
Colston Budd Rogers & Kafes Pty Ltd

as Trustee for C & B Unit Trust
ABN 27 623 918 759

Our Ref: TR/11923/mr

Transport Planning
Traffic Studies
Parking Studies

1 December, 2021

Sasco Developments Pty Ltd
c/- Planning Ingenuity

Attention: Jeff Mead
Email: jeff@planningingenuity.com.au

Dear Sir,

RE: MEADOWBANK MIXED USE DEVELOPMENT **TRAFFIC REVIEW OF FARADAY LANE CONNECTION**

1. As requested we have reviewed the traffic effects of Council's suggestion to connect Faraday Lane to Constitution Road. We understand that Council has suggested this connection in order to:
 - minimise traffic generated by the proposed development using Railway Road and Underdale Lane; and
 - facilitate a future alternative connection between Constitution Road and Bank Street (consistent with the Council's Concept Plan for Meadowbank Station Centre). A copy of the concept plan is provided in Attachment A.
2. Our review is set out through the following sections:
 - road network changes;
 - traffic redistribution;
 - traffic generation;
 - traffic effects; and
 - summary.

Road Network Changes

3. Amended plans have been prepared by Alpha Engineering and Development showing Faraday Lane regraded and connected to Constitution Road. As part of the works, Faraday Lane (between Constitution Road and Underdale Lane) and Underdale Lane (between Bay Street and Faraday Lane) would be widened to provide a nine metre wide carriageway. Access to the proposed development would be the same as in the submitted DA plans (car park access from Faraday

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Lane and loading dock access from Constitution Road). No right turns from Constitution Road into Faraday Lane have been assumed (as a right turning vehicle would block the single eastbound lane on Constitution Road and alternative access is available via Underdale Lane).

Traffic Redistribution

4. Connecting Faraday Lane to Constitution Road will result in a redistribution of development traffic and some westbound traffic on Constitution Road. Until the Bank Street bridge over the railway is relocated to align with Underdale Lane, the diversion of traffic from Constitution Road to Faraday Lane would be a proportion of southbound traffic through the roundabout controlled intersection of Railway Road/Bay Street/Bay Drive (currently some 20 to 60 vehicles per hour in the weekday morning and afternoon peak hours.

Traffic Generation

5. Existing uses on the site generate some 20 and 25 vehicles per hour (two way) in the weekday morning and afternoon peak hours.
6. The proposed development will generate some 204 and 260 vehicles per hour in the weekday morning and afternoon peak hours respectively. Thus the net increase in traffic would be some 185 to 235 vehicles per hour in the weekday morning and afternoon peak hours.
7. A proportion of retail traffic generated by the proposed development would be passing trade (that is traffic already travelling past the site along Constitution Road/Railway Road). TfNSW Guidelines suggest this would be some 25% of the retail trips.

Traffic Effects

8. Traffic counts were undertaken on Thursday 13 May 2021 at the following intersections:
 - Constitution Road/See Street;
 - Railway Road/Bank Street/Bay Drive/Underdale Lane;
 - Faraday Lane/Underdale Lane; and
 - Underdale Lane/Bowden Street.
9. The traffic flows are summarised in Figures 1 and 2 (attached). These updated counts are considered more appropriate than the estimated 2021 traffic flows based on previous 2017 traffic counts. We understand that development

within Meadowbank is largely now completed. Traffic flows on Faraday Lane and Underdale Lane are summarised below in Table I.

Table I Existing Weekday Morning and Afternoon Two Way Peak Hour Traffic Flows (vehicles per hour)		
Location	Weekday AM	Weekday PM
Underdale Lane		
- East of Faraday Lane	145	210
- West of Faraday Lane	145	200
Faraday Lane		
- South of Constitution Road	0	0
- North of Underdale Lane	20	25

10. Examination of Table I reveals that:

- Underdale Lane carries some 145 to 210 vehicles per hour in the weekday morning and afternoon peak hours; and
- Faraday Lane carries some 20 to 25 vehicles per hour in the weekday morning and afternoon peak hours.

11. The capacity of the road network is generally determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections have been analysed using the SIDRA network program. SIDRA is designed to analyse traffic signal controlled intersections, roundabouts and priority intersections.

12. The program produces a number of measures of intersection operations. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):-

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode.
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	“A”	Good
15 to 28	=	“B”	Acceptable delays and spare capacity
29 to 42	=	“C”	Satisfactory but accident study required
43 to 56	=	“D”	Near capacity and accident study required
57 to 70	=	“E”	At capacity and requires other control mode
>70	=	“F”	Unsatisfactory and requires other control mode

13. It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

14. The SIDRA analysis found that:

- the priority controlled intersection of Constitution Road and See Street operates with average delays of less than 30 seconds per vehicle (for the movement with the highest delay, right turns out of See Street) in the weekday morning and afternoon peak hours. This represents level of service B/C, a satisfactory level of service;
- the roundabout controlled intersection of Railway Road, Bay Drive and Banks Street operates with average delays of less than 15 seconds per vehicle (for the approach with the highest delay, Bay Drive) in the weekday morning and afternoon peak hours. This represents level of service A/B, a good level of service; and
- the priority controlled intersections of Underdale Lane with Bay Drive, Faraday Lane and Bowden Street operate with average delays of less than 15 seconds per vehicle (for the movement with the highest delay) in the weekday morning and afternoon peak hours. This represents level of service A/B, a good level of service.

15. Development traffic (taking into existing traffic generation and passing trade) has been assigned to the adjacent road network as shown in Figures 1 and 2. This takes into account the connection of Faraday Lane to Constitution Road (with no right turn into Faraday Lane. 50% of southbound traffic through the Bank Street/Bay Drive/Railway Road roundabout has been diverted to Faraday Lane. The increase in traffic flows in Underdale Lane and Faraday Lane are summarised below in Table 2.

Table 2 Existing + Development Weekday Morning and Afternoon Two Way Peak Hour Traffic Flows (vehicles per hour) with Faraday Lane connected to Constitution Road				
Location	Weekday AM		Weekday PM	
	Existing	+ Dev	Existing	+ Dev
Underdale Lane				
- East of Faraday Lane	145	+26	210	+16
- West of Faraday Lane	145	+115	200	+105
Faraday Lane				
- South of Constitution Road	0	+98	0	+140
- North of Underdale Lane	20	+121	25	+71

16. Examination of Table 2 reveals that:
- traffic flows in Underdale Lane (east of Faraday Lane) would increase by some 16 to 26 vehicles per hour (two way) in the weekday morning and afternoon peak hours. In the short section between Faraday Lane and Bay Drive, traffic flows would increase by some 115 and 105 vehicles per hour (two way); and
 - traffic flows in Faraday Lane would increase by some 70 to 120 vehicles per hour (two way) in the weekday morning and afternoon peak hours.
17. SIDRA analysis has been undertaken for existing traffic plus development traffic with Faraday Lane connected to Constitution Road as shown in Figures 1 and 2. The analysis found that:
- the priority controlled intersection of Constitution Road and See Street would continue to operate with average delays of less than 30 seconds per vehicle (for the movement with the highest delay, right turns out of See Street) in the weekday morning and afternoon peak hours. This represents level of service B/C, a satisfactory level of service;
 - the roundabout controlled intersection of Railway Road, Bay Drive and Banks Street would continue to operate with average delays of less than 15

seconds per vehicle (for the approach with the highest delay, Bay Drive) in the weekday morning and afternoon peak hours. This represents level of service A/B, a good level of service;

- the priority controlled intersections of Underdale Lane with Bay Drive, Faraday Lane and Bowden Street would continue to operate with average delays of less than 15 seconds per vehicle (for the movement with the highest delay) in the weekday morning and afternoon peak hours. This represents level of service A/B, a good level of service; and
 - the priority controlled intersection of Constitution Road and Faraday Lane would operate with average delays of less than 30 seconds per vehicle (for the movement with the highest delay, right turns out of Faraday Lane) in the weekday morning and afternoon peak hours. This represents level of service B/C, a satisfactory level of service
18. With the connection of Faradays Lane to Constitution Road and the development traffic, weekday morning and afternoon peak hour traffic flows on Faraday Lane will be some 150 vehicles per hour (two way). These flows are less than the maximum environmental capacity for a local road (300 vehicles per hour).

Summary

19. In summary, the key findings of our traffic review of the connection of Faraday Lane to Constitution Road are:
- Council has suggested connecting Faraday Lane to Constitution Road in order to
 - minimise traffic generated by the proposed development using Railway Road and Underdale Lane; and
 - facilitate a future alternative connection between Constitution Road and Bank Street (consistent with the Council's Concept Plan for Meadowbank Station Centre)
 - Faraday Lane would be widened to provide a nine metre carriageway;
 - the proposed development will generate a net increase in traffic of some 185 to 235 vehicles per hour in the weekday morning and afternoon peak hours;
 - traffic flows in Faraday Lane would increase to some 150 vehicles per hour (two way) in the weekday morning and afternoon peak hours;
 - these flows are less than the maximum environmental capacity for a local road (300 vehicles per hour); and

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- intersections would continue to operate at satisfactory or better levels of service in the weekday morning and afternoon peak hours.

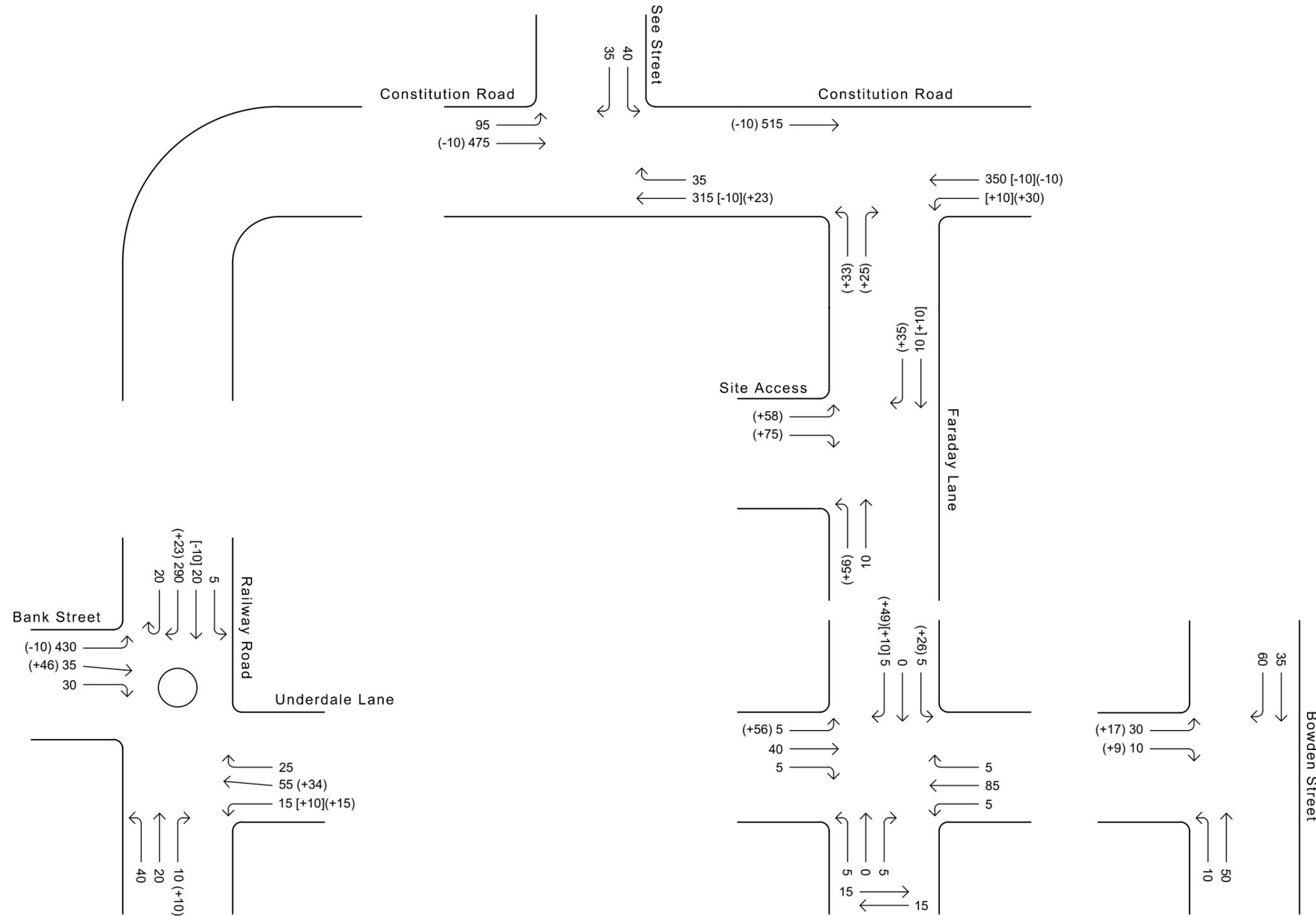
20. We trust the above provides the information you require. Finally, if you should have any queries, please do not hesitate to contact us.

Yours faithfully,

COLSTON BUDD ROGERS & KAFES PTY LTD

A handwritten signature in black ink, appearing to read 'T. Rogers'. The signature is stylized, with a large 'R' and a circular flourish at the end.

T. Rogers
Director

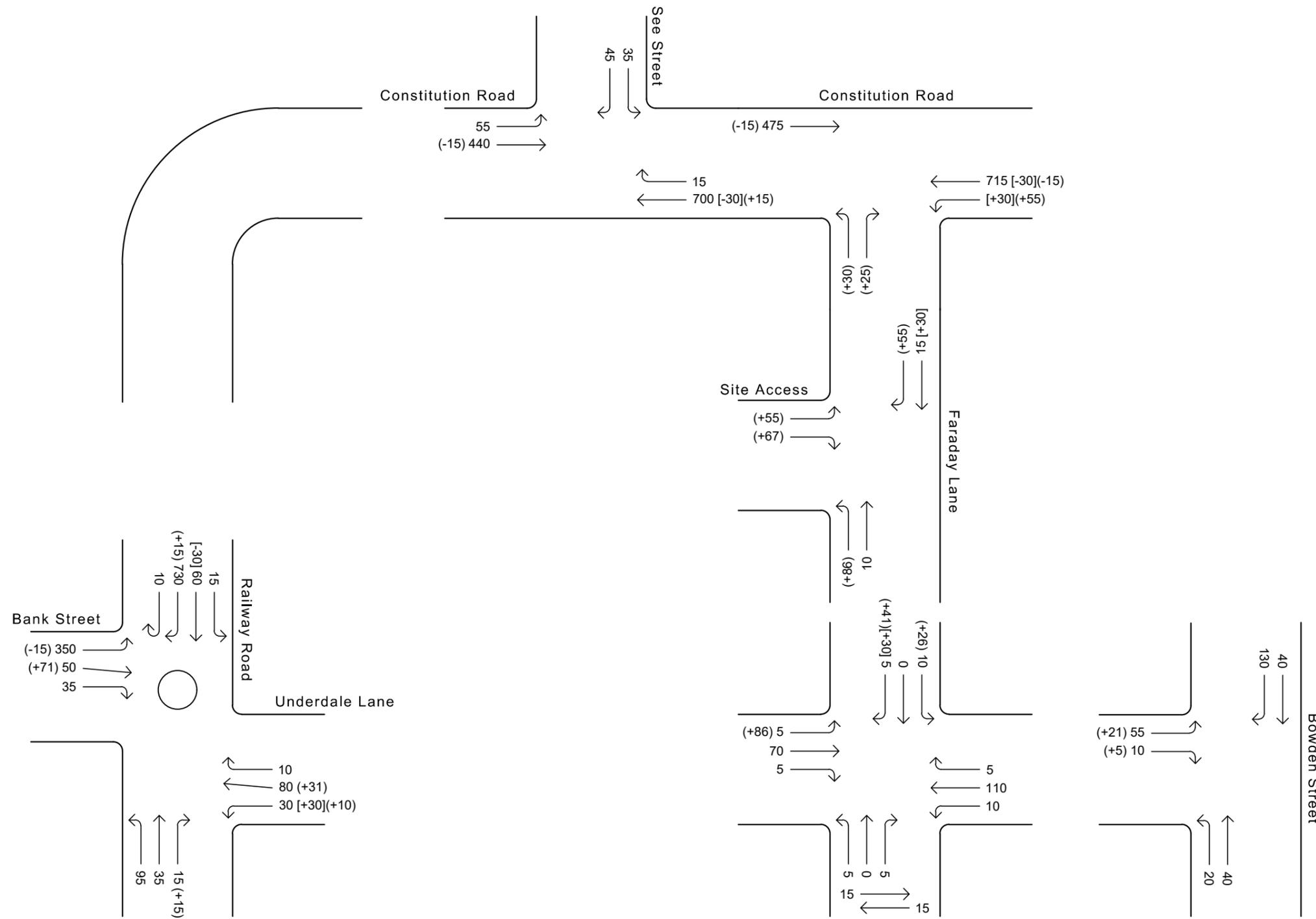


LEGEND

- 100 - Existing Peak Hour Traffic Flows
- (+10) - Additional Development Traffic
- - Roundabout

Existing weekday morning peak hour traffic flows plus development traffic

Figure 1



LEGEND

- 100 - Existing Peak Hour Traffic Flows
- (+10) - Additional Development Traffic
- - Roundabout

Existing weekday afternoon peak hour traffic flows plus development traffic

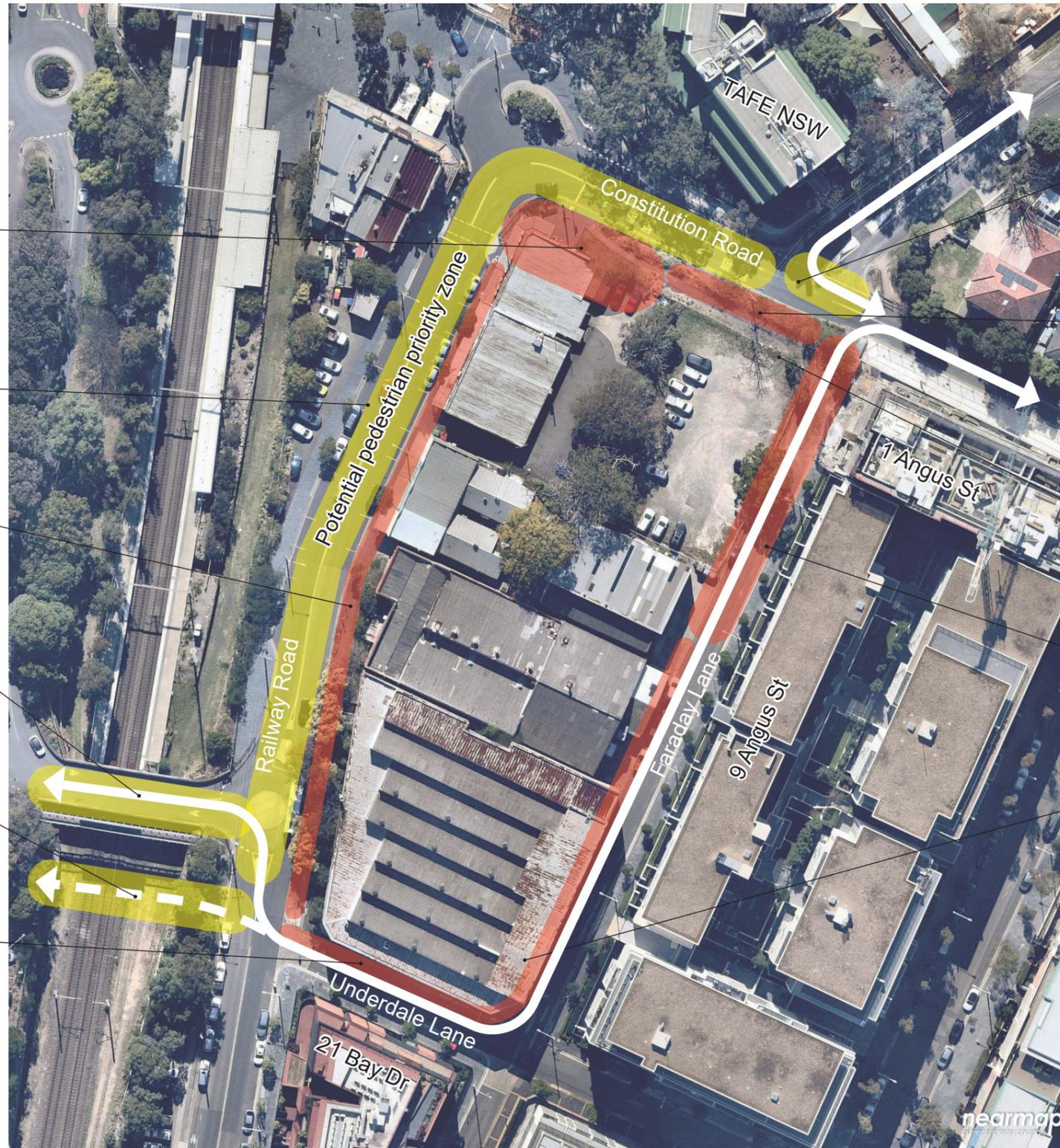
Figure 2

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ATTACHMENT A

Council's Concept Plan for Meadowbank Station Centre

CONCEPT PLAN FOR MEADOWBANK STATION CENTRE



New urban plaza

MEEP Masterplan Key Project 08:
Investigate a potential low-speed pedestrian priority zone in Railway Road and Constitution Road

Public domain upgrade along Railway Road

MEEP Masterplan Key Project 04:
Investigate opportunity to widen Bank Street bridge

MEEP Masterplan Key Project 04:
Investigate opportunity in the long term to create a new bridge connection to align with Underdale Lane; new signalised intersection with Railway Road is to have an exclusive right turning lane

Widening Underdale Lane and Faraday Lane to alleviate local traffic and facilitate adjacent MEEP Masterplan projects

MEEP Masterplan Key Project 04:
Investigate banning right turning movement out of See Street, tightening street corner and providing a pedestrian crossing

Removing existing vegetation, creating a footpath that links to the east with the new footpath on the southern side of Constitution Road

Proposed service vehicle driveway remains in the same location

Widening and regrading Faraday Lane and enabling a direct vehicular connection to Constitution Road to alleviate local traffic and facilitate adjacent MEEP Masterplan projects

Proposed passenger vehicle driveway remains in the same location

KEY

- Public domain improvements to be delivered as part of the new development by Applicant
- Future improvements opportunities by City of Ryde