

**MELBOURNE METRO RAIL PROJECT ENVIRONMENT EFFECTS STATEMENT**  
**INQUIRY AND ADVISORY COMMITTEE**

**MMRA TECHNICAL NOTE**

**TECHNICAL NOTE NUMBER:** 019

**DATE:** 10 August 2016

**PRECINCT:** Parkville and Domain Stations

**EES/MAP BOOK REFERENCE:** EES Technical Appendix D – Transport Impact Assessment

**SUBJECT:** Further technical investigations and analysis in relation to the Parkville and Domain precincts undertaken since the Transport Impact Assessment exhibited with the EES was prepared.

Information relating to the impact on trams at the Royal Parade and College Crescent intersection.

Further technical investigations and analysis relating to Swanston Street outside the University of Melbourne.

**NOTE:**

1. Technical Note 1 advised that more information would be provided in response to Item 1 of the request for information made by the IAC on 13 July 2016.
2. This Technical Note provides information about some of the matters requested by the IAC.

**Issue 1:**

*Further technical investigations and analysis in relation to the Parkville and Domain precincts undertaken since the TIA exhibited with the EES was prepared.*

**MMRA Response:**

3. Modelling of the Domain precinct is still ongoing and not provided in this paper. However, the key issues arising from further technical investigations and analysis of the Parkville precinct are provided below.
4. The Parkville Precinct construction transport model presented in the Transport Impact Assessment at Technical Appendix D of the EES (TIA) assumes the total closure of Grattan Street, between Royal Parade and Leicester Street, during the construction of the Melbourne Metro Rail Project. Since the EES was exhibited, the Parkville Precinct construction transport model was used to test several options for the road configuration of Grattan St (west), between Flemington Rd and Royal Parade, to reduce the effects on the road network of constructing the Parkville Station entrance outside the Victorian Comprehensive Cancer Centre (VCCC).
5. The MMRA has concluded, based upon initial model tests described below, that during construction this section of Grattan St, between Royal Parade and Flemington Road, should operate one way eastbound, with two traffic lanes. This would minimise impacts across the network, specifically at Haymarket Roundabout and Gatehouse Street, and optimise accessibility for emergency vehicles accessing the RMH.
6. The 2021 Parkville Precinct model was used to test two scenarios for Grattan Street (west) between Flemington Road and Royal Parade:
  - Scenario 1: Grattan Street between Flemington Road and Royal Parade – one lane in each direction.
  - Scenario 2: Grattan Street between Flemington Road and Royal Parade – the westbound lane was removed, in place of two eastbound lanes. The west approach of the Grattan Street and Royal Parade intersection consisted of a left turn lane and a shared through and right turn lane. Due to the removal of the westbound link, bus routes on Grattan Street were re-routed via Flemington Road.
7. The general model statistics depicted in Table 1 illustrate that both scenarios have a comparable impact on the nearby road network.

**Table 1:** AM Peak Period General Model Statistics for Parkville Precinct construction model

Options	VHT (veh hrs)	VKT (veh km)	Total Vehicles	Mean Speed (kph)
Scenario 1	2,410	31,135	18,228	12.9
Scenario 2	2,417	31,197	18,243	12.9

8. Table 2 below illustrates signalised intersection delays (measured in seconds) within the Parkville Precinct construction model area. Overall, Scenario 2 is estimated to provide the most beneficial outcome, with commuters estimated to experience marginally less delay within the model area.

**Table 2: AM Peak Period forecast delays (seconds)**

Intersection	Approach	Movement	Scenario 1	Scenario 2
Haymarket Roundabout	Elizabeth St (N)	L	20	18
		T <sub>outer</sub>	41	37
		T <sub>inner</sub>	94	110
		R	151	165
	Elizabeth St (SE)	T	72	91
		R <sub>outer</sub>	90	90
		R <sub>inner</sub>	67	67
	Peel St (S)	L	44	42
		T <sub>outer</sub>	50	48
		T <sub>inner</sub>	72	72
	Flemington Rd (NW)	L <sub>outer</sub>	62	0
		L <sub>inner</sub>	0	0
		T	162	149
		R <sub>outer</sub>	172	154
R <sub>inner</sub>		92	102	
Elizabeth Street / Grattan Street / Royal Parade	Royal Pde (N)	L	N/A	N/A
		T <sub>outer</sub>	24	17
		T <sub>inner</sub>	61	101
		R	N/A	N/A
	Grattan St (E)	L	N/A	N/A
		T	N/A	N/A
		R <sub>outer</sub>	N/A	N/A
		R <sub>inner</sub>	N/A	N/A
	Elizabeth St (S)	L	21	N/A
		T <sub>outer</sub>	19	23
		T <sub>inner</sub>	20	24
		R	N/A	N/A
	Grattan St (W)	L	66	47
		T	N/A	N/A
R <sub>outer</sub>		76	69	
R <sub>inner</sub>		0	0	
Flemington Road / Grattan Street / Wreckyn Street	Grattan St (E)	L	0	N/A
		T	35	N/A
		R <sub>outer</sub>	24	N/A
		R <sub>inner</sub>	17	N/A
	Flemington Rd (SE)	L	43	70
		T <sub>outer</sub>	32	36
		T <sub>inner</sub>	27	30
	Wreckyn St (SW)	L	91	70
		T	78	63
		R <sub>outer</sub>	130	109
		R <sub>inner</sub>	0	0
	Flemington Rd (NW)	L	48	38
		T <sub>outer</sub>	77	61
		T <sub>inner</sub>	25	24
R		105	109	

9. It should also be noted that in Scenario 1 (one lane each-way), the eastbound demand is constrained by the link capacity to 240 vehicles per hour (vph) whilst westbound flows are only 40 vph, mainly buses. Providing the additional eastbound lane increases capacity of this link.

**Issue 2:**

*Information relating to the impact on trams at the Royal Parade and College Crescent intersection.*

**MMRA Response:**

10. Trams along Royal Parade in the vicinity of College Crescent are segregated from general traffic on the approaches and through the intersection, with the exception of right turn movements from Royal Parade into MacArthur Road. These right turn movements are not expected to increase as result of Melbourne Metro. Consequently, no impacts on trams at this intersection are expected.
11. MMRA is nevertheless proposing two measures at this intersection, both of which will potentially assist trams at this location (although that is not their primary purpose, but an added consequence of these measures).

*Ban right turns from Royal Parade into MacArthur Road*

12. The first measure is to ban the right turn from Royal Parade onto MacArthur Road during the peak periods. There are presently 60 to 65 such movements per hour in both the AM and PM periods, requiring an average of 17 seconds of green time per cycle for Royal Parade. This means that during this phase northbound traffic, both cars and / or trams cannot run.
13. Banning these right turn movements will thus free-up available green time for other movements through the intersection and/or reduce cycle time. Traffic currently making the right turn onto Macarthur Road would turn right at Walker Street (approximately 570m north), from where it could access either The Avenue or more probably Kendall Avenue and Elliott Avenue.
14. The proposed ban will also benefit tram movements along Royal Parade. Presently, vehicles turning right from Royal Parade into MacArthur Street obstruct trams, preventing them from crossing the intersection even though there may be a green light for the ahead movements. Banning this right turn has the potential to reduce delays to trams in either direction.

*Reduce cycle time in AM peak at the College Crescent/Royal Parade/MacArthur Road intersection*

15. The second proposed measure is to reduce the cycle time in the AM peak at the College Crescent/Royal Parade/MacArthur intersection from 130secs to 110secs.
16. The approach to Royal Parade along College Crescent, from the east in particular, is comprised of multiple short lanes. This means that with a long cycle time, the long green phase operates with different vehicle arrival and departure characteristics. In the first instance, cars are ready to depart the intersection from the four stop lines, and are therefore discharged through the intersection with maximum efficiency. However, once this “ready and waiting” four abreast queue has been discharged, the next group of traffic needs to disperse from the single or dual approach lanes into the four signal approaches before discharging from the intersection, which is less efficient.

17. Shortening the cycle time would result in a shorter but more frequent green period, which means that the proportion of the green time where the approach is working at maximum efficiency will be greater than is presently the case.
18. The effect of these options is likely to mean that the capacity along Macarthur Road can be maintained but delays along Royal Parade, including to trams, would be reduced.

**Issue 3:**

*Further technical investigations and analysis relating to Swanston Street outside the University of Melbourne.*

**MMRA Response:**

19. Travel time outputs from the Parkville Precinct construction transport model for the 2021 No Project and Construction scenarios have been analysed along a route from Cemetery Road to Grattan Street. Details of this analysis are provided in Tables 3 and 4 below.

**Table 3: AM peak northbound**

Intersection	Distance (m)	Travel Time (s)		Volume (veh/hour)	
		Base AM	Construction AM	Base AM	Construction AM
Grattan Street (Start)	0	0	0	-	-
Elgin Street	340	22	20	164	463
Cemetery Road East (End)	649	58	75	293	595

**Table 4: AM peak southbound**

Intersection	Distance (m)	Travel Time (s)		Volume (veh/hour)	
		Base AM	Construction AM	Base AM	Construction AM
Cemetery Road East (Start)	0	0	0	-	-
Elgin Street	390	59	159	685	814
Grattan Street (End)	700	65	165	382	597

20. These Tables illustrate that construction of the Parkville station will result in increased travel times. However, it is considered these would result in small changes to total journey times, and overall the road network has capacity to accommodate the predicted increases.
21. The analysis for this route in the PM peak is presented in Tables 5 and 6 below.

**Table 5: PM peak northbound**

Intersection	Distance (m)	Travel Time (s)		Volume (veh/hour)	
		Base PM	Construction PM	Base PM	Construction PM
Grattan Street (Start)	0	0	0	-	-
Elgin Street	340	21	39	623	935
Cemetery Road East (End)	649	52	106	698	1048

**Table 6: PM peak southbound**

Intersection	Distance (m)	Travel Time (s)		Volume (veh/hour)	
		Base PM	Construction PM	Base PM	Construction PM
Cemetery Road East (Start)	0	0	0	-	-
Elgin Street	390	32	63	243	623
Grattan Street (End)	700	65	68	261	594

22. In the southbound PM peak, traffic flows in the 2021 construction scenario are nearly double the No Project scenario, though again the road network has capacity to absorb this, and journey times in the two scenarios are very similar. In the PM peak, vehicle flows increase by 350 veh/hr and journey time increases by 54 seconds. Given the location is within a dense urban road network, this difference is not considered significant and is well within daily variations, and can easily be caused by missing a green light at a set of traffic lights.
23. Volumes in the PM peak are higher than the AM peak, although again the highest percentage increase is in the counter-peak direction, and volumes remain less than in the peak direction.

**CORRESPONDENCE:** No correspondence.

**ATTACHMENTS:** No attachments.