

Amendment C88 of the Hobsons Bay Planning Scheme

Proposed Rezoning

At

Altona North Precinct 15

Hearing to Commence: 20th November, 2017

Date of Report: 12th November, 2017

Traffic Engineering Peer Review

Amendment C88 of the Hobsons Bay Planning Scheme

Proposed Rezoning at Altona North Precinct 15

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Executive Summary

- a) The CIA modelling is not sufficiently robust to capture traffic impacts on the local road network surrounding Precinct 15,
- b) The conclusion that traffic volumes along The Avenue and Melbourne Road will significantly reduce following development of Precinct 15 is not logical,
- c) The SIDRA modelling included in the ITS should have been based on the more recent version of the CIA model that includes connector street access from Precinct access to both Kyle Road and New Street,
- d) There are concerns that the existing freeway interchanges at West Gate Freeway/Millers Road and West Gate Freeway/Melbourne Road will not be able to accommodate future traffic volumes without mitigation,
- e) Given the uncertainties relating to the traffic modelling no further development on the Precinct 15 site should be contemplated beyond what is outlined in the CDP unless more robust traffic modelling is undertaken with suitable measures identified to ameliorate traffic concerns,
- f) The DCP item at Millers Road/Blackshaws Road should be modified to incorporate the scope of works proposed by VicRoads and Council subject to meeting swept path requirements,
- g) The DCP should contribute to the funding and implementation of the Altona North Local Area Traffic Management Plan Study,
- h) Modification of the traffic signals at Millers Road/Marigold Avenue/Duosa Road should be undertaken to include split phasing on the Marigold Avenue and Duosa Road approaches,
- i) Substantial changes will be required to the operation of Marigold Avenue due to the significant increase in traffic volumes resulting from the development of Precinct 15 which may require conversion to one-way westbound operation and/or parking restrictions subject to community consultation,
- j) Changes should be undertaken at the Melbourne Road/The Avenue intersection to improve the safety of the left turn slip lane movement from west to north and to discourage traffic from taking this route ahead of Melbourne Road,
- k) Detector loops should be installed in Ross Street that are linked to the nearby pedestrian operated signals in Melbourne Road to better facilitate the left turn movement out of Ross Street,
- l) The proposed right turn lanes at the Blackshaws Road/Broadway/Site Access intersection should be extended,
- m) Right turn lanes and signal mast arms should be installed at the Blackshaws Road/Kyle Road/Mills Street intersection,
- n) The proposed Blackshaws Road cross-section at Figure 1 of the CDP should be amended to include on-road bicycle lanes in place of indented parking,
- o) A direct public transport route (bus service) should be provided through the Precinct 15 site to connect between Altona Gate Shopping Centre and Spotswood Railway Station, and
- p) More substantial changes should be made to both Cyclamen Avenue and Aloha Street to support the proposed bicycle routes.

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Appendix A: CV

Appendix B: December 2016 Peer Review

**STATEMENT TO THE PLANNING PANEL APPOINTED BY THE MINISTER FOR PLANNING FOR
AMENDMENT C88 TO THE HOBSONS BAY PLANNING SCHEME BY ROSS THOMSON, TRAFFIC
ENGINEER**

1 Introduction

I have been engaged by Maddocks Lawyers on behalf of Hobsons Bay City Council to undertake a peer review of the traffic modelling undertaken in relation to the proposed rezoning of the 'Altona North Precinct 15' site bounded by Blackshaws Road to south, Kyle Road to the west, New Street to the east and the West Gate Freeway to the north in Newport.

The proposal is to rezone the subject land from Industrial 1 Zone (IN1Z) and Industrial 3 Zone (IN3Z) to Comprehensive Development Zone (CDZ2), rezone the Brooklyn Terminal Station site from Industrial 1 Zone (IN1Z) to Special Use Zone (SUZ6), apply a Development Contributions Plan Overlay (DCPO) and Environmental Audit Overlay (EAO) and remove a Heritage Overlay (HO).

2 Statement of Witness

2.1 Qualifications and Experience

My name is Ross Graeme Thomson. I am a Senior Associate at 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), University of Melbourne, Parkville
- Member, Australian Institute of Traffic Planning and Management Incorporated (AITPM)
- Senior Road Safety Auditor

I have over 17 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 short term placements in local government and at Yarra Trams in the role of a traffic engineer.

I have relevant experience and expertise in parking studies, concept and functional designs, development impact assessments, intersection capacity modelling, road safety audits, traffic management and general traffic engineering, road safety and transportation planning.

A copy of my CV is attached at Appendix A.

2.2 Scope of Work

This report considers the external traffic impacts resulting from the likely redevelopment of the Altona North Precinct 15 site facilitated by the proposed rezoning and in particular includes a peer review of the Altona North Precinct Integrated Transport Study prepared by GTA Consultants for the Victorian Planning Authority in December 2016.

2.2.1 Key Tasks

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

- Review and analysis of existing traffic volumes data,
- Review and analysis of external traffic generation and distribution,
- Review of strategic traffic modelling data,
- Review of intersection capacity analysis,
- Review of proposed mitigating works including road and intersection works covered by the Development Contributions Plan,
- Review of historical crash data,
- Review of submissions relating to external traffic impacts, and
- preparation and giving of Expert Evidence in accordance with Planning Panels Victoria – Guide to Expert Evidence.

2.2.2 Experiments

I have visited the site to observe existing AM and PM peak traffic conditions within the area surrounding the site.

All other traffic data/analysis referenced within the following report has been conducted by others.

2.2.3 Referenced Documents

I have reviewed the following documents as part of my assessment:

The following key documents have been relied upon when preparing this report:

- Transport Modelling and Analysis Final Transport Modelling Report, prepared by GHD (July, 2016),
- Altona North Integrated Transport Study Precinct 15 prepared by GTA Consultants (2nd December, 2016),
- Hobsons Bay Cumulative Impact Assessment Precinct 15 Collector Roads Technical Note, prepared by GHD (December 2016),
- Peer Review of Transport Assessment prepared by Traffix Group (dated 22nd December, 2016)¹,
- Altona North Development Contributions Plan 2017-2037, prepared by VPA (June, 2017),
- Altona North Comprehensive Development Plan 2017-2037, prepared by VPA (June, 2017),
- Nicholson Planning and Development Submission to Planning Scheme Amendment C88 dated 30 August, 2017,

¹ December 2016 Peer Review attached at Appendix B

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- Michael Holt Submission to Planning Scheme Amendment C88 dated 1 September, 2017,
- VicRoads Submission to Planning Scheme Amendment C88 dated 1 September, 2017,
- West Gate Tunnel Transport Impact Assessment, prepared by GHD, May 2017², and
- John Kiriakidis evidence to development application for 38-48 Blackshaws Road & 24 Sutton Street, South Kingsville (Precinct 16), VCAT Reference P1113/2015, GTA Consultants, 18 February 2016.

3 Amendment C88

3.1 Comprehensive Development Plan

Planning Scheme Amendment C88 seeks to rezone the land known as 'Altona North Precinct 15' from Industrial 1 Zone (IN1Z) and Industrial 3 Zone (IN3Z) to Comprehensive Development Zone (CDZ2), and rezone the Brooklyn Terminal Station site from Industrial 1 Zone (IN1Z) to Special Use Zone (SUZ6) and apply a Development Contributions Overlay.

It is envisaged that the rezoning will facilitate development of 3,000 dwellings, 5,500m² of gross retail floor space and 33,000m² of gross commercial floor space³.

A Comprehensive Development Plan (CDP) has been prepared for the area which includes a new internal road network as presented in Figure 1.

² <https://www.dropbox.com/s/zi961urvqdfnll1/Technical%20report%20A%20Transport%20Part%202.pdf?>

³ Comprehensive Development Plan, Table 1 – Summary Land Use Budget

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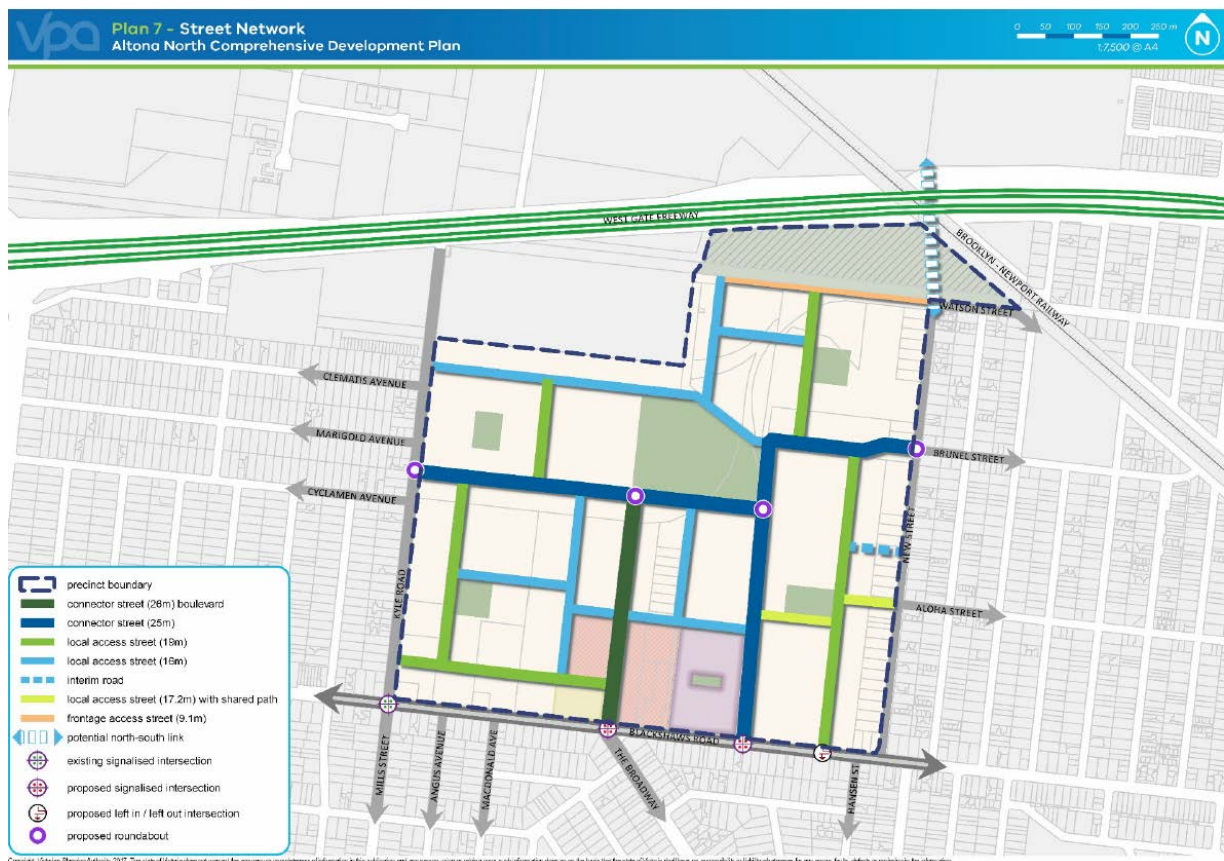


Figure 1: Proposed Street Network

The proposed internal road network includes a proposed east-west connector street running through the site, linking between the site frontage roads at Kyle Road and New Street. Two north-south connector streets are also proposed within the site linking to Blackshaws Road to the south, with one forming a northern extension of The Broadway.

Signalised intersections are proposed at both connector street intersections with Blackshaws Road, whilst four roundabouts are proposed on the east-west connector street including at its intersections with Kyle Road and New Street.

3.2 DCP Transport Projects

A Development Contributions Plan (DCP) has been prepared to apply to the entire Altona North Precinct 15 area. Costs associated with land acquisition and construction of each of the connector streets and intersections noted above are included in the DCP.

An additional intersection site where works are included in the DCP is at Blackshaws Road/Millers Road where it is proposed to modify the existing operation of the traffic signals and make changes to the linemarking on the Blackshaws Road east approach.

The relevant plan illustrating locations where intersection works are proposed in the DCP is presented at Figure 2.

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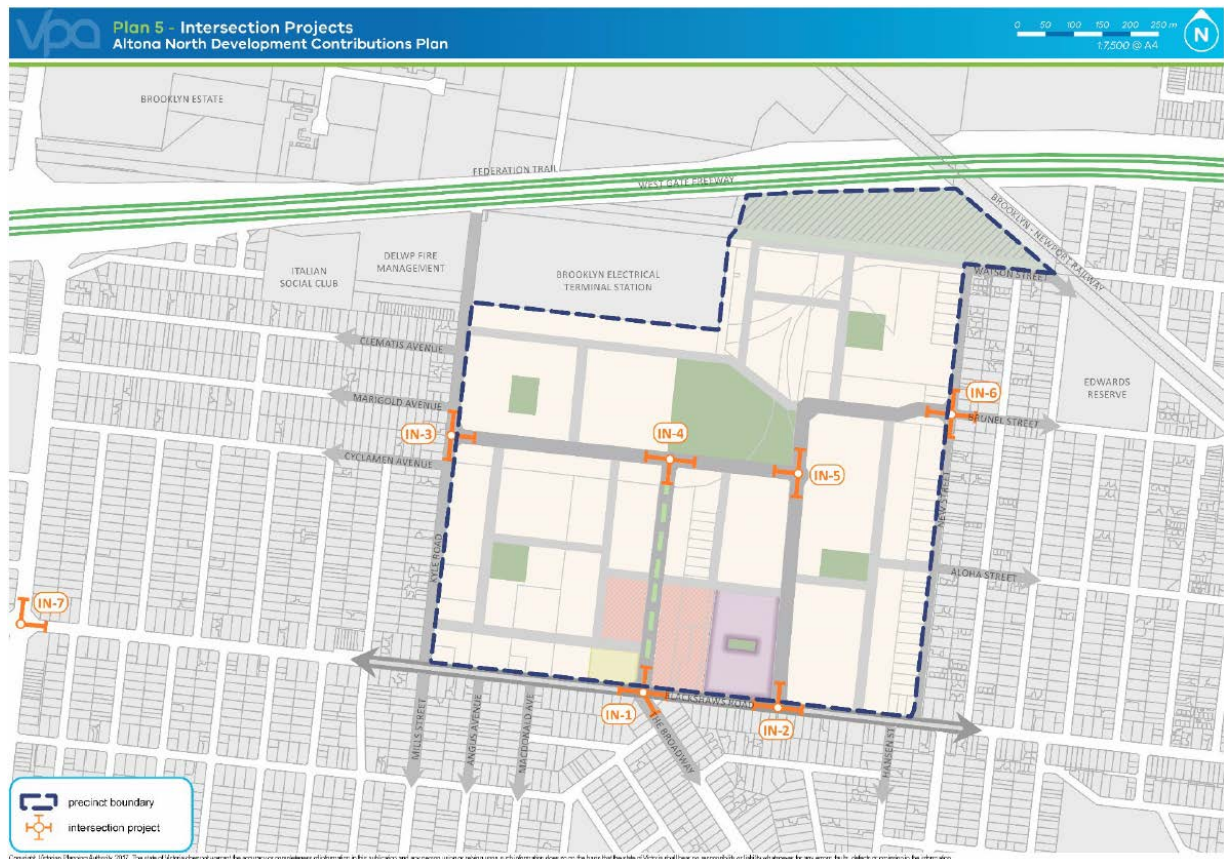


Figure 2: DCP Funded Intersection Works

3.3 Non DCP Transport Projects

The Comprehensive Development Plan also lists a number of transport related projects as part of a Precinct Infrastructure Plan which are not included in the DCP. Funding for these projects is to be collected through other mechanisms including contributions from Council, VicRoads and other State Government agencies as well as from developers. The additional transport projects are listed below and are noted in the diagram at Figure 3.

1. Blackshaws Road Cycle Lane Markings,
2. Blackshaws Road/New Street Intersection,
3. Blackshaws Road/Hansen Street Intersection,
4. Blackshaws Road/Shutt Street Intersection,
5. Spotswood Train Station Bus Stop,
6. Marigold Avenue Bus Stop Improvements,
7. Brunel Street Bus Stop Improvements,
8. Federation Trail Link Shared Path,
9. Cyclamen Avenue Bike Path,
10. Aloha Street Bike Path,

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11. The Broadway Bike Path, and
12. Spotswood Train Station Bicycle Parkiteer Facility.

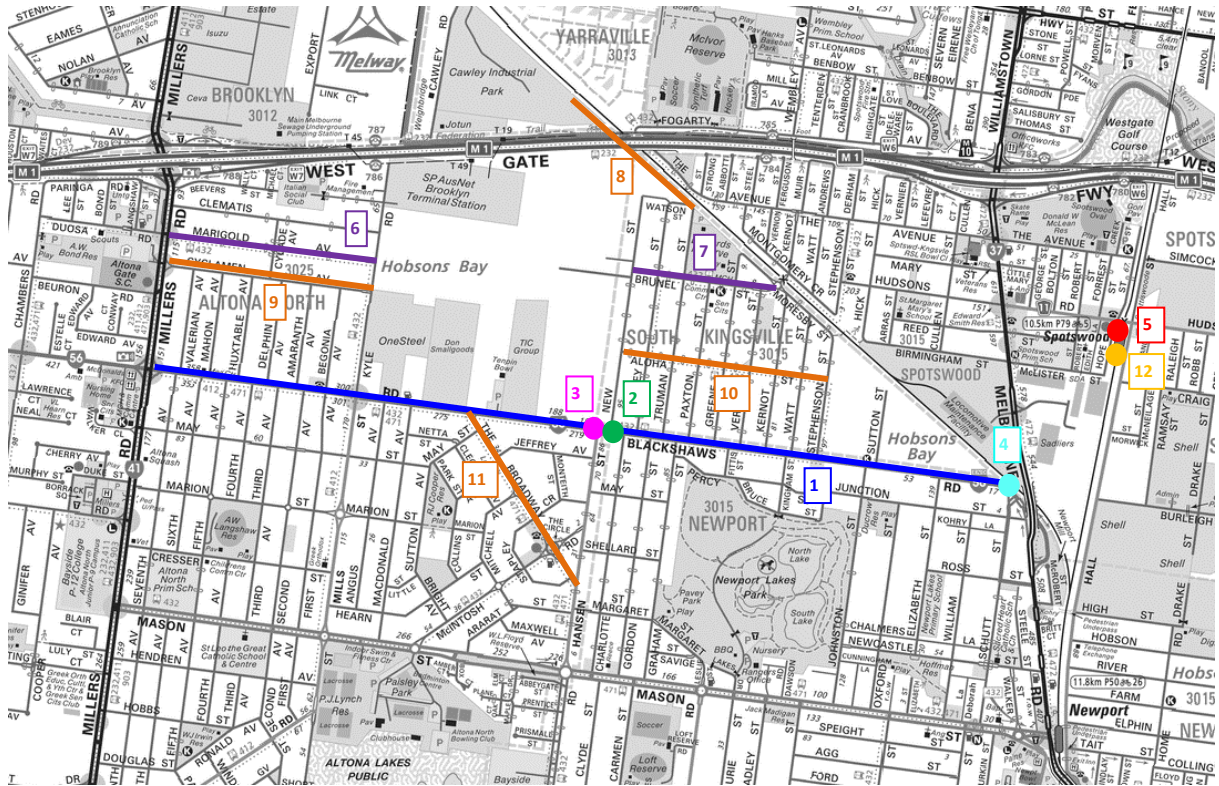


Figure 3: Additional Non-DCP Transport Works in CDP

I understand that the Federation Trail Link Shared Path (Project No. 8 above) is proposed to be funded as part of the West Gate Tunnel Project.

4 Existing Conditions

The Altona North Precinct 15 site is divided into a number of separate properties including some large properties fronting Blackshaws Road and Kyle Road and many smaller properties fronting New Street. The majority of the precinct is currently vacant, although industrial uses are still operating on a number of the smaller properties.

4.1 Surrounding Road Network

Precinct 15 is located in close proximity to the West Gate Freeway, with two nearby interchanges located at Millers Road to the west and Melbourne Road to the east. A diagram highlighting the main traffic route options between Precinct 15 and the West Gate Freeway interchanges is presented at Figure 4.

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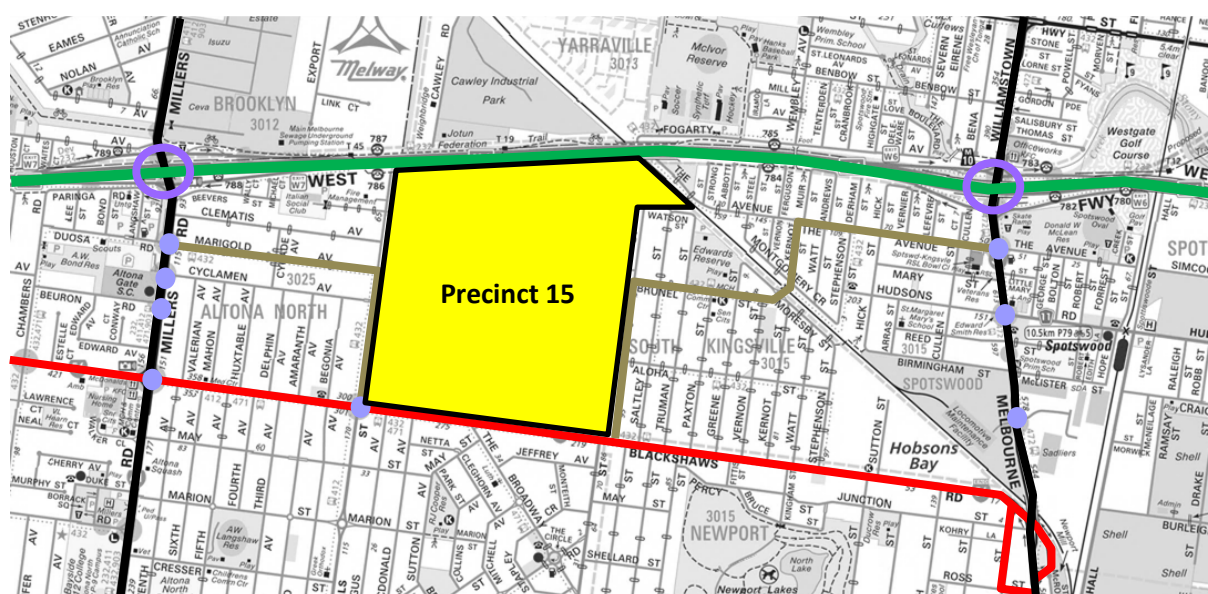


Figure 4: Main Traffic Routes to West Gate Freeway

The four route options from the site to the West Gate Freeway include:

- Blackshaws Road, Millers Road, West Gate Freeway (arterial road route),
- Blackshaws Road, Schutt Street, Ross Street, Melbourne Road, West Gate Freeway (arterial road route),
- Kyle Road, Marigold Avenue, Millers Road, West Gate Freeway (local street route), and
- New Street, Brunel Street, Kernot Street, The Avenue, West Gate Freeway (local street route).

The first two options involve travel within the VicRoads arterial road network, whereas the second two options involve a significant amount of traffic on local streets. In both cases the local street route options involve less travel distance than the arterial road options.

Some key attributes about each of the roads listed above are noted in Table 1.

Table 1: Surrounding Road Network Attributes

Road	Key Attributes
Blackshaws Road	<ul style="list-style-type: none"> • Undivided arterial road • One wide traffic lane in each direction • Kerbside parking permitted within traffic lanes • 60km/h speed limit
Millers Road	<ul style="list-style-type: none"> • Divided arterial road • Two through lanes and bicycle lane in each carriageway • Bus priority lanes at intersections • Closely spaced traffic signals along route • 60km/h speed limit

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Road	Key Attributes
Melbourne Road	<ul style="list-style-type: none"> • Generally undivided arterial road • Two through lanes in each direction • multiple traffic signals along route • 60km/h speed limit
Marigold Avenue	<ul style="list-style-type: none"> • Undivided local street containing bus route • Narrow 7m carriageway with no marked traffic lanes • Parking permitted on both sides of the street • Traffic signals at Millers Road (access in both north and south directions) • Speed cushions located along road • 50km/h speed limit
Kyle Road	<ul style="list-style-type: none"> • Undivided local street • One wide traffic lane in each direction • Kerbside parking permitted within traffic lanes • Traffic signals at Blackshaws Road • 50km/h speed limit
New Street	<ul style="list-style-type: none"> • Undivided local street • Narrow 7m carriageway with no marked traffic lanes • Parking permitted on both sides of the street • Speed cushions located along road • 50km/h speed limit
Brunel Street	<ul style="list-style-type: none"> • Undivided local street • 9m carriageway with no marked traffic lanes • Parking permitted on both sides of the street • Speed cushions located along road • 50km/h speed limit
Kernot Street	<ul style="list-style-type: none"> • Undivided local street • 8.5m carriageway with one marked traffic lane in each direction • Parking permitted on both sides of the street • Railway level crossing located near Brunel Street roundabout • 50km/h speed limit
The Avenue	<ul style="list-style-type: none"> • Undivided local street • Marked traffic and bicycle lanes in each direction • Kerbside parking permitted within bicycle lanes • Traffic signals at Melbourne Road with left turn slip lane • 50km/h speed limit

4.2 Public Transport Services

Precinct 15 is accessible by public transport with three bus routes in close proximity to the site through the intersection at Blackshaws Road/Kyle Road/Mills Street.

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These services include:

- Route 412 between Laverton and Footscray,
- Route 432 between Newport and Yarraville, and
- Route 471 between Williamstown and Sunshine.

All three of these routes service the nearby Altona Gate Shopping Centre, and two of the routes also connect to Newport Railway Station approximately 2.5km to the south-east. The closest railway station to the site is Spotswood, located approximately 2km to the east of the site.

A diagram illustrating the existing public transport services near the site is presented at Figure 5.

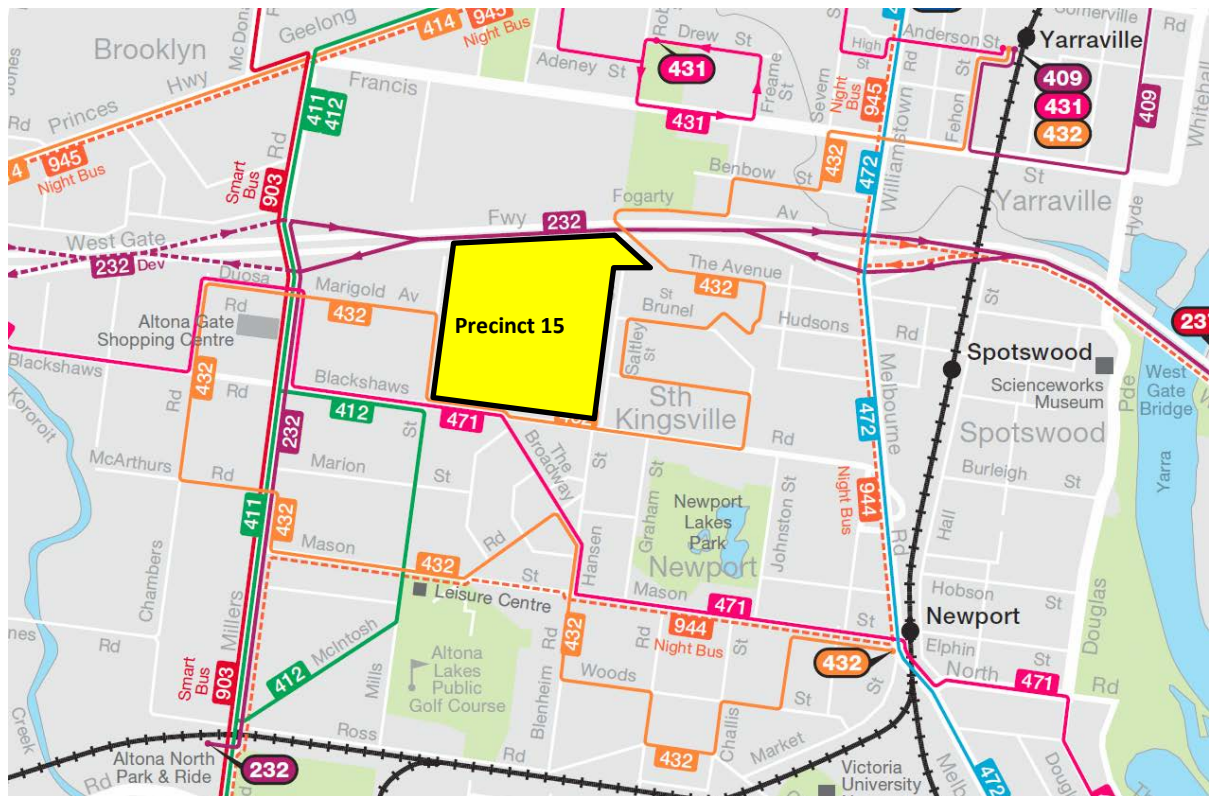


Figure 5: Existing Public Transport Services

Services are reasonably frequent on the two bus routes connecting to Newport Railway Station, with services operating at 20 minute headways on both bus routes 432 and 471. A 40 minute service headway operates on bus route 412.

Trains operate from Spotswood Railway Station at 10 minutes intervals in both directions, with trains operating even more frequently from Newport Station at 5 minute intervals, as express services also depart from this station.

5 Traffic Modelling

An Integrated Transport Study (ITS) was prepared by GTA Consultants for the Victorian Planning Authority to guide the provision of transport infrastructure to service a future redevelopment of the Alton North Precinct 15 site.

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The ITS is reliant on strategic transport modelling using the Victorian Strategic Transport Model (VITM) undertaken by GHD for Hobsons Bay City Council. This strategic transport modelling is referred to as the Cumulative Impact Assessment or CIA and considers full development of the Precinct 15 site as well as other sites within Hobsons Bay and the surrounding area up until the year 2031. Changes to the transport network are also incorporated into the model including the West Gate Tunnel Project and the Melbourne Metro Rail Project.

A number of different scenarios were considered as part of the CIA modelling, however the version that was adopted for the ITS is Scenario 6a which is based on 3,000 dwellings within the Precinct 15 site.

5.1 CIA Modelling Limitations

A shortcoming of the Scenario 6a model is that it does not include connector road access into the site from Kyle Road and New Street as per the arrangement included in the CDP. Instead, the only connector road access to the site that is included in the model is via Blackshaws Road. This has the impact of overestimating traffic volume generated by the site travelling along Blackshaws Road, Kyle Road and New Street, whilst underestimating traffic travelling along local streets to the east and west of the site including Marigold Avenue, Brunel Street, Kernot Street and The Avenue.

A later Scenario incorporating the connector road connections was modelled by GHD in December 2016 (Scenario 6g) however this was not included in the ITS. The more recent modelling undertaken by GHD suggests that traffic volumes on the local streets west of the site including Marigold Avenue are expected to experience an additional 800 vehicle movements in the 2 hour AM peak period compared to the traffic volume increase assumed in the ITS. This represents a 67% increase in traffic volume compared to what has been assumed in the ITS. For Brunel Street to the east of Precinct 15, the more recent modelling suggests the traffic volume will be 45% higher than what has been assumed in the ITS.

Another limitation of strategic transport models more generally is that their accuracy is limited to the level of detail that it included in the base model. Whereas strategic models are regularly calibrated to a suitable level of accuracy for the arterial road network, they are often less accurate for local roads as the more finely grained nature of the local road network is not included in the model.

For the local road network surrounding Precinct 15 it is noted that only Clematis Avenue (and not Marigold Avenue) has been included in the model as a local street connection between Millers Road and Kyle Road and that no traffic counts have been undertaken to calibrate the model in The Avenue, Schutt Street, Ross Street or Blackshaws Road to the east of New Street.

An extract from the Calibration and Validation report for the CIA model showing the locations where counts were undertaken to calibrate the model is presented in Figure 6. In this figure count locations are represented by red spots or black circles.

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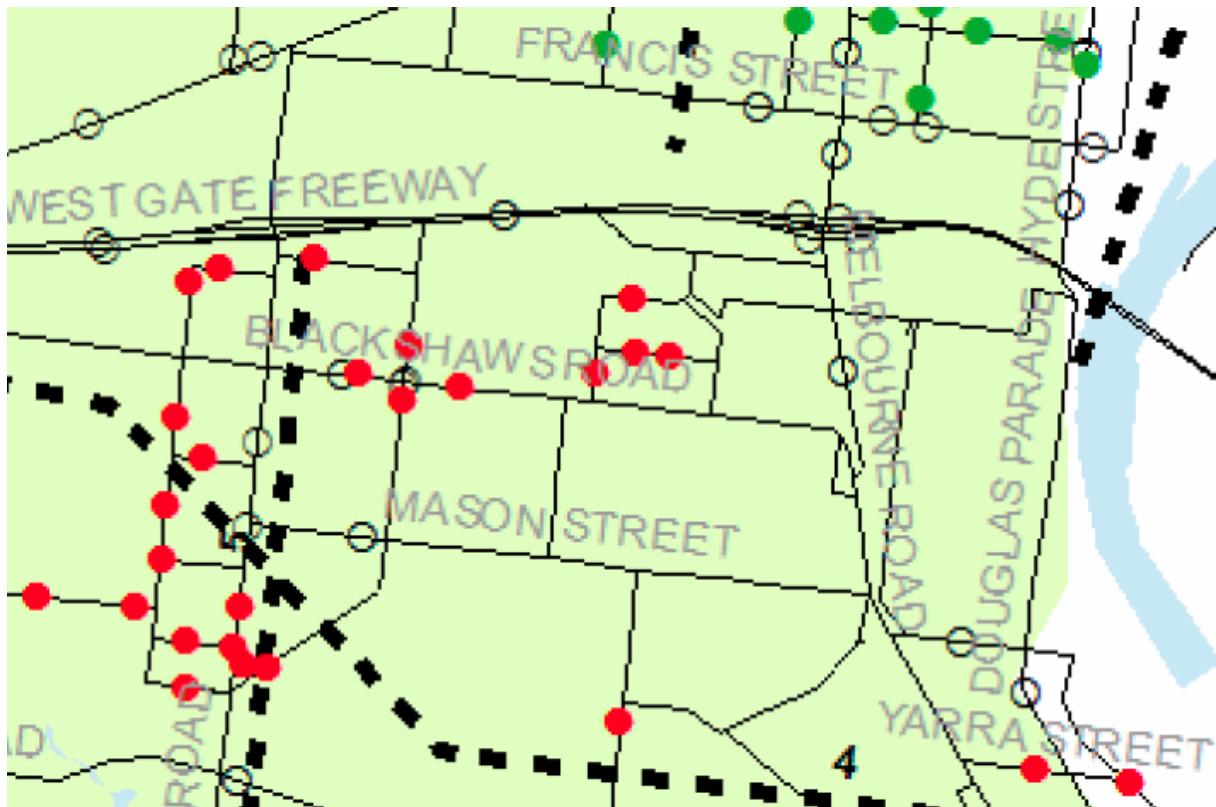


Figure 6: CIA Model Traffic Count Locations for Calibration

5.2 Existing Conditions SIDRA Intersection Modelling

In addition to the CIA Modelling, separate traffic counts at individual intersections were also undertaken to inform the ITS including along Millers Road, Blackshaws Road and Melbourne Road in the vicinity of Precinct 15. These counts provide actual turning movements at intersections and are more accurate than the mid-block link volumes provided in the CIA.

SIDRA Intersection models were prepared for each of the above intersections to assess the existing intersection performance. Due to the close spacing of intersections along both Millers Road and Melbourne Road, the intersections along each of these roads were modelled as networks.

Importantly, the SIDRA Intersection modelling included the critical intersections along Millers Road at West Gate Freeway, Marigold Avenue and Blackshaws Road and also the critical intersection along Melbourne Road at Ross Street, The Avenue and West Gate Freeway.

The SIDRA Intersection analysis identified three intersections that are currently operating very poorly in the AM peak at West Gate Freeway/Millers Road, West Gate Freeway/Melbourne Road and Millers Road/Clematis Avenue. During the PM peak all of the intersections were found to operate within acceptable limits.

5.3 Assumed Traffic Distribution

In order to predict post development traffic volumes through each of the critical intersections, the CIA model has been interrogated to identify the percentage change in traffic volume on each link between the base 2015 model (existing conditions) and the 2031 post development model (Scenario 6a).

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Diagrams are included in the ITS which show the predicted traffic growth on each link in the CIA model. The diagram representing the percentage change in approach volumes for the AM peak is reproduced in Figure 7 and the diagram representing the change in departure volumes for the PM peak is reproduced in Figure 8.



Figure 7: CIA Model AM Peak Traffic Growth Presented in ITS (Approach Volumes)

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Figure 8: CIA Model PM Peak Traffic Growth Presented in ITS (Departure Volumes)

A key concern for both diagrams is that there is assumed to be a reduction in traffic volumes along Marigold Avenue, Kyle Road, The Avenue and Melbourne Road, whilst traffic volumes along Clematis Avenue and Hudsons Road are predicted to significantly increase.

The reduction in traffic volumes along Marigold Avenue, Kyle Road, The Avenue and Melbourne Road is illogical given that development within Precinct 15 would be expected to result in some traffic being distributed along these streets. The reason for the anomalies along Marigold Avenue and The Avenue can be explained due to the limitations of the CIA modelling discussed previously. However, it is concerning that this has formed the basis for the traffic assessments within the ITS.

The projected reduction in traffic volume along Melbourne Road is apparently due to the projected impacts of the West Gate Tunnel Project and is explained in the ITS as follows:

'It is noted that Scenario 6a not only includes the development of Precinct 15 (subject site), but Precinct 16, Precinct 20 and other 'business as usual' background development growth expected up to 2031 in and affecting the area. This includes the construction of the Western Distributor and widening of the West Gate Freeway, which based on the CIA Model is expected to attract additional traffic volumes through improved travel times and additional network capacity, as well as redirecting some traffic flows due to changes in travel routes and access locations to the freeway network.'

Ultimately, the CIA Model indicates that there will be increased traffic volumes in Millers Road trying to access the interchange with the West Gate Freeway and Western

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Distributor (last access point before the Yarra River) and a reduction in traffic volumes on Melbourne Road, as it won't be possible to access the Western Distributor from the interchange with the West Gate Freeway, so less people will want to utilise this interchange.'

The above assumes that a large portion of traffic which currently utilises Melbourne Road to access the West Gate Freeway will shift to Millers Road to instead access the West Gate Tunnel and that this shift will outweigh any additional traffic generated by Precinct 15 towards Melbourne Road. This assumption is improbable in my opinion given that the West Gate Tunnel is proposed to be tolled whereas the West Gate Bridge will remain free and that traffic currently on Melbourne Road would need to deviate in the wrong direction (i.e. away from Melbourne) in order to access the freeway network at Millers Road to head towards the West Gate Tunnel. Further, if the West Gate Tunnel project did attract more traffic via the Millers Road interchange, this would make the Melbourne Road interchange comparatively more attractive as it would become less congested.

A more detailed review of the CIA model outputs shows that in fact traffic volumes along Melbourne Road are projected to grow between the 2015 base year and 2031 in the base case scenario without assuming any development in Precinct 15.⁴ Further traffic growth is found to occur when the development of Precinct 15 is also included in the model.

A review of strategic transport modelling outputs from the West Gate Tunnel project shows that traffic volumes along the section of Melbourne Road between Hudsons Road and the West Gate Freeway are expected to increase significantly, with traffic in the northbound direction increasing from 2,200 vehicles in the 2 hour AM peak period to 4,000 vehicles between 2016 and 2031 after the West Gate Tunnel project has been completed.⁵

The above suggests that the traffic volume assumptions in relation to Melbourne Road in the ITS are substantially incorrect and that traffic impacts on this route have been underestimated.

To determine post development traffic volumes through individual intersections, the percentage change from the CIA modelling has been applied to the existing turning movement volumes documented in the ITS with some interpretation applied to ensure there is a reasonable balance in traffic volumes between upstream and downstream intersections.

The process used in the ITS to convert link volumes into turning movement volumes is considered reasonable, however it is reliant on the accuracy of the CIA model, which as discussed has a number of shortcomings.

To further highlight the irregularities with the CIA modelling, I have obtained screenshots from the Google Maps application to represent travel times from the Precinct 15 site to the West Gate Freeway to the east of the Melbourne Road interchange during the AM peak period between 8am and 9am via the 4 alternative routes discussed in Section 4.1. These results are presented in Figure 9 through to Figure 12.

⁴ GHD Transport Modelling and Analysis Final Transport Modelling Report, July 2017, Figure 25

⁵ GHD West Gate Tunnel Transport Impact Assessment, May 2017, Appendix C

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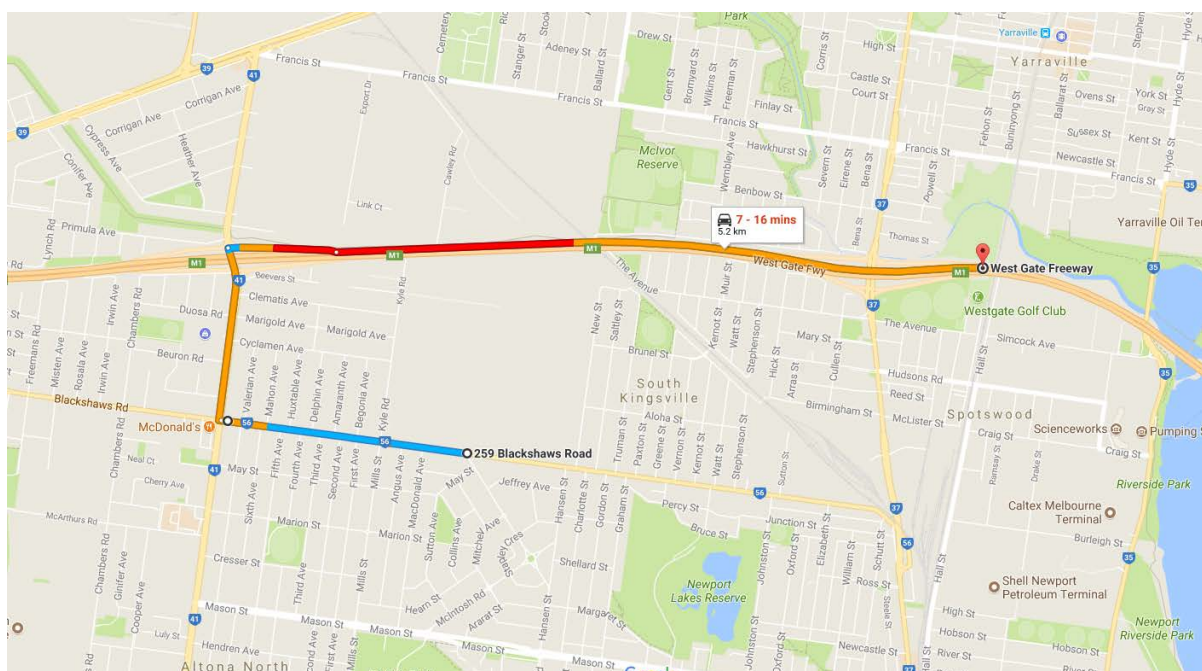


Figure 9: AM Peak Travel Time to West Gate Bridge via Blackshaws Road/Millers Road

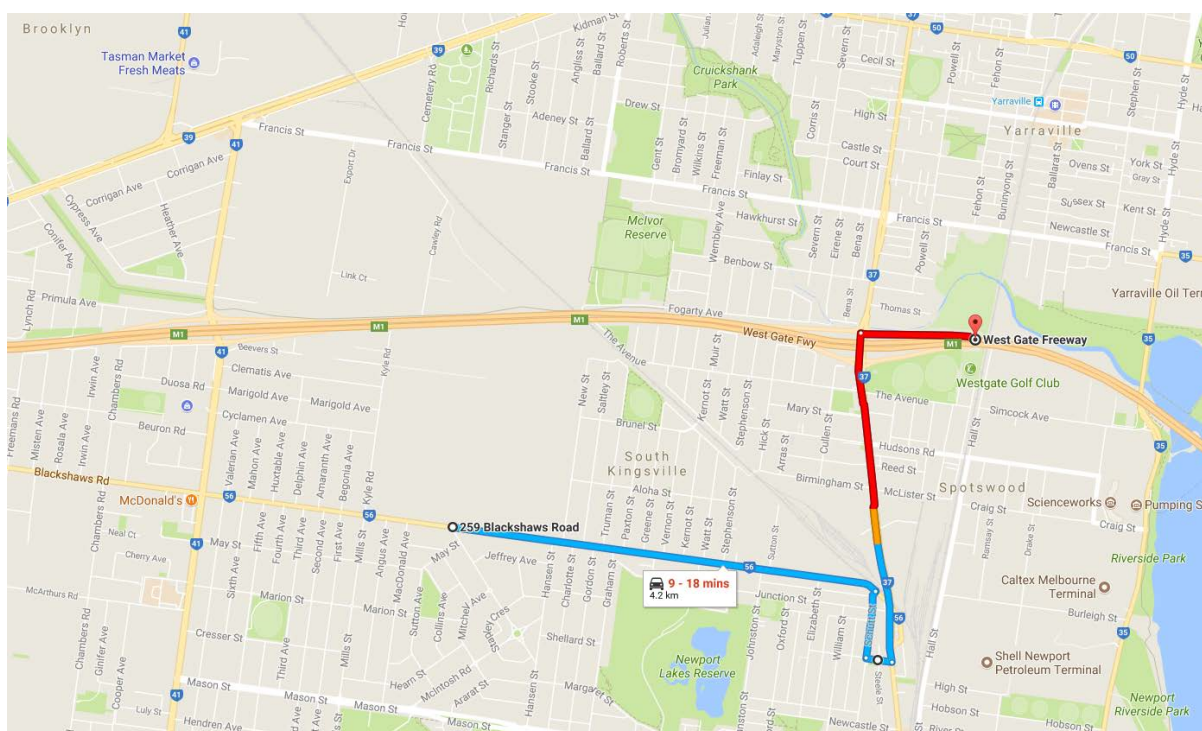


Figure 10: AM Peak Travel Time to West Gate Bridge via Blackshaws Road/Melbourne Road

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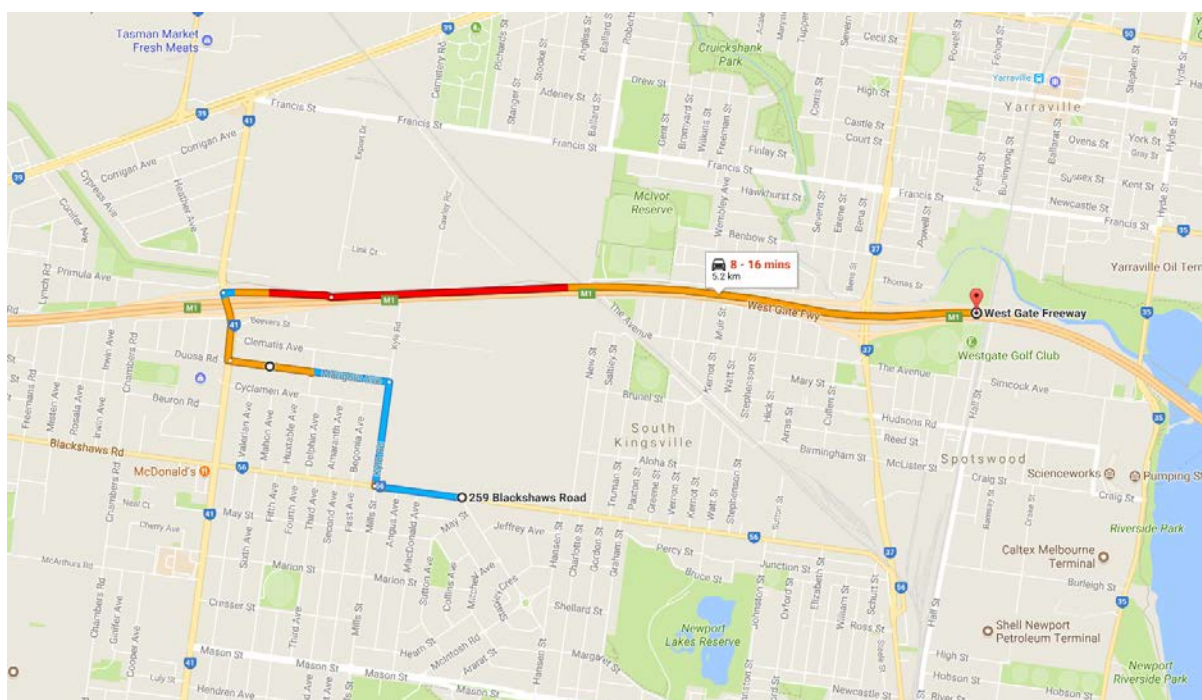


Figure 11: AM Peak Travel Time to West Gate Bridge via Marigold Avenue/Millers Road

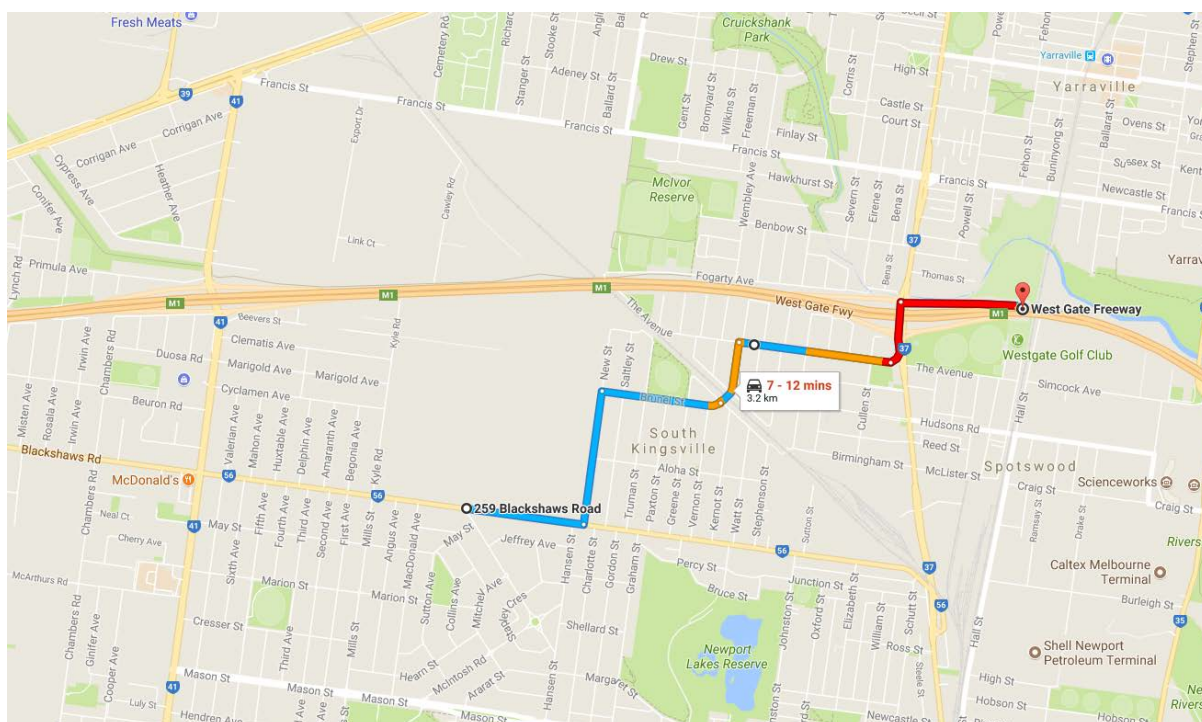


Figure 12: AM Peak Travel Time to West Gate Bridge via The Avenue/Melbourne

A summary of the travel times via the various route alternatives is presented in Table 2.

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Table 2: AM Peak Travel Times to West Gate Bridge

Route	Minimum Travel Time	Maximum Travel Time	Average Travel Time
Blackshaws Road/ Millers Road	7 min	16 min	11.5 min
Blackshaws Road/ Melbourne Road	9 min	18 min	13.5 min
Marigold Avenue/Millers Road	8 min	16 min	12 min
The Avenue/Melbourne Road	7 min	12 min	9.5 min

The comparison table suggests that the route via The Avenue and Melbourne Road is likely to be the most attractive route for traffic generated by Precinct 15 to access the West Gate Bridge.

It is noted that this analysis is weighted towards the two routes via Blackshaws Road as the routes all commence at the Blackshaws Road/Broadway intersection and do not include delay turning into Blackshaws Road which would be a feature of these routes. Further, trips generated by development within the northern portion of the site is likely to be further attracted to the Marigold Avenue and The Avenue routes.

Interrogating the difference between the existing and post development turning movements documented in the ITS⁶, it is possible to identify the increase in traffic volume distributed in each of the three directions from the site as noted below.

- Traffic distributed to/from the south via Kyle Road, New Street or one of the proposed site access roads to Blackshaws Road,
- Traffic distributed to/from the west to Millers Road via Marigold Avenue, Clematis Avenue or Cyclamen Avenue, and
- Traffic distributed to/from the east via Brunel Street.

Table 3: Adopted Traffic Distributions in ITS (Vehicles per Hour)

Traffic Distribution	AM Entering	AM Exiting	AM Total	PM Entering	PM Exiting	PM Total
South to Blackshaws Road	409	987	1396	625	616	1241
West to Millers Road via local streets	-2	10	8	492	31	523
East via Brunel Street	5	460	465	7	53	60
TOTAL	412	1457	1869	1124	700	1824

⁶ Reference ITS Figures 6.5, 6.6, 6.11 & 6.12

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The adopted traffic distribution in the ITS suggests that there is an underestimate of traffic accessing the site via the local streets to the west in the morning and an underestimate of traffic accessing the site to the east via Brunel Street and The Avenue particularly in the afternoon.

Some of the individual turning movements that are most questionable in the ITS are:

- Negligible change in traffic volumes turning right from Marigold Avenue into Millers Road during both peak periods.
- Negligible change in traffic volume turning left from Ross Street into Melbourne Road during AM peak.
- Significant reduction in traffic turning left from The Avenue into Melbourne Road during AM peak period (reduction from 715 to 224 vehicles per hour).
- Significant reduction in traffic turning right from Melbourne Road onto West Gate Freeway in AM peak (reduction from 1,071 to 512 vehicles per hour).

Although there are concerns about the distribution of traffic generated by the site, the quantum of traffic generated between 1,824 to 1,869 vehicle movements in the peak hour is considered reasonable as presented in Table 4 based on a first principles assessment adopting typical traffic generation rates and applying discounts for internally based trips.

Table 4: Estimated Peak Hour Traffic Generation

Use	Peak Hour Traffic Generation Rate	Peak Hour Traffic Generation (vehicle movements)
3,000 dwellings	0.5 per dwelling	1,500
5,500m ² Retail Floor Space ⁷	12.5 per 100m ²	688
33,000m ² Commercial Floor Space ⁸	1.2 per 100m ²	396
Sub-Total		2,584
Less Internal Trip Discount 25% Residential Component		-375
Less Internal Trip Discount – Retail/Commercial Component		-375
TOTAL PEAK HOUR GENERATION		1,834

The ITS states that the CIA assumes a mode split of 12% to public transport generated by Precinct 15 as part of the 2031 post development modelling. This is broadly consistent with the existing public transport mode share of 13.9% for journeys to work from the suburb of Altona North from the recent 2016 Census.

Further interrogation of the CIA report, however, shows that the stated 12% mode share is based on a combination of 18% mode share of trips from the site by public transport in the AM peak and 5%

⁷ Assumed on the basis of majority supermarket floor space

⁸ Assumed as commercial office space

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mode share of trips to the site by public transport in the same period. The reported journey to work figure in the ABS Census relates only to journeys to work from the suburb of Altona North, so in reality the CIA is reporting on a higher than existing level of trips generated by public transport. Accordingly, the public transport mode share is not conservative as stated in the ITS.

5.4 Post Development SIDRA Intersection Modelling

Notwithstanding the issues identified with the adopted traffic distribution, the ITS presents the results of SIDRA Intersection modelling at each of the critical intersections assuming the adopted post development traffic volumes.

The results show that a number of the intersections are expected to operate beyond acceptable levels as noted below.

- Millers Road intersections at West Gate Freeway, Marigold Avenue, Cyclamen Avenue, Beuron Road and Blackshaws Road, and
- Melbourne Road intersection with West Gate Freeway.

The ITS downplays the significance of the Millers Road intersections operating above capacity by assuming that improvement works to be undertaken at the Millers Road/West Gate Freeway interchange as part of the West Gate Tunnel Project will alleviate these concerns. However, there is no detail included in the ITS describing the quantum of these works or any intersection modelling provided to confirm that these works will be sufficient.

In relation to the Melbourne Road/West Gate Freeway interchange there is no discussion of the need for mitigating works despite the SIDRA analysis confirming that the intersection will operate above its capacity and despite no mention of mitigating works to be undertaken as part of the West Gate Tunnel project. The expected underestimation of traffic volumes through this intersection in the CIA model will further intensify the need to treat this intersection and the adjacent intersection at Melbourne Road/The Avenue, which does not appear to have been accurately modelled due to the issues with the CIA data.

An interrogation of the SIDRA models previously provided to Hobsons Bay reveals that there has been no allowance made in the models to allow for ramp metering on the freeway on-ramps during peak periods. This suggests that both the West Gate Freeway/Melbourne Road and West Gate Freeway/Millers Road interchanges are likely to operate worse than what has been reported in the ITS. An appropriate method to represent this impact could be to apply a capacity reduction factor to apply to entry movements onto the freeway.

Given the uncertainties with the traffic modelling that has been undertaken and the likelihood that a number of intersections will be operating beyond their desirable capacities, it would not be appropriate to allow any further development on the Altona North Precinct 15 site beyond what has been contemplated in the CDP unless more robust traffic modelling were to be undertaken with suitable measures identified to ameliorate traffic concerns.

Millers Road/Blackshaws Road

The ITS acknowledges a need to undertake mitigating works at the Millers Road/Blackshaws Road intersection as the existing intersection is found to operate above capacity in the post development

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scenario even when downstream queuing on Millers Road back from the West Gate Freeway is ignored.

The proposed solution is to modify the existing signal operation and linemarking on the Blackshaws Road east approach to the intersection to incorporate split phasing for the Blackshaws Road approaches and provide a double right turn lane for the right turn movement from east to north. This is consistent with the \$25,300 treatment (IN-7C) included in the DCP.

This modified arrangement is found to improve performance so that the intersection operates marginally below its capacity with a Degree of Saturation (volume/capacity ratio) of 0.99 in the AM peak, however is still greater than the typical DOS limit of 0.95 that is considered acceptable.

Interrogation of the SIDRA files revealed a number of minor anomalies including that the average delays to buses on Millers Road (including the 903 Smartbus Route) are projected to increase from 10 seconds to 48 seconds in the AM peak due to the introduction of the split phasing. Also, it appears that traffic has not been restricted from using the existing bus lanes on the Millers Road approaches to the intersection. Correcting these issues in the model is likely to push the post development DOS above 1.0 such that capacity is exceeded.

Council and VicRoads have explored further alternatives to improve performance at this intersection which include minor widening of the Blackshaws Road east approach to include three stand-up lanes including a through traffic lane in addition to the two right turn lanes.

A series of concept plans have been prepared by Council to show the amended arrangement, with one such plan presented below at Figure 13.

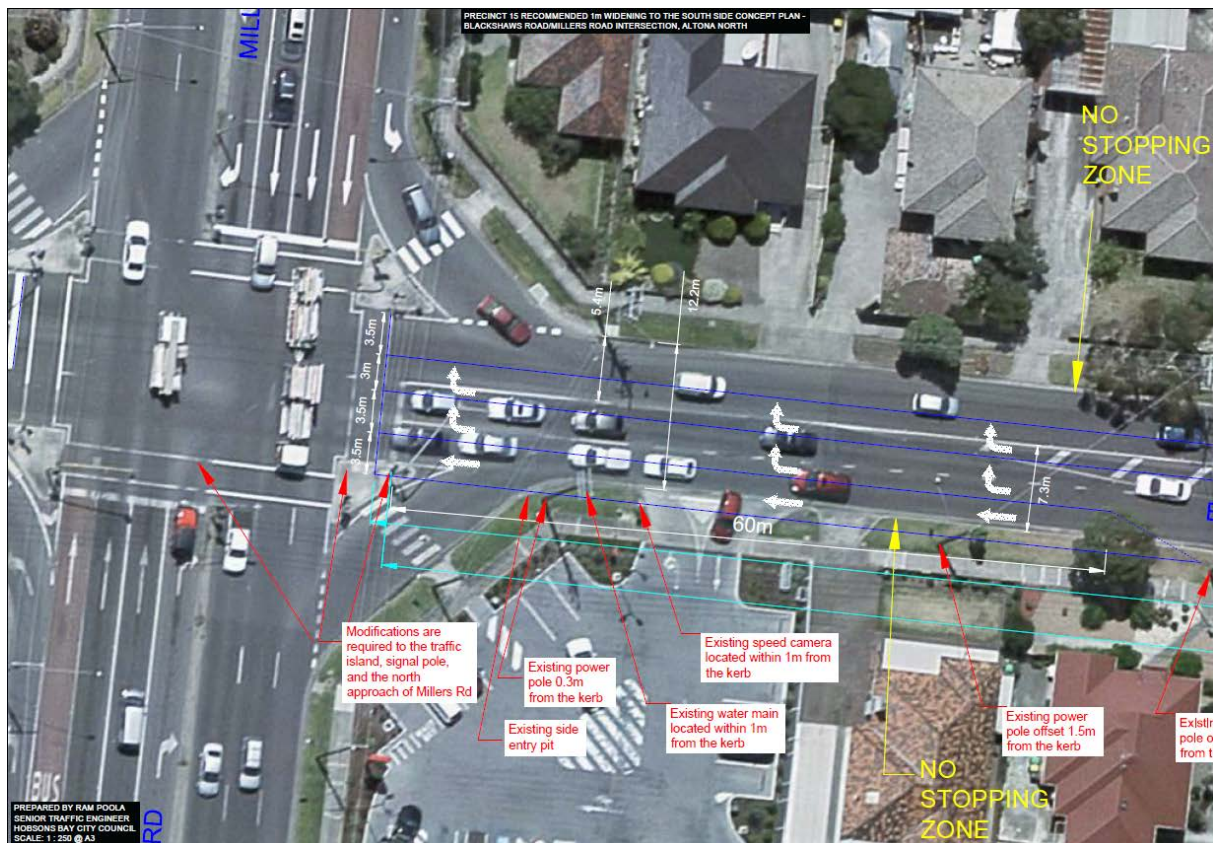


Figure 13: Blackshaws Road/Millers Road Intersection Works Recommended by Council/VicRoads

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VicRoads has undertaken further SIDRA modelling to test this alternative treatment and has found that it results in better performance than the arrangement proposed in the ITS.

It is my opinion that the arrangement proposed by VicRoads/Council is preferable to the arrangement in the ITS noting that the ITS/CDP arrangement does not fully address the projected traffic congestion issues and will still result in the intersection resulting beyond acceptable limits. I note that some refinement to the Council concept is likely to be required to ensure that heavy vehicles can adequately turn right from Millers Road south approach into Blackshaws Road to head east.

5.5 Other Mitigation Measures Not Included in DCP

As demonstrated above there are expected to be a number of traffic impacts in the surrounding road network that are not addressed by items included in the DCP. Indeed, the DCP itself identifies a number of transport projects necessary to facilitate development that are not proposed to be DCP funded.

It is understood that the reason for the works not being included in the DCP is that they are to be subject to a Local Area Traffic Management study (LATM) to address the impacts to the surrounding local street network resulting from development of Precinct 15 and will be subject to consultation with the local community to ensure that the proposed measures have community support.

It is understood that the LATM study is expected to cost in the order of \$40,000 and that the cost of implementing works recommended in the LATM is expected to be in the order of \$500,000 to \$600,000. Given the need for the need for the LATM study results directly from the development of Precinct 15, it is my opinion that it would be a reasonable proposition for the study and the implementation of its recommendation to be funded at least in part from the proposed development, noting that traffic volumes on a number of local streets are expected to increase significantly.

Marigold Avenue

Marigold Avenue is likely to be the street that is most impacted by the Precinct 15 development given that it is the only local street west of Precinct 15 that provides signalised access onto Millers Road and facilitates right turn movements to head north towards the freeway.

Whereas southbound traffic on Millers Road turning left towards Precinct 15 will have the choice of three local streets in Clematis Avenue, Marigold Avenue and Cyclamen Avenue, all westbound traffic wishing to turn right onto Millers Road using the local street network is expected to travel along Marigold Avenue.

The most recent iteration of the CIA model (Scenario 6g) suggests that traffic volumes on the local streets west of Kyle Road are expected to increase to 2,000 vehicles in the two hour peak period 7am and 9am, with the majority of this traffic expected to use Marigold Avenue due to the traffic signals at Millers Road.

With a pavement cross-section of only 7.0m and the possibility of parking on both sides of the street, the projected traffic volume of 2,000 vehicles is within the range of what could be an appropriate traffic volume over a 24 hour period and not what could be accommodated during the morning peak. Indeed if this traffic volume were to eventuate it could be expected that there would be regular grid-lock situations where vehicles in both directions are blocked due to parked vehicles narrowing the

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trafficable width to a single lane. It could also be expected that there would be westbound traffic queues extending for a significant length of the street.

Conditions at the Marigold Avenue/Millers Road/Duosa Road were observed during the AM peak period. It was noted that traffic turning right out of Marigold Avenue has to filter through traffic turning left out of Duosa Road as both movements occur at the same time. This limits the amount of traffic that is able to turn right out of Marigold Avenue each cycle. Many vehicles turning right out of Marigold Avenue were observed to ignore the priority rules that apply at the intersection and undertake the right turn at the same time as traffic turned left out of Duosa Road. This results in a potentially unsafe situation and may have contributed to the three casualty crashes at this intersection noted in the ITS.

To address the issues at the Marigold Avenue/Millers Road/Duosa Road intersection it may be necessary to adjust the signal phasing such that Marigold Avenue and Duosa Road operate in a split phasing arrangement to eliminate the conflict between left and right turning movements. Such an arrangement would provide more opportunity to control the amount of traffic that is able to turn right out of Marigold Avenue which could also provide priority to the bus that operates along this street.

More fundamentally there are also issues with the amount of traffic expected to use Marigold Avenue and the impacts when parking occurs along the street. Potential solutions could include converting Marigold Avenue and Cyclamen Avenue to a one-way pair such that Marigold Avenue permits only westbound movements and Cyclamen Avenue only eastbound movement to reduce the potential for conflicts in the street. Other potential treatments could include removal of on-street parking or implementing a full closure or partial closure of the eastern end of the street to deter through traffic.

Each of the above possible solutions would significantly impact existing residents and it is therefore appropriate that they should be considered as part of a comprehensive LATM study.

Brunel Street, Kernot Street and The Avenue

Each of Brunel Street, Kernot Street and The Avenue are also expected to experience an increase in traffic volume as a result of the Precinct 15 development. However unlike Marigold Avenue, the cross-section of these streets is generally sufficient to accommodate increased traffic volumes. Nevertheless, it would be appropriate for the LATM study to also incorporate these streets to consider whether any additional traffic management is necessary.

The intersection at Melbourne Road/The Avenue requires further consideration noting that there are currently 715 vehicles that turn left at this intersection from The Avenue into Melbourne Road to head north during the AM peak hour.

Conditions in the AM peak period were observed at this intersection and it was found that vehicles regularly queued two abreast within the existing unsignalised left turn slip lane and that vehicles often 'pushed in' to the stationary northbound traffic queue in Melbourne Road to access the right turn lanes onto the West Gate Freeway. This had the effect of allowing traffic using The Avenue to have a much quicker route to the West Gate Freeway than vehicles travelling northbound on Melbourne Road and also caused potential for collisions as the northbound left lane on Melbourne Road was regularly free flowing whilst the right lane was queued, with vehicles from The Avenue regularly blocking the free flowing lane to access the right turn lane queue. The ITS identified five casualty crashes that occurred at this intersection in the last five years.

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A potential solution to this issue may be to realign the left turn slip lane from The Avenue to intersect with Melbourne Road at a high entry angle to replace the existing sub-standard arrangement and to signalise the left turn slip lane to prevent traffic from The Avenue pushing into the queue ahead of northbound traffic on Melbourne Road. To ensure that capacity is maintained it may be necessary to formally provide for two left turn slip lanes as part of this arrangement.

Melbourne Road/West Gate Freeway Interchange

The Melbourne Road/West Gate Freeway Interchange is currently operating above its capacity and this is only likely to worsen following the development of Precinct 15, despite the finding in the CIA modelling that traffic volumes on Melbourne Road will reduce.

Improvements to the Melbourne Road/West Gate Freeway interchange however, may be beyond the scope of what could reasonably be funded through a direct contribution from the Precinct 15 development, however further improvements will need to be identified for State Government funding which could include provision of a third northbound right turn lane onto the West Gate Freeway.

Melbourne Road/Ross Street Intersection

One of the shortcomings of Blackshaws Road as an arterial route is that it does not connect directly with Melbourne Road to facilitate left turn movements to head north. The existing arrangement involves eastbound traffic diverting via Schutt Street and Ross Street in order to turn left onto Melbourne Road.

Whilst SIDRA modelling in the ITS suggests that the left turn movement into Melbourne Road from Ross Street will operate acceptably, similar analysis undertaken recently by Mr John Kiriakidis from the same consultancy (GTA) who prepared the ITS as part of his evidence for the nearby Precinct 16 development at 38-48 Blackshaws Road found differently. In his evidence Mr Kiriakidis stated:

‘However, due to the amount of additional traffic turning left onto Melbourne Road (west approach) in the AM peak hour period, intersection performance (during this peak hour period) is expected to deteriorate and operate with a very poor level of service.’

Indeed, SIDRA outputs included in his evidences suggested that the left turn movement onto Melbourne Road would operate with a Degree of Saturation above 1.0. His evidence goes on to suggest that installing detector loops in Ross Street that activate the nearby pedestrian operated signals to the south in Melbourne Road may be appropriate in the longer term to provide gaps in the Melbourne Road traffic to allow Ross Street traffic to exit.

This arrangement is considered appropriate in my opinion and is also supported by VicRoads in their evidence together with the banning of the right turn exit movement from Ross Street into Melbourne Road which I also support. Contributions to these works should be shared in my opinion between the developments at Precincts 15 and 16, noting that improvements to the left turn movement from Ross Street into Melbourne Road would be complimentary to discouraging traffic from using the local street route via Brunel Street, Kernot Street and The Avenue.

Blackshaws Road Turn Lane Treatments

One of the non-DCP funded treatments included in the documentation within the DCP includes changes to the existing cross-section of Blackshaws Road to include protected right turn lanes into Hansen Street, New Street and Schutt Street.

These treatments would replace the existing informal cross-section of Blackshaws Road which currently provides for two informal lanes in each direction when there is no on-street parking, but provides for only one lane in each direction when parking occurs. Implementing the protected right turn lanes treatments would result in the need for the removal of parking at these locations and is appropriate in my opinion although adjacent residents would need to be consulted.

Blackshaws Road/The Broadway/Site Access

The proposed linemarking treatment at Blackshaws Road/The Broadway/Site Access (DCP IN-01) appears to have very short auxiliary turn lanes on Blackshaws Road that are likely to overflow. These turn lanes should be extended in my opinion, to the satisfaction of VicRoads, to minimise the likelihood of turning traffic queues overflowing into the adjacent lane.

Blackshaws Road/Kyle Road/Mills Street

It is somewhat surprising that no works are proposed at this existing signalised intersection noting that modelling suggests that traffic volumes are expected to increase and that there were ten casualty crashes that occurred at this intersection in the last five years as documented in the ITS.

An inspection of this intersection revealed that there are currently no marked turning lanes in Blackshaws Road, there are no mast arms to make the traffic signals conspicuous to approaching traffic and no turn phases to assist right turning traffic.

In my opinion it would be appropriate for works at this intersection to be undertaken such that the intersection appearance is consistent with the nearby intersections proposed to the east on Blackshaws Road as part of DCP IN-01 and DC IN-02. This would include as a minimum the installation of protected right turn lanes to provide a three lane treatment on the Blackshaws Road approaches. The provision of mast arms would also be desirable to ensure that the signals are adequately visible to approaching traffic. Partial or fully controlled right turn phases could also be considered if the above measures were not deemed to be sufficient.

Blackshaws Road Cross-Section

There is some conflict within the CDP relating to the proposed cross-section for Blackshaws Road. Figure 1 in the CDP suggests that it is to consist of a 7.0m wide carriageway with indented parking bays as shown in Figure 14.

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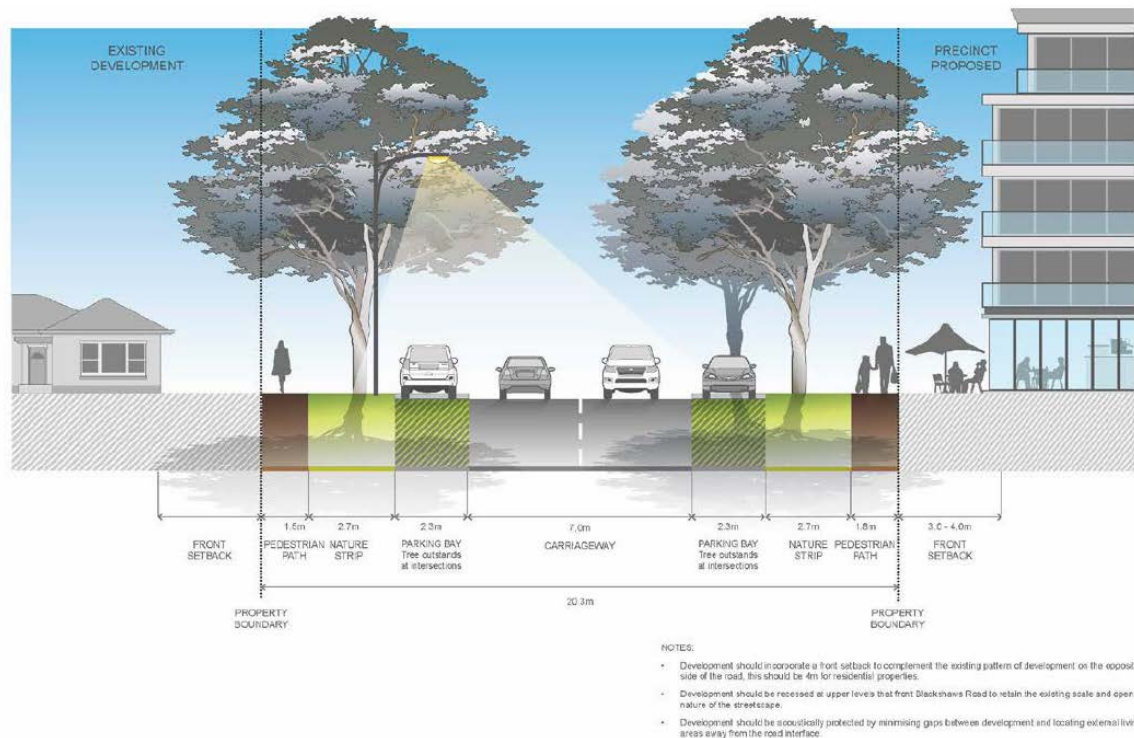


Figure 1: Blackshaws Road Interface (20.3m)

Figure 14: Proposed Blackshaws Road Cross-Section

This cross-section is not compatible with the provision of on-road bicycle lanes which are shown in Plan 8 of the CDP as presented in Figure 15, are included as an item in the Precinct Infrastructure Plan, are included in the VicRoads Principle Bicycle Network as presented in Figure 16 and form part of the Hobsons Bay Strategic Bicycle Plan.

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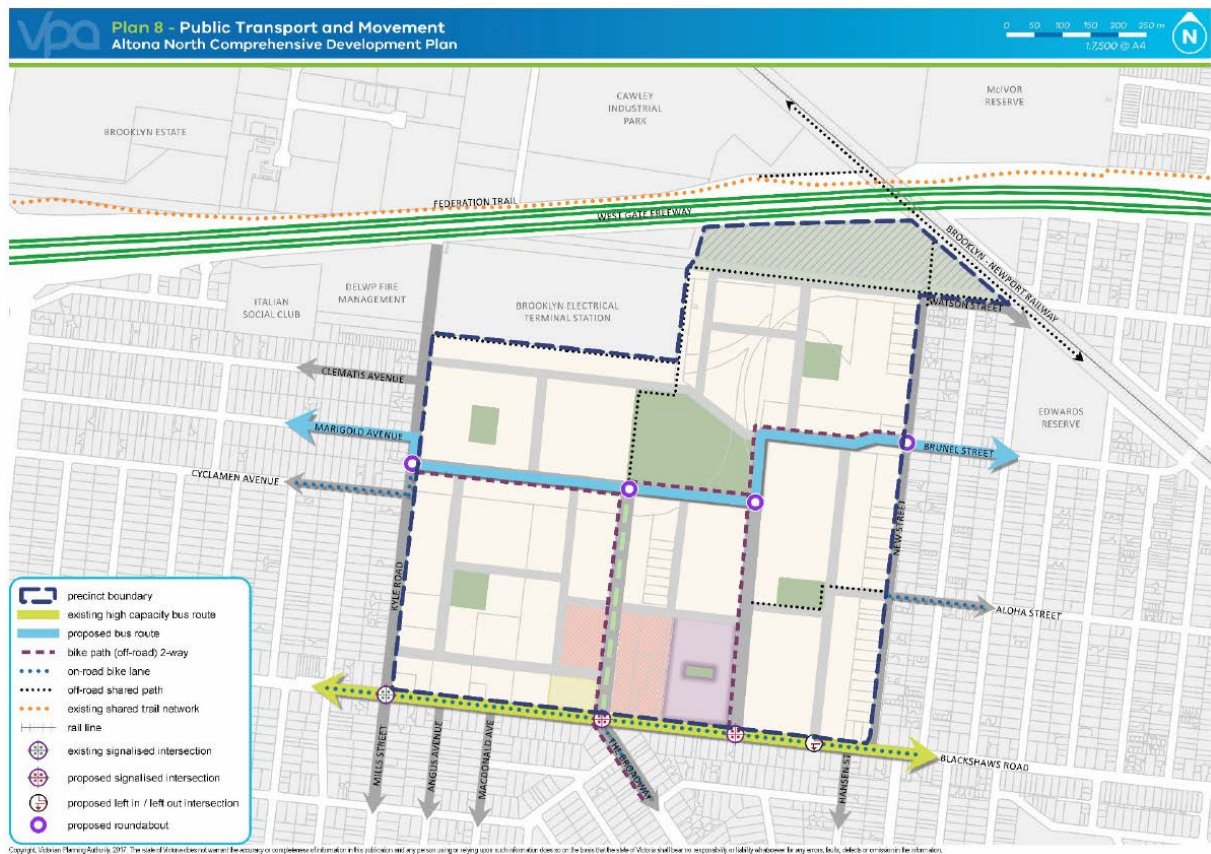


Figure 15: Proposed Public Transport and Movement Network

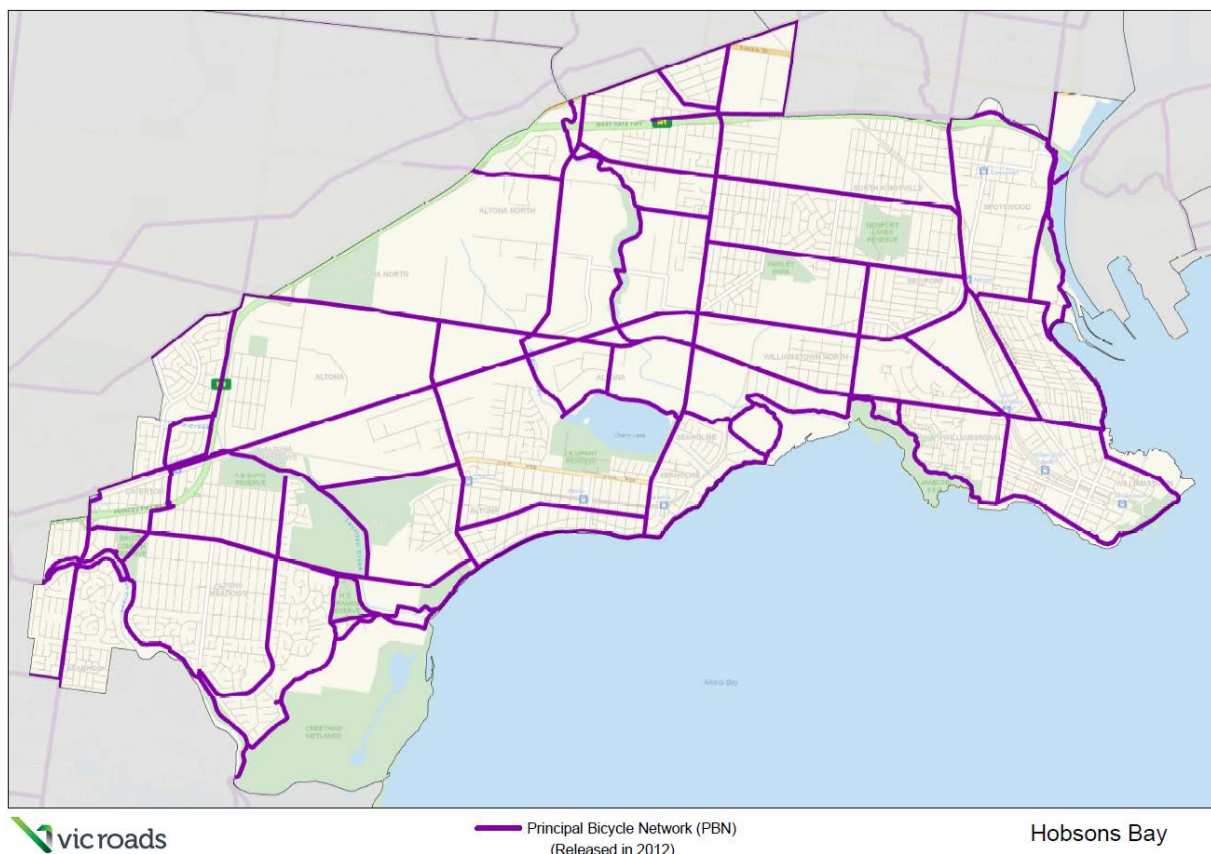


Figure 16: VicRoads Principal Bicycle Network

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The cross-section presented at Figure 1 of the CDP is also inappropriate in my opinion as much of frontage of the site will be taken up with protected right turn lanes into the two signalised access points, Hansen Street and also to Kyle Road as per my recommendation above.

A more appropriate cross-section for Blackshaws Road would include continuous on-road bicycle lanes in place of on-street parking. The presence of on-road bicycle lanes could compliment the protected right turn lanes at the expense of on-street parking and are likely to fit within the existing pavement width.

Public Transport Facilities

One of the recommendations discussed in the ITS is to provide a direct bus service through the Precinct 15 site between Altona Gate Shopping Centre to the west and Spotswood Railway Station to the east.

The Route 471 service already provides a fairly direct connection between Altona Gate Shopping Centre and Newport Railway Station that runs past the southern site frontage however there is no existing bus service that connects to Spotswood Station. The 471 route to Newport Station may also be unattractive to future Precinct 15 residents as it is taking them in the direction away from central Melbourne when most commuters are likely to want to catch a train towards Melbourne City.

The existing Route 432 service provides access to both Newport and Yarraville Railway Stations but is very circuitous as demonstrated in the diagram at Figure 17.

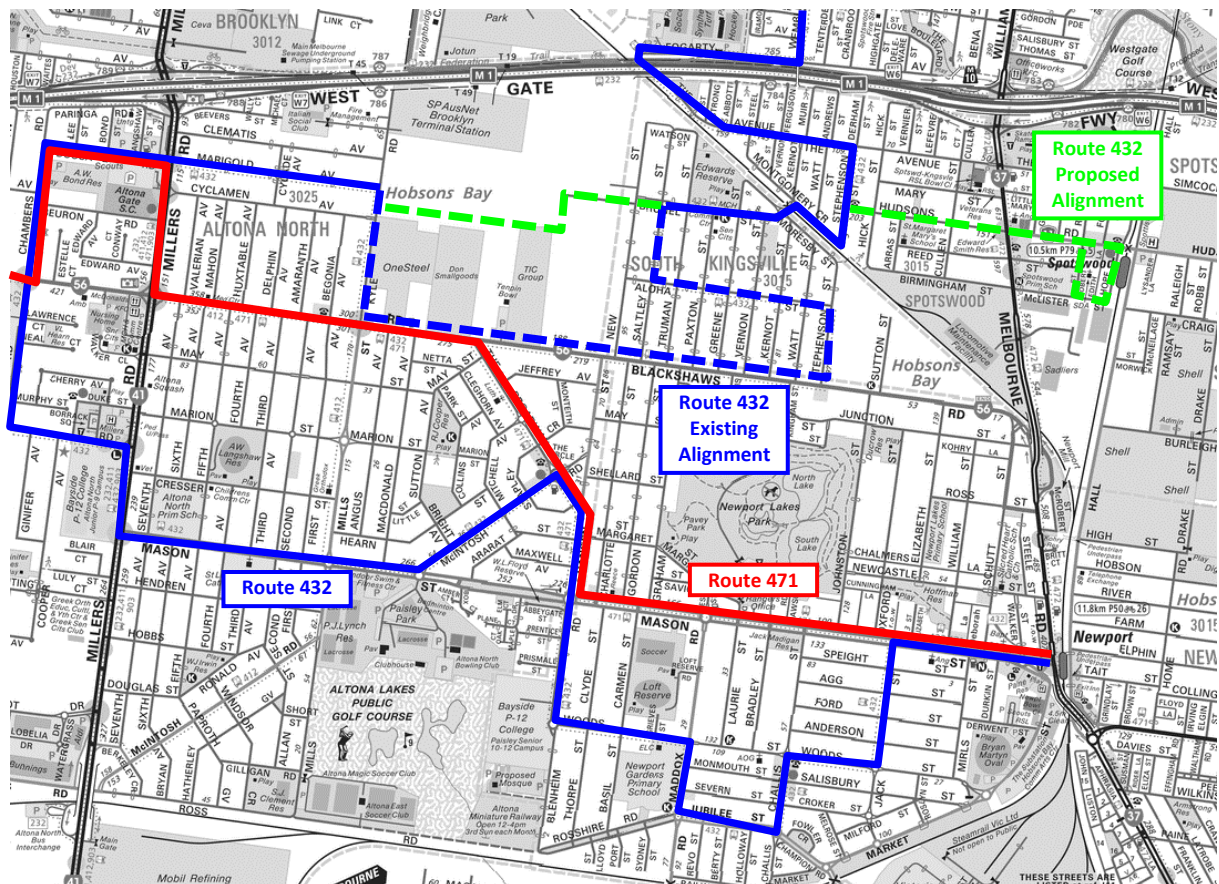


Figure 17: Recommended Bus Route Changes

To alleviate this issue, I support the recommendation to provide a direct service through the site to access the closest railway station at Spotswood utilising the signalised crossing of Melbourne Road at

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Hudsons Road. This could be achieved by straightening out the existing Route 432 service to remove the existing sections along Blackshaws Road and Aloha Street. This would save time on the existing service and may allow the connection to Spotswood Railway Station to be included without the need for additional resourcing of buses. I note that the proposed connector streets within the Precinct 15 site have been designed with suitable cross-sections such that they can support a bus service.

As identified in the ITS and the Precinct Infrastructure Plan this change would necessitate the creation of a bus loop and provision of a bus stop in the vicinity of Spotswood Railway Station. Improvements to bus priority through signalling changes at Millers Road/Marigold Avenue as discussed earlier and bus stop improvements along Marigold Avenue and Brunel Street would also support this service.

In the event that Marigold Avenue were to be restricted to one-way traffic flow in a westbound direction only as per one of my previous recommendations, the eastbound bus service would be required to deviate along Cyclamen Avenue. This is not expected to impede bus services and is likely to result in improvements as buses would be less likely to be delayed by parked cars and opposing traffic flows within the existing narrow cross-section of Marigold Avenue.

Walking and Cycling Facilities

A number of walking and cycling improvements are recommended in the ITS and are included in the Precinct Infrastructure Plans, although only a linear reserve shared path within the site is included as a DCP item.

Apart from the proposed on-road bicycle lanes along Blackshaws Road which have already been discussed, other items include on-road bicycle lanes along The Broadway, a shared path link to the Federation Trail, a Parkiteer facility at Spotswood Railway Station and informal bicycle routes along Cyclamen Avenue and Aloha Street to link to Altona Gate Shopping Centre and Spotswood Railway Station respectively.

I support all of the above treatments, however I am concerned that the proposed treatments for Cyclamen Avenue and Aloha Street involving the addition of a small number of speed cushions, pram ramps and traffic signal hardware do not go far enough in prioritising these routes for cycling.

I note that a new section was recently added to the VicRoads Traffic Engineering Manual which defines 'Bicycle Streets' whereby cyclists are prioritised over other transport modes. Features of such streets include extensive use of bicycle 'sharrow' markings, regular signage, raised pavement sections at intersections, single lane narrow points and use of green pavement as well as speed cushions to make motorists aware of the intended use of the street by cyclists.

A diagram from the relevant section of the VicRoads Traffic Engineering Manual is presented at Figure 18 illustrates a number of additional features which should be considered for implementation in Cyclamen Avenue and Aloha Street subject to consultation with local residents as part of the LATM study.

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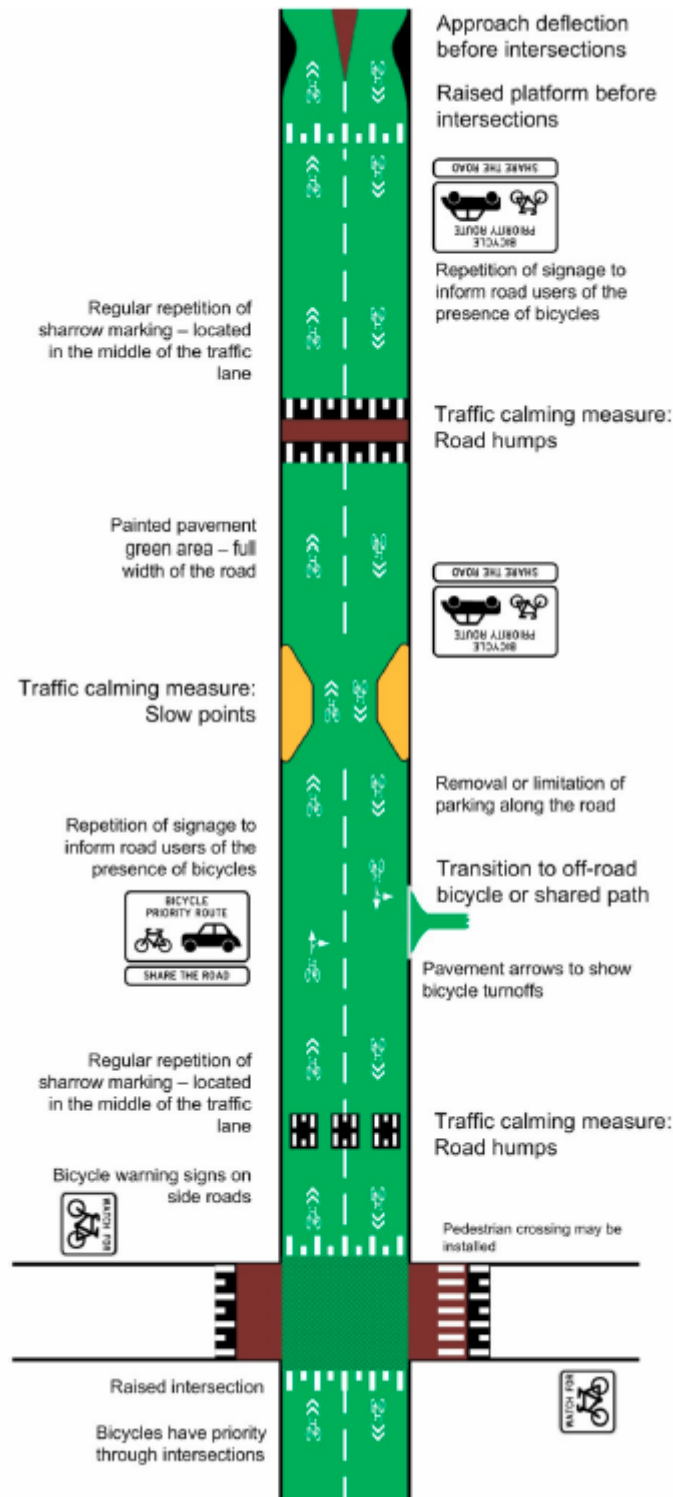


Figure 18: Bicycle Street Example (VicRoads TEM)

6 Conclusions

Having reviewed the relevant background information relating to the external traffic impacts resulting from the proposed rezoning of Precinct 15 and having inspected the surrounding road network I am of the opinion that:

- a) The CIA modelling is not sufficiently robust to capture traffic impacts on the local road network surrounding Precinct 15,
- b) The conclusion that traffic volumes along The Avenue and Melbourne Road will significantly reduce following development of Precinct 15 is not logical,
- c) The SIDRA modelling included in the ITS should have been based on the more recent version of the CIA model that includes connector street access from Precinct access to both Kyle Road and New Street,
- d) There are concerns that the existing freeway interchanges at West Gate Freeway/Millers Road and West Gate Freeway/Melbourne Road will not be able to accommodate future traffic volumes without mitigation,
- e) Given the uncertainties relating to the traffic modelling no further development on the Precinct 15 site should be contemplated beyond what is outlined in the CDP unless more robust traffic modelling is undertaken with suitable measures identified to ameliorate traffic concerns,
- f) The DCP item at Millers Road/Blackshaws Road should be modified to incorporate the scope of works proposed by VicRoads and Council subject to meeting swept path requirements,
- g) The DCP should contribute to the funding and implementation of the Altona North Local Area Traffic Management Plan Study,
- h) Modification of the traffic signals at Millers Road/Marigold Avenue/Duosa Road should be undertaken to include split phasing on the Marigold Avenue and Duosa Road approaches,
- i) Substantial changes will be required to the operation of Marigold Avenue due to the significant increase in traffic volumes resulting from the development of Precinct 15 which may require conversion to one-way westbound operation and/or parking restrictions subject to community consultation,
- j) Changes should be undertaken at the Melbourne Road/The Avenue intersection to improve the safety of the left turn slip lane movement from west to north and to discourage traffic from taking this route ahead of Melbourne Road,
- k) Detector loops should be installed in Ross Street that are linked to the nearby pedestrian operated signals in Melbourne Road to better facilitate the left turn movement out of Ross Street,
- l) The proposed right turn lanes at the Blackshaws Road/Broadway/Site Access intersection should be extended,
- m) Right turn lanes and signal mast arms should be installed at the Blackshaws Road/Kyle Road/Mills Street intersection,
- n) The proposed Blackshaws Road cross-section at Figure 1 of the CDP should be amended to include on-road bicycle lanes in place of indented parking,

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- o) A direct public transport route (bus service) should be provided through the Precinct 15 site to connect between Altona Gate Shopping Centre and Spotswood Railway Station, and
- p) More substantial changes should be made to both Cyclamen Avenue and Aloha Street to support the proposed bicycle routes.

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.



ROSS THOMSON

Ross Thomson, B.E. (Civil) Hons., M.A.I.T.P.M.

Appendix A: CV

Curriculum Vitae

Ross Thomson



Position	Senior Associate	Qualifications	Bachelor of Engineering (Civil) (Hons), University of Melbourne Accredited Senior/Lead Road Safety Auditor (VIC) Basic Construction Industry Induction Rail Industry Worker
Professional History	Traffix Group: Since 2000		
Location of Experience	The majority of Ross’ experience has been gained in Melbourne and regional Victoria, with some projects in New South Wales, South Australia and New Zealand.		
Summary of Experience	Ross Thomson (Senior Associate) has a Bachelor of Civil Engineering (Honours). Ross has over 17 years’ experience with Traffix Group and extensive experience in traffic impact assessments, project development, parking management studies, road safety audits and local area traffic management schemes. Ross has been the project manager for major traffic impact assessments including Cooper Street, Epping Bunnings Development, Heidelberg Road Bicycle Lanes, Oakleigh Masters Development and a high rise development at the Mentone Bowl site. In addition, Ross also has significant experience developing road safety and traffic management projects and improvements to on-road public transport priority including upgrades to bus and tram services. Ross is an accredited Senior Road Safety Auditor in Victoria.		
Key Areas of Expertise	PROJECT DEVELOPMENT/EVALUATION <ul style="list-style-type: none">Rail (Huntingdale Railway Station Bus Interchange, Hampton Railway Station Redevelopment, Alphington Railway Station Redevelopment, Level Crossing Improvements).Tram (Nicholson Street Easy Access Stops, Queensbridge Street Platform Stops).Bus (Mernda Bus Priority, Doncaster Bus Depot Improvements, Hoddle Street Bus Lanes).Freight (West Swanson Freight Terminal Improvements).Pedestrian (Melbourne CBD Pedestrian Safety Projects, Hampshire Road Pedestrian Improvements).Bicycle (Buckley Street/Napier Street Bicycle Route).Road Safety (crash investigation and countermeasure development).Major Developments (Cooper Street, Epping, Masters Development, Oakleigh, Mentone Bowl site, Mentone). ROAD SAFETY AUDITS <ul style="list-style-type: none">Accredited Senior/Lead Road Safety Auditor (VIC).Audit team leader for over 100 road safety audits at various stages.Preliminary and detailed design, post opening.Event traffic management plans (Melbourne 2006 Commonwealth Games).Roadworks traffic management (Level Crossing Removal Projects, Regional Rail Link, West Gate Bridge). PLANS AND STRATEGIES <ul style="list-style-type: none">Parking Studies/Strategies (Thomastown & Lalor Parking Study, Altona Parking Strategy, Croydon Parking Strategy)Walking & Cycling Plan (Wellington Walking & Cycling Strategic Plan)Freight (Brooklyn Industrial Precinct Plan, Metropolitan North West Region Truck Rest Area Strategy)Master Plans/Structure Plans (Queen Victoria Market, Spring Creek Precinct Structure Plan)		

Project Name	Project Scope	Year	Project Role
Huntingdale Railway Station Modal Interchange	Traffix Group was engaged as a sub consultant to Arcadis to undertake the design of an upgraded bus interchange at Huntingdale Railway Station including the design of a signalised access and changes to the layout of Huntingdale Road to accommodate new access points to commuter carparks.	2016	Ross managed the design process including developing a range of concept options, undertaking intersection capacity assessments and attending meetings with PTV and VicRoads.
Level Crossing Removal Project	Traffix Group was engaged by CPB Contractors to undertake Road Safety Audits associated with changes to traffic conditions as part of the level crossing removal projects at Main Road and Furlong Road, St Albans, Blackburn Road in Blackburn and Heatherdale Road in Blackburn.	2016	Ross conducted Road Safety Audits throughout the duration of the works including desktop audits of traffic management plans and site based audits upon implementation.
Spring Creek Precinct Structure Plan	Traffix Group was engaged by Surf Coast Shire to prepare a transport infrastructure assessment for the Spring Creek Structure Plan area located to the west of Torquay This assessment included identifying opportunities for site access, assessment of internal road network, SIDRA modelling of key existing and proposed intersections surrounding the site for existing conditions and post development, and preparation of concept plans describing recommended works at each intersection.	2016	Ross was the project manager for this project and regularly liaised with Council, VicRoads and VPA to ensure the assessment addressed the project requirements.
Strategic Cycling Corridors	Traffix Group was engaged by VicRoads to identify Strategic Cycling Corridors within the Metropolitan North West Region. The project involved extensive consultation with Councils, site inspections, mapping of proposed bicycle routes and review and collation of existing information.	2015	Ross managed the process undertaking regular liaison with VicRoads and facilitated the stakeholder meetings with the Councils.
Mernda Bus Priority Project	Traffix Group was engaged by PTV to investigate bus priority projects as part of a temporary bus service between South Morang and Mernda which was to be introduced in advance of the rail extension. The project including identifying locations where buses are currently delayed, undertaking consultation with Council, VicRoads and bus operators, developing treatments and estimating project costs and benefits.	2014/15	Ross undertook the majority of the work involved in this project including site inspections, stakeholder engagement and development and assessment of treatment options.
Amcor Site Redevelopment	Traffix Group was engaged by City of Yarra to provide independent traffic engineering advice relating to the impacts of the proposed redevelopment of the former AMCOR papermill site in Alphington, The advice in particular included a thorough review of the traffic modelling that was undertaken by another traffic engineering consultant on behalf of the development.	2014/15	Ross was the primary contact for Council throughout the duration of this project attending regular meetings and providing written advice at regular intervals.
Hampton Railway Station Urban Design Framework	Traffix Group was initially engaged by MGS Architects and then later directly by Bayside Council to consider traffic impacts and access and layout options resulting from proposals to redevelop the area surrounding the Hampton Railway Station. The assistance included swept path assessments to accommodate bus movements accessing a redeveloped bus interchange.	2013-15	Ross was the project manager for this project and coordinated the various design checks and swept path assessments that were required. He also regularly liaised with Council and attended a public consultation session.
Queen Victoria Market Master Plan	Traffix Group was engaged by City of Melbourne to undertake a traffic impact assessment of the proposed master plan for the Queen Victoria Market Precinct. The project involved collecting extensive traffic data, projecting future traffic volumes, intersection analysis and the preparation of concept plans of various road and intersection alignment options.	2014	Ross was the project manager for this project and responsible for all liaison with the City of Melbourne.
Queens Bridge Street Tram Renewal Project	Traffix Group was engaged Yarra Trams to prepare functional layout plans, traffic signal plans and a traffic impact assessment for the renewal of tram tracks, including DDA-compliant tram stop platform stops, and the reconfiguration of traffic lanes, between the Yarra River and Kings Way.	2014	Ross was the project manager for this project and responsible for all liaison with Yarra Trams and VicRoads.
Victoria University Carpark	Traffix Group prepared concept design plans for the constructions and formalisation of the at-grade carpark associated with the main Ballarat campus of Victoria University.	2013	Ross was the project manager for this project and attended meetings with the client and managed the design process.

Appendix B: December 2016 Peer Review

Memorandum

Attention: Karmen Markis, Hobsons Bay City Council
Project: Altona North Precinct 15 (Former Don Smallgoods Site)
Our Ref: G14072M-03C
Date: 22nd December, 2016

Altona North Precinct 15 (Former Don Smallgoods Site)

1 Purpose

The purpose of this memo is to provide a peer review of the transport assessment for the Precinct 15 site on Blackshaws Road, Altona North undertaken by GTA Consultants (dated 2nd December, 2016) as well as the memo on the feasibility of the proposed north-south link associated with the Precinct 15 site (dated 27th October, 2016) and the Precinct 15 Collector Roads Technical Note by GHD relating to Scenario 6G of the CIA model.

2 Changes from Previous Transport Assessment

The 2016 Integrated Transport Study is similar to the assessment prepared in 2015, however there is a major change in relation to the Traffic Impact Assessment methodology described below.

Approach / Methodology

Whereas the 2015 assessment relied on a first principles assessment of generated traffic for the development, the 2016 assessment primarily relies on the Cumulative Impact Assessment (CIA) undertaken by GHD at the request of Hobsons Bay City Council (HBCC) and VicRoads that utilised the Victorian Integrated Transport Model (VITM) to undertake a strategic modelling analysis of the area. The purpose of the CIA Modelling was to determine the long term capacity of the major corridor roads and their ability to support the additional traffic volumes due to development. This change in methodology addressed previous comments from HBCC to better substantiate the adopted traffic distribution.

Percentage changes in traffic volumes along the link roads were extracted from the CIA model and applied to GTA's existing turning movement volumes. Whilst this approach is likely to give a reasonable estimate of future traffic volumes, a more appropriate method may be to instead identify the difference in traffic volume between the existing and post development CIA models for each link and convert this traffic to turning movement volumes to add to the existing traffic surveyed by GTA.

In addition to the methodology change detailed above, there were a number of subtle changes to the ITS that are described below.

Subject Site

The subject site no longer includes the separate rectangular section to the west of Mills Road north of Clematis Avenue. This area was approximately 4,430m² and had a frontage of 35m to Kyle Road.

Population, Dwelling Mix and Car Ownership

An additional section has been included in the 2016 report detailing the population and dwelling type information from the Hobsons Bay ABS data from 2006 and 2011 as well as Journey to Work Data. This information was previously used in the calculation of the traffic generation and distribution but has been moved to the front of the report in a standalone section.

Accident Statistics

The accident statistics used in the report have been updated for the five year period up to 31st December, 2015.

Surrounding Developments

A section in the 2015 report detailing the surrounding developments has been removed from the 2016 report likely because they have been incorporated into the CIA transport model.

Site Access Points

The outlined site access points have been updated to include an additional signalised intersection at Blackshaws Road / The Broadway as well as a roundabout between Kyle Road and a new connector street between Marigold Avenue and Cyclamen Avenue.

Active Transport Facilities

Additional cyclist facilities have been proposed including mixed traffic bicycle facilities along the length of Cyclamen Avenue and Aloha Street as well as on-road bicycle lanes on The Broadway between Blackshaws Road and Hansen Street.

Mitigation Measures

The proposed right turn lane on the east approach of Millers Road / Blackshaws Road has been extended by an additional 100m to 300m. In addition, increases in the length of 'No Stopping' parking restrictions to accommodate additional right turn lanes along Blackshaws Road are now at Schutt Street and no longer at Kyle Road and The Broadway.

Integrated Transport Response

Greater detail has been provided in the Integrated Transport Response to include mode split targets as well as specific strategies to achieve the aforementioned targets. The mode split targets adopted in the report were likely chosen as they are similar to the splits from the Maribyrnong area as follows:

- Car/Truck Driver = 53%
- Car Passenger = 24%
- Public Transport = 18%
- Active Transport = 5%

It should be noted that the ITS states that the CIA model adopts a 12% public transport mode share suggesting that the Precinct 15 development is seeking to achieve a public transport mode share above what has been included in the CIA model. However, the CIA final report presents a figure that suggests the 2031 model already provides an 18% public transport share.

The key target that the report aims to achieve is the 5% active transport proportion which is targeting the key trips of commuters accessing the CBD and local short trips of less than 5km.

Car Parking Analysis

The carparking analysis has a reduced carparking provision for the mixed use zones of 250 spaces (previously 280 spaces). This is questioned as the retail floor space has remained consistent at 5,500spm between the 2015 and 2016 reports. Specific details on the calculation of this demand is not provided in the report.

Planning Requirements Checklist

The section detailing the planning requirements against Clause 56 has been expanded and updated to include the new recommendations as a result of the changed outputs.

Change Summary

Overall, the change in the 2016 report indicate that there are very few changes to the extent of the works recommended from the previous report from 2015. Due to the reductions in traffic volumes on the road network as a result of the CIA model, the above recommended works would generally be considered appropriate. However, if the CIA model was found to be deficient for the purposes of the assessment and the local road volumes were higher, it is likely that additional mitigating works would be required.

3 Appropriateness of the CIA Modelling

An investigation into the strategic model outputs in Figures 6.7 to 6.10 suggest that the CIA model only included a single access point to Blackshaws Road with only one link shown into the development site. This results in a drastic reduction in traffic along Kyle Road (between 40%-80% reduction) which would be unexpected if an access point was provided along Kyle Road as the proposal states. The modelling of a single access point has significant implications for the overall model. With all vehicles exiting to Blackshaws Road the travel time savings of taking The Avenue or Marigold Avenue would be drastically reduced. However, the access points to New Street and Kyle Road allow development traffic to avoid the congested intersections of Blackshaws Road / Millers Road and the complicated Ross Street / Melbourne Road intersection. This is a significant flaw in the model and it should be revised to incorporate the additional access points.

With this acknowledged, further commentary on the appropriateness of the CIA modelling is provided below.

GTA acknowledge that the CIA model provided by GHD is “underestimating traffic volumes within the local road network of the HBCC area and overestimated the traffic volumes on the West Gate Freeway”.

In addition, the GHD reports states “strategic modelling is not necessarily the appropriate tool to assess traffic performance at an intersection level” and that mesoscopic modelling is recommended to model intersections near the managed motorway.

No attempt has been made by GTA to determine whether or not the VITM model provides an appropriate base with which to undertake the assessments.

Changes in major turning movement volumes at critical locations between the 2015 version of the ITS and the 2016 version are summarised in the table below. Note that movements marked as “N/A” were not included in the report.

Movement	AM Peak		PM Peak	
	From Freeway	To Freeway	From Freeway	To Freeway
Millers Road / West Gate Freeway – Right Turn South to East (Left Turn East to South)				
Existing Conditions	N/A	545	N/A	257
2015 GTA Report	N/A	N/A	N/A	N/A
2016 GTA Report	N/A	935	N/A	421
Millers Road / Marigold Avenue – Right Turn East to North (Left Turn North to East)				
Existing Conditions	50	97	68	82
2015 GTA Report	53	165	162	151
2016 GTA Report	39	97	520	87
Millers Road / Blackshaws Road – Right Turn East to North (Left Turn North to East)				
Existing Conditions	167	215	378	229
2015 GTA Report	340	421	395	292
2016 GTA Report	321	671	457	337
Ross Street / Melbourne Road – Left Turn West to North (Right Turn North to West)				
Existing Conditions	0	144	47	110
2015 GTA Report	17	259	47	185
2016 GTA Report	0	148	0	157
The Avenue / Melbourne Road – Left Turn West to North (Right Turn North to West)				
Existing Conditions	25	715	191	217
2015 GTA Report	52	443	241	198
2016 GTA Report	19	224	151	201
Melbourne Road / West Gate Freeway – Right Turn South to East (Left Out East to South)				
Existing Conditions	N/A	1,071	N/A	502
2015 GTA Report	N/A	N/A	N/A	N/A
2016 GTA Report	N/A	512	N/A	255

From the table above, the movements in the 2016 post-development scenario that we question include:

- Significant increase in the left turn volume into Marigold Avenue in the PM peak,
- No change in vehicle movements out of Marigold Avenue in the AM peak under the post-development scenario,
- No change in vehicle movements out of Ross Street in the AM peak under the post-development scenario,

- Significant reduction in left out volumes at The Avenue / Melbourne Road under the post-development scenario, and
- Reduction in right turning volumes onto the West Gate Freeway from Melbourne Road.

The issues with these volumes are likely related to the provision of a single access point for the development being to Blackshaws Road, as discussed previously.

The VITM model appears to shift some of the traffic that currently travels along Melbourne Road to Millers Road presumably because the Western Distributor will not include a connection at Melbourne Road. We think the levels of traffic that have been relocated are excessive as vehicles in the vicinity of Melbourne Road are unlikely to travel a significant distance to the west to utilise the Western Distributor to head back towards the City, noting that the Western Distributor will also attract a toll charge. On this basis, we are of the opinion that the traffic volume shifts from Melbourne Road to Millers Road have been overestimated.

To test whether or not the model is accurately representing what would occur, it is recommended that GTA look at a sensitivity case without shifting traffic to the Western Distributor from Melbourne Road.

In addition, we recommend that GTA undertake a comparison between the VITM outputs and first principles across the whole network to determine how accurate the adopted method is at modelling intersection movements. In addition, a comparison should be made with the traffic modelling previously undertaken for the Caltex site (Precinct 16) to determine if the outputs are consistent.

4 Millers Road Congestion

When contemplating the issue of congestion along Millers Road, the ITS report provides the following extract from GHD's CIA report:

"Millers Road south of West Gate Freeway would remain congested with or without the full development (under Scenario 6a)."

The issue of congestion along Millers Road is unresolved in the post development conditions. The network model outputs in the report state that the critical intersection at Millers Road / Blackshaws Road has an overall DOS of 1.69 which in actuality would be worse due to the SIDRA analysis not factoring in ramp metering at the Millers Road / West Gate Freeway interchange. The GTA report is reliant on mitigating works being undertaken as part of the Western Distributor project, however it is unclear what these works would be and whether these works could address the significant issues that have been identified in the report.

5 Melbourne Road (Hudson Street to West Gate Freeway)

The SIDRA intersection analysis undertaken for this section does not take into account the ramp metering at the West Gate Freeway. This will have a significant effect on the operation of the intersections within the vicinity of the West Gate Freeway as capacity reduction factors to account for the metering have not been used.

In particular, the 2016 model at Melbourne Road / Hudsons Road gives a 95th percentile queue length of only 120m on the south approach in the existing AM peak. Site inspections undertaken during the

AM peak time on a typical Tuesday morning identified northbound queues on Melbourne Road extending from the West Gate Freeway on-ramp south through the intersections of The Avenue and Hudsons Road to an observed length exceeding 700m. This queue length was consistently observed across a period of 30 minutes with sample photographs of the observed queue shown below in Figure 1 and Figure 2.



**Figure 1: Melbourne Road Northbound Queue
North of Hudsons Road – AM Peak**



**Figure 2: Melbourne Road Southbound Queue
South of Hudsons Road – AM Peak**

This suggests that the existing conditions model needs additional calibration to replicate realistic intersection operation conditions.

6 Melbourne Road / Ross Street Intersection

Previous traffic modelling undertaken for the intersection of the Melbourne Street / Ross Street intersection as part of the nearby Precinct 16 development suggested that this intersection would experience significant congestion under a post-development scenario which includes Precinct 15. This appears to no longer be the case in the ITS for Precinct 15. We question this result given that Ross Street is located close to Precinct 16 and traffic generated from this area would be expected to use Ross Street as the primary route to access the freeway network via Melbourne Road.

7 Millers Road / Marigold Avenue Intersection

The GTA report assumes that the difficulty in exiting onto Millers Road from Marigold Avenue would make this an undesirable traffic route, resulting in no development traffic using this route in the AM peak. This assumption is questionable as it is still likely to provide a time saving over the alternative route via Blackshaws Road and Millers Road for at least some proportion of traffic. If the green time from Marigold Avenue was reduced to discourage development traffic from using this street, this is likely to be an unacceptable solution for residents living on Marigold Avenue as it would result in long delays and regular large queues forming along the street.

In addition, the 520 vehicles that have been projected to turn left from Millers Road into Marigold Avenue during the PM peak hour are considered inappropriate given the restricted road widths and traffic conditions of Marigold Avenue. This will be an unacceptable outcome for the residents currently

residing in Marigold Avenue. Suggested solutions could include parking restrictions to provide more opportunities for vehicles to pass, the installation of paired one-way streets (with Cyclamen Avenue) or the closure of Marigold Avenue at Kyle Road.

It should be noted that each of these options would also have impacts on existing residents with the road closure option likely to have the greatest impact.

8 The Avenue Traffic Volumes

As the CIA modelling shows a reduction in traffic volumes along Melbourne Road, the ITS assumes that the traffic volumes along The Avenue will reduce in kind, as this local road route would become “less attractive” presumably as the time saving benefits of the route would be reduced.

We believe that the argument for the reduction in volumes along The Avenue is not convincing. In the event that traffic volumes along Melbourne Road were to reduce, the route via The Avenue is likely to become more attractive as the access to the West Gate Freeway via Melbourne Road would become less congested. This is in comparison to the alternative access via Millers Road, which the modelling suggests will have significant congestion problems. The assumption of only a single access from Precinct 15 to Blackshaws Road in the CIA model and no direct access to New Street is likely to contribute to the underutilisation of traffic on The Avenue.

On this basis, amendments should be made to the model to accommodate additional traffic volume utilising The Avenue.

9 Traffic Generation Levels

The traffic volumes generated by Precinct 15 in the Cumulative Impact Analysis were different to what GTA had predicted in previous iterations of the ITS.

The differences in the resulting traffic generation from the site are summarised below in the table below.

Table 1: Traffic Generation Comparison

Model	AM Peak		PM Peak	
	In	Out	In	Out
GTA Analysis (2015)	169	1,070	997	812
GHD VITM Model (2016)	886	1,324	1,328	1,068

As shown in the table above, the overall traffic generation from Precinct 15 is higher during both peak periods in the updated modelling.

10 Traffic Distribution

The differences in traffic distribution between the previous GTA report from 2015 and the current 2016 ITS are significant. The 2016 report shows a majority of generated traffic would utilise the Blackshaws Road access points with an insignificant amount of traffic utilising the access points to Kyle Road and

New Street which is inconsistent with the 2015 assessment and is due to the incorrect access arrangements assumed as part of the CIA.

The traffic distribution previously adopted in the 2015 assessment was deemed appropriate and is summarised in Table 2 below.

Table 2: 2015 Traffic Distribution

Peak	Direction	Marigold Avenue	Blackshaws Road	New Street
AM Peak	In	40%	51%	9%
	Out	20%	64%	16%
PM Peak	In	24%	64%	12%
	Out	22%	62%	16%
Total		23%	63%	14%

Although the 2016 report from GTA does not provide the volumes splits between the various access points to the development, it does provide the following phrase:

"It has been assumed that 50% of the (generated) traffic volumes will utilise the two proposed intersections along Blackshaws Road, with the remaining 50% utilising the other site access points to Kyle Road, Marigold Avenue and New Street."

This statement appear to contradict the adopted traffic volumes in the CIA model which show no change in traffic volume in Marigold Avenue and a reduction in traffic volumes on The Avenue which likely occurs due to the single access point for the development to Blackshaws Road.

11 Blackshaws Road Intersections

We support the proposal to provide two signalised intersections at access points between the development and Blackshaws Road, including the intersection aligned with the existing intersection at Blackshaws Road and The Broadway to form a cross-intersection.

The provision of auxiliary right turn lanes at existing Blackshaws Road intersection at Hansen Street, New Street and Schutt Street are also supported.

The provision of the signalised cross-intersection at The Broadway avoids the staggered intersection arrangement and allows better connectivity with the adjacent neighbourhoods.

12 Road Safety Issues

The ITS report presents crash data that reveals a disproportionately high number of crashes that occurred at the Blackshaws Road/Kyle Road/Mills Street intersection (2 'serious' crashes and 8 'other' crashes'). This included four (4) cross traffic collisions and two (2) right through collisions.

It is concerning that despite the high existing crash rate and projected increase in traffic volumes as a result of the development no recommendations made proposing improvements to road safety at this location. The high number of cross-traffic collisions and right through collisions suggests that potential treatments such as mast-arms, exclusive right turn lanes, increased parking setbacks and partial or

fully controlled right turns may be appropriate treatments to improve safety of this intersection in the future.

This is particularly an issue given that the development is expected to result in additional traffic turning in and out of Kyle Road as shown in the 2016 report.

13 Blackshaws Road / Millers Road

The Integrated Transport Study undertaken by GTA Consultants provides the following mitigating measures relating to Millers Road / Blackshaws Road:

- Extend the right-turn lane on the east approach of the intersection by 240m to 300m through modification to road markings and introduction of parking restrictions that at least restricts kerbside parking during the commuter peak,
- Convert the through lane on the east approach of the intersection to a shared through and right turn lane by modifying the directional arrow markings, and
- Modify the intersection phasing to have a split phasing for the east and west approaches.

Generally speaking the proposed works may be appropriate, subject to the resolution of the items below.

The extension of the right turn lane may cause some accessibility issues for vehicles exiting adjacent side streets (of which there are six in total). Queuing from the intersection may prevent vehicles turning right out into Blackshaws Road. Right turn bans may be needed in and out of side streets on the north side of Blackshaws Road to the east of Millers Road.

It should be ensured that delays to the existing bus services along Millers Road (Smartbus route) are not substantially increased as a result of the recommendations. Investigation of the networked SIDRA model at the intersection of Blackshaws Road / Millers Road indicates that average delays in the exclusive bus lanes increase by up to 48 seconds in the AM peak and 10 seconds in the PM peak under post-development conditions. This would not be acceptable, particularly given Millers Road is a Smartbus Route. We consider that signal timings would need to be further reviewed to ensure that any additional delays to buses are minimised.

In addition, it was noted that the SIDRA model permits light and heavy vehicles as well as buses in the exclusive bus lane. This incorrectly increases the capacity of the approach giving a lower degree of saturation than if the lane was used exclusively for buses as planned.

Furthermore, the removal of on-street parking to enable the extension of the right turn lane may cause issues for residents of abutting properties.

14 Bicycle Recommendations

We are supportive of the provision of the bicycle link to the Federation Trail via the existing freight railway line and the provision of a bicycle link to Spotswood Railway Station.

The provision of a bicycle link along Cyclamen Avenue to Altona Gate Shopping Centre is questioned given that the narrow carriageway width of approximately 6.5m and on-street parking is permitted.

The bicycle link to the Federation Trail and Spotswood Railway Station provide benefits to both Precinct 15 and the wider Hobsons Bay area with costs being shared between the two parties.

15 Bus Recommendations

We support the proposals made in relation to bus improvements around the study area including:

- Providing a local bus route that connects with Spotswood Station,
- Improved service frequency and priority of services in the vicinity of Precinct 15, and
- Provision of a more direct bus route between Altona Gate Shopping Centre and Spotswood or Yarraville Stations.

As the benefits of the above bus recommendations are shared between Precinct 15, Precinct 16 and the wider community, the implementation costs should be shared between all parties involved.

16 Review of North-South Link Feasibility Study (GTA Consultants)

Purpose of the Link

The intention of the North-South Link is to provide an additional access across the freeway to the north. We note there would be limited benefits for traffic to head north to access Geelong Road to head towards the Maribyrnong River as the intersection between Roberts Street (the northern continuation of New Street) and Geelong Road is a left in / left out arrangement which would not allow direct access to anything north or east of this intersection.

The report also acknowledges that the northbound volumes from the model are likely overestimated due to the intersection arrangement but no mention is made of how the feasibility study is adjusted to account for this issue.

VITM Modelling

GTA have acknowledged that they have not investigated the suitability of the strategic model outputs for use on local road volume changes. As mentioned previously in the ITS, GTA acknowledge that the CIA model from GHD is “underestimating traffic volumes within the local road network of the HBCC area and overestimated the traffic volumes on the West Gate Freeway”. As before, GTA have made no attempt to compensate for this identified deficiency in the model to suit it for the purposes of this assessment, which primarily deals with local road traffic volumes.

Alternate Route Impacts

The alternative alignment for the New Street extension provides a tunnel under the freight line that connects with The Avenue. The benefits of this extension seem minor given that a route already exists from New Street along Brunel Street / Kernot Street to The Avenue via the level crossing. The existing connection is more direct than the proposed alternative and it is unlikely that the proposal will have any meaningful benefit given that freight movements along the rail line are relatively infrequent with an average of 14 trains scheduled to utilise this crossing each day, with most train movements occurring outside of peak periods.

Project Benefits

The report states that the benefits are considered 'conservative on the high side'. It is likely that the wording should say optimistic as it assumes that peak hour travel time savings will occur throughout the day, which it admits will not occur in reality which would result in less of a benefit for the project.

Findings

We agree with the findings of the report that the costs of the project are likely to far outweighs the benefits of the north-south link, particularly as the benefits and redistributed northbound traffic volumes have been overestimated.

Funding

The report is unclear on how the proposed north-south link would be funded if it were to proceed past the feasibility stage. As it is unlikely to be considered an arterial road it is assumed that Council would fund the project. The need to tunnel under the railway line is likely to incur a significant cost (the memo states \$30 million for the primary option and \$10 million for the alternative).

17 Review of Revised CIA Model (Scenario 6G)

Upon Council request, GHD have prepared a revised strategic modelling scenario including the internal connector streets within Precinct 15 connecting through to Kyle Road and New Street. A technical note was prepared by GHD that compares the revised scenario to the full development Scenario 6A that was originally prepared.

GHD identifies the main impacts of including the connector streets as follows:

- Traffic is shown to use the proposed connector streets for accessing the site via Kyle Road and New Street rather than Blackshaws Road,
- The addition of the connector streets reduces the traffic on Blackshaws Road, Kyle Road, New Street and Melbourne Road compared to Scenario 6A, and
- Although the model only includes one connection to Millers Road (notionally labelled Clematis Avenue), most traffic will travel via Marigold Avenue as it is the only route which permits right turn access to Millers Road. The left in/left out restrictions on the other road will result in most traffic taking Marigold Avenue particularly in the westbound bound direction to access the freeway.

A number of assessments were undertaken of the post-development road network by GTA that were based on the Scenario 6A model. Table 3 below outlines how Scenario 6G would change these assessments.

Table 3: Summary of Scenario Assessments

GTA Assessment (Scenario 6A)	Revised CIA Model (Scenario 6G)	Commentary
A significant level of analysis has been undertaken on the assumption that a majority of the traffic will utilise Blackshaws Road.	The revised model shows that under Scenario 6G, Blackshaws Road will carry 1,200 fewer vehicles in the 2 hour AM peak and 1,270 fewer vehicles in the PM peak than Scenario 6A.	This has significant implications regarding the recommended mitigation measures along Blackshaws Road and at the local road connections with Melbourne Road and Millers Road.
The GTA report states that the operation of the intersections of Millers Road with Clematis Avenue, Marigold Avenue and Cyclamen Avenue will operate satisfactorily in the future as “they will only have to manage relatively low volumes of side road traffic”.	Scenario 6G suggests an additional 790 vehicles will use these streets compared to Scenario 6A in the 7am-9am peak and an additional 840 vehicles will use these streets in the 2 hour PM peak along the local roads between the subject site and Millers Road.	<p>This level of additional traffic on the local roads would be very noticeable to residents and would have a significant impact on the operation of the intersection of Marigold Avenue with Millers Road as the other two streets are ‘left in / left out’.</p> <p>The 2031 Scenario 6G model shows a total of 2,000 vehicles will use these streets in the 2 hour AM peak along this section. It can be safely assumed that a majority of these vehicles will utilise the signalised access of Marigold Avenue. Conservatively assuming 1,000 vehicles an hour, this is an exceedingly high number of vehicles for a local road with a narrow cross-section.</p>
The GTA report was compiled on the understanding that the traffic volumes along the local roads to the east of the development would experience little to no growth.	The 6G model suggests that traffic volumes to the east will substantially increase with approximately 500 additional vehicles in the 2 hour AM peak and approximately 450 additional vehicles in the 2 hour PM peak.	This has implications on potential mitigation works to the east of the subject site, particularly along Hudsons Road, The Avenue and Brunel Street/Kernot Street and at the intersections of Melbourne Road/Hudsons Road and Melbourne Road/The Avenue.

On this basis, it is recommended that the assessments undertaken in the GTA ITS be redone to incorporate the Scenario 6G model, which is likely a more realistic representation of future volumes.

18 Conclusion

Overall, the process undertaken by GTA as part of the ITS appear to be generally appropriate. However, the issue is that it is reliant on the accuracy of the modelling undertaken in the CIA which appears to have a number of identified deficiencies, particularly relating to the sections of Millers Road and Melbourne Road where there are closely spaced intersections in close proximity to the interchanges with the West Gate Freeway and the fact that the version of the CIA model used by GTA did not include the collector street access through to Kyle Road and New Street.

As a minimum, the ITS needs to be revised to adopt the updated Scenario 6G modelling undertaken by GHD which includes the connector streets between Kyle Road and New Street to more accurately model the future traffic volumes on the local road network in the vicinity of the site.

Additional modelling should also include properly calibrated microsimulation or SIDRA analysis to assess the impacts of the additional traffic on the existing road network especially where there are closely spaced intersections along Melbourne Road and Millers Road. This will be necessary to determine the extent of mitigating works that will be required in these areas to facilitate development.