**Moonee Valley Racecourse Traffic Study**
Technical Review

November 2011

**This report has been prepared from the office of CPG**

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## Contents

## 1 Executive Summary

This report is a technical review of the Development Master Plan for Moonee Valley Racecourse and has been undertaken by CPG Australia on behalf of the City of Moonee Valley.

The review of the study reveals that, in most cases, the methodology used in the report is reasonable, although high level and low in detail. Many of the assumptions and calculations seem simplistic with much of the background and source data used either not referenced or included in the report with numerous statements made with little or no supporting evidence included as justification.

Specifically, there are concerns regarding the traffic generation and distribution assumptions for the development, the assumptions regarding mode share of non-car traffic, assumptions regarding future traffic conditions and the traffic impact on the local road network.

The microsimulation analysis section of the study shows that congestion on the road network will increase due to the development of Moonee Valley Racecourse and thus travel times and queuing at intersections will increase causing delays to traffic, trams and buses.

The report concludes that the increase in traffic caused by the development of the Moonee Valley racecourse which will be managed by “appropriately developed and executed transport improvement measures”. However the report does not specify the form that these appropriate transport improvement measures would take and how they would alleviate increases in congestion.

It is considered that for a major development such as this, circa 3,000 dwellings, more detail is required to accurately predict the impact of the proposals on the local road network and the effects that this will have on the City of Moonee Valley as a whole.

# 2 Introduction

CPG Australia has been commissioned by Moonee Valley City Council to undertake a technical review of the Development Master Plan for Moonee Valley Racecourse.

## 2.1 Purpose of this Review

This report presents the outcome of a review and assessment of the three key aspects of the Moonee Valley Racecourse Development Master Plan, namely, the methodology, the assumptions and the data used in the study. The main sections of the development plan that will be focused on are the Integrated Transport Planning, Road Network Access and Movement Strategy, Traffic impact and Car Parking.

The sections on Existing Conditions and Indicative Development Proposals have been used to inform the development of the sections listed above. However, the existing conditions section has also been included in the technical review as it contains essential information for the traffic study.

In addition to the above, the results of the Moonee Valley Racecourse traffic study will be contrasted with the results obtained as part of the strategic modelling work currently being undertaken by CPG for Moonee Valley City Council. This will be done at a later stage, once the strategic modelling is complete or nearing completion.

Wherever possible, the report includes separate sub-sections for a description of what is included in the report and for commentary. This however is not appropriate for all sections and therefore the text is a combination of description and commentary.

Also included is a subsection detailing comments provided by VicRoads regarding the report. These comments have been included in the recommendations section of this review.

In addition, to provide a ‘quick glance’ summary of the review, a table has been included in section 2 of this report, which includes a concise version of the descriptions and commentaries made. However, it is recommended that the report is read in its entirety first and the table is used as an ***aide mémoire***.

## 3 Summary of the Technical Review

Table 1 below summarises the key issues that have been identified in the Moonee Valley Racecourse Development Master Plan as a result of this technical review.

Table 1 – Summary of Technical Review

| Development Master Plan Section | | Methodology | Assumptions/ Data Used | Technical Review Section |
|---|---|---|---|---|
| **No.** | **Title** | | | |
| 3.1 – 3.6 | Existing Conditions – Road Network Operations | This section of the study details the location of the site and proximity to local amenities, local road network and conditions, traffic volume data collected, travel time data collected, race day operations and some general comments regarding the network performance. | • Peak periods identified as 08:00 to 09:00 and 17:00 to 18:00 for the AM and PM respectively<br>• SCATS loop count data, automatic tube counts and manual turning count survey data have been collected<br>• Travel time surveys have been undertaken on 8 routes across the study area<br>• A survey of race day traffic operations has been included. | 4 |
| | | **Recommendations/Actions**<br>• Provide traffic flow profile data at each intersection in the study area for both AM and PM peaks.<br>• Include queue length profiles for both peak periods.<br>• Incorporate a table/graph of fluctuation in travel times over the peak periods.<br>• Supply travel time data for routes 3 and 4 for the AM peak | | |
| 3.7 | Existing Conditions – Sustainable Transport Infrastructure | This section analyses the provision of sustainable transport (public transport, cycling and walking), in the immediate surrounds of Moonee Valley Racecourse.<br><br>Public transport services within 800m of the site are identified and walking and cycling paths as well as the location of signalised crossings in the area have been mapped together with a summary of key local destinations.<br><br>***Comments***:<br>• The analysis is at high-level and of qualitative nature<br>• For public transport, provides an indication of the level of accessibility to stops/stations and services but lacks | • The maximum distance for walking appears to have been assumed to be 800m for access to public transport<br>• Access distances are measured along the road network and not in a straight line<br>• No indication in the report of the sources of data used in the assessment of access to public transport<br><br>***Comments***<br>• 800m used as maximum walking distance is generally accepted for access to public transport<br>• The use of network distances, as opposed to | 5 |

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| | | details with regards to accessibility to key destinations<br>• A calculation of journey times by public transport and cycling from/to the study site, would have allowed the analysis to include catchments which could be compared with likely demand origins and destinations<br>• For walking and cycling, the analysis is limited to a map highlighting signalised crossings, paths and four locations in the vicinity of the development site | straight lines, is good practice and provides an accurate representation of reality | |
| | | **Recommendations/Actions**<br>• Generate public transport and cycling catchment areas by calculating journey times from/to the study site and compare with likely demand origins and destinations, which could be taken from VITM.<br>• Include additional details (e.g. frequency, capacity) of the public transport services in the area<br>• Provide a table or graph showing the current usage of existing Cycle and Pedestrian Infrastructure near to the proposed development site.<br>• Indicate on the walk catchment map the assumed site boundaries or points used to generate the catchment area for greater clarity<br>• Include references to data sources | | |
| 3.8 | Existing Conditions – Travel Demands | The Travel Demands section of the report summarises population and employment growth and mode share, as modelled in VITM for 2009, for an area of 4km radius around Moonee Ponds Activity Centre and contrasts it with similar information for 4km areas around Northland Shopping Centre and Prahran Activity Centre<br><br>Mode share from VISTA 07 is also reported, at LGA level.<br><br>***Comments***:<br>• The reviews of population/employment growth and mode share are useful and valid and provide information to help set the scene for the study<br>• However, having access to VITM and VISTA07 data, the level and location of demand should have been analysed<br>• Without this review, the analysis is incomplete | • Northland Shopping Centre and Prahran Activity Centre, representing areas with high and low car dependency, were compared to the study site<br>• Analysis based on the definition of a 4km radius around the study site and the comparison sites<br>• Target for mode share has been defined as somewhere between the current Moonee Ponds mode share and that of Prahran Activity Centre<br>• VITM and VISTA07 are main data sources<br><br>Comments:<br>• No justification for the size of the area of influence around the study and chosen comparison sites<br>• However, it appears valid to use two areas with different travel and demographic characteristics for the exercise<br>• The data used comes from the two most relevant and up to date transport planning data sources in Victoria. | 6 |
| | | **Recommendations/Actions**<br>• Present information showing the level and distribution of demand to/from the study area<br>• A table/graph should be included showing the existing distribution of travel distances for trips generated to and | | |

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| | | from the Moonee Ponds Activity Centre catchment area and comparing it with other the two catchment areas specified in the report.<br>• Discuss the reasoning for using 4km as the radius for the areas used in the analysis | | |
| 5 | Integrated Transport Planning | This section of the study seeks to estimate the future public transport and active transport infrastructure requirements of travel to and from the new development site. In order to do so the expected level of public transport patronage is calculated and a set of key walking and cycling movements that should be catered for are listed.<br><br>***Comments***:<br>• Based on current demand and service levels of public transport<br>• There is no indication of how bus and tram services will be affected by the changing traffic conditions due to the development<br>• No account has been made in the analysis on likely increased demand from future developments in Moonee Valley, Broadmeadows and Craigeburn not to mention the impacts on public transport availability in the City of Moreland.<br>• Walking and cycling only considered in qualitative terms but includes a comprehensive review of pedestrian and cyclist facilities<br>• Overall, the assessment has been simplified excessively and provides little value to the study | • The public transport trip rate for the development area will be twice that of the Moonee Valley LGA due to its proximity to public transport<br>• All public transport trips occur in the morning and evening peaks<br>• All public transport trips have their destination in the CBD<br>• Future rolling stock capacity will remain unchanged<br>• Future service frequencies will remain unchanged<br>• All PT trips will be produced by the site, i.e. no PT trips will be attracted to it<br>• Data used sourced from ABS Census 06 and VISTA 07<br><br>***Comments***:<br>• Assumptions have been made with no supporting evidence<br>• VITM would have been a suitable source to complement this section and to support the assumptions made | 7 |
| | | **Recommendations/Actions**<br>• Utilise trip rates calculated from VISTA to estimate generated trips and apply a mode choice model, which could be, for instance, a simplified version of the MITM or VITM mode choice models, to forecast future public transport trips<br>• Include an analysis of service levels and boardings/alightings of the different modes within the walking catchment of the development site to provide some additional supporting evidence to the estimation of sub-mode share<br>• Use VITM future year service assumptions and patronage forecasts in the assessment of public transport requirements, as well as information on likely future PT rolling stock and service levels.<br>• Present Figures from VITM for walking and cycling demand generated in the zone of the development site.<br>• Include supporting evidence or a clear justification for the assumption that public transport trip rates are double because of the proximity to public transport<br>• Provide support, and update, if necessary, the assumptions regarding the time of day of PT trips – this could be | | |

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| | | based on an analysis of VISTA07 and/or Census06 data of an area with high PT mode share<br>• Examine VITM future year matrices in combination with a review of current destinations based on sources such as VITM, VISTA or Census to provide a better indication of the geographic distribution of trips and include in the PT trip generation calculations. | | |
| 6 | Road Network Access and Movement Strategy | Traffic generation rates have been derived based on the following land use types: residential dwellings, commercial office, retail and serviced apartment and applied to the development.<br><br>***Comments***:<br>• The methodology is adequate although rates used are low | • Peak Hour Trip Rates<br>Residential Apartments = 0.3 trips per unit<br>Commercial Office = 1 trip per 100sqm<br>Retail = 2.8 trips per 100sqm<br>Serviced Apartments = 0.3 trips per unit<br><br>• Events day traffic will be the same as existing conditions<br><br>***Comments***:<br>• Trip rates used are considered to be low for this development | 8 |
| | | **Recommendations/Actions**<br>• Justify the trip rates that have been used in the calculation of the development traffic and provide the source data.<br>• Justify the assumptions regarding major event traffic conditions. | | |
| 7.4 | Development Traffic Distribution | This section of the study aims to establish the distribution of traffic generated by the Moonee Valley Racecourse development.<br><br>***Comments***:<br>• The methodology is sound but over simplified<br>• No justification or supporting evidence has given for the assumptions that have been made | • Information from ABS Census 2006 and VISTA 07 datasets has been extracted and summarised.<br>• All traffic to/from the site is local (within Moonee Valley)<br>• 60/40 split in east/west traffic<br><br>***Comments***:<br>• Sweeping assumptions have been made with no supporting evidence<br>• VITM would have been a suitable source to complement this section and to support the assumptions made | 9 |
| | | **Recommendations/Actions**<br>• Adjust traffic distribution in accordance with Department of Transport VITM Model or provide evidence to support the traffic distribution assumptions used. | | |
| 7 | Traffic Impact | This section of the report details the microsimulation modelling that was undertaken detailing the model coding, calibration and validation, option testing and sensitivity tests. | • 0.2 to 0.3% annual traffic growth for next 10 years<br>• 6 road and intersection/access improvements are to be implemented with the development<br>• Moonee Ponds junction will be reconfigured within | 0 |

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| | | ***Comments***:<br>• The methodology is sound and consistent with standard practice and complies with current guidelines<br>• The sensitivity test is not considered to be worst case and should be included in the option testing. | the next 10 years with the southbound approach of Mt. Alexander Road closed and converted to a public transport interchange, with traffic redistributed to Pascoe Vale Road.<br><br>***Comments***:<br>• Assumptions regarding road infrastructure are considered reasonable<br>• The traffic conditions that have been modelled are not considered to be representative of future traffic conditions.<br>• No major event traffic has been modelled.<br>• The sensitivity test is not robust. | |
| | | **Recommendations/Actions**<br>• Include Pattison St and Ormond Rd Intersection in the model<br>• Include detail of signal settings (such as, phasing, cycle and phasing timing, signal control logics, etc.) for the intersections.<br>• It is necessary to check the consistency of input traffic volume data in the model therefore this data must be included in the report.<br>• Include a plan showing the public transport routes and stops.<br>• The traffic volumes used in the modelling must be revised to with regard to future traffic conditions and traffic generated by the development.<br>• The models must be rerun with two separate input profiles and assignments for car and heavy vehicle traffic to more accurately reflect the on-street conditions.<br>• Include calibration results for 7:00am - 8:00am, 4:30pm - 5:00pm and 6:00pm – 6:30pm.<br>• Add a figure in the report showing the fluctuation of observed and modelled travel time over the simulation period.<br>• High pedestrian volume on the event day is to be modelled to replicate the interaction between pedestrian and vehicles and the possible impact on traffic.<br>• Check the feasibility of the proposed signal settings with the VicRoads Signal Engineers.<br>• Include travel time results from the option modelling to show how traffic diverted from routes 2 and 3 as a result of the changes to the road network are affected.<br>• Include justification as to why the queue length on the existing road network would result in increased queuing along all approaches of the Moonee Pond Junction with the exception of the Pascoe Vale Road north approach.<br>• Include an analysis of traffic impacts on public transport operations.<br>• Revise the option testing to include five scenarios; 1 – existing road infrastructure with existing traffic plus development traffic, 2 – as 1 but with the 6 proposed mitigating measures, 3 – revised structure plan road infrastructure with existing traffic conditions, 4 – revised structure plan road infrastructure with existing traffic plus development traffic, 5 – structure plan road infrastructure and the 6 proposed mitigating measures with existing traffic plus development traffic. | | |

<table>
<tr><td></td><td></td><td colspan="2">• The sensitivity analyses should be a ‘worst case’ traffic conditions scenario that could be expected to occur on the network.</td><td></td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Car Parking</td><td>This section of the study aims to establish the number of car parking spaces required by the Moonee Valley Racecourse development.<br><br>Comments:<br>• The methodology is high level and non-specific with no justification or supporting evidence supplied.</td><td>• A rate of 1 space per residential unit has been used<br><br>Comments:<br>• The numbers provided therein are of unknown origin and unknown validity.<br>• The table only covers residential uses.<br>• The surrounding text twice states that a more detailed assessment of car parking rates should be undertaken at development/town planning stage</td><td rowspan="2">11</td></tr>
<tr><td colspan="2">Recommendations/Actions<br>• If the report is intended to guide future individual developments regarding the level of parking provision, a more robust precinct-level assessment of the car parking is required.<br>• The source data for the justification of parking rates used in the report must be included.<br>• If the report is not intended to provide this guidance, specific rates that are not robustly justified should not be shown.<br>• Should a precinct-level parking assessment be undertaken, this must consider any overflow parking effects onto surrounding residential streets and recommend mitigating actions.</td></tr>
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# 4 Existing Conditions – Road Network and Operations

The existing site conditions of the redevelopment of Moonee Valley Racecourse are detailed in **section 3, subsections 3.1 to 3.6 of the Development Master Plan report**.

## 4.1 Description

The site location and local road network have been identified with the key features such as; proximity to local amenities, existing site accesses, road restrictions and layouts highlighted.

The report details the traffic data that has been gathered for the study from sources such as SCATS loop count data, automatic tube counts and manual turning count surveys and provides a summary of AM and PM peak traffic volumes in the study area. The profile of traffic volumes throughout the day have been interpreted from the SCATS data and the peak periods identified as;

- 08:00 to 09:00 in the morning
- 17:00 to 18:00 in the evening

Travel time data has also been collected as part of the study for the following 8 routes through the study area;

- Route 1: Pascoe Vale Road northbound – between Gladstone Street and Wilson Street
- Route 2: Pascoe Vale Road southbound – between Wilson Street and Gladstone Street
- Route 3: Mt. Alexander Road southbound – between Albert Street and Davies Street
- Route 4: Mt. Alexander Road northbound – between Davies Street and Albert Street
- Route 5: Wilson Street eastbound – between Pascoe Vale Road and Melville Road
- Route 6: Wilson Street westbound – between Melville Road and Pascoe Vale Road
- Route 7: Dean Street eastbound – between Pascoe Vale Road and Melville Road
- Route 8: Dean Street westbound – between Melville Road and Pascoe Vale Road

The routes listed above cover the main roads in the study area. The travel time data has been used in the calibration and validation of the microsimulation model.

The results of a traffic survey of a ‘typical’ race day at Moonee Valley Racecourse have been detailed and the following observation made;

- Attendance at the racecourse was 3,500 people
- Gates opened to the public at 10:40 am with the first race taking place at 12:25 pm and the last at 4:45 pm
- Approximately 65% of all traffic was observed using the eastern access point (Dean Street and Wilson Street)
- 25% of arriving traffic accessed the site via Wilson Street
- 35% of traffic exited the site via Wilson Street during the departure period
- 30% of all traffic accessed the track via Wilson Street
- The arrival peak was 11:15 am to12:15 pm with 262 vehicle movements
- The departure peak was 4:15 pm to 5:15 pm with 322 vehicle movements
- The arrival and departure peaks of the racecourse occur outside of the network peak (12:00 pm to 1:00 pm)
- Of the total traffic generated by the racecourse, a peak of 414 veh/h entered and a peak of 479 veh/h exited the centre of the track

In addition some observations regarding the road network performance during average weekday conditions have been included.

### 4.2 Comments

The data and observations that have been made in this section of the report in the most part tie into the rest of the study.

### 4.3 VicRoads Comments

Regarding the Section 3 - Existing Conditions, of the report VicRoads have made the following comments;

***"3.2 Road Network***
***Capacity of road is to be measured at the nearest intersections especially during peak hours. Daily and/or peak hour mid block traffic volume does not provide an idea on the level of traffic congestion during peak hours and capacity of intersections (bottlenecks).***

***Traffic volume profile and data on queue lengths at intersections can provide necessary information on the level of existing traffic congestion.***

***3.5 Travel Time Survey***
***Although Table 3.1 provides information on the average travel times along the routes, it may be worthwhile to provide tables / graphs those chow the fluctuation of travel times over the survey period so that it would be possible to know the changes of travel time over the simulation periods.***

***Travel time data during 8am-9am for the Route 3 & 4 is missing. No reasoning is provided in the report.***

***3.6 Race Day Operation***
***Although it is stated that the arrival (11:15am – 12:15pm) and departure (4:15pm – 5:15pm) peak occur outside the road network peak for Saturday (12pm – 1pm) in the report, it is noticeable that arrival peak overlaps the Saturday peak. Moreover, these peaks vary little day to day."***

## 4.4 Recommended Actions

- Provide traffic flow profile data at each intersection in the study area for both AM and PM peaks.
- Include queue length profiles for both peak periods.
- Incorporate a table/graph of fluctuation in travel times over the peak periods.
- Supply travel time data for routes 3 and 4 for the AM peak.

# 5 Existing Conditions – Sustainable Transport Infrastructure

The existing site conditions of the redevelopment of Moonee Valley Racecourse are detailed in **section 3, subsection 3.7 of the Development Master Plan report**.

## 5.1 Methodology

### 5.1.1 Description

The provision of sustainable transport (public transport, cycling and walking), in the immediate surrounds of Moonee Valley Racecourse has been reviewed in the study.

Access to public transport has been assessed by establishing 400m and 800m walking catchment areas from a central point in the development site. All services serving stops and stations within the catchment are reported.

Walking and cycling paths and the location of signalised crossings in the area have been mapped, together with a summary of key destinations which appear to be expected to generate walking/cycling trips, such as the Moonee Ponds Activity Centre, parks and schools.

### 5.1.2 Commentary

The analysis that has been carried out is of a very high level and qualitative in nature. It provides, in the case of public transport, an indication of the level of accessibility to stops/stations and services but lacks details with regards to accessibility to key destinations, such as the CBD. Thus, the analysis appears only to be used to provide a descriptive commentary.

Similarly for walking and cycling, the analysis is limited to a map highlighting signalised crossings, paths and four locations in the vicinity of the development site.

A calculation of journey times by public transport and cycling from/to the study site should be carried out to allow the analysis to include catchments which could be compared with likely demand origins and destinations. This would lead to a more robust assessment of the potential for the use of public transport and cycling as alternatives to car.

## 5.2 Assumptions

### 5.2.1 Description

The maximum distance for walking appears to have been assumed to be 800m for access to public transport.

For the public transport assessment, it is unclear what location or locations used to represent the development site in the estimation of the 400m and 800m catchment areas. From the drawing that has been included in the report (Figure 3.9), the shape of the catchment area indicates that the distances are measured along the road network and not in a straight line.

### 5.2.2 Commentary

The 800m used as maximum walking distance is generally accepted for access to public transport as it equates to approximately 10 minutes, at an average commuter's walking speed (typically assumed to be 4.8km/h).
The use of network distances is good practice and provides an accurate representation of reality. For greater clarity and to support the assessment the origin locations should be indicated on the map.

## 5.3 Data Used

### 5.3.1 Description

There is no indication in the report of the sources of data used in the assessment of access to public transport.

For Walking and Cycling, the study mentions the Moonee Valley Cycling and Walking Strategy.

### 5.3.2 Commentary

Use of the Moonee Valley Cycling and Walking Strategy seems adequate.
For public transport, VITM networks and demand matrices should be used to support the assessment.

## 5.4 VicRoads Comments

Regarding the Section 3 - Existing Conditions, of the report VicRoads have made the following comments;

***"3.8.1Public Transport***
***The report shows the distances of the available public transport services from the subject site. It is also necessary to know the frequencies of these services during commuter and event peak periods. A table can be included in the report. Among many factors those impact mode share, frequency of public transport has significant impact on mode share.***

***3.8.2 Cycle and Pedestrian Infrastructure***
***A table/graph can be provided showing the current usage of existing Cycle and Pedestrian Infrastructure near to the proposed development site."***

## 5.5 Recommended Actions

- Generate public transport and cycling catchment areas by calculating journey times from/to the study site and compare with likely demand origins and destinations, which could be taken from VITM.

- Include additional details (e.g. frequency, capacity) of the public transport services in the area

- Provide a table or graph showing the current usage of existing Cycle and Pedestrian Infrastructure near to the proposed development site.

- Indicate on the walk catchment map the assumed site boundaries or points used to generate the catchment area for greater clarity
- Include references to data sources

# 6 Existing Conditions – Travel Demands

The existing site conditions of the redevelopment of Moonee Valley Racecourse are detailed in **section 3, subsection 3.8 of the Development Master Plan report**.

## 6.1 Methodology

### 6.1.1 Description

The Travel Demands section of the report summarises population and employment growth and mode share, as modelled in VITM for 2009, for an area of 4km radius around Moonee Ponds Activity Centre and contrasts it with similar information for 4km areas around Northland Shopping Centre and Prahran Activity Centre. This contrasting appears to have been done with the objective of understanding how travel could be expected to be characterised in the study area, however this is not stated in the report.

A target mode share is mentioned in the analysis and appears to have been used to inform the feasibility of mode share in the study site reaching levels similar to those in Prahran Activity Centre.

In addition, mode share from VISTA 07 is also reported, but at LGA level and ranked in comparison with the rest of Melbourne Metropolitan LGAs.

### 6.1.2 Commentary

The review of population and employment in the area is a useful first step, given the direct relationship between population/employment and the need for travel. Mode share, which was also reviewed, is also a valid and important set of information as it helps ‘set the scene’ for travel in the area.

However, having access to VITM and VISTA07 data, the final set of data which should have been analysed to help build a picture of demand from travel in the study area, is the level of demand and the location of this demand. In other words, how many people are travelling and where from/to. Both VITM and VISTA07 include information, albeit at different levels of detail, and should be used for this purpose.

Without the final set of data, the analysis of current travel demand is, fundamentally, incomplete.

## 6.2 Assumptions

### 6.2.1 Description

The analysis was based on the definition of a 4km radius around the study site and two other locations in Melbourne used for comparison. This suggests that 4km is assumed to be the size of the area of influence.

The two locations chosen to compare with the study site were Northland Shopping Centre and Prahran Activity Centre. It is understood that these were chosen as they represented an area with high car dependency and an area with less car dependency and greater public transport usage, respectively.

A target for mode share has been defined as somewhere between the current Moonee Ponds mode share and that of Prahran Activity Centre.

### 6.2.2 Commentary

There is no justification for the size of the area of influence around the study and chosen comparison sites. It could be argued that for this type of study a smaller area should have been used as conditions such as the offer of public transport and population density may change substantially within a 4km radius.

It is valid to use two areas with different travel and demographic characteristics for the exercise which was carried out.

It is unclear, however, how the target mode share has been set as there is no justification for it presented in the report.

The Travel Demand section of the report concludes that "***It is expected that with the appropriate support to limit private vehicle travel, the site is likely to generate relatively low levels of private vehicle activity, and higher public transport and walk and cycle trips.***" Based on the proximity of the development site to public transport and active travel infrastructure, this is a reasonable conclusion.

## 6.3 Data Used

### 6.3.1 Description

The analysis was based principally on two data sources, the Victorian Integrated Transport Model (VITM) and the Victorian Survey of Travel and Activity 2007 (VISTA07).

### 6.3.2 Commentary

The data used comes from the two most relevant and up to date data sources which can be used for transport planning in Victoria.

### 6.3.3 VicRoads Comments

Regarding the Section 3 - Existing Conditions, of the report VicRoads have made the following comments;

***"3.9.1 Population and Employment***
***A table / graph can be included showing the existing distribution of travel distances for trips generated to and from the Moonee Ponds Activity Centre catchment area and comparing it with other two catchment areas. This table/graph will help to justify the following comment stated in the report:***

***"It shows that there is a real opportunity for travel to be contained within a relatively small inner suburban area of the network, without…… by walking and cycling."***

***The three catchment areas are compared in view of population, employment, mode share and uses. It is worthwhile to compare the three areas in view of transport infrastructure supply too. Such as, per person (for example) availability of public transport / pedestrian and bicycle facilities / road infrastructure, frequency of public transport, etc. This comparison will help to justify the statement in page 23:***

***"As indicated in Figure 3.12, it is ex……..over future years."***

***For example, following table shows the number of jobs per person in the three catchment areas. This table is prepared using the Table 3.3 and 3.4 in the report.***

***Table: Number of job per person***

| *Catchment Area* | *2009* | *2031* | *Difference* | *09-31* |
|---|---|---|---|---|
| *Moonee Ponds* | *0.47* | *0.49* | *0.02* | *4.46%* |
| *Northland SC* | *0.45* | *0.44* | *-0.01* | *-1.19%* |
| *Prahran Activity Centre* | *1.14* | *1.16* | *0.02* | *1.67%* |

***It is noticeable from the above table that the number of jobs per person in Prahran Catchment Area is 142% and 137% higher than Moonee Ponds catchment area in 2009 and 2031 respectively. Although the number of job creation is higher in Moonee Ponds area than Prahran area, number per person job in Prahran area is 137% higher than Moonee Ponds area in 2031.***

***Although there are other factors such as supply of transport infrastructure, it can be said in view of the above table that similar number of jobs per person may be required to have similar travel behaviour in Moonee Ponds and Prahran Activity Centre catchment areas.***

***It is noted that the comparison of the attributes is to be made in view per person***

***and/or per square km area to justify the statements stated in clause 3.9.4, such as:***

***- Population density (persons/sq km)***
***- Number of jobs per person***
***- Supply of public transport per person (km/person) or per square km.***
***- Supply of road infrastructure per person (km/person) or per square km.***
***- Supply of shopping area per person or square km***
***- Area of mixed use development per square km.***
***- etc."***

## 6.4 Recommended Actions

- Present information showing the level and distribution of demand to/from the study area.

- Include a table/graph showing the existing distribution of travel distances for trips generated to and from the Moonee Ponds Activity Centre catchment area and comparing it with other the two catchment areas specified in the report.

# 7 Integrated Transport Planning

The integrated transport planning strategy for the redevelopment of Moonee Valley Racecourse is detailed in **section 5 of the Development Master Plan report**.

## 7.1 Methodology

### 7.1.1 Description

This section of the study seeks to estimate the future public transport and active transport infrastructure requirements of travel to and from the new development site. In order to do so the expected level of public transport patronage is calculated and a set of key walking and cycling movements that should be catered for are listed.

To estimate the PT patronage increase resulting from the development, the number of dwellings was used as a starting point from which a number of daily public transport trips were calculated. The number of trips per household is based on VISTA07 figures for the area, adjusted (multiplied by 2) to take into account the level of accessibility to public transport of the subject site.

The total trips are subsequently 'assigned' to public transport sub-modes (train, bus and tram) based on ABS 2006 Census figures for mode of travel to work for the Moonee Valley LGA.

To calculate the tram and train requirements, daily demand has been converted to hourly demand and subsequently distributed evenly to all services in the hour. These figures are then added to current patronage levels and compared with vehicle capacity. The analysis has not been replicated for buses.

### 7.1.2 Commentary

As a first cut 'back-of-the-envelope' calculation, this approach would be appropriate. However, given the profile of the study, and the amount of data available this is a very weak assessment. In addition to the simplicity of the analysis, there are a number of simplifications which could invalidate the conclusions that were presented.

Trip generation should, ideally, be established first without considering the mode of travel and subsequently calculate the proportion of those trips which are likely to travel by PT. This should be done utilising trip rates calculated from VISTA and subsequently applying a simplified mode choice model which should be roughly based on that included in VITM.

Considering that there may have been budget and time limitations which affected the scope of this work, a more detailed analysis could have been undertaken to

establish the 'PT trip rate', based on VISTA and the levels of accessibility to public transport within the Moonee Valley LGA. Of concern is that no account has been made in the analysis on likely increased demand from future developments in Moonee Valley, Broadmeadows and Craigeburn not to mention the impacts on public transport availability in the City of Moreland.

The subsequent 'assignment' of trips to particular sub-modes is based on Census values for all of Moonee Valley LGA. This is inconsistent with the previous step, where an adjustment was made to take into account the proximity to public transport. A simple analysis of service levels and boardings/alightings of the different modes within the walking catchment of the development site may have provided some additional supporting evidence and should be included.

There is a flaw in the approach in that the development demand has been added to ***current*** demand and on ***current*** service levels/capacity. Clearly, demand is growing and supply is planned to be changed over the next two decades. VITM contains future year service assumptions, and produces future year demand forecasts which should be used in the assessment.

The public transport patronage assessment concludes that the existing tram can accommodate the expected demand and that one additional train service per hour will be required, and subsequently states that "***Naturally further additional services may be required in any event to accommodate the continued population growth and increase in public transport utilisation…***".

The estimation of demand for walking and cycling is difficult and thus it is not surprising that it was not attempted as part of this study. However, figures from VITM should be used as an indication of what demand would be likely to be.

The review of pedestrian and cyclist facilities appears to be comprehensive.

As it stands, however, the 'Integrated Transport Planning' section adds little value to the study and should be re-assed with regard to the comments above.

## 7.2 Assumptions

### 7.2.1 Description

The following are key assumptions used in the estimation of public transport demand:

- The public transport trip rate for the development area will be twice that of the Moonee Valley LGA due to its proximity to public transport
- All public transport trips occur in the morning and evening peaks
- All public transport trips have their destination in the CBD

Based on the analysis there are also the following ***implied*** assumptions (though it is worth noting these are not stated in the report):

- Future rolling stock capacity will remain unchanged
- Future service frequencies will remain unchanged
- All PT trips will be ***produced*** by the site, i.e. no PT trips will be ***attracted*** to it

### 7.2.2 Commentary

The assumption that public transport trip rates are double because of the proximity to public transport has no supporting evidence. Without any backing analysis it is not possible to say if it is an over or under estimate or if it is a reasonable assumption and therefore should be included in the report.

The assumptions regarding the time of day of PT trips could have been based on an analysis of VISTA07 and/or Census06 data of an area with high PT mode share. If, as is planned for this development, public transport is the principal mode then it is likely that the trips will be spread out throughout the day as they would include a significant amount of trips for purposes other than commuting. This should be incorporated into the PT trip generation calculations.

With regards to trip origin/destination, an examination of VITM future year matrices in combination with a review of current destinations based on sources such as VITM, VISTA or Census would provide a better indication of the geographic distribution of trips. It is unlikely that ***all*** commuting trips will have the CBD as their destination therefore further analysis of the PT trip origin/destination is required.

The assessment also assumes implicitly that rolling-stock and service levels will remain unchanged in the future. Though this is not stated, the fact that current services and their capacity are used, mean that, effectively, this assumption has been made. VITM would have been a good source of information with regards to service provision and a review of the most modern rolling stock used on the network could provide an indication as to what capacity to expect of the vehicles. In addition it must be noted that any increase in traffic congestion on the road network, caused by the development or otherwise, will have a significant effect on the bus and tram services as these would be caught in the congestion causing reducing travel times, increasing delays and affecting the reliability and performance of the services.

## 7.3 Data Used

### 7.3.1 Description

The analysis uses VISTA 07 and ABS Census 06.

### 7.3.2 Commentary

The data sources used are sound, but the information extracted appears to have been at a very high level. More detailed information should have been extracted and would have supported more rigorous analyses.

In addition, VITM should have been a key data source which was not utilised. Although the model is strategic in nature, it provides the most informed and scientific estimates of travel demand for the future in Melbourne.

## 7.4 VicRoads Comments

Regarding the Section 5 – Integrated Transport Planning, of the report VicRoads have made the following comments;

***"5.2.2 Public Transport Patronage***

***In view of Figure 5.1, the share of tram and other modes has increased and the share of private car has decreased from 1996 to 2006 in view of percentages. But it does not necessarily mean that number of cars in the road has decreased. Car volume may increase because of population increase and increase of car ownership. It is necessary to check the increase/decrease of vehicular volume on road over the time period.***

***We think the estimate of 2 public transport usages per dwelling may not be justified yet. Because:***
***- The comparison between Moonee Ponds catchment area and Prahran Catchment area is not correct;***
***- Even if we consider that the Moonee Ponds area will be similar to the Prahran area in view of attributes stated above, the question is what are the current mode shares in the Prahran area?***
***- It is better to provide mode shares of similar"***

## 7.5 Recommended Actions

- Utilise trip rates calculated from VISTA to estimate generated trips and apply a mode choice model, which could be, for instance, a simplified version of the MITM or VITM mode choice models, to forecast future public transport trips

- Include an analysis of service levels and boardings/alightings of the different modes within the walking catchment of the development site to provide some additional supporting evidence to the estimation of sub-mode share

- Use VITM future year service assumptions and patronage forecasts in the assessment of public transport requirements, as well as information on likely future PT rolling stock and service levels.

- Present Figures from VITM for walking and cycling demand generated in the zone of the development site.

- Include supporting evidence or a clear justification for the assumption that public transport trip rates are double because of the proximity to public transport

- Provide support, and update, if necessary, the assumptions regarding the time of day of PT trips – this could be based on an analysis of VISTA07 and/or Census06 data of an area with high PT mode share

- Examine VITM future year matrices in combination with a review of current destinations based on sources such as VITM, VISTA or Census to provide a better indication of the geographic distribution of trips and include in the PT trip generation calculations.

# 8 Road Network Access and Movement Strategy

The road network access and movement strategy for the redevelopment of Moonee Valley Racecourse is detailed in **section 6 of the Development Master Plan report**.

## 8.1 Traffic Generation

### 8.1.1 Description

Traffic generation rates have been derived based on the following land use types:

**Residential apartment** rates have been derived empirically from one nearby apartment block (341 Ascot Vale Road) along with four comparison sites, two each in Southbank and South Yarra. Trip generation rates of 0.3 movements per peak hour and 3 movements per day were assumed.

**Commercial office** rates have been assumed to be 0.5 vehicle movements per car space in each of the AM and PM peak hours. A parking provision rate of 2 spaces per 100sqm has also been assumed. By combining the above yields a rate of 1 vehicle movement per 100sqm during the peak period. A daily rate of 5 vehicle movements per 100sqm is five times that of the peak hour rate, which is consistent with RTA 2002.

**Retail** trip generation rates encompassing medical, education, retail, entertainment and community/civic land uses have been assumed to be 2.8 movements per 100sqm, which is half the RTA 2002 Friday specialty shops peak hour rate. The 50% discount was justified by claiming that as the retail component mainly services the development and nearby residential areas, a higher proportion of walking and cycling trips will result, thereby reducing the traffic generation rate. Daily traffic generation was taken to be ten times the peak hour rate, which is generally in accordance with RTA 2002.

**Serviced apartment** rates have been assumed to be 0.3 peak hour trips per room, based on surveys undertaken by GTA Consultants. Daily vehicle trip rate was assumed to be 3 trips per unit, which is the same as RTA 2002.

The report then summarises total traffic generation at full development to be 1,358 trips in the peak hour, and 12,780 trips per day.

### 8.1.2 Commentary

The traffic generation component is generally satisfactory, mostly utilising the well-accepted RTA 2002 guide as a basis for trip generation rates. Table 2 below shows the trip generation rates used in the report along with the RTA 2002 guide rates.

Table 2 – Peak Hour Trip Rate Comparison

| Land Use | RTA 2002 Peak Hour Trip Rates | GTA Development Master Plan report Trip Rates |
|---|---|---|
| High Density Residential Apartments | 0.29 trips per dwelling | 0.3 trips per dwelling |
| Smaller Units & Flats (up to two bedrooms) | 0.4 - 0.5 per dwelling | |
| Larger Units & Townhouses (three or more bedrooms) | 0.5 – 0.65 per dwelling | |
| Dwelling Houses | 0.85 per dwelling | |
| Office | 2 per 100 sqm GFA | 1 per 100 sqm GFA |
| Retail | Requires detail investigation | 2.8 per 100 sqm GFA |
| Medical centres | 8.8 per 100 sqm (but is highly variable) | Rate not specified |
| Hotel | No rate available | 0.3 per room |

The above rates have been generally accepted by the traffic engineering community and are in widespread use. Note that variances from these rates are acceptable with sufficient justification. Therefore any traffic generation figures presented that are different from the above should be considered on their individual merits and not immediately dismissed. In some cases, there is a wide variation in the available rates as reported in the findings of RTA 2002, therefore interpretation of the rates presented above must be taken with care.

As the comparison sites are within well established activity centres with better public transport connectivity than that available across the development site, the validity of the reduced rates will depend on where the apartment blocks are situated. Dwellings located fronting McPherson Street would fare best, being within 800 metres of Moonee Ponds railway station

However, the following concerns are raised:

- **Residential apartment** rates will only be applicable for high-density apartment blocks. Townhouses or lower density residential lots, if any are proposed as part of the mix, would generate significantly more traffic than the rates presented.

- The **comparison sites** used to determine residential apartment rates are different from the subject site in that they have significantly better public transport connections and are in closer proximity to shops. Eureka/Freshwater Place, being in the heart of Southbank, are surrounded by bus and tram routes, not to mention a short walk from Flinders Street station and the Melbourne CBD. The River St and Chapel St sites are 400m from Chapel Street shops, 500-600m from South Yarra station and 4km from the CBD via the Yarra River bike trails. The Mondo

apartment block is adjacent to the Puckle Street shops and 500m from Moonee Ponds Station. In contrast, the bulk of the subject site is more than 800m from Moonee Ponds Station a more limited choice of tram/bus routes. Therefore, the rates presented are satisfactory for residential buildings located close to the site's western frontage, but any residential buildings proposed fronting Wilson Street are likely to experience higher traffic generation rates.

- **Commercial office** rates are based on an assumption of 0.5 vehicle movements per car parking space. The report states that guidance on the traffic generating characteristics was sought from surveys and from the Inner Municipalities Parking Study 1991. However, the report provides no specific data for comparison, so it is not possible to judge the appropriateness of the assumed rate.

- The resulting assumed **commercial office** rates are half of those presented in RTA 2002. They are based on an assumption of parking provision at the rate of 2 spaces per 100sqm, whereas the current DPCD parking provisions review draft (Aug 2011) outlines an activity centre parking generation rate of 3 spaces per 100sqm (itself a reduction from 3.5 spaces per 100sqm currently in the VPP). Given the limited public transport connections to the majority of the site, it is considered that a greater traffic generation rate should be adopted.

- The 50% discount provided to **retail** traffic generation rates is simplistic and difficult to accept without further justification. If the development site is intended to be an extension of the Moonee Ponds activity centre, the justification of "local shops attracting local residents" would not apply to the extent that it is presently assumed. However, it should be noted that RTA 2002 does allow for a reduction in ***residential*** trips involving local shopping, schools and local social visits. As it would not be possible to determine the future composition (and therefore the future regional significance) of the retail land uses, it is recommended that the full retail rate be applied (5.6 trips/100sqm peak hour, 56 trips/100sqm per day) and a commensurate reduction of up to 25% of residential trips (as allowed for by RTA 2002) be applied instead. This may produce the same end result, but will provide a more rigorous traffic generation model, particularly should the composition of the development change.

- The assumed **serviced apartment** peak hour traffic generation rate is reduced by 25% from the RTA 2002 rate of 0.4 trips per room in the peak hour. The report claims that this is consistent with surveys undertaken by GTA Consultants, but no comparison data was given, therefore the survey data must be included in a table in the report as evidence.

### 8.2 Proposed Road Layout and Cross Sections

These sections do not raise any concerns.

### 8.3 Event traffic management

#### 8.3.1 Description

Traffic during race days and large event days are proposed to use the infield as a car park, consistent with current practice. Access to the infield will change from the existing arrangement as the Wilson Street access will be moved to the west (opposite Juliet Street) and signalised.

#### 8.3.2 Commentary

The report makes the assumption that the traffic impact on the surrounding road network during major events will be commensurate with existing conditions. This is the only section of the report that makes any reference to major events at the racecourse and no data or analysis has been supplied to justify this assumption and therefore must be included in the report.

### 8.4 Vehicle access to infield

This section does not raise any concerns.

### 8.5 VicRoads Comments

Regarding the Section 6 - Road Network Access and Movement Strategy of the report VicRoads have made the following comments;

***6.3 Traffic Generation***

***Retail***
***If any survey data on mode share is available for the retail precent in the northwest corner of Moonee Pond Junction, it can be used to justify the discount rate of 50% to the 5.6 movements per 100sqm. At this stage no empirical evidence is given in the report to justify such discount.***

***As per following Table 3.1 Peak hour traffic generation rate, Guide to Traffic Generation Developments, RTA NSW 5.6 vehicle trips per 100sqm GLFA is applied to the Total Floor Area: 20,000 – 30,000 square metre. It is noted that the area of mixed use in the proposed site is 8,500sqm (refer to Table 4.1 on page 26 in the report). In that case, RTA NSW trip generation rate for retail is 12.5 trips per 100sqm on Friday peak.***

**Table 3.1**
**Peak hour traffic generation rate**

| Range in Total Floor Area. (GLFA - $m^2$). | Peak Hour Generation Rate. (vehicles per $100m^2$ GLFA) | | |
|---|---|---|---|
| | Thursday. (V(P)/A) | Friday. (V(P)/A) | Saturday PVT(A) |
| 0 - 10,000 | 12.3 | 12.5 | 16.3 |
| 10,000 - 20,000 | 7.6 | 6.2 | 7.5 |
| 20,000 - 30,000 | 5.9 | 5.6 | 7.5 |
| 30,000 - 40,000 | 4.6 | 3.7 | 6.1 |

## 8.6 Recommended Actions

- Justify the trip rates that have been used in the calculation of the development traffic and provide the source data.
- Justify the assumptions regarding major event traffic conditions.

# 9 Development Traffic Distribution

The development traffic distribution of the Moonee Valley Racecourse site is detailed in **section 7.4 of the Development Master Plan report**. Due to the importance of this section with regard to the findings of the study it has been treated as a separate section.

## 9.1 Methodology

### 9.1.1 Description

This section of the study aims to establish the distribution of traffic generated by the Moonee Valley Racecourse development. To do so information from ABS Census 2006 and VISTA 07 datasets has been extracted and summarised.

Two maps presented indicate that, of trips originating within the Moonee Valley LGA, approximately 50% have an internal destination; and of trips with destination within Moonee Valley LGA, approximately 46% have an internal origin.

Following this, it is stated that a trip matrix has been developed and a map which presents the distribution of the trips is shown. The distribution shows that 60% of trips are to/from the East of the site, and 40% to the West, but the zones used and the methodology used to estimate these proportions are not described.

### 9.1.2 Commentary

The approach followed provides an understanding of the ***current*** distribution of traffic, and for this purpose it is sound.

However, the conclusion of the analysis of current traffic distribution is that "***… it is expected that the majority of vehicle trips generated by the proposed development will originate and end within the City of Moonee Valley.".*** It is unclear how this conclusion was reached, given that the data shows that 50% of destinations and 54% of origins of trips are from and to Monee Valley, respectively, are located outside the LGA.

The traffic distribution that has been used in the traffic model does not appear to have any source. A review of the VITM forecast demand distribution of trips with origin/destination in the zones in the area where the development will be located would have provided a reasonable distribution to use as an input to the traffic model.

Without any supporting evidence, the traffic distribution used in the modelling cannot be considered more than a guess. This is a fundamental part of the modelling process but is unfortunately one which appears to have been simplified to the extreme.

## 9.2 Data Used

### 9.2.1 Description

This analysis is based on data from ABS Census 2006 and VISTA 07

### 9.2.2 Commentary

Census and VISTA datasets are adequate for current year information, but VITM should have been used to provide a more robust assessment of demand in future years.

## 9.3 VicRoads Comments

Regarding the Section 7.4 – Development Traffic Distribution, of the report VicRoads have made the following comments;

***Development of Traffic Distribution***
***It is not clear how the values of traffic distributions shown in the Figure 7.9 are estimated. Is the dynamic assignment undertaken using MITM model with the inclusion of proposed development? If yes, is the MITM model calibrated in the surrounding area of the proposed site? If yes, what is the extent of the additional calibration area?***

## 9.4 Recommended Actions

- Include supporting evidence regarding the traffic distribution assumptions used in the analysis

## 9.5 Comparison to Refined VITM for Moonee Valley

CPG have been commissioned by the City of Moonee Valley to refine the Department of Transports VITM model to cover the city's road network in more detail. This model is intended to produce forecasts of future traffic demand in the city to support the planning of the network.

As part of this review CPG has compared the traffic demand data used in the Moonee Valley Racecourse Development Master Plan with the refined VITM model to establish the validity of some of the assumptions used.

The comparison carried out is limited to a review of the growth in traffic in the area, to validate the assumptions made in the traffic study and the traffic distribution (specifically Figure 7.9 of the traffic report). The reason for this is that the levels of detail of the models (VITM is strategic in nature vs. a local micro-simulation model) does not allow for direct comparisons of link flows or the like.

Growth Assumptions

From the results of the VITM model it can be seen that the growth in traffic volumes between 2011 and 2021 is -1.8% which is not significant and is within the range of daily fluctuation. This is consistent with the statement made in the Development Master Plan as justification for not increasing base traffic volumes for the 2021 scenario in the VISSIM modelling.

Traffic Distribution

The traffic distribution used in the Development Master Plan, shown in Figure 1 and is discussed in the section above, is simplistic with no justification offered for the proportions used.

Figure 1 - Development Master Plan Development Traffic Distribution


The traffic distribution presented in the Development Master Plan is relatively uniform (15% each to the North East, East, South East, South, West and North West and 10% to the South West) and does not appear to account for the different travel patterns for arriving and departing traffic.

Figure 2 - VITIM Development Traffic Distribution for the AM Peak Arrivals (blue) and Departures (pink)

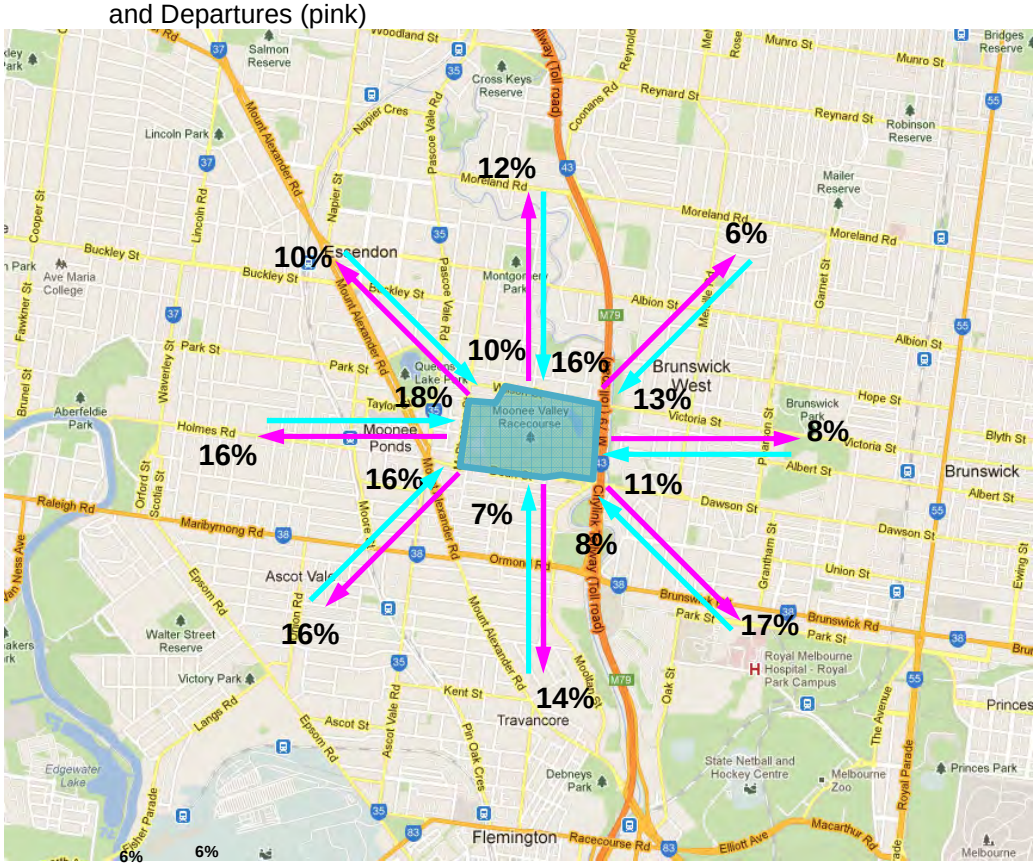



Figure 2 shows that the traffic distribution predicted by VITM is NOT uniform in all directions and rather has distinctive patterns.

Outbound flows are directed mainly towards the South and West (65% of all trips), with fewer trips to the North and North-West, and fewer still to the East and North East. This is consistent with the location of major employment sites in Melbourne.

Inbound flows show an inverse pattern, which is also justified as the trips appear to originate in primarily residential areas. It should be noted that, although there are large residential areas to the South and Southeast, these are further away from the study site than those of the North and West.

Following these findings, traffic distribution assumptions in the micro-simulation are recommended to be adjusted.

Indeed, the VITM model is reviewed in more detail it indicates that the distribution of development traffic on the local road network can be very complex due to the available routes. The distribution of the racecourse development traffic from the VITM model is shown in Figures 3, 4 and 5 for the AM peak. This level of detail cannot be derived form the analysis undertaken in the Development Master Plan.

Figure 3 - VITIM Development Traffic Distribution AM Peak Arrivals (blue) and Departures (pink)

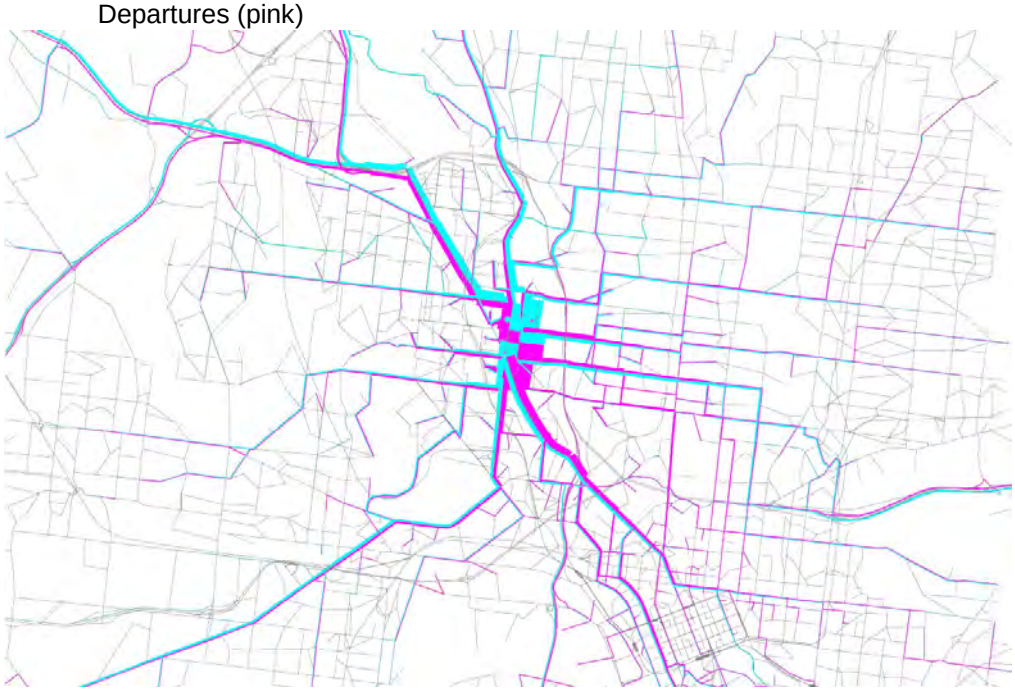


Figure 4 - VITIM Development Traffic Distribution AM Peak Arrivals

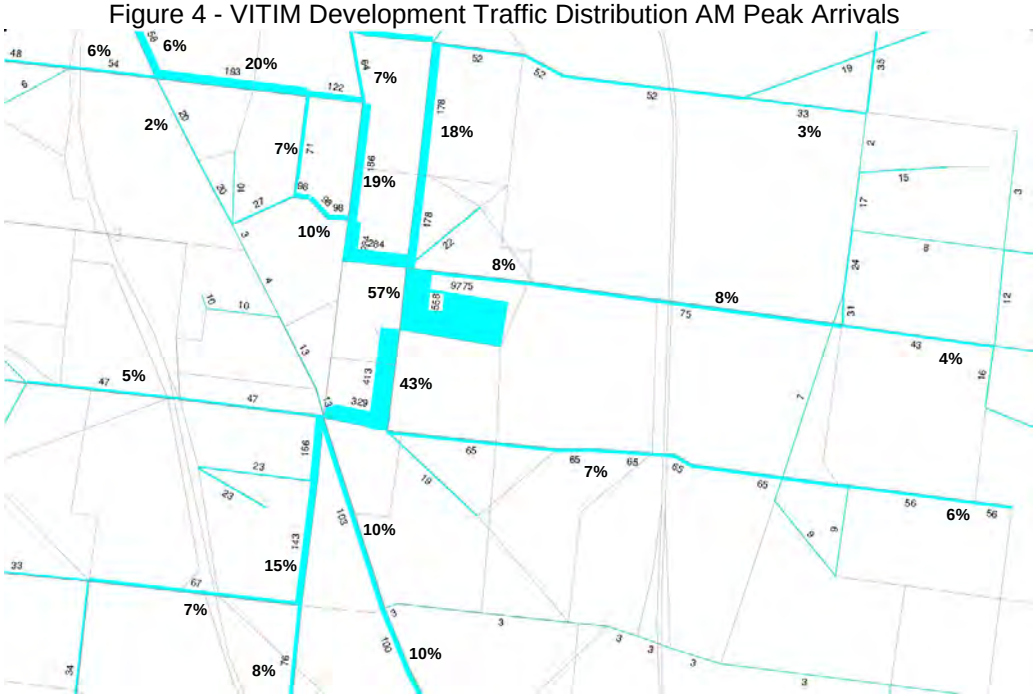
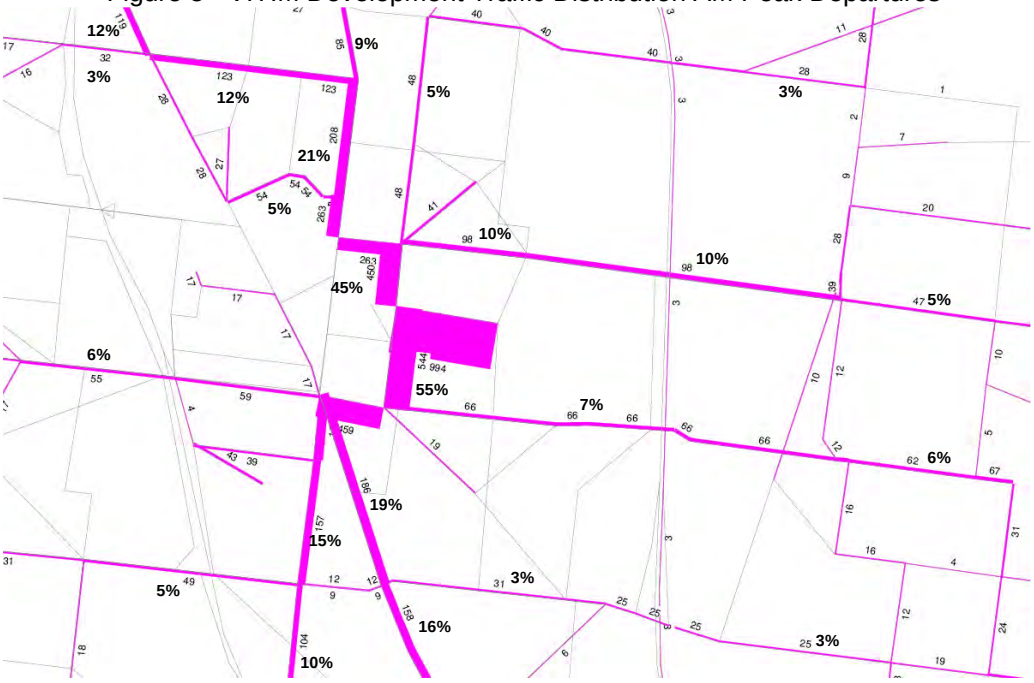


Figure 5 - VITIM Development Traffic Distribution AM Peak Departures



# 10 Traffic Impact

The traffic impact of the redevelopment of Moonee Valley Racecourse is detailed in section **7 of the Development Master Plan report**. This section of the report details the microsimulation modelling that was undertaken.

## 10.1 Model Build Methodology

### 10.1.1 Methodology

***Description***

The model has been built using the VISSIM microsimulation software package and is based on aerial photographs. Links and connectors within the model have been coded to match the existing road geometry.

Traffic restrictions such as speed limits, clearways, etc. have been coded into the model. Traffic demand has been modelled in 15 minute intervals for the 06:30 – 09:30 AM Peak and 16:00 – 19:00 PM peaks with 30 minute 'warm-up' and 'cool-down' periods at the start and end of each models to allow accurate traffic loading on the network. Five 'seed' runs have been made for each model in order to obtain average run results.

***Commentary***

The methodology used in the coding of the microsimulation model is consistent with standard practice and complies with current guidelines.

### 10.1.2 Assumptions and Data

***Description***

The following assumptions and data have been used in the modelling of the study area.

- Traffic Restrictions – speed limits, clearways and vehicle restriction by time and vehicle class have been coded into the model (details not supplied in the report).

- Signalised intersections – Vehicle actuated (VisVAP) signal controllers have been used on the intersections with tram priority elsewhere fixed time signals have been used with phase timings based on SCATS data (details not supplied in the report).

- Traffic Assignment – Static assignment (i.e. volume of traffic is fixed over the simulation period) has been used for existing traffic with dynamic assignment (i.e. traffic volume varies over the simulation period) used for the development traffic.

- Public Transport – Starting and dwell times have been based on timetables and site observations (details not supplied in the report).

- Traffic Composition – Vehicle Traffic has been split between cars (98%) and heavy vehicles (2%) network wide. Trams and buses have been coded separately on fixed routes according to timetables. Pedestrians have also been coded but no details have been supplied in report.

***Commentary***

The majority of the assumptions made in the model coding are reasonable given the size and purpose of the model. However, not all of the data used in the modelling has been provided for examination and therefore must be included in the report.

It is considered that for an added level of accuracy that two separate input profiles and assignments should have been used for the car and heavy vehicles as these may vary on different parts of the network.

## 10.2 Calibration and Validation

### 10.2.1 Methodology

***Description***

The report states that the calibration and validation of the microsimulation model has been carried out in accordance with the Austroads Research Report 2006, ***The Use and Application of Microsimulation Traffic Model***, and the targets are set out in Table 7.1 of the report.

***Commentary***

The methodology used in the calibration and validation of the microsimulation model is consistent with standard practice and complies with current guidelines.

### 10.2.2 Data

Table 7.2 to 7.5 detail the calibration and validation results. It can be seen form these tables that the model has achieved a reasonable level of calibration for the link flow results and that the travel time results have a satisfactory level of validation with all routes within 1 minute of the surveyed times.

It is therefore considered that the base model is an adequate representation of the road network.

## 10.3 Option Testing Results

### 10.3.1 Methodology

***Description***

The base and 3 options have been tested for 2011 traffic conditions. The options tested are as follows;

- Option 1 – Existing network traffic plus development traffic with 6 local road improvements.
- Option 2 – Existing Traffic with Moonee Ponds junction improvements.
- Option 3 – Combination of options 1 and 2, existing traffic plus development traffic with Moonee Ponds junction and 6 local road improvements.

The above options were then run with 5 'seeds' to obtain average run results, with the following model outputs recorded;

- General Statistics for the overall network such as average speed, average delay time per vehicle and average stopped delay per vehicle for cars, buses and trams.
- Travel Times on 8 specified routes through the network
- Queue Length data at the Moonee Ponds junction.
- Traffic Volumes on the key road links in the vicinity of the development site.

Using the modelling results, a comparison of the operation of each network option has been made.

***Commentary***

The methodology used in the option testing is considered reasonable and in line with standard practice. However the options that have been tested do not cover all possible scenarios and the analysis fails to isolate the impact of the various infrastructure and development interventions for comparison. Therefore it is considered that the following 5 options should be tested against the calibrated existing conditions (base) model;

- Option 1 – new scenario – base model + development traffic (without the proposed 5 improvements) – This would isolate the impact of the development and allow identification of the best mitigating measures.

- Option 2 – currently tested as option 1 – (option 1 above + the proposed 6 mitigating measures) – This would indicate how the proposed mitigating measures improve the capacity of the road network etc.

- Option 3 – currently tested as option 2 – structure plan road infrastructure + existing traffic – which would Indicate the impact of the proposed structure plan improvements.

- Option 4 – new scenario – structure plan road infrastructure + development traffic – which would Indicate the effect of the development traffic + structure plan improvements

- Option 5 – currently tested as option 3 – Structure plan road infrastructure + development traffic + proposed mitigating 6 infrastructure improvements – which would Indicate the total effect of the proposed development and 6 mitigating measures with the structure plan proposals.

### 10.3.2 Assumptions

***Description***

Within the option testing assumptions have been made regarding improvements to local roads, changes to Moonee Ponds junction and the traffic generated by the development. The development traffic generation and distribution assumptions have been assessed in section 9 of this report.

In addition it has been assumed, with data taken from VITM, that the annual growth in traffic volumes in the network is between 0.2 and 0.3%. Therefore traffic volumes in 2021 will not be significantly greater than current levels and as such has not been modelled.

With the development of the site the following intersections modifications and road improvements will be made;

- Wilson Street / Thomas Street intersection – upgraded to traffic signals.
- Dean Street / McPherson Street intersection – upgraded to traffic signals.
- Wilson Street / Juliet Street / proposed site access – upgraded to traffic signals.
- Pascoe Vale Road between Mt. Alexandra Road and Wilson Street – introduction of clearways during peak hours.
- McPherson Street / Alexandra Street / Proposed site access – Roundabout constructed.
- McPherson Street / Coates Street / Proposed site access – Roundabout constructed.

The details of intersections to be converted to traffic signals are shown in figures 7.3 to 7.5 of the report, however it must be noted that no details of the signal phasing of these intersections or the 2 roundabouts to be constructed have been included in the report. It has been assumed that these road improvements will only be implemented with the development of the Moonee Valley Racecourse site and have been tested in options 1 and 3.

The proposed changes to the Moonee Ponds junction have been modelled as part of the study. However as there are no concept plans of the redevelopment

available at the time of the study the following changes to the intersection have been included in the model;

- Dual right turn lanes from Mt. Alexander Road into Taylor Street
- Dual left turn lanes from Mt. Alexander Road into Kellaway Avenue
- Duplication of Kellaway Avenue
- Redirection of the tram lines for routes 59 and 82 extension to Mt. Alexander Road north
- Closure and removal of the southbound approach of Mt. Alexander Road and implementation of new public transport interchange.
- Tram priority at the traffic signals
- Some realignment works
- Closure of the southbound traffic lanes from Dean Street to Gladstone Street on Ascot Vale Road
- Pascoe Vale Road / Coates Street intersection changed to left-in / left-out only
- One right turn lane and one shared left/right turn lane from Kellaway Avenue onto Pascoe Vale Road

Due to the reconfiguration of the Moonee Ponds junction, southbound traffic on Mt. Alexander Road has been redirected onto Pascoe vale Road via Kellaway Avenue. No other traffic redistribution, as a result of the changes to Moonee Ponds junction, has been considered in the option testing although this has been investigated in the sensitivity test detailed in section 10.4 of this report.

It has been assumed that the changes to Moonee Ponds junction will be implemented within the next 10 years and have been tested in options 2 and 3.

***Commentary***

As discussed in section 9 of this report, it is considered that the development traffic distribution used in the models is not detailed enough for this study. With regard to the reconfiguration of Moonee Ponds junction it is considered that the assumptions that have been made regarding the road layout are reasonable considering that there are currently no plans available for this scheme.

It must be noted however that the assumptions regarding the redistribution of traffic due to the reconfiguration of Moonee Ponds junction are not considered to be reflective of future conditions as only a simple diversion of southbound traffic from Mt. Alexander Road to Pascoe Vale Road has been made with no traffic taking alternative routes. With such a major change to the layout and operation of Moonee Ponds Junction it would be reasonable to assume that through traffic would divert across the whole road network. Therefore the future traffic flow volumes used in the modelling should be revised.

In addition there is little analysis of how the public transport services are affected by the increase in traffic and congestion caused by the development. As trams and buses in the area are road based any increase in congestion will affect the

level of service that can be provided and thus have an impact on the attractiveness of these transport modes to people using the development.

The analysis of the effects on public transport is considered important as the study indicates that the development would have high patronage and that public transport would help to offset the vehicle traffic generated by the development. Therefore a detailed analysis of the public transport results must be included.

### 10.3.3 Results Data

The base and option models were then run with 5 'seeds' to obtain average run results for general network statistics, travel times, queue lengths and traffic volumes which were used in the assessment of the network.

The general network statistic results are detailed in tables 7.8 and 7.9 of the report for the AM and PM peaks respectively. These results show that the proposed development would increase congestion in the study area, options 1 and 3, when compared to the base (existing conditions) and the Moonee Ponds junction improvements (option 2) respectively.

The travel time results are detailed in tables 7.10 and 7.11 of the report for the AM and PM peaks respectively. These results show that the proposed development would significantly increase travel times through the study area, options 1 and 3, when compared to the base (existing conditions) and the Moonee Ponds junction improvements (option 2) respectively. In addition bus travel time results are detailed in tables 7.12 and 7.13 of the report for the AM and PM peaks respectively. These results show even greater increases in travel times due to the development.

The queue length results are detailed in figures 7.11 and 7.12 of the report for the AM and PM peaks respectively. These results show that the proposed development would cause there to be increases in queue lengths at Moonee Ponds junction on all approaches with the exception of Pascoe Vale Road in both AM and PM peaks.

The traffic volume results for the base and option 1 models are detailed in table 7.14 of the report for the AM peak only, the results for the option 2 and 3 and PM peak are not shown. The results show that the proposed development would significantly increase traffic volumes on the local roads surrounding the site but have little overall impact on the major roads of Mt. Alexander Rd, Pascoe Vale Road and Ascot Vale Road.

It is considered that these results are consistent with the data that has been entered into the models. It must be noted that, as detailed in section 9, there are some issues regarding the traffic distribution used in the study.

## 10.4 Sensitivity Analysis

### 10.4.1 Methodology and Assumptions

The sensitivity test has been carried out to model the expected future network traffic conditions with the implementation of the reconfiguration of the Moonee Ponds junction. It is stated in the report that as a result of the new configuration of Moonee Ponds junction that through traffic on Mt. Alexander Road and Pascoe Vale Road will be reduced by between 10 to 20%, however no justification is given for this estimate.

In addition, the report states that traffic on the local roads in the study area will be 'attracted' back to Mt. Alexander Road and Pascoe Vale Road, therefore replacing the through traffic that has redistributed due to the network changes.

Essentially the sensitivity tests are option 3, existing traffic plus development traffic with Moonee Ponds junction and 6 local road improvements, with a reduction in traffic volumes on the local roads of 10 and 20%.

### 10.4.2 Data

Tables 7.16 and 7.17 of the report show the general network statistics for the AM and PM sensitivity tests respectively. As is expected, with reductions in traffic volumes on the network, they show an improvement in network performance for vehicle traffic.

### 10.4.3 Comment

Typically a sensitivity test would involve the assessment of 'worst case' traffic conditions so that the weak points in the network can be identified and mitigating measures can be investigated further. For this study it is considered that the Option 3 modelling, detailed in the previous section plus, for instance, a 10% increase in traffic volumes would be a more informative sensitivity test than what has been carried out. This would enable an evaluation of the how the road network would perform under an extreme event, such as an unplanned road closure, and identify the critical parts of the network.

## 10.5 VicRoads Comments

Regarding the Section 7 – Traffic Impact, of the report VicRoads have made the following comments;

***7.2.1 Model Extents***

***In the previous review, it was suggested to include Pattison St and Ormond Rd Intersection in the model. It is noted that substantial number of traffic will access the site and the city link through this intersection.***

***7.2.6 Signalised Intersections***

***The report does not include detail of signal settings (such as, phasing, cycle and phasing timing, signal control logics, etc.) for the intersections. It may be worthwhile to get this information and check them. It is noted that signal settings is the most important / critical part of micro-simulation model. It is better to compare IDM data and input signal data in the model.***

***7.2.7 Develop Initial Assignment Parameters***

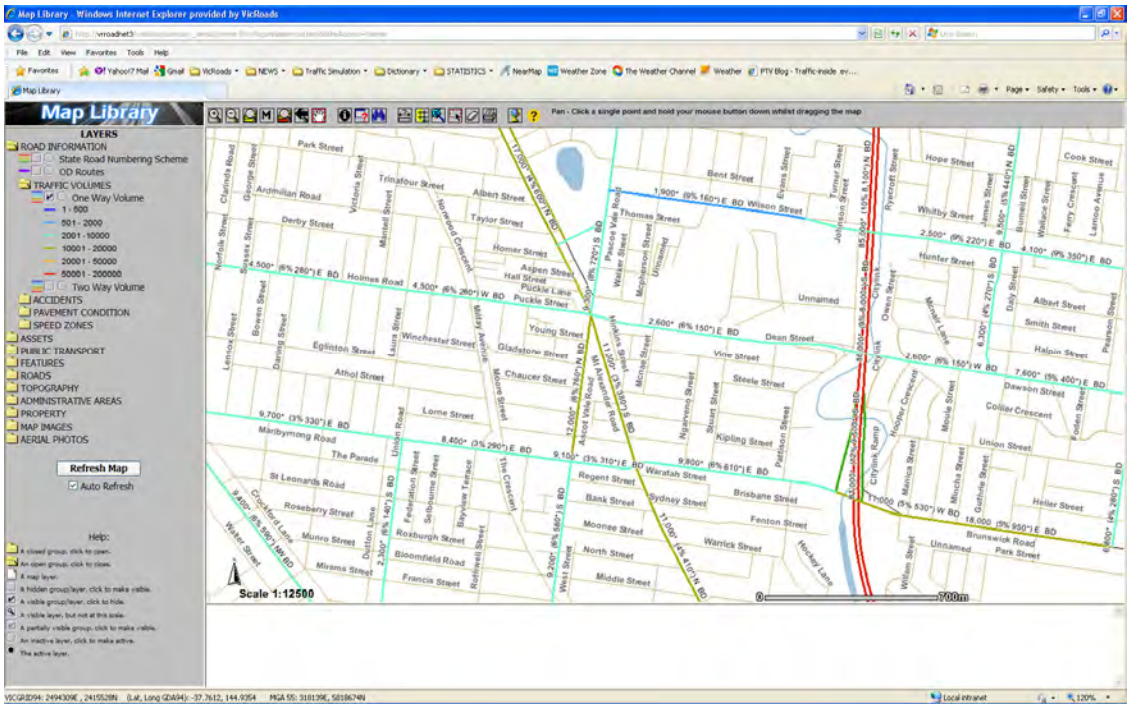
***It is also necessary to check the consistency of input traffic volume data in the model.***

***7.2.8 Coding Public Transport Stops and Routes***

***A plan showing the public transport routes and stops can be included in the report.***

***7.2.9 Traffic Composition***

***Following figure is collected from VicRoads internal GIS map. It shows the higher percentages of HGVs in the major roads surrounding the subject area.***




### *7.3.2 Results*

***Where modelling has been undertaken for 3 hours in the morning peak (6:30am – 9:30am) and 3 hours in the afternoon peak (4:00pm – 7:00pm) with 30 minute 'warm up" and warm down periods, calibration results are shown only for 1 hour (8:00am – 9:00am) in AM peak and 1 hours in PM peak. Calibration results for 7:00am - 8:00am, 4:30pm - 5:00pm and 6:00pm – 6:30pm are missing in the report.***

***Table 7.2 shows some of the targeting criterion is not satisfied in the base model. These discrepancies may happen because of incorrect signal setting, not having variation of signal timing over the simulation period, not considering bottleneck and the downstream that may cause spillback (blocking back condition) of traffic in the subject modelling network. Any microsimulation model should include the bottlenecks that cause spillback of traffic in the subject area. The model is also to be extended beyond the back of the existing and anticipated future queue lengths. If these items are not coded correctly, the result of model for the options will be flawed.***

***A Figure can be added in the report showing the fluctuation of observed and modelled travel time overt the simulation period. From the report, it is not clear how many travel time surveys have been undertaken along the routes and their timetable.***

***The discrepancies found in travel time along route 2 and 8 may be because of fewer numbers of observed data, where modelled average travel time is the average of all vehicles that finishes their journeys along these routes. These discrepancies may also happen because of incorrect coding of signal setting and traffic behaviour.***

***Although the discrepancies of travel time along route 2 and 8 are within target criterion (i.e. 1 minute), the distance of these routes are about 720 metre and 1690 metre respectively.***

***A Figure showing the fluctuation of observed and modelled queue lengths over the simulation period on the selected major approaches of the selected major intersections can be added in the report. It will help to justify whether base model is replicating the existing traffic conditions on site.***

### *7.4 Option Testing*

***It is noted that roundabouts work better in low vehicular volume environment, but it is not pedestrian friendly as the speeds of vehicle and pedestrian are not same. It may further impacted by the design of the roundabout. At the high traffic volume at roundabouts, pedestrians are unable to cross roundabout unless they are given priority by sign posting.***

***Roundabouts at the proposed site may work well in non-event days when both vehicle and pedestrian volumes are low. However, when high pedestrian and vehicular volumes is expected in the event days, roundabout may not work at expected level from safety and efficiency point of view in these days.***

***Is the pedestrian at the existing and proposed roundabout included in the model for the event day modelling? High pedestrian volume on the event day is to be modelled to replicate the interaction between pedestrian and vehicles and the possible impact on traffic. It is also noted that the crossing pedestrian volume at the intersections will be higher and impact the vehicular movement. Signal phase timing also changes depending on pedestrian demand.***

### *7.4.2 Key Assumptions*

***Signal Control***
***The proposed signal settings for the options are to be feasible. It may be a good idea to check the feasibility of the proposed signal settings with the VicRoads Signal Engineers.***

***Ten Year Assessment***
***Unless the MITM model is further calibrated in the surrounding area of the proposed development at reasonable extent, the stated growth of traffic is questionable. VicRoads Strategic Planning team can provide the anticipated growth rate of traffic in the subject area.***

### *7.5.2 Travel Times – General Traffic*

***Table 7.10 shows no travel time data along Route 2 for Option 2 & 3. Route 2 is along the Pascoe Vale Road in the southbound direction between Wilson Street and Gladstone Street. In option 2 and 3, still there is traffic movement in the southbound direction along this route and as such travel time data is to be presented for Route 2.***

***As per new Structural Plan, Route 3 (Mount Alexander Road Southbound – between Albert Street and Davies Street) is diverted through Kellaway Avenue. It would be interesting to know the travel time along the new diverted route. It is expected that travel time along the new diverted route will be longer as motorists have to travel a longer distance and cross one additional intersection. But the Table 7.10 shows travel time along route 3 decreases in Option 2 & 3 when compared to existing conditions.***

### *7.5.3 Queue Lengths*

***It is stated in the report (Page 54) that the existing road network would result in increased queuing along all approaches of the Moonee Pond Junction with the exception of the Pascoe Vale Road north approach. No reasoning is given in the report to justify why the queue length on this approach decreases.***

### *7.6 Sensitivity Analysis*

***Modelling (Traffic assignment) at strategic level using MITM can be undertaken with further calibration in the surrounding area of the subject site to justify the statement in regards to possible diversion of traffic***

## 10.6 Recommended Actions

- Include Pattison St and Ormond Rd Intersection in the model
- Include detail of signal settings (such as, phasing, cycle and phasing timing, signal control logics, etc.) for the intersections.
- It is necessary to check the consistency of input traffic volume data in the model therefore this data must be included in the report.
- Include a plan showing the public transport routes and stops
- The traffic volumes used in the modelling must be revised with regard to future traffic conditions and traffic generated by the development.

- The models must be rerun with two separate input profiles and assignments for car and heavy vehicle traffic to more accurately reflect the on-street conditions.

- Include calibration results for 7:00am - 8:00am, 4:30pm - 5:00pm and 6:00pm – 6:30pm.

- Add a figure in the report showing the fluctuation of observed and modelled travel time over the simulation period.

- High pedestrian volume on the event day is to be modelled to replicate the interaction between pedestrian and vehicles and the possible impact on traffic.

- Check the feasibility of the proposed signal settings with the VicRoads Signal Engineers.

- Include travel time results from the option modelling to show how traffic diverted from routes 2 and 3 as a result of the changes to the road network are affected.

- Include justification as to why the queue length on the existing road network would result in increased queuing along all approaches of the Moonee Pond Junction with the exception of the Pascoe Vale Road north approach.

- Include an analysis of how public transport is affected by changes in traffic conditions.

- Revise the option testing to include five scenarios; 1 – existing road infrastructure with existing traffic plus development traffic, 2 – as 1 but with the 6 proposed mitigating measures, 3 – revised structure plan road infrastructure with existing traffic conditions, 4 – revised structure plan road infrastructure with existing traffic plus development traffic, 5 – structure plan road infrastructure and the 6 proposed mitigating measures with existing traffic plus development traffic.

- Include a sensitivity analysis of ‘worst case’ traffic conditions scenario that could be expected to occur on the network.

# 11 Car Parking

The car parking provision for the redevelopment of Moonee Valley Racecourse is detailed in **section 8 for the Development Master Plan report**.

## 11.1 Methodology

### 11.1.1 Description

The approach described in the report is high level without detailing any specific issues with the car parking for the proposed development. References are made to Clause 52.06 of the Moonee Valley Planning Scheme and a review of the Victorian Planning Provisions anticipates that a new set of rates will be adopted in the near future. The report argues that a lower level of parking is expected to be adopted to minimise private vehicle activity. All these statements are non-specific and do not raise any issues.

The "Statutory car parking requirements" section of the report, however, states that for the master planning process it has been recommended that the residential component of the proposal will have an average allocation of one car space per dwelling, including visitor parking. The source or basis for this recommendation is not provided.

### 11.1.2 Commentary

Table 8.1 has been included in the report, although it is uncertain what the table is showing for the following reasons:

- The numbers provided therein are of unknown origin and unknown validity.
- The table only covers residential uses.
- The surrounding text twice states that a more detailed assessment of car parking rates should be undertaken at development/town planning stage.

Table 3 below shows the car parking rates for the proposed development land uses. It is based on Review of Parking Provisions – Advisory Committee Report 2008 – Column B (Activity Centre) and the rates have been generally accepted by the traffic engineering community and are in widespread use. Note that variances from these rates are acceptable with sufficient justification. Therefore any parking or traffic generation figures presented that are different from the above should be considered on their individual merits and not immediately dismissed.

Table 3 – Currently Accepted Car Parking Rates

| Land Use | Parking Rates |
|---|---|
| High Density Residential Apartments | 1 to each dwelling |
| Smaller Units & Flats (up to two bedrooms) | 1 to each dwelling |
| Larger Units & Townhouses (three or more bedrooms) | 2 to each dwelling |
| Dwelling Houses | Not specified, but typically 2 to each dwelling (per rescode) |
| Office | 3 to each 100 sqm NFA |
| Retail | Requires detail investigation but typically 3.5 to each 100 sqm GLFA |
| Medical centres | 3.5 to each 100 sqm of GLFA |
| Hotel | 3.5 to each 100 sqm GLFA |

Similarly, sections 8.4 – car parking layout and 8.5 – loading arrangements provide no guidance other than to say that these considerations be undertaken at the town planning stage.

Overall, the car parking section adds little to the report, other than the statements of intent (section 8.1 – approach), which is probably appropriate given this is a high level report.

### 11.2 VicRoads Comments

Regarding the Section 8 – Car Parking, of the report VicRoads have made the following comments;

***4.2 Car Parking***

***Of course, limited availability of car parking influences the mode share along with other factors, but still car is the most convenient mode of transport. People will still look for opportunity of using private car that may create problem in the nearby residential streets and increase congestion.***

### 11.3 Recommended Actions

- If the report is intended to guide future individual developments regarding the level of parking provision, a more robust precinct-level assessment of the car parking is required.

- The source data for the justification of parking rates used in the report must be included.
- If the report is not intended to provide this guidance, specific rates that are not robustly justified should not be shown.
- Should a precinct-level parking assessment be undertaken, this must consider any overflow parking effects onto surrounding residential streets and recommend mitigating actions.

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