

Moorebank Precinct West Intermodal Terminal Facility - Modification

Construction Traffic Impact Assessment



SIMTA

SYDNEY INTERMODAL TERMINAL ALLIANCE

Part 4, Division 4.1, State Significant
Development

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Moorebank Precinct West – Concept Plan Modification

Modification Proposal

Construction Traffic Impact Assessment

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Report No	AA008765	
Date	June 2016	
Revision Text	E	

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REVISIONS

Revision	Date	Description	Prepared by	Approved by
B	May 2016	Internal Review	LG, MY	MR
C	June 2016	Internal Review	LG,MY	MR
D	June 2016	Internal Review	LG,MY	MR
E	June 2016	Final	LG, MY	MR

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1 INTRODUCTION

The Moorebank Intermodal Company (MIC) has received Concept Plan Approval, under Part 4, Division 4.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act), to develop the Moorebank Precinct West (MPW Project) on the western side of Moorebank Avenue, Moorebank, in south-western Sydney (the MPW site).

On 4 June 2015, the MIC, with the approval of the Commonwealth Government, entered an agreement with the Sydney Intermodal Terminal Alliance (SIMTA) under which SIMTA will obtain approvals, build and operate all stages of the MPW Project at Moorebank. SIMTA is seeking approval to modify the MPW Concept Proposal and Stage 1 (Early Works) approval (SSD_5066) (MPW Concept Plan Approval).

The Environmental Impact Assessment (EIS) prepared for the Concept Plan Approval identified that fill material required for the development of the MPW site would be largely sourced from excavations within the MPW site and hence imported fill volumes for the project would be relatively minor. Subsequent civil design development for the MPW Project has identified that fill required to be imported to the MPW site is estimated at 1,600,000 cubic metres (m³). It is proposed to undertake additional site preparatory works, including the import, placement and stockpiling of clean fill, as a modification to the approved Stage 1 (Early Works).

This Construction Traffic Impact Assessment has been prepared to support an application made under section (s) 96(2) of the EP&A Act to modify the MPW Concept Plan Approval (SSD_5066).

1.1 Proposed works

It is proposed to undertake additional site preparatory works, including the import, placement and stockpiling of clean fill, as a modification to the approved Early Works. The proposed modification would result in an intensification of activity associated with the approved Early Works. The works, for which a modification is sought (the Modification Proposal), include the following:

- Minor vegetation removal (not Endangered Ecological Communities, slightly above that provided within Early Works)
- Import, by truck, of approximately 1,600,000m³ of fill (from offsite locations)
- Stripping and stockpiling of topsoil within the area of impact, cut and fill (within the primary earthworks areas) and stockpiling of clean fill within the primary earthworks areas (see Figure 1-1)
- Temporary sediment and erosion control works, including onsite detention basins (greater than those envisaged within the Early Works)
- Establishment of temporary internal haulage routes, construction compounds (including, but not limited to, a materials crusher and other plant and equipment) (additional to those included within Early Works).

Figure 1-1 shows the location and extent of the Modification Proposal, which would occur largely within the footprint of the approved Early Works.

It is anticipated that the Modification Proposal works would be undertaken during the hours identified in Table 1-1. These hours extend those identified in the MPW Concept Plan documentation to include the evening period between 6pm-10pm on weekdays and Saturday afternoons between 1pm and 6pm.

Table 1-1 Proposed hours for Modification Proposal works

Day	Proposed Hours	Activities
Weekdays	6:00am – 7:00am	<ul style="list-style-type: none"> • Material Delivery.
	7:00am – 6:00pm	<ul style="list-style-type: none"> • Material Delivery • Direct Placement; and • Stockpiling; and • Crushing.
	6:00pm – 10:00pm	<ul style="list-style-type: none"> • Material Delivery; and • Direct Placement; or • Stockpiling.
Saturdays	7:00am – 8:00am	<ul style="list-style-type: none"> • Material Delivery; and • Direct Placement; or • Stockpiling.
	8:00am – 1:00pm	<ul style="list-style-type: none"> • Material Delivery • Direct Placement; and • Stockpiling; and • Crushing.
	1:00PM – 6:00PM	<ul style="list-style-type: none"> • Material Delivery; and • Direct Placement; or • Stockpiling.

Further details regarding the construction methodology is provided in Section 2.

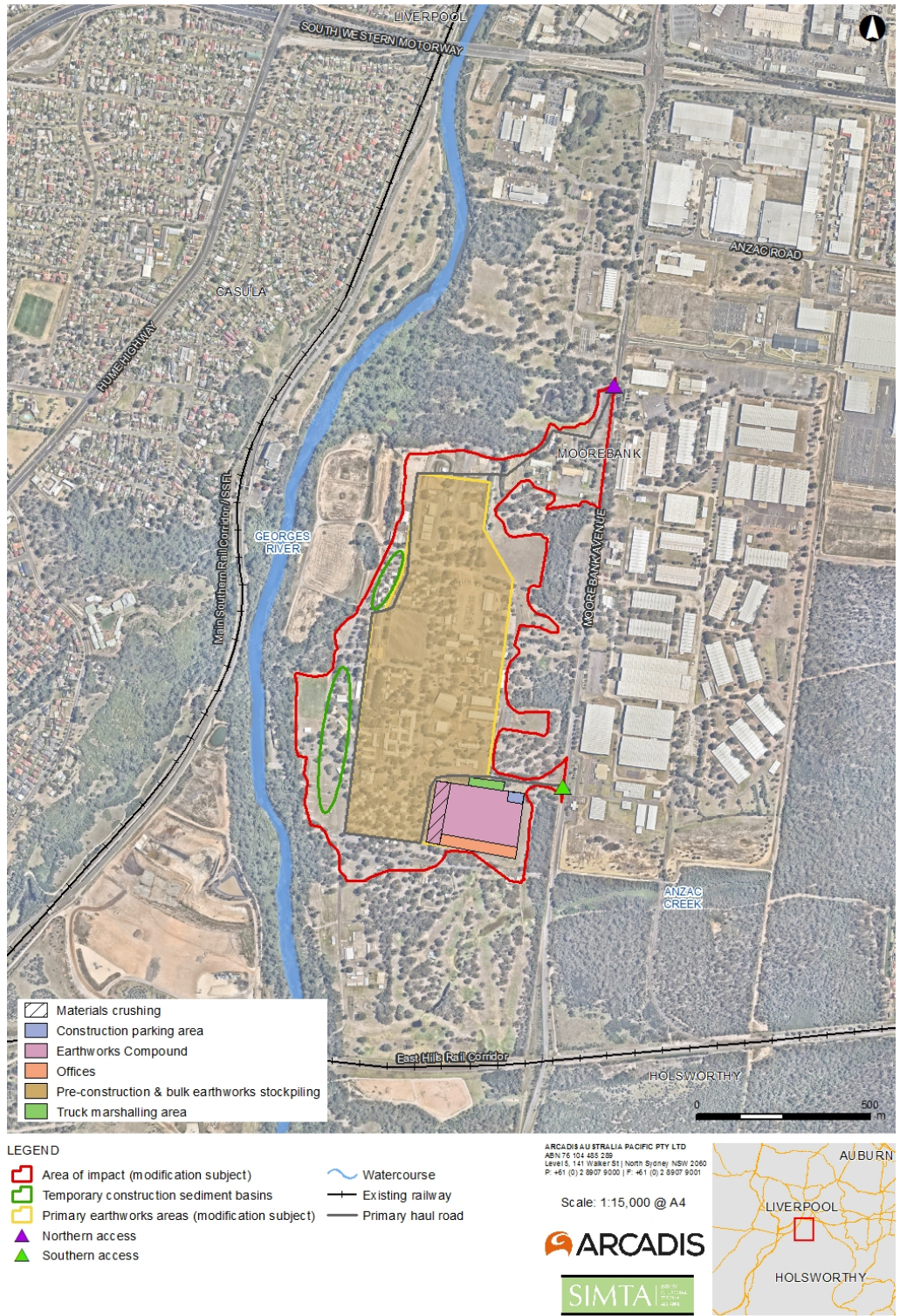


Figure 1-1 Proposed earthworks (MPW Concept Plan modification)

1.2 Report Structure

This Construction Traffic Impact Assessment report contains the following six chapters providing an assessment of the traffic issues relating to the modification proposal.

- Section 1 provides an overview of the MPW site, background information and study objectives.
- Section 2 outlines the construction staging, proposed site access, construction site layout and staff parking for the modification proposal.
- Section 3 outlines the existing environment including road network and traffic volumes.
- Section 4 quantifies the expected traffic movements during construction works.
- Section 5 reports construction traffic impact and identifies measures to mitigate the identified impacts.
- Section 6 provides a conclusion of the traffic impact investigation.

2 CONSTRUCTION METHODOLOGY

2.1 Construction program and activities

The proposed Modification Proposal works are planned to commence in the last quarter of 2016 for an approximate construction period of six to nine months. The pre-construction program for the Modification Proposal would cease on commencement of construction activities associated with the next stage of the MPW Project. This will minimise the opportunity for overlapping of works programs and therefore, streamline the works packages to be undertaken under the MPW Concept Plan Approval.

The Modification Proposal includes only activities that are identified within the Early Works of the MPW Concept Plan Approval. This avoids overlapping of works programs and provides clarity to works to be undertaken under the MPW Concept Plan Approval, as part of Early Works. The general activities for the Modification Proposal include:

- Vegetation clearance (excluding removal of EEC)
- Removal of existing buildings and road pavements, as required
- Stripping and removal of approximately 77,000 m³ of Asbestos Containing Material (ACM) to the Glenfield Waste Facility (GWF)
- Establishment of two access points at Chatham Road (southern entrance) and at the signalised intersection approximately 550m south of the Anzac Road/Moorebank Avenue intersection (northern exit)
- Establishment of temporary erosion and sediment controls, including two sediment basins
- Minor clearing and grubbing of the area of impact
- Stripping and stockpiling of topsoil within the area of impact
- Establishment of stockpiling pads and associated temporary access roads
- Installation of temporary construction compounds, including amenities and office
- Construction of hardstands for staff parking and laydown areas
- Establishment of construction compound fencing and hoardings
- Establishment of associated plant and equipment (including, but not limited to, materials screening, crushing and washing facilities)
- Construction of access roads and internal haulage routes
- Crushing and screening of oversized materials and demolition materials stockpiled during Early Works for direct placement on site
- Import, placement and stockpiling of approximately 1,600,000 m³ of clean fill, equating to 22,000 tonnes per day.

2.2 Construction workforce and hours

Approximately 105 construction personnel would be required during the peak Modification Proposal works period.

It is anticipated that the works would be undertaken during the hours identified in Table 1-1. These hours extend beyond those identified in the MPW approvals documentation, and include additional hours during the evening period between 6pm-10pm on weekdays and additional hours during Saturday afternoons between 1pm and 6pm.

Any other construction works associated with the Modification Proposal and undertaken outside of these hours would be undertaken in consultation with relevant authorities, in accordance with the MCoA for the MPW Concept Plan Approval. As such, works outside these hours that may be permitted would include:

- Any works which do not cause noise emissions to be audible at any nearby sensitive receptors or comply with the ‘Outside Standard Construction Hours’
- The delivery of materials which is required outside of these hours as requested by Police or other authorities for safety reasons
- Emergency work to avoid the loss of lives, property and/or to prevent environmental harm
- Any other works as approved through the Construction Noise and Vibration Management Plan.

2.3 Construction traffic movements

The majority of vehicles would travel to and from the site via the M5 Motorway. A small number of trucks (i.e.16 trips per day (two-way) in the peak) would head south from the MPW site to the Glenfield Waste Facility (GWF) to dispose of unsuitable materials via Cambridge Avenue. However, no trucks bringing clean fill material to the MPW site would be permitted to access the site via this route. Some light vehicles would travel to the site via Anzac Road with the majority of light vehicles accessing the site via the M5 Motorway. Access to and from the site would be via Moorebank Avenue. Vehicles would enter the site at either the southern or northern access points, then be directed to the appropriate location within the site and then exit from the northern or southern access point (Figure 1-1).

Vehicles would travel within the site via a number of internal haul roads. A primary haul road has been identified in Figure 1-1. Other haul roads would be established within the site to provide access to direct placement and stockpiling areas within the primary earthworks area.

The approximate number of construction vehicles and movements during the peak construction period are detailed in Table 2-1.

Table 2-1 Construction traffic movements

Vehicle type	Number of vehicles per day	Vehicle trips per day (two-way)
Heavy vehicles	745	1,490
Light vehicles	95	190

3 EXISTING CONDITIONS

3.1 Road Network

It is expected that the majority of traffic associated with the Modification Proposal would travel north from the MPW site via Moorebank Avenue and the M5 South West Motorway. A small number of vehicles would travel south from the MPW site to the GWF via Cambridge Avenue. Table 3-1 outlines key roads on the road network adjacent to the MPW site.

Table 3-1 Existing key roads on the road network adjacent to the MPW site

Road Names	Road Hierarchy	Characteristics
M5 South West Motorway	Motorway	The M5 South West Motorway (M5) is a 22km tolled road with generally three lanes in each direction between Camden Valley Way, Prestons and King Georges Road, Beverly Hills. It is operated by Interlink Roads. It forms part of the M5 transport corridor, the main passenger, commercial and freight route between Sydney Airport, Port Botany and south west Sydney. It is also a key part of the Sydney Orbital Network, a series of interconnected roads that link key areas of the Greater Sydney Metropolitan Region.
Moorebank Avenue	State Road ⁽¹⁾ / Local Road	Moorebank Avenue is currently a two-lane undivided road (one lane on each direction) between Cambridge Avenue and M5 South West Motorway (adjacent to the site) and four-lane undivided road (two lane on each direction) north of the M5 South West Motorway. This road provides a north-south link between Liverpool and Glenfield. It also forms a grade separated interchange with the M5 South West Motorway. Moorebank Avenue between M5 and Anzac Road is owned and maintained by Liverpool City Council. Moorebank Avenue between Anzac Road and Cambridge Avenue is a private road on Commonwealth land.
Anzac Road	Local Road	Anzac Road is an east-west local road that connects Moorebank Avenue and Heathcote Road. It provides access to Moorebank Business Park and the residential area of Wattle Grove. This is generally a two-lane undivided road.
Cambridge Avenue	Local Road	Cambridge Avenue is a local road which connects Moorebank Avenue from the south to Macquarie Fields through to Campbelltown. It is generally a two-lane road (one lane each direction). Cambridge Avenue is owned and maintained by Campbelltown City Council. Cambridge Avenue crosses the Georges River via a low level narrow bridge (subject to flooding).

Note: (1) Moorebank Avenue north of the M5 Motorway is classified as State Road.

3.2 Traffic Volumes

Traffic count surveys undertaken for SIMTA, MIC and Roads and Maritime's wider Liverpool Moorebank Arterial Road Investigations (LMARI) traffic model in 2015 have been used for this Construction Traffic Impact Assessment where relevant. Table 3-2 below shows existing peak hour traffic volumes on Moorebank Avenue, Anzac Road and Cambridge Avenue. These roads are likely to be impacted by the Modification Proposal.

Table 3-2 Peak hour traffic volumes on key roads in 2015

Site ID	Locations	AM Peak (8-9am)		PM Peak (5-6pm)	
		NB/EB ⁽¹⁾	SB/WB ⁽¹⁾	NB/EB ⁽¹⁾	SB/WB ⁽¹⁾
M-1	Moorebank Ave, South of Anzac Rd	950	430	450	840
M-2	Anzac Rd, East of Moorebank Rd	720	490	510	520
M-3	Moorebank Ave, South of Jacquinet Road	920	360	350	920
M-9	Cambridge Avenue, East of Canterbury Road	960	330	340	930

Note: (1) Northbound (NB), Eastbound (EB), Southbound (SB), Westbound (WB)

In the AM peak, traffic volumes on Moorebank Avenue (south of Anzac Road) were approximately 950 vehicles per hour in the northbound direction. The traffic volumes on Moorebank Avenue were substantially lower in the southbound direction in the AM peak, approximately 430 vehicles per hour. In the PM peak, the highest traffic volume was observed in the southbound direction approximately 840 vehicles. Similarly in the PM peak, about 450 vehicles per hour were observed in the northbound direction.

The peak flows on Anzac Road (east of Moorebank Avenue) were between 490 and 720 vehicles in one hour.

The peak traffic flows on Cambridge Avenue (east of Canterbury Road) were found to be similar to Moorebank Avenue. In the AM peak, approximately 960 vehicles per hour were observed in the eastbound direction. The westbound direction traffic in the AM peak was approximately 330 vehicles per hour. In the PM peak, the highest traffic volume was observed in the westbound direction, approximately 930 vehicles in one hour.

Existing (2015) traffic volumes for AM peak one hour (8-9am) and PM peak one hour (5-6pm), respectively, are shown in Appendix A.

For the purpose of this traffic impact assessment, a 2017 assessment year was adopted to assess the worst case scenario for the Modification Proposal work period. The future background traffic growth was assumed to be an average of 1.65% per annum for the study area. Predicted 2017 background traffic volumes for AM peak one hour (8-9am) and PM peak one hour (5-6pm), respectively are shown in Appendix A.

4 CONSTRUCTION TRAFFIC GENERATION

4.1 Construction Traffic Movements

As described above, access to and from the MPW site would be via Moorebank Avenue. The access points proposed are shown in Figure 1-1. Traffic volume estimates are based on the proposed Modification Proposal schedule and the estimated volume of material to be moved during the Modification Proposal works. Table 4-1 below shows the worst case scenario estimated number of truck and light vehicles generated by the Modification Proposal.

It is anticipated that approximately 190 light vehicle trips per day (two-way) and 1,490 heavy vehicle trips per day (two-way) would occur during the Modification Proposal works period, over a six to nine month period. As with any construction activity, daily volumes are expected to vary in the six to nine month period, however this would be the peak volumes anticipated.

Table 4-1 Estimated Truck Loads and Light Vehicles

Works Period	Normal Hours (7AM to 6PM) 11 hrs	Evenings and Saturday Afternoon (6PM to 10 PM) 4 hrs	Night time (6AM – 7AM) 1 hr	Total Vehicles (16 hours)	Total Daily Trips (two-way)
<i>Trucks importing fill materials and removing ACM from site</i>	449	184	100	733	1,466 ¹
<i>Other truck (i.e. Maintenance vehicles, heavy equipment deliveries, fuel trucks etc.)</i>	10	2	0	12	14
Total Trucks	459	186	100	745	1,490
<i>Construction workers</i>	50	10	10	70	140
<i>Delivery vehicles</i>	20	5	0	25	50
Total Light Vehicles	70	15	10	95	190

Note: 1 – Includes 16 trips per day (two-way) for the removal of ACM from the site.

The following assumptions have been made in the traffic generation estimates:

- A truck generation of 1,490 trucks trips per day (two-way) has been calculated based on the movement of 1.6M tonnes of fill (maximum of 22,000 m³ per day) to/from the site
- A total of 105 construction workers and staff with an anticipated rate of one in three (1:3) workers ride sharing
- A total of 77,000 m³ of ACM removal will result in 16 trips per day (two-way) to and from the GWF
- All vehicle movements will originate and exit from the north with the exception of the ACM removal which will originate and exit from the south

The estimated number of daily car movements varies between 9 and 53 car trips (one-way) depending on the time of day. The estimated number of daily truck movements is anticipated to be constant throughout the day with a maximum of 47 trips per hour (one-way) between 6am and 10pm daily (see Figure 4-2).

The above traffic generation is considered to represent a worst case scenario whereby the maximum anticipated daily trips have been estimated. Daily trips on a week-by-week basis are likely to fluctuate, however, the maximum number of trips have been assessed as a part of this Traffic Impact Assessment.

4.2 Construction Traffic Distribution

The majority of staff cars, approximately 90%, would travel from the north via the Moorebank Avenue/M5 Motorway interchange with the remaining 10% expected to use Anzac Road.

All trucks are expected to travel from the north via the Moorebank Avenue/M5 Motorway interchange with the exception of 16 daily trips (two-way) to and from the GWF for the removal of ACM from the site which would travel via Cambridge Avenue. No construction trucks are expected to travel via Anzac Road.

4.3 Peak Hour Traffic Generation

4.3.1 Workers trip generation

The analysis has assumed that during the peak Modification Proposal work period, 28% of daily construction worker trips would arrive at the site between 6-7 am. Similarly, 24% of daily construction worker trips would depart the site between 5-6 pm on weekdays. The daily construction worker trip profile is show in Figure 4-1.

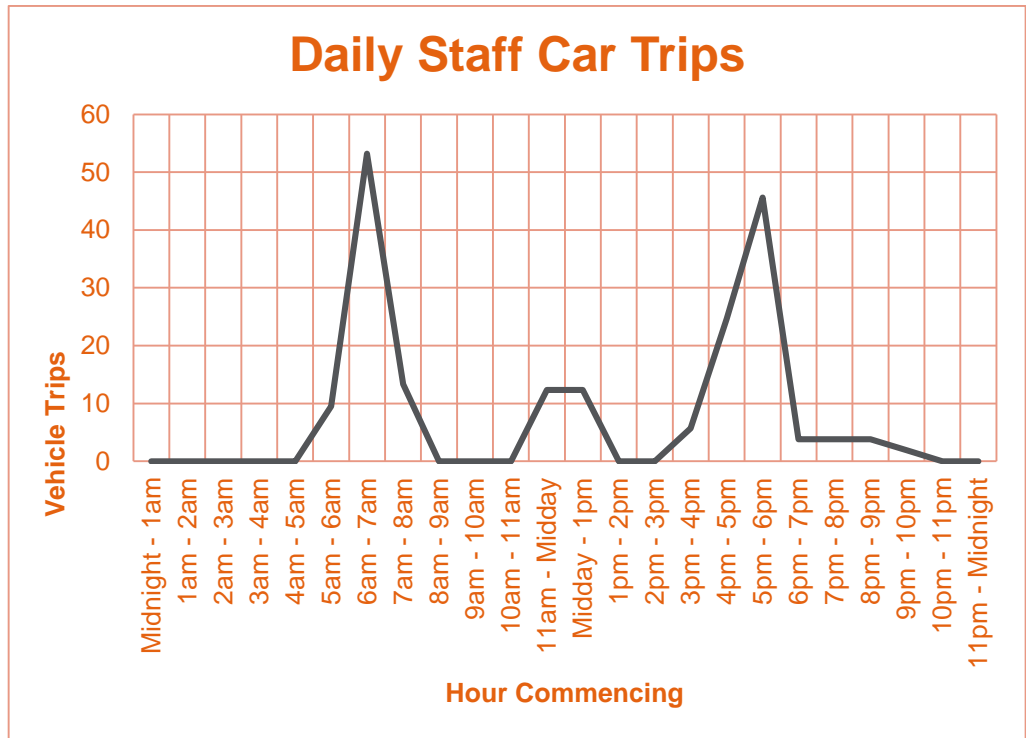


Figure 4-1 Construction worker trip profile

4.3.2 Construction truck generation

The construction truck movements each weekday are assumed to be evenly distributed over an approximate 16 hour period, between 6 am and 10 pm on most weekdays. Figure 4-2 below shows the distribution of construction truck movements throughout the day.

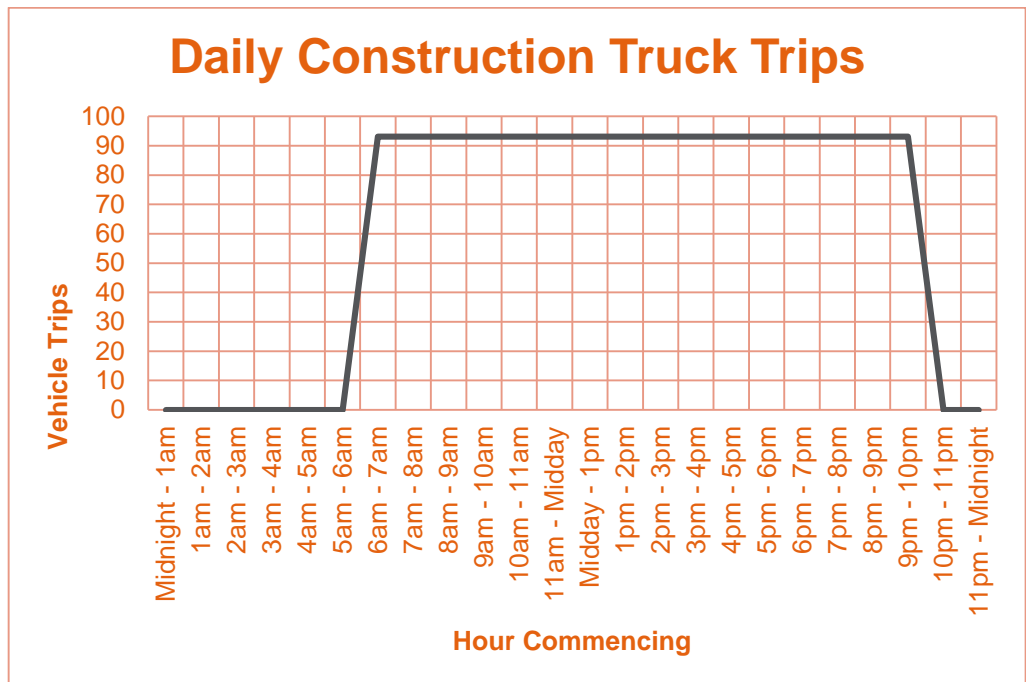


Figure 4-2 Construction truck trip profile

4.3.3 Daily trip generation

Table 4-2 below summarises weekday hourly construction traffic movements to and from the site.

Table 4-2 Weekday hourly construction traffic movements

Hour commencing	Hourly Construction Traffic Movements					
	Staff Car Movements		Construction Truck Movements		Total Construction Vehicles (Car + Truck)	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
5am - 6am	10	0	0	0	10	0
6am - 7am	53	0	47	47	100	47
7am - 8am	13	0	47	47	60	47
8am - 9am	0	0	47	47	47	47
9am - 10am	0	0	47	47	47	47
10am - 11am	0	0	47	47	47	47
11am - Midday	1	12	47	47	48	59
Midday - 1pm	12	1	47	47	59	48
1pm - 2pm	0	0	47	47	47	47
2pm - 3pm	0	0	47	47	47	47
3pm - 4pm	0	6	47	47	47	53
4pm - 5pm	0	25	47	47	47	72
5pm - 6pm	0	46	47	47	47	93
6pm - 7pm	2	2	47	47	49	49
7pm - 8pm	2	2	47	47	49	49
8pm - 9pm	2	2	47	47	49	49
9pm - 10pm	1	1	47	47	48	48

This estimation represents the predicted hourly traffic generation for the Modification Proposal construction work period. The resulting peak Modification Proposal construction traffic volumes were superimposed onto the peak background traffic volumes to present a worst case scenario for the traffic impact assessment.

5 TRAFFIC IMPACTS AND MITIGATION MEASURES

5.1 Modelling Scenarios

It is proposed that the access for construction vehicles is via Chatham Avenue/Moorebank Avenue intersection and MPW Access Road/Moorebank Avenue intersection. This TIA has assessed the impact of traffic generated during the Modification Proposal work period whereby construction traffic would enter and/or exit the proposed intersections under three scenarios (i.e. Scenarios 1, 2 and 3 providing multiple access combinations) as shown in Table 5-1. This analysis approach provides flexibility for access to/from the site i.e. able to accommodate changes in access arrangements due to unexpected changes during the construction stage.

Scenario 4 examines the cumulative impact of traffic generated from the Modification Proposal, Early Works (as described in the MPW EIS / SRTS) and MPE Stage 1 - Site preparation, earthworks and engineering fill works periods (as described in the CTIA for MPE Stage 1).

Table 5-1: SIDRA Model Scenarios

Scenario	Modification Proposal Traffic	Northern Access Intersection (MPW Access Road/Moorebank Ave)	Southern Access Intersection (Chatham Ave/Moorebank Ave)
1	Construction Activities	Exit (100% of traffic)	Entry (100% of traffic)
	ACM Removal	Nominal traffic volumes ¹	Entry/Exit (100% of traffic)
2	Construction Activities	Nominal traffic volumes ¹	Entry/Exit (100% of traffic)
	ACM Removal	Nominal traffic volumes ¹	Entry/Exit (100% of traffic)
3	Construction Activities	Entry/Exit (100% of traffic)	Nominal traffic volumes ¹
	ACM Removal	Nominal traffic volumes ¹	Entry/Exit (100% of traffic)
4	Cumulative impact of traffic generated from the Modification Proposal, Early Works (as described in the MPW EIS / SRTS) and MPE Stage 1 - Site preparation, earthworks and engineering fill works periods (as described in the CTIA for MPE Stage 1) with access arrangement for Scenario 2 which is the “worst case” in terms of network impacts..		

Note:

1. Nominal traffic volumes has been assumed for the intersection analysis for a conservative assessment.

The impact assessment has been conducted for the following intersections which provide access to the MPW site on Moorebank Avenue:

1. M5 Interchange/Moorebank Avenue (signalised intersection)
2. Bapaume Road/Moorebank Avenue (priority intersection)
3. Anzac Road/Moorebank Avenue. (signalised intersection)
4. MPW Access Road/Moorebank Avenue (approximately 118 m south of the DNSDC signalised intersection)
5. Chatham Avenue/Moorebank Avenue intersection (signalised intersection)

A network SIDRA model has been developed for the impacted intersections along Moorebank Avenue and analysed. To facilitate a “green wave” of traffic to increase intersection capacity and to minimise delay, signal coordination has been assumed for the signalised intersections.

5.2 Traffic Impact Modelling

The traffic impacts as a result of the Modification Proposal work period traffic for all assessed scenarios was modelled using the SIDRA traffic analysis software (version 7 at the time of undertaking the assessment). Table 5-2 below shows standard Level of Service (LOS) criteria used for intersection assessment as per RMS Guide.

Table 5-2 Level of Service Criteria for Intersection Capacity Analysis

Level of Service (LOS)	Average Delay per Vehicle (sec/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

Source: RMS Guide to Traffic Generating Developments

5.3 Traffic Forecasts

5.3.1 Scenario 1, 2 & 3

The estimated 2017 AM and PM peak one hour turning movement volumes with the MPW Modification Proposal construction traffic for Scenarios 1, 2 and 3 are shown in **Appendix A**.

During the Modification Proposal works period, the traffic (staff cars and trucks) to/from the MPW site will increase traffic at the M5 Motorway / Moorebank Avenue interchange by approximately 4% in the AM and PM peak, respectively. The likely increase in traffic at the study intersections along Moorebank Avenue due to Modification Proposal is shown in Table 5-3. It can be seen that the Modification Proposal traffic contribution in peak period is relatively small compared to the existing intersection traffic volumes along Moorebank Avenue i.e. between <1% and 10 %.

Table 5-3: Impact of Modification Proposal Traffic – 2017 AM/PM

Intersection	Increase (%)	
	AM	PM
1.M5 Interchange/Moorebank Ave	137 vehs/hr (4%)	130 vehs/hr (4%)
2.Bapaume Rd/Moorebank Ave	137 vehs/hr (8%)	130 vehs/hr (8%)
3.Anzac Rd/Moorebank Ave	142 vehs/hr (7%)	135 vehs/hr (7%)
Scenario 1		
4.MPW Access Rd/Moorebank Ave	142 vehs/hr (10%)	135 vehs/hr (10%)
5.Chatham Ave/Moorebank Ave	102 vehs/hr (7%)	49 vehs/hr (4%)
Scenario 2		
4.MPW Access Rd/Moorebank Ave	142 vehs/hr (10%)	135 vehs/hr (10%)
5.Chatham Ave/Moorebank Ave	146 vehs/hr (10%)	139 vehs/hr (10%)
Scenario 3		
4.MPW Access Rd/Moorebank Ave	142 vehs/hr (10%)	135 vehs/hr (10%)
5.Chatham Ave/Moorebank Ave	4 vehs/hr (<1%)	4 vehs/hr (<1%)

5.3.2 Scenario 4

Table 5-4 tabulates the traffic generation used to determine the impact of cumulative traffic from the Early Works and MPE Stage 1 assumed to occur in 2017.

The estimated 2017 AM and PM peak one hour turning movement volumes with cumulative construction traffic (i.e. Scenario 4) is shown Appendix A.

Table 5-4 Traffic Generation for Cumulative Assessment

Cumulative Assessment Works	Number of light vehicles – Two-way (AM Peak)	Number of heavy vehicles – Two-way (AM Peak)	Number of light vehicles – Two-way (PM Peak)	Number of heavy vehicles – Two-way (PM Peak)
Early Works ¹	55	10	55	10
MPE Stage 1 ²	287	24	249	18

Note:

1. Based on data extracted from Parsons Brinckerhoff *Moorebank Intermodal Terminal Project – Environmental Impact Statement – Volume 3*

2. Based on data extracted from Arcadis (formerly Hyder) *Stage 1 SIMTA Construction Traffic Impact Report*

5.4 Impact at Key Access Roads/Intersections

5.4.1 SIDRA modelling results – Scenario 1

Scenario 1 SIDRA modelling results are presented below in **Table 5-5** for the AM and PM peak (without construction traffic). **Table 5-6** presents the AM and PM peak results (with construction traffic).

Based on the SIDRA analysis for Scenario 1, the results suggest that the existing intersections of M5 interchange / Moorebank Avenue, Bapaume Road / Moorebank Avenue and Anzac Road / Moorebank Avenue is expected to operate satisfactorily at Level of Service C or better in both the AM and PM peak hour period during the construction period.

The analysis also suggests the proposed access to the MPW site via the Chatham Avenue / Moorebank Avenue and MPW Access Road / Moorebank Avenue intersections would operate at Level of Service B or better in both the AM and PM peak periods. The SIDRA analysis indicated that construction traffic from the proposed access points would not adversely impact through traffic on Moorebank Avenue.

Table 5-5 Scenario 1 Without Modification Proposal construction traffic – 2017

Intersection	LOS	
	AM	PM
M5 Interchange/Moorebank Ave	LOS C	LOS B
Bapaume Rd/Moorebank Ave	LOS A	LOS A
Anzac Rd/Moorebank Ave	LOS B	LOS B

Table 5-6 Scenario 1 With Modification Proposal construction traffic – 2017

Intersection	LOS	
	AM	PM
M5 Interchange/Moorebank Ave	LOS C	LOS B
Bapaume Rd/Moorebank Ave	LOS A	LOS A
Anzac Rd/Moorebank Ave	LOS B	LOS B
MPW Access Rd/Moorebank Ave	LOS A	LOS A
Chatham Ave/Moorebank Ave	LOS B	LOS A

5.4.2 SIDRA modelling results – Scenario 2

Scenario 2 SIDRA modelling results are presented below in **Table 5-7** for the AM and PM peak (without construction traffic). **Table 5-8** presents the AM and PM peak results (with construction traffic).

Based on the SIDRA analysis for Scenario 2, the results suggest that the existing intersections of M5 interchange / Moorebank Avenue, Bapaume Road / Moorebank Avenue and Anzac Road / Moorebank Avenue would operate satisfactorily at Level of Service C or better in both the AM and PM peak hour period during the construction period.

The analysis also suggests the proposed access to the MPW site via the Chatham Avenue / Moorebank Avenue and MPW Access Road / Moorebank Avenue intersections would operate at Level of Service B or better in both the AM and PM peak periods. The SIDRA analysis indicates that construction traffic from the proposed access points would not adversely impact through traffic on Moorebank Avenue.

Table 5-7 Scenario 2 Without Modification Proposal construction traffic – 2017

Intersection	LOS	
	AM	PM
M5 Interchange/Moorebank Ave	LOS C	LOS B
Bapaume Rd/Moorebank Ave	LOS A	LOS A
Anzac Rd/Moorebank Ave	LOS B	LOS B

Table 5-8 Scenario 2 With Modification Proposal construction traffic – 2017

Intersection	LOS	
	AM	PM
M5 Interchange/Moorebank Ave	LOS C	LOS B
Bapaume Rd/Moorebank Ave	LOS A	LOS A
Anzac Rd/Moorebank Ave	LOS B	LOS B
MPW Access Rd/Moorebank Ave	LOS B	LOS A
Chatham Ave/Moorebank Ave	LOS B	LOS A

5.4.3 SIDRA modelling results – Scenario 3

Scenario 3 SIDRA modelling results are presented below in **Table 5-9** for the AM and PM peak (without construction traffic). **Table 5-10** presents the AM and PM peak results (with construction traffic).

Based on the SIDRA analysis for Scenario 3, the results suggest that the existing intersections of M5 interchange / Moorebank Avenue, Bapaume Road / Moorebank Avenue and Anzac Road / Moorebank Avenue would operate satisfactorily at Level of Service C or better in both the AM and PM peak hour period during the construction period.

The analysis also suggests the proposed access to the MPW site via the Chatham Avenue / Moorebank Avenue and MPW Access Road / Moorebank Avenue intersections would operate at Level of Service B or better in both the AM and PM peak periods. The SIDRA analysis indicated that construction traffic from the proposed access points would not adversely impact through traffic on Moorebank Avenue.

Table 5-9 Scenario 3 Without Modification Proposal construction traffic – 2017

Intersection	LOS	
	AM	PM
M5 Interchange/Moorebank Ave	LOS C	LOS B
Bapaume Rd/Moorebank Ave	LOS A	LOS A
Anzac Rd/Moorebank Ave	LOS B	LOS B

Table 5-10 Scenario 3 With Modification Proposal construction traffic – 2017

Intersection	LOS	
	AM	PM
M5 Interchange/Moorebank Ave	LOS C	LOS B
Bapaume Rd/Moorebank Ave	LOS A	LOS A
Anzac Rd/Moorebank Ave	LOS B	LOS B
MPW Access Rd/Moorebank Ave	LOS B	LOS A
Chatham Ave/Moorebank Ave	LOS A	LOS A

5.4.4 SIDRA modelling results – Scenario 4

Scenario 4 SIDRA modelling results are presented below in **Table 5-11** for the AM and PM peak (with cumulative construction traffic).

Based on the SIDRA analysis for Scenario 4, the results suggest that the existing intersections of M5 interchange / Moorebank Avenue, Bapaume Road / Moorebank Avenue and Anzac Road / Moorebank Avenue would operate satisfactorily at Level of Service C or better in both the AM and PM peak hour period during the construction period.

The analysis also suggests the proposed access to the MPW site via the Chatham Avenue / Moorebank Avenue and MPW Access Road / Moorebank Avenue intersections would operate at Level of Service C or better in both the AM and PM peak periods. The SIDRA analysis indicated that construction traffic from the proposed access points would not adversely impact through traffic on Moorebank Avenue.

Table 5-11 Scenario 4 With Cumulative Construction Traffic (AM Peak) – 2017

Intersection	LOS	
	AM	PM
M5 Interchange/Moorebank Ave	LOS C	LOS B
Bapaume Rd/Moorebank Ave	LOS A	LOS A
Anzac Rd/Moorebank Ave	LOS C	LOS B
MPW Access Rd/Moorebank Ave	LOS B	LOS A
Chatham Ave/Moorebank Ave	LOS C	LOS A

5.5 Access / Egress

It is proposed to utilise signalised intersections to provide access to the MPW site. The proposed signalised intersections have also been assessed to accommodate the cumulative construction traffic as a result of the Modification Proposal, Early Works and MPE Stage 1 assumed to occur in 2017 (i.e. construction activities at both MPW and MPE sites at the same time – cumulative scenario). The analysis conducted showed that the cumulative traffic volumes do not significantly impact the performance of the proposed intersection layouts.

The swept paths at the MPW Access Road / Moorebank Avenue and Chatham Avenue / Moorebank Avenue intersections would be altered to ensure safe and efficient access for the designated vehicles (expected to be up to a B-double in size, noting that Moorebank Avenue is a designated B-double route).

5.6 Road Safety

As part of this Construction Traffic Impact Assessment, a site inspection was conducted along Cambridge Avenue (from the access road to the GWF to Moorebank Avenue). The following observations were made:

- Inadequate/no sealed road shoulders, particularly on the east approach to the Glenfield Causeway
- Poor forward sight distance due to horizontal and vertical alignment of the road
- Narrow causeway (i.e. allowance for one light and one heavy vehicle at any one time to cross the Glenfield Causeway)

The projected number of truck movements to/from the GWF is approximately 16 truck trips (two-way) per day, or 1 truck trip per hour over a 16-hour day, which is minimal. In addition to the REMMs and the MCoA (refer to Table 5-12), it is recommended that a Road Safety Audit on Cambridge Avenue is undertaken prior to the commencement of the Modification Proposal works period to identify the traffic safety risks and determine appropriate mitigation measures to be implemented (e.g. truck movements to occur outside peak hours, driver awareness and safety training, speed monitoring and reporting protocols, etc.) for the Modification Proposal.

5.7 Parking

It is proposed that approximately 75 car parking spaces will be provided as a component of the Modification Proposal. It is anticipated that approximately 70 vehicles (50 construction workers and 20 delivery vehicles as per Table 4-1) would arrive during the normal operating hours of 7am to 6pm. It is anticipated that the number of provided bays will adequately cater for the anticipated peak number of workers travelling to the site.

5.8 Public Transport

There is currently one bus service in the proximity of the MPW site, with the service operating north along Moorebank Avenue from Anzac Avenue. There is also one service in each peak hour that runs south, past the MPW site. Given that the majority of Modification Proposal activities would be contained on the MPW site rather than Moorebank Avenue, it is considered unlikely that there would be any significant impacts to public transport services. Any works which impact the carriageway of Moorebank Avenue would be undertaken outside of peak hours to limit impacts to the network operation.

5.9 Pedestrian and Cyclists

The Modification Proposal works would have minor impacts to pedestrian and cyclist movements that need to be considered with measures developed to mitigate the risks. These include:

- Potential conflict between cyclists accessing the site and trucks
- Interface between the walking desire lines from the main car park to the construction site across the truck egress.

5.10 Road Access Restrictions

Road access restrictions would be applied to ensure all pre-construction related vehicles are not travelling through nearby residential areas to access the MPW site. In particular operational restrictions and signposting developed in conjunction with Council and local residents will be implemented to ensure no construction related heavy vehicles can travel along Anzac Avenue through the Wattle Grove residential area.

Site operation and logistics plans would take this restriction into consideration when planning deliveries and haul routes, and the restriction on travelling along Anzac Road would be reinforced during site induction training for truck operators. This will ensure sensitive local residential roads are protected from amenity impacts associated with heavy vehicle movements and arterial roads are utilised.

In accordance with the Minister's Conditions of Approval for the MPW Concept Plan, a Community Communication Strategy (CCS) would be prepared. The CCS will inform local residents of the proposed construction activities and road access restrictions the construction traffic must adhere to, including vehicles associated with the Modification Proposal works. The program would be initiated prior to commencement of the Modification Proposal and Early Works to ensure that the community are aware of pre-construction activities, with particular regard to pre-construction traffic. The program would establish communication protocols for community feedback on issues relating to construction vehicle driver behaviour and construction related matters.

5.11 Local Property Access

The existing local accesses along Moorebank Avenue would be maintained during construction. It is expected that the site access would be controlled primarily by signals. However, should a larger vehicle require access to the site, such as a low loader, a traffic controller would be used to allow larger trucks to encroach across the access road where required and would also ensure sufficient time to complete their turning manoeuvre is provided. Sufficient signage would be installed to ensure unauthorised vehicles do not enter the site.

5.12 Access for Emergency Vehicles

It is proposed that all access points for the site be made available for emergency vehicle access when the need arises. This would be considered as part of the site safety and incident management plans. As the works are not encroaching onto the road network, this would be an internal site consideration, and is unlikely to have an impact on the surrounding arterial road network.

5.13 Mitigation Measures

As required under MCoA D20(a), a Construction Traffic and Access Management Plan (CTAMP) would be prepared, detailing management controls to be implemented to avoid or minimise impacts to traffic, pedestrian and cyclist access, and the amenity of the surrounding environment. The CTAMP would be approved by the DP&E prior to commencement of construction and would be implemented during the Modification Proposal. Specific components, additional to those presented in the MCoA of this plan would include:

- Review of speed restrictions along Moorebank Avenue and additional signposting of speed limitations
- Installation of specific warning signs at entrances to the construction site to warn existing road users of entering and exiting construction traffic
- Establishing pedestrian walking routes and crossing points
- Distribution of day warning notices to advise local road users of scheduled construction activities
- Installation of appropriate traffic control and warning signs for areas identified where potential safety risk issues exist
- The promotion of car-pooling for construction staff and other shared transport initiatives during the pre-construction phase
- Management of the transportation of materials to maximise vehicle loads and therefore minimise vehicle movements.

Mitigation measures identified within the SRtS and the MCoA for the MPW Concept Plan Approval that are applicable to the management of traffic impacts are listed in Table 5-12. These measures would be implemented during the Modification Proposal.

Table 5-12 REMMs applicable to traffic management for the Proposal

REMM	Mitigation measure
The following mitigation measures would be implemented as part of the traffic management plans to be prepared for the Project:	
4I	Reducing the volumes of construction vehicles travelling during peak periods, especially if the increase in traffic generated by construction activities impedes on the operation of Moorebank Avenue.
4J	Maintain access to neighbouring properties. It is particularly important that the ABB site has access throughout the construction stages.
4K	In addition to the Community Engagement Plan (or equivalent) (Refer to 2A), a communication plan will be developed to provide information to the relevant authorities and bus operators in addition to the local community. The communication plan will need to incorporate a contact list with the chain of command.
4L	Implement relevant traffic control measures to inform drivers of the construction activities and locations of heavy vehicle access locations.
4M	Obtain Road Occupancy Licences (ROLs) as necessary.
4O	Traffic on Moorebank Avenue would be monitored during peak periods to ensure that queuing at intersections does not impact on other road users.

An additional mitigation measure is proposed below:

- Road Safety Audit on Cambridge Avenue to be undertaken prior to the commencement of the Modification Proposal works period to identify the traffic safety risks and determine appropriate mitigations which would need to be implemented (e.g. truck movements to occur outside peak hours, driver awareness and safety training, speed monitoring and reporting protocols, etc.).
- Proposed Chatham Avenue/Moorebank Avenue intersection. To accommodate construction traffic as a result of the Modification Proposal, this intersection is proposed to be a signalised 3-leg intersection. The lane configuration at this intersection is proposed to remain unchanged from the existing layout on Moorebank Avenue with the exception of an increase in the turn storage length for the north approach from 20m to 200m. It should be noted that the SIDRA analysis has indicated that 70m would be adequate storage length for the right-turn movement on the north approach. However, a storage length of 200m would be provided to enhance vehicular access to the site. On the south approach, the left-turn storage length is recommended to be increased from 15m to 25m. The proposed changes are able to be implemented within the current right-of-way of the road.
- Proposed MPW Access Road/Moorebank Avenue intersection. As a result of the Modification Proposal, the intersection is proposed to be a 3-leg signalised seagull intersection with the western approach facilitating access for construction traffic generated by the Modification Proposal. With the signalised seagull intersection,

southbound through movements are not impeded i.e. free-flowing to provide increased intersection throughput. On the north approach, a right turn storage length of 85 m is recommended to facilitate heavy vehicle access to the MPW site. Two full approach lanes (one for left-turn movement and one lane for northbound through movement) on the south approach are recommended.

6 CONCLUSIONS AND RECOMMENDATIONS

This Traffic Impact Assessment Report has been prepared by Arcadis to support the Modification Proposal on the MPW site and to identify any traffic impacts and recommend measures to improve the safety or operation of the adjacent road network during Modification Proposal activities.

The analysis has determined that the construction traffic associated with the Modification Proposal would have minimal impacts on the performance of the existing M5 Motorway / Moorebank Avenue interchange, Bapaume Road / Moorebank Avenue intersection and Anzac Road / Moorebank Avenue intersections in both the AM and PM peak periods. No upgrades are required at those intersections due to the addition of the Modification Proposal construction traffic. The impact of the construction traffic is anticipated to be minor at the proposed MPW Access Road / Moorebank Avenue and Chatham Avenue / Moorebank Avenue intersections.

In summary, through the implementation of the mitigation measures approved for the MPW Concept Plan and recommended mitigation measures identified in this study, traffic impacts associated with the Modification Proposal are expected to be adequately managed in addition to those predicted within the MPW Concept Plan EIS.

APPENDIX A – EXISTING AND FUTURE TRAFFIC VOLUMES

Existing 2015 Traffic Turn Movements - AM Peak

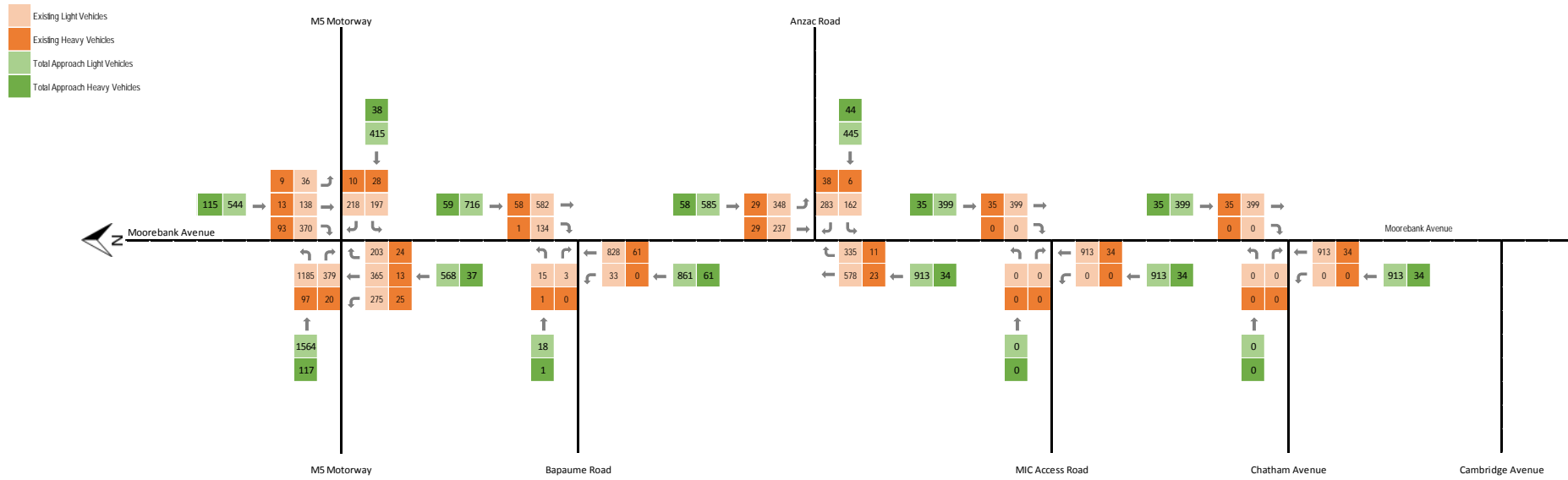


Figure 1 Existing Background Traffic Volumes – 2015 AM Peak

Existing 2015 Traffic Turn Movements - PM Peak

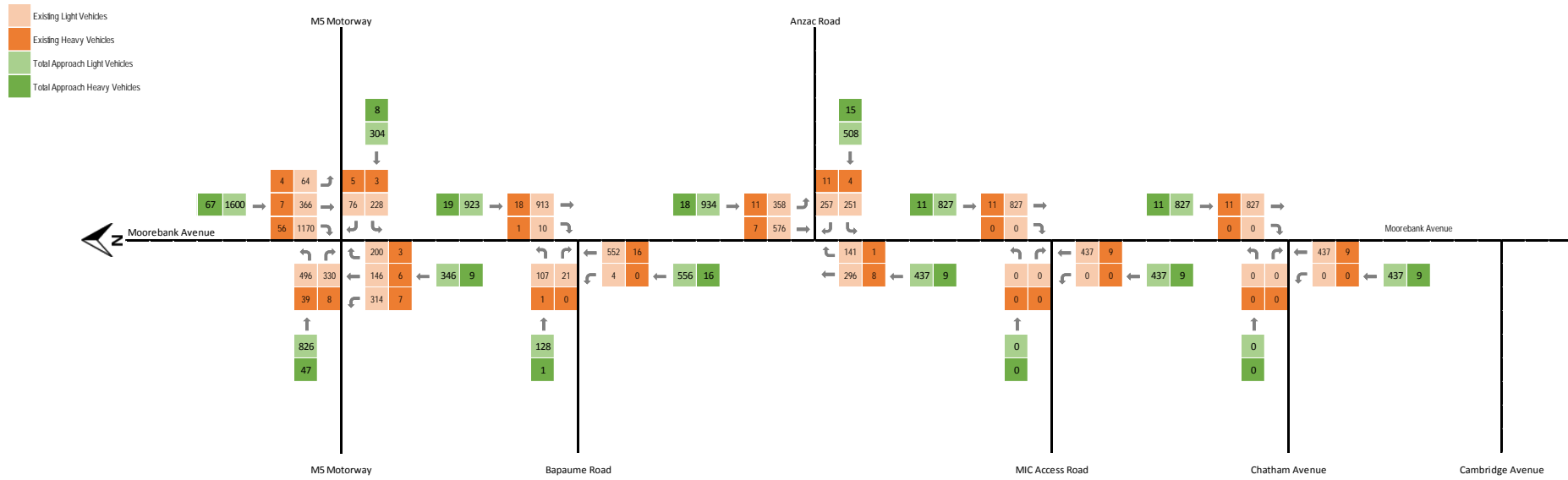


Figure 2 Existing Background Traffic Volumes – 2015 PM Peak

Existing 2017 Traffic Turn Movements - AM Peak

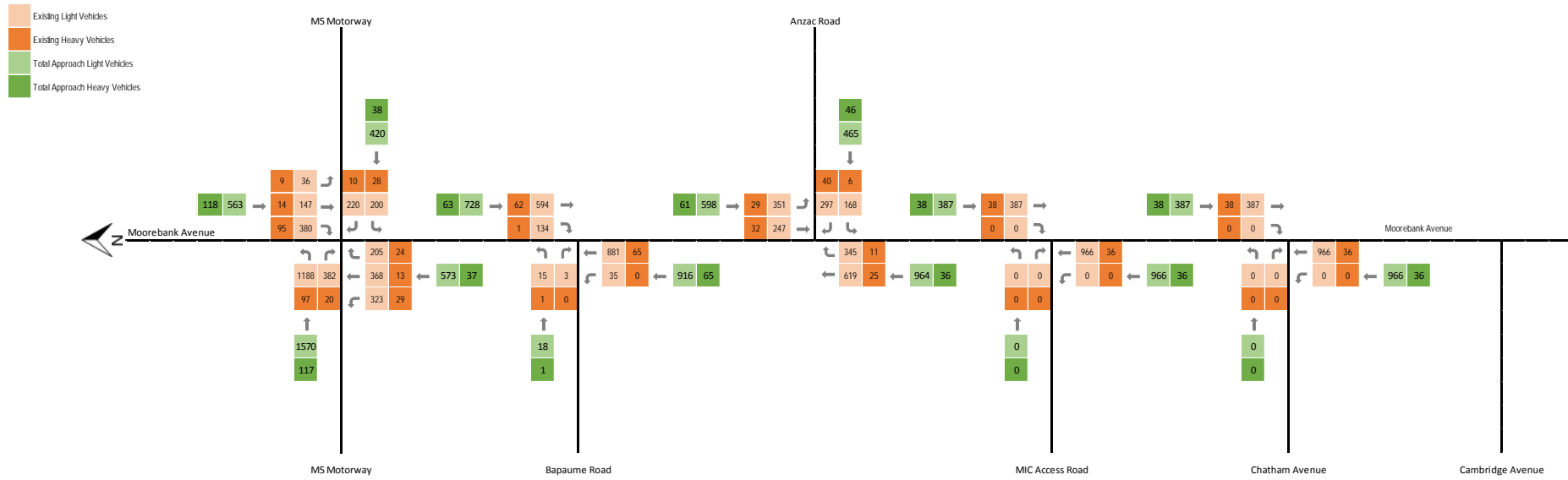


Figure 3 Estimated Background Traffic Volumes – 2017 AM Peak

Existing 2017 Traffic Turn Movements - PM Peak

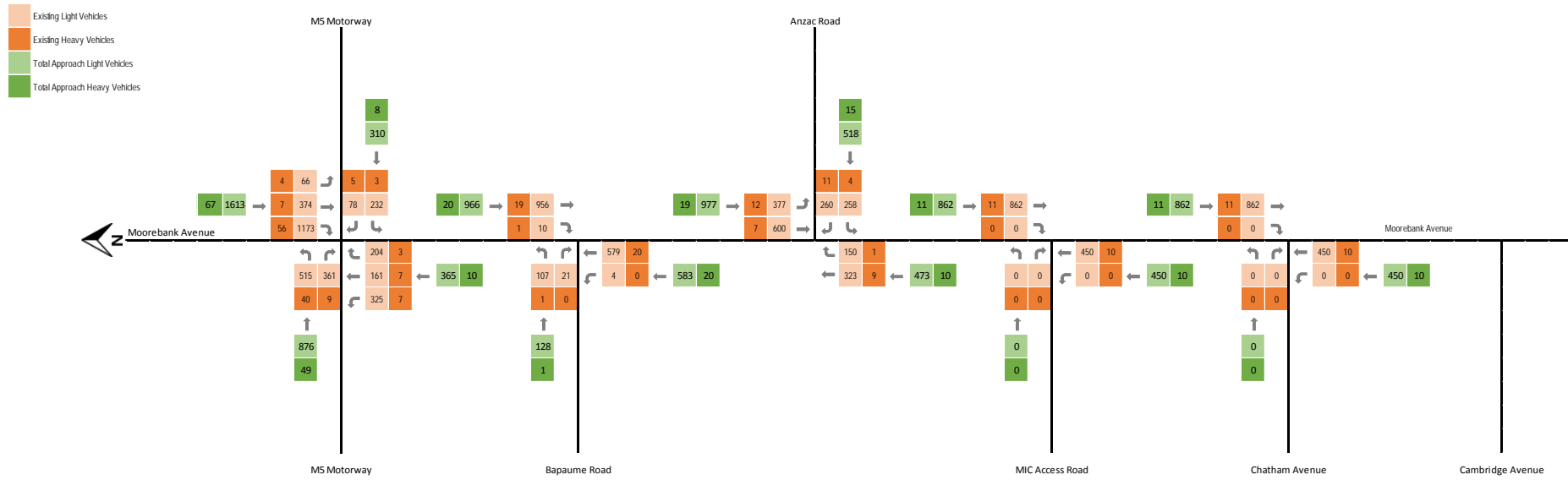


Figure 4 Estimated Background Traffic Volumes – 2017 PM Peak

MIC Construction 2017 Traffic Turn Movements - AM Peak

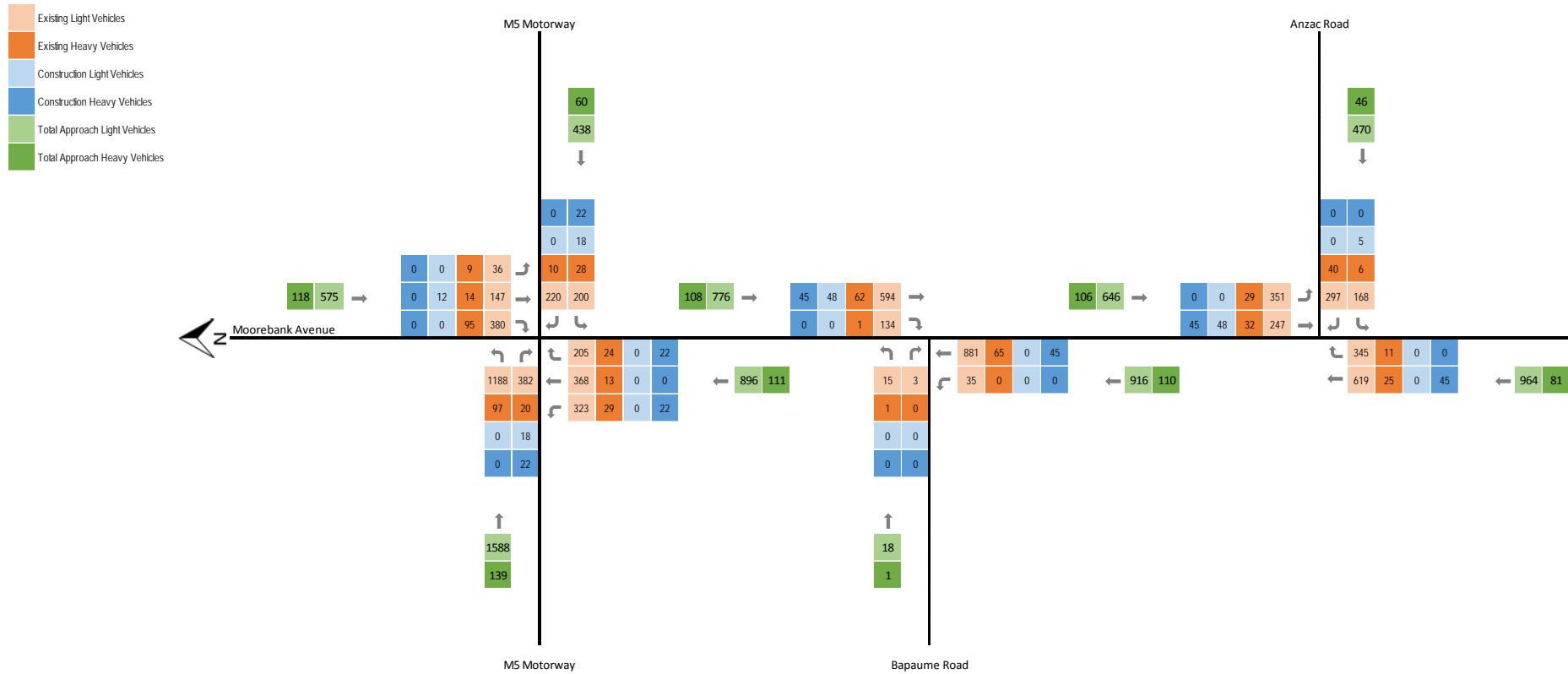


Figure 5 Estimated Traffic Volumes – 2017 AM Peak – Existing Intersections (Scenario 1, 2 & 3)

MIC Construction 2017 Traffic Turn Movements - PM Peak

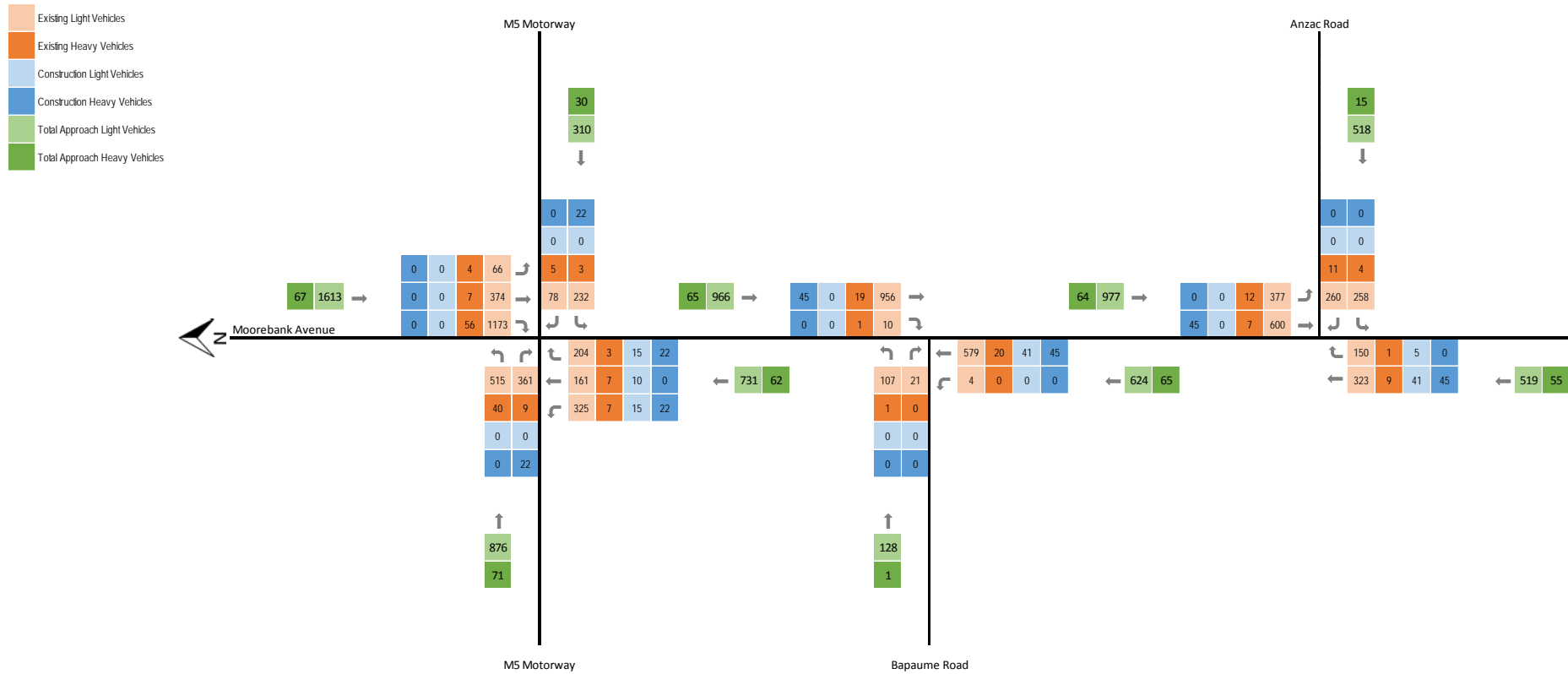


Figure 6 Estimated Traffic Volumes – 2017 PM Peak – Existing Intersections (Scenario 1, 2 & 3)

MIC Construction 2017 Traffic Turn Movements - AM Peak

- Existing Light Vehicles
- Existing Heavy Vehicles
- Construction Light Vehicles
- Construction Heavy Vehicles
- Total Approach Light Vehicles
- Total Approach Heavy Vehicles

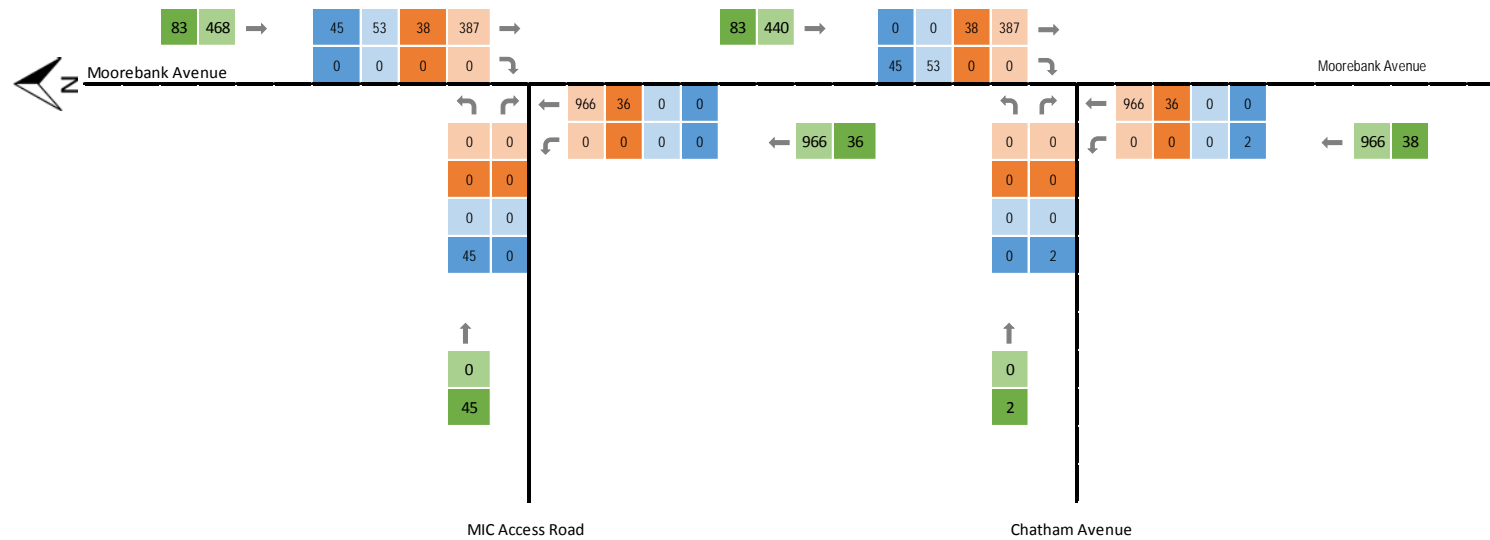


Figure 7 Estimated Traffic Volumes – 2017 AM Peak – Site Access Intersections (Scenario 1)

MIC Construction 2017 Traffic Turn Movements - PM Peak

- Existing Light Vehicles
- Existing Heavy Vehicles
- Construction Light Vehicles
- Construction Heavy Vehicles
- Total Approach Light Vehicles
- Total Approach Heavy Vehicles

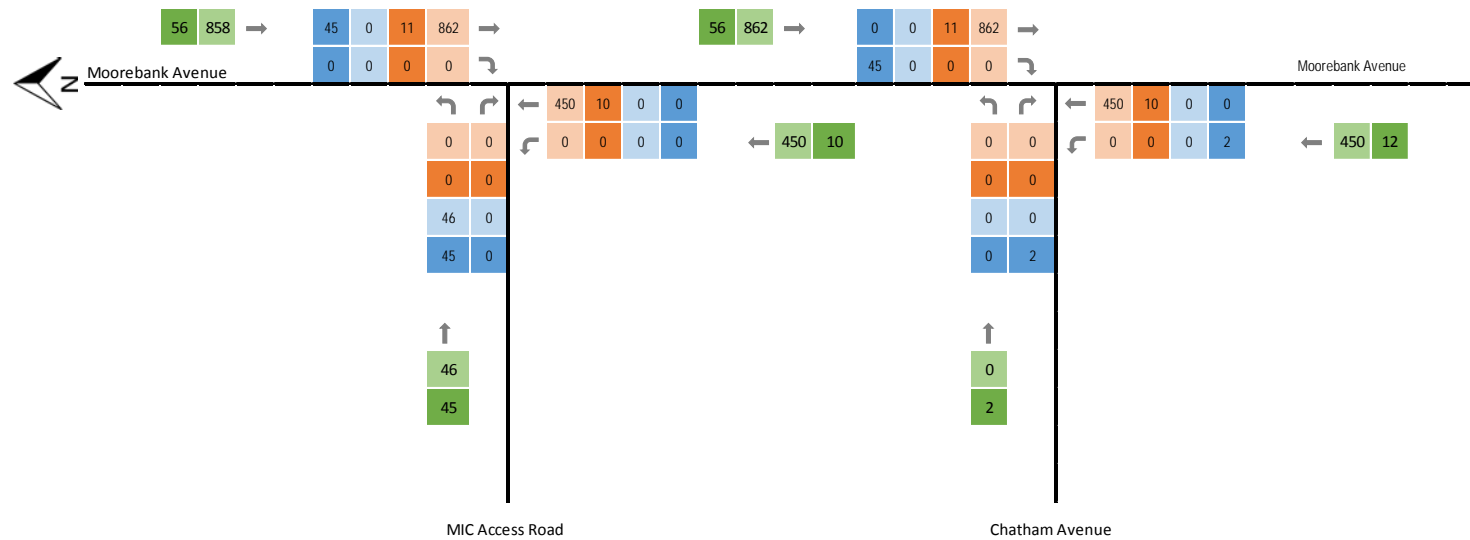


Figure 8 Estimated Traffic Volumes – 2017 PM Peak – Site Access Intersections (Scenario 1)

MIC Construction 2017 Traffic Turn Movements - AM Peak

- Existing Light Vehicles
- Existing Heavy Vehicles
- Construction Light Vehicles
- Construction Heavy Vehicles
- Total Approach Light Vehicles
- Total Approach Heavy Vehicles

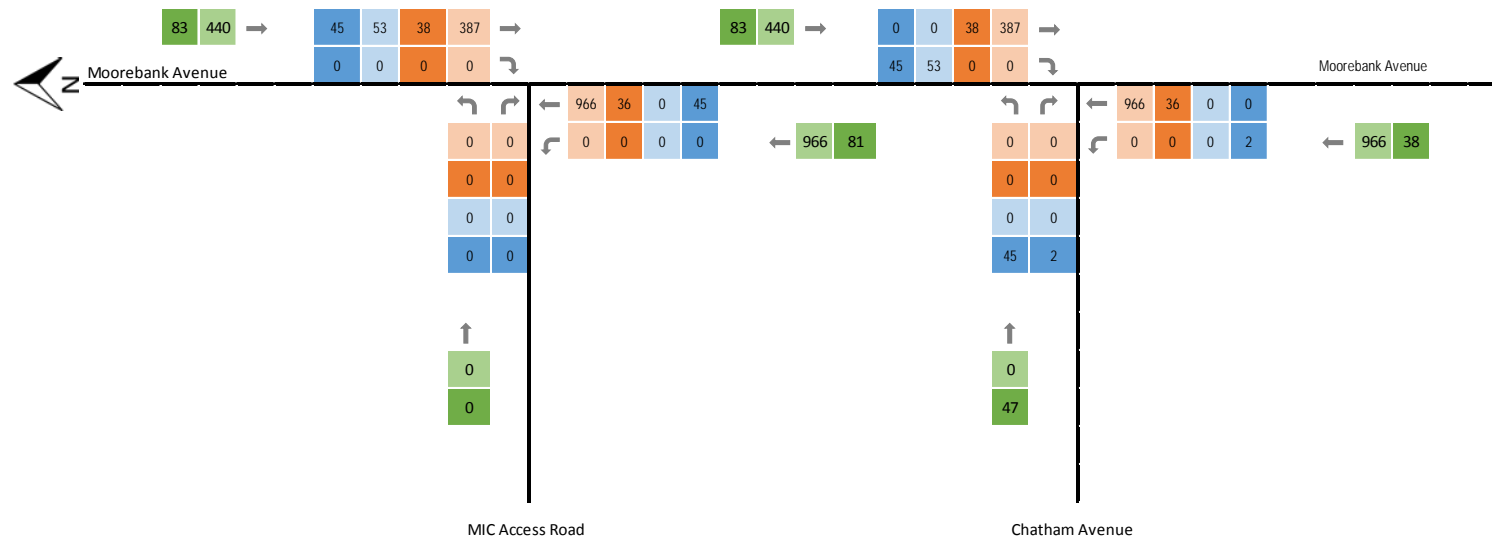


Figure 9 Estimated Traffic Volumes – 2017 AM Peak – Site Access Intersections (Scenario 2)

MIC Construction 2017 Traffic Turn Movements - PM Peak

- Existing Light Vehicles
- Existing Heavy Vehicles
- Construction Light Vehicles
- Construction Heavy Vehicles
- Total Approach Light Vehicles
- Total Approach Heavy Vehicles

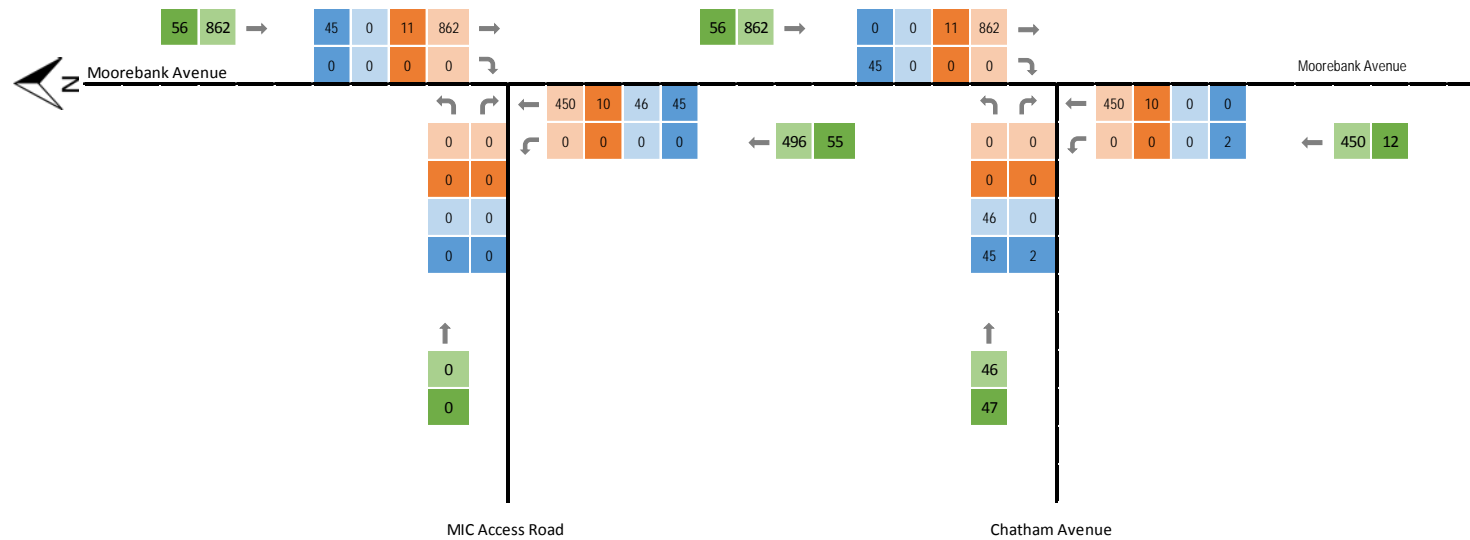


Figure 10 Estimated Traffic Volumes – 2017 PM Peak – Site Access Intersections (Scenario 2)

MIC Construction 2017 Traffic Turn Movements - AM Peak

- Existing Light Vehicles
- Existing Heavy Vehicles
- Construction Light Vehicles
- Construction Heavy Vehicles
- Total Approach Light Vehicles
- Total Approach Heavy Vehicles

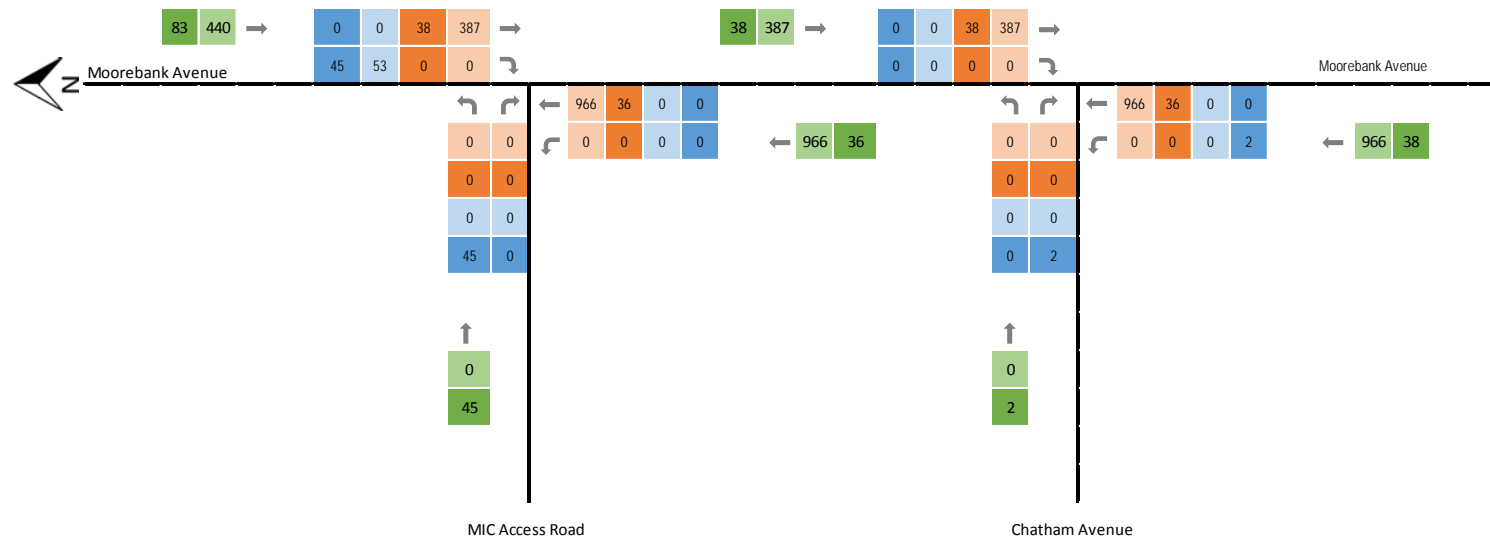


Figure 11 Estimated Traffic Volumes – 2017 AM Peak – Site Access Intersections (Scenario 3)

MIC Construction 2017 Traffic Turn Movements - PM Peak

- Existing Light Vehicles
- Existing Heavy Vehicles
- Construction Light Vehicles
- Construction Heavy Vehicles
- Total Approach Light Vehicles
- Total Approach Heavy Vehicles

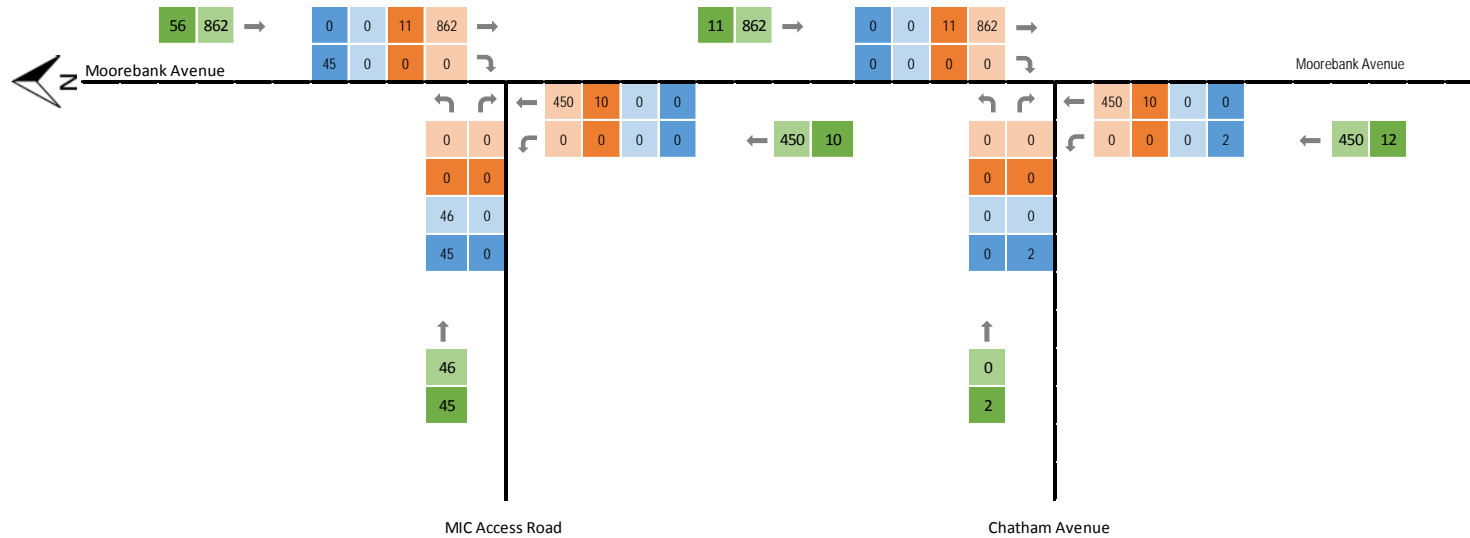


Figure 12 Estimated Traffic Volumes – 2017 PM Peak – Site Access Intersections (Scenario 3)

MIC Construction 2017 Traffic Turn Movements - AM Peak

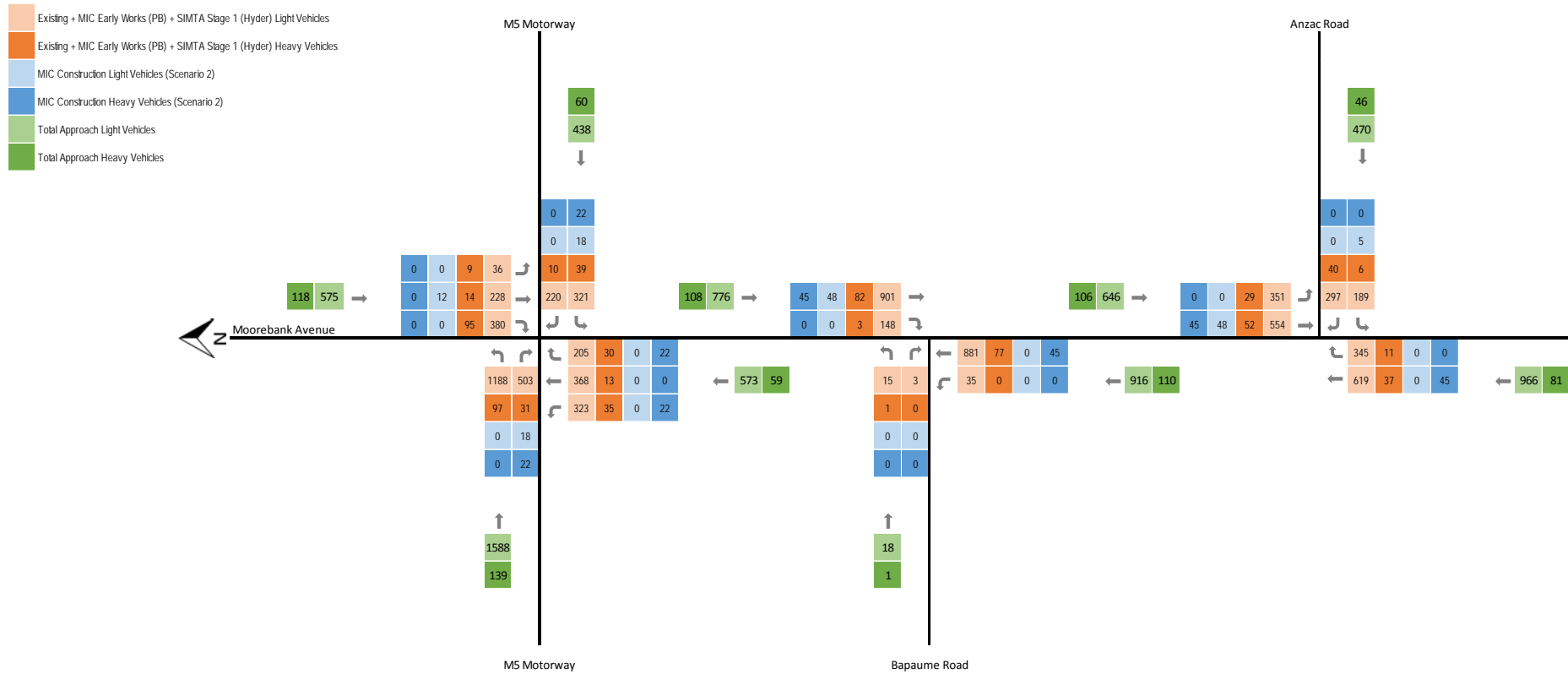


Figure 13 Estimated Traffic Volumes – 2017 AM Peak – Existing Intersections (Scenario 4)

MIC Construction 2017 Traffic Turn Movements - PM Peak

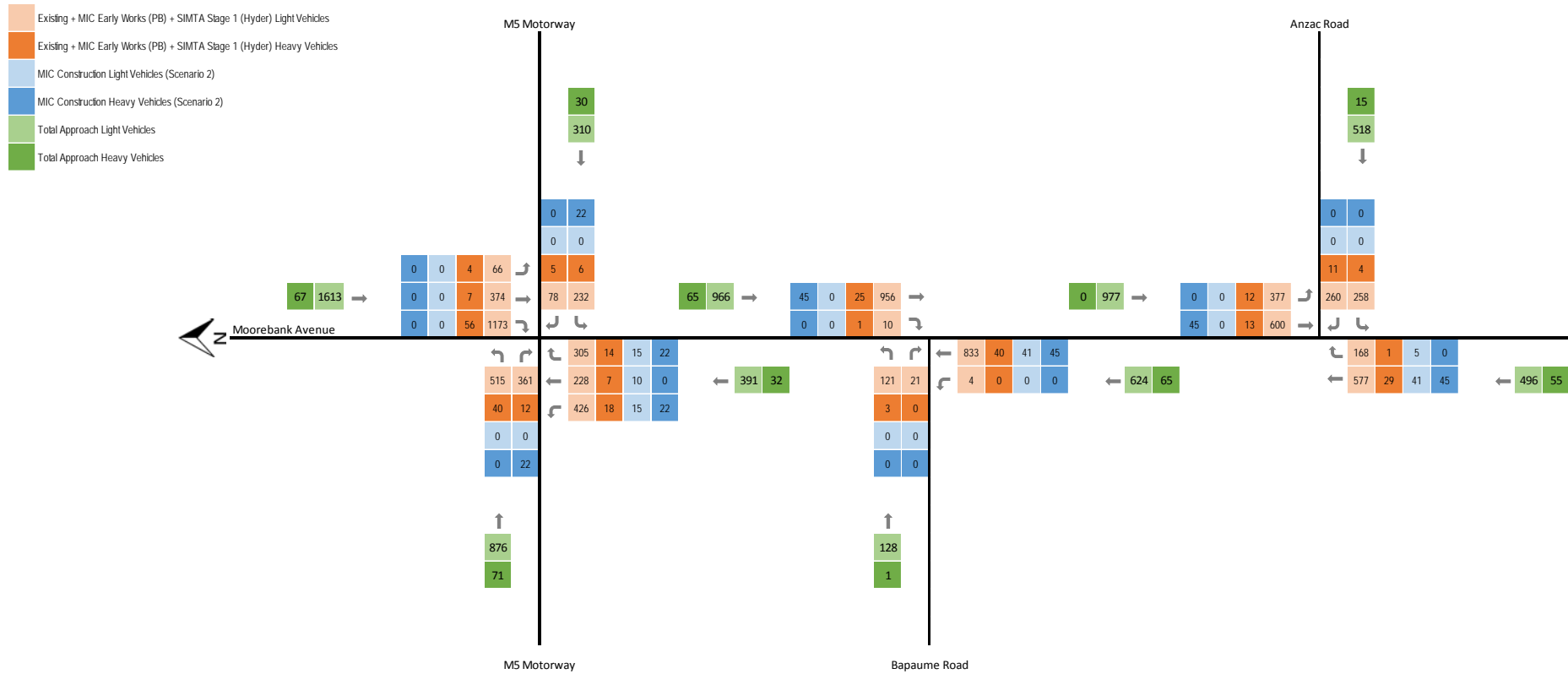


Figure 14 Estimated Traffic Volumes – 2017 PM Peak – Existing Intersections (Scenario 4)

MIC Construction 2017 Traffic Turn Movements - AM Peak

- Existing + MIC Early Works (PB) + SIMTA Stage 1 (Hyder) Lig
- Existing + MIC Early Works (PB) + SIMTA Stage 1 (Hyder) Heavy Vehicles
- MIC Construction Light Vehicles (Scenario 2)
- MIC Construction Heavy Vehicles (Scenario 2)
- Total Approach Light Vehicles
- Total Approach Heavy Vehicles

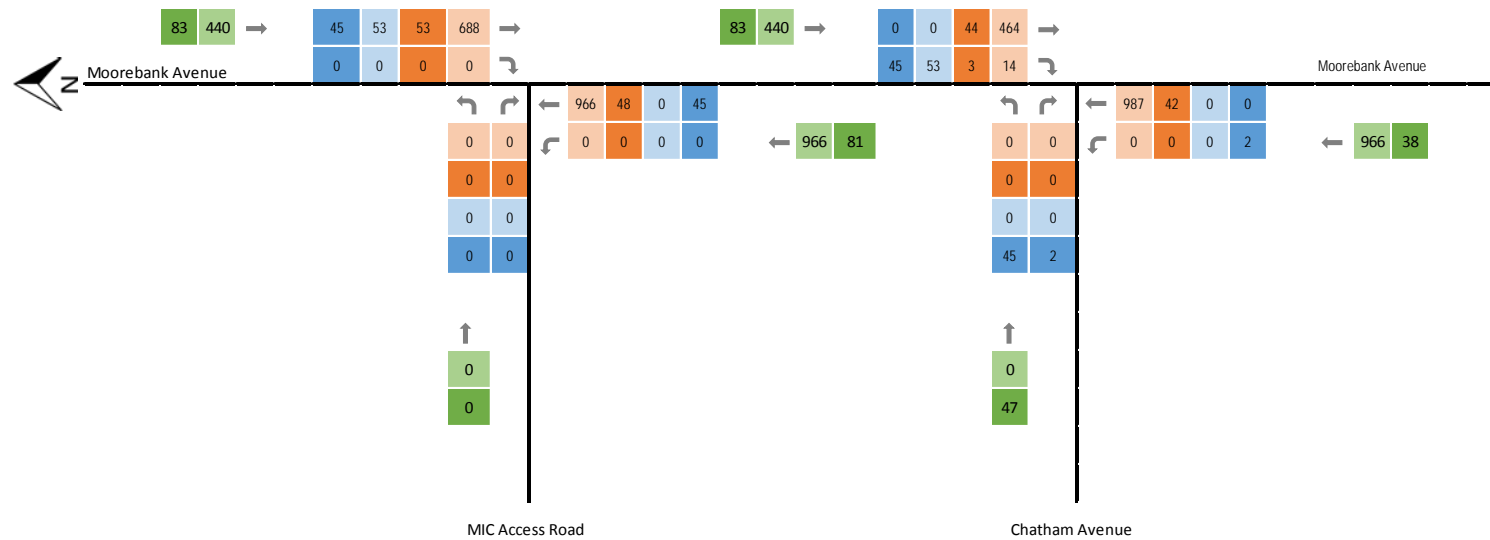


Figure 15 Estimated Traffic Volumes – 2017 AM Peak – Site Access Intersections (Scenario 4)

MIC Construction 2017 Traffic Turn Movements - PM Peak

- Existing + MIC Early Works (PB) + SIMTA Stage 1 (Hyder) Lig
- Existing + MIC Early Works (PB) + SIMTA Stage 1 (Hyder) Heavy Vehicles
- MIC Construction Light Vehicles (Scenario 2)
- MIC Construction Heavy Vehicles (Scenario 2)
- Total Approach Light Vehicles
- Total Approach Heavy Vehicles

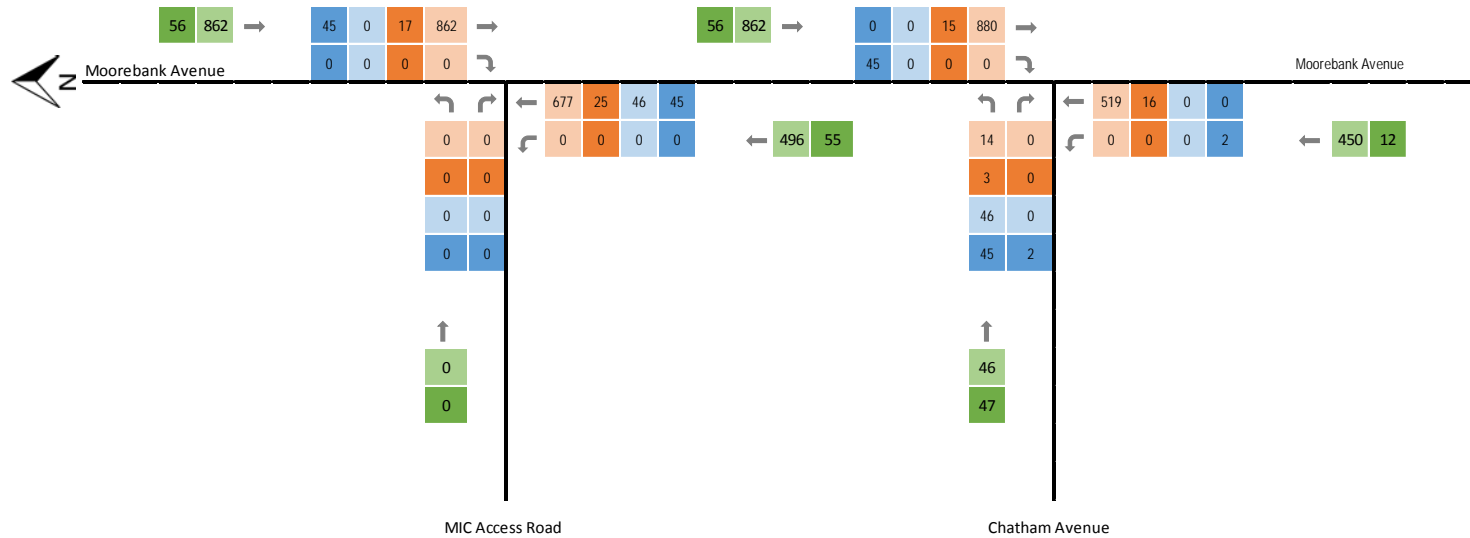


Figure 16 Estimated Traffic Volumes – 2017 PM Peak – Site Access Intersections (Scenario 4)