North East Link Project

Expert Evidence to Joint Inquiry Advisory Committee

Associated with

Marcellin College, Bulleen Road, Bulleen

Hearing to Commence: 25 July 2019
Date of Report: 17 July 2019
Traffic Engineering Review

North East Link

Expert Evidence to Joint Inquiry Advisory Committee at
Marcellin College, Bulleen Road, Bulleen

Our Reference: G27028A-01A

COPYRIGHT: The ideas and material contained in this document are the property of Traffix Group (Traffix Group Pty Ltd – ABN 32 100 481 570). Use or copying of this document in whole or in part without the written permission of Traffix Group constitutes an infringement of copyright.

LIMITATION: This report has been prepared on behalf of and for the exclusive use of Traffix Group’s client, and is subject to and issued in connection with the provisions of the agreement between Traffix Group and its client. Traffix Group accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report by any third party.
Executive Summary

This report presents a traffic engineering assessment of the information available within the Environmental Effects Statement and Planning Scheme Amendment GC98 and detailed in the brief provided to my office by Rigby Cooke Lawyers.

In particular, I have been engaged to provide traffic engineering opinion in regards to potential impacts to the operation of Marcellin College during the construction stages and ultimate post development conditions as a result of the North East Link Project.

The following sets out my key findings, based on the various reports and plans that formed part of the Environmental Effects Statement:

1. Post North Link Project, access between Marcellin College and Bulleen Road will be provided via:
   a. New signalised intersection to the ‘primary’ central access location that will include signalised legs to Bulleen Road north, Bulleen Road south and Marcellin College Access, and
   b. New signalised intersection to the secondary/service access at northern boundary of school site that will includes signalised legs to Bulleen Road north, Bulleen Road south and Venuto Club/Casey Grammar Sports Centre Access, and an unsignalised leg to Marcellin College.

2. The existing southern exit only access from Marcellin College to Bulleen Road will be removed as part of the North East Link with exit movements from school car parking areas occurring via the ‘primary’ central access only.

3. It is unclear whether the proposal intends to provide for entry and exit access to the Manningham Club site through the Marcellin College site via the central intersection as the exhibited information is inconsistent in many respects. Whilst a potential connection is discernible within the artists impression plans, it is not identified in any capacity within the horizontal alignment plans, which are intended to document the scope of works. The supporting documents do not provide any discussion in relation to this, or suggest that a public road or easement would be created through the school site. Furthermore, the modelling references the eastern leg of the Marcellin College intersection as the Manningham Club, which further suggests an inconsistency in the assessment. The modelling on the central intersection does not appear to account for the Marcellin College traffic and most certainly, not the combined impacts of providing access to both sites.

4. I am of the opinion that access to the Manningham Club via the Marcellin College, is not appropriate or a viable arrangement on the basis that the uses are fundamentally incompatible to share access (i.e. place of education and licenced premises). This relates to:
   a. The consolidation of two significant accesses would exacerbate traffic impacts on Bulleen Road, and the times and manner in which the school uses its access as a one-way link road for school drop-off and pick-up and the adjacent area as a sporting field.
   b. Any signage requirements necessary to identify and direct access to the Manningham Club will be opposed by Marcellin College either within its land or along its frontage.
   c. The additional width and more complex internal arrangements that would be necessary to accommodate a two-way access road for the Manningham Club.
5. In my view, the most appropriate course is to acknowledge that the access to the Manningham Club from Bulleen Road would be closed (as per the horizontal alignment plans), unless a direct left-in/left-out arrangement can be accommodated in the design along the Manningham Club’s site frontage,

6. The various modelling of the new ‘primary’ central access to Marcellin College from Bulleen Road appears to include some errors, specifically:
   a. various figures and tables identify the intersection leg as ‘Manningham Club’ rather than ‘Marcellin College’,
   b. it is unclear whether the leg volumes are based on existing recorded volumes for Manningham Club or Marcellin College,
   c. the level of exit traffic demand for the Marcellin College Leg would appear to be significantly underestimated based on an empirical analysis, and on this basis, the level of entry movements into Marcellin College are also likely to have been underestimated,
   d. it is unclear whether the analysis of the Marcellin College Leg takes into consideration ‘peak flow factors’ that are relevant and appropriate for determining school-based traffic, including entering and exiting movements,
   e. it is unclear if the analysis takes into consideration any potential future growth in school populations and associated on-site car parking areas, and
   f. it is unclear whether the analysis takes into consideration the removal of the Marcellin College southern access i.e. all exit movements to be consolidated to a single location.

7. Access to Marcellin College from Bulleen Road is critical to the efficient operation of the school and should be maintained with full directional access during the construction and post development stages.

8. A significant area within the Marcellin College frontage is identified as a temporary works site. The specific use of this land is not defined at this time and it may be possible that this area is used as a staff car parking area accommodating a significant level of car parking and associated traffic.

   As the school will continue to operate during the construction periods, some consideration for the variation in traffic volumes and whether temporary traffic signals are required to ensure that queuing remains manageable is required.

   The school requires unfettered access to the school by all school buses as well as for drop-off and pick-up activities by parents. Sandra Street and the internal accessways within the school do not have the capacity and are not arranged in a manner that would enable these to be relied upon to meet the demands of the school, particularly for the number and size of school buses.

9. The horizontal alignment plans identify that the right-turn lane into Marcellin College from Bulleen Road will provide for an overall length of approximately 65m. Whilst this length would accord with the minimum requirement for a deceleration lane under Austroads Part 4A, it does not provide for any significant ability for additional storage of vehicles. As a result, I would expect that during the school peak periods, queuing vehicles may impact through traffic under the post development conditions under a signalised intersection arrangement.
Table of Contents

1 Introduction ........................................................................................................................................... 5
2 Statement of Witness .............................................................................................................................. 5
  2.1 Qualifications and Experience ........................................................................................................ 5
  2.2 Project Team .................................................................................................................................... 5
    2.2.1 Key Tasks .................................................................................................................................. 6
    2.2.2 Inspections ............................................................................................................................... 6
    2.2.3 Referenced Documents ............................................................................................................. 6
3 Existing Conditions ............................................................................................................................... 7
  3.1 Subject Site ..................................................................................................................................... 7
    3.1.1 Road Network ......................................................................................................................... 8
    3.1.2 Vehicle Access to Marcellin College ....................................................................................... 9
4 Existing School Car Parking Conditions ............................................................................................. 10
5 North East Link – Impacts To Marcellin College Access .................................................................. 13
  5.1 Post Development Access Arrangements ...................................................................................... 13
  5.2 Access From Manningham Club ................................................................................................... 16
6 Traffic Impact Considerations – Future Access Arrangements ............................................................ 18
  6.1 Expected School Traffic Volumes .................................................................................................. 21
    6.1.1 School Traffic Generation – Exit Movements ........................................................................ 22
    6.1.2 School Traffic Generation - Right-in Impacts ....................................................................... 25
  6.2 Traffic Impacts During Construction and Associated Considerations ........................................ 25
7 Marcellin Submission – Traffic Engineering Considerations ............................................................... 28
8 Conclusions .......................................................................................................................................... 30

List of Figures

Figure 1: Locality Plan .............................................................................................................................. 7
Figure 2: Subject Site .............................................................................................................................. 8
Figure 3: ‘Primary’ Central Access to Bulleen Road (Fully Directional) .................................................... 10
Figure 4: Southern Access to Bulleen Road (Exit Only) ...................................................................... 10
Figure 5: Site Access to Sandra Street (Fully Directional) .................................................................. 10
Figure 6: Sandra Street/Thompsons Road Intersection (Left-in/Left-out) ............................................. 10
Figure 7: Existing On-Site Parking Resources (long-term parking) ..................................................... 11
Figure 8: Existing On-Site Parking Resources (short-term parking) ................................................... 12
Figure 9: Proposed Traffic Signals – Bulleen Road & Marcellin College ‘Primary’ Central Accessway 14
Figure 10: Southern Access – Closure and Internal Realignment .......................................................... 15
Figure 11: Proposed Intersection – Bulleen Road & Marcellin College Northern Service Accessway

Figure 12: Artists Impression Video Screen Shot (2018) North East Link Impacts at Southern site Boundary

Figure 13: Bulleen Road Recorded and Adopted Traffic Volumes

Figure 14: Change in total average weekday traffic volumes

Figure 15: Total Average Weekday Traffic Volumes – 2036 ‘with project’

Figure 16: TTIA Traffic Impact Analysis – Bulleen Road / Marcellin College

Figure 17: Predicted Marcellin College Peak Hour Traffic Volumes AM Peak

Figure 18: Predicted Marcellin College Peak Hour Traffic Volumes PM Peak

Figure 19: Construction Site Over School Frontage to Bulleen Road
STATEMENT TO THE JOINT INQUIRY AND ADVISORY COMMITTEE BY THE MINISTER FOR PLANNING FOR THE ENVIRONMENTAL EFFECTS STATEMENT AND PLANNING SCHEME AMENDMENT GC98 BY CHARMAINE DUNSTAN, TRAFFIC ENGINEER

1 Introduction

Traffic Group has been engaged by Marcellin College to undertake a review of the background documents associated with the Environmental Effects Statement (EES) prepared in association with the North East Link project.

Specifically, my review has considered the impacts to the operation of Marcellin College during the construction and post development stages.

2 Statement of Witness

2.1 Qualifications and Experience

My name is Charmaine Chalmers Dunstan. I am a Director of Traffix Group Pty Ltd practicing from Suite 8, 431 Burke Road, Glen Iris.

My qualifications and membership of professional associations are as follows:

• Bachelor of Civil Engineering (honours), Monash University, Clayton
• Masters of Traffic, Monash University
• Member, Engineers Australia (IEAUST)
• Fellow, Victorian Planning & Environmental Law Association

I have over 20 years experience as a Traffic Engineering and Transport Planning consultant with Traffix Group Pty Ltd and formerly Turnbull Fenner Pty Ltd. My experience also includes a number of local government appointments which involved acting in the role of Council’s Transport Co-ordinator or Senior Traffic Engineer.

I have experience and expertise in traffic management, road safety planning and engineering, parking management and strategy development, and development impact assessment of a range of land-use developments.

2.2 Project Team

Matthew Huynh (Traffic Engineer, Traffix Group) assisted with site inspections and the preparation of this report.

Martin O’Shea (Senior Associate, Traffix Group) assisted with the preparation of this report.
2.2.1 Key Tasks

Based on the available information, the scope of my engagement has included the following tasks:

- inspection of the site and surrounding environs,
- Environmental Effects Statement and associated background documents for the North East Link Project, including:
  - North East Link Environmental Effects Statement,
  - North East Link Environmental Effects Statement – Map book - Horizontal Alignment Part 1,

2.2.2 Inspections

Inspections of the site and surrounding area have been undertaken during the school term (as part of a previous project) and school holiday period (as part of reviewing the site conditions for this matter).

2.2.3 Referenced Documents

Public submission documents provided in association with the North East Link Environmental Effects Statement, as provided at:


3 Existing Conditions

3.1 Subject Site

Marcellin College is located on the east side of Bulleen Road, approximately 500m north of the Eastern Freeway in Bulleen. A locality plan and aerial photograph of the site are provided at Figure 1 and Figure 2, respectively.

Marcellin College provides education services to over 1,400 students across years 7 to 12. Vehicle access to the site is provided via three access points Bulleen Road (declared Arterial Road and Road Zone Category 1) and a single access point to Sandra Street (local road). Further discussion regarding the vehicle access arrangements is provided within this report.

There are a number of on-site parking areas, with the site providing approximately 221 car spaces, including 57 short-term (i.e. parent) car spaces and 164 long-term spaces car spaces.

The site is zoned Special Use Zone 1, with nearby land use a mixture of residential and public uses.

Figure 1: Locality Plan
3.1.1 Road Network

**Bulleen Road** is a VicRoads declared Arterial Road and Road Zone Category 1 under the Planning Scheme. Bulleen Road generally provides two traffic lanes and a bicycle lane in each direction separated by a central median, with right-turn deceleration lanes located within the central median providing access to a number of properties, including the subject site.

In the vicinity of the school, on-street parking is not permitted along Bulleen Road.

A posted speed limit of 70km/h applies to Bulleen Road outside of school times when a speed limit of 40km/h applies.

**Sandra Street** is classified as a ‘local access road’ under the City of Manningham Register of Public Roads. Sandra Street has a carriageway width of approximately 7.3m, which provides for kerbside parking on both sides of the road and a single lane for through traffic or alternatively, parking on one side of the road and single lane of through traffic in each direction.

On-street parking in Sandra Street is typically subject to short-term (2P) restrictions. However, in the vicinity of the school ‘No Stopping 8-9am, 3-4pm School Days’ restrictions apply.

A posted speed limit of 40km/h applies to Sandra Street.
3.1.2 Vehicle Access to Marcellin College

Vehicle access to the school is provided via two crossovers to Bulleen Road (declared Arterial Road) and a single crossover to Sandra Street (local road). A description of each of these access points is provided as follows:

Northern Access to Bulleen Road

The northern access to Bulleen Road provides for access to service vehicle areas that extend along the northern boundary of the ovals.

The access to Bulleen Road is limited to left-in/left-out movements only and does not include any separate turn lanes.

Central ‘Primary’ Access to Bulleen Road

The central site access to Bulleen Road is fully directional unsignalised intersection which allows for ingress and egress movements between Marcellin College and Bulleen Road.

A right-turn deceleration lane is provided in the central median of Bulleen Road with an overall length of approximately 57m (including taper).

This intersection provides vehicle access to short-term drop-off/pick-up (i.e. parent) spaces and the other car parking areas provided within the school. I understand that bus access is limited to occur via this location only (i.e. bus parking and turnaround area provided).

An aerial image of this access can be seen in Figure 3.

Southern Access to Bulleen Road

The southern site access to Bulleen Road is limited to egress movements only. Vehicles can undertake left-out and right-out movements via a median break in Bulleen Road.

This access benefits from ‘Keep Clear’ line marking.

There is a two-way private/public road that runs parallel to this access point through to Thompsons Road which provides access to the Manningham Club and a Dan Murphy’s (bottle shop).

An aerial image of this access can be seen in Figure 4.

Access to Sandra Street

Access to Sandra Street is fully directional allowing for ingress and egress movements between the site and Sandra Street.

In the vicinity of the school, ‘No Stopping’ restrictions apply to Sandra Street during peak school times (i.e. 8-9am and 3-4pm school days) allowing for a single lane of through traffic in each direction.

An aerial image of this access can be seen in Figure 5.

Sandra Street/Thompsons Road Intersection

Vehicle access to Sandra Street from Thompsons Road is limited to left-in/left-out movements only. For vehicles travelling from the northeast along Thompsons Road (i.e. southwest bound). Vehicles can access Marcellin College by performing a U-turn approximately 50m southwest of Sandra Street on
Thompsons Road from the right-turn deceleration lane or via the intersection of Barak Street and Thompsons Road.

An aerial image of this intersection can be seen in Figure 6.

Figure 3: ‘Primary’ Central Access to Bulleen Road (Fully Directional)

Figure 4: Southern Access to Bulleen Road (Exit Only)

Figure 5: Site Access to Sandra Street (Fully Directional)

Figure 6: Sandra Street/Thompsons Road Intersection (Left-in/Left-out)

### 4 Existing School Car Parking Conditions

A review of the on-site parking areas has been undertaken based on aerial imagery of the school (image dated Thursday 23rd August, 2018) and site inspection at 1pm on Wednesday 10th July, 2019. The site inspection was conducted during the school holidays and do not include the parking demands associated with typical school activity.

A number of off-street parking areas are available within the Marcellin College campus comprising a total of 222 car spaces including 3 disabled spaces, and 8 bus bays including an additional 2 bays (between 2:30pm-3:30pm) as detailed in Figure 7 and Figure 8.
The results of the inventory indicated a total of 201 vacant spaces at 1pm on Wednesday 10th July, 2019 (21 cars parked, 9% occupancy) at a school holiday time.

The aerial photograph image dated Thursday 23rd August, 2018 represents a typical day during the school term (middle of the school day) and shows that car spaces within the school are heavily utilised.

![Diagram of Existing On-Site Parking Resources](image)

**Figure 7: Existing On-Site Parking Resources (long-term parking)**

- **Bray Oval Eastern Carpark**: 74 x car spaces, and 2 x Loading/Mini Bus spaces
- **Sandra Street Southeastern Carpark**: 37 x car spaces
- **Visitor Carpark**: 47 x car spaces
- **‘Private’ Carpark**: 6 x car spaces

*Source: Nearmap*
Figure 8: Existing On-Site Parking Resources (short-term parking)
5 North East Link – Impacts To Marcellin College Access

The Victorian State Government has approved the North East Link project with design work currently underway. The North East Link will connect the Eastern Freeway (to be upgraded) to the M80 Ring Road.

Vehicle access to Marcellin College will be impacted by the North East Link project due to the interchange works at the Eastern Freeway.

Guidance on the intended future vehicle access arrangements for Marcellin College at Bulleen Road has been taken primarily from:

- Artist impressions of the North East Link Project which identify vehicle access arrangements around Marcellin College,
- Sheet 22 of ‘North East Link Project – Horizontal Plan: operation reference design’ (Map book - Horizontal Alignment Part 1), and
- Traffic and Transport Impact Assessment (TTIA) prepared by Smedley Technical & Strategic that details analysis undertaken in association with site access to Marcellin College (Technical report A Traffic and Transport)

5.1 Post Development Access Arrangements

A summary of the post development vehicle access arrangement from Bulleen Road resulting from the North East Link Project are summarised as follows.

Signalisation of Central ‘Primary’ access to Bulleen Road

As part of the works the installation of new traffic signals at the ‘Primary’ central access to the school is proposed. The traffic signals are identified with the following works:

- Right-in deceleration/storage lane with an overall length of approximately 65m,
- Left-turn deceleration/slip lane with an overall length of approximately 65m,
- Single right-out lane for the Marcellin College Leg,
- Left-turn slip lane for Marcellin College Leg, and
- Single entry lane into Marcellin College.

The traffic signals will offer a benefit to the school in that they will generally improve the capacity of this intersection to accommodate entry and exit movements. They will also improve the safety of this intersection by controlling the entry and exit turning movements.

It would be expected that any detailed intersection and traffic signal design would allow for the appropriate design vehicles that are frequently required to access Marcellin College (i.e. 14m long coaches).

An excerpt from Sheet 22 of the ‘North East Link Project – Horizontal plan: operation reference design’ (Map book - Horizontal Alignment Part 1) which identifies this intersection is provided in the figure below.
As a result of the new Bulleen Road overpass and associated change in levels, the existing southern school egress to Bulleen Road will be removed. This access currently provides for exit only movements, with the ability for cars to exit towards the north and south.

The southern accessway will be realigned around the western boundary of the school oval to connect to the ‘primary’ central accessway. This connection will occur at a distance of approximately 40m east of the traffic signals and would be expected to accommodate one-way traffic only consistent with its existing operation.

The change in access will result in an increase in the number of exit movements required to be accommodated at the central ‘primary’ access to Bulleen Road. That is, a consolidation of exit movements at a signalised intersection. The increased number of exit movements and signalisation of the intersection at the central location is likely to result in an increase in the extent of internal queuing for the school at peak times.

An excerpt from Sheet 22 of the ‘North East Link Project – Horizontal plan: operation reference design’ (Map book - Horizontal Alignment Part 1) identifying the new internal link and removal of the southern access is provided in the figure below.
It would certainly be the case that cross-section and alignment depicted in Sheet 22 contemplates a one-way circulation road, that would remain on private land within the school grounds for the exclusive use of the school. This additional queuing will be able to be accommodated along the circulation road, which will in effect offer a longer storage area than the existing arrangement.

This plan does not show a connection to the Manningham Club site in any form, but rather a connection or extension from the school’s internal circulation toad, which is used for drop-off and pick-up activities.

Figure 10: Southern Access – Closure and Internal Realignment

Northern Service Accessway

A new set of traffic signals are proposed to be constructed adjacent to the northern service accessway. These signals are provided to access the Venuto Club in addition to the Casey Grammar Sporting Complex to the south-west.

The plans identify that the school accessway will require some realignment in proximity of the traffic signals. The specific reason for the internal realignment is not specified and there does not appear to be any reason for this. This aspect should be reviewed to minimise the loss of the playing fields.

The plans appear to depict an arrangement where the northern accessway is likely to form an unsignalised leg within the signalised intersection, with movements limited to left-in and left-out only. Appropriate signage would be required to enforce this arrangement.
An excerpt from Sheet 22 of the ‘North East Link Project – Horizontal plan: operation reference design’ (Map book - Horizontal Alignment Part 1) which identifies the intersection is provided in the following figure.

Figure 11: Proposed Intersection – Bulleen Road & Marcellin College Northern Service Accessway

5.2 Access From Manningham Club

The existing site conditions do not allow vehicle access between the Marcellin College site and the Manningham Club car parking areas, etc. located to the south.

The exhibited horizontal reference design plans do not identify any connection between the Marcellin College site and the Manningham Club car parking areas.

Whilst a potential two-way connection is discernible within the artists impression plans, it is not identified in any capacity within the horizontal alignment plans, which are intended to document the scope of works.

The earlier artist impression designs identified a new service road type connection along the western boundary of the Southern Oval to provide two-way connection through to the Manningham Club. A figure sourced from the earlier artists impressions (screen shot from the 2018 animation video, when the project was initially released) identifying this connection is provided at Figure 12. This screen shot from an animation video is clearly inconsistent with the horizontal alignment plan at Sheet 22. This video is no longer available to this clarity on the North East Link website.
Furthermore, the supporting documents do not provide any discussion in relation to potential shared access between these sites, or suggest that a public road or carriageway easement would be created through the school site. Therefore, the proposal is unclear or misleading.

The modelling references the eastern leg of the Marcellin College intersection as the Manningham Club, which further suggests an inconsistency in the assessment. The modelling on the central intersection does not appear to account for the Marcellin College traffic and most certainly, not the combined impacts of providing access to both sites.

Any intention of a connection through the school site to the Manningham Club site, presents significant consequences for the school. I support the school’s view that access to the Manningham Club via the Marcellin College, is not appropriate or a viable arrangement on the basis that the uses are fundamentally incompatible to share access (i.e. place of education and licenced premises).

The key concerns relate to:

- The consolidation of two significant accesses would exacerbate traffic impacts on Bulleen Road, and the times and manner in which the school uses its access as a one-way link road for school drop-off and pick-up and the adjacent area as a sporting field.

- Any signage requirements necessary to identify and direct access to the Manningham Club will be opposed by Marcellin College either within its land or along its frontage.

- The additional width and more complex internal arrangements that would be necessary to accommodate a two-way access road for the Manningham Club, particularly as this is used as a one-way circulation route for the school.

Without the reliance on the Marcellin College site, it is unclear as to whether a viable access between the Manningham Club and Bulleen Road can be created. Any such access would be likely limited to

Figure 12: Artists Impression Video Screen Shot (2018) North East Link Impacts at Southern site Boundary

Source: www.northeastlink.vic.gov.au/project
left-in and left-out access only and would need to take into consideration and level differences that occur along Bulleen Road.

6 Traffic Impact Considerations – Future Access Arrangements

In order to ensure that the access arrangements to the Marcellin College operate efficiently and safely under the future conditions I have undertaken a review of the assumptions identified within the Traffic and Transport Impact Assessment (TTIA) prepared by Smedley Technical & Strategic (Technical report A Traffic and Transport).

A summary of the components of this assessment relevant to the Marcellin College site and future access arrangements are provided as follows.

Bulleen Road Base Case and Future Conditions

The base traffic conditions along Bulleen Road were identified within the Transport Modelling Summary Report Transport Modelling for North East Link (March 2019) – Prepared by VLC (Appendix B of Traffic and Transport Impact Assessment (TTIA) prepared by Smedley Technical & Strategic (Technical report A Traffic and Transport)).

This report identified that in 2017 Bulleen Road between Thomsons Road and Manningham Road, carried traffic volumes of:

- **Southbound**
  - 19,759 vehicles/day
  - 2,806 vehicles/hour during AM Peak Hour (2 hour volume)
  - 2,093 vehicles/hour during PM Peak Hour (2 hour volume)

- **Northbound**
  - 24,652 vehicles/day
  - 2,837 vehicles/hour during AM Peak Hour (2 hour volume)
  - 3,814 vehicles/hour during PM Peak Hour (2 hour volume)

An excerpt from the Transport Modelling Summary Report is provided in the following figure.

![Figure 13: Bulleen Road Recorded and Adopted Traffic Volumes](image)

In regard to the future traffic conditions and impacts along Bulleen Road, between Thomsons Road and Manningham Road, the Traffic and Transport Impact Assessment (TTIA) prepared by Smedley Technical & Strategic identified:

- **Southbound** - Increase of 1,400 vehicles per day (vs. no project scenario), and
- **Northbound** - Negligible variation in traffic (vs. no project scenario).
The TTIA also provided average weekday traffic volumes for the arterial network around the project which identified:

- Southbound – 21,000-28,000 vehicles per day, and
- Northbound – 23,000-30,000 vehicles per day.

Extracts from the TTIA which identify the project traffic impacts and the 2036 daily traffic volumes are detailed in the following figures.

Figure 14: Change in total average weekday traffic volumes
Traffic Impacts Along School Access Leg

The various model analyses detailed within the TTIA identifies that at the new signalised intersection with Marcellin College the eastern leg is referenced as ‘Manningham Club’. This suggests a further inconsistency in the assessment.

It is not clear as to whether the input traffic volumes account for the Marcellin College traffic, the Manningham Club traffic volumes alone or the combined volumes if access is shared.

Notwithstanding the above, I have assumed that the eastern leg referenced as ‘Manningham Club’ is instead, the signalised leg providing access to the Marcellin College car and bus parking areas (which may or may not include a connection to the Manningham Club site).

Given the confusion between which site this intersection leg represents, I am of the opinion that the source/origin of the traffic volumes used in the various analysis have been determined on inaccurate traffic conditions. Intuitively, it appears that the traffic volumes for the eastern intersection leg fall short of what could be reasonably expected for a secondary school of this size in isolation.

Further analysis/review of this matter is provided as follows.

The adopted approach volumes for the eastern leg were detailed at Appendix E of the TTIA. The tables detailed the adopted traffic volumes that for the ‘Manningham Club’ leg as follows:

- **AM Peak Hour**
  - First Hour – 20 vehicles per hour
  - Second Hour – 40 vehicles per hour

- **PM Peak Hour**
  - First hour – 70 vehicles per hour

Figure 9-13 – Total average weekday traffic volumes (AWDT), 2036 ‘with project’ – study area south
(Smedley Technical & Strategic Traffic and Transport Impact Assessment)
Second Hour – 110 vehicles per hour

An excerpt from Appendix E of the TTIA which identifies the volumes detailed above is provided in the following figure.

In regards to the presented results, it would also appear that there may be an error in that the during the ‘PM Peak hour Second Hour – No Project Case’ the level of service for Bulleen Road represents an unrealistic outcome (Level of Service F - defined as a “road in constant traffic jam” under the Glossary and abbreviations of the TTIA). It is likely that the input and output data is erroneous in this table as a close examination of the numbers indicates that a number of figures are likely to be transposed or in error between the different approach legs. This leads to concerns about the level of confidence that can be applied to subsequent decisions about the capacity of intersections to accommodate various access scenarios.

![Figure 16: TTIA Traffic Impact Analysis – Bulleen Road / Marcellin College](image)

6.1 Expected School Traffic Volumes

I am of the opinion that the adopted volumes for the ‘Manningham Club Access’ significantly under represents the level of traffic generation that would occur for Marcellin College in isolation, and most certainly for any proposal for a consolidated access with the Manningham Club.
It is also noted that for any school development it is appropriate for peak flow factors to be applied which take into consideration the concentration of traffic that occurs during the drop-off and pick-up periods over a more confined period.

To provide context as to the inadequacy of the adopted volumes an assessment of the indicative traffic impacts of a school of this size is provided as follows.

6.1.1 School Traffic Generation – Exit Movements

Given the timing of my engagement/instructions surveys of the existing school operating conditions and traffic generation could not be completed. Accordingly, an assessment of the expected school traffic impacts has been undertaken based on appropriate empirical traffic generation data for a similar sized school.

In my experience, secondary schools typically generate in the order of 0.6 - 0.65 vehicle trip ends (vte) per enrolled student (inclusive of staff demands) in each of the peak hours. These movements are concentrated over a period of less than 1 hour.

The school has advised that a significant proportion of students (approx. 75% of students), travel to and from the site via chartered bus services.

In order to determine the realistic traffic volumes generated by Marcellin College, I have considered traffic surveys undertaken by Traffix Group of Padua College (Mornington Campus). This school similarly experiences a high reliance on bus services with in the order of 20 buses provided for a 1,550 student population. The surveys of Padua College identified ‘hourly’ and ‘half-hourly’ traffic generation rates per student of:

- AM Peak hour (8:10-9:10am) – 0.53 vehicle trips per enrolled student
- PM Peak hour (3:00-4:00pm) – 0.31 vehicle trips per enrolled student
- AM Peak half hour (8:20-8:50am) – 0.41 vehicle trips per enrolled student
- PM Peak half hour (3:20-3:50pm) – 0.24 vehicle trips per enrolled student

Significantly, the peak half hour rates recorded during the Padua College surveys identify that in the order of 75% of the overall peak hour traffic occurs within a half hour period. This has the net effect of increasing the queueing impacts of the school at these times on internal approaches (as exit queues) and external approaches (as a right-turn at the signalised intersection) as the demands are concentrated over a shorter time period.

I am satisfied that for present purposes, these rates are appropriate for determining the likely traffic generation impacts for Marcellin College. Adopting the current enrolment levels of 1,430 students, Marcellin College would be expected to generate:

- AM Peak hour (0.53 vte/student) – 758 veh/hour
- AM Peak half hour (0.41 vte/student) – 586 veh/30min
- PM Peak hour (0.31 vte/student) – 443 veh/hour
- PM Peak half hour (0.24 vte/student) – 343 veh/30min
Allowing for the school-based traffic to be split 50/50 between Sandra Street access and Bulleen Road access (consistent with the school’s experience), this equates to two-way traffic volumes at Bulleen Road of:

- AM Peak hour (50%) – 379 veh/hour
- AM Peak half hour (50%) – 293 veh/30min
- PM Peak hour (50%) – 222 veh/hour
- PM Peak half hour (50%) – 172 veh/30min

Allowing for a further 50/50 split between entry and exit movements, the traffic generation at the school access to Bulleen Road is provided below for the post-operation case.
When considering the exit movements only, the above analysis represents the following increases compared to the adopted analysis within the TTIA (Technical report A Traffic and Transport):

- **AM Peak hour**
  - Adopted in TTIA model - 40 veh/hour (max)
  - Empirical – 190-294 veh/hour
  - Difference – up to 254 veh/hour

- **PM Peak**
  - Adopted in TTIA model– 110 veh/hour (max)
  - Empirical – 111-172 veh/hour
  - Difference – up to 71 veh/hour

It is essential that the appropriate peak flow factors are adopted for modelling the traffic impacts of schools as they have the potential to significantly exceed the storage capacity of turn lanes and have impacts on the operation and safety of access points (in this case a newly created signalised intersection). There is no way identifying this in the material available, however, the under-estimated traffic volumes suggest that the school traffic has not been accounted for.
It is noted that my assessment of the traffic volumes also assumes that no connection is provided to the actual ‘Manningham Club’ site via a shared access arrangement. In the event that this connection did occur, the approach volumes would need to be further increased to include this traffic.

Based on the above assessments, I am of the opinion that:

- The proposed signalised access to Marcellin College from Bulleen Road will consolidate all entry and exit movements to a single location at a signalised access, compared to two exit locations under current conditions. This may result in an increase in the length on internal queuing which can be accommodated along the extended one-way link road.

- The proposed signalised access to Marcellin College from Bulleen Road will improve the ability for traffic to safely turn right-out of Marcellin College onto Bulleen Road compared to the current conditions.

- The adopted traffic volumes within the TTIA for the signalised access to Marcellin College have been under estimated or based on incorrect data collection or assumptions.

- Further analysis based on the actual traffic generation from the Marcellin College site is required to ensure that an acceptable level of queuing/delay occurs for the future traffic signals.

- Any assessment of the school access should apply appropriate peak flow factors that allow for 75% of the peak hour traffic to be generated within a 30min period and based on accurate traffic data from Marcellin College existing operation. This may require modifications to the intersection design.

6.1.2 School Traffic Generation - Right-in Impacts

Given the identified discrepancy/shortfall in the assessed approach volumes, I am of the opinion that discrepancies/shortfall may have also been adopted in the analysis of entry movements into the Marcellin College site.

The right turn lane into Marcellin College from Bulleen Road is identified at approximately 65m long (including taper). Whilst this length generally accords with the required lane length for a 70km/h speed limit for deceleration purposes, it does not provide for any additional storage.

As such, any extensive queuing within the right-turn lane into Marcellin College during the peak hours may result in impacts to the through traffic capacity of Bulleen Road as vehicles will spill out into the traffic lanes.

Overall, I am of the opinion that additional information is required to confirm the entry traffic movements adopted within TTIA and that further analysis of the right-in movements based on the existing conditions is required.

6.2 Traffic Impacts During Construction and Associated Considerations

The extent of impacts to Bulleen Road during the construction activity is unknown at this time and accordingly, the specifics of any impacts are also unknown.

The specific impacts will be understood at such time as the construction method details are determined by contractors. Within the TTIA, Bulleen Road has not been identified as one of the specific
roads where temporary closures are to be required. As such I have assumed that at this time full access along Bulleen Road and access to Marcellin College would be available for the duration of the works.

A number of sites that abut the project construction zones have been identified for the purpose of material and equipment storage in addition to accommodating construction staff parking and staff facilities.

In regard to the operation of the various sites, the TTIA advised:

*The majority of worksites would operate for nine hours per day (hauling for eight hours), typically from 7:00 am to 5:30 pm. This means the workforce would arrive before the AM peak and exit during or after the PM peak.*

Indicative work-force numbers across the various sites was provided within the TTIA with in the order of 350 staff anticipated within the North East Link Precinct in those areas around the subject site (as per Table 10-13 of the TTIA).

The extent of the proposed site compound that impact the Manningham College site is provided in Figure 19. Whilst the specific purpose/usage of the site has not been confirmed the area of the Marcellin College site nominated for use would suggest a significant level of either staff or material could be accommodated within this zone.

Vehicle access to this project site is proposed to occur via the existing school access roads to Bulleen Road. This may include the northern, central ‘primary’ and southern access.

Whilst it is difficult for me to provide specific commentary regarding the potential traffic increase associated with the new ‘project site’ and impacts on the school operation I am of the opinion that to ensure the suitable operation of the school can occur consideration for limiting access from the project to occur outside of school peak hours may be appropriate.

It is certainly the case that the school would require unfettered access to the school by all school buses as well as for drop-off and pick-up activities by parents. Sandra Street and the internal accessways within the school do not have the capacity and are not arranged in a manner that would enable these to be relied upon to meet the demands of the school, particularly for the number and size of school buses.

In the event that significant increases in traffic are required during the school peak hours, consideration to other traffic management practices should occur. These may include:

- Installation of temporary traffic signals at ‘primary’ central access.
- Restrict access to the site compound to left-in/left-out only via the northern vehicle crossover so as to minimise conflicts with existing school-based traffic.
Figure 10-16 – Site compounds Manningham Road to Eastern Freeway
(Smedley Technical & Strategic Traffic and Transport Impact Assessment)

Figure 19: Construction Site Over School Frontage to Bulleen Road
7 Marcellin Submission – Traffic Engineering Considerations

As submissions to the Joint Inquiry Committee has been prepared on behalf of Marcellin College by Rigby Cooke Lawyers (letter dated 7 June 2019). The key concerns associated with traffic engineering matters are detailed in the following table with my commentary provided as relevant to my investigations.

<table>
<thead>
<tr>
<th>Marcellin College Submission</th>
<th>Discussion / Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Future Internal Works and Access Requirements</strong></td>
<td>Based on my site inspection, I am of the opinion that whilst vehicle access into Marcellin College may be physically possible through Sandra Street (for vehicle up to 12.5m long), this arrangement would not represent the preferred access outcome and during any construction activity would result in a scenario that would unlikely be acceptable for Council or local residents. Furthermore, any access into the site from Sandra Street for larger vehicles would be reliant on on-street car parking being permanently/temporarily removed along both sides around the school access and various intersections and bends. The school would not be able to use the bus and drop-off/pick-up facilities within the school and this would clearly have significant impacts internal and external impacts. It is noted that access into the site from Sandra Street is not physically possible for 14m long coaches or semi-trailer sized vehicles. It would be reasonable to expect that any larger scale construction activity at the site for the redevelopment works would require access for semi-trailer sized vehicles. Based on the above, I am of the opinion that access to Bulleen Road would be critical for any future internal works to be undertaken as part of Marcellin College and for this reason fully directional access to Bulleen Road from Marcellin College should be maintained for the duration of works.</td>
</tr>
<tr>
<td>Bulleen Road has one entry and egress point running between Garter Fields and Lyon Oval (Primary Access Point). An additional egress only point is provided to Bulleen Road to the south of Lyons Oval (Secondary Access Point). Sandra Street is a residential street and provides an alternative entry and egress point, however, buses and heavy vehicles cannot access Marcellin Campus from this point. Bus access/egress is via the Primary Access Point. Marcellin proposes to undertake major redevelopment works in the next 18 months with access for heavy vehicles required during this period.</td>
<td></td>
</tr>
<tr>
<td><strong>Temporary Occupation of School Sporting Grounds</strong></td>
<td>As a result of the loss of on-site sporting facilities there would be an increase in the number of bus movements to and from the school associated with student transfer. As previously noted above, access through Sandra Street for buses is not viable. Accordingly, bus access will need to occur through the access to Bulleen Road and this access should be unfettered. Based on the above, I am of the opinion that access to Bulleen Road would be critical for access to off-</td>
</tr>
<tr>
<td>Temporary Occupation of significant parts of Gartner Fields and Lyons Oval (Temporary Occupation) will have a detrimental impact on sports and recreational uses on the Marcellin Campus both for the school and community groups. At least two, possibly three, of the sports grounds will be unavailable for use during Temporary Occupation. The suggestion by NELA that alternative off site facilities will be made available</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Marcellin College Submission

for the period of Temporary Occupation is unacceptable, will be disruptive to the class timetable and expensive with buses being required to transport students to and from the offsite facilities.

Access

The Marcellin Campus requires unrestricted car and bus access from Bulleen Road at all times (including weekends). Approximately 75% of students arrive and depart the Marcellin Campus via bus to Heidelberg Station and other local destinations. The bus movements are estimated at 24 per day. Buses are unable to access the Marcellin Campus from Sandra Street, therefore, it is critical that continuity of access to and egress from the Primary Access Point is maintained.

Marcellin submits that:

- during construction works to Bulleen Road unrestricted access/egress to the Primary Access Point must be maintained;
- temporary traffic lights must be installed at the Bulleen Road and Primary Access Point; and
- Bulleen Road must not be diverted onto the Temporary Occupation area.

Discussion / Opinion

site sporting facilities and for this reason fully directional access to Bulleen Road from Marcellin College is to be maintained for the duration of works.

As detailed within this report, I am of the opinion that unrestricted access to Marcellin College should be maintained to Bulleen Road under post development conditions and for the duration of works during the North East Link Project.
8 Conclusions

Following a review of the relevant background documents within the EES for the North East Link project as they relate to Marcellin College, I am of the opinion that:

1. Post North Link Project, access between Marcellin College and Bulleen Road will be provided via:
   
   a. New signalised intersection to the ‘primary’ central access location that will include signalised legs to Bulleen Road north, Bulleen Road south and Marcellin College Access, and
   
   b. New signalised intersection to the secondary/service access at northern boundary of school site that will includes signalised legs to Bulleen Road north, Bulleen Road south and Venuto Club/Casey Grammar Sports Centre Access, and an unsignalised leg to Marcellin College.

2. The existing southern exit only access from Marcellin College to Bulleen Road will be removed as part of the North East Link with exit movements from school car parking areas occurring via the ‘primary’ central access only.

3. It is unclear whether the proposal intends to provide for entry and exit access to the Manningham Club site through the Marcellin College site via the central intersection as the exhibited information is inconsistent in many respects. Whilst a potential connection is discernible within the artists impression plans, it is not identified in any capacity within the horizontal alignment plans, which are intended to document the scope of works. The supporting documents do not provide any discussion in relation to this, or suggest that a public road or easement would be created through the school site. Furthermore, the modelling references the eastern leg of the Marcellin College intersection as the Manningham Club, which further suggests an inconsistency in the assessment. The modelling on the central intersection does not appear to account for the Marcellin College traffic and most certainly, not the combined impacts of providing access to both sites.

4. I am of the opinion that access to the Manningham Club via the Marcellin College, is not appropriate or a viable arrangement on the basis that the uses are fundamentally incompatible to share access (i.e. place of education and licenced premises). This relates to:
   
   a. The consolidation of two significant accesses would exacerbate traffic impacts on Bulleen Road, and the times and manner in which the school uses its access as a one-way link road for school drop-off and pick-up and the adjacent area as a sporting field.
   
   b. Any signage requirements necessary to identify and direct access to the Manningham Club will be opposed by Marcellin College either within its land or along its frontage.
   
   c. The additional width and more complex internal arrangements that would be necessary to accommodate a two-way access road for the Manningham Club.

5. In my view, the most appropriate course is to acknowledge that the access to the Manningham Club from Bulleen Road would be closed (as per the horizontal alignment plans), unless a direct
left-in/left-out arrangement can be accommodated in the design along the Manningham Club’s site frontage,

6. The various modelling of the new ‘primary’ central access to Marcellin College from Bulleen Road appears to include some errors, specifically:
   a. various figures and tables identify the intersection leg as ‘Manningham Club’ rather than ‘Marcellin College’,
   b. it is unclear whether the leg volumes are based on existing recorded volumes for Manningham Club or Marcellin College,
   c. the level of exit traffic demand for the Marcellin College Leg would appear to be significantly underestimated based on an empirical analysis, and on this basis, the level of entry movements into Marcellin College are also likely to have been underestimated,
   d. it is unclear whether the analysis of the Marcellin College Leg takes into consideration ‘peak flow factors’ that are relevant and appropriate for determining school-based traffic, including entering and exiting movements,
   e. it is unclear if the analysis takes into consideration any potential future growth in school populations and associated on-site car parking areas, and
   f. it is unclear whether the analysis takes into consideration the removal of the Marcellin College southern access i.e. all exit movements to be consolidated to a single location.

7. Access to Marcellin College from Bulleen Road is critical to the efficient operation of the school and should be maintained with full directional access during the construction and post development stages.

8. A significant area within the Marcellin College frontage is identified as a temporary works site. The specific use of this land is not defined at this time and it may be possible that this area is used as a staff car parking area accommodating a significant level of car parking and associated traffic.

As the school will continue to operate during the construction periods, some consideration for the variation in traffic volumes and whether temporary traffic signals are required to ensure that queuing remains manageable is required.

The school requires unfettered access to the school by all school buses as well as for drop-off and pick-up activities by parents. Sandra Street and the internal accessways within the school do not have the capacity and are not arranged in a manner that would enable these to be relied upon to meet the demands of the school, particularly for the number and size of school buses.

9. The horizontal alignment plans identify that the right-turn lane into Marcelin College from Bulleen Road will provide for an overall length of approximately 65m. Whilst this length would accord with the minimum requirement for a deceleration lane under Austroads Part 4A, it does not provide for any significant ability for additional storage of vehicles. As a result, I would expect that during the school peak periods, queuing vehicles may impact through traffic under the post development conditions under a signalised intersection arrangement.
I have made all inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.

CHARMAINE CHALMERS DUNSTAN

B.E. (Civil) Hons., Masters of Traffic, M.IEAust., F.V.P.E.L.A.