either side of Evans St approx. 260m long from Davey to Hunter as detailed in scope assumption including demo street pavement, site prep, fill, kerb, drainage, tie-in to existing footpath - road surfacing to remainder of road area including allowance for demo asphalt layer, pavement renewal incl. drainage - assume suitable for both regular road closures and heavy vehicles - DDA bays and associated kerbs/ramps - street trees, allow semi-mature tree every 15m along 260m length x 2 sides - approx. 35 trees - new street lighting, assume single luminaire either side, to full 260m length - 10m spacing Contamination allowances include assumption of level 2 to 15% of project area to a nominal 400mm depth; similarly level 3 contamination allowed for 15% of project area to a nominal 400mm depth. Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assume minimal allowance for traffic management crew, temp barriers - Utilities minimal allowance as not expected to encounter utilities with minimal demo works - Environmental management and cultural/heritage management nominal \$45k allowance each for protection works							
	DIRECT COSTS	4,814 m2		699		3,367,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	5 %		3,367,000		168,400		
	Allowance for Contractor Preliminaries & Supervision	18 %		3,367,000		606,100		
	Allowance for Margin	12 %		3,973,100		476,800		
	SUBTOTAL - INDIRECT COST					1,251,300		
	SUBTOTAL - CONSTRUCTION COST						4,618,300	
	Client costs							
	Development & Delivery Phase Costs	8 %		4,618,300		369,500		
	SUBTOTAL - PROJECT COST excl CONTINGENCY						4,987,800	
	Client Contingency - allowance considers mid-range risk of works	15 %		4,618,300		692,800		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						5,680,600	
8	TOTAL Evans Street redesign	4,814 m2		1,190				5,700,000

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
9	Reconfigure Hunter Street car parking							
	Scope assumptions: Minor reconfiguration works to Hunter Street carparking up to Davey Street. Scope includes removal of kerbs and raised surfaces to mitigate trip hazards during mass crowd movements through the area. No upgrade to footpath assumed. Allowance for patch repair in areas. Key metric: Project area <u>5,200 m2</u> length of 250m Main works costs Rate makes allowance for: - removal of kerbs and raised areas as detailed in scope assumption - allowance for patch repair demo of pavement and re-sheet/re-paving to 20% of project area Contamination allowances excluded for this scope No allowance for street lighting or re-signalisation works. Direct cost non-measurable allowances include: - Traffic management and Staging and temporary works requirements assume minimal allowance for traffic management, temp barriers - Utilities allowance excluded - Environmental management and cultural/heritage management excluded							
	DIRECT COSTS	5,200 m2		40		210,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	3 %		210,000		6,300		
	Allowance for Contractor Preliminaries & Supervision	12 %		210,000		25,200		
	Allowance for Margin	10 %		235,200		23,600		
	SUBTOTAL - INDIRECT COST					55,100		
	SUBTOTAL - CONSTRUCTION COST						265,100	
	Client costs							
	Development & Delivery Phase Costs	6 %		265,100		16,000		
	SUBTOTAL - PROJECT COST excl CONTINGENCY						281,100	
	Client Contingency - allowance considers low risk of works	5 %		265,100		13,300		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						294,400	
9	TOTAL Reconfigure Hunter Street car parking	5,200 m2		58				300,000

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
10a	Park and Ride - Greenfield							
Scope assumptions:								
Scope assumptions per park and ride include:								
- 200 surfaced parking bays, linemarking								
- 2x indented bus bay								
- 1x bus shelter, 1 x bus stop								
- Public toilets								
Key metric: no. parking bays		200	no.					
Main works costs								
Rate makes allowance for asphalt carparking for 200 no. bays (assuming approx. 4,700m2) as detailed in scope assumption including earthworks, site prep, asphalt pavement, kerb, drainage, linemarking and signage, tie-in to existing road, lighting, landscaping etc								
Greenfield therefore bulk earthworks allowed - assumed 400mm cut/fill balance								
Contamination allowances excluded for this scope								
Allowances for 2x indented bus bay, 1x bus shelter, 1 x bus stop, Public toilets (1 M 1 F)								
Direct cost non-measurable allowances include:								
- Traffic management crew during tie-in work to existing road. Temp. barriers allowance at existing road								
- Utilities excluded as site TBC								
- Environmental management and cultural/heritage management excluded								
DIRECT COSTS		200	no.	12,450		2,490,000		
INDIRECT COSTS								
Allowance for Contractor Design		4	%	2,490,000	99,600			
Allowance for Contractor Preliminaries & Supervision		15	%	2,490,000	373,500			
Allowance for Margin		10	%	2,863,500	286,400			
SUBTOTAL - INDIRECT COST						759,500		
SUBTOTAL - CONSTRUCTION COST							3,249,500	
Client costs								
Development & Delivery Phase Costs		8	%	3,249,500	260,000			
SUBTOTAL - PROJECT COST excl CONTINGENCY							3,509,500	
Client Contingency - allowance considers mid-range risk of works		15	%	3,249,500	487,500			
TOTAL ESTIMATED PROJECT COST incl CONTINGENCY							3,997,000	
10a	TOTAL Park and Ride - Greenfield	200	no.	20,000				4,000,000

Item	Description	Quantity	UOM	Rate	Total	Total	Total	Total
Mac Point Transport - Strategic Costings								
10b	Park and Ride - Brownfield							
	Scope assumptions: <i>Scope assumptions per park and ride include:</i> - 200 surfaced parking bays, linemarking - 2x indented bus bay - 1x bus shelter, 1 x bus stop - Public toilets Key metric: no. parking bays <u>200 no.</u> Main works costs Rate makes allowance for asphalt carparking for 200 no. bays (assuming approx. 4,700m2) as detailed in scope assumption including demo allowance to existing, site prep, asphalt pavement, kerb, drainage, linemarking and signage, tie-in to existing road, lighting, landscaping etc. Brownfield therefore no bulk earthworks allowed - assumed demo existing. Contamination allowances excluded for this scope Allowances for 2x indented bus bay, 1x bus shelter, 1 x bus stop, Public toilets (1 M 1 F) Direct cost non-measurable allowances include: - Traffic management crew during tie-in work to existing road. Temp. barriers allowance at existing road - Utilities excluded as site TBC - Environmental management and cultural/heritage management excluded							
	DIRECT COSTS	200 no.		12,200		2,440,000		
	INDIRECT COSTS							
	Allowance for Contractor Design	4 %		2,440,000		97,600		
	Allowance for Contractor Preliminaries & Supervision	15 %		2,440,000		366,000		
	Allowance for Margin	10 %		2,806,000		280,600		
	SUBTOTAL - INDIRECT COST					744,200		
	SUBTOTAL - CONSTRUCTION COST						3,184,200	
	Client costs							
	Development & Delivery Phase Costs	8 %		3,184,200		254,800		
	SUBTOTAL - PROJECT COST excl CONTINGENCY						3,439,000	
	Client Contingency - allowance considers mid-range risk of works	15 %		3,184,200		477,700		
	TOTAL ESTIMATED PROJECT COST incl CONTINGENCY						3,916,700	
10b	TOTAL Park and Ride - Brownfield	200 no.		19,600				3,920,000

Appendix L

CVs





24 years with WSP

29 years of experience

LOCATION

Sydney (George St), Australia

TECHNICAL SKILLS

Events and Venues

Entertainment precincts

City centre / Precinct multimodal transport plans

Pedestrian Planning & Crowd Management

Public transport network planning

Park-and-Ride planning

MANAGEMENT SKILLS

Project Leadership

Stakeholder Management

Coordination and Integration

PROFILE

Graeme is a Technical Director with over 29 years' experience in both consulting and the public sector. He provides advisory services to clients on state, city wide and precinct scale planning schemes through identifying their transport policy, service and infrastructure requirements which are built upon the concept of Future Mobility.

Building on his experience in the planning and design of transit interchanges, he has developed several related specialties in the design and management of temporary interchanges, the impacts of peak loads during events, comprehensive spectator transport schemes (with a significant portfolio of Olympic, major events and stadiums), pedestrian flow assessment and scenario modelling, and stadium design parameters for crowd management. Graeme has developed event venue and transport concepts for some of the world's largest cities including Beijing, Auckland, London, Tokyo, Madrid and Dubai. He has also worked on over 25 stadium projects in Sydney, Melbourne, Brisbane, Gold Coast, Perth and Canberra.

EDUCATION

Master of Engineering Science (Transport Planning), University of New South Wales	1998
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Bachelor of Science (Transport Geography) (Hons.), University of Newcastle	1993
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Bachelor of Science (Geography), University of Newcastle	1992
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PROFESSIONAL ASSOCIATIONS

WSP Technical Leadership Recognition Program - Technical Principal

Australian Institute of Traffic Planning and Management (AITPM) - Fellow

PROFESSIONAL EXPERIENCE

- **Gabba Stadium Redevelopment and Precinct Works – Project Validation Report, Brisbane, Qld, Australia (2022): Department of Energy and Public Works, Project Director.** Graeme is the Traffic and Transport technical lead and reviewer for the Gabba Project Validation Report, supporting architects Populous through the optioneering stage. Graeme is providing technical direction to the WSP team to provide assessments and reviews of mode shares, traffic management plans, Olympic transport overlay needs and traffic considerations for the Gabba precinct. In this role he is a member of multi-agency transport working groups and has led discussions that have aligned planning assumptions and identified gaps between agencies (DEPW, Stadiums QLD, TMR, BCC and consultants).
- **Brisbane 2032 Olympic Bid Transport Technical Advice, Brisbane, Qld, Australia (2021): Department of Premier and Cabinet (Qld), Technical Advisor.** Undertook a rapid venue planning exercise with sports architects Populous to develop transport schemes for alternate venues including a major stadium and a CBD based competition venue. This involved developing road network plans, security and vehicle access strategies, public transport and pedestrian movement plans for all Games client groups.
- **Dubai 2020 World Expo Transport Plan, Dubai, United Arab Emirates (2019 - 2022): Roads and Transport Authority (RTA Dubai), Project Director.** WSP was engaged to develop a transport plan for the Dubai World Expo 2020. This involved developing operational plans for Metro rail, dedicated shuttle buses, car parking plans, shared mobility services and on-site pedestrian activity. Graeme

undertook a technical review role of all deliverables prepared by WSP Middle East and supported the Project Manager to deliver the commission through bi-weekly reviews over a period of 2 years.

- **2018 Commonwealth Games Transport Operations Assurance Review, Gold Coast, Qld, Australia (2017 - 2018): Department of Transport and Main Roads (TMR), Technical Advisor.** Managed project assurance reviews over an 18-month period to review and challenge the preparation of transport operations plans for the 2018 Commonwealth Games. This included a review of operational plans and participation in readiness exercises for transport control centres, venue precincts and event rail stations.
- **Central Precinct Master Plan Sydney Olympic Park, Sydney Olympic Park, NSW, Australia (2020 - 2022): Sydney Olympic Park Authority, Project Director.** As part of an integrated design team with urban designers, architects and landscape architects, we developed a new precinct master plan for the Central Precinct at Sydney Olympic Park to incorporate a new Sydney Metro station, a light rail line and a mixed use commercial, residential and retail precinct which will become the new heart of Sydney Olympic Park. This involved developing new street environments based upon the Movement and Place framework, increased active transport connections and pedestrian priority areas, development site access strategies and enhanced public transport networks. A key feature of the design was to create a precinct which could integrate event loading of 26,000 spectators into the Metro station during event mode whilst keeping the remaining parts of the precinct operational. Reducing temporary event overlay was achieved through careful and coordinated design of the urban realm, landscape and built form.
- **Sydney Olympic Park Stadia Precinct Transport Review, Sydney, NSW, Australia (2020): Sydney Olympic Park Authority, Project Director.** This study scoped the transport requirements for precinct development opportunities immediately adjacent to the Olympic Stadium. The Transport review undertook a park wide public transport capacity assessment for both every day and event mode which incorporated a new metro station and line as well as the introduction of light rail. It also undertook a 30-minute city accessibility analysis using WSP's Customer Connectivity Tool. It also investigated the consolidated operation of event bus services into the northern end of Olympic Boulevard.
- **Sydney Olympic Park Event Transport Management Plan Review, Sydney Olympic Park, NSW, Australia (2019 - 2020): Sydney Olympic Park Authority (SOPA), Technical Advisor.** Led the review of the transport operational plan to manage the movement of people and vehicles around the Sydney Olympic Park precinct during special events. This included the review of traffic control plans and crowd management plans documenting the pedestrian movements, key control/decision points, staffing and infrastructure plans.
- **Marvel Stadium Development Study, Melbourne, Vic., Australia (2018): Development Victoria, Technical Advisor.** Prepared a study to investigate the development potential for various parcels of land immediately adjacent to Marvel Stadium in Melbourne. The study included detailed dynamic pedestrian flow analysis, traffic and parking generation.
- **Perth Stadium Operational Event Plan, Perth, WA, Australia (2017): Main Roads WA (MRWA), Technical Advisor.** Developed an operational plan to manage the movement of people and vehicles around the Perth Stadium precinct during special events. Involved with the preparation of control plans and crowd management plans documenting the pedestrian movements, key control/decision points, staffing and infrastructure plans.

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- **Auckland Event Venues Transport Review, Auckland, New Zealand (2014): Auckland Transport, Technical Advisor.** Prepared a technical review of operational management plans for Auckland's major sporting and entertainment venues. Evaluated pedestrian movement, public transport operations, traffic access and parking. Developed a series of operational management improvements.
 - **Perth Stadium Technical Advisor – Transport and Access, Perth, WA, Australia (2013 - 2014): Department of Sport and Recreation, Technical Advisor.** Completed a technical evaluation of proponent's technical designs and schemes for a new 60,000 seat stadium and sports precinct. Evaluated pedestrian movement, public transport operations, traffic access and parking.
 - **Metricon Stadium Transport Management Plan, Gold Coast, Qld, Australia (2010 - 2011): Department of Public Works – Project Services, Project Director.** Led the planning for the design and implementation of transport plans to facilitate the operation of Queensland's newest stadium. The project involved developing a transport management plan, documenting traffic control plans, developing patron transport information maps and event monitoring.
 - **Eden Park Redevelopment Transportation Master Plan, Auckland, New Zealand (2006 - 2010): Eden Park Redevelopment Board, Lead Transport Planner.** Developed event transportation master plan to support the redevelopment of New Zealand's national stadium for the 2011 Rugby World Cup. Redesigned local rail station to cater for event crowds, designed new purpose-built event bus terminal within the stadium and restricted of private parking around the stadium associated with events, provided project planning documentation, resource consent hearing expert witness requirements.
 - **Perth Major Stadium Feasibility Study, Perth, WA, Australia (2006 - 2007): Department of Sport and Recreation, Lead Transport Planner.** Completed a transport assessment of five sites for a new major stadium for Perth. Reviewed existing transport facilities, developed transport master plans in conjunction with key stakeholders and presentation to the Major Stadia Taskforce.
 - **Moore Park Precinct Event Operations Plan, NSW, Australia (2004 - 2005): Centennial Parklands, Senior Transport Planner.** Documented existing facilities and operations for events including event traffic management, event parking management, event staffing resource levels and contingency planning in the Moore Park entertainment precinct. Tasks included venue and operator consultation, site surveys and analysis of crowd attendance and transport data.
 - **London 2012 Olympic Games Last Mile, United Kingdom (2011 - 2012): London Organising Committee for the Olympic Games (LOCOG), Technical Advisor.**
 - **Athens 2004 Olympic Games, Games Time Operations, Greece (2004): Athens Organising Committee for the 2004 Olympic Games, Technical Advisor.**
 - **Salt Lake 2002 Olympic Winter Games, Games Time Operations, Salt Lake City, Utah, United States (2002): Salt Lake Organising Committee for the 2002 Olympic Winter Games, Project manager venue operations.**
 - **Sydney Olympic Park Master Plan 2030, NSW, Australia (2004 - 2009): Sydney Olympic Park Authority (SOPA), Technical Advisor.**

PUBLICATIONS AND PRESENTATIONS
Presentations

Venue Precinct Planning - The foundations for an integrated approach <i>AITPM National Conference. Brisbane, Qld. 28-31 July 2015.</i>	2015
Beyond the Stadium - Activating pedestrian routes to events <i>AITPM National Conference. Perth, WA. 31 July-2 August 2013.</i>	2013
Cycling and Major Events <i>Asia-Pacific Cycle Congress. Gold Coast, Qld. 10-13 March 2013.</i>	2013
Examples from event transport planning in Australia and New Zealand <i>UITPANZ Special Event Planning Masterclass. Gold Coast, Qld. 14 November 2013.</i>	2013
Active Transport Planning for Major Events - Experiences from London 2012 <i>Pedbiketrams Technical Seminar. Brisbane, Qld. August, 2012.</i>	2012
Planning Transport for Stadiums - An international review <i>ITE National Conference on Transportation, Phoenix, Arizona, USA. 22-25 March 2009.</i>	2009



LUKE SOUTHAM

Associate Project Manager



8 years with WSP

14 years of experience

LOCATION

Gold Coast (Nerang), Australia

KEY SKILLS

Project management

Stakeholder engagement and management

Multi-disciplinary team management

Event transport planning and management

PROFILE

Luke is an Associate Project Manager and has 14 years' experience in major events in Queensland, Qatar, the UAE, South Africa and London in both the public and private sectors. Luke focuses on major event transport planning and project management for cross discipline projects and is WSP's Program Lead for coordinating our 2032 Olympics approach to market, pursuits and projects.

From 2015 – 2018 Luke was Project Manager on Gold Coast 2018 Commonwealth Games projects where his operational experience was used in the planning and design of transport operations around venues. During this time Luke worked closely with roads agencies, police, transport providers, local governments and the Organising Committee to deliver transport and traffic management plans and public transport overlay planning all delivered through co-design workshop processes which he led.

EDUCATION

Graduate Certificate in Business Administration, Southern Cross University	2017
Diploma in Business, Macleay College	2000

RELEVANT EXPERIENCE

- **Macquarie Point Public Transport Event Access, Hobart, Tasmania (2023): Macquarie Point Development Corporation, Project Manager.** The Public Transport Event Access project focussed on working with stakeholders including Mac Point, Department of State Growth and ITas to develop and agree mode share targets for various event scenarios, to inform spatial planning and ingress and egress routes for spectators. Luke led this project for WSP which was delivered in a collaborative way to build a consensus on mode shares and supporting infrastructure expectations across agencies. The project met challenging timeframes in support of the Masterplan submission and crucially set expectations and consensus across Mac Point, Department of State Growth and Hobart City Council.
- **Brisbane 2032 Alternative Venue Investigations, Brisbane, Queensland (2023 – 2024) Department of State Development and Infrastructure, Project Manager.** WSP was tasked with investigating the suitability of three sites for a stadium in the Brisbane area. Our investigations included a review of the current road, public transport and active transport networks, and the future needs to support Olympic transport and legacy event transport. Luke led the team through a rapid 'sprint' style process for the three venues in two weeks. The team conducted spectator demand modelling to drive recommendations on public transport uplift, new train stations and improved pathways.
- **River Derwent Ferry Service Expansion Planning, Hobart, Tasmania, Australia (2022 - Present): Department of State Growth, Project Manager.** River Derwent Ferry Service Expansion Planning project is assessing new ferry wharf locations and ferry services for the River Derwent in Hobart. This follows the successful trial of the Bellerive to Brooke Street Pier service. As Project Manager Luke led the WSP team through the long list multi-criteria assessment, SWOT (strength, weaknesses, opportunities and threats) analysis and prepared the draft masterplan report on the suggested stages for the first two expansions of the ferry network. Luke and the WSP team are currently advising the state on an ad hoc basis.
- **Surfers Paradise Travel Demand Management Projections and Recommendations, Gold Coast (2023): City of Gold Coast, Project Manager.** Luke is leading our team in developing modal splits in conjunction with the City of Gold Coast to anticipate traffic and public transport hotspots for the inaugural Pacific

Airshow Gold Coast. The Airshow is expected to generate 20,000 ticketed spectators on the beach and 10,000-20,000 un-ticketed spectators in the surrounding areas. The team is also preparing a data collection plan to capture insights across the Gold Coast network over the event weekend so that planning for the following four years is data driven rather than estimate and assumption based.

- **Gabba Stadium Redevelopment and Precinct Works – Project Validation Report, Brisbane (2022): Populous (ultimate client Department of Energy and Public Works), Project Manager.** Luke is the Traffic and Transport lead for the Gabba Project Validation Report, supporting architects Populous through the optioneering and reference design stage. Luke is coordinating the WSP team to provide assessments and reviews of mode shares, traffic management plans, Olympic transport overlay needs and traffic considerations for the Gabba precinct. In this role he is a member of multi-agency transport working groups and has led discussions that have aligned planning assumptions and identified gaps between Department of Energy and Public Works, Stadiums QLD, TMR, BCC and consultants.
- **Strategic Transport Planning for Major Gold Coast Events, Gold Coast (2022): City of Gold Coast, Project Manager.** Project Manager for a strategic transport project, assisting the City of Gold Coast in understanding the risks and opportunities that will come with the 2032 Olympics. Key areas focused on the scale of the event, modelling, planning and data expectations and an investment roadmap. Luke led our team of specialist transport planners, Olympics experts and investment strategists with outputs that resulted in the City reprogramming some projects to align with Olympics timeframes.
- **2018 Commonwealth Games, Road Network Operations Detailed Design, Gold Coast (2017 - 2018): Department of Transport and Main Roads (TMR), Project Manager.** Detailed design for TMR's road network operations responsibilities. Coordinated the project team including designers, drafters, transport planners and engineers and integrated with complementary work streams and stakeholders.
- **2018 Commonwealth Games, Local Area Transport and Traffic Plans (LATTP) (2015 - 2017): City of Gold Coast, Project Manager.** Project manager of the LATTP project for the City of Gold Coast (with partners TMR and GOLDOC). This involved transport planning for each Commonwealth Games venue with plans being reviewed and revised in multi-agency workshops which Luke led. Tasks included contributing to and reviewing local access maps, active travel routes and bus routes and understanding and documenting local impacts.
- **2018 Commonwealth Games, Transport Facility Operations, Gold Coast (2016 - 2018): Department of Transport and Main Roads (TMR), Project Manager.** This project delivered transport plans for park-and-rides and also fulfilled a secondment into the TMR Venue Transport team to aid in transport planning and development of standard operating procedures and contingency plans. Luke worked alongside public transport operators and communications teams to facilitate the planned operations and adjust services to meet demand across rail, bus and taxi operators.



17 years with WSP

20 years of experience

LOCATION

Melbourne, Australia

TECHNICAL SKILLS

Transport advisory

Transport planning

Traffic engineering

Project evaluation

MANAGEMENT SKILLS

Project management

Team leadership

People management

PROFILE

Sarah is a chartered principal transport engineer with experience across transport planning and traffic engineering, with a focus in integrated transport and land use planning. She has a strong interest in shaping networks, streets and places for people. Over her years of experience, she has developed extensive experience in project management, technical analysis, communication and reporting. She has experience in managing multidisciplinary projects and takes a collaborative approach when working with clients. Sarah has worked across the transport project life cycle, from strategic project planning and assessment through to post completion evaluation. Her skills focus on transport planning and advisory, precincts, active transport, movement and place and benefit realisation.

EDUCATION

Bachelor of Engineering (Honours), University of Melbourne 2003

Bachelor of Arts, University of Melbourne 2003

PROFESSIONAL ASSOCIATIONS

Engineers Australia – MIEAust CPEng

Registered Professional Engineer Victoria (RPEV)

Australian Institute of Traffic Planning and Management (AITPM) - Full Member

PROFESSIONAL EXPERIENCE

Transport planning and design

- **Eureka Stadium and Bendigo Showgrounds Station – Site Investigations - Transport Planner (Client: DTP) 2023.** The 2026 Commonwealth Games were to be held in five regional centres across Victoria: Geelong, Bendigo, Ballarat, Gippsland and Shepparton. Eureka Stadium and the Bendigo Showgrounds were identified as locations to host events, and DTP investigated the feasibility of providing heavy rail access via new railway stations. Sarah undertook transport planning and station access investigations for a potential new railway station at Eureka Stadium and Bendigo Showgrounds, considering the needs of spectators for the Games, ongoing events, and every day operations.
- **DoT TA Geelong Fast Rail Corridor Strategy (2021-current), Workstream Lead.** The Geelong Fast Rail project was to deliver faster rail services for Geelong and cut travel times for passengers. This project determined surface transport initiatives to support the future rail corridor and leverage rail investment, to inform further planning. The project used a methodology that prioritised walking to stations, followed by other modes and limiting/avoiding additional carparking.
- **Docklands Stadium Master Plan Transport Services, Melbourne, Vic., Australia (2018 - 2019): Development Victoria, Project Manager.** Supported Development Victoria's conceptual master plan for the Docklands Stadium precinct, WSP completed a study incorporating pedestrian modelling for different time periods (peak periods and event periods) around the stadium concourses. The study included assessment of future development scenarios to understand the effect on pedestrian movements, as well as considering the future traffic and transport network supporting the stadium precinct.
- **DoT TA Sunshine Transport Precinct Plan (2021), Workstream Lead.** This project provided the Department of Transport (DoT) with key technical inputs to define the local transport priorities needed to complement the Western Rail Plan and

other major rail transport projects, and to fulfil the Government's vision for the Sunshine Transport Precinct. The technical inputs project included review and assessment of current and future network performance using Movement and Place and identifying initiatives to support the precinct objectives.

- **Arden Central Movement and Parking Strategy (2020-2021), Development Victoria, Project Manager.** WSP was engaged by Development Victoria to prepare a Movement and Parking Strategy for the proposed Arden Central Precinct. The project included a background and research report prepared for the first stage of this project, and the concept development and validation of stage 2.

A key focus has been to integrate this Strategy with the vision for Arden Central, including the target for 90 per cent of all trips to the precinct by public or active transport by 2051. The future growth and development of the precinct around the new metro station will integrate seamlessly with adjacent inner-city suburbs and the wider metropolitan Melbourne transport network.

- **Cycling Level of Traffic Stress Tool, Melbourne, Vic., Australia (2020): Department of Transport (VIC) (Dot), Project Manager.** This project developed a cycling Level of Traffic Stress tool for the Victorian context. Level of Traffic Stress (LTS) has been identified as a core factor in the selection of cycling as a travel mode. Cycle infrastructure can be planned to minimise stress and boost participation in active transport.
- **Hobsons Bay Transport Planning Study, Vic., Australia (2019 - 2020): Department of Transport (VIC) (DoT) and Hobsons Bay City Council, Deputy Project Manager/Transport Planner.** Review of the Hobsons Bay current and future transport network and places influencing the movement patterns in the study area. This incorporated movement and place assessment and workshops, and identified challenges and opportunities for active transport, public transport, freight and general traffic networks.
- **2006 Commonwealth Games, Melbourne, Vic., Australia (2006): Office of Commonwealth Games Coordination, Traffic Manager.** Responsible for traffic and transport operations for Royal Park precinct (State Netball Hockey Centre) during the Commonwealth Games.
- **2006 Commonwealth Games, Melbourne, VIC, Australia (2005 - 2006): Office of Commonwealth Games Coordination, Traffic Officer.** Planned, developed, scoped and implemented traffic operations plans and traffic implementation plans for four Commonwealth Games venues, including the Commonwealth Games Village. Liaised and negotiated with local authorities and key stakeholders (including emergency services) for planning and management of operations.



ALEX GU; FIEAust, CPEng, RPEV

Technical Executive



15 years with WSP

24 years of experience

Areas of expertise

Transport modelling

Transport planning

Economic evaluation

LANGUAGES

English

Chinese

PROFILE

Alex is WSP's national capability leader in transport modelling. He has 24 years' experience, specialising in transport planning and modelling, economic appraisal, traffic engineering, and management. He has worked extensively throughout Australia and New Zealand.

Alex is a specialist transport modeller with skills in multiple modelling software packages and is responsible for the delivery of many transport studies across Australia. He has led modelling teams involved in work from strategic planning, demand forecasting to microsimulation, and has trained/supervised transport modellers.

Alex has worked with the Greater Hobart Urban Travel Demand Model on previous projects for the Department of State Growth and he and our modelling team will be able to jump straight into the model, knowing its limitations and nuances.

EDUCATION

Graduate Diploma of Economics, University of London/London School of Economics	2017
Postgraduate Diploma in Management, Melbourne Business School	2011
Postgraduate Certificate Public Private Partnership, University of Melbourne	2007
Master of Science (Eng.) Transport Planning and Engineering, University of Leeds	1998
Bachelor of Engineering (Civil), Tsinghua University	1996

PROFESSIONAL ASSOCIATION

Institution of Engineers Australia: Fellow	FIEAust
Institution of Engineers Australia: Chartered Professional Engineer	CPEng
Registered Professional Engineer Victoria	RPEV

PROFESSIONAL EXPERIENCE

Transport planning, modelling, and appraisal

- **GHUTDM Strategic Modelling Support, Hobart, TAS, Australia (2023-present): Department of State Growth (DSG), Project Director.** WSP is contracted to provide ongoing ad-hoc modelling support to DSG, primarily through providing training and guidance on the use of the Greater Hobart Urban Travel Demand Model (GHUTDM) and the Cube modelling software suite.
- **MetroPlan Modelling via Greater Hobart Urban Travel Demand Model, Hobart, TAS, Australia (2021): Department of State Growth (DSG), Project Director.** The MetroPlan was a comprehensive plan to direct the growth and development of Greater Hobart to help fulfil the objectives of the Greater Hobart Act 2019. This engagement involved the provision of strategic modelling services using the Greater Hobart Urban Travel Demand Model (GHUTDM) in Cube Voyager to test and assess at a high-level, the network impacts of various land-use and public transport scenarios.
- **Greater Hobart Urban Travel Demand Model (GHUTDM) Update, Hobart, Tas., Australia (2020): Department of State Growth, Project Manager.** The objective of this project was to recalibrate the GHUTDM to year 2019 and improve its transport demand forecast accuracy. The main tasks included updating model data using the most recent input datasets, updating the road, public transport and active transport networks, updating the public transport fare structure to reflect current arrangements, incorporating public transport crowding into the public transport module within the model, improving the resolution of car parking supply, reviewing literature and best practice to determine

the appropriate value for user costs, improve the accuracy of the Park and Ride module within the model, including additional travel mode options, and extending the model's design years. A full model development report and a user guide were produced at the completion of the project.

- **Better Buses – Strategic Transport Modelling, Melbourne, Vic., Australia (2023): Infrastructure Victoria, Project Director and Internal Reviewer.** Infrastructure Victoria (IV)'s Better Buses for Melbourne program included a range of activities to explore how bus reform can improve travel, better support Melbourne's growth and address social and environmental challenges. The role of strategic modelling was contributed to the evidence base, quantify and assess the benefits of bus reform from a reimagined bus system.

The Victorian Integrated Transport Model (VITM) was used to evaluate and provide commentary on the performance of various bus reform programs. Therefore, for the project to be successful, IV needed to have confidence in how modelled demand responds to changes in conditions, including service supply, service costs and public perception of bus services. This was achieved by undertaking model response validation in addition to traditional static model validation based on observed traffic and patronage counts.

- **VITM Reference Scenarios and Insights, Melbourne, Vic., Australia (2022): Department of Transport (DoT), Project Manager and Lead Modeller.** The Victorian Integrated Transport Model (VITM) are routinely used to provide the demand forecasts that form a critical input for evaluating transport investment decisions and the anticipated impacts of transport projects. The COVID-19 pandemic has significantly impacted travel demand, changing fundamental forecasting assumptions such as population projections, where we chose to live and work, and our ability to work remotely rather than commuting daily for work. Similarly, new travel modes such as electric vehicles, connected and automated vehicles, Mobility as a Service (MaaS), and micromobility are emerging. Uncertainties about their future uptake, shifts in government policy, and timing have focused attention on whether we can continue to rely on a fixed set of travel-behaviour assumptions to inform demand forecasts and the investment decisions they underpin.

WSP helped DoT develop practical industry guidance to help quantify the potential impact of these 'uncertainties' on transport planning and investment decisions by reviewing the potential impacts of the sources of future uncertainty and how they can be tested within the current VITM.

- **Hobsons Bay Transport Planning Study, Melbourne, Vic., Australia (2019-2020): Department of Transport/Hobsons Bay Council, Lead Transport Modeller.** The Hobsons Bay Transport Planning Study was a collaborative study between Hobsons Bay City Council and the Department of Transport to establish a strategic transport vision and priorities for Hobsons Bay and respond to the challenges that stem from the West Gate Tunnel Project, primarily involving freight movement.

Alex conducted a review of the strategic modelling conducted as part of the West Gate Tunnel Project to understand the implications on the wider study area and undertook a high-level modelling analysis of the traffic impacts of intersection upgrades and alternative routes for trucks.



OSCAR HAYES

Associate Principal, Cities and Place



9 years of experience

TECHNICAL SKILLS

Cycling and Micromobility
Transport Planning and Design
Policy and Strategy
Stakeholder Management and
Community Engagement

ACHIEVEMENTS

Global Designing Streets
Initiative (GDCI)- Streets for
Kids Leadership Accelerator
2022

Menzies Institute, Rethinking
Transport Forum 2022

Winner Planning Institute of
Australia (PIA) 2021 National
Awards for Planning
Excellence- Best Large Project
(Transport Strategy 2030)

PROFILE

Oscar is a Strategic Transport Planner with experience across state and local government. His expertise in transport planning is strengthened by broader skills in community engagement, stakeholder management and strategic communications.

Oscar specialises in active transport planning, street design, place-based policy, strategy development and emerging transport technology including micromobility. He is focused on removing barriers to implementation of active transport infrastructure. Oscar excels in a multidisciplinary team environment and loves to amplify different perspectives and skills.

Oscar is based in Tasmania and has a deep understanding of the unique local dynamics of Tasmanian transport policy, with a strong appreciation of the pressing challenges facing Hobart as a city.

EDUCATION

Master of Urban Planning, University of Melbourne	2017
Bachelor of Arts, University of Melbourne	2014

RELEVANT PROFESSIONAL EXPERIENCE

Associate Principal, Cities (2023 -): WSP

- Project manager for *West Hobart Local Area Mobility Plan*, City of Hobart (2024-) to identify, prioritise and plan projects to increase local walking and cycling.
- Transport planning lead for *Walk, wheel, ride Tasmania*, Department of State Growth (2023-). WSP are delivering a 10-year active transport and micromobility strategy for Tasmania. Oscar's depth of experience and future thinking is helping the Tasmanian Government support more people to choose active transport.
- Design strategy for *Collins Street Tactical Bicycle Lanes*, City of Hobart (2024-). WSP are providing design and stakeholder engagement advice to implement a new cycleway in Collins Street, Hobart.
- Project Manager for *Tasmania Cycling Infrastructure Planning Guide*, Department of State Growth (2024-). Oscar is leading a collaborative project to develop cycling network planning guidelines for Tasmania, piloting local cycle network plans for two local government areas.
- Project Manager for *Tasmania Cycling Infrastructure Design Guide*, Department of State Growth (2023-24). Oscar is leading the development of an innovative cycling design guide to improve active transport design and delivery in Tasmania.
- Technical lead for *Freight Micromobility Options Analysis* for Transport for NSW (2023) on the use of micromobility for freight in high density urban areas. Oscar facilitated national and international stakeholder engagement to identify options to increase the use of electric cargo bikes for freight tasks.
- Cycle network planning lead for *Cycling and micromobility planning guidance*, Austroads (2023). WSP worked with Stantec to deliver national cycle planning guidance and updates to the Austroads Guide to Traffic Management (AGTM). Oscar applied his in-depth understand of cycle network design and implementation to define best practice national guidance.

- Project manager for *Randwick Active Transport Strategy*, Randwick City Council (2023-24) to identify, prioritise and plan projects and policies to increase walking and cycling for transport.
- Project lead for *Active Transport Tactical Design Guidance*, Department of State Growth TAS (2023). Identified ways to reduce delivery time and cost by applying tactical techniques for active transport. Guidance on design, communications and engagement, evaluation.
- Project manager for *Movement and Place training pilot*, Department of Planning and Environment NSW (2023-). Design and deliver a learning program to upskill strategic planners to apply the NSW Movement and Place Framework.

Senior Transport Planner (2019– 2022): City of Melbourne

- Key projects: Accelerated Bike Lane Program including network planning and design, project prioritisation, active transport modelling, stakeholder engagement and communications strategy. Shared E-bike Launch, Independent Transport Review with Deloitte, Economic Contribution of Transport Modes study with Urbis, ‘Let’s Ride, Melbourne’ behaviour change pilot with RACV, Transport Strategy 2030 implementation, major transport project advice and various street design projects.
- Lead transport planner on quick-build bike lane program delivery. Provided project design advice, established evaluation framework and post-installation engagement. Managed data collection and visualisation for monitoring of new bike lanes. Negotiated a micromobility operational legal agreement which guided the 2022 shared e-scooter trial. Delivered a range of leading bicycle behaviour change initiatives in Victoria. Project managed post-covid transport policy review with focus on economic recovery.
- Undertook complex multi-stakeholder negotiation and collaboration on a variety of projects. Worked with Department of Transport and planning, central Melbourne LGAs, transport operators and advocacy organisations.

Strategic Planner (2017 - 2019): City of Melbourne

- Key projects: Transport Strategy 2030, West Gate Tunnel EES submission, Metro Tunnel Project advice, Fishermans Bend transport planning and the City of Melbourne Bike Lane Design Guidelines.
- Extensive contribution to Melbourne’s transport planning and policy. Negotiated to align design outcomes with local policy on major transport projects. Contributed to best practice engineering design guidelines for active transport.

Stakeholder and Communications Consultant (2015 - 2017): Nation Partners

- Key projects: Level Crossing Removal Project (CD9), West Gate Tunnel Project and the Fitzroy Gasworks Redevelopment
- Managed analysis of community engagement feedback; established a community reference group. Experience with online engagement tools, communications tools, experience with probity requirements.