



Melbourne Metro Rail Project EES Inquiry and Advisory Committee Hearing - Parkville Station Traffic & Transport Evidence

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Client // University of Melbourne
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Melbourne Metro Rail Project EES Inquiry and Advisory Committee Hearing - Parkville Station

Traffic & Transport Evidence

Issue: Final 12/08/16

Client: University of Melbourne

Reference: V105280

GTA Consultants Office: VIC



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1. Introduction

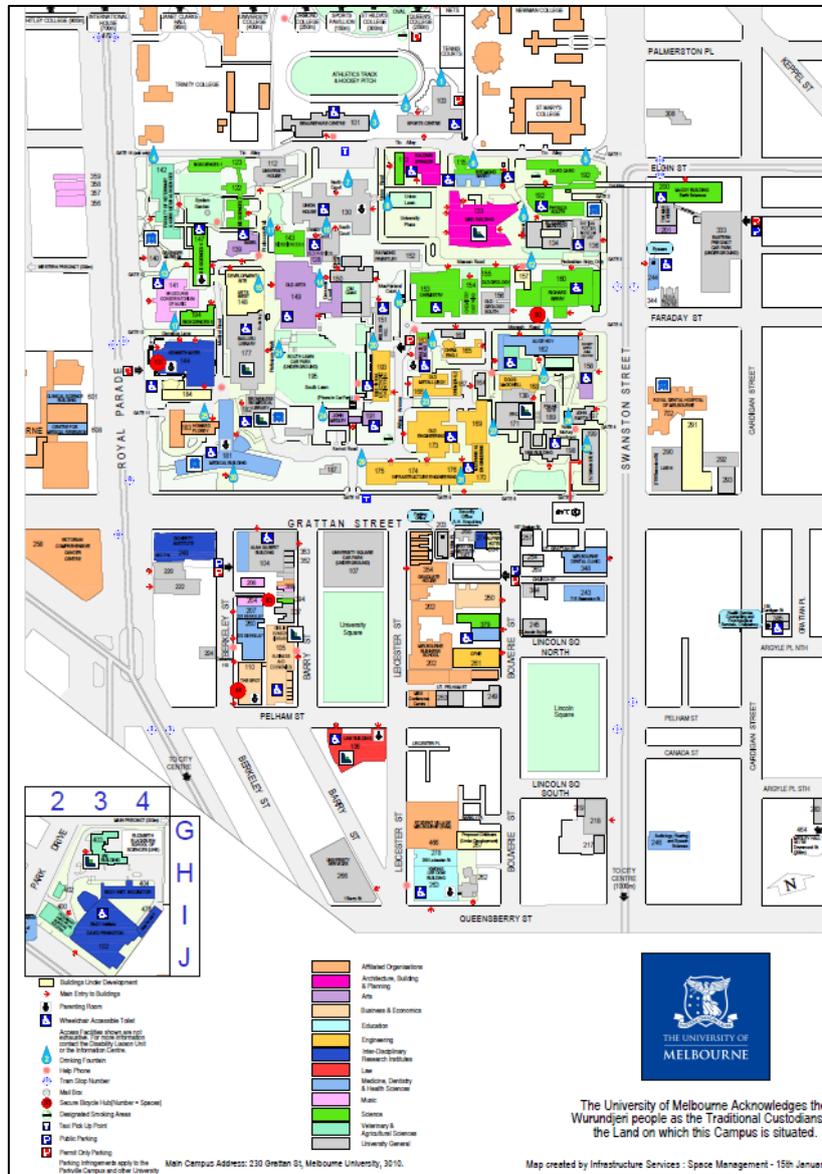
1.1 Background Context

The Melbourne Metro Rail Project (the Project) consists of a 9km rail tunnel between South Yarra and Kensington connecting the existing Cranbourne/Pakenham and Sunbury lines. The Project will create additional capacity for passengers accessing the Melbourne CBD on the new line, as well as freeing up capacity in the city loop for other existing lines. Five new underground stations will be delivered as part of the Project, including a new station at Parkville adjacent to the University of Melbourne (the University).

There are approximately 45,000 students and 8,100 staff that study and work at the University (based on 2012 statistics). The University is the number 1 ranked university in Australia (Academic Ranking of World Universities 2015) and number 33 in the world (Times Higher Education World University Rankings 2015-2016). Melbourne was also named as the second most student-friendly city in the world (QS Best Student City Rankings).

The University straddles Grattan Street, with the majority of the University facilities accommodated in the northern campus, but with facilities located to the south of Grattan Street and accessed via the local road network such as Berkeley Street, Barry Street, Leicester Street and Bouverie Street. The layout of the northern and southern University facilities around Grattan Street is presented in Figure 1.1.

Figure 1.1: University of Melbourne Facilities Layout



The Parkville education and medical precinct is identified as one of three National Employment Clusters (NEC) in Plan Melbourne, with the document intended to guide Melbourne's housing, commercial and industrial development through to 2050. NEC's are intended to deliver high-quality jobs in Melbourne's suburbs. In this respect, a total of 32,700 people are currently employed in the Parkville Employment Cluster (including 25% at the University).

The University is supportive of the Melbourne Metro Rail Project and delivery of the Parkville train station, recognising the Project's benefits to the Parkville precinct around accessibility and the development of the area.

The University will be affected by the Parkville station, both during its construction and legacy (post development) phases. Given its status within the Parkville precinct as a major educator and employer, the University should be consulted on all Project traffic and transport matters that will impact on its operation.

1.2 Expert Witness Details

Jason Sellars BE (Hons) Civil and Transportation Engineering
Associate Director – GTA Consultants (Vic) Pty Ltd

L25, 55 Collins Street, Melbourne

Areas of Expertise: Traffic Engineering & Transport Planning

I have a Bachelor of Engineering Degree and have over 14 years' experience in traffic engineering design and traffic and parking impact assessments. This experience covers a wide range of projects in Australia and the UK. I have been involved in the preparation of traffic and transport reports and design advice, as well as the presentation of expert evidence at VCAT and Panel hearings. I have particular experience in the delivery of development planning advice for town planning applications for commercial, residential, retail and educational developments, and have performed as a member of multi-disciplinary teams on numerous projects.

Further details of my experience are provided in Appendix A.

1.3 Relationship to Applicant

I have no ongoing private or business relationship with the University and I have been retained to provide expert witness services at the Inquiry and Advisory Committee for a mutually agreed fee.

1.4 Instructions & Scope of Report

I was commissioned by the University in August 2016 to undertake a review of the traffic and transport material prepared for the Project and to present expert traffic and transport evidence at the Inquiry and Advisory Committee.

Prior to preparing this evidence I was briefed by Ms Megan Schroor of Rigby Cooke Lawyers regarding the Project.

This evidence sets out my review findings of the traffic and transport material prepared for the Project, including consideration of the following:

- i Existing traffic and transport conditions surrounding the University.
- ii The proposed delivery of the project.
- iii The anticipated impacts of the delivery of the Project on the operation of the University.
- iv The recommended Environmental Performance Requirements for the Project.

1.5 References

In preparing this evidence, reference has been made to the following:

- Melbourne Planning Scheme.
- Melbourne Metro Rail Project Transport Impact Assessment prepared by the AJM Joint Venture and dated 20 April 2016 (Revision C1).
- Chapter 8 (transport) of the Environment Effects Statement.
- University of Melbourne Parkville Campus Movement Counts (June 2016) prepared by Traffix Group.
- City of Melbourne Walking Plan 2014-17.
- City of Melbourne Bicycle Plan 2016-2020.
- City of Melbourne Transport Strategy 2012: Planning for Future Growth.
- City of Melbourne City North Structure Plan 2012: Planning for Future Growth.
- Pedestrian and cyclist surveys undertaken by GTA as referenced in the context of this evidence.
- An inspection of the site and its surrounds.

1.6 Tests, Experiments & Assistance

In preparing this evidence, I received assistance from the following people:

- Mr Andrew Farran (Associate) – BE (Civil)(Hons).
- Mr Tom Kennedy (Consultant) – BCom, ME(Civil)(Distinction).

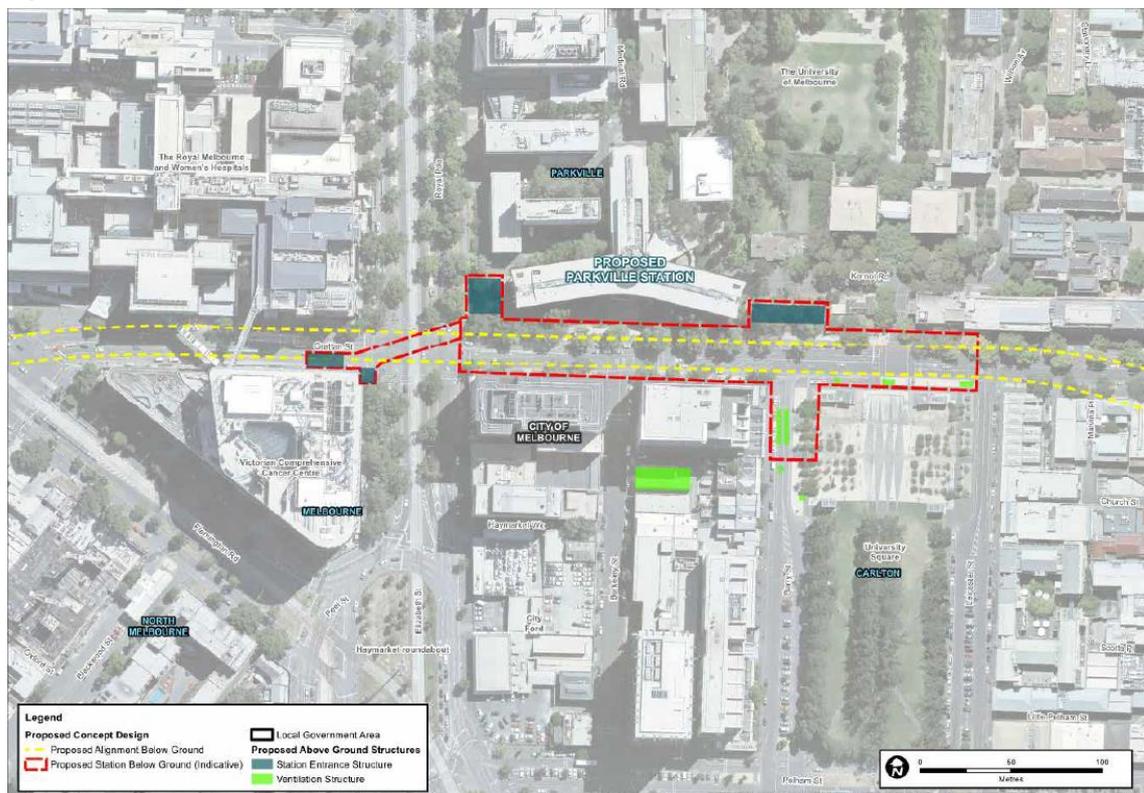
2. Existing Conditions

2.1 Preamble

The Parkville Station is proposed to be located beneath the section of Grattan Street between Royal Parade and Leicester Street.

Figure 2.1 outlines the proposed rail alignment and train station extents.

Figure 2.1: Proposed Location of Parkville Train Station



Source: AJM TIA, April 2016.

2.2 Existing Road Network

2.2.1 Grattan Street

Grattan Street is a two-way local road (Council controlled) aligned in an east-west direction. It has a 30.0m-wide road reserve (approximately) which accommodates a footpath on its southern side and a shared path on its northern side, kerbside parallel car parking on both sides of the road and two traffic lanes in each direction.

Signalised pedestrian crossings of Grattan Street are provided at the Royal Parade signalised intersection, to the east of Berkeley Street, at Gate 10 of the University, at the Bouverie Street signalised intersection and also at the Swanston Street signalised intersection.

2.2.2 Royal Parade

Royal Parade is a two-way arterial road (VicRoads controlled) aligned in a north-south direction. Close to Grattan Street it has a 60.0m-wide road reserve (approximately) which accommodates footpaths on both sides of the road, kerbside parallel car parking on both sides of the road, two bicycle lanes, two median divided traffic lanes in each direction and centrally located light rail (tram) lines.

Signalised pedestrian crossings of Royal Parade are provided at the Grattan Street signalised intersection and at a location to the south of Gate 12 (Genetics Lane) of the University.

2.2.3 Swanston Street

Swanston Street is a two-way major road (Council controlled) aligned in a north-south direction. Close to Grattan Street it has a 30.0m-wide road reserve (approximately) which accommodates footpaths on both sides of the road, some parallel car parking on the west side, two bicycle lanes, two traffic lanes and centrally located light rail (tram) lines. The centrally located tram zone widens in the vicinity of Gate 4 (Monash Road) of the University to accommodate a raised tram platform.

Signalised pedestrian crossings of Swanston Street are provided at the northern and southern ends of the raised tram platform.

2.2.4 Berkeley Street

Berkeley Street is a two-way local road (Council controlled) aligned in a north-south direction. It has a 21.0m wide road reserve (approximately) accommodating footpaths on both sides of the road, two wide traffic lanes and parallel kerbside car parking on both sides of the road. Speed hump treatments are located intermittently along the street.

2.2.5 Barry Street

Barry Street is a two-way local road (Council controlled) aligned in a north-south direction. At its southern end it has a 30.0m-wide road reserve (approximately) accommodating footpaths on both sides of the road, a wide northbound traffic lane and a southbound traffic lane, separated by centrally located angled car parking. Kerbside parallel car parking is provided on both sides of the road. A U-turn facility is provided at the northern end of the centrally located car parking.

At its northern end, the road reserve accommodates footpaths on both sides of the road, traffic lanes in each direction, two bicycle lanes and kerbside parallel car parking on the west side of the road. The on-street bicycle lanes terminate approximately 80m to the south of Grattan Street.

2.2.6 Leicester Street

Leicester Street is a two-way local road (Council controlled) aligned in a north-south direction. At its southern end it has a 30.0m-wide road reserve (approximately) accommodating wide northbound and southbound traffic lanes separated by centrally located angled car parking. Kerbside parallel car parking is provided on both sides of the road. A U-turn facility is provided at the northern end of the centrally located car parking.

At its northern end, the road reserve accommodates footpaths on both sides of the road, traffic lanes in each direction, two bicycle lanes and kerbside parallel car parking on the east side of the road. The on-street bicycle lanes terminate approximately 80m to the south of Grattan Street.

2.3 VicRoads SmartRoads Road User Hierarchy

SmartRoads is a VicRoads policy which sets 'modal' priorities on the road network and underpins many of the strategies significant to the operational directions that support broader strategies around land use and transport. The policy notes:

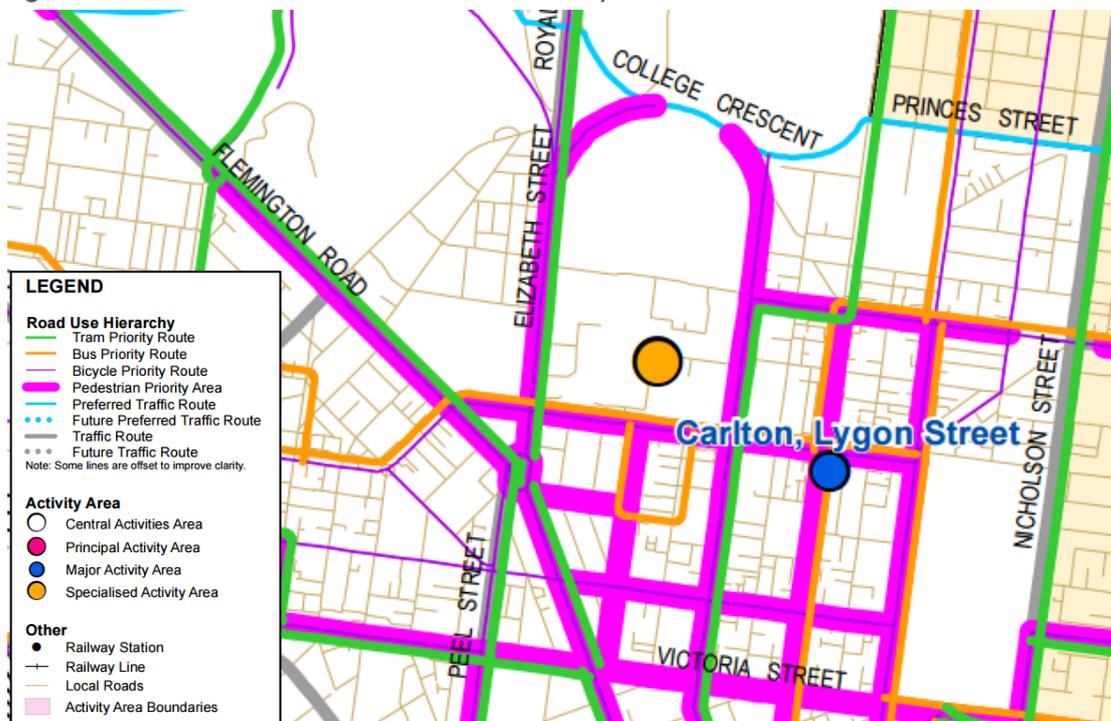
*"There is no single solution to managing congestion on our roads. Sustainable management of congestion will require an integrated approach involving better management of the existing network, building new infrastructure, visionary land use planning, encouraging sustainable transport modes, and changes in behaviour by individuals, businesses and a level of government."*¹

All road users will continue to have access to all roads. However, certain routes will be managed to work better for cars while others for public transport, cyclists and pedestrians during the various peak and off-peak periods. In this regard, the following is noted by VicRoads for the various modes assigned to roads across the network that form part of the Network Operating Plans:

- *"Facilitate good pedestrian access into and within activity centres in periods of high demand"*
- *"Prioritise trams and buses on key public transport routes that link activity centres during morning and afternoon peak periods"*
- *"Encourage cars to use alternative routes around activity centres to reduce the level of 'through' traffic"*
- *"Encourage bicycles through further developing the bicycle network"*
- *"Prioritise trucks on important transport routes that link freight hubs and at times that reduce conflict with other transport modes"*

The VicRoads SmartRoads Network Operating Plan for the area surrounding the University has been reproduced in Figure 2.2.

Figure 2.2: VicRoads SmartRoads Road User Hierarchy



Source: VicRoads SmartRoads (<https://www.vicroads.vic.gov.au/traffic-and-road-use/traffic-management/smartroads>).

¹ Sourced from VicRoads

Figure 2.2 illustrates that Grattan Street, Swanston Street, Royal Parade and Leicester Street are designated Pedestrian Priority Areas.

Royal Parade and Swanston Street are also designated Tram Priority Routes, with Grattan Street and the circulation loop on Bouverie Street, Pelham Street and Leicester Street designated as Bus Priority Routes.

Swanston Street, Grattan Street, Royal Parade and parts of College Crescent are designated as Bicycle Priority Routes.

2.4 External Pedestrian Facilities

Sealed public footpaths are provided on all streets in the vicinity of the University.

In addition, Grattan Street is serviced by a 3.2m-wide shared path on the north side and a 2.8m footpath on the south side, widening to 6.0m adjacent to the bus stops alongside University Square.

Pedestrian access is available across University Square. The square is accessible from Pelham Street to the south, Barry Street to the west, Leicester Street to the east and Grattan Street to the north.

The following pedestrian crossing facilities are available on surrounding roads:

- Pedestrian operated signals on Royal Parade, adjacent to Gate 11.
- Signalised pedestrian crossings of all legs of the Royal Parade/Grattan Street intersection.
- Pedestrian operated signals on Grattan Street, located to the east of Berkeley Street.
- Signalised pedestrian crossing of the east and west legs of Grattan Street at the Grattan Street/Gate 10 intersection.
- Signalised pedestrian crossings of the south and west legs of the Grattan Street/Bouverie Street intersection.
- Signalised pedestrian crossings of all legs of the Swanston Street/Grattan Street intersection.
- Pedestrian operated signals on Swanston Street at the north and south ends of tram stop 1.
- Pedestrian operated signals on Monash Road (Gate 4).

The locations of the pedestrian facilities are presented in Figure 2.3.

Figure 2.3: Existing Controlled Pedestrian Crossings in the Vicinity of the University



The two pedestrian crossings on Grattan Street located either side of Gate 10 were observed to be highly utilised during peak hours. Typical observed conditions are shown in Figure 2.5.

Figure 2.4: Observed Peak Hour Pedestrian Movements at Gate 10 Pedestrian Crossings



2.5 Bicycle Facilities

The following bicycle facilities are located on the surrounding road network:

- Linemarked bicycle lanes on both sides of Royal Parade, Swanston Street and Bouverie Street.
- Shared pedestrian/bicycle path on the east side of Royal Parade.
- Linemarked bicycle lanes on both sides of Barry Street and Leicester Street for a distance of approximately 80m to the south of Grattan Street.
- Shared pedestrian/bicycle path on the north side of Grattan Street between Royal Parade and Swanston Street.

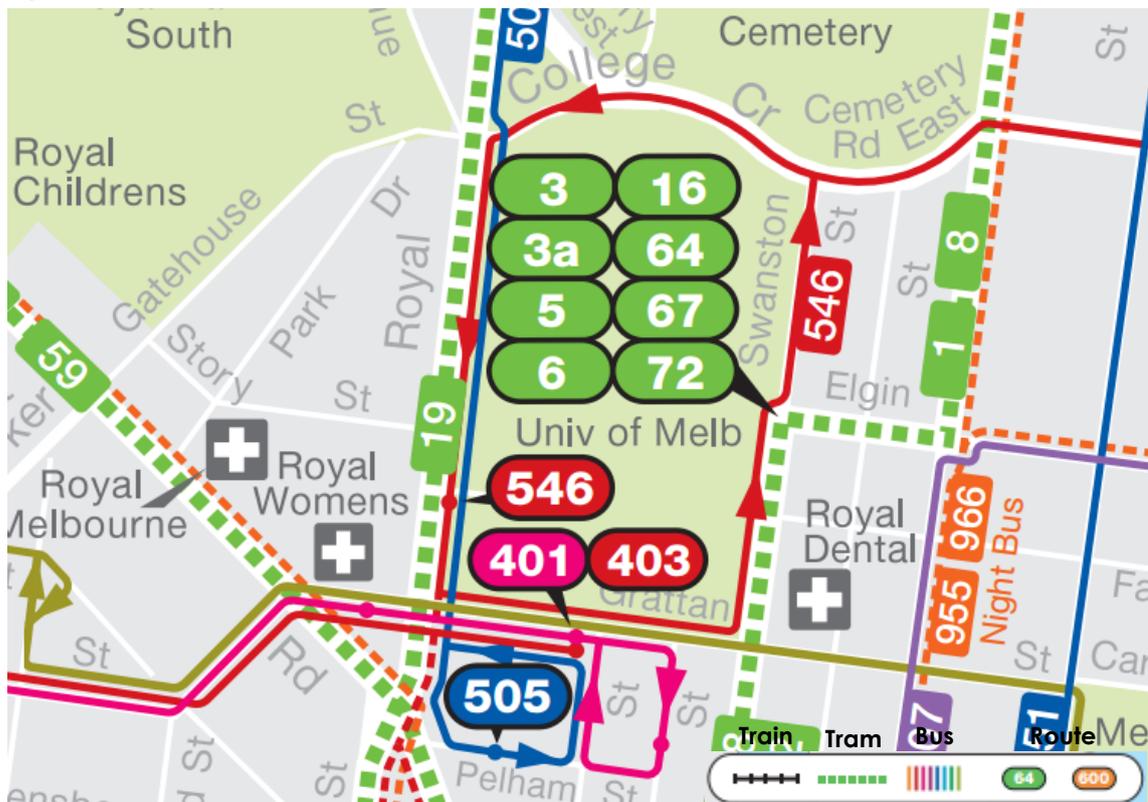
A number of Melbourne Bike Share facilities are located in the surrounding area, at the following locations:

- Union House, accessed via Tin Alley.
- University Square, accessed via Grattan Street.

2.6 Public Transport Facilities

Figure 2.5 shows the public transport services in the vicinity of the Project and the University, with the routes details summarised in Table 2.1 and stop locations shown in Figure 2.6.

Figure 2.5: Public Transport Services

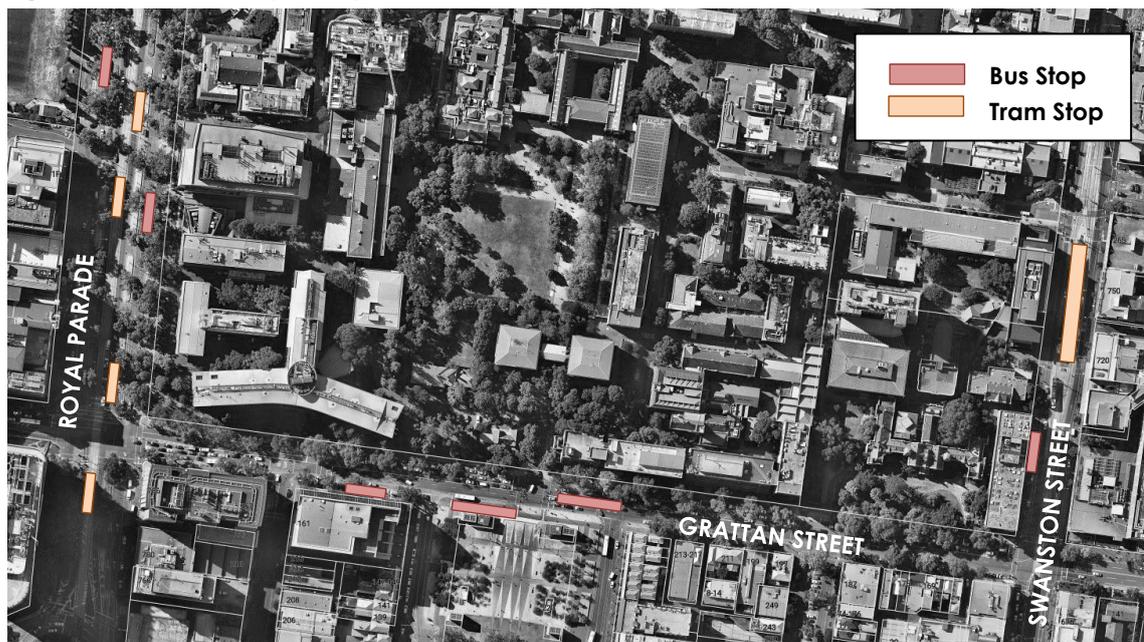


Source: Public Transport Victoria.

Table 2.1: Public Transport Services

Mode	Route	Destination
Tram	1	East Coburg – South Melbourne Beach
	3/3a	Melbourne University – East Malvern
	5	Melbourne University – Malvern
	6	Melbourne University – Glen Iris
	8	Moreland – Toorak
	16	Melbourne University – Kew via St Kilda Beach
	64	Melbourne University – East Brighton
	67	Melbourne University – Carnegie
	72	Melbourne University – Camberwell
Bus	19	North Coburg – Flinders Street Station (City)
	546	Heidelberg – Melbourne University, via Queen Victoria Market
	403 (Express Shuttle)	Footscray Station – University of Melbourne, via RMH
	402 (Express Shuttle)	Footscray Station – East Melbourne, via North Melbourne
	401 (Express Shuttle)	North Melbourne Station – University of Melbourne via RMH
	505	Moonee Ponds – University of Melbourne via Parkville Gardens

Figure 2.6: Public Transport Stop Locations



Map Source: Google Maps.

2.7 Car Parking Facilities

2.7.1 Public Car Parking

There are three public car parking facilities operated by the University in the vicinity of the main campus, as follows:

- University Square Car Park.
- Royal Parade Car Park.
- Eastern Precinct Car Park.

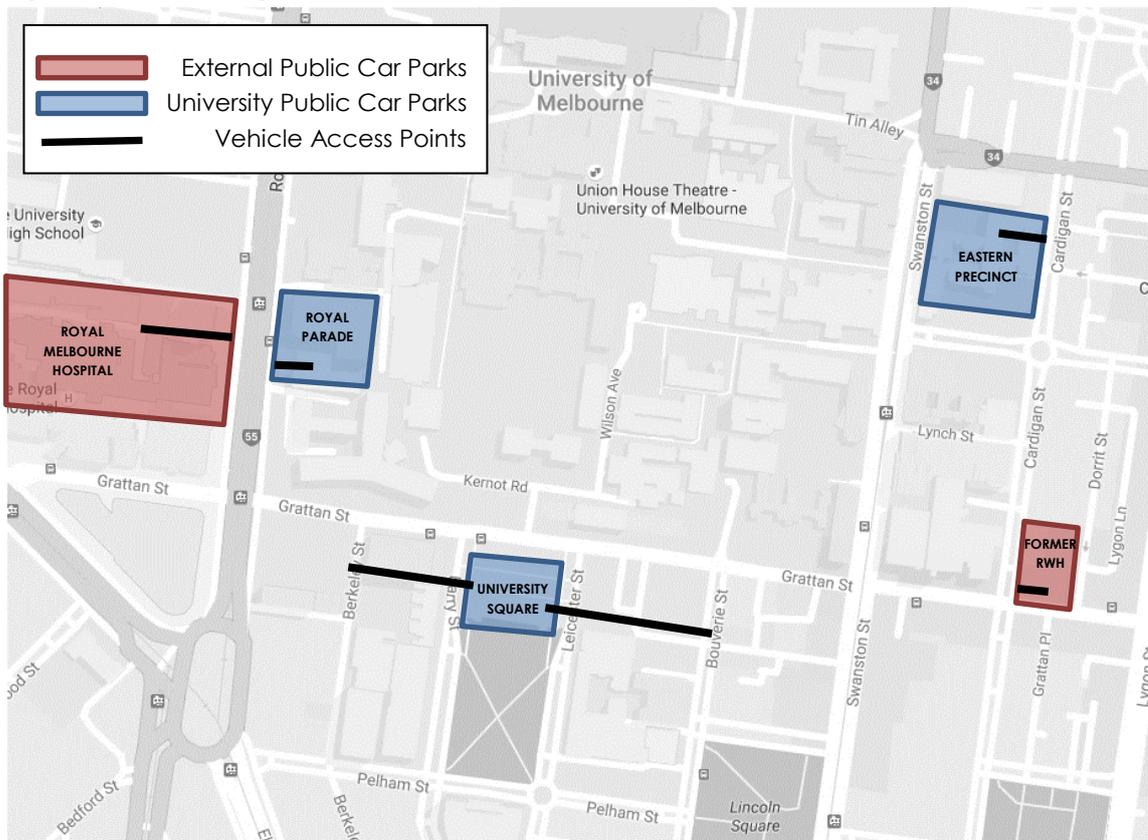
All parking facilities are available seven days a week from 6:00am to 10:00pm. The University website indicates that the University Square car park fills rapidly on weekdays during the semester.

In addition, a number of external car parking providers operate facilities in the vicinity of the University, as follows:

- Former Royal Women's Hospital (RWH) Car Park.
- Royal Melbourne Hospital.

The locations of these car park are presented in Figure 2.7.

Figure 2.7: Car Parking Facilities in the Vicinity of the University



Map Source: Google Maps.

In addition to these public car parks, the South Lawn car park is located within the University campus. This is a permit only car park and is not available to the public. There is also a permit only car park at 207 Bouverie Street that is not available to the public.

2.7.2 On-Street Car Parking

On-street car parking is provided on most streets in the area surrounding the University. The majority of car spaces are either subject to time restrictions or are paid parking spaces.

There are some very short-term (up to ½P) spaces and a handful of 1P spaces on Pelham Street and Barry Street. There are also some longer term car parking (generally 4P) available on Bouverie Street, Leicester Street and Grattan Street, with all day parking (P) parking available in the central median of Leicester Street and Barry Street.

A high demand for the on-street car parking was observed.

2.8 University of Melbourne Transport Characteristics

2.8.1 University Location

The University of Melbourne (Parkville Campus) is located in Parkville, approximately 2km to the north of the CBD. The campus straddles Grattan Street.

The University buildings are largely located to the north of Grattan Street and are also bordered by Swanston Street to the east, Royal Parade to the west and Tin Alley to the north.

Associated colleges and sports facilities are situated between Tin Alley and College Crescent further to the north.

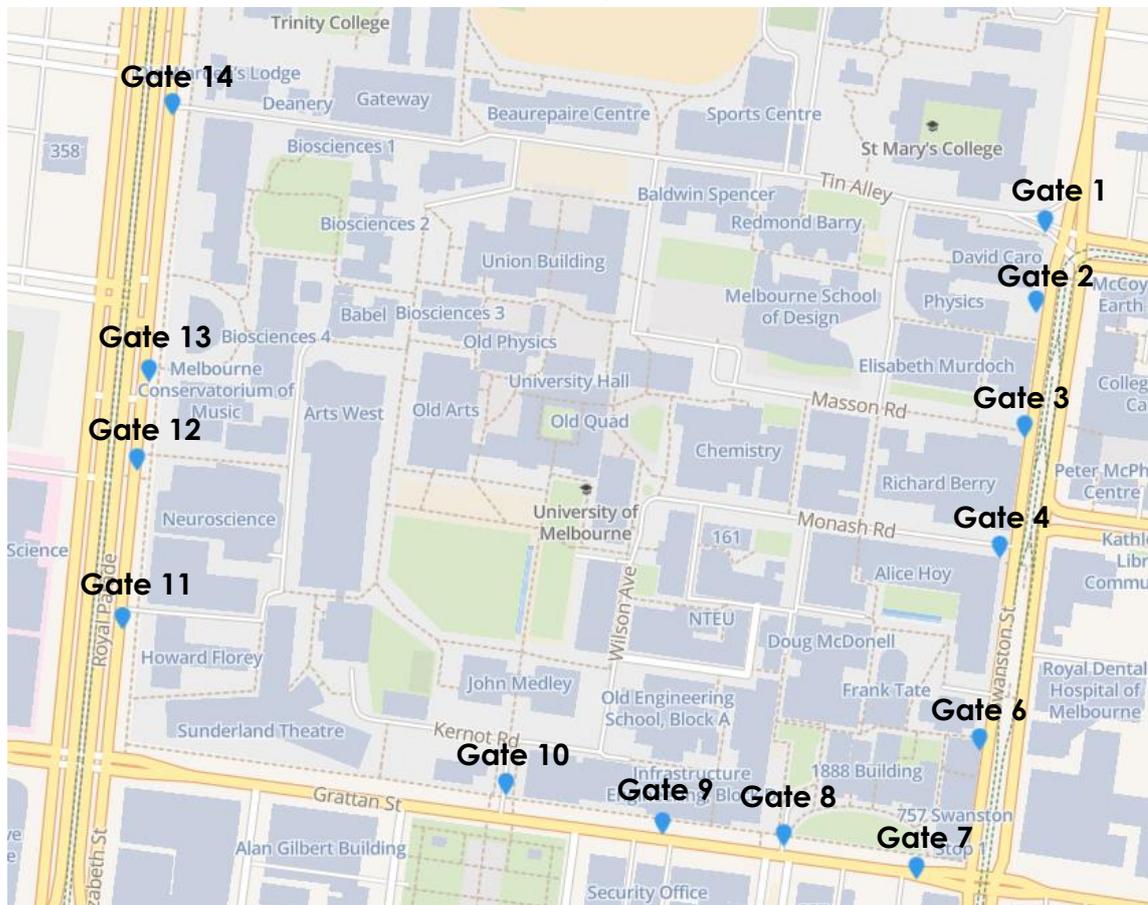
There are University facilities located on the south side of Grattan Street and these are accessed via the local road network including Berkeley Street, Barry Street, Leicester Street and Bouverie Street.

2.8.2 University Access Arrangements

Access to the University northern campus is provided from the surrounding road network via 13 gates (Gate 5 does not formally exist at present) to the east, south and west.

The location of the gates is shown in Figure 2.8, with a summary of the access arrangements provided in Table 2.2.

Figure 2.8: University Northern Campus Access Arrangements



Source: University of Melbourne (<https://maps.unimelb.edu.au/parkville/gates>).

Table 2.2: University Northern Campus Access Arrangements

Access Point	Gate Name	Street Frontage	Permitted Movements
Gate 1	Tin Alley	Swanston Street	Permit holders and other authorised vehicles, motorcycles, bicycles, pedestrians
Gate 2	Physics Service Yard	Swanston Street	Service and delivery vehicles only
Gate 3	Masson Road	Swanston Street	Bicycles, pedestrians, limited vehicle access under special circumstances
Gate 4	Monash Road	Swanston Street	Permit holders and other authorised vehicles, motorcycles, bicycles, pedestrians
Gate 6	Gate 6	Swanston Street	Designated pedestrian area, delivery vehicles permitted between 8pm and 8am
Gate 7	Gate 7	Grattan Street	Service and delivery vehicles only within service area, pedestrian entry via gate
Gate 8	Gate 8	Grattan Street	Permit holders and other authorised vehicles, motorcycles, bicycles, pedestrians
Gate 9	Dept. of Infrastructure Engineering Yard	Grattan Street	Service and delivery vehicles only
Gate 10	Kernot Road	Grattan Street	Main vehicle access point, motorcycles, bicycles, pedestrians
Gate 11	Medical Road	Royal Parade	Permit holders and other authorised vehicles, motorcycles, bicycles, pedestrians
Gate 12	Genetics Lane	Royal Parade	Bicycles, pedestrians, limited vehicle access under special circumstances
Gate 13	Gate 13	Royal Parade	Bicycles, pedestrians, limited vehicle access under special circumstances
Gate 14	Tin Alley	Royal Parade	Permit holders and other authorised vehicles, motorcycles, bicycles, pedestrians

Source: University of Melbourne (<http://about.unimelb.edu.au/campuses-and-facilities/transport-and-parking/gates>).

2.8.3 University Transport Movement Surveys

Surveys of the access points to the northern campus and the road network providing access to the southern facilities were undertaken by Traffix Group on Tuesday 17 May 2016 and Thursday 19 May 2016. The results of the surveys are reported in the University of Melbourne Parkville Campus Movement Counts (June 2016) report.

The surveys were undertaken at the University northern campus access points to the external road network, as well as internal University locations and various local road locations providing access to the southern campus facilities. For the purposes of this evidence, consideration has been given to the survey data collected at the locations identified in Figure 2.9 and Figure 2.10.

Figure 2.9: University Northern Campus Access Survey Locations

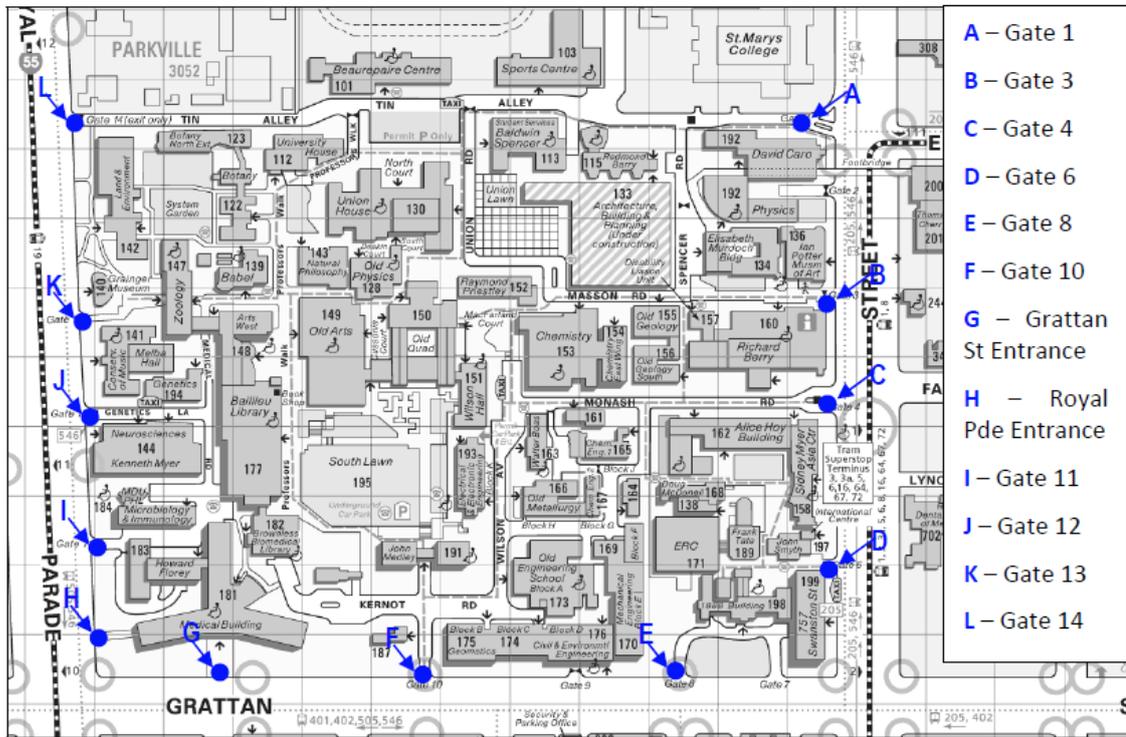
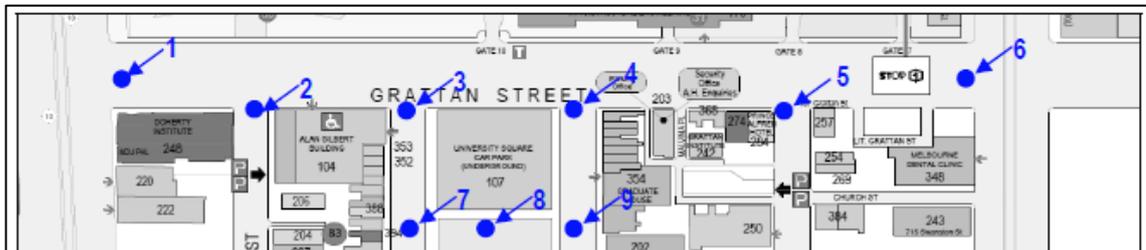


Figure 2.10: External Road Network Survey Locations (University Southern Facilities)



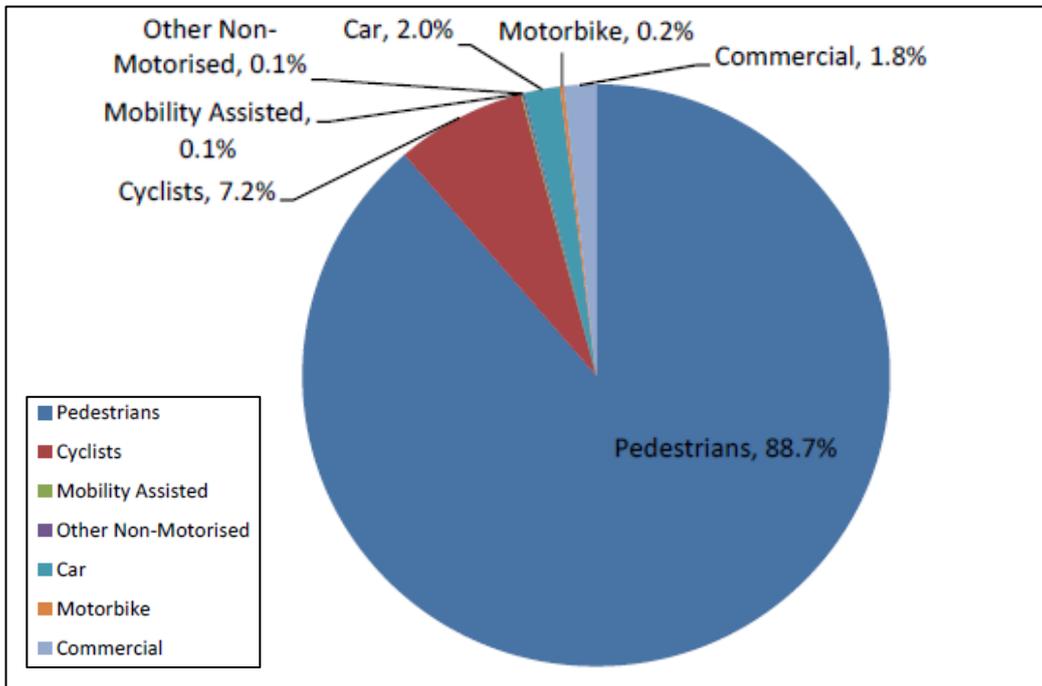
The Traffic Group report provided movement data at each of the locations identified in Figure 2.9 and Figure 2.10 at 15-minute intervals for the following transport modes (where applicable):

- Private vehicle movements.
- Commercial vehicle movements.
- Bicycle movements.
- Pedestrian movements.
- Other non-motorised movements.
- Mobility assisted movements.

The detailed survey results are presented in figures presented in Appendix B of this evidence.

The University is a significant generator of transport activity, with in excess of 67,500 movements into and out of the northern campus entrances on a typical semester weekday. The vast majority of movements to and from the University northern campus are pedestrian movements, with the survey data indicating this travel mode represents approximately 89% of the total movements surveyed over a 12-hour period. Cycling represents 7% of the total movements surveyed, with private vehicles and commercial vehicles each representing approximately 2% of all movements. A breakdown of the mode share at the surveyed University Gates 1 to 14 is presented in Figure 2.11.

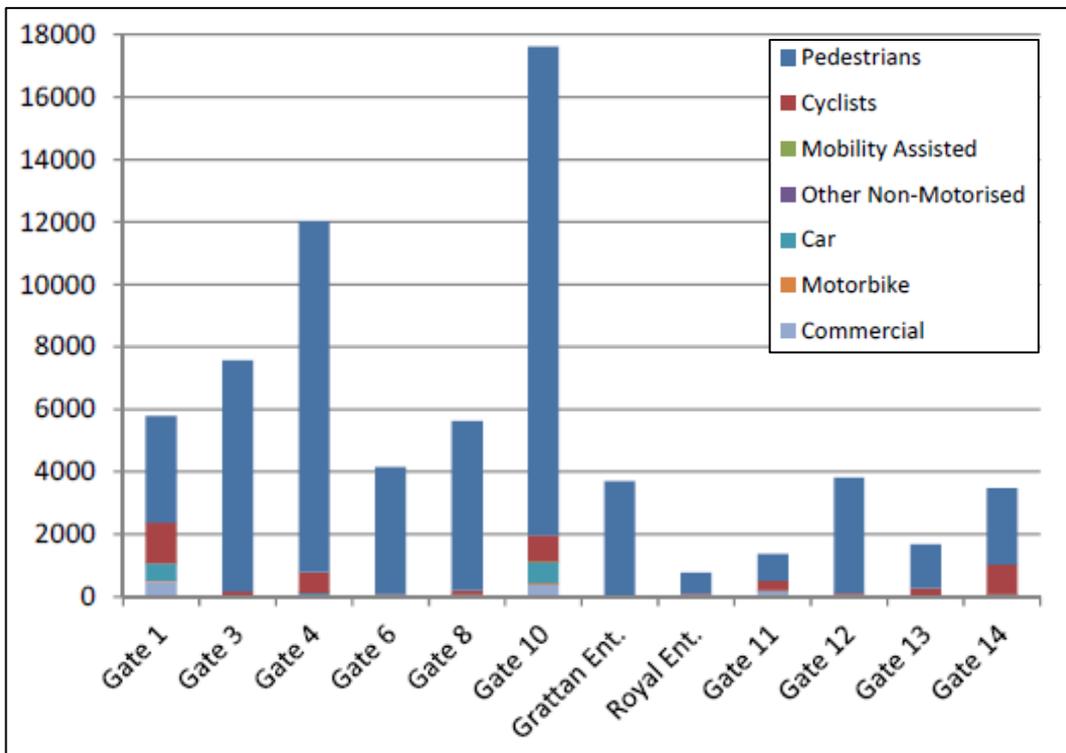
Figure 2.11: Overall Mode Share at University Northern Campus Accesses – 12-Hour Period



Source: Traffix Group Report, June 2016.

A breakdown of mode share by each University northern campus gate is presented in Figure 2.12.

Figure 2.12: Mode Share at University Northern Campus Accesses – 12-Hour Period

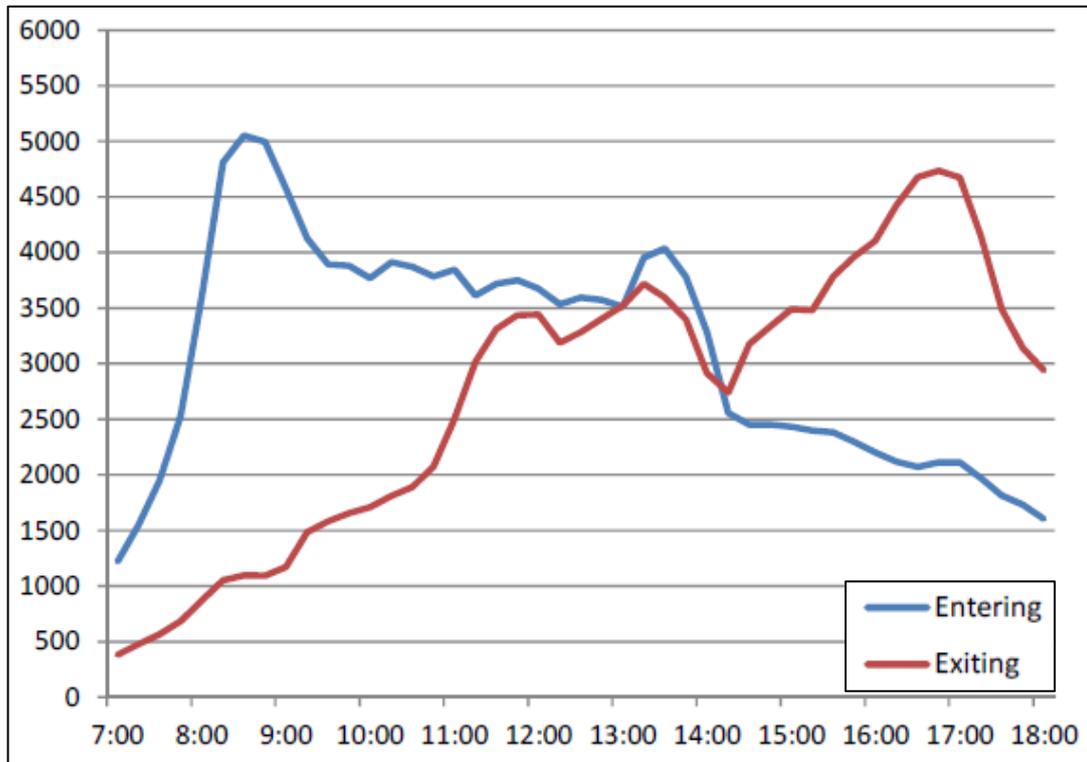


Source: Traffix Group Report, June 2016.

The survey data for the University northern campus accesses suggests distinct peak period patterns. Entry volumes increase rapidly in the morning, peaking between 8:30am and 9:30am (in

excess of 5,000 entry movements) and decreasing gradually across the day. Conversely, exit volumes gradually increase across the day and peak between 4:45pm and 5:45pm (in excess of 4,500 exit movements), decreasing into the evening. Figure 2.13 presents the rolling hourly movements by time of day across all University accesses at the main campus.

Figure 2.13: Rolling Hourly Movements at University Northern Campus Accesses (All Transport Modes)



Source: Traffix Group Report, June 2016.

2.8.4 Additional Transport Movement Surveys

GTA commissioned transport movement surveys in August 2016 at the following locations:

- At the University Gate 10 on Grattan Street, including the pedestrian crossings located either side of Gate 10.
- At the Grattan Street/Berkeley Street intersection, including the pedestrian crossing located to the east of Berkeley Street.
- The entrance to the Melbourne Medical School building.
- The pedestrian crossing of the Grattan Street east approach of the Royal Parade signalised intersection.

The surveys were undertaken on Thursday 4 August 2016 at the following times:

- AM Peak: 7:30am – 9:30am
- PM Peak: 4:30pm – 6:30pm

The survey locations are presented in Figure 2.14.

Figure 2.14: Additional Survey Locations



The detailed survey results are presented in Appendix B of this evidence.

A summary of the Traffix Group and GTA survey findings is presented in the following section of this evidence.

2.8.5 Summary of Surveys by Transport Mode at Key Locations

The transport mode survey findings at Gate 10, the Medical Building and at the northern end of Berkeley Street, being the locations that will be most impacted by the Project, are summarised in the following sections.

Pedestrian Movements

The pedestrian movements reported in the Traffix Group report are presented in Table 2.3.

Table 2.3: Pedestrian Movements – Traffix Group Surveys

Time Period	Gate 10		Medical Building		Berkeley Street	
	Entry	Exit	Entry	Exit	Entry [1]	Exit [2]
AM Peak	1,012	213	244	57	92	138
PM Peak	552	1,032	125	350	79	131
12-Hour	8,443	7,199	1,863	1,822	1,406	1,346

[1] Entering Grattan Street.

[2] Exiting Grattan Street.

The peak hour pedestrian volumes surveyed at the Medical Building entrance and on Berkeley Street are similar to the values obtained from the traffic surveys commissioned by GTA, which identified the movements presented in Table 2.4. The Traffix Group survey results identified higher pedestrian movements at Gate 10 than those recorded in the GTA surveys.

Table 2.4: Pedestrian Movements – GTA Surveys

Time Period	Gate 10		Medical Building		Berkeley Street	
	Entry	Exit	Entry	Exit	Entry [1]	Exit [2]
AM Peak	680	90	334	38	71	111
PM Peak	324	740	109	311	52	128
12-Hour	-	-	-	-	-	-

[1] Entering Grattan Street.

[2] Exiting Grattan Street.

Additionally, the GTA surveys recorded the following peak hour pedestrian movements:

- Along the pathways on the north and south sides of Grattan Street.
- Across the pedestrian crossings at Gate 10.
- Across the east pedestrian crossing of Royal Parade.
- Across the pedestrian crossing at Berkeley Street.

These survey findings are presented in Table 2.5.

Table 2.5: Pedestrian Movements along Grattan Street and at Pedestrian Crossings – GTA Surveys

Location	Time Period	Eastbound	Westbound	Northbound	Southbound
Grattan Street at Gate 10 (Both Sides)	AM Peak	166	303	-	-
	PM Peak	245	271	-	-
Ped Crossings at Gate 10	AM Peak	-	-	468	401
	PM Peak	-	-	402	935
Royal Parade – East Leg Crossing	AM Peak	-	-	365	166
	PM Peak	-	-	197	271
Ped Crossing East of Berkeley Street	AM Peak	-	-	158	128
	PM Peak	-	-	171	145

Bicycle Movements

The bicycle movements reported in the Traffix Group report are presented in Table 2.6.

Table 2.6: Bicycle Movements – Traffix Group Surveys

Time Period	Gate 10		Medical Building		Berkeley Street	
	Entry	Exit	Entry	Exit	Entry [1]	Exit [2]
AM Peak	79	37	1	0	3	13
PM Peak	55	70	0	0	16	0
12-Hour	477	360	7	5	62	46

[1] Entering Grattan Street.

[2] Exiting Grattan Street.

The traffic surveys commissioned by GTA identified the movements presented in Table 2.7.

Table 2.7: Bicycle Movements – GTA Surveys

Time Period	Gate 10		Medical Building		Berkeley Street	
	Entry	Exit	Entry	Exit	Entry [1]	Exit [2]
AM Peak	30	24	0	0	5	32
PM Peak	62	27	0	0	80	2
12-Hour	-	-	-	-	-	-

[1] Entering Grattan Street.

[2] Exiting Grattan Street.

Additionally, the GTA surveys identified the peak hour through bicycle movements (i.e. excluding movements to and from the University) along Grattan Street at Berkeley Street and at Gate 10 presented in Table 2.8.

Table 2.8: Bicycle Movements along Grattan Street – GTA Surveys

Location	Time Period	Eastbound	Westbound
At Berkeley Street	AM Peak	125	39
	PM Peak	48	101
At Gate 10	AM Peak	56	46
	PM Peak	13	27

Private Motor Vehicles

The private motor vehicle movements reported in the Traffix Group report are presented in Table 2.9.

Table 2.9: Private Motor Vehicle Movements – Traffix Group Surveys

Time Period	Gate 10		Berkeley Street	
	Entry	Exit	Entry [1]	Exit [2]
AM Peak	80	12	36	254
PM Peak	15	76	123	56
12-Hour	384	325	814	1,053

[1] Entering Grattan Street.

[2] Exiting Grattan Street.

The peak hour private motor vehicle movements surveyed at Gate 10 are consistent with the values obtained from the traffic surveys commissioned by GTA, which identified the movements presented in Table 2.10.

Table 2.10: Private Motor Vehicle Movements – GTA Surveys

Time Period	Gate 10		Berkeley Street	
	Entry	Exit	Entry [1]	Exit [2]
AM Peak	73	16	27	219
PM Peak	18	71	152	52
12-Hour	-	-	-	-

[1] Entering Grattan Street.

[2] Exiting Grattan Street.

Additionally, the GTA surveys identified the peak hour vehicle movements (private and commercial) along Grattan Street at Gate 10 and at Berkeley Street presented in Table 2.11.

Table 2.11: Vehicle Movements along Grattan Street

Location	Time Period	Eastbound	Westbound
At Berkeley Street	AM Peak	803	593
	PM Peak	761	737
At Gate 10	AM Peak	774	652
	PM Peak	826	733

Commercial Vehicle Access

The commercial vehicle movements reported in the Traffix Group report are presented in Table 2.12.

Table 2.12: Commercial Vehicle Movements – Traffix Group Surveys

Time Period	Gate 10		Berkeley Street	
	Entry	Exit	Entry [1]	Exit [2]
AM Peak	25	18	10	14
PM Peak	3	3	5	5
12-Hour	195	195	149	156

[1] Entering Grattan Street.

[2] Exiting Grattan Street.

The GTA surveys identified the peak hour commercial vehicle movements as presented in Table 2.13.

Table 2.13: Commercial Vehicle Movements – GTA Surveys

Time Period	Gate 10		Berkeley Street	
	Entry	Exit	Entry [1]	Exit [2]
AM Peak	8	5	5	6
PM Peak	2	2	5	3
12-Hour	-	-	-	-

2.8.6 Public Transport Patronage

The number of passengers boarding and alighting bus services from the bus stops located on either side of Grattan Street and close to Gate 10 as reported in the Traffix Group report are presented in Table 2.14.

Table 2.14: Grattan Street Bus Stops Passenger Boarding and Alighting – Traffix Group Surveys

Time Period	Eastbound at Gate 10		Westbound at University Square	
	Boarding	Alighting	Boarding	Alighting
AM Peak	2	675	2	12
PM Peak	12	19	280	3
12-Hour	85	2,096	1,247	71

The number of passengers boarding and alighting tram services from tram stop 1 located on Swanston Street as reported in the Traffix Group report are presented in Table 2.15.

Table 2.15: Tram Stop 1 (Swanston Street) Passenger Boarding and Alighting – Traffix Group Surveys

Time Period	North Crossing		South Crossing	
	Boarding	Alighting	Boarding	Alighting
AM Peak	45	1,048	20	539
PM Peak	714	183	519	119
12-Hour	4,224	5,461	2,518	2,750

2.9 Accident Statistics

A review of the reported casualty accident history for the roads and intersections adjacent to the University have been sourced from the VicRoads CrashStats accident database. This database records all accidents causing injury that have occurred in Victoria since 1987 (as recorded by Victorian Police) and categorises these accidents as follows:

- Fatal injury: at least one person was killed in the accident or died within 30 days as a result of the accident.
- Serious injury: at least one person was sent to hospital as a result of the accident.
- Other injury: at least one person required medical treatment as a result of the accident.

A summary of the accidents recorded in the period January 2011 to December 2015 is presented in Table 2.16. The accidents have been summarised as 'fronting main campus' for accidents along Royal Parade, Grattan Street or Swanston Street at the University frontage. Accidents for 'south of campus' capture the blocks south of Grattan Street within close proximity to the University or associated buildings.

Table 2.16: CrashStats Summary

Location	Other Injury	Serious Injury	Fatal	Total
Bicycle – Fronting Main Campus	27	10	0	37
Bicycle – South of Campus	1	0	0	1
Pedestrian – Fronting Main Campus	8	7	0	15
Pedestrian – South of Campus	0	0	0	0

3. Project Description

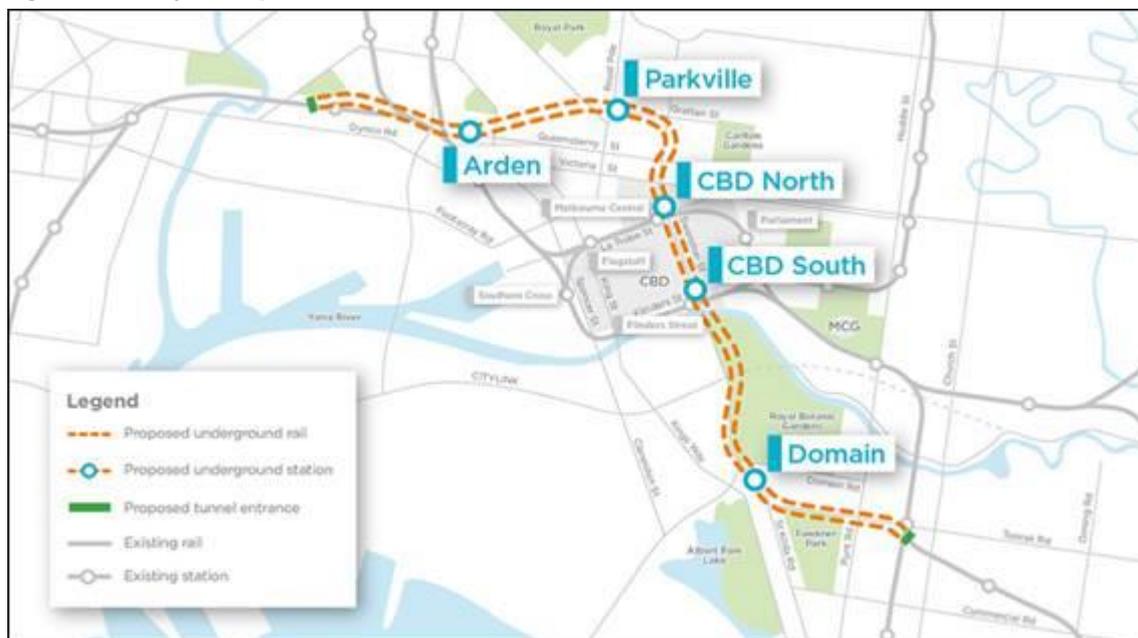
3.1 Overview

The Project is a fully funded (\$10.9B) project of state significance designed to increase the capacity of the metropolitan railway system. The Project includes the following key components:

- Two rail tunnels between Kensington and South Yarra, through Melbourne's Central Business District (CBD). These lines will create a connection to the existing Sunbury and Cranbourne/ Pakenham railway lines.
- A total five new train stations will be constructed at Domain, CBD South, CBD North, Parkville and Arden.

An overview of the Project is illustrated in Figure 3.1.

Figure 3.1: Project Map and Overview



Source: www.metrotunnel.vic.gov.au.

Following its completion, the Project will free up capacity on the existing City Loop allowing additional trains to operate on the Upfield, Craigieburn, Sunbury, Frankston, Cranbourne, Pakenham, Werribee and Sandringham lines. Specifically, it is estimated that the Project will deliver additional capacity for approximately 40,000 passengers during each peak period, ease overcrowding in the inner core of the existing rail network whilst relieving tram overcrowding and congestion issues within the Melbourne CBD and its immediate vicinity.

The Project is expected to commence in late 2018 and finish in 2026. It is expected to create 3,900 jobs across the state of Victoria with 4,700 jobs supported at the peak of its construction.

3.2 Environmental Effects Statement Process

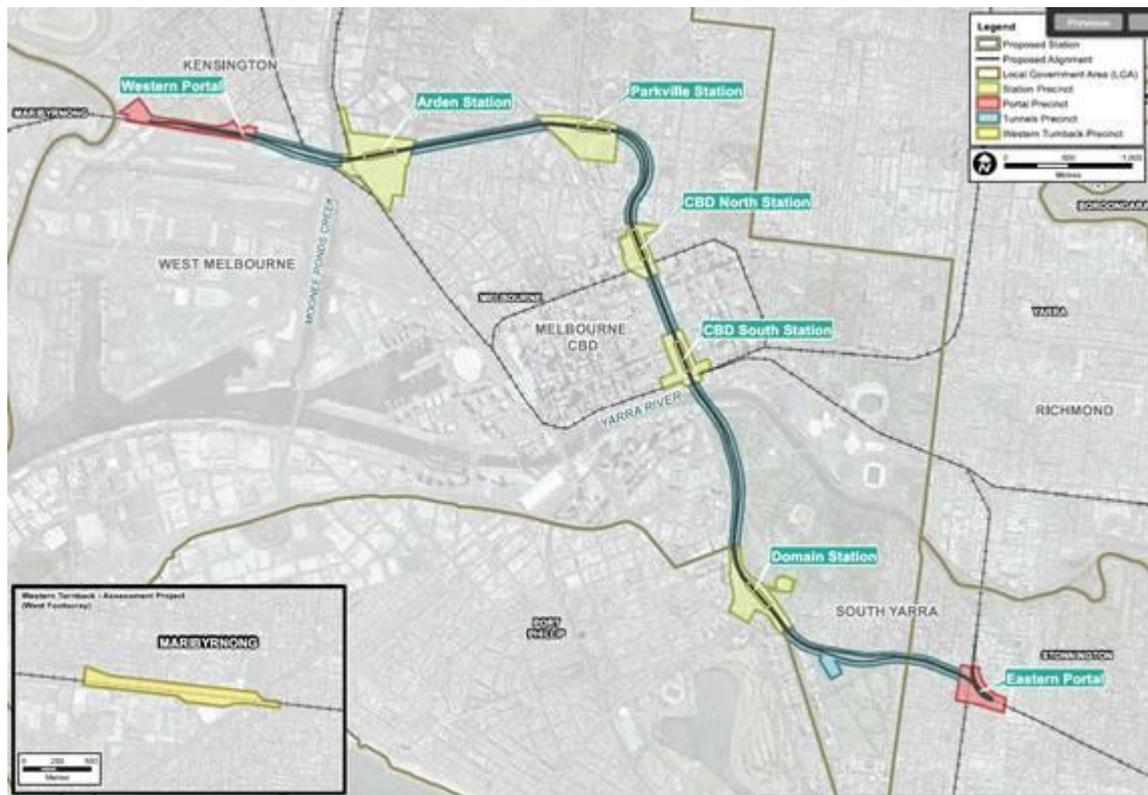
The Project is currently being assessed via an Environment Effects Statement (EES) process. The EES allows for an overarching and integrated assessment of impacts of the Project and draws on the findings of a number of supporting documents and studies before any approval or conditions

are granted. The EES process also allows for a comprehensive public engagement program to seek input from the community and other stakeholders which will help confirm the ultimate delivery of the Project including considerations throughout the construction period.

As part of the EES process, a Transport Impact Assessment (TIA) was prepared by Aurecon Jacobs Mott MacDonald in association with Grimshaw Joint Venture (AJM) in April 2016. The AJM TIA provides a review of transport related aspects associated with the construction phase and legacy (post development) phase of the Project.

For the purposes of the EES assessment, the Project has been broken down into nine precincts as shown in Figure 3.2.

Figure 3.2: Project Precincts



(Source: AJM TIA).

The AJM TIA presents details of the following during the construction and legacy phases of the Project:

- Road network impacts.
- Public transport impacts.
- Active transport impacts.

3.3 Construction Phase

3.3.1 Construction Site Layout

The Parkville Station is proposed to be located underneath Grattan Street generally between Leicester Street and Royal Parade. Construction hoarding will be provided across the width of Grattan Street, with the understanding that access for vehicles and cyclists will be prohibited, along with east-west pedestrian movements. North-south pedestrian movements across Grattan

Street will be accommodated at crossing points located at the northern end of Berkeley Street and at University Square close to Gate 10. The northern end of University Square and Barry Street have been identified as construction staging areas.

The proposed Parkville Station construction layout is presented in Figure 3.3.

Figure 3.3: Parkville Station Construction Layout



Source: Appendix F of the AJM TIA.

3.3.2 Road Network Revisions

A number of roads surrounding the proposed Parkville Station will be closed to vehicles and cyclists during the construction phase, as follows:

- Grattan Street (between Royal Parade and Leicester Street).
- The northern portion of Barry Street.
- Berkeley Street will remain open to all traffic movements, however there will be no vehicle and cyclist access permitted to Grattan Street.

In addition, there are expected to be lane closures on Elizabeth Street and Royal Parade at the signalised intersection with Grattan Street.

3.3.3 Active Transport

As detailed in Section 2 of this report there are three access points to the University from Grattan Street. As detailed in Figure 3.4, the easternmost access (Gate 9) will be maintained, with temporary pedestrian access to be provided across Grattan Street for Gate 10 and the western access (Medical Building). Specifically, pedestrian access to Gate 10 and the Medical Building across Grattan Street will be provided via breaks in the construction hoardings at the northern end of University Square and Berkeley Street.

Figure 3.4: Pedestrian Movements During Construction across Grattan Street



Grattan Street will be closed to cyclists during the construction phase. The AJM TIA suggests that commuter cyclist demands will be rerouted to alternate cycle routes such as Rathdowne Street, Royal Parade and Swanston Street, but does not specifically detail how local east-west bicycle movements will be managed.

3.3.4 Public Transport

Grattan Street will be closed to all vehicles (including buses) between Royal Parade and Leicester Street and as such bus routes 401, 402, 403 and 505 will be impacted. There are presently three bus stops on Grattan Street between Royal Parade and Leicester Place (one on the north side of the road and two on the south side).

Bus route 401 bus provides an important connection between North Melbourne train station and the University.

No specific details have been provided in the AJM TIA as to the diversion of the bus routes and the relocation of bus stops.

3.3.5 Car Parking

On-Street

The AJM TIA notes the following on page 94 regarding the on-street car parking impacts during construction:

"There would be restrictions to on street loading, drop off and parking bays within or near the construction zone on Grattan Street, Berkeley Street, Barry Street, Leicester Street and Royal Parade during construction."

No details of replacement car parking have been provided in the AJM TIA.

In the order of 140 to 150 on-street car parking spaces and loading zones will be impacted during the construction phase. The on-street parking areas likely to be impacted are identified in Figure 3.5.

Figure 3.5: On-Street Car Parking Impacts



Off-Street

The proposed restriction on vehicle access at Gate 10 of the University will prevent vehicle access to the South Lawn car park located within the University campus from this location.

It appears that the proposed construction hoardings around University Square will restrict pedestrian access to the east and west lift cores providing access to the car park located beneath University Square.

3.3.6 Construction Traffic Volumes

The anticipated construction traffic volumes for Parkville Station have been sourced from the AJM TIA. A summary of the anticipated truck movements is provided in Table 3.1.

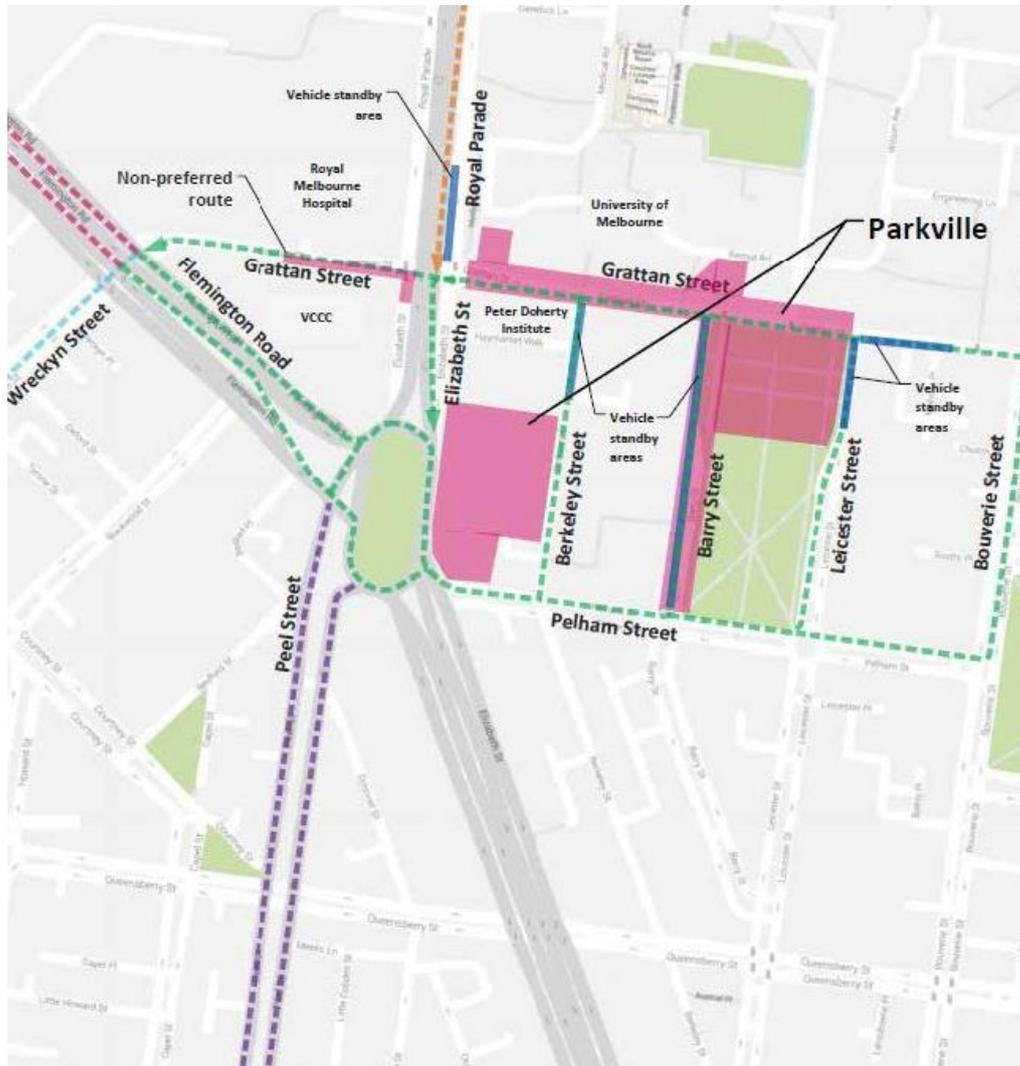
Table 3.1: Anticipated Construction Truck Movements to/from Parkville Station

Item	Truck Volumes
Average Daily Truck Trips	100 truck movements
Peak Daily Truck Trips	140 truck movements

Source: AJM TIA, page 94.

The nominated construction vehicle routes are illustrated in Figure 3.6. Construction vehicles will utilise Grattan Street, Elizabeth Street/Royal Parade, Pelham Street, Berkeley Street, Barry Street and Leicester Street in the immediate vicinity of the University.

Figure 3.6: Nominated Construction Vehicle Access Routes



(Source: Figure 8.8 of the AJM TIA).

No details have been provided regarding light vehicle or staff trips to and from the construction site or the car parking arrangements for construction workers.

3.3.7 Construction Workers

The AJM TIA indicates that the Parkville Station workforce will comprise up to 169 workers.

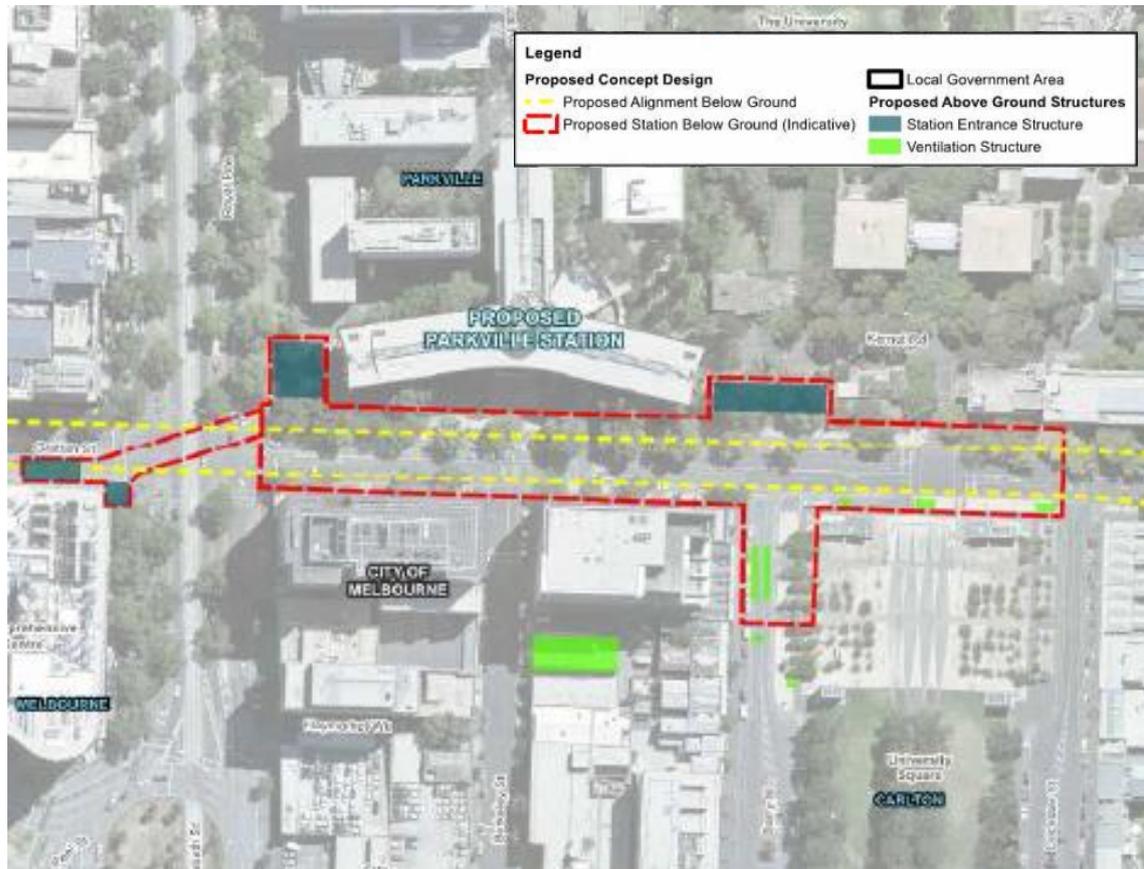
3.4 Legacy Phase

The future Parkville Station is proposed to be located underneath Grattan between Royal Parade and Leicester Street. The station will be located on the Sunbury and Cranbourne/Pakenham lines. Pedestrian access to station is proposed via three portals, as follows:

- Northwest corner of the Grattan Street/Gate 10 intersection.
- Northeast corner of the Royal Parade/Elizabeth Street/Grattan Street intersection.
- Southwest corner of the Royal Parade/Elizabeth Street/Grattan Street intersection.

An overview of the proposed Parkville Station layout is illustrated in Figure 3.7.

Figure 3.7: Project Overview – Legacy Phase



Source: Figure 7.12 of the AJM TIA.

Modifications to the existing road network are proposed, as follows:

- Grattan Street reduced from two to one through lane in each direction.
- Elizabeth Street/Royal Parade reduced to two traffic lanes in each direction at the intersection with Grattan Street.
- The right turn from Royal Parade (north approach) into Grattan Street (west approach) is to be prohibited.
- The northern end of Barry Street to be closed to vehicles.
- The southern pedestrian crossing at the Royal Parade/Hospital Access intersection is to be relocated approximately 50m to the north.
- A reconfigured signalised access to Gate 10 from Grattan Street is proposed with a shared through and left lane on the west approach and shared through and right lane on the east approach.

A new DDA tram stop is proposed on the north approach of the Royal Parade/Elizabeth Street/Grattan Street intersection. Two public bus bays will be provided on the north and south sides of Grattan Street near the Gate 10 access. Additionally, rail replacement bus bays are to be provided on the north side of Grattan Street.

On-road bicycle lanes will be provided in both directions on Grattan Street and will replace the existing shared path located on the north side of Grattan Street.

As a result of the narrowing of the Grattan Street carriageway, the southern footpath will be widened. The existing pedestrian operated signals on the east side of the Grattan Street/Berkeley Street intersection are proposed to be removed.

4. Anticipated Parkville Station Impacts

4.1 Preamble

It is anticipated that the Parkville Station will impact on the operation of the University during both the construction phase (predominately) and the legacy phase. The anticipated impacts have been identified in the following sections of this evidence.

4.2 Construction Phase

4.2.1 Pedestrians

The survey information presented in Section 2 of this evidence indicates that Gate 10 is the busiest pedestrian access serving the University (with 15,642 pedestrian movements surveyed between 7:00am and 7:00pm). Presently pedestrians are able to conveniently enter Gate 10 from the north and south sides of Grattan Street.

During construction, the available documentation indicates that pedestrian movements will be restricted to two crossing points of Grattan Street and the construction area as follows:

- A reduced width pedestrian route (as a result of construction hoardings) across University Square towards Gate 10.
- At the northern end of Berkeley Street towards the Medical Building.

With respect to the University Square pedestrian routes, the construction hoardings, plus the right angle turn, will create a tunnelling effect for pedestrians. This layout may present an uncomfortable environment for pedestrians and consideration should be given to the likely pedestrian demands along this route and whether the nominated arrangement will comfortably accommodate these demands.

Additionally, the restricted sightlines along the route and the closure of Grattan Street to vehicles will reduce the level of passive surveillance and in turn may result in safety concerns for students, particularly at night.

It is anticipated that the construction works may result in increased pedestrian movements along Berkeley Street. This street has been identified as a construction vehicle route and it also provides vehicle access to the University car park located beneath University Square. There is the potential for increased conflicts between pedestrian and vehicles in the street.

Any pedestrian conflicts with construction traffic and cars will require careful management to ensure a safe environment for all users is maintained.

Changes to the public transport provision (such as the diversion of bus routes) and the periodic closures to tram route 19 on Royal Parade could intensify the patronage of the tram routes running along Swanston Street, resulting in increased pedestrian demands at the controlled crossings of Swanston Street. The capacity and layout of these controlled crossings should be reviewed to confirm their appropriateness to cater for increased pedestrian demands. The survey data presented in Section 2 indicates that tram stop 1 already accommodates significant pedestrian demands.

This is an important consideration with the AJM TIA noting the following on page 91:

"The area is dissected by major road corridors and in particular, the north-south arterial roads. Next to the major roads, pedestrian activity levels can be poor due to high vehicular traffic volumes."

4.2.2 Cyclists

Grattan Street will be closed to east-west cyclist movements. It is envisaged that many non-University cyclists will be displaced to alternate east-west roads in the vicinity of Grattan Street, such as Pelham Street and Queensberry Street. However, the University related cyclist movements will likely redistribute to Royal Parade and Swanston Street and gain access to the University through the various gates located on these roads.

The survey data presented in Section 2 of this evidence suggests that in the order of 120 cyclists presently access Gate 10 on Grattan Street during the road network peak hours, with over 800 cyclists across a 12-hour period.

4.2.3 Public Transport

Bus services will be diverted during the construction phase and bus stops will be relocated. It is expected that bus services 401, 402, 403 and 505 will be diverted.

Service 401, linking North Melbourne train station to the University, is a very high frequency service, with up to 15 peak hour services. Service 402 is also a high frequency service with up to six peak hour services.

The diversion of these services will need to be carefully managed to ensure that an appropriate level of service is maintained. Additionally, the relocated bus stops will need to be provided close to existing University gates and pedestrian crossing opportunities to ensure that safe and convenient access is provided. A review of the nominated locations should be undertaken to confirm there is sufficient spatial provision to accommodate passengers boarding and alighting the buses.

Any lowering of the level of service offered by the bus routes (in terms of convenience, proximity of stops to the University, travel time, etc.) may result in a passenger shift from buses to alternate public transport options, such as trams on the Swanston Street and Royal Parade corridors. Of note, Table 8-19 on page 105 of the AJM TIA identifies increased travel times for bus services during the construction phase.

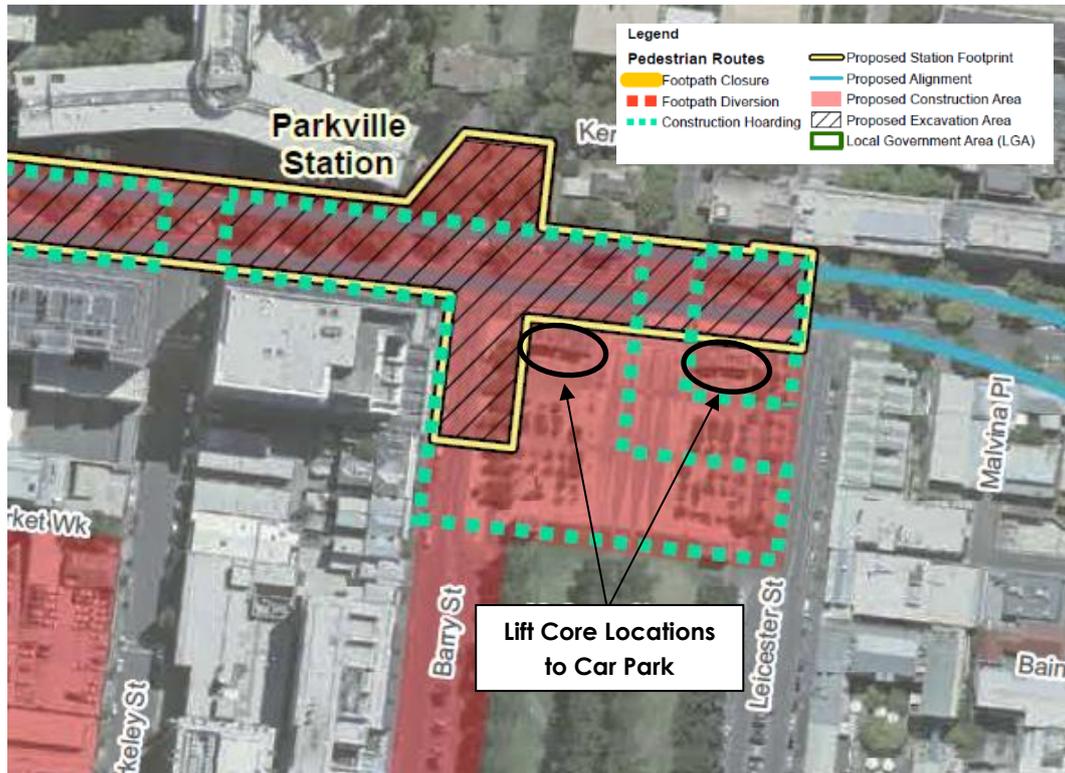
Increased tram patronage levels could increase boardings and alightings at the Swanston Street and Royal Parade tram stops, with corresponding increases in pedestrian movements across both roads. The AJM TIA identifies that traffic volumes on Swanston Street and Royal Parade are expected to increase during construction, with Swanston Street expected to operate at its theoretical capacity. The resulting pedestrian – vehicle conflicts will require management and as identified earlier a review should be undertaken of the capacity and layout of controlled crossings of Swanston Street and Royal Parade to confirm their appropriateness to cater for increased pedestrian demands.

4.2.4 Car Parking

It is estimated that between 140 and 150 on-street car parking spaces will be temporarily removed during the construction phase, with no alternative car parking arrangements identified in the available documentation. It is unclear whether there is sufficient spare capacity in the on-street and off-street car parking resources to cover the loss of any car parking or to accommodate the car parking demands of construction workers.

Pedestrian access to the car park located beneath University Square is provided via two lift cores located within University Square. The proposed construction hoardings, as depicted in Figure 4.1, appear to restrict pedestrian access to the lift cores. Under this arrangement it is unclear how pedestrians will access the car park other than via the vehicle accesses located on Bouverie Street and Berkeley Street, which is not considered an appropriate outcome.

Figure 4.1: Lift Core Locations to University Square Car Park



4.2.5 Vehicle Access

The Gate 10 access on Grattan Street provides vehicle access to the University South Lawn car park as well as accommodating the majority of the University's service vehicle demands.

The survey information presented in Section 2 of this evidence indicates 89 private vehicles movements at Gate 10 during the AM and PM peak hours², with 709 private vehicles movements at the gate over a 12-hour period³.

The survey information presented in Section 2 also indicates 43 commercial vehicle movements at Gate 10 during the AM peak hours⁴, with six commercial vehicle movements at the gate during the PM peak hour. Over a 12-hour period, the surveys recorded 390 commercial vehicle movements at the gate.

The closure of Gate 10 to vehicles during the construction period will necessitate these vehicles using alternative accesses into the University. There are a number of alternative gates that could be used depending on the purpose of the commercial vehicle and its size. Because of this, the rerouting of these vehicles is not a simple process and is one that will necessitate a thorough design and safety review.

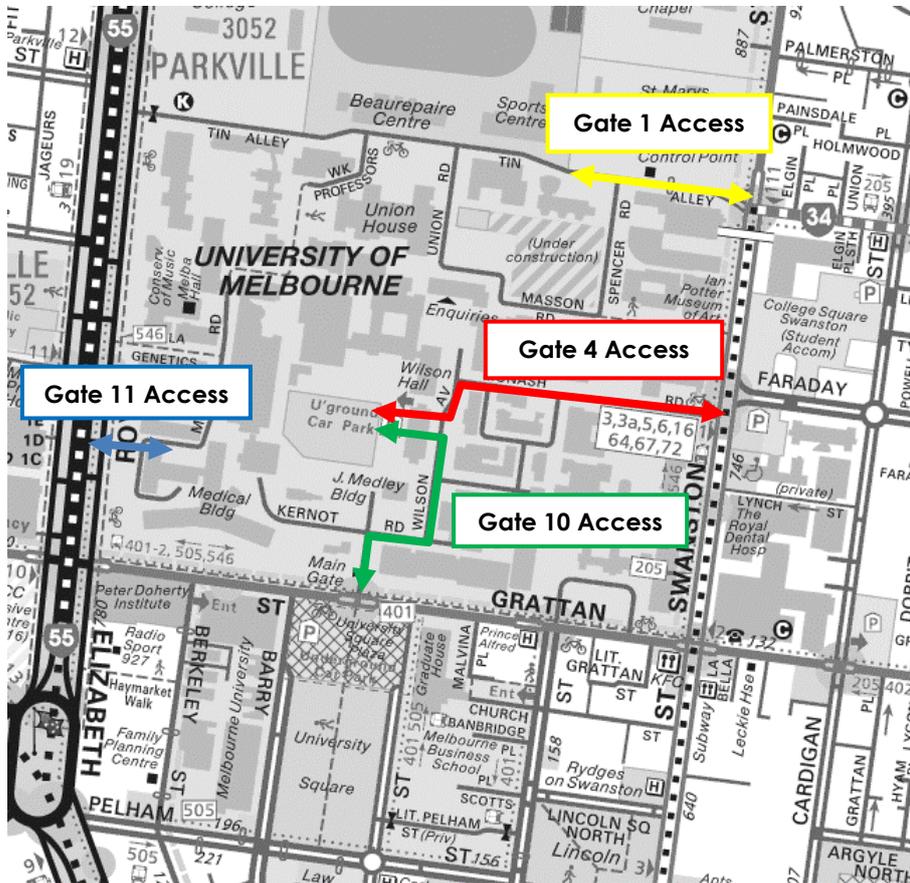
² Based on the GTA August 2016 surveys.

³ Based on the Traffix Group surveys.

⁴ Based on the Traffix Group Surveys.

Possible alternatives would be to relocate the Gate 10 vehicle movements to Gate 4 (Monash Road) and Gate 1 (Tin Alley) on Swanston Street or Gate 11 on Royal Parade. The existing internal vehicle access routes through these gates are presented in Figure 4.2.

Figure 4.2: Vehicle Access Routes from Gate 1, Gate 4, Gate 10 and Gate 11



By way of context, should Gate 4 be adopted as the alternative vehicle access arrangement, it will result in increased traffic activity levels at the gate and on Swanston Street. Presently Gate 4 caters for 104 vehicle movements (private and commercial) during a 12-hour period. The redistribution of all the Gate 10 private (709 movements) and commercial (390 movements) traffic to this location could result in the access carrying 1,203 vehicles over a 12-hour period. The AJM TIA suggests that Swanston Street will be operating at capacity during the construction phase as a result of the displaced traffic from the Grattan Street closure.

Further, Gate 4 is located close to the controlled pedestrian crossing at the northern end of the tram stop 1 and also carries 11,223 pedestrian movements over a 12-hour period. Additionally, a review of Monash Road layout would need to be undertaken to confirm its ability to accommodate larger vehicle movements.

Lastly, I have been advised that the University has the emerging Carlton Connect project, which comprises a mixed-use precinct on land located at 114-152 Grattan Street in Carlton (the site of the former Royal Women's Hospital). The delivery of this project is expected to occur at the same time as the delivery of Parkville Station and the impact of the construction traffic associated with this development is a further key consideration.

All of these factors combined indicate that the road network, and in particular Swanston Street, is likely to be put under significant pressure during the construction phase and reinforces the need for a robust assessment of the alternative vehicle access strategy for the University.

The above is simply a snapshot of some of the challenges that the University will face during the construction phase of the Project.

4.3 Legacy Phase

4.3.1 Parkville Station Portals

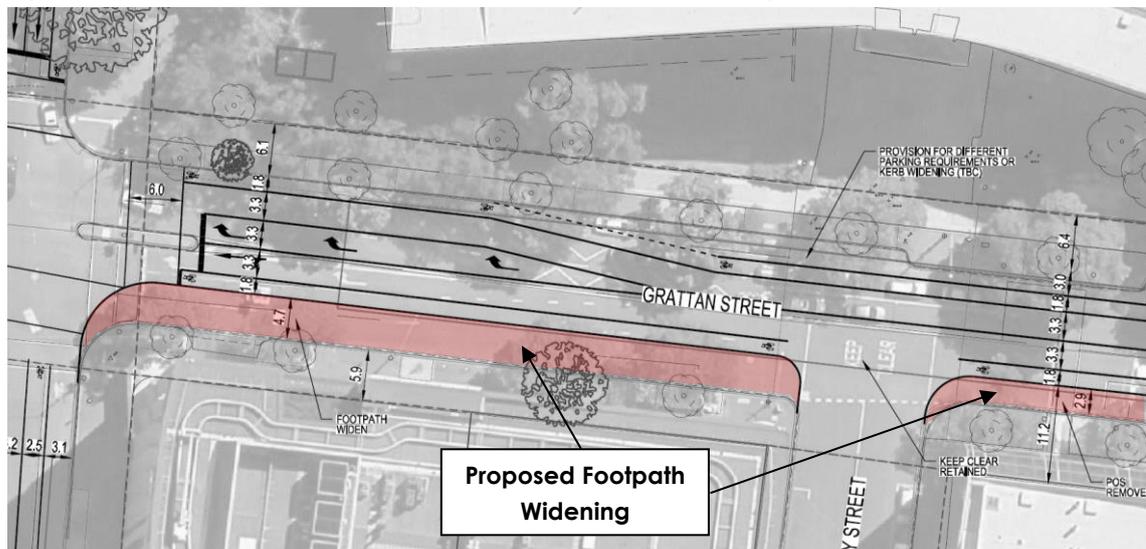
The current Parkville Station design nominates three pedestrian portals, with two on the north side of Grattan Street and one on the west side of Royal Parade/Elizabeth Street.

The current design will require all pedestrians accessing the northern portals from the south to cross Grattan Street. In order to reduce pedestrian demands across Grattan Street, and noting that it is proposed to remove the existing pedestrian operated signals on Grattan Street located to the east of Berkeley Street, there may be some benefit in also providing a portal on the south side of Grattan Street.

4.3.2 Pedestrians

As a result of narrowing the Grattan Street carriageway it is proposed to significantly widen the footpath on the southern side of Grattan Street whilst largely maintaining the existing width on the north side. An extract from the functional layout plan for the section of Grattan Street between Royal Parade and Berkeley Street is presented in Figure 4.3.

Figure 4.3: Grattan Street Functional Layout Plan – Footpath Widening on South Side of Road



Source: Parkville Road Functional Layout Plan Sheet 2 prepared by AJM.

The functional layout plan indicates that the footpath widths on Grattan Street are proposed to be modified, as follows:

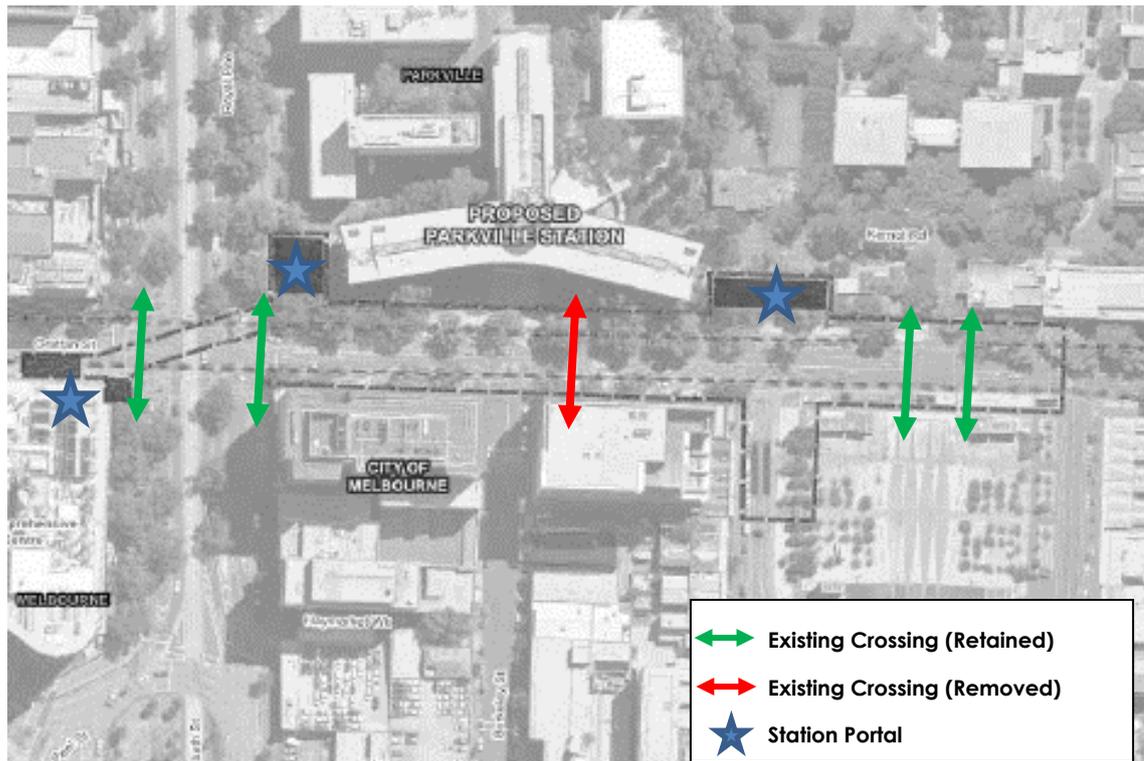
- South side: 5.9m-8.3m to 10.6m-11.2m wide.
- North side: 6.1m-6.4m (no change).

Pedestrian demand surveys indicate that the current demands on the north side of Grattan Street are greater than those on the south side. The future demands once Parkville Station is operational are expected to increase significantly, with the expectation that the majority of these demands will occur on the north side of Grattan Street and close to the station portals. Consideration should therefore be given in the functional layout design to an increase in the footpath width on the north side of Grattan Street.

It is proposed to remove the existing pedestrian operated signals from the east side of Berkeley Street on Grattan Street. The pedestrian crossing forms a key north-south link connecting the Medical Building on the main campus to the University buildings to the south of Grattan Street. The pedestrian crossing presently carries for 286 and 316 pedestrians during the AM and PM peak hours, respectively.

The proposed north-south pedestrian crossings of Grattan Street and the station portal locations are presented in Figure 4.4.

Figure 4.4: Pedestrian Crossings of Grattan Street and Station Portal Locations



The removal of the existing crossing to the east of Berkeley Street will require students to the Medical Building to cross Grattan Street at the widened pedestrian crossing at the Royal Parade intersection or the existing pedestrian crossings located close to Gate 10. Both of these locations are expected to carry increased pedestrian demands as a result of pedestrians moving to and from the station portals. The existing pedestrian crossing is conveniently located for pedestrian movements to and from the Medical Building and consideration should be given to retaining this crossing.

4.3.3 Cyclists

It is proposed to reduce the width of the existing Grattan Street carriageway from two traffic lanes in each direction to a traffic and bicycle lane in each direction. The proposed bicycle lanes are proposed to be provided on-road between the car parking lane and the traffic lane. This presents a business as usual approach and consideration should be given to a best practice approach where cyclists are physically separated from the car parking lane and traffic lane.

There are a number of locations throughout Melbourne where separated or "Copenhagen" style bike lanes are provided. This type of design should be considered for Grattan Street to ensure as safe an environment for cyclists as possible.

4.3.4 Vehicle Access

Grattan Street in the vicinity of the Gate 10 intersection is presently configured with two traffic lanes in each direction. Under this existing, a vehicle turning left or right into Gate 10 can do so without materially impacting on through traffic movements.

Reducing Grattan Street to one lane in each direction will necessitate through vehicles having to wait behind a right turning vehicle. The proposed Grattan Street/Gate 10 intersection layout is presented in Figure 4.5.

Figure 4.5: Future Grattan Street/Gate 10 Intersection Layout



It is unclear whether any detailed intersection modelling has been undertaken to inform the proposed Grattan Street/Gate 10 intersection design or the design of other road connections with Grattan Street. Detailed modelling should be undertaken to confirm that the proposed intersection layouts will deliver an appropriate level of road network performance.

5. Environmental Performance Requirements

5.1 Preamble

The EES identifies recommended Environmental Performance Requirements (EPR) for the Construction and Legacy phases of the projects, along with mitigation measures. The EPRs are reviewed in the following sections of this evidence.

5.2 Construction Phase

The Construction phase EPRs are presented in

Table 5.1 along with possible management measures.

Table 5.1: Construction Phase Environmental Performance Requirement

Description	Environmental Performance Requirement	Possible Management Measures
Road transport	<ul style="list-style-type: none"> ○ Develop and implement a transport management plan(s) in consultation with the relevant road management authorities to minimise disruption to traffic, car parking, pedestrian and bicycle movements during construction, including but not limited to: <ul style="list-style-type: none"> ○ Management of any temporary or permanent full or partial closure of traffic lanes including (but not limited to) Royal Parade, Grattan Street and Barry Street, Parkville ○ Monitoring of travel behaviour changes caused by construction works, including pre-construction baseline data and periodic reporting on behaviour change. Use this data as an input to the design of transport networks following construction ○ Transport management plan(s) must be developed recognising other projects operating concurrently, where relevant ○ Potential routes for construction vehicles travelling to and from all Melbourne Metro construction work sites, recognising sensitive receptors ○ Provision of suitable routes for vehicles to maintain connectivity for road users to the medical and educational facilities adjacent to the Parkville construction work sites ○ Provision of alternate parking where possible to replace parking lost from Grattan Street during construction and preventing parking at undesignated locations on local roads ○ Provision of car parking for construction workers where possible ○ In consultation with emergency services, develop suitable measures to ensure emergency service access is not inhibited as a result of Melbourne Metro construction work sites ○ Special arrangements for delivery or removal of large loads. 	<ul style="list-style-type: none"> ○ Prepare Transport Management Plan ○ Consult with relevant authorities ○ Consult with emergency services.

Description	Environmental Performance Requirement	Possible Management Measures
Public transport	<ul style="list-style-type: none"> ○ Develop and implement measures to minimise disruption to the tram and bus networks resulting from the construction of Melbourne Metro in consultation with the relevant road management authorities and the satisfaction of Public Transport Victoria, including (but not limited to): <ul style="list-style-type: none"> ○ Options to divert the 401, 402, 403, 505 and 546 bus services ○ Periodic closures of Royal Parade tram route ○ Bus replacement services for disrupted rail customers. 	<ul style="list-style-type: none"> ○ Prepare Transport Management Plan ○ Prepare Rail Occupation Plan ○ Consult with relevant authorities.
Active transport	<ul style="list-style-type: none"> ○ Develop and implement transport management measures in consultation with relevant authorities for cyclists and pedestrians to maintain connectivity throughout construction for road and shared path users including (but not limited to) Grattan Street ○ In consultation with the City of Melbourne, provide suitable routes for, cyclists and pedestrians to maintain connectivity and safety for roads and shared paths to provide continued access, including (but not limited to) Grattan Street ○ Implement active control at construction work site access points to maintain safety by avoiding potential conflicts between trucks, pedestrians and cyclists. 	<ul style="list-style-type: none"> ○ Prepare Transport Management Plan ○ Consult with relevant authorities.
Travel demand management	<ul style="list-style-type: none"> ○ In advance of construction works, MMRA to develop and implement a travel demand management strategy and appropriate tools to promote specific transport behaviour changes in response to road, bicycle and pedestrian paths closures/modifications and to reduce traffic congestion around construction works sites, particularly where road closures and restrictions are proposed. The strategy must be consistent with the MMRA Community and Stakeholder Engagement Plan. 	<ul style="list-style-type: none"> ○ Prepare Travel Demand Management Strategy and associated transport management measures ○ Consult with relevant authorities.

Commentary on the possible management measures for the four transport elements is provided in the following sections.

5.2.1 Road Transport

The Transport Management Plan (TMP) for road transport should be informed by traffic movement surveys of the roads and intersections in the surrounding area. Detailed traffic impact analysis of intersections and the University gates expected to be impacted by the Project should be undertaken.

The car parking conditions in the surrounding area should be investigated to clearly identify existing supply against demands. This information will be required as a starting point to assess the impacts of the temporary loss of car parking during construction combined with potential increased demands as a result of construction workers.

The University is to provide input which must be taken into account on the TMP for road transport on the basis of the following:

- The closure of Grattan Street will result in University related traffic patterns being altered, particularly at Gate 10, with increased traffic movements (cars and service vehicles) expected at other University access points, particularly at Gate 4 (Monash Road) which is the only viable alternative access for service vehicles diverted from Gate 10, but also

one that is located close to the signalised pedestrian crossings located at the northern end of the Swanston Street tram superstop.

- Expected traffic volume increases on Swanston Street and Royal Parade may impact on the operational and safety performance of existing University access points. The AJM Transport Impact Assessment notes the following on page 99:

"In the AM peak hour, the closure of Grattan Street is predicted to cause the majority of the vehicles to reroute via Swanston Street and Queensferry Street. Swanston Street currently does not have the capacity to accommodate this increase in traffic, and thus would likely be a key congestion point."

- Construction vehicle routes have been identified that will result in construction vehicles using Berkeley Street, Leicester Street and Bouverie Street. Berkeley Street is expected to have increased pedestrian demands during construction as it appears to have been identified as a pedestrian access route to the University during construction. Additionally, Berkeley Street and Bouverie Street provide vehicle access to the University car park located beneath University Square. The potential for conflict between construction vehicles, pedestrians and cars entering and exiting the University car park will require management.
- The removal of on-street car parking from Grattan Street and parts of Barry Street will reduce supply in an area that presently experiences high demands. The inclusion of construction worker car parking will exacerbate the situation.

5.2.2 Public Transport

The University is to provide input which must be taken into account on the TMP for public transport on the basis of the following:

- Various bus routes presently on Grattan Street will need to be diverted during construction. These routes have high student patronage levels.
- Bus route 401 operates as a shuttle service between North Melbourne train station and the University, with high demands for the service at the train station. The AJM Transport Impact Assessment notes the following on page 91 regarding route 401:

"It is a prepaid service and the timetable alters with the university semester dates. It is a very high frequency service, with up to 15 buses per hour in the peak hour."

- Anecdotally, there is a high student demand for route 401 at North Melbourne train station, and any changes or interruptions to this service may result in longer wait times for passengers at the train station, leading to increased queues.
- Bus route 402 is noted on page 91 of the AJM Transport Impact Assessment as:

"...a high frequency service (up to six buses per hour in the peak hour.)"

- The relocation of bus routes and bus stops should be investigated with the University to ensure that the proposed changes do not dilute the level of public transport accessibility to the University.
- Temporary bus stop locations must be appropriate for the level of demand expected, ensuring that appropriate footpath and pedestrian crossing widths are provided.
- Temporary bus stop locations must minimise conflict between passengers and other transport modes (i.e. trams, cyclists and motorised vehicles).
- Periodic closures to the Royal Parade tram route (19) have the potential to increase patronage levels on the Swanston Street tram routes and may increase pedestrian demands across Swanston Street and to the University's Swanston Street access points. Tram route 19 is identified in the AJM Transport Impact Assessment as:

“Route 19 has the fifth highest patronage out of all tram routes in Melbourne. There are over 8,000 boardings and alightings per day at tram stops 10 and 11 on Royal Parade, outside Melbourne University and Royal Melbourne Hospital.”

5.2.3 Active Transport

The TMP for active transport should be informed by pedestrian and cyclist movement surveys of the footpaths, shared paths, pedestrian crossings and on-road bicycle lanes in the surrounding area. Detailed analysis of the existing and construction phase facilities should be undertaken.

The University is to provide input which must be taken into account on the TMP for active transport on the basis of the following:

- Grattan Street presently carries high pedestrian volumes, particularly at Gate 10.
- It appears that the construction works will limit pedestrian movements across Grattan Street to a dedicated path through University Square (formed as a result of construction hoardings) and along Berkeley Street. The University Square arrangement may result in a tunnel-like effect, presenting an uncomfortable walking environment during high pedestrian demand periods. Increased pedestrian demands on Berkeley Street as a result of pedestrians being diverted from other routes has the potential to increase the conflict between pedestrians, construction vehicles and vehicle movements to/from the University car park access.
- The potential limit on passive surveillance across the University Square route as a result of the construction hoardings raises some concerns for the safety of students, particularly at night. The City of Melbourne Walking Plan 2014-17 recognises the importance of pedestrians feeling safe in their environment, stating:

“People walking in Melbourne need to feel personally secure. A high level of personal security will encourage more people to walk more, including at night and in places with which they are not familiar.”

Additionally:

“Passive surveillance is a key factor in creating a feeling of personal security.”

- The distribution of bicycle movements away from Grattan Street, with demands potentially increasing on Royal Parade and Swanston Street, will require management to ensure an appropriate environment is provided for cyclists on these roads, particularly where their traffic volumes are expected to increase during construction.
- The AJM Transport Impact Assessment notes the following on page 106:

“Improving access to Tin Alley (which runs through the Melbourne University campus) would also provide a reasonable alternative connection for riders, although it is noted that this is a private, one-way road.”

It is evident that the University has the potential to facilitate bicycle movements during construction and should be consulted on this matter.

- Conflict between construction traffic and pedestrians at the Berkeley Street and Gate 10 crossings of the construction area will require careful management to ensure a safe environment for all users is maintained.

5.2.4 Travel Demand Management

The Travel Demand Management Strategy should be prepared with input from the University which must be taken into account given it is a significant contributor to transport movements across the Parkville precinct.

5.2.5 Other Considerations

All the TMPs must contain sufficient detail to inform stakeholders of expected outcomes from management measures and must be provided to stakeholders in a reasonable timeframe prior to the implementation of the measures for the provision of input which must be taken into account. Details must also be included regarding the timing on the implementation of the management measures to provide the University sufficient time to inform the large student population and staff of the changes and the expected impacts.

Input from the University in the preparation of the TMPs will be important to ensure that appropriate outcomes are achieved for the surrounding area and the University.

It is recommended that the TMPs are live documents that evolve to respond to project challenges, construction methodology and stakeholder expectations. The documents should also recognise that alternative measures may be required during non-typical (special) events at the University, such as graduation ceremonies.

5.3 Legacy Phase

The Legacy phase EPRs are presented in Table 5.2 along with possible management measures.

Table 5.2: Legacy Phase Environmental Performance Requirements

Description	Environmental Performance Requirement	Possible Management Measures
Road transport	<ul style="list-style-type: none"> ○ Design all roadworks and shared path works to relevant design standards to maintain safety of movement in consultation with the relevant road management authorities as required ○ Develop and implement a plan for the reinstatement of Grattan Street, Parkville in consultation with the relevant road management authorities that includes: <ul style="list-style-type: none"> ○ Optimal replacement of car parking spaces along Grattan Street to service the needs of the hospitals and the university, including the retention or replacement of specific short-term and DDA compliant parking ○ Optimal design of the road network around Grattan Street associated with the changed demands and network changes on Grattan Street and Royal Parade/Elizabeth Street. 	<ul style="list-style-type: none"> ○ Prepare car parking management plan ○ Consult with relevant authorities ○ Design all works to relevant standards.
Public transport	<ul style="list-style-type: none"> ○ Review, with Public Transport Victoria, the bus services in the areas around Parkville station including a review of the route 401 bus frequency that will have reduced demand following implementation of Melbourne Metro ○ Optimise the design of Melbourne Metro stations to ensure integration with existing and planned future uses and so that they will provide connections between the new Parkville station and the new tram stop on Royal Parade. 	<ul style="list-style-type: none"> ○ Review bus service plans ○ Design and optimise form and function of stations and interfaces with other public transport services ○ Consult with relevant authorities.
Active transport	<ul style="list-style-type: none"> ○ Where practicable to do so, reinstate on-road bicycle lanes and bicycle parking provisions removed during construction in cooperation with the relevant road management authority and the local council ○ Provide wayfinding information to enhance connectivity for pedestrians and public transport users. 	<ul style="list-style-type: none"> ○ Consult with relevant authorities ○ Provide wayfinding information.

Commentary on the possible management measures for the three transport elements is provided in the following sections.

5.3.1 Road Transport

The University is to provide input which must be taken into account on the preparation of any car parking management plans for the area surrounding the University given that it is responsible for the operation of a number of car parks in the surrounding area.

Detailed traffic impact analysis is recommended to assess the impact of the post development Grattan Street layout on the performance of the University access points on Grattan Street, plus other road connections with Grattan Street. This analysis will assist in identifying any performance issues and the delivery of appropriate intersection and access layouts. The 2031 road functional layout plans presented in Appendix E of the AJM TIA may need to be amended to account for the findings of this detailed analysis.

Whilst the design of the roadworks and shared paths will be to relevant design standards, there appears to be no mention of best practice delivery. The 2031 road functional layout plans presented in Appendix E of the AJM TIA identify linemarked on-road bicycle lanes proposed on Grattan Street. These bicycle lanes would be adjacent to sections of kerbside car parking. It is recommended that some form of physical separation be provided between the bicycle lanes, the traffic lanes and the kerbside car parking.

5.3.2 Public Transport

The University is to provide input which must be taken into account on any changes to bus routes that provide services directly to the University. Any changes will need to deliver an appropriate level of service.

The design of interchanges between buses, trams and trains should seek to minimise conflicts between passengers and other road users and to provide sufficient facilities (i.e. footpath and pedestrian crossing widths) to accommodate expected patronage levels. It is noted that the Parkville Station portal located close to the University Gate 10 is anticipated to generate up to 4,140 passenger movements during the weekday AM peak two-hour period and 4,910 passenger movements during the weekday PM peak two-hour period⁵. These are significant numbers, which when combined with the current pedestrian activity levels at Gate 10, will result in a busy pedestrian environment. Detailed pedestrian modelling should be undertaken to confirm appropriate spatial provision at and around the station portals.

5.3.3 Active Transport

As identified in Section 5.3.1 it would be desirable for the provision of on-road bicycle lanes on Grattan Street to adopt best practice principles.

Appropriate bicycle parking provision and layouts, that are conveniently accessible, should be delivered close to the station entrances.

⁵ Table 4-10 of Appendix D (Transport Modelling Summary) of the AJM TIA.

6. Summary of Opinion & Other Statements

6.1 Summary of Opinion

The University is supportive of the Melbourne Metro Rail Project and delivery of the Parkville train station, recognising the Project's benefits to the Parkville precinct around accessibility and the development of the area.

The University will be affected by the Parkville Station both during its construction and post development. Given its status within the Parkville precinct as a major educator and employer, the University should be fully consulted on all Project traffic and transport matters that will impact on its operation.

Based on the analysis and discussions presented within this evidence, the following is a summary of my opinion:

- i The following changes to traffic and transport elements surrounding the University are anticipated during the construction phase:
 - o Existing University bicycle movements along the closed section of Grattan Street and at Gate 10 will likely redistribute to Royal Parade and Swanston Street and will access the University via the various gates along these roads.
 - o Existing University vehicle movements at Gate 10 will relocate to other University access points.
 - o Existing University pedestrian movements along the closed section of Grattan Street will be focussed on the pedestrian accesses across Grattan Street located at the northern end of Berkeley Street and University Square.
 - o Existing bus routes will be diverted away from Grattan Street and bus stops will be relocated.
 - o On-Street car parking will be removed from Grattan Street and the northern portion of Barry Street.
- ii Potential impacts as a result of the traffic and transport element changes are as follows:
 - o The distribution of bicycle movements away from Grattan Street, with demands potentially increasing on Royal Parade and Swanston Street, will require management to ensure an appropriate environment is provided for cyclists on these roads, particularly where their traffic volumes are expected to increase during construction.
 - o The closure of Grattan Street will result in University related traffic patterns being altered, particularly at Gate 10, with increased traffic movements (cars and service vehicles) expected at other University access points.
 - o There are a number of alternative gates that could be used by commercial vehicles depending on the purpose of the vehicle and its size. The rerouting of these vehicles is not a simple process and is one that will necessitate a thorough design and safety review.
 - o It appears that pedestrian movements across Grattan Street will be limited to dedicated paths through University Square (formed as a result of construction hoardings) and along Berkeley Street. The University Square arrangement may result in a tunnel-like effect, presenting an uncomfortable walking environment during high pedestrian demand periods. Additionally, the potential limit on passive surveillance across the University Square route as a result of the construction

- hoardings raises some concerns for the safety of students, particularly at night. This outcome may result in pedestrians relocating to other pedestrian crossing locations on Grattan Street, such as the crossing at the Bouverie Street intersection.
- Pedestrian access to the car park located beneath University Square is provided via two lift cores located within University Square. The proposed construction hoardings appear to restrict pedestrian access to the lift cores. Under this arrangement it is unclear how pedestrians will access the car park other than via the vehicle accesses located on Bouverie Street and Berkeley Street, which is not considered an appropriate outcome. This matter must be resolved with the University.
 - Increased pedestrian demands on Berkeley Street as a result of pedestrians being diverted from other routes has the potential to increase the conflict between pedestrians, construction vehicles and vehicle movements to/from the University car park access.
 - Bus routes 401 and 402, have high student patronage levels. Bus route 401 operates as a shuttle service between North Melbourne train station and the University, with high demands for the service at the train station. Any changes or interruptions to this service may result in longer wait times for passengers at the train station, leading to increased queues.
 - The removal of on-street car parking from Grattan Street and parts of Barry Street will reduce supply in an area that presently experiences high demands. The inclusion of construction worker car parking will exacerbate this situation.
- iii The following changes to traffic and transport elements on Grattan Street are anticipated during the legacy phase:
- Alterations to the Grattan Street cross-section to deliver single traffic lanes in each direction, on-street bicycle lanes on both sides of Grattan Street, kerbside car parking and widened pedestrian footpaths.
 - Removal of the pedestrian operated signals on Grattan Street located immediately to the east of the Berkeley Street intersection.
 - The closure of the northern portion of Barry Street.
 - Inclusion of two station portals on the north side of Grattan Street.
- iv Potential impacts as a result of the traffic and transport element changes are as follows:
- The performance of Gate 10, Berkeley Street, Royal Parade and Leicester Street at their interfaces with Grattan Street will potentially be impacted.
 - The provision of the two station portals on the north side of Grattan Street will result in increased pedestrian movements across Grattan Street. Consideration should be given to locating a third portal on the south side of Grattan Street.
- v Environmental Performance Requirements (EPR) are recommended for the construction phase and legacy phase of the project. The construction phase EPRs mainly focus on the delivery of Transport Management Plans (TMP) with appropriate consultation with relevant authorities and emergency services. The University must have the opportunity to provide input which must be taken into account on the preparation of the TMPs given it is a significant contributor to transport movements in the Parkville precinct.
- vi The legacy phase EPRs focus on the delivery of a car parking management plan for the precinct, review of bus services in the precinct with a particular focus on reducing the frequency of bus route 401, integration of the new train station with other public transport facilities, provision of appropriate bicycle facilities and the provision of a

wayfinding strategy. The University must have the opportunity to provide input which must be taken into account on the preparation of these works.

I am satisfied that meaningful investigations have been undertaken to determine the potential impacts of the Project during the construction and legacy phases. The identification of future works to be undertaken (i.e. Transport Management Plans, Car Parking Management Plans etc.) is an appropriate design response. However, it is important that those parties most impacted by the Project have the opportunity to be involved in the process to ensure that the impacts are minimised and addressed appropriately. The University is to provide input which must be taken into account on all Project traffic and transport matters that will impact on its operation.

6.2 Other Statements

- i No opinion provided in this evidence is provisional.
- i No questions or statements outside of my expertise have been addressed in this evidence.
- ii This evidence is not incomplete or inaccurate.

Declaration

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



Jason Sellars
Director

12/08/16

Appendix A

Curriculum Vitae – Mr Jason Sellars



Jason Sellars

Director

GTA consultants

transportation planning, design and delivery

Jason has over 14 years consulting experience in the field of traffic and transport planning. This experience covers a wide range of projects in Australia and the UK. He is regularly involved in the preparation of traffic reports, travel plans and traffic management plans for a variety of development land uses, as well as in the delivery of conceptual, schematic and detailed design advice for car park layouts, loading facilities and vehicle access arrangements.

Jason regularly presents expert traffic and transport evidence at the Victoria Civil and Administrative Tribunal (VCAT).

Specialist Skills

- Statutory transport planning and policy
- Traffic and transport design advice
- Delivery of traffic and transport evidence.

Office

Melbourne

Qualifications

BEng(Hons)(Civil)Trans

Napier University, Edinburgh

Memberships and Affiliations

Member of the Victorian Planning and Environmental Law Association

Project Experience

Traffic and Transport Planning

Commercial

Masters Developments including Knoxfield, Williams Landing, Shepparton and Cranbourne

Woolworths Developments, including North Melbourne, Highett and Middle Brighton

Various office and retail developments in metropolitan Melbourne.

Residential

2-4 Yarra Street, South Yarra

Waterside Development, Port Melbourne

31 Strathalbyn Street, Kew

Riverwood Development, Alphington

Mixed Use

30-32 St Georges Road, Preston

140-142 Cotham Road, Kew

Other

56-58 The Corso, Parkdale

Professional Background

2008 – Present: GTA Consultants

Jason has worked on a large variety of projects at GTA across a broad range of specialised areas of expertise, including:

- Transport Impact Assessments & Appraisals
- Integrated Transport Planning
- Transport Masterplanning
- Local Area Traffic Management
- Road Safety

2007 – 2008: Cardno Grogan Richards

Jason was involved in preparation of traffic reports, intersection design and masterplan development. He also provided traffic and transport advice and was involved in the review of car park and site access layouts for office, residential and retail developments.

2006 – 2007: VicRoads Metropolitan North West Region

Jason was responsible for town planning permit referrals to VicRoads.

Prior to 2006: Overseas Experience

Principal Consultant at Steer Davies Gleave (UK), Senior Engineer at WSP Group (UK), Engineer at Halcrow Crouch (UK).



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Appendix B

University Transport Mode Diagrams

Figure B2: Pedestrian Access Movements by Gate

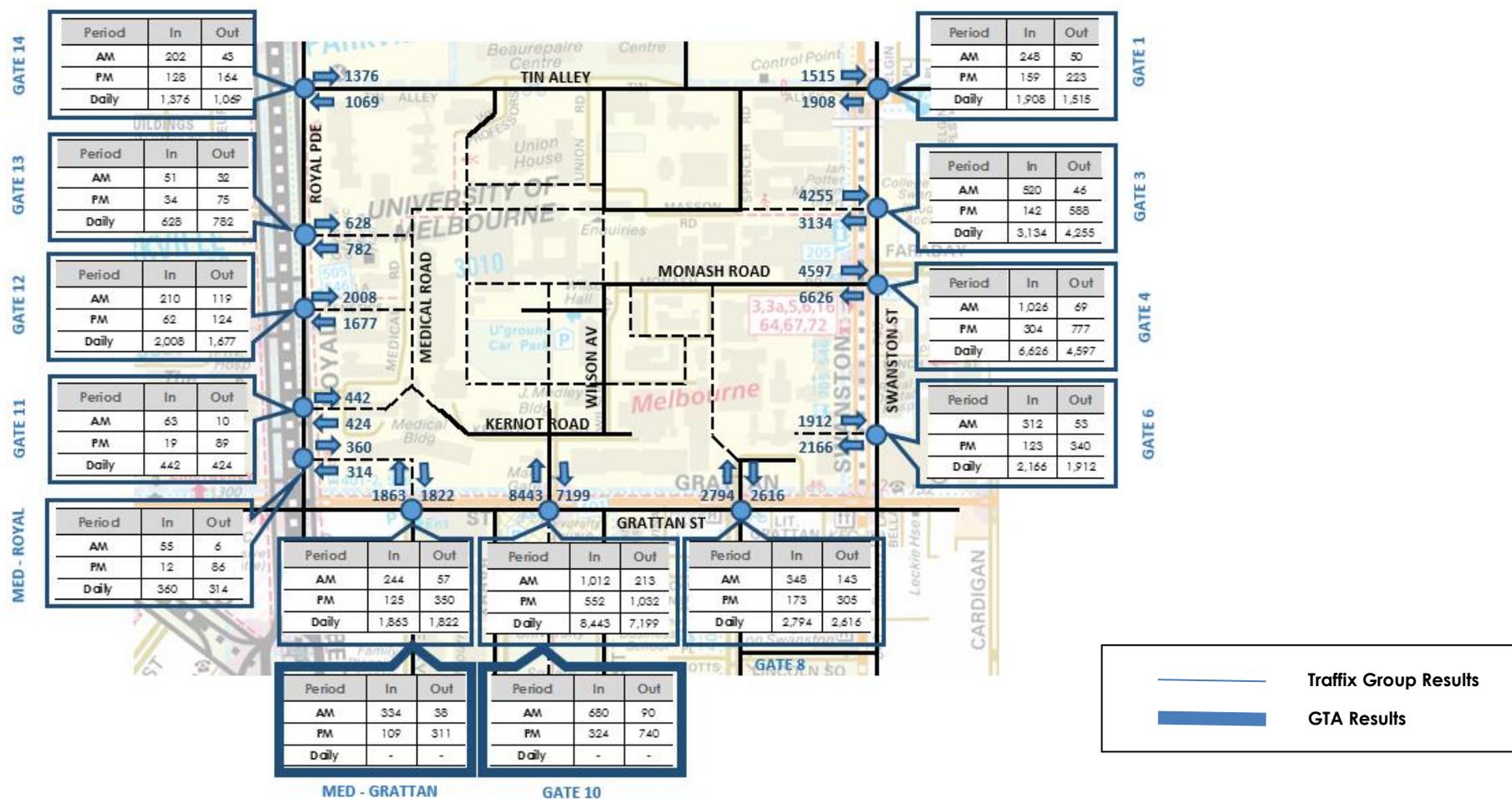


Figure B3: Bicycle Access Movements by Gate

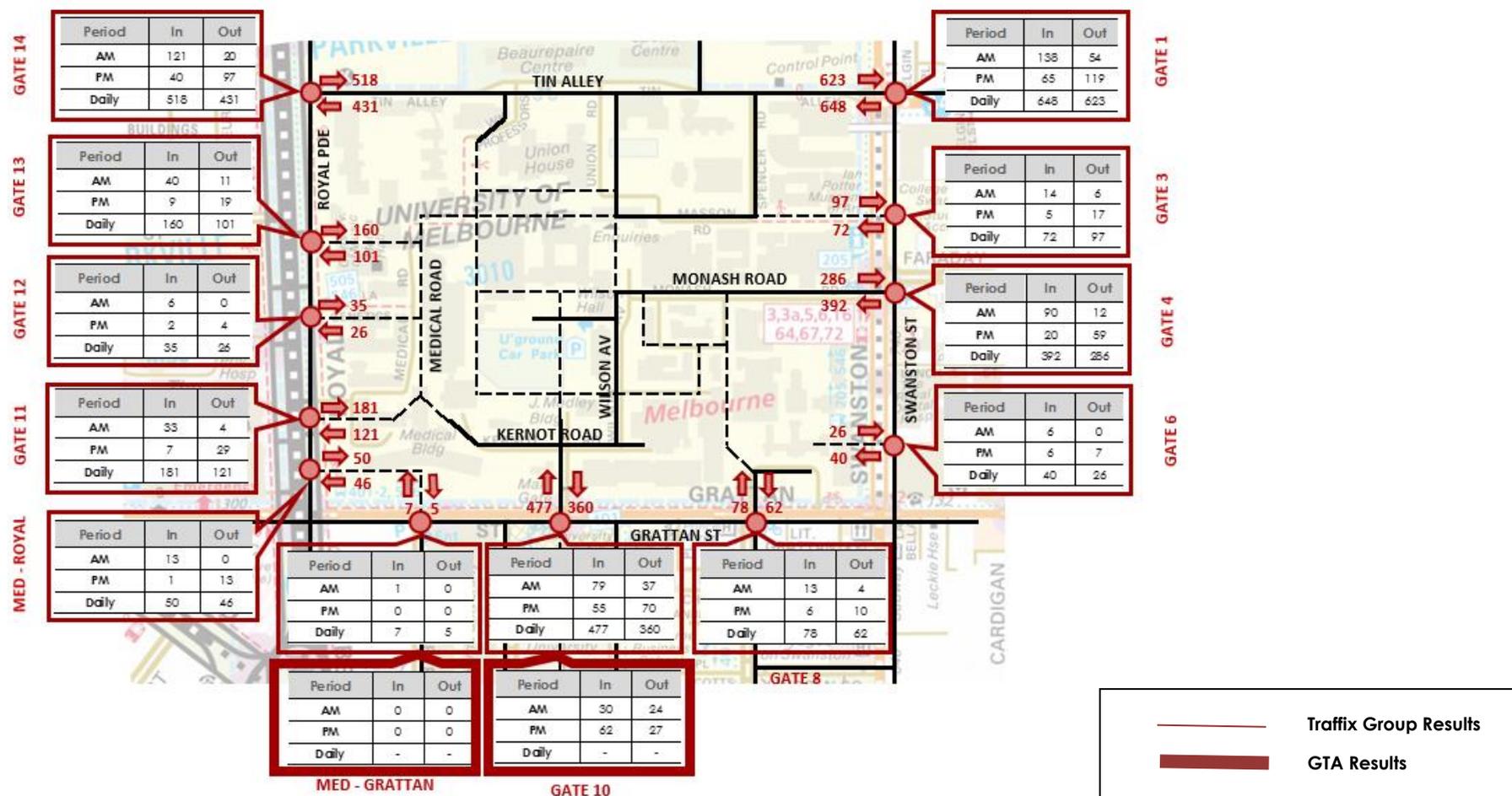


Figure B4: Private Vehicle Movements by Gate

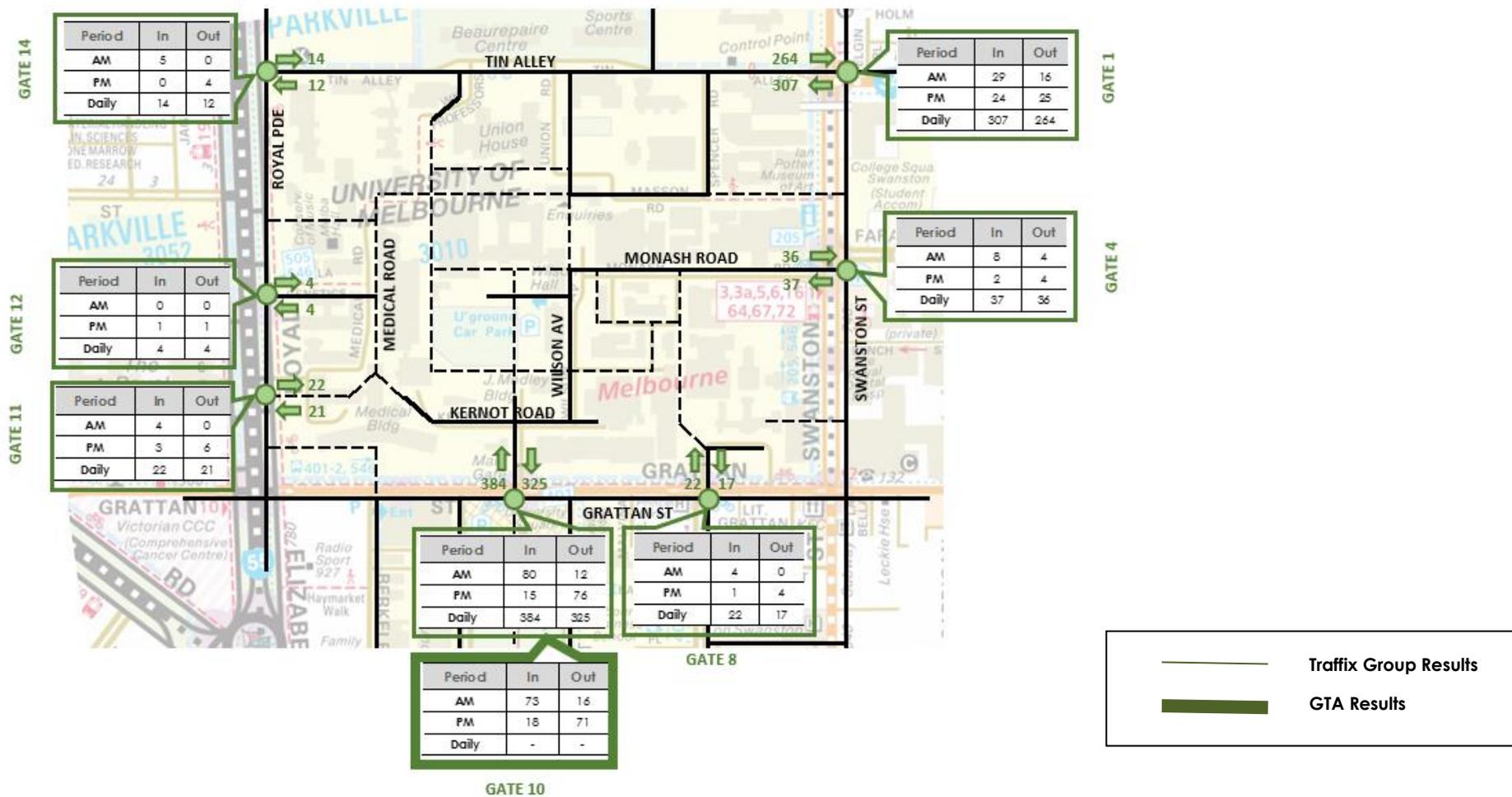


Figure B5: Commercial Vehicle Movements by Gate

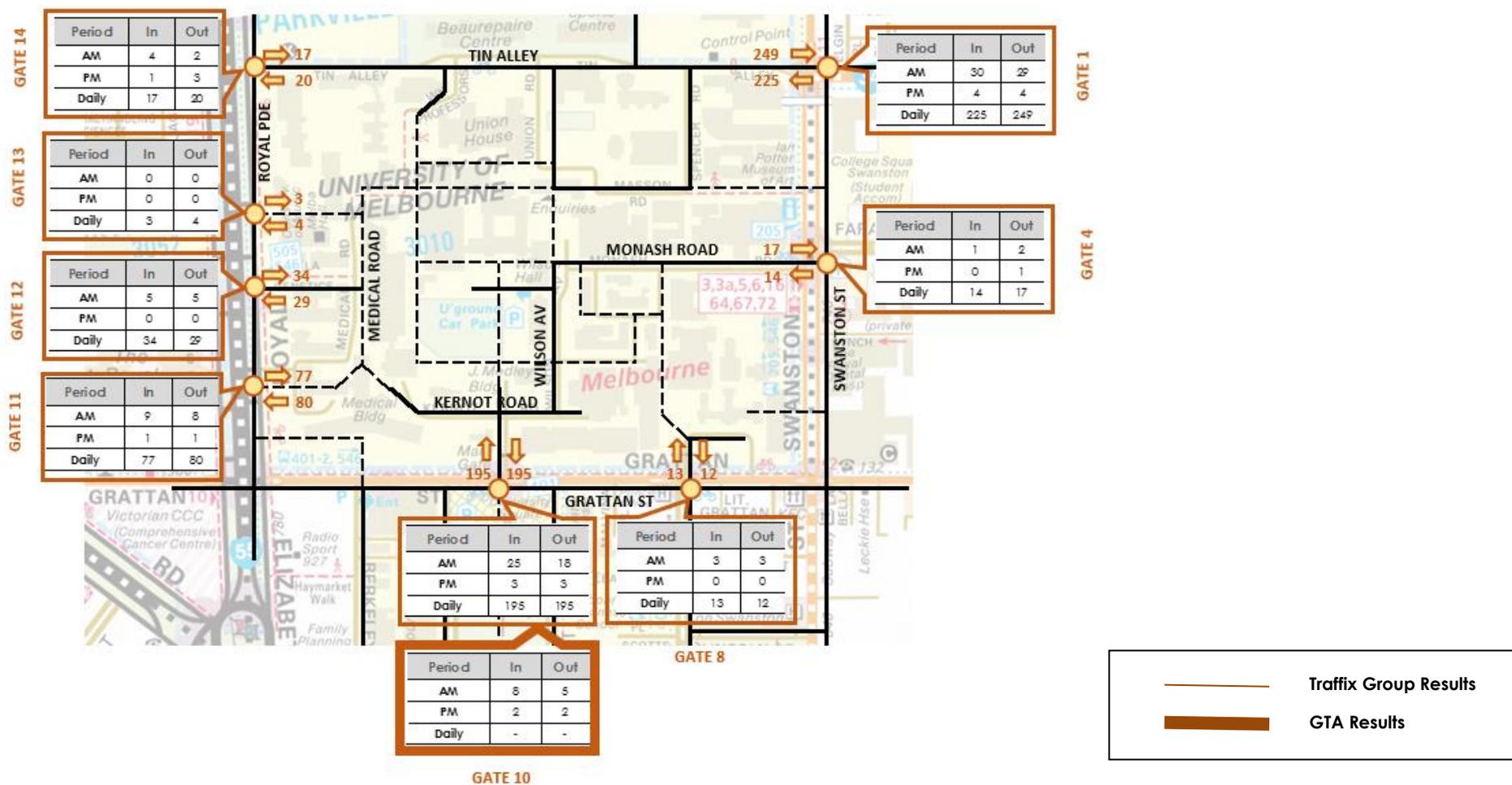


Figure B6: Surrounding Road Network Volumes - Pedestrians

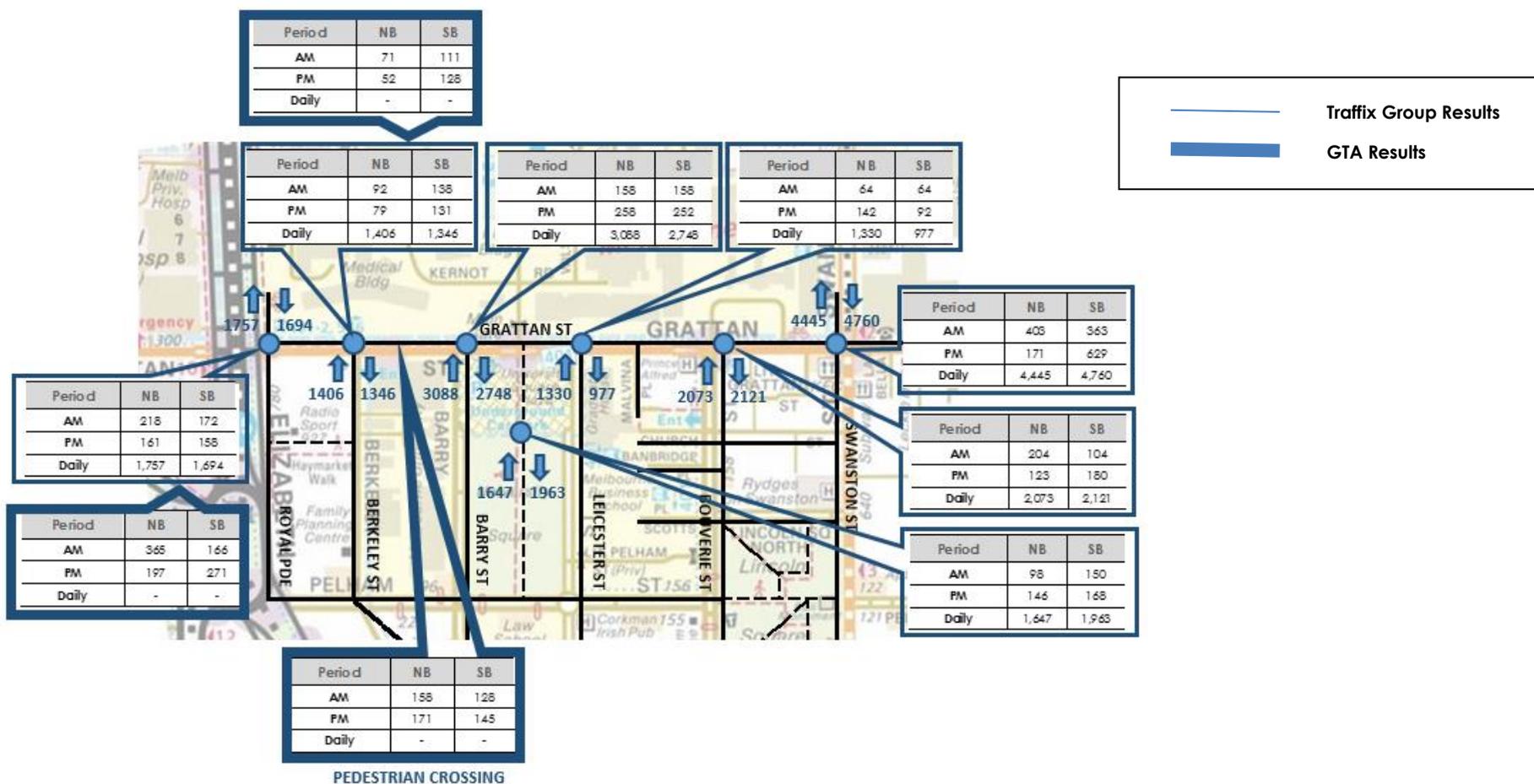


Figure B7: Surrounding Road Network Volumes - Cyclists

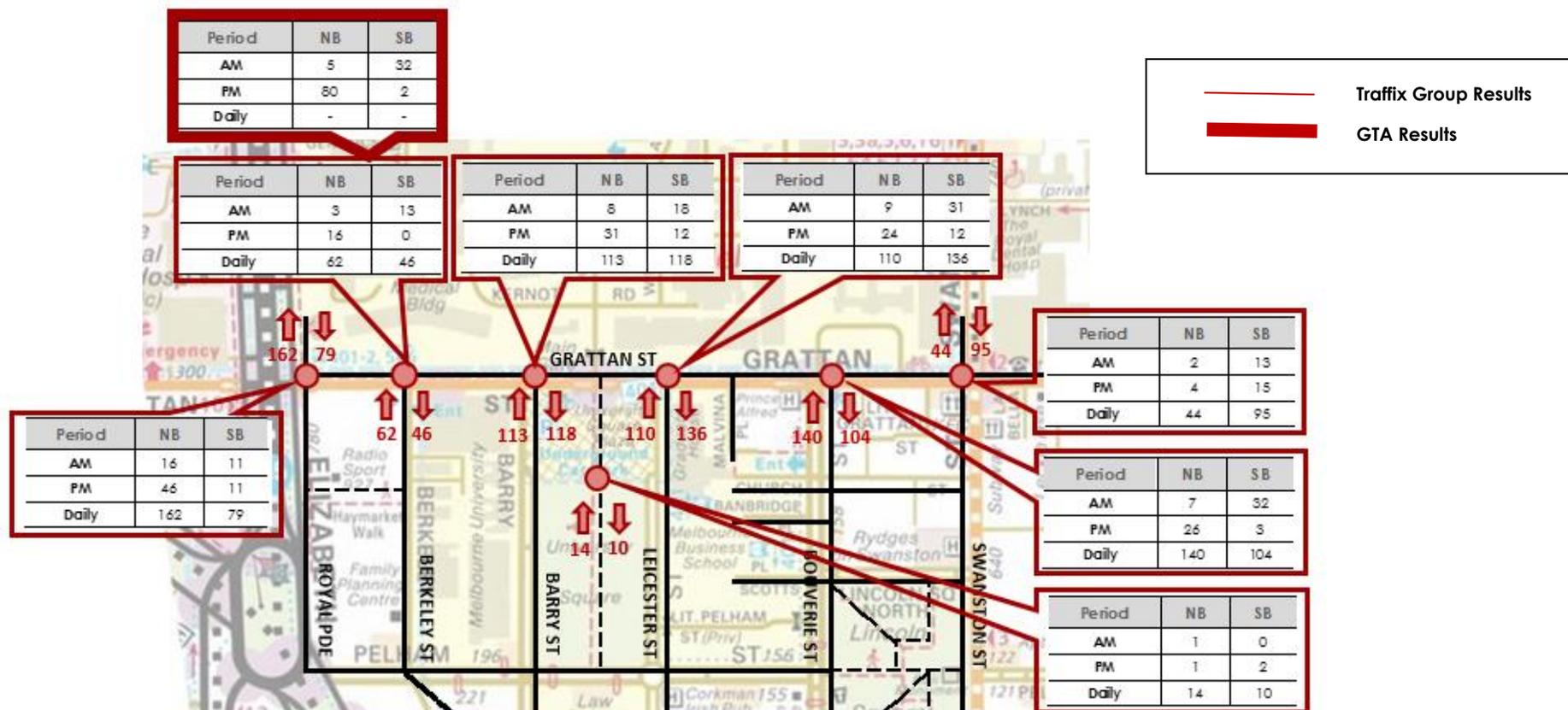


Figure B8: Surrounding Road Network Volumes – Private Vehicles



Figure B9: Surrounding Road Network Volumes – Commercial Vehicles



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