MINUTES OF MEETING

MANLY TRAFFIC COMMITTEE

HELD MONDAY, 13 OCTOBER 2014

Note: All minutes are subject to confirmation at a subsequent Council of Planning and Strategy Committee Meeting.

PRESENT:

Councillors

Councillor Alan Le Surf	Manly Council
Councillor Hugh Burns	Manly Council

Other Members

Mr John O'Connor	Representative for Mr Mike Baird MP Member for Manly
Mr Alex Coates	Roads and Maritime Services
Sgt Nino Jelovic	Manly Police

Other Representatives

Mr Evan van Leeuwen	State Transit Authority

Council Staff

Mr Ben Hubbard	Traffic and Transport Manager – Civic & Urban Services
Mr Khanh Nguyen	Traffic Officer – Civic & Urban Services

Apologies

Sgt Nino Jelovic	Manly Police

TO THE MAYOR AND COUNCILLORS OF THE COUNCIL

The **Manly Traffic Committee** met on the 13th OCTOBER 2014 to consider the matters referred to and reports having reaches the decisions taken and recommendations stated hereunder.

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ITEM 2 **APOLOGIES AND LEAVE OF ABSENSE**

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ITEM 6 **DATE OF NEXT MEETING**

ITEM 1 WELCOME AND INTRODUCTIONS

Chairman Councillor Alan Le Surf opened the Meeting and introduced those present.

ITEM 2 APOLOGIES AND LEAVE OF ABSENSE

See Apologies above.

ITEM 3 DECLARATIONS OF INTEREST

PECUNIARY

None

NON - PECUNIARY

ITEM 4 REPORTS

ITEM 48/14 BIRKLEY ROAD, MANLY –
TEMPORARY ROAD CLOSURES (STREET PARTY)
(ITEM 48/14: 13/10/2014)

SUMMARY

For Council to approve a temporary road closure in Birkley Road, Manly in order to facilitate a street party request.

REPORT

Council has received an application for a temporary road closure in Birkley Road between Arthur Street and Herbert Street to facilitate a "street party" under Council's "Meet Your Street" initiative. The requested date for the temporary road closure is on Sunday, 29th November 2014 from 4pm to 8pm.

The impacts on traffic resulting from the temporary road closures in Birkley Road between Arthur Street and Herbert Street are expected to be minimal, for the following reasons:

- Birkley Road is a local road with low traffic volumes;
- There are no bus service routes that interfere with subject section of Birkley Road;
- Alternative routes are available for through traffic and connecting roads;
- There have been recorded accidents in the subject section of Birkley Road;
- The temporary road closure is being held on a Saturday evening;

Access for pedestrians and cyclist will be maintained and the temporary road closure will be managed using the ***Manly Council's Traffic Control Plan (TCP) No. 1*** and the standard street party conditions.

DISCUSSION

No objections or comments were raised about the temporary road closure proposal / street party.

RECOMMENDATION

It is recommended that Council:

- Approves the proposed temporary road closures in Birkley Road between Arthur Street and Herbert Street on Saturday, 29th November 2014 from 4pm to 8pm. The applicant must abide to Manly Council's Street Party Standard Terms and Conditions.

ITEM 49/14 EDWIN STREET, FAIRLIGHT –
TEMPORARY ROAD CLOSURES (STREET PARTY)
(ITEM 49/14: 13/10/2014)

SUMMARY

For Council to approve a temporary road closure in Edwin Street, Fairlight in order to facilitate a street party request.

REPORT

Council has received an application for a temporary road closure in Edwin Street, Fairlight between Suwarrow Street and Daintrey Street to facilitate a "street party" under Council's "Meet Your Street" initiative. The requested date for the temporary road closure is on Saturday, 13th December 2014 from 4pm to 8pm.

The impacts on traffic resulting from the temporary road closures in Edwin Street are expected to be minimal, for the following reasons:

- Edwin Street is a local road with very low traffic volumes;
- There are no bus service routes via Edwin Street;
- Alternative routes are available for through traffic and connecting roads;
- There are no recorded accidents within Edwin Street;
- The temporary road closure is being held on a Saturday evening;

Access for pedestrians and cyclist will be maintained and the temporary road closure will be managed using the ***Manly Council's Traffic Control Plan (TCP) No. 1*** and the standard street party conditions.

DISCUSSION

No objections or comments were raised about the temporary road closure proposal / street party.

RECOMMENDATION

It is recommended that Council:

- Approves the proposed temporary road closures in Edwin Street between Suwarrow Street and Daintrey Street on Saturday, 13th December 2014 from 4pm to 8pm. The applicant must abide to Manly Council's Street Party Standard Terms and Conditions.

ITEM 50/14 CRESCENT STREET, FAIRLIGHT – TEMPORARY ROAD CLOSURES (STREET PARTY) (ITEM 50/14: 13/10/2014)

SUMMARY

For Council to approve a temporary road closure in Crescent Street, Fairlight in order to facilitate a street party request.

REPORT

Council has received an application for a temporary road closure in Crescent Street, Fairlight between Griffiths Street and Parkview Lane to facilitate a "street party" under Council's "Meet Your Street" initiative. The requested date for the temporary road closure is on Saturday, 6th December 2014 from 3pm to 7pm.

The impacts on traffic resulting from the temporary road closures in Crescent Street are expected to be minimal, for the following reasons:

- Crescent Street is a local road with very low traffic volumes;
- There are no bus service routes via Crescent Street;
- Alternative routes are available for through traffic and connecting roads;
- There are no recorded accidents within Crescent Street;
- The temporary road closure is being held on a Saturday evening;

Access for pedestrians and cyclist will be maintained and the temporary road closure will be managed using the ***Manly Council's Traffic Control Plan (TCP) No. 1*** and the standard street party conditions.

DISCUSSION

No objections or comments were raised about the temporary road closure proposal / street party.

RECOMMENDATION

It is recommended that Council:

- Approves the proposed temporary road closures in Crescent Street between Griffiths Street and Parkview Lane on Saturday, 6th December 2014 from 3pm to 7pm. The applicant must abide to Manly Council's Street Party Standard Terms and Conditions.

ITEM 51/14 RAGLAN STREET, MANLY – STREET UPGRADES, MANLY2015 (ITEM 51/14: 13/10/2014)

SUMMARY

For Council to consider the proposed removal all existing on-street parking in Raglan Street as a part of the Manly 2015, Raglan Street Upgrades.

REPORT

Since 2007 Manly Council has been forming a Master plan for the upgrade of the Manly village centre. This Master plan has become known as Manly2015 and involves the upgrade of various streets, laneways and plaza areas in the Manly CBD.

The implementation of Manly2015 includes the upgrade of the section of Raglan Street Manly, between the intersections of Belgrave Street/Pittwater Road and North Steyne. The proposed Raglan Street upgrades will include the following works: footpath widening; new bike lanes; new kerb and drainage; paving, seating, bike racks; street lighting; street trees and furniture; and signage. Council is working on finalising a project schedule

The impacts/result of the proposed Raglan Street upgrades in terms of parking and traffic includes:

- Removal of all seven (7) on-street parking spaces on the southern side of Raglan Street, between Hernrietta Lane and Short Street;
- Removal of the "Children's Crossing" between the section of Short Street and Central Avenue (St Mary's School has been consulted and support the removal);
- Reduction of the eastbound carriageway from two (2) travelling lanes to one (1);
- On-road bicycle kerbside bicycle lanes in both directions;
- Upgrade of the existing pedestrian refuge at the intersection of Raglan Street and North Steyne

The Design Plan for the proposal is shown in **Attachment 1.**

Refer to **Attachment 2** and **Attachment 3** for the associated Traffic Management Plan and the Road Safety Audit respectively for the proposed Raglan Street Upgrade.

DISCUSSION

Comments for this item include:

- Cllr burns felt the plan should have been discussed at OM meeting of Council prior to coming to the MLTC. Note: the MLTC only considering parking aspects and giving advice as per the committees remit.

- Cllr Burns felt that the plan should be considered in its wider context. i.e. including the Manly 2015 and other projects that could affect traffic flow or loss of parking. This includes a parking impact plan showing the net impact to on-street parking supply from all proposed projects in the Manly CBD. This view was echoed by other committee members.

- The parking for the Paradise Motel was mentioned. Views were mixed but some wanted the access consolidated so that it is not so wide. The Manager of the Paradise Motel has made representation to Council to say that the business will have difficulty functioning without a drop off and pick up bay on the footpath if the road is narrowed to a signal lane in each direction and no provision is made for parking.

- Some comments were also made about the left turn and dedicated through /right turn proposed at the western end of Raglan Street (currently this is a through and left and through and right so we lose a through lane. The intersection arrangement provides a dedicated left and shared through and right to match the forecast turning movements as shown in the SIDRA analysis results appended to the Traffic Management Plan for the Raglan Street enhancement works. The SIDRA results show that the proposed arrangement will function with a good level of service.
- The RMS said a signal plan would be needed if approach loops need to be moved because of the cycle advance stop lines.

- The committee also felt that a crossing facility near Whistler Street linking across the two sides of Raglan Street should be incorporated into the design.

- The RMS stated that the pedestrian refuge in Raglan Street at North Steyne should incorporate a 3 metre wide gap for pedestrians as per current Australian Standards. The latest concept plan for Raglan Street shows that the gap is 2.5 metres.

- The RMS noticed discrepancies in treatment of the intersection of Whistler Street and Raglan Street in regards to the stop line which is displayed as straight (180^0) in the current concept plan however in the road safety audit the stop line was displayed as diagonal from the western corner to the extended eastern corner.

The RMS will be reviewing and providing comments to the associated Traffic Management Plan for the proposed Raglan Street project.

RECOMMENDATION

That Council:

- Consult affected residents about the proposed removal of parking.

- Reviews the affects of the Raglan Street upgrade project within the context of the other Manly 2015 projects.

ITEM 52/14 AUDREY STREET, BALGOWLAH – SIGNPOST NO STOPPING RESTRICTIONS AT INTERSECTION (ITEM 52/14: 13/10/2014)

SUMMARY

For Council to consider implementing No Stopping restrictions in Audrey Street at the intersection with Maretimo Street, Balgowlah.

REPORT

Council has received a request from a resident of Audrey Street to restrict on-street parking further east in Audrey Street from the intersection of Maretimo Street.

Audrey Street is parallel Sydney Road between Maretimo Street and Wanganella St. It has carriageway width from kerb to kerb of ~7 metres. This width is narrower than the recommended road width of 11 metres that would allow bi-directional traffic and on-street parking on both sides.

Council is aware that side streets near Sydney Road are prone to commuter parking and it is being claimed that vehicles are consistently parking too close to the intersection for long durations. This is problematic for vehicles entering Audrey Street from Maretimo Street because of the restricted swept paths and potential collision with oncoming traffic that are exiting Audrey Street simultaneously due to the reduction to one travelling lane caused by parked vehicles on either side and close to the intersection. See ***Figure* 10.**

In order to address the issues with vehicles parking too close to the intersection of Audrey Street and Maretimo Street, it is proposed to implement No Stopping restrictions in Audrey Street expanding 20 metres east of Maretimo Street alignment and include line marking of double barrier (BB) centre lines to compliment the restrictions. The proposed 20 metres No Stopping restrictions and BB lines is similar to the existing treatment at the intersection of Audrey Street and Wanganella Street, as shown in ***Figure 1*.**

DISCUSSION

Traffic Committee acknowledges that commuter parking is prevalent in Audrey Street and nearby however it is something Council accepts as it cannot always be addressed. STA representative stated that any restrictions around intersections would benefit buses in regards to improved turning circles. Councillor Hugh Burns asked this item to be brought back with consultation results before approving.

RECOMMENDATION

That Council implements the following proposal in Audrey Street at the intersection with Maretimo Street, Balgowlah, subject to consultation with affected residents:-

- Implement 20 metres of No Stopping restrictions starting east of the Maretimo Street alignment with relevant signage.
- Line mark double barrier centrelines to compliment the proposed No Stopping restrictions.

ANNEXURES

Figure 10: *View of the intersection of Audrey St & Maretimo St with parked vehicles.*

Figure 1: *Aerial Audrey Street between Maretimo St and Wanganella St.*

ITEM 53/14 DARLEY ROAD, MANLY – PEDESTRIAN CROSSING SAFETY (PARKING RESTRICTIONS) (ITEM 53/14: 13/10/2014)

SUMMARY

For Council to consider converting an existing 2P parking space to motorcycle parking spaces on the eastern side of Darley Road prior to the pedestrian crossing at Ashburner Street.

REPORT

Council has received a request from a resident to review the pedestrian crossing at the intersection of Darley Road and side street Ashburner Street regarding concerns over the lack of visibility for seeing oncoming pedestrians by southbound traffic.

The intersection of Darley Road and Ashburner Street is a busy intersection particularly in the morning from pedestrians heading west towards Manly Wharf to catch the ferry and motorists travelling southbound towards Manly Hospital. It is claimed that kerbside on-street parking on the eastern side of the road on approach and adjacent to the pedestrian (wombat) crossing, blocks motorists' view from seeing oncoming pedestrians, especially large parked vehicles e.g. 4WD. **See *Figure 2.***

Unwary motorists travelling southbound are unable to see sporadic pedestrians coming from the corner until they are very close to the pedestrian crossing due to height of parked vehicles obstructing visibility. Visibility is not so much of an issue for the northbound approach as there are no obstructions and motorists have full view of pedestrians coming from either side of the road/intersection.

In order to improve the visibility for the southbound approach to the pedestrian crossing in Darley Road at Ashburner Street, it is proposed to convert 6 metres of the existing 2P parking restrictions prior to the pedestrian crossing on the eastern side of the road to motorcycle parking only. Motorcycles have a lower profile which would improve the visibility and allows 5 motorcycles (1.2m width, 90^0) to park as oppose to prohibiting 6 metres of on-street parking on approach to the pedestrian crossing. **Refer to *Figure 3.***

DISCUSSION

The RMS representative reminded the committee that there was a requirement for No Stopping on approach to a crossing, even when parking is indented. It was therefore recommended that a space be removed and made No Stopping.

RECOMMENDATION

That Council converts the first 6 metres (equivalent to 7.5 metres from edge of crossing) of on-street parking on the eastern side of Darley Road on approach to the pedestrian crossing to No Stopping.

ANNEXURES

Figure 2: *Southbound view in Darley Road towards the pedestrian crossing at Ashburner Street.*

Figure 3: *Aerial Darley Road at Ashburner Street proposal.*

ITEM 6 GENERAL BUSINESS

The following item was raised by Manly Surfers Action Group:

NORTH STEYNE, MANLY – REAR TO KERB PARKING

Representatives from the Manly Surfers Action Group attended the Traffic Committee Meeting to touch base on the rear to kerb parking change. Pictures were distributed to members showing the hazards with parents with pram unloading onto the road from front to kerb only parking restrictions; and showing that vans can park rear to kerb appropriately without encroaching on the shared footpath.

The traffic manager said that he would put a proposal to the executive change the parking between Pine Street and Pacific Parade to front to kerb or rear to kerb.

The following item was raised by Mr. John O'Connor:

PITTWATER ROAD, MANLY – TRAFFIC CALMING

Mr. John O'Connor raised issues with speeding in Pittwater Road between Alexander Street and Pine Street, Manly that have been brought to the MP. Council is arranging a traffic survey for this location and for bring the results back to the traffic committee for future discussion.

KENNETH ROAD, MANLY – PARKING ARRANGEMENT

Mr. John O'Connor asked if there has been an update on the Kenneth Road parking issue. The Traffic Manager confirmed that he had sent further information to the RMS.

Councillor Hugh Burns asked if a comparison of the current number of spaces and the number of spaces with parallel parking spaces could be provided.

The following item was raised by Councillor Hugh Burns & Councillor Alan Le Surf:

MANLY JAZZ FESTIVAL 2014 REVIEW

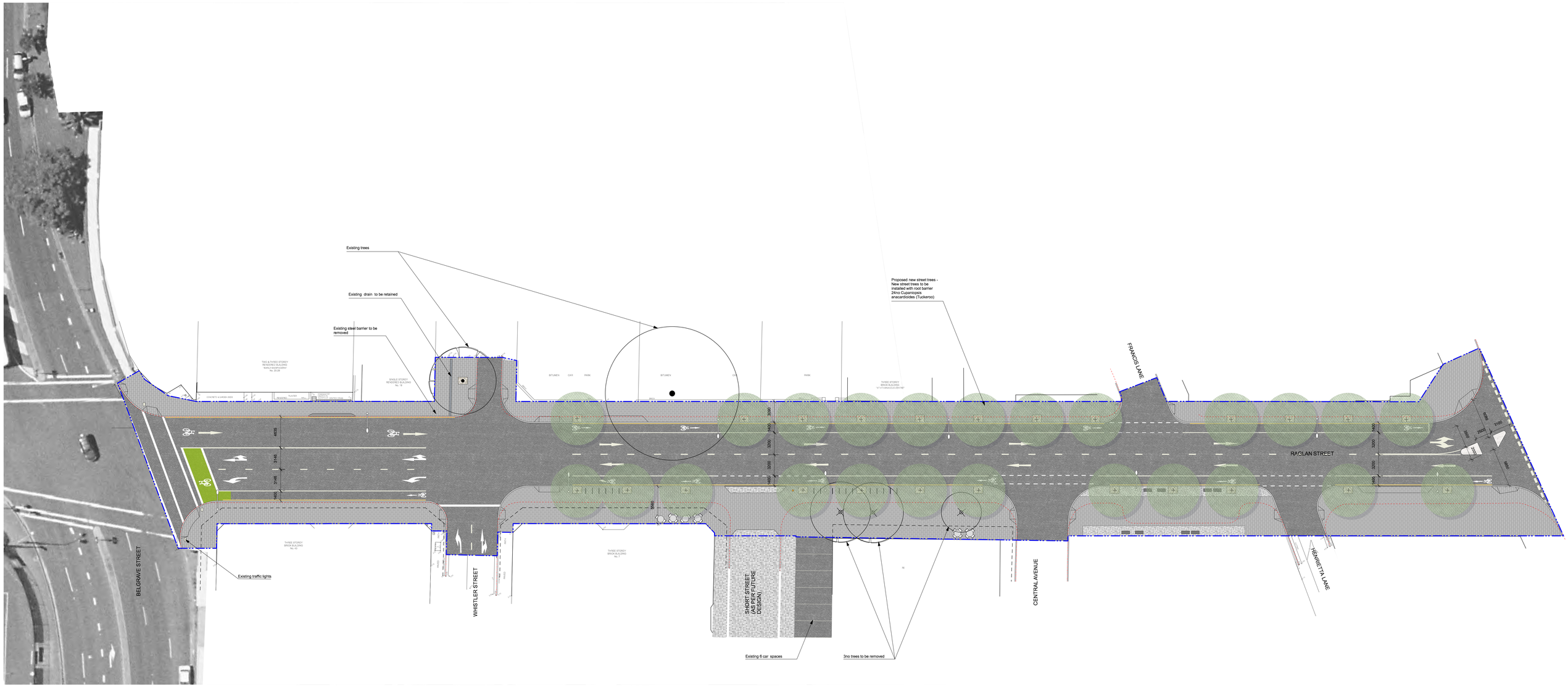
The Traffic Committee discussed the running of the recent Jazz Festival (October 4rd – 6th) in Manly CBD. There have been reoccurring issues with the traffic management for the event, similarly with the other Manly CBD events that require road closures. These include:

- A lack of additional advance warning signs to deter and detour motorists heading towards the road closures at the intersection of Darley Road and Wentworth Street.

- No police personnel present to man the two signalised crossings for the pedestrians from the Manly Wharf to the Corso and across Darley Road to the Corso (St Matthew's Church). Past events have had police present to man each of these crossings to ensure pedestrian compliance with the traffic signals.

The traffic committee asked that these issues be raised with the Events Committee.

ITEM 6 DATE OF NEXT MEETING – 9.30AM MONDAY 10 NOVEMBER 2014


Existing trees
Existing drain to be retained
Existing steel barrier to be removed
Proposed new street trees - New street trees to be installed with root barrier 24no Cupaniopsis anacardioides (Tuckeroo)
FRANCIS LANE
RAGLAN STREET
HENRIETTA LANE
BELGRAVE STREET
WHISTLER STREET
CENTRAL AVENUE
SHORT STREET (AS PER FUTURE DESIGN)
Existing traffic lights
Existing 6 car spaces
3no trees to be removed
TWO & THREE STOREY RENDERED BUILDING Nos.20-26
SINGLE STOREY RENDERED BUILDING No. 19
THREE STOREY BRICK BUILDING No. 4/2
THREE STOREY BRICK BUILDING No.7
THREE STOREY STONE BUILDING No.1/1A
BITUMEN
CAR PARK
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Issue History

File Name	Prepared by	Reviewed by	Issued by	Date	Issued to
P1785 001T Raglan St Manly TMP.doc	A Finlay	S Read	A Finlay	4/09/2014	Jo Bramma Manly Council

Traffic Management Plan for proposed works in Raglan Street, Manly

1. PART A – DESCRIPTION OF PROPOSED MEASURES

Manly Council proposes to upgrade the streetscape of Raglan Street, between Belgrave Street and North Steyne, by widening footpaths, introducing dedicated one-way cycleways on each side, and landscaping. The intent is to make Raglan Street more pedestrian and cyclist friendly, and to reinforce the existing 40 km/h High Pedestrian Activity Area (HPAA) speed limit. The extent of the proposed works are shown in Figure 1.1 below, while the detailed architect drawing is at Attachment A.

Source: Google Maps

Figure 1.1: Extent of Proposed Works

The proposed works are part of the ultimate *Manly 2015* improvement program, but are intended to be completed in advance of the other major *Manly 2015* projects. In particular, the Raglan Street works would be independent of the closure of Sydney Road east of Belgrave Street, and the consequent conversion of Whistler Street to two-way traffic between Sydney Road and Raglan Street.

2. PART B – IDENTIFICATION AND ASSESSMENT OF IMPACTS

2.1 EXISTING CONDITIONS

This section of Raglan Street is currently marked as three traffic lanes over most of its length, with two lanes eastbound and one lane westbound. The western section between Whistler Street and Belgrave Street is two lanes in each direction. Limited, time restricted parking is permitted on the southern side of Raglan Street, but the northern side is either No Stopping or No Parking. There is a School Zone between

Whistler Street and Central Avenue (within the overall 40 km/h HPAA), and some of the parking restrictions change at School Zone times. Immediately east of Whistler Street (within the School Zone) is a pedestrian refuge. Raglan Street is designated as an on-road cycling route, but there are currently no bicycle logos on the road surface. Bus routes 136 and 139 use Raglan Street in the eastbound direction only.

The western intersection of Raglan Street with Pittwater Road (to the north) and Belgrave Street (to the south), is controlled by traffic signals in a simple two-phase arrangement, with four signalised pedestrian crossings. There is left turn red arrow protection for the western crossing from northbound left turning vehicles, but all other crossings have filter turns permitted.

Whistler Street is one-way northbound, and there are Keep Clear markings on Raglan Street at the intersection with Whistler Street, reflecting the tendency of westbound traffic to queue through the intersection from Belgrave Street.

Short Street is effectively a cul-de-sac off Raglan Street with very low traffic volumes.

Central Avenue is two-way at the Stop sign controlled intersection with Raglan Street, but is one-way southbound, south of the entry/egress of the council car park on the eastern side. Central Avenue services two car parks and some apartment buildings, and connects with Sydney Road at its southern end.

Henrietta Lane is one-way southbound and currently acts as a service lane to the rear of properties fronting North Steyne.

2.2 PROPOSED ARRANGEMENTS

The proposed upgrading of Raglan Street generally involves widening footpaths and installing one-way, on-road bicycle lanes on each side. Traffic lanes would be reduced to one in each direction, except for the western section between Whistler Street and Belgrave Street, where two westbound lanes would be maintained, as shown in Figure 2.1 below. It is proposed to alter the lane disciplines in this section, such that Lane 1 would be left turn only, while Lane 2 would be shared through and right. Kerb extensions are proposed immediately east of Whistler Street to encourage pedestrians to cross at this point, but the warrant for a zebra crossing is not currently met.

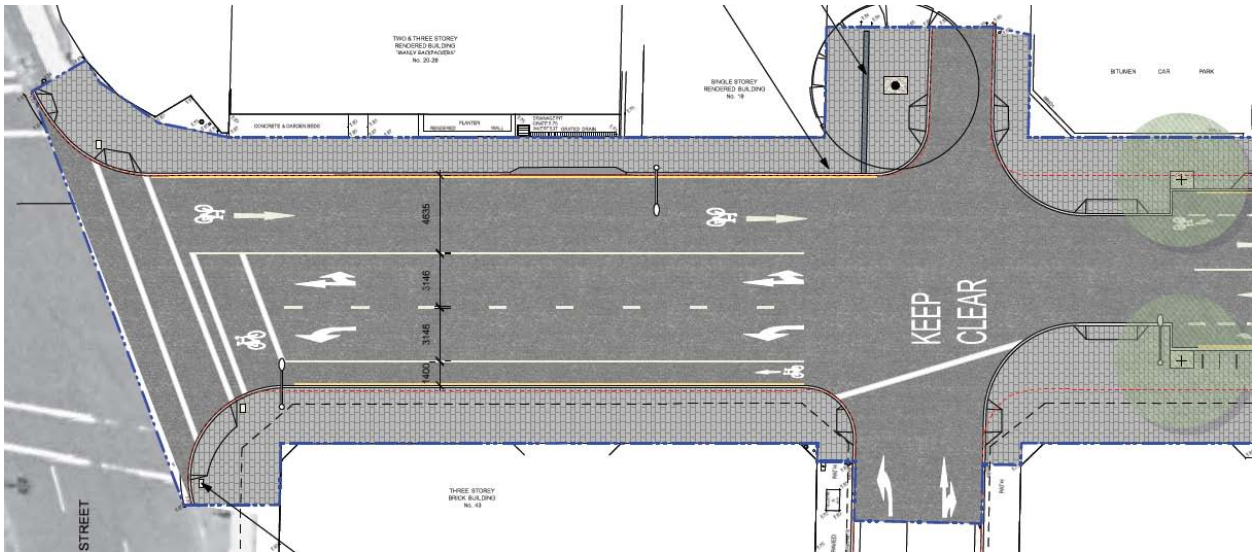


Figure 2.1: Proposed western section of Raglan Street

The central section of Raglan Street (see Figure 2.2) is proposed to have one traffic lane and one on-road bicycle lane in each direction. Short Street would become a pedestrian priority Shared Zone, with a continuous footpath treatment at Raglan Street.

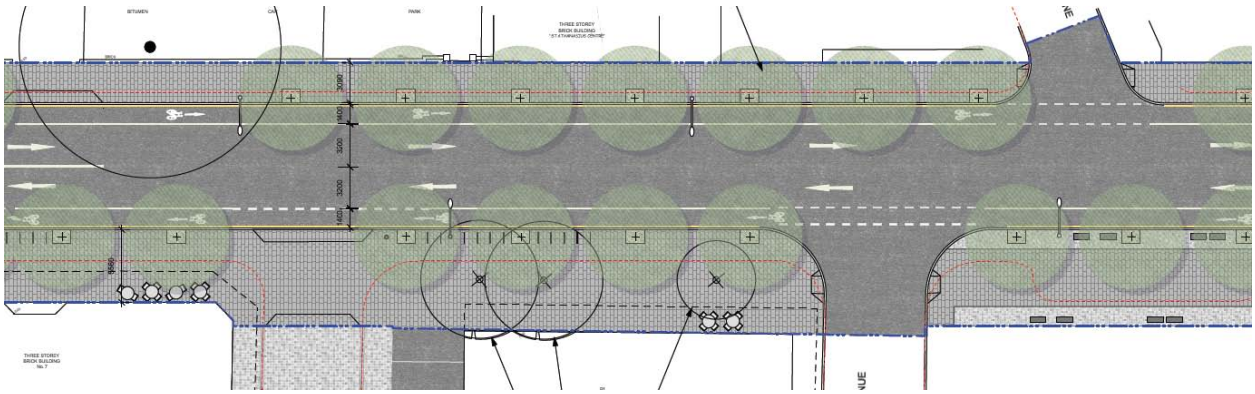


Figure 2.2: Proposed central section of Raglan Street

The eastern section of Raglan Street is proposed to continue the treatment but with a pedestrian refuge immediately west of the North Steyne intersection, as shown in Figure 2.3 below. The significant change here is that there would be just a single lane approach to North Steyne, compared to the existing two lane approach.

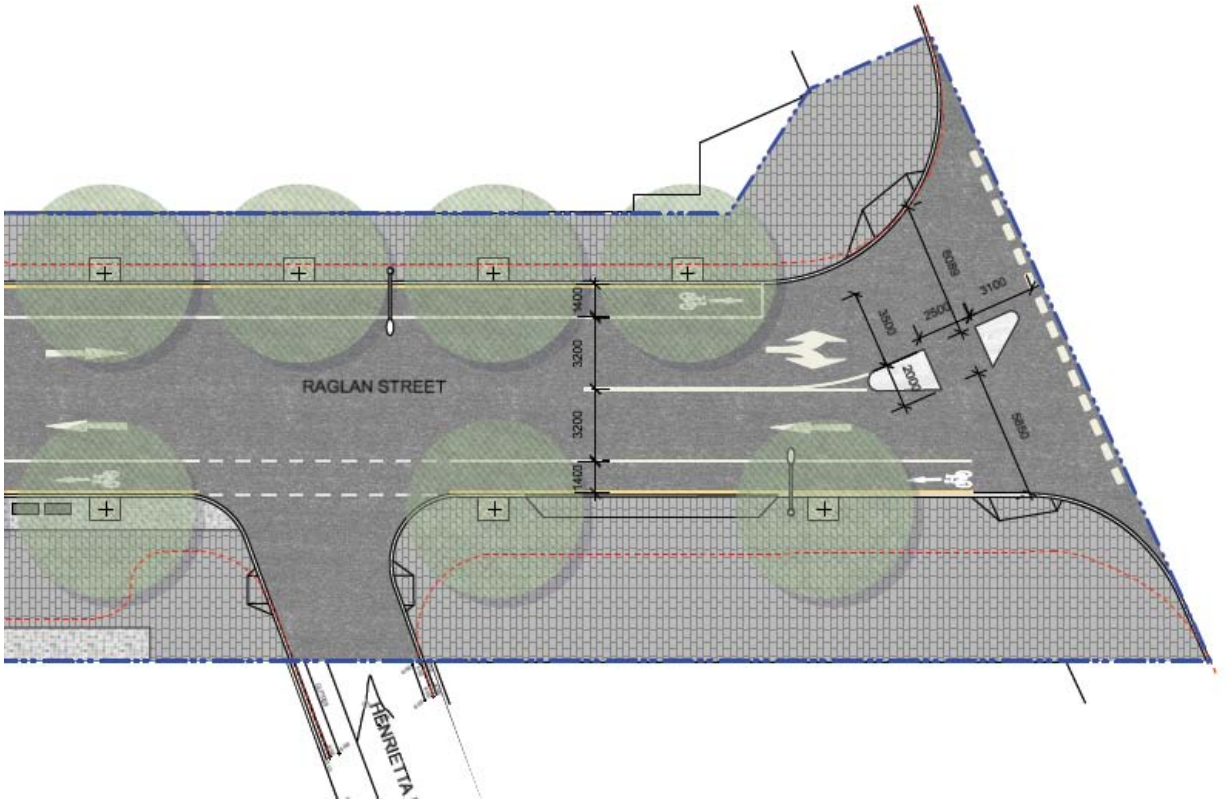


Figure 2.3: Proposed eastern section of Raglan Street

2.3 IMPACTS OF PROPOSED ARRANGEMENTS

The proposed arrangements are not expected to create any significant changes in traffic patterns. Nevertheless, SIDRA modelling has been undertaken to test the impacts of the proposed lane arrangements at the western and eastern ends of Raglan Street. These analyses have used 2010 traffic volumes that were collected as part of the Paramics micro-simulation modelling of the *Manly 2015*

concepts. (Traffic patterns are expected to change significantly under *Manly 2015*, but the proposed Raglan Street enhancements are intended to be in place beforehand.)

2.3.1 Intersection Analysis- Raglan Street/Belgrave Street/Pittwater Road

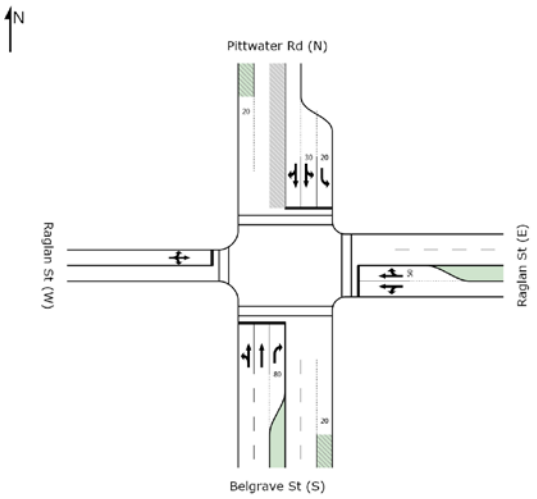


Figure 2.4: Existing Layout

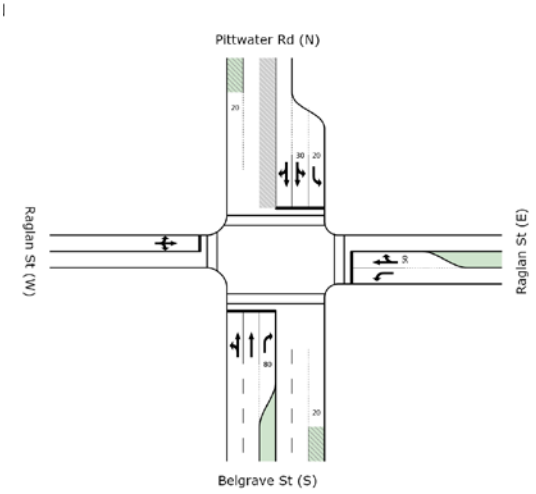


Figure 2.5: Proposed Layout

Table 2.1: Intersection Performance Result – Existing Traffic (2010) and Layout

Intersection	AM/PM Peak	Approach	Demand Flows (Veh/h)	Degree of Saturation (v/c)	Average Delay (S)	Level of Service	95% Back of Queue (m)
Raglan Street/Belgrave Street/ Pittwater Road	AM	Belgrave Street (S)	457	0.287	19.3	B	10.3
		Raglan Street (E)	284	0.507	31.5	C	7.0
		Pittwater Road (N)	658	0.501	19.2	B	17.0
		Raglan Street (W)	112	0.208	30.7	C	5.6
		All Vehicles	1511	0.507	22.4	B	17.0
	PM	Belgrave Street (S)	515	0.415	28.2	B	14.1
		Raglan Street (E)	334	0.558	23.9	B	7.5
		Pittwater Road (N)	559	0.556	27.6	B	16.9
		Raglan Street (W)	155	0.212	22.1	B	6.4
		All Vehicles	1562	0.558	26.5	B	16.9

Table 2.2: Intersection Performance Result – Proposed Layout

Intersection	AM/PM Peak	Approach	Demand Flows (Veh/h)	Degree of Saturation (v/c)	Average Delay (S)	Level of Service	95% Back of Queue (m)
Raglan Street/Belgrave Street/ Pittwater Road	AM	Belgrave Street (S)	457	0.279	17.9	B	9.9
		Raglan Street (E)	284	0.530	34.3	C	7.3
		Pittwater Road (N)	658	0.524	18.1	B	18.4
		Raglan Street (W)	112	0.228	33.1	C	5.8
		All Vehicles	151	0.530	22.2	B	18.4
	PM	Belgrave Street (S)	515	0.392	26.2	B	13.7
		Raglan Street (E)	334	0.581	25.9	B	7.8
		Pittwater Road (N)	559	0.569	26.0	B	18.3
		Raglan Street (W)	155	0.226	24.1	B	6.7
		All Vehicles	1562	0.581	25.9	B	18.3

It can be seen that the overall intersection performance would remain at Level of Service B under the proposed arrangements, with acceptable average delays and queue lengths.

2.3.2 Intersection Analysis- Raglan Street/North Steyne

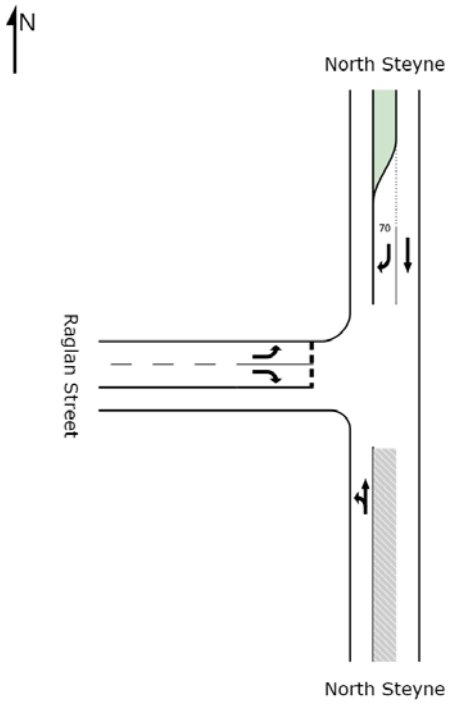


Figure 2.6: Existing Layout

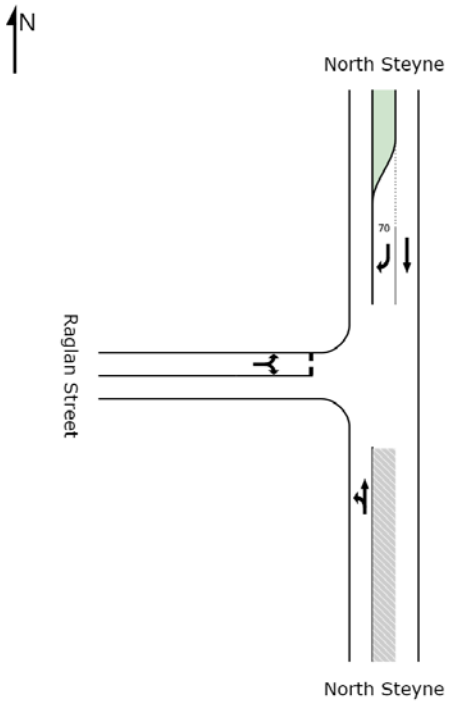


Figure 2.7: Proposed Layout

Table 2.3: Intersection Performance Result – Existing Traffic (2010) and Layout

Intersection	AM/PM Peak	Approach	Demand Flows (Veh/h)	Degree of Saturation (v/c)	Average Delay (S)	Level of Service	95% Back of Queue (m)
Raglan Street/North Steyne	AM	North Steyne (S)	431	0.223	0.9	A	0
		North Steyne (N)	600	0.220	2.3	A	1.1
		Raglan Street (W)	191	0.351	14.5	C	1.7
		All Vehicles	1221	0.351	3.7	N/A	1.7
	PM	North Steyne (S)	492	0.254	0.8	A	0
		North Steyne (N)	467	0.182	2.4	A	0.9
		Raglan Street (W)	282	0.379	13.3	B	1.9
		All Vehicles	1241	0.379	4.3	N/A	1.9

Table 2.4: Intersection Performance Result – Proposed Layout

Intersection	AM/PM Peak	Approach	Demand Flows (Veh/h)	Degree of Saturation (v/c)	Average Delay (S)	Level of Service	95% Back of Queue (m)
Raglan Street/North Steyne	AM	North Steyne (S)	431	0.223	0.9	A	0
		North Steyne (N)	600	0.220	2.4	A	1.1
		Raglan Street (W)	191	0.522	19.0	B	3.6
		All Vehicles	1221	0.522	4.5	N/A	3.6
	PM	North Steyne (S)	492	0.254	0.8	A	0.0
		North Steyne (N)	467	0.182	2.5	A	0.9
		Raglan Street (W)	282	0.674	20.4	B	6.0
		All Vehicles	1241	0.674	5.9	N/A	6.0

Again, it can be seen that the intersection performance would remain acceptable, with the worst Level of Service B under the proposed arrangements, and with acceptable average delays and queue lengths.

3. PART C – MEASURES TO AMELIORATE IMPACTS OF RE-ASSIGNED TRAFFIC

Given the insignificant reassignment of traffic, and the acceptable SIDRA modelling results, no amelioration measures are proposed.

4. PART D – ASSESSMENT OF PUBLIC TRANSPORT SERVICES AFFECTED

Given that only two bus routes (136 and 139) services use this section of Raglan Street in the eastbound direction only, there would be no significant impact on bus services.

5. PART E – PROVISION FOR EMERGENCY VEHICLES, HEAVY VEHICLES, CYCLISTS AND PEDESTRIANS

Emergency vehicles – no impact on operations.

Heavy Vehicles – swept path checks have indicated that heavy vehicles would still be able to negotiate the eastbound entrance to the single lane section of Raglan Street at the western intersection.

Cyclists – enhanced facilities due to the separate, one-way bicycle lanes on each side of Raglan Street, and the proposed bike box at the western intersection.

Pedestrians – enhanced facilities due to the widened footpaths and improved streetscape.

6. PART F – ASSESSMENT OF EFFECTS ON EXISTING AND FUTURE DEVELOPMENTS WITH TRANSPORT IMPLICATIONS IN THE VICINITY OF THE PROPOSED MEASURES

[TBA by Council]

7. PART G – ASSESSMENT OF THE EFFECTS OF PROPOSED MEASURES ON TRAFFIC MOVEMENTS IN ADJOINING COUNCIL AREAS

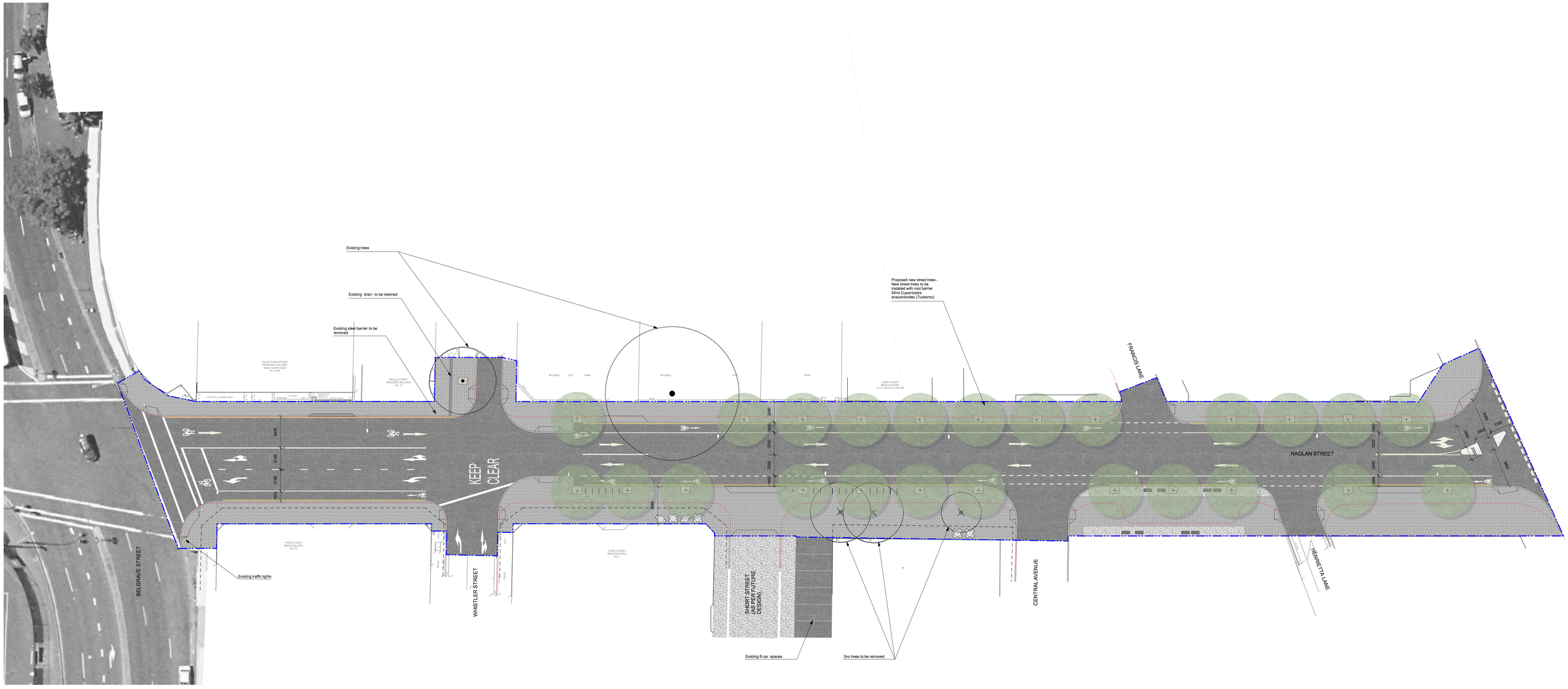
There would be no impact of the proposed measures on adjoining Council areas.

8. PART H – PUBLIC CONSULTATION PROCESS

The proposed works in Raglan Street are part of the 'North Quarter' package of works in the *Manly 2015* project. *Manly 2015* has been the subject of extensive community consultation, including public information sessions, presentations, and website pages (see: http://203.147.192.201/manly2015/current-site/three-key-components-to-manly-2015-going-forward/north-quarter-including-short-street-central-avenue-henrietta-lane-and-raglan-street/). There have also been meetings with the Manly Chamber of Commerce and the Manly Precinct Committees.

ATTACHMENT A

ARCHITECT DRAWING



General
- Works boundary
- Existing kerb line
- Existing awning (approx location)

Pavements
- Bitumen - 2427 m2
- Bluestone granite kerb (as per The Corso) - 500 lm
- Dark stone pavement (as per The Corso) - 1800 m2
- Concrete (refuge)
- Stone setts (as per Short Street) - 80 m2
- Linemarking
- No stopping line

Furniture + Fittings
- Cafe outdoor seating
- Bike racks - 17no
- Seating - 8no
- Lighting - 9no
- Manly Council standard wayfinding sign - 1no
- WSUD Tree Pit - 24no

Trees
- Existing Tree to be Removed - 3no
- Existing Tree to be Retained
- Proposed street tree - 24no

Raglan Street

Manly

DESIGN PLAN

REVISION A | SCALE 1:200 @ A0

0 5 10 15 20 25 M

01

MCGREGOR COXALL
LANDSCAPE ARCHITECTURE
URBAN DESIGN
ESD

Sydney
T +61 2 9417 3853 F +61 2 9417 5501
Melbourne
T +61 3 9939 1608 F +61 3 9939 4414
www.mcgregorcoxall.com

ATTACHMENT B

SIDRA OUTPUTS

MOVEMENT SUMMARY

Site: Base Case AM

Raglan St / Pittwater Rd
Signals - Fixed Time Cycle Time = 110 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgrave St (S)											
1	L	18	0.0	0.062	21.5	LOS B	2.4	16.7	0.51	0.85	38.7
2	T	338	0.0	0.285	15.1	LOS B	10.3	72.2	0.58	0.50	40.7
3	R	101	0.0	0.287	33.2	LOS C	5.2	36.7	0.73	0.77	30.3
Approach		457	0.0	0.287	19.3	LOS B	10.3	72.2	0.61	0.57	37.9
East: Raglan St (E)											
4	L	143	0.0	0.212	33.0	LOS C	6.9	48.0	0.73	0.77	20.4
5	T	80	0.0	0.507	27.0	LOS B	7.0	48.8	0.75	0.61	19.7
6	R	61	0.0	0.507	34.1	LOS C	7.0	48.8	0.75	0.79	20.4
Approach		284	0.0	0.507	31.5	LOS C	7.0	48.8	0.74	0.73	20.2
North: Pittwater Rd (N)											
7	L	105	0.0	0.502	21.1	LOS B	4.6	31.9	0.52	0.75	37.1
8	T	497	0.0	0.501	17.9	LOS B	17.0	118.8	0.67	0.58	38.2
9	R	56	0.0	0.501	26.6	LOS B	17.0	118.8	0.71	0.95	35.3
Approach		658	0.0	0.501	19.2	LOS B	17.0	118.8	0.65	0.64	37.8
West: Raglan St (W)											
10	L	36	0.0	0.208	33.1	LOS C	5.6	39.1	0.73	0.79	29.1
11	T	38	0.0	0.208	25.9	LOS B	5.6	39.1	0.73	0.59	29.1
12	R	38	0.0	0.208	33.1	LOS C	5.6	39.1	0.73	0.78	29.1
Approach		112	0.0	0.208	30.7	LOS C	5.6	39.1	0.73	0.72	29.1
All Vehicles		1511	0.0	0.507	22.4	LOS B	17.0	118.8	0.66	0.64	33.9

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	33.6	LOS D	0.1	0.1	0.78	0.78
P3	Across E approach	53	17.5	LOS B	0.1	0.1	0.56	0.56
P5	Across N approach	53	31.3	LOS D	0.1	0.1	0.75	0.75
P7	Across W approach	53	14.8	LOS B	0.1	0.1	0.52	0.52
All Pedestrians		212	24.3				0.65	0.65

Level of Service (Aver. Int. Delay): LOS C. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS D. LOS Method for individual pedestrian movements: Delay (HCM).

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MOVEMENT SUMMARY

Site: Base Case PM

Raglan St / Pittwater Rd
Signals - Fixed Time Cycle Time = 110 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgrave St (S)											
1	L	31	0.0	0.089	28.7	LOS C	3.3	23.1	0.63	0.81	34.3
2	T	379	0.0	0.415	23.7	LOS B	14.1	98.9	0.74	0.63	34.8
3	R	105	0.0	0.394	44.3	LOS D	6.3	44.4	0.87	0.79	26.1
Approach		515	0.0	0.415	28.2	LOS B	14.1	98.9	0.76	0.68	32.6
East: Raglan St (E)											
4	L	156	0.0	0.177	24.9	LOS B	6.3	44.0	0.61	0.75	23.9
5	T	96	0.0	0.558	19.7	LOS B	7.5	52.4	0.65	0.54	23.3
6	R	82	0.0	0.558	26.8	LOS B	7.5	52.4	0.65	0.79	23.5
Approach		334	0.0	0.558	23.9	LOS B	7.5	52.4	0.63	0.70	23.7
North: Pittwater Rd (N)											
7	L	73	0.0	0.518	28.0	LOS B	3.4	23.5	0.64	0.72	32.8
8	T	442	0.0	0.556	26.7	LOS B	16.9	118.5	0.79	0.68	32.9
9	R	44	0.0	0.556	36.3	LOS C	16.9	118.5	0.84	0.91	30.5
Approach		559	0.0	0.556	27.6	LOS B	16.9	118.5	0.77	0.70	32.7
West: Raglan St (W)											
10	L	43	0.0	0.212	25.3	LOS B	6.4	44.7	0.62	0.80	32.5
11	T	68	0.0	0.212	18.1	LOS B	6.4	44.7	0.62	0.52	33.1
12	R	43	0.0	0.212	25.3	LOS B	6.4	44.7	0.62	0.79	32.5
Approach		155	0.0	0.212	22.1	LOS B	6.4	44.7	0.62	0.67	32.7
All Vehicles		1562	0.0	0.558	26.5	LOS B	16.9	118.5	0.72	0.69	31.3

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	24.9	LOS C	0.1	0.1	0.67	0.67
P3	Across E approach	53	24.9	LOS C	0.1	0.1	0.67	0.67
P5	Across N approach	53	22.9	LOS C	0.1	0.1	0.65	0.65
P7	Across W approach	53	21.6	LOS C	0.1	0.1	0.63	0.63
All Pedestrians		212	23.6				0.65	0.65

Level of Service (Aver. Int. Delay): LOS C. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual pedestrian movements: Delay (HCM).

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MOVEMENT SUMMARY

Site: Proposed AM

Raglan St / Pittwater Rd
Signals - Fixed Time Cycle Time = 110 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgrave St (S)											
1	L	18	0.0	0.057	20.0	LOS B	2.2	15.2	0.48	0.85	39.7
2	T	338	0.0	0.273	13.4	LOS A	9.9	69.2	0.55	0.47	42.1
3	R	101	0.0	0.279	32.4	LOS C	5.2	36.2	0.72	0.77	30.7
Approach		457	0.0	0.279	17.9	LOS B	9.9	69.2	0.59	0.55	38.9
East: Raglan St (E)											
4	L	143	0.0	0.229	35.3	LOS C	7.1	49.9	0.76	0.78	19.5
5	T	80	0.0	0.530	30.2	LOS C	7.3	51.1	0.79	0.64	18.4
6	R	61	0.0	0.530	37.3	LOS C	7.3	51.1	0.79	0.80	19.3
Approach		284	0.0	0.530	34.3	LOS C	7.3	51.1	0.77	0.74	19.2
North: Pittwater Rd (N)											
7	L	105	0.0	0.523	19.7	LOS B	4.7	33.1	0.50	0.76	38.2
8	T	497	0.0	0.524	17.0	LOS B	18.4	128.5	0.68	0.60	38.8
9	R	56	0.0	0.524	25.1	LOS B	18.4	128.5	0.69	0.96	36.2
Approach		658	0.0	0.524	18.1	LOS B	18.4	128.5	0.65	0.66	38.5
West: Raglan St (W)											
10	L	36	0.0	0.228	35.5	LOS C	5.8	40.7	0.76	0.79	28.2
11	T	38	0.0	0.228	28.3	LOS B	5.8	40.7	0.76	0.62	28.1
12	R	38	0.0	0.228	35.5	LOS C	5.8	40.7	0.76	0.79	28.2
Approach		112	0.0	0.228	33.1	LOS C	5.8	40.7	0.76	0.73	28.1
All Vehicles		1511	0.0	0.530	22.2	LOS B	18.4	128.5	0.66	0.65	34.1

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	36.0	LOS D	0.1	0.1	0.81	0.81
P3	Across E approach	53	14.3	LOS B	0.1	0.1	0.51	0.51
P5	Across N approach	53	33.6	LOS D	0.1	0.1	0.78	0.78
P7	Across W approach	53	13.3	LOS B	0.1	0.1	0.49	0.49
All Pedestrians		212	24.3				0.65	0.65

Level of Service (Aver. Int. Delay): LOS C. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS D. LOS Method for individual pedestrian movements: Delay (HCM).

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MOVEMENT SUMMARY

Site: Proposed PM

Raglan St / Pittwater Rd
Signals - Fixed Time Cycle Time = 110 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgrave St (S)											
1	L	31	0.0	0.081	26.7	LOS B	3.1	21.4	0.60	0.81	35.3
2	T	379	0.0	0.392	21.5	LOS B	13.7	95.6	0.71	0.61	36.1
3	R	105	0.0	0.369	43.1	LOS D	6.2	43.7	0.85	0.79	26.5
Approach		515	0.0	0.392	26.2	LOS B	13.7	95.6	0.73	0.66	33.6
East: Raglan St (E)											
4	L	156	0.0	0.188	26.8	LOS B	6.6	46.0	0.64	0.76	23.0
5	T	96	0.0	0.581	21.8	LOS B	7.8	54.7	0.69	0.57	22.1
6	R	82	0.0	0.582	29.0	LOS C	7.8	54.7	0.69	0.80	22.5
Approach		334	0.0	0.581	25.9	LOS B	7.8	54.7	0.67	0.71	22.6
North: Pittwater Rd (N)											
7	L	73	0.0	0.570	26.3	LOS B	5.2	36.2	0.61	0.78	34.4
8	T	442	0.0	0.569	25.2	LOS B	18.3	128.2	0.79	0.69	33.6
9	R	44	0.0	0.569	33.8	LOS C	18.3	128.2	0.82	0.92	31.7
Approach		559	0.0	0.569	26.0	LOS B	18.3	128.2	0.77	0.72	33.5
West: Raglan St (W)											
10	L	43	0.0	0.225	27.3	LOS B	6.7	46.7	0.65	0.80	31.6
11	T	68	0.0	0.226	20.1	LOS B	6.7	46.7	0.65	0.54	32.0
12	R	43	0.0	0.226	27.3	LOS B	6.7	46.7	0.65	0.80	31.6
Approach		155	0.0	0.226	24.1	LOS B	6.7	46.7	0.65	0.69	31.7
All Vehicles		1562	0.0	0.581	25.9	LOS B	18.3	128.2	0.72	0.69	31.6

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	27.0	LOS C	0.1	0.1	0.70	0.70
P3	Across E approach	53	21.0	LOS C	0.1	0.1	0.62	0.62
P5	Across N approach	53	24.9	LOS C	0.1	0.1	0.67	0.67
P7	Across W approach	53	19.8	LOS B	0.1	0.1	0.60	0.60
All Pedestrians		212	23.2				0.65	0.65

Level of Service (Aver. Int. Delay): LOS C. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual pedestrian movements: Delay (HCM).

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MOVEMENT SUMMARY

Site: AM_2010_North Steyne & Raglan

North Steyne and Raglan Street
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: North Steyne											
1	L	88	0.0	0.223	4.5	LOS A	0.0	0.0	0.00	0.65	36.7
2	T	342	0.0	0.223	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		431	0.0	0.223	0.9	LOS A	0.0	0.0	0.00	0.13	39.3
North: North Steyne											
8	T	401	0.0	0.206	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
9	R	199	0.0	0.220	7.1	LOS A	1.1	8.0	0.51	0.72	35.0
Approach		600	0.0	0.220	2.3	LOS A	1.1	8.0	0.17	0.24	38.2
West: Raglan Street											
10	L	132	0.0	0.171	7.0	LOS A	0.8	5.6	0.47	0.69	35.1
12	R	59	0.0	0.351	31.1	LOS C	1.7	11.6	0.87	1.02	24.6
Approach		191	0.0	0.351	14.5	LOS C	1.7	11.6	0.60	0.79	31.0
All Vehicles		1221	0.0	0.351	3.7	NA	1.7	11.6	0.18	0.29	37.2

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on the worst delay for any vehicle movement.

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SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: PM_2010_North Steyne & Raglan

North Steyne and Raglan Street
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: North Steyne											
1	L	93	0.0	0.254	4.5	LOS A	0.0	0.0	0.00	0.66	36.7
2	T	399	0.0	0.254	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		492	0.0	0.254	0.8	LOS A	0.0	0.0	0.00	0.12	39.3
North: North Steyne											
8	T	316	0.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
9	R	152	0.0	0.182	7.5	LOS A	0.9	6.3	0.53	0.74	34.8
Approach		467	0.0	0.182	2.4	LOS A	0.9	6.3	0.17	0.24	38.1
West: Raglan Street											
10	L	208	0.0	0.295	8.1	LOS A	1.6	11.1	0.54	0.80	34.4
12	R	74	0.0	0.378	28.0	LOS B	1.9	13.2	0.85	1.02	25.5
Approach		282	0.0	0.379	13.3	LOS B	1.9	13.2	0.62	0.86	31.5
All Vehicles		1241	0.0	0.379	4.3	NA	1.9	13.2	0.21	0.33	36.8

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on the worst delay for any vehicle movement.

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MOVEMENT SUMMARY

Site: Proposed_ AM_2010_North Steyne & Raglan

North Steyne and Raglan Street
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: North Steyne											
1	L	88	0.0	0.223	4.5	LOS A	0.0	0.0	0.00	0.65	36.7
2	T	342	0.0	0.223	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		431	0.0	0.223	0.9	LOS A	0.0	0.0	0.00	0.13	39.3
North: North Steyne											
8	T	401	0.0	0.206	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
9	R	199	0.0	0.220	7.3	LOS A	1.1	8.0	0.51	0.73	34.8
Approach		600	0.0	0.220	2.4	LOS A	1.1	8.0	0.17	0.24	38.1
West: Raglan Street											
10	L	132	0.0	0.522	18.8	LOS B	3.6	25.1	0.69	1.08	29.0
12	R	59	0.0	0.522	19.3	LOS B	3.6	25.1	0.69	1.05	28.9
Approach		191	0.0	0.522	19.0	LOS B	3.6	25.1	0.69	1.07	28.9
All Vehicles		1221	0.0	0.522	4.5	NA	3.6	25.1	0.19	0.33	36.7

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on the worst delay for any vehicle movement.

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MOVEMENT SUMMARY

Site: Proposed_PM_2010_North Steyne & Raglan

North Steyne and Raglan Street
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: North Steyne											
1	L	93	0.0	0.254	4.5	LOS A	0.0	0.0	0.00	0.66	36.7
2	T	399	0.0	0.254	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		492	0.0	0.254	0.8	LOS A	0.0	0.0	0.00	0.12	39.3
North: North Steyne											
8	T	316	0.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
9	R	152	0.0	0.182	7.7	LOS A	0.9	6.3	0.53	0.76	34.6
Approach		467	0.0	0.182	2.5	LOS A	0.9	6.3	0.17	0.25	38.1
West: Raglan Street											
10	L	208	0.0	0.675	20.3	LOS B	6.0	42.2	0.75	1.29	28.4
12	R	74	0.0	0.676	20.7	LOS B	6.0	42.2	0.75	1.21	28.3
Approach		282	0.0	0.674	20.4	LOS B	6.0	42.2	0.75	1.27	28.3
All Vehicles		1241	0.0	0.674	5.9	NA	6.0	42.2	0.24	0.43	35.7

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on the worst delay for any vehicle movement.

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SIDRA INTERSECTION

RAGLAN STREET
CONCEPT DESIGN STAGE
ROAD SAFETY AUDIT

FOR

MANLY COUNCIL

Gold Coast
Suite 26, 58 Riverwalk Avenue
Robina QLD 4226
P: (07) 5562 5377
W: www.bitziosconsulting.com.au

Brisbane
Level 2, 428 Upper Edward Street
Spring Hill QLD 4000
P: (07) 3831 4442
E: admin@bitziosconsulting.com.au

Sydney
Studio 203, 3 Gladstone Street
Newtown NSW 2042
P: (02) 9557 6202

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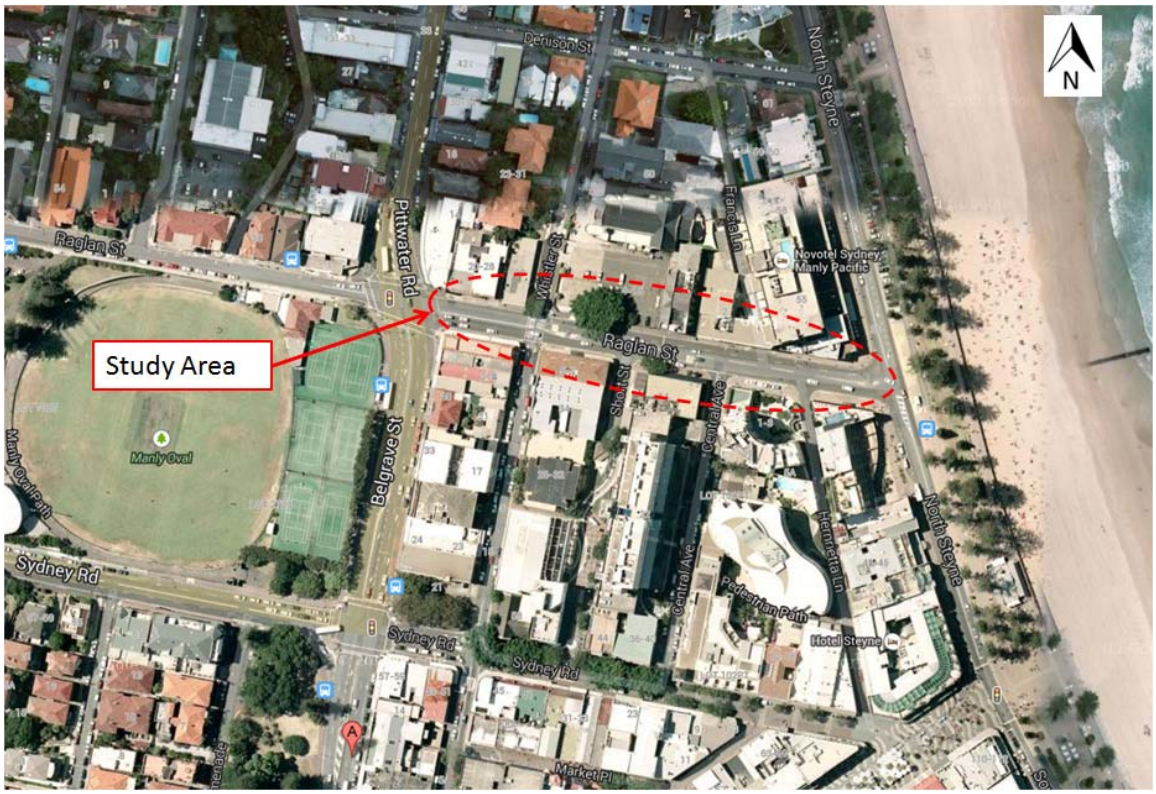
1. INTRODUCTION

1.1 BACKGROUND

Bitzios Consulting has been engaged by Manly Council to conduct a Concept Design Road Safety Audit of the section of proposed Raglan Street Upgrade between North Steyne and Belgrave Street. The location of the subject site is shown in Figure 1.1.



Source: Google Maps

Figure 1.1: Study Area

1.2 SCOPE OF THE ASSESSMENT

The road safety audit was undertaken in accordance with the procedures set out in the Austroads – Road Safety Audit (2009) manual and the RMS Guide to Road Safety Practices Part 1. The audit involved undertaking a concept design stage road safety audit (as per the Austroads Road Safety Audit Checklist 2) for the route highlighted in Figure 1.1.

2. ROAD SAFETY AUDIT PROCESS

2.1 DEFINITIONS

The Austroads Road Safety Manual (2009) guide defines a road safety audit as:

"a formal examination of a future road or traffic project or an existing road, in which an independent, qualified team reports on the project's crash potential and safety performance."

The essential elements of this definition are that it is:

- a formal process and not an informal check;
- an independent process;
- carried out by someone with appropriate experience and training; and
- restricted to road safety issues.

The objectives of a road safety audit are:

- to identify potential safety problems for road users and others affected by a road project; and
- to ensure that measures to eliminate or reduce the problems are considered fully.

The benefits of conducting road safety audits are that:

- the likelihood of crashes on the road network can be reduced; and
- the severity of crashes can be reduced.

The aim of a road safety audit is:

"to identify any safety deficiencies of design, layout and road furniture which are not consistent with the road's function and use. There should be a consistency of standards such that the road users' perception of local conditions assists safe behaviour."

2.2 METHODOLOGY

The road safety audit was undertaken in accordance with the requirements of the Austroads Road Safety Audit Manual. Items audited as part of the road safety audit included, but were not limited to:

- road alignment (horizontal and vertical);
- intersection geometry;
- intersection sight distances;
- signs and pavement markings;
- provision for special road users including pedestrians and cyclists and potential conflict points; and
- roadside objects and hazards.

2.3 AUDIT TEAM

The road safety audit was carried out by an audit team comprising:

- Praveen Bollavaram – Lead Auditor (level 3) (Bitzios Consulting); and
- Jeremy O'Neil – Team Member (level 2) (Bitzios Consulting).

2.4 INFORMATION SOURCES

Data sources for the road safety audit included:

- RTA Guidelines for Road Safety Practices (Part 1);
- RMS's Technical Direction Bicycle Storage Areas and Advance Bicycle Stop Lines (TDT 2009/06);
- Australian Standard Manual of Uniform Traffic Control Devices Part 2: Traffic Control Devices for General Use (AS1742.2-2009);
- Austroads Guide to Traffic Management Part 8: Local Area Traffic Management; and
- Austroads Guide to Road Safety.

2.5 AUDIT HISTORY

The audit team has not been made aware of any previous audits undertaken for this project.

2.6 RISK ASSESSMENT

The issues identified have been prioritised based on Austroad's standard risk assessment. The risk level is based on a combination of the frequency that a crash type will happen by the severity of the resulting crash. Table 2.1 below is from the Austroads Guide to Road Safety, Part 6.

Table 2.1: Risk Matrix

Severity	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

Source: Austroads Guide to Road Safety part 6 Road Safety Audits

3. CONCEPT DESIGN ROAD SAFETY AUDIT

This section summarises the safety issues identified during the audit of the concept plans. The key audit findings are outlined below in Section 3.1 followed by a table of specific issues in Section 3.2

3.1 KEY AUDIT FINDINGS

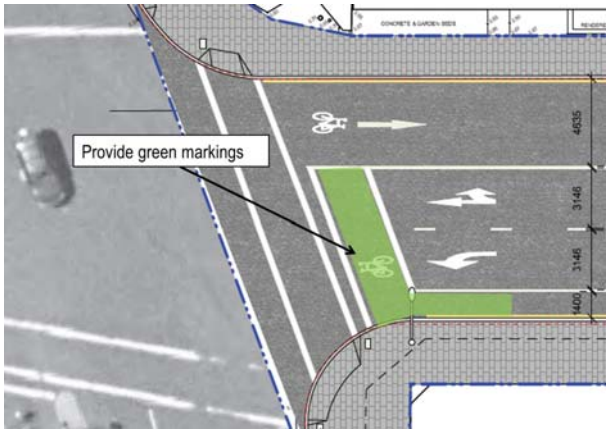
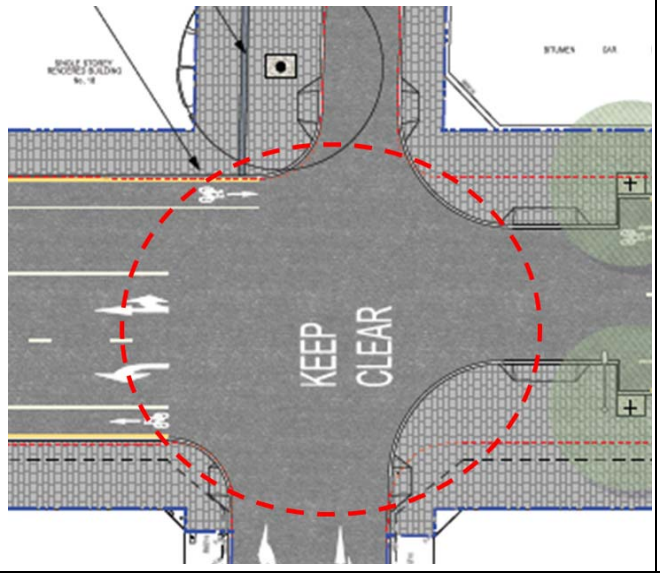
The key findings of the audit are as follows:

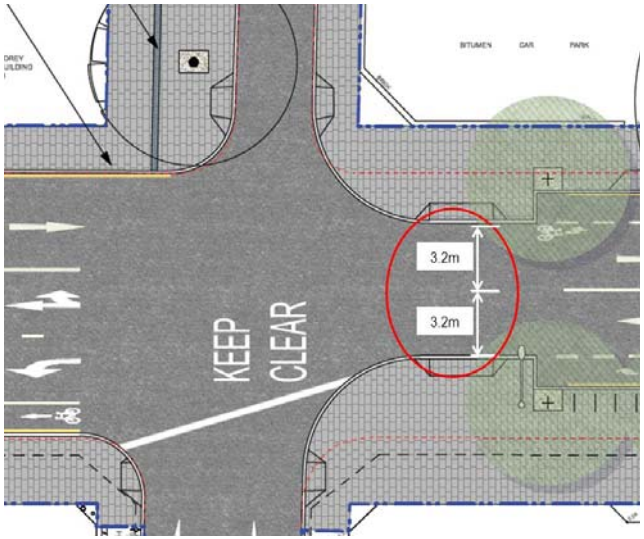
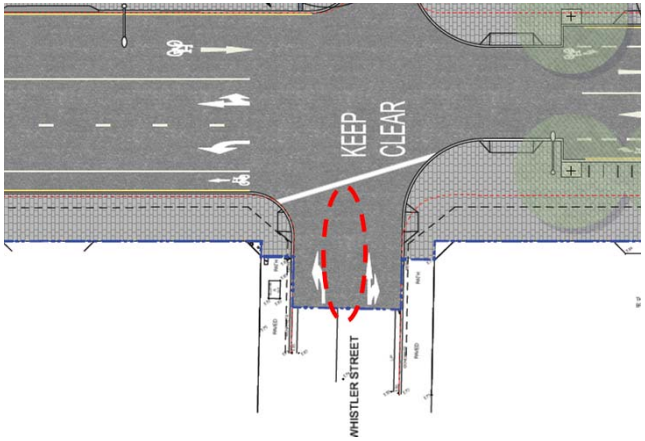
- the on-road cycle route on Raglan Street includes a undesirable squeeze point near the Whistler Street intersection;
- there is limited centre line marking on Raglan Street to separate traffic flows;
- the "Keep Clear" pavement markings at the Raglan Street / Whistler Street intersection are unclear; and
- there is no delineation to guide traffic through a reverse curve movement on Raglan Street at the Whistler Street intersection.

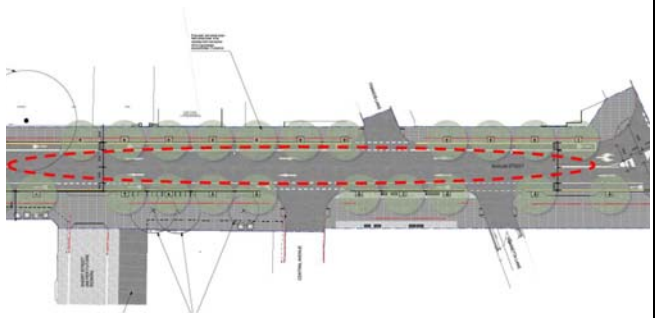
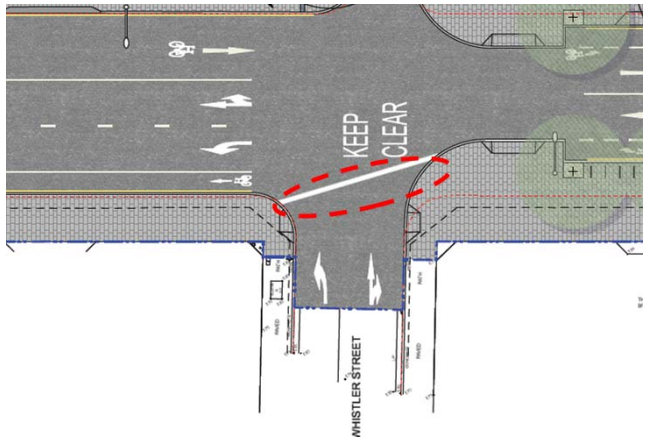
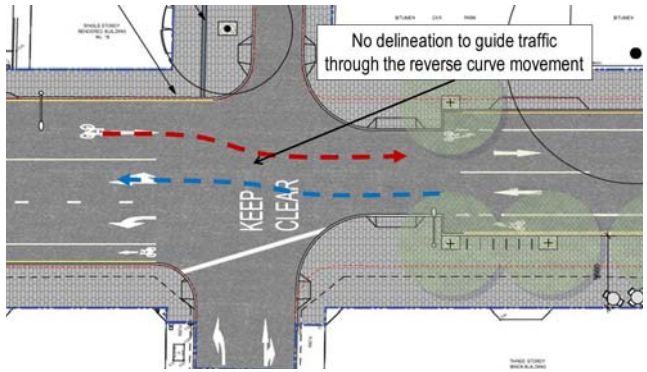
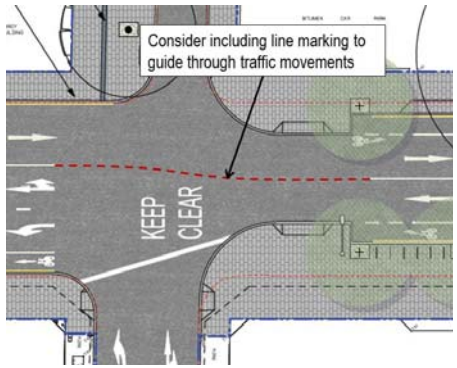
3.2 AUDIT FINDINGS

Table 3.1 details the key safety issues identified during the audit of the concept design drawings together with the suggested treatments.

Table 3.1: Concept Design Stage Road Safety Audit Findings and Suggested Treatments

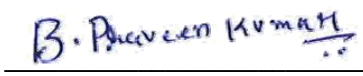
Item	Risk Priority	Issues	Site Illustration	Suggested Treatment
1	Low	The bicycle storage area at the Ragan Street / Pittwater Street intersection has no green pavement colouring. RMS's Technical Direction *Bicycle Storage Areas and Advance Bicycle Stop Lines* (TDT 2009/06) recommends that green pavement colouring be provided for both the storage area and bicycle approach lane.		Provide green pavement colouring for both the storage area and bicycle approach lane.
2	Medium	It is unclear where vehicles are required to "keep clear" for the Raglan Street / Whistler Street intersection's keep clear arrangement. This could result in blocking of traffic from the side street with potential safety implications.		-There should be a solid line on either side of the KEEP CLEAR pavement marking. -The KEEP CLEAR should be a total of 7.5m in depth. Each word should have a height of 2.5m, the space between should also be 2.5m -KEEP CLEAR should be replicated on the eastbound side of road if queuing is envisaged to be an issue at this location. -KEEP CLEAR should have a 'centre' justification (currently 'left') in accordance with AS1742.2 *Figure 5.13.*

Item	Risk Priority	Issues	Site Illustration	Suggested Treatment
3	High	The shared cycle/traffic lane at the pedestrian crossing on Raglan Street creates a squeeze point between cyclist and vehicles. The Austroad Guide to Traffic Management Part 8: Local Area Traffic Management states that "*practice should be that lane widths are either designed to be wide enough in all instances to allow the safe passage of a cyclist and a vehicle side by side (3.7 m or more) or narrow enough to permit the passage of a vehicle or bicycle only (3.0 m or less). Widths in between these two extremes create squeeze points and result in conflicts*"		It is recommended that the footpath kerb extension be redesigned to eliminate the cyclist squeeze point conflict.
4	Low	The Whistler Street approach to Raglan Street has no lane line to separate turning traffic movements.		Provide lane line for the Whistler Street approach to Raglan Street.

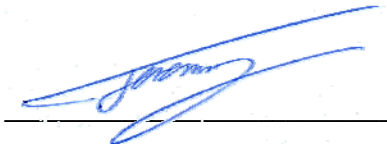
Item	Risk Priority	Issues	Site Illustration	Suggested Treatment
5	Low	There is no dividing separation line provided for Raglan Street.		Consideration should be given to installing a dividing separation line on Raglan Street if the forecast AADT is greater than 2500 vehicles
6	Low	The Whistler Street stop line is skewed. Stop lines should generally be either parallel to the line of the intersecting road or at right angles to vehicles approaching the line.		Recommend realigning stop line closer to a right angle position for approaching traffic.
7	High	The Raglan Street eastbound alignment at Whistler Street requires traffic to undertake a reverse curve movement however no delineation has been provided. This could result in conflicts with opposing traffic flows which is exacerbated by the narrow lane widths at this location		

4. CONCLUDING STATEMENT

Bitzios Consulting Pty Ltd makes every endeavour to fully exercise its duty of care to its clients and all road users in any recommendations from being engaged to conduct a road safety audit report. Bitzios Consulting Pty Ltd, in making any recommendation, is fully aware and wishes you to be fully aware that there can be a number of different factors or combination of factors that cause road crashes. Whilst Bitzios Consulting Pty Ltd makes every endeavour to make recommendations to enhance road safety by addressing foreseeable risk, those recommendations cannot completely eliminate the risk of crashes.



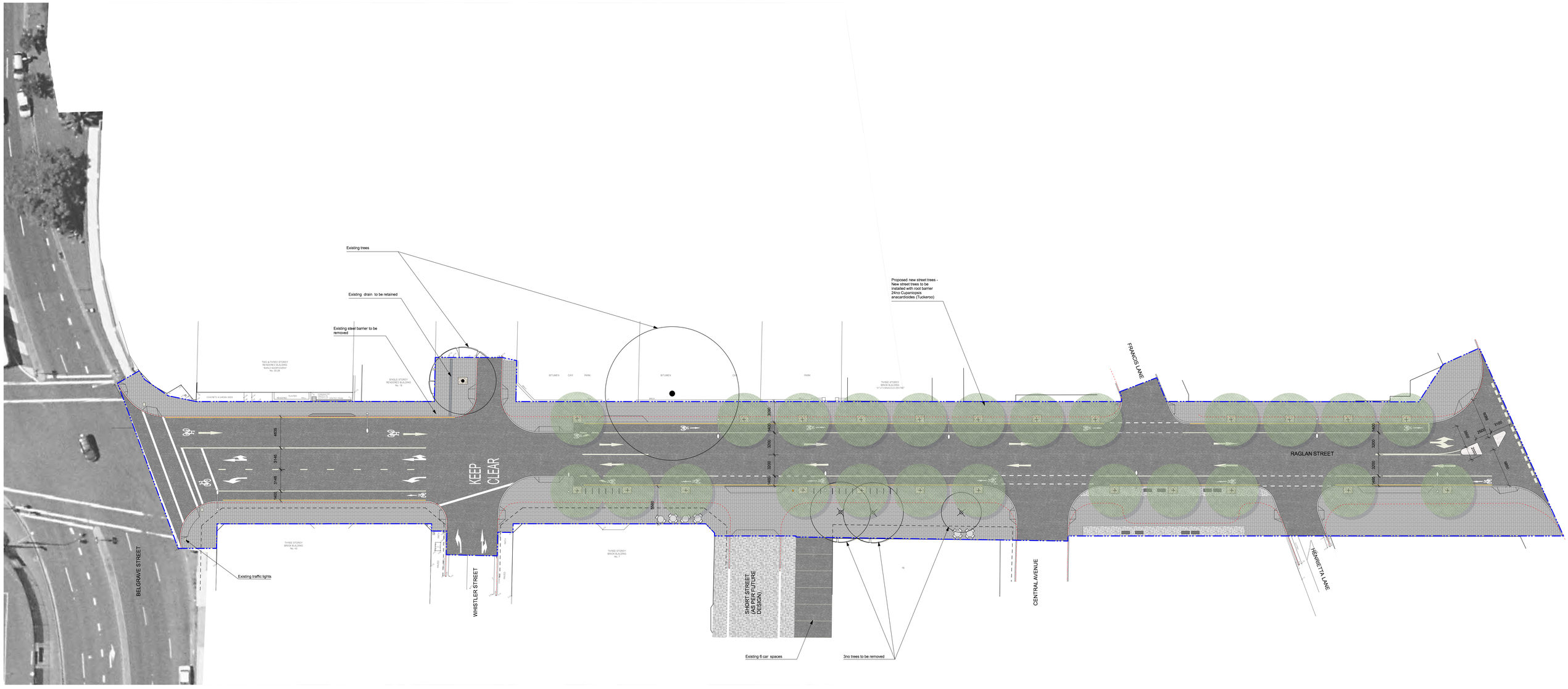
Praveen Bollavaram, Senior Road Safety Auditor Level 3 (Lead Auditor)



Jeremy O'Neill, Senior Road Safety Auditor Level 2 (Team Member)

APPENDIX A

AUDITED CONCEPT DESIGN PLANS



General
- Works boundary
- Existing kerb line
- Existing awning (approx location)

Pavements
- Bitumen - 2427 m2
- Bluestone granite kerb (as per The Corso) - 500 lm
- Dark stone pavement (as per The Corso) - 1800 m2
- Concrete (refuge)
- Stone setts (as per Short Street) - 80 m2
- Linemarking
- No stopping line

Furniture + Fittings
- Cafe outdoor seating
- Bike racks - 17no
- Seating - 8no
- Lighting - 9no
- Manly Council standard wayfinding sign - 1no
- WSUD Tree Pit - 24no

Trees
- Existing Tree to be Removed - 3no
- Existing Tree to be Retained
- Proposed street tree - 24no

Raglan Street

Manly

DESIGN PLAN

REVISION A | SCALE 1:200 @ A0

0 5 10 15 20 25 M

01

MCGREGOR COXALL
LANDSCAPE ARCHITECTURE
URBAN DESIGN
ESD

Sydney
T +61 2 9417 3853 F +61 2 9417 5501
Melbourne
T +61 3 9939 1608 F +61 3 9939 4414
www.mcgregorcoxall.com