

Executive summary

The data collection and analysis undertaken as part of this study has provided a comprehensive understanding of the traffic trends within the Fishermans Bend. The analysis of data has shown that the majority of trips within the Fishermans Bend precinct are through trips, with a small proportion being local trips.

A local trip is when a vehicle is recorded at an initial (entry to study area) camera location but was not matched to any other camera location across the survey period. This would normally be expected to occur when a vehicle has a destination within the study area and stays for a period of time.

The following provides a summary of the key trends within the Fishermans Bend precinct.

Summary of Traffic Volume Analysis

Traffic volume data was collected in late February and early March 2013 within the Fishermans Bend precinct. The data has been analysed at each of the sites and the key findings include:

- The majority of traffic travelling through the precinct are cars. The data indicates 94% of vehicles recorded were cars.
- Site 9 - Montague Street recorded the highest volume of vehicles in both directions.
- Site 12 - Cecil Street in the northbound direction recorded the lowest one-way traffic volume.
- The site which recorded the greatest proportion of heavy vehicles was Site 2 - Williamstown Road in the westbound direction.
- Williamstown Road carries a significantly greater volume of car traffic than Plummer Street.
- Plummer Street has a higher percentage of heavy vehicles but a slightly lower volume of heavy vehicles compared to Williamstown Road.
- The data suggests that Plummer Street provides a role as an alternative truck route and is assisting to reduce the number of east-west truck movements along Williamstown Road.

Summary of Outer Cordon Movements

Inbound Traffic Movements

The analysis of inbound traffic movements focussed on the AM Peak period, between 7am and 10am. The following key results emerged from the analysis:

- At Site 21 northbound on Beaconsfield Parade 6,190 vehicles were observed in the AM peak period. The most common destinations were Site 18 northbound Graham Street (31%), local trips (22%), Site 15 northbound Ingles Street (20%) and Site 1 northbound Todd Road (16%);
- At Site 22 northbound on Canterbury Road 3,686 vehicles were observed in the AM peak period. The most common destinations were local trips (67%) and Site 13 northbound Ferrars Street (20%);

- At Site 23 westbound on Albert Road 2,032 vehicles were observed in the AM peak period. Most vehicles (62%) were local trips. The most common inner cordon location was Site 15 northbound Ingles Street (14%);
- At Site 24 westbound on Park Street 999 vehicles were observed, of which 66% were destined for non-Fishermans Bend locations. The most popular inner cordon location was Site 15 northbound Ingles Street (13%); and
- At Site 25 westbound located on Dorcas Street 543 vehicles were observed in the AM peak period. Most vehicles (66%) were local trips with 20% observed at Site 15 northbound on Ingles Street.

Outbound Traffic Movements

The analysis of inbound traffic movements focussed on the PM Peak period, between 4pm and 7pm. The following key results emerged from the analysis:

- At Site 1 southbound on Todd Road 1,019 vehicles were observed in the PM Peak. The majority of trips were to either Site 21 eastbound Beaconsfield Parade (68%) or to a local destination (28%);
- At Site 18 southbound on Graham Street 2,953 vehicles were observed in the PM Peak. The majority of trips were to Site 21 eastbound Beaconsfield Parade (52%) and to a local destination (42%);
- At Site 16 southbound on Bridge Street 1,005 vehicles were observed in the PM Peak. The large majority (75%) were local trips. The most common destinations for vehicles in the outer cordon were Site 23 eastbound and Site 21 eastbound Beaconsfield Parade, where approximately 7% of vehicles were matched respectively;
- At Site 15 southbound on Ingles Street 3,459 vehicles were observed in the PM Peak. Trips were distributed across a wide range of locations. A total of 47% went to a local destination, 23% went to Site 21 eastbound Beaconsfield Parade and 9% went to Site 22 southbound Canterbury Road;
- At Site 14 eastbound on Montague Street 2,130 vehicles were observed during the PM Peak period. The large majority of trips (85%) were local trips. The most common destinations in the outer cordon were Site 22 southbound Canterbury Road (5%), Site 23 eastbound Albert Road (4%) and Site 24 eastbound Park Street (4%);
- At Site 13 eastbound located on Ferrars Street 1,133 vehicles were observed in the PM Peak period. Most trips were to destinations that were not on the outer cordon (47%). However a substantial proportion (43%) was observed at Site 22 southbound on Canterbury Road; and
- At Site 12 southbound located on Cecil Street 668 vehicles were observed in the PM Peak period, of which 656 were light vehicles. Most vehicles (67%) local trips. The most common outer cordon destinations were Site 22 SB Canterbury Road (11%), Site 23 eastbound Albert Road (8%), and Site 24 eastbound Park Street (8%).

Summary of Inner Cordon Movements

Analysis of the surveyed origin-destination data reveals the following with respect to the cordoned Fishermans Bend study area:

- Across the 12 hour period from 7am to 7pm, approximately 90,000 trips pass through the precinct, whereas approximately 23,000 trips are attracted into the area during the same time period.

The approximate 90,000 trips can be broken down as follows:

- 80,121 light vehicles;
- 4,871 rigid trucks;
- 3,433 articulated trucks; and
- 899 buses

The approximate 23,000 trips can be broken down as follows:

- 21,944 light vehicles;
- 311 rigid trucks;
- 153 articulated trucks; and
- 41 buses

- Across the same 12 hour period, approximately 16,000 trips were generated by the Fishermans Bend precinct.
 - 15,679 light vehicles;
 - 52 rigid trucks;
 - 426 articulate trucks; and
 - 3 buses.
- The highest volumes of heavy vehicles (both rigid and articulated trucks) were recorded at the Webb Dock location during the AM (0700-1000) and inter-peak (1000-1600) periods. The data clearly demonstrates that these vehicles are predominately destined for West Gate Freeway and utilise Todd Road to access the freeway;
- Vehicles recorded entering the precinct on Todd Road (southbound) are also predominately destined for West Gate Freeway, with only 28% of trips travelling through the network to alternate destinations;
- 44% of vehicles entering the precinct from the south via Graham Street (between 7am and 7pm) were recorded as local trips (3,319 vehicles), 8% of which were heavy vehicles (182 rigid trucks and 79 articulated trucks);
 - Whilst the data collected provides a good representation of trip distributions from Graham Street, it is noted that an OD camera was not placed at Prohasky Street which provides access to the West Gate Freeway via Plummer Street. Site 7 northbound on Salmon Street was also not recording data during the main survey, which is discussed in Section 6.

The analysis in Section 6 shows that approximately 700 of these local trips exited the precinct by travelling northbound along Salmon Street (site 7). 97% of the 700 were light vehicles;

It is possible that a number of the remaining local trips from Graham Street are accessing the freeway via Prohasky Street. However, it is not possible to accurately determine the number of vehicles that make this movement based on the data that has been obtained for this study.
- 44% of vehicles entering the precinct from the south via Graham Street were recorded as having a local destination, 8% of which were heavy vehicles;
- 55% of vehicles entering the precinct from the south via Ingles Street throughout the day travel through the network to either Lorimer Street or Montague Street. Only 5% of these vehicles have a local destination within the Fishermans Bend area;

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1. Introduction

1.1 Background

The Department of Transport (DoT) has commissioned GHD to undertake the Fishermans Bend Existing Conditions Survey. This project comprises of an extensive data collection exercise to identify:

- How many vehicles travel through Fishermans Bend?
- How many vehicles have a destination in Fishermans Bend?
- What types of vehicles travel on the roads within the study area?
- Is the Plummer Street truck route working?

GHD has utilised the services of SkyHigh to collect the traffic data for this study.

1.2 Purpose of this report

The purpose of this report is to summarise the existing traffic conditions within the Fishermans Bend precinct. This includes a summary of the overall requirements of the project, methodology, results, and key trends.

1.3 Assumptions

The core assumptions for this study were:

- It is assumed that the data collected is representative of typical traffic conditions within the Fishermans Bend precinct.
- Due to the porous nature of the study area with multiple local roads, all unmatched trips are considered to have a local destination.

1.4 Structure of Report

This report is structured as follows:

- Section 2 provides a background to the project;
- Section 3 summarises the project methodology;
- Section 4 provides a summary of the traffic volumes within the study area;
- Section 5 provides a summary of the results of the origin destination survey; and
- Section 6 provides details on the additional surveys required and the results of these surveys.

2. Project Overview

2.1 Background

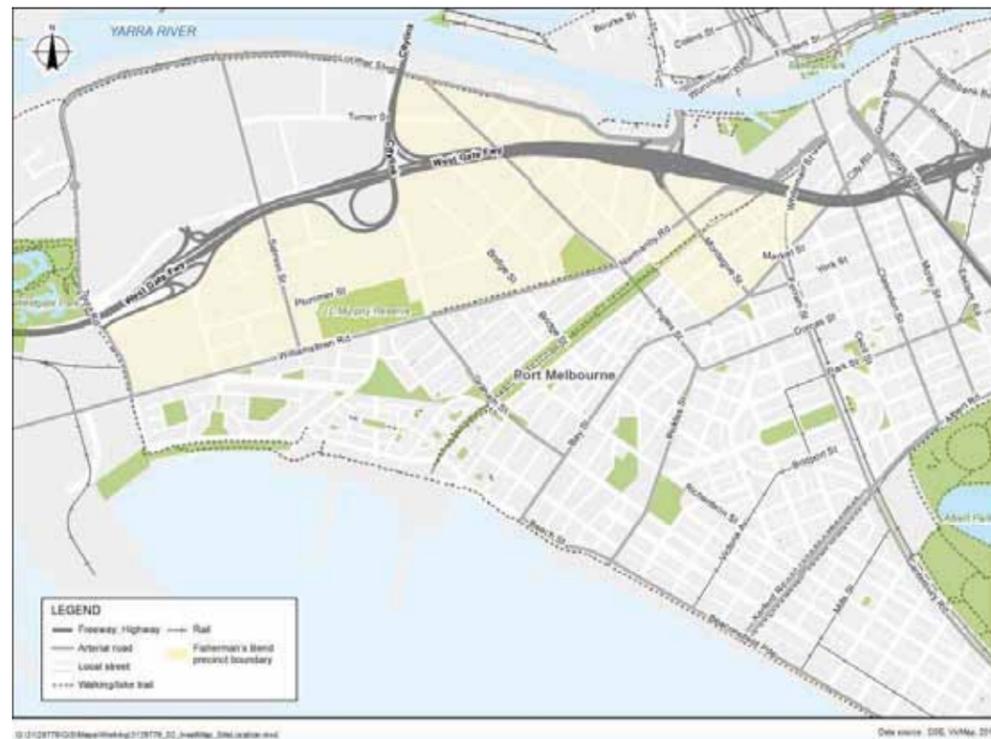
The Victorian State Government has identified the Fishermans Bend precinct as a key urban renewal area close to the Melbourne Central City. It is currently occupied by light industry and logistics related businesses, located within three kilometres of the centre of the Melbourne CBD.

The predicted changes to land use and the associated increases in population has raised the need to understand the existing transport conditions within the precinct, to assess the potential impact of the proposed redevelopment on the existing road network. This will also assist in developing a plan for sustainable land use and transport solutions as part of the development.

The majority of the Fishermans Bend precinct lies to the south of the West Gate Freeway corridor, which anecdotally results in a high percentage of through traffic wishing to access the freeway via the interchanges at Montague Street and Todd Road. The presence of the light industrial land use and Webb Dock at the western end of the precinct also results in perceived high levels of freight traffic, particularly between the Todd Road interchange and Webb Dock.

The study area and surrounding road network is shown in Figure 1.

Figure 1 Overview of Study Area



2.2 Key Roads within Study Area

The following provides a summary of the key roads within the study area:

2.2.1 West Gate Freeway (M1)

The West Gate Freeway is the highest classification of road within the study area and is managed by VicRoads. It provides up to four lanes in each direction and is a key strategic route across Melbourne. The West Gate Freeway has interchanges in the vicinity of the Fishermans Bend precinct located at Montague Street and Todd Road.

2.2.2 Montague Street

Montague Street is an arterial road under the management of VicRoads. It provides two lanes in each direction in the vicinity of City Road increasing to three lanes in each direction as it approaches the interchange with the West Gate Freeway. Montague Street provides a connection between the freeway at its northern end and the light industrial properties at its southern end.

2.2.3 Todd Road

Todd Road is an arterial road under the management of VicRoads. It provides two lanes in each direction, with an interchange with the West Gate Freeway. It provides a key connection between the West Gate Freeway and Webb Dock, and as such, carries a high proportion of heavy vehicles.

2.2.4 Williamstown Road

Williamstown Road is an arterial road under the management of VicRoads. It provides two lanes in each direction, connecting Webb Dock to the West Gate Freeway via Montague Street. Residential properties abut the southern frontage of Williamstown Road, while light industrial and logistical businesses abut the northern frontage.

2.2.5 City Road

City Road is an arterial road under the management of VicRoads. It provides up to three lanes in each direction, reducing to two lanes in each direction in the vicinity of Montague Street. It provides a connection from Swan Street Bridge into Port Melbourne, carrying high volumes of heavy vehicles due to the abutting industrial land uses and the placarded vehicle restrictions in the Domain and Burnley Tunnels.

2.3 Purpose of the Project

The purpose of this project is to gain a better understanding of the current traffic volumes and trends within the Fishermans Bend precinct and determine how many vehicles travel through the precinct compared to those that have a local destination. The key objectives of this project are to answer the following:

- How many vehicles travel through Fishermans Bend?
- How many vehicles have a destination in Fishermans Bend?
- What types of vehicles travel on the roads within the study area?
- Is the Plummer Street truck route working?

3. Project Methodology

In order to answer the key questions outlined in the project brief a comprehensive project methodology was implemented which focused on the collection and the analysis of survey data.

As discussed previously SkyHigh were employed as specialist sub-consultants for this project. SkyHigh has previous experience across Australia in undertaking large origin-destination surveys of this nature. The OD survey was performed for a 12 hour period.

3.1 Preliminary works

Prior to the commencement of any data collection or analysis it was necessary to undertake detailed preliminary works. It was recognised from the outset that this project carried inherent risks that would need to be managed and the preliminary works undertaken by the project team helped address project risks.

3.1.1 Management of risks

DoT, GHD, and SkyHigh undertook a proactive approach to managing the inherent risks. Ultimately the success of this project is based on how useful and accurate the analysis is for other DoT projects/discussions that are undertaken after project completion. Fundamentally, useful and accurate findings are based on sound data upon which important decisions can confidently be made. On that basis, the biggest risk to this project related to the quantity of data that is required to be collected in a narrow time period and the risk that something may go wrong (e.g. traffic incident or vandalism) at any one of those sites, or indeed in the analysis of the data itself. The following tasks were undertaken as part of the risk management strategy:

- Detailed survey planning; and
- Creation of a live risk register document which outlined key risks, proposed mitigation measures and responsibilities for implementing these measures.

3.1.2 Survey Planning

A large scale survey programme was established by GHD. This built upon the suggested survey programme in the DoT brief and was further developed in conjunction with DoT and their stakeholders. In order to conduct a project of this scale GHD employed SkyHigh to undertake the surveys necessary for this project. Detailed pre-survey planning was undertaken to:

- Review initial suggested survey sites and suggest the precise location of where cameras should be placed; and
- Identify a survey period that fell within a 'typical' week, which is a week where there were no unusual factors that may have affected traffic or freight volumes.

A site visit was conducted in February 2013 by GHD and SkyHigh to review the proposed camera survey locations. This enabled the team to understand the risks associated with each site such as the blocking of cameras by vehicles or trees, sun glare and possible vandalism.

3.2 Review of Survey Period

3.2.1 Survey Dates

The selection of the survey dates took into consideration the overall project timeline, the amount of time required to analyse the data and other constraints such as school holidays and public holidays. To ensure that the surveys were performed on a 'typical' day, a week was selected that was free from these constraints. Discussions were also held with stakeholders such as

VicRoads to select the most appropriate week free of activities such as major road closures. In addition to these discussions, automatic tube counters were placed within the study area for the week of the survey to provide seven days of traffic volume data to compare to the rest of the week to check that the traffic volumes on the actual survey day were similar to other days of that week.

It was originally proposed to perform the surveys in the week beginning Tuesday 19 February 2013 through to Friday 22 February 2013, with the data collection occurring between Tuesday to Thursday to provide 'typical' traffic conditions. However this was postponed to provide additional time to setup due to the large amount of equipment required. This delay proved fortunate as there was a closure of the M1 freeway corridor and a truck incident which would have impacted the traffic conditions within the study area, resulting in 'non-typical' conditions.

The surveys were rescheduled to the week beginning Monday 25 February 2013, with the data collection proposed for the Tuesday. The data collection equipment was installed from Monday morning. Weather conditions on the Tuesday morning resulted in the abandoning of the survey for that day with significant rain experienced in the AM peak period. The actual surveys were successfully completed on Wednesday 27 February 2013 with fine weather and no traffic incidents on the road network which would have impacted traffic conditions.

3.2.2 Monitoring of equipment

Vandalism of equipment and equipment malfunction were identified as key risks from the outset of the project. To minimise these risks SkyHigh performed regular inspections of all camera and additional inspections of sites identified as 'priority' throughout the day and during the peak periods. No vandalism was experienced during the survey period.

3.3 Survey Approach

3.3.1 Survey methodology

The bulk of the data capture for this study will be performed through an origin destination survey. Cameras are setup at key locations across the road network, recording number plates and the time that they were observed. These number plates are then matched with other camera sites as the vehicle exits the study area. If vehicles cannot be matched, it is assumed that these vehicles have a destination within the study area.

To complement the OD data, automatic tube counters (ATC) were placed on Williamstown Road and Plummer Street. The ATC's were placed for a full week and were recording hourly volumes for 24 hours a day. They also provide vehicle classification and speed.

3.3.2 Data capture

Captured number plates were reviewed manually from footage. This allowed SkyHigh staff to pause each vehicle as it passed, which is typically a more accurate number plate readings and vehicle classification compared to recording data in the field. Number plate data were then entered into the SkyHigh "OD" program which matches the number plates between the origin and destination stations.

With projects of this size and complexity a small percentage of number plates are not accurately visible due to:

- Dirty, obscured or missing plates.
- Vehicles traveling very close together causing blocking of plates.
- Multiple traffic lanes (ie vehicles travelling side by side), although this issue was mitigated through the use of multiple cameras at locations with more than one traffic lane.

- Direct Sunlight – At some times during daylight hours, some cameras can be subject to sunlight shining directly onto the front of the lens causing a glare which severely restricts the ability to read the number plates during these periods.

Automatic tube counters were also placed on Williamstown Road and Plummer Street to record for a full week. These tube counters provide hourly traffic count data and also provide information such as the classification of vehicles and vehicle speed.

A minimum daily capture rate was agreed with DoT for all survey locations and was set at 80% of all vehicles observed to pass each location. The observed capture rate was typically between 90% and 98%. The exception to this was the survey data used from Tuesday 26 February for site 7. The capture rate at this location was between 68% and 95% due to the heavy rain at the start of the surveys. As this site is not a critical site, this lower capture rate is considered acceptable.

3.3.3 Survey Locations

The camera and automatic tube counter locations are shown in Figure 2. Two survey cordons were used to assist in the assessment of the data. An outer cordon (shown in purple) were used to determine how vehicles were travelling to and from the Fishermans Bend precinct, while the inner cordon (shown in red) were used to assess how vehicles were travelling through the precinct.

Figure 2 Camera and Tube Counter Locations



Table 1 provides a summary of the camera and ATC locations across the study area highlighting the inner and outer cordon sites.

Table 1 Summary of Camera and ATC Locations

Cordon	Site Number	Location
Inner	1	Todd Road south of Williamstown Road
	2	Williamstown Road west of Todd Road
	3	Todd Road north of West Gate Freeway
	4	West Gate Freeway westbound exit ramp
	5	West Gate Freeway eastbound exit ramp
	6	West Gate Freeway eastbound entry ramp
	7	Salmon Street north of West Gate Freeway
	8	Ingles Street south of Lorimer Street
	9	Montague Street south of Munro Street
	10	Normanby Road west of Clarendon Street
	11	City Road west of Clarendon Street
	12	Cecil Street south of City Road
	13	Ferrars Street south of City Road
	14	Montague Street north of City Road
	15	Ingles Street south of Williamstown Road
	16	Bridge Street south of Williamstown Road
	17	Williamstown Road east of Graham Street
	18	Graham Street south of Williamstown Road
	19	Plummer Street west of Graham Street
	20	Williamstown Road ATC west of Graham Street
Outer	21	Beaconsfield Parade south of Pickles Street
	22	Canterbury Road south of Albert Road
	23	Albert Road west of Clarendon Street
	24	Park Street west of Clarendon Street
	25	Dorcas Street west of Clarendon Street

Four camera locations within the study have been set as 'priority' sites due to their strategic role within the arterial road network. These sites are as follows:

- Site 2 - Williamstown Road west of Todd Road
- Site 9 – Montague Street south Munro Street
- Site 11 - City Road west of Clarendon Street
- Site 14 - Montague Street north of City Road

These locations have been selected as they are key access locations to the Fishermans Bend precinct and they are anticipated to carry higher traffic volumes. Site 2 is also a strategic location due to the access to and from Webb Dock. The analysis of traffic conditions at these sites is presented in Section 4.

The outer cordon sites have been placed on key arterial routes that would be used to access the Fishermans Bend precinct. These sites have been analysed in the AM peak period for inbound (to Fishermans Bend) trips and outbound for PM peak trips. This analysis is presented in Section 4.4

3.4 Data Analysis Methodology

3.4.1 Data Processing

SkyHigh undertook a large proportion of the data processing for this project. Video footage at each of the sites was downloaded and processed to ascertain the key information required for this project such as number plate, type of vehicle and time that the vehicle passed the camera location.

SkyHigh's analysis was centred on providing the following outputs:

- Matched pairs at each of the OD camera sites;
- Identification of the vehicle type (car, rigid truck, articulated truck and bus); and
- Results from the automatic tube counters.

3.4.2 Additional Surveys

During the data processing stage, it was discovered that the recorded data at two camera sites had failed. These sites were:

- Site 2 eastbound which had a corrupted memory card that could not be accessed for data analysis; and
- Site 7 northbound which was slightly moved after an inspection which resulted in it not being pointed in the correct direction.

Site 2 was considered a priority site as it would record vehicles travelling from Webb Dock, and therefore would require re-surveying. This was arranged for 13 March to avoid holidays and the Grand Prix.

Site 7 wasn't considered a priority site and did not require re-surveying. While the survey on Tuesday 26 February was rained out, the cameras were still recording for the full day. As such, SkyHigh were able to use this data to supplement the lost data at site 7.

The analysis of this additional survey data is discussed in Section 6.

3.4.3 Data Analysis

Data received from SkyHigh was thoroughly checked by GHD to monitor the quality and accuracy of data. Queries raised during this process were fed back to SkyHigh and updates to the data were made as necessary. Once the data was accepted for use GHD then undertook a detailed review of the data to answer the key study questions as required by DoT.

The data has been analysed in three peak periods, the AM peak from 7am to 10am, the inter-peak from 10am to 4pm and the PM peak from 4pm to 7pm.

3.4.1 Data presentation

SkyHigh presented the captured data in a series of 15 minute trip tables, which detailed movements into and out of each respective site, and the number of matched origin-destination trips recorded as determined by the project team. This data was then analysed by GHD and presented in the following sections of this report.

3.4.1 Recordings at Multiple Locations

Through the analysis of the data it is evident that some vehicles travelled via multiple OD camera locations as well as making multiple trips throughout the day. This can result in higher matched volumes (site to site) compared with the actual number of vehicles recorded passing the initial camera.

Our analysis presents both volumes (ie vehicles and vehicle trips), with the volumes travelling through the camera site representing the number of vehicles travelling into the study area, while the data in the OD analysis section shows the number of vehicles travelling throughout the study area possibly to multiple locations before leaving the study area. This can result in the graphs used to present the OD data having higher volumes than what was recorded passing through the camera site.

3.4.1 Local Trips

A local trip is when a vehicle is recorded at an initial (entry to study area) camera location but was not matched to any other camera location across the survey period. This would normally be expected to occur when a vehicle has a destination within the study area and stays for a period of time.

Additional vehicles may have been lost due to capture error such as blocked or illegible number plates or human error in recording the number plates. These errors would be incorporated into the local trips as it is not possible to match these plates at another camera location. This could increase the number of local trips, however the overall error rate was low at each camera location, typically 50-10%.

Whilst the adopted survey locations have picked up the most significant routes in and out of the Fishermans Bend precinct, it is acknowledged that it was not possible to place cameras at every road in and out of the precinct. Accordingly, there will be an additional proportion of trips to, from and within the precinct that would not have been recorded as part of this survey, particularly trips via the lower order roads.

4. Traffic Volume Analysis

This section presents a summary of the traffic volumes recorded across the survey period. Analysis of the traffic volumes through the priority sites and a summary of all other sites are presented in this section. Analysis of key routes is provided in Section 5.

The analysis of the traffic volume data aims to identify the type of vehicles travelling on roads within the Fishermans Bend precinct. Additionally the analysis will investigate whether Plummer Street is acting as a heavy vehicle alternate route for Williamstown Road.

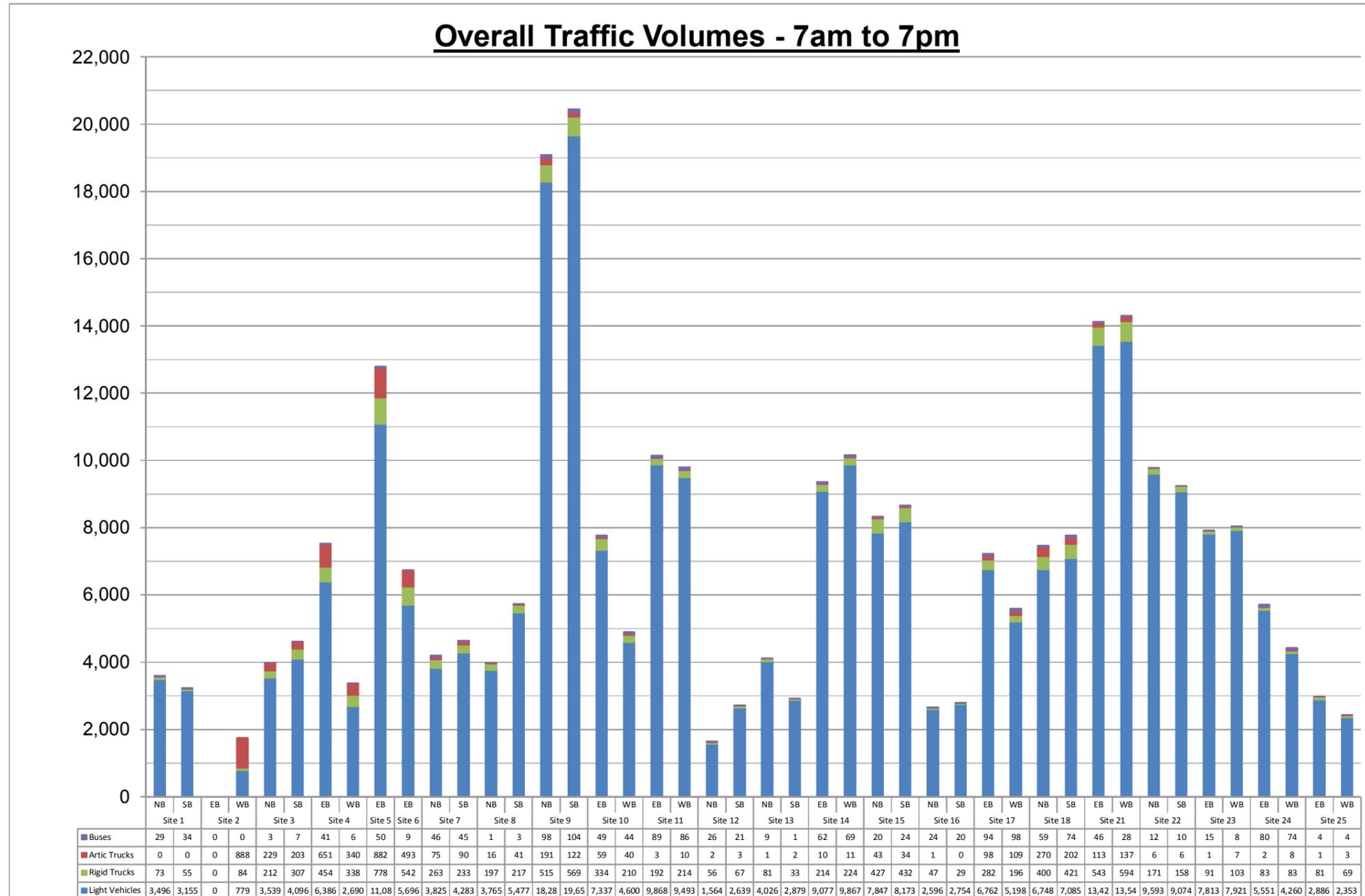
4.1 Summary of all sites

Traffic data has been collected for a number of sites within the Fishermans Bend precinct to understand the traffic movements occurring through the area. As previously mentioned the traffic data has been primarily completed for the time period between 7am and 7pm. The traffic volumes for all sites are presented in Figure 3.

The key findings presented in Figure 3 include:

- The majority of traffic travelling through the precinct are cars. The data indicates 94% of vehicles recorded were cars.
- Heavy vehicles were recorded at all sites.
- Site 9 (Montague Street) recorded the highest volume of vehicles in both directions. A total of 39,533 vehicles were recorded to travel through this site (two-way volume). 20,445 vehicles were recorded in the southbound direction and 19,088 vehicles were recorded in the northbound direction.
- Site 12 (Cecil Street) in the northbound direction recorded the lowest one-way traffic volume with a total of 1,648 vehicles recorded throughout the day.
- The site which recorded the greatest proportion of heavy vehicles was Site 2 (Williamstown Road) in the westbound direction. This site recorded 66% heavy vehicles, where a greater volume of articulated trucks were recorded than cars. This site also recorded the second lowest one-way volume with a total of 1,751 vehicles recorded.
- Sites 3 (Todd Road), 4 (Westgate Freeway Link Road), 5 (Cook Street Off Ramp) and 6 (Cook Street On Ramp) all recorded heavy vehicle percentage between 10% and 20%. All other sites recorded heavy vehicle percentage less than 10%.

Figure 3 Overall Traffic Volumes



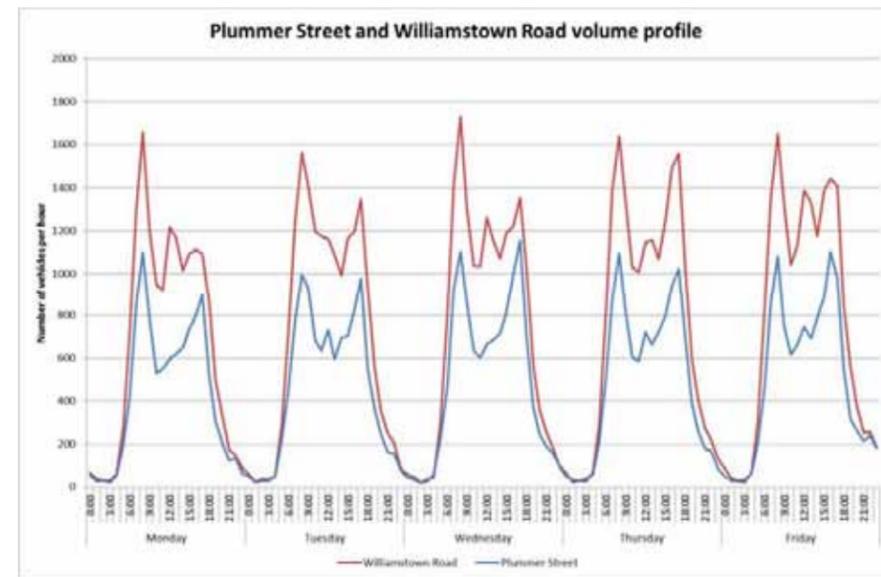
4.2 Automatic Tube Counter (ATC) Assessment -Sites 19 and 20

A classified traffic volume and speed survey (ATC) was undertaken in Plummer Street (east of Salmon Street) and Williamstown Road (east of Page Avenue) for the week commencing Monday 25th February 2013. The purpose of this count was to determine whether the survey day represented typical traffic condition.

The daily volume profile for Plummer Street and Williamstown Road is presented in Figure 4. As presented in this figure, the daily volume profiles for each site are relatively consistent across the week. Consequently it is considered that analysing precinct wide traffic data for one day during this week can be considered to be representative of a typical day.

It is interesting to note that traffic volumes on a Monday and Friday are consistent with the mid-week volumes. Across Melbourne it would be expected that volumes on Mondays and Fridays would be different due to the effect of the weekend, however this typical trend is not seen at these two sites.

Figure 4 Plummer Street and Williamstown Road Volume Profile



Plummer Street

Plummer Street, east of Salmon Street, has two lanes of traffic in either direction and a speed limit of 60 km/h. A summary of key volumes is presented in Table 2.

Table 2 Plummer Street Traffic Volume Summary

		Combined	Eastbound	Westbound
Daily Traffic Volumes (veh/day)	Weekday Average	11,273	5,085	6,188
	7 Day Average	9,312	4,090	5,222
Actual Peak Hour Volumes (veh/day)	8:00am-9:00am	1,075	489	586
	5:00pm-6:00pm	1,006	623	384
Speed (km/h)	Average	55.3	56.8	54.2
	85 th Percentile	61	62	59.9
Classification	% Heavy Vehicles	14.7%	13.5%	15.3%

Williamstown Road

Williamstown Road, east of Page Street, has two traffic lanes in either direction and a speed limit of 60km/h. A summary of key volumes is presented in Table 3.

Table 3 Williamstown Road Traffic Volume Summary

		Combined	Eastbound	Westbound
Daily Traffic Volumes (veh/day)	Weekday Average	17,457	10,282	7,175
	7 Day Average	15,215	9,031	6,184
Actual Peak Hour Volumes (veh/day)	8:00am-9:00am	1,647	845	802
	5:00pm-6:00pm	1,353	889	464
Speed (km/h)	Average	58.2	29.3	56.6
	85 th Percentile	63.6	64.5	61.8
Classification	% Heavy Vehicles	11%	12.4%	8.8%

Heavy Vehicle Alternate Route

We understand that Plummer Street has been identified as a heavy vehicle alternate route parallel to Williamstown Road. We have undertaken surveys to understand if this is operating as a heavy vehicle alternate route.

Williamstown Road has a high volume of traffic travelling along the road throughout the day and adjacent land uses are predominantly residential. A reduction of heavy vehicles utilising the road is expected to improve capacity and amenity.

Table 4 presents the volume and percentage of heavy vehicles travelling along Plummer Street and Williamstown Road for an average weekday, based on the ATC data recorded. Figure 5 presents the volume profile for heavy and light vehicles along Plummer Street and Williamstown Road for an average weekday.

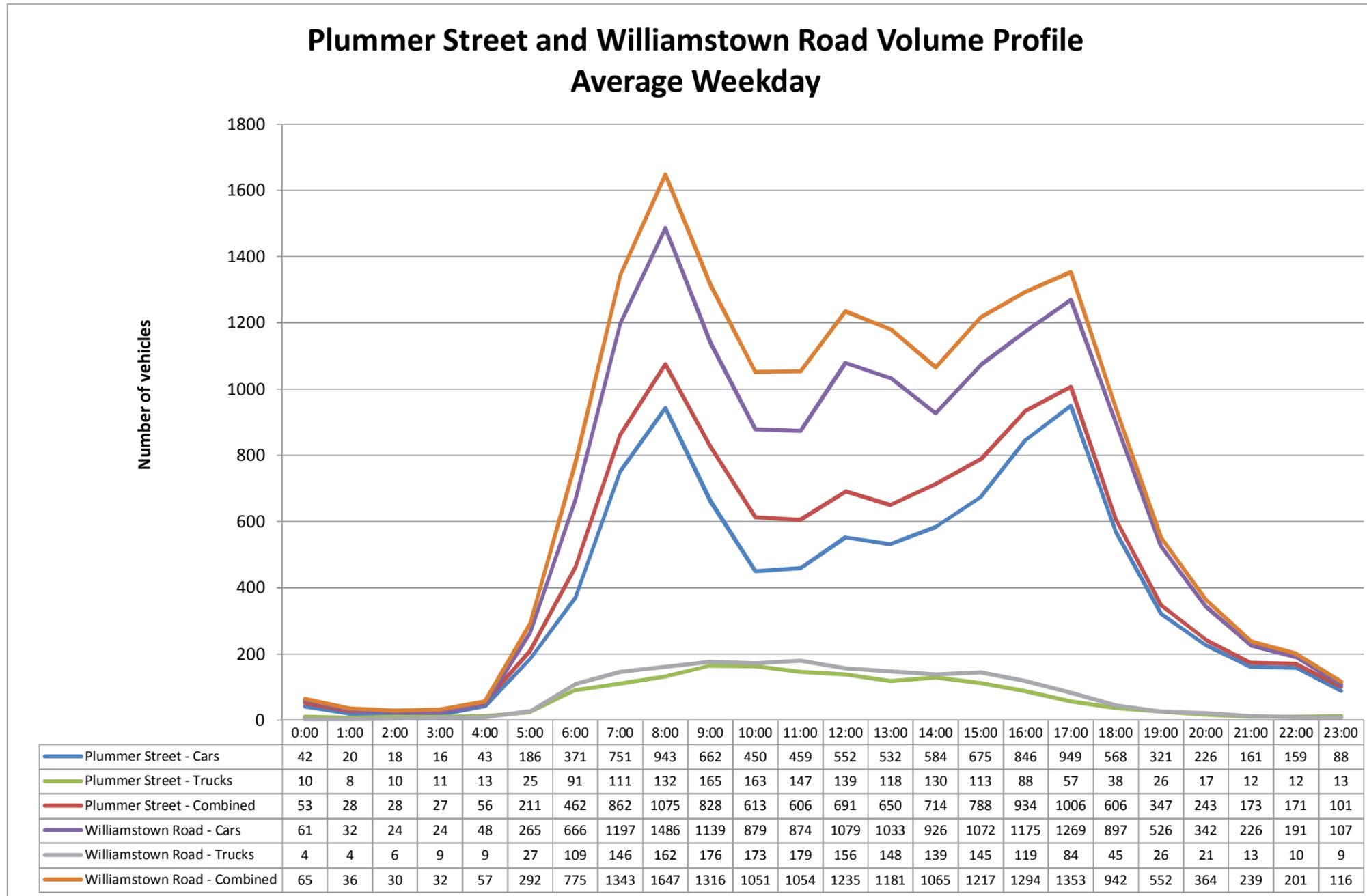
Table 4 Heavy Vehicle Comparison for an Average Weekday

	Number of Heavy Vehicles	Total Traffic Volume	% Heavy Vehicles
Plummer Street - Combined	1,680	11,273	14.2%
Plummer Street - Eastbound	683	5,085	13.4%
Plummer Street - Westbound	966	6,188	15.6%
Williamstown Road - Combined	1,917	17,457	11%
Williamstown Road – Eastbound	1,281	10,282	12.5%
Williamstown Road - Westbound	637	7,175	8.9%

As shown in Table 4 and Figure 5, Williamstown Road carries a significantly greater volume of car traffic than Plummer Street and hence the percentage of heavy vehicles is reduced. This is expected since Williamstown Road is a higher order arterial road and Plummer Street is a collector road within an industrial area. Overall truck volumes on each road is similar throughout the day.

The data suggests that Plummer Street provides a role as an alternative truck route and is assisting to reduce the number of east-west truck movements along Williamstown Road.

Figure 5 Plummer Street and Williamstown Road Volume Profile



4.3 Inner Cordon Sites

The following section presents the data and a discussion for the priority sites within the inner cordon. The figures referred to in this section are located in Appendix A of the separate Fishermans Bend Appendix Report. The traffic data for all other sites within the inner cordon has been summarised and tabulated in Section 4.3.5.

4.3.1 Site 2 – Williamstown Road, west of Todd Road

Site 2 is located on Williamstown Road west of Todd Road and forms part of the inner cordon of the survey.

Traffic data for Site 2 was collected on a combination of Wednesday 27th February and Wednesday 13th March for the 12 hour period between 7am and 7pm. The eastbound direction surveys were required to be repeated due to camera failure. The traffic volume profiles for the eastbound and westbound directions are presented in Figure 1 and Figure 2 with the key findings including:

- A total of 3,611 vehicles (54% heavy vehicles) were recorded on Williamstown Road, west of Todd Road. 1,860 vehicles were recorded to travel in the eastbound direction and 1,751 vehicles were recorded to travel in the westbound direction.
- In the eastbound direction, a total of 141 rigid trucks and 824 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 12 noon and 1pm where 16 rigid trucks and 101 articulated trucks were recorded.
- In the westbound direction, a total of 141 rigid trucks and 824 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 11am and 12 noon where 11 rigid trucks and 114 articulated trucks were recorded.
- The volume profile for the eastbound direction indicates the following:
 - The recorded peak volume was 210 vehicles (52% heavy vehicles) and occurred between 2pm and 3pm.
 - The lowest hourly volume recorded was 54 (26% heavy vehicles) and was between 6pm and 7pm.
 - The proportion of articulated vehicles and cars are similar during the inter-peak. The proportion of articulated vehicles is on average double the volume of cars in the AM peak and on average half the volume of cars in the PM peak.
 - The volume of rigid vehicles is significantly lower than light vehicles and articulated vehicles.
- The volume profile for the westbound direction indicates the following:
 - The recorded peak volume was 224 vehicles (56% heavy vehicles) and occurred between 11am and 12 noon.
 - The lowest hourly volume recorded was 26 vehicles (50% heavy vehicles) and was between 6pm and 7pm.
 - The proportion of articulated vehicles and cars are similar throughout the day.
 - The volume of rigid vehicles is significantly lower than light vehicles and articulated vehicles.

4.3.2 Site 9 – Montague Street, south of Munroe Street

Site 9 is located on Montague Street south of Munroe Street and forms part of the inner cordon of the survey.

Traffic data for Site 9 was collected on Wednesday 27th February for the 12 hour period between 7am and 7pm. The traffic volume profiles for the northbound and southbound directions are presented in figure 3 and Figure 4 with the key findings including:

- A total of 39,533 vehicles (4% heavy vehicles) were recorded on Montague Street, south of Munroe Street. 19,088 vehicles were recorded to travel in the northbound direction and 20,445 vehicles were recorded to travel in the southbound direction.
- The proportion of heavy vehicles varies throughout the day however is generally no more than 10% heavy vehicles.
- In the northbound direction, a total of 515 rigid trucks and 191 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 10am and 11am where 79 rigid trucks and 14 articulated trucks were recorded.
- In the southbound direction, a total of 569 rigid trucks and 122 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 10am and 11am where 85 rigid trucks and 14 articulated trucks were recorded.
- The volume profile for the northbound direction indicates the following:
 - The volumes are slightly skewed to the PM peak.
 - The PM peak hour was between 5pm and 6pm and recorded 2,131 vehicles (1% heavy vehicles).
 - The AM peak hour was between 8am and 9am and recorded 1,621 vehicles (5% heavy vehicles).
 - Traffic volumes recorded for the inter-peak varied with the lowest recorded hourly volume being 1,164 which occurred between 10am and 11am.
- The volume profile for the southbound direction indicates the following:
 - The peak volumes occur during the AM and PM peak periods.
 - The AM peak hour was between 8am and 9am and recorded 2,303 vehicles (3% heavy vehicles).
 - The PM peak hour was between 6pm and 7pm and recorded 2,146 vehicles (4% heavy vehicles).
 - Traffic volumes recorded for the inter-peak were relatively consistent and ranged between 1,250 and 1,500 vehicles per hour.

Montague Street Interchange SCATS Volumes

SCATS volumes for the intersection of Montague Street and Westgate Freeway have been obtained for Wednesday 27th February 2013 to understand the traffic movements north of Site 9 (on the departure side of the site). The Montague Street - Westgate Freeway intersection is complex with numerous movements in multiple directions. For the purposes of this assessment the intersection has been simplified and only the northbound approach assessed.

Figure 6 depicts a simplified sketch of the intersection with the AM and PM peak volumes for each movement. The movements within the figure represent:

- Left turn: entry onto Westgate Freeway, westbound. This includes the entry onto the Bolte Bridge.
- Through: through movements along Montague Street, citybound.
- Right turn: entry onto Westgate Freeway, eastbound.

Figure 6 Montague Street – Westgate Freeway Intersection Northbound Approach SCATS Data

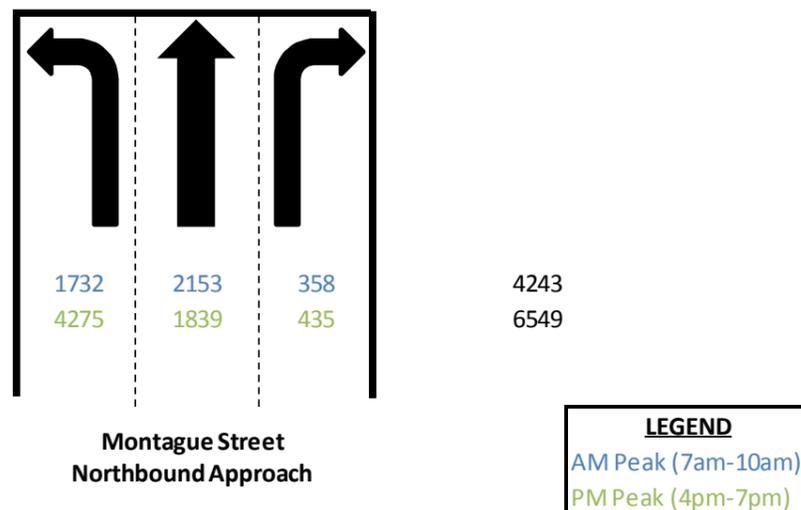


Figure 6 indicates that there were a total of 4,243 vehicles travelling through the Montague Street-Westgate Freeway intersection in the AM peak and 6,549 vehicles in the PM Peak.

During the AM peak, the majority of vehicles travel through the intersection and continue along Montague Street (towards the city) however a number of vehicles also turn left onto the Westgate Freeway. In the PM peak, the majority of vehicles turn left onto the Westgate Freeway. This volume is over double the volume travelling through the site along Montague Street.

During both the AM and PM peaks the right turn demand onto the Westgate Freeway is minimal in comparison to the other movements.

4.3.3 Site 11 – City Road, west of Clarendon Street

Site 11 is located along City Road west of Clarendon Street and forms part of the inner cordon of the survey.

Traffic data for Site 11 was collected on Wednesday 27th February for the 12 hour period between 7am and 7pm. The traffic volume profiles for the eastbound and westbound directions are presented in Figure 5 and Figure 6 with the key findings including:

- A total of 19,955 vehicles (3% heavy vehicles) were recorded on City Road, west of Clarendon Street. 10,152 vehicles were recorded to travel in the eastbound direction and 9,803 vehicles were recorded to travel in the westbound direction.
- The proportion of heavy vehicles varies throughout the day however is generally no more than 6% heavy vehicles.
- In the eastbound direction, a total of 192 rigid trucks and 3 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 10am and 11am where 33 rigid trucks and no articulated trucks were recorded.
- In the westbound direction, a total of 214 rigid trucks and 10 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 7am and 8am where 31 rigid trucks and 2 articulated trucks were recorded. The data indicates that majority of the truck movements occur between 7am and 4pm with 15 rigid trucks and 1 articulated truck recorded between 4pm and 7pm.
- The volume profile for the eastbound direction indicates the following:
 - There are clear AM and PM peak periods.
 - The AM peak hour was between 8am and 9am and recorded 1,212 vehicles (2% heavy vehicles).
 - The PM peak hour was between 5pm and 6pm and recorded 979 vehicles (1% heavy vehicles).
 - Traffic volumes recorded for the inter-peak were relatively consistent and ranged between 700 and 800 vehicles per hour.
- The volume profile for the westbound direction indicates the following:
 - The traffic volumes travelling through the site slightly increased throughout the survey period with volumes ranging from close to 700 to just over 1,000 vehicles per hour.
 - The peak hour recorded was between 6pm and 7pm where 1,044 vehicles (3% heavy vehicles) were recorded. It is acknowledged that the peak hour has occurred within the last hour of the survey and the peak hour of the day may occur beyond the survey period. However given the data available we have assumed the peak hour is between 6pm and 7pm

4.3.4 Site 14 – Montague Street, north of City Road

Site 14 is located along Montague Street north of City Road and forms part of the inner cordon of the survey.

Traffic data for Site 14 was collected on Wednesday 27th February for the 12 hour period between 7am and 7pm. The traffic volume profiles for the eastbound and westbound directions are presented in Figure 7 and Figure 8 with the key findings including:

- A total of 19,534 vehicles (3% heavy vehicles) were recorded on Montague Street, north of City Road. 9,363 vehicles were recorded to travel in the eastbound direction and 10,171 vehicles were recorded to travel in the westbound direction.
- The proportion of heavy vehicles varies throughout the day however is generally no more than 10% heavy vehicles.
- In the eastbound direction, a total of 214 rigid trucks and 10 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 10am and 11am where 36 rigid trucks and 1 articulated truck were recorded. The data indicates that majority of the truck movements occur between 7am and 4pm with only 18 rigid trucks recorded between 4pm and 7pm.
- In the westbound direction, a total of 224 rigid trucks and 11 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 10am and 11am where 33 rigid trucks and 2 articulated trucks were recorded. The data indicates that majority of the truck movements occur between 7am and 4pm with 20 rigid trucks recorded between 4pm and 7pm.
- The volume profile for the eastbound direction indicates the following:
 - The volumes are slightly skewed to the AM peak.
 - The peak hour was between 8am and 9am and recorded 1,136 vehicles (2% heavy vehicles).
 - Traffic volumes recorded for the inter-peak and PM peak were relatively consistent and ranged between 600 and 800 vehicles per hour.
- The volume profile for the westbound direction indicates the following:
 - The traffic volumes travelling through the site increased throughout the survey period with the peak hour recorded being between 6pm and 7pm where 1,158 vehicles (1% heavy vehicles) were recorded.
 - The peak hour volume (between 6pm and 7pm) recorded was approximately double the minimum hourly volume recorded (between 7am and 8am). It is acknowledged that the peak hour has occurred within the last hour of the survey and the peak hour of the day may occur beyond the survey period. However given the data available we have assumed the peak hour is between 6pm and 7pm

4.3.5 Other Sites

Table 5 lists a summary of the data collected at the non-priority inner cordon sites.

Table 5 Non Priority Inner Cordon Sites Volume Summary

Site	Combined Vehicles (%Heavy vehicles)	Eastbound/Northbound Direction Vehicles (%Heavy vehicles)	Westbound/Southbound Direction Vehicles (%Heavy vehicles)
Site 1	6,842 (3%)	3,598 (3%)	3,244 (3%)
Site 3	8,596 (11%)	3,983 (11%)	4,613 (11%)
Site 4	10,906 (17%)	7,532 (15%)	3,374 (20%)
Site 5	N/A	12,798 (13%)	N/A
Site 6	N/A	6,740 (15%)	N/A
Site 7	8,860 (8%)	4,209 (9%)	4,651 (8%)
Site 8	9,717 (5%)	3,979 (5%)	5,738 (%)
Site 10	12,673 (6%)	7,779 (6%)	4,894 (6%)
Site 12	4,378 (4%)	1,648 (5%)	2,730 (3%)
Site 13	7,032 (2%)	4,117 (2%)	2,915 (2%)
Site 15	17,000 (6%)	8,337 (6%)	8,663 (6%)
Site 16	5,471 (2%)	2,668 (3%)	2,803 (2%)
Site 17	12,837 (7%)	7,236 (7%)	5,601 (7%)
Site 18	15,259 (9%)	7,477 (10%)	7,782 (9%)

4.4 Outer Cordon

The following section presents the data and a discussion for the outer cordon sites. The figures referred to in this section are located in Appendix B of the separate Fishermans Bend Appendix Report.

4.4.1 Site 21 – Beaconsfield Parade, east of Pickles Street

Site 21 is located along Beaconsfield Parade east of Pickles Street and forms part of the outer cordon of the survey.

Traffic data for Site 21 was collected on Wednesday 27th February for the 12 hour period between 7am and 7pm. The traffic volume profiles for the eastbound and westbound directions are presented in Figure 9 and Figure 10 with the key findings including:

- A total of 28,435 vehicles (5% heavy vehicles) were recorded on Beaconsfield Parade, east of Pickles Street. 14,129 vehicles were recorded to travel in the eastbound direction and 14,306 vehicles were recorded to travel in the westbound direction.

- The proportion of heavy vehicles varies throughout the day however is generally no more than 10% heavy vehicles.
- For the eastbound direction, a total of 543 rigid trucks and 113 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 10am and 11am where 78 rigid trucks and 11 articulated trucks were recorded. The data indicates that majority of the truck movements occur between 7am and 12 noon.
- For the westbound direction, a total of 594 rigid trucks and 137 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 9am and 10am where 65 rigid trucks and 21 articulated trucks were recorded.
- The volume profile for the eastbound direction indicates the following:
 - The overall volumes are significantly skewed to the PM peak, although it is noted that truck volumes are highest in the AM peak. Based on this the Origin Destination (OD) matrices for the site (Included in Section 5 of this report) will only be analysed for the PM peak.
 - The peak hourly volume recorded for the site was 1,789 (2% heavy vehicles) which occurred between 4pm and 5pm.
 - The AM peak recorded similar hourly volumes to the inter-peak hourly volumes and ranged between 800 and 1,050 vehicle per hour.
 - The hourly volumes increase significantly from 3pm with the recorded peak volume recorded between 4pm and 5pm.
- The volume profile for the westbound direction indicates the following:
 - The overall volumes are significantly skewed to the AM peak. The peak hour recorded a volume of 2,445 vehicles per hour (2% heavy vehicles) and occurred between 8am and 9am. The hourly volume recorded between 8am and 9am is approximately double the recorded hourly volumes for any hour in the inter-peak and PM peak. This suggests the traffic flow is primarily vehicles accessing the CBD in the morning. Therefore only the AM peak will be analysed as part of the OD matrices analysis in Section 5 of this report.
 - The recorded hourly volumes dropped dramatically from 10am.
 - The recorded hourly volumes for the site indicate a slight peak during the PM peak however the volumes are relatively steady with the inter-peak in comparison to the AM peak. The PM peak hourly volume was recorded to be 1,046 vehicles (3% heavy vehicles) and occurred between 5pm and 6pm.

4.4.2 Site 22 – Canterbury Road, south of Kerferd Road

Site 22 is located along Canterbury Road south of Kerferd Road and forms part of the outer cordon of the survey.

Traffic data for Site 22 was collected on Wednesday 27th February for the 12 hour period between 7am and 7pm. The traffic volume profiles for the northbound and southbound directions are presented in Figure 11 and Figure 12 with the key findings including:

- A total of 19,030 vehicles (2% heavy vehicles) were recorded on Canterbury Road, south of Kerferd Road. 9,782 vehicles were recorded to travel in the northbound direction and 9,248 vehicles were recorded to travel in the southbound direction.
- The proportion of heavy vehicles varies throughout the day however generally is no more than 5% heavy vehicles.

- For the northbound direction, a total of 171 rigid trucks and 6 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 11am and 12 noon where 22 rigid trucks and no articulated trucks were recorded. The data indicates that majority of the truck movements occur between 7am and 4pm with only 8 truck movements recorded between 4pm and 7pm.
- For the southbound direction, a total of 158 rigid trucks and 6 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 12 noon and 1pm where 22 rigid trucks and no articulated trucks were recorded. The data indicates that majority of the truck movements occur between 7am and 4pm with only 16 truck movements recorded between 4pm and 7pm.
- The volume profile for the northbound direction indicates the following:
 - The volumes are significantly skewed to the AM peak. The peak hourly volume was between 8am and 9am where a total of 1,420 vehicles were recorded (1% heavy vehicles). The hourly volumes recorded during the AM peak are approximately double the hourly volumes for the rest of the survey period. Based on this the OD matrices for the site will only be analysed for the AM peak.
 - The hourly volumes recorded during the inter-peak and the PM peak is between 600 and 800 vehicles per hour.
- The volume profile for the southbound direction indicates the following:
 - The volumes are skewed to the PM peak. The hourly volumes recorded during the PM peak are close to double the recorded hourly volumes for any other hour surveyed. Based on this the OD matrices for the site will only be analysed for the PM peak.
 - The recorded volumes indicate there is a slow increase of traffic volumes between 7am and 2pm. After 2pm traffic volumes increase significantly and the peak volume recorded was 1,152 vehicles (0.3% heavy vehicles) which occurred between 6pm and 7pm.

4.4.3 Site 23 – Albert Road, west of Clarendon Street

Site 23 is located along Albert Road west of Clarendon Street and forms part of the outer cordon of the survey.

Traffic data for Site 23 was collected on Wednesday 27th February for the 12 hour period between 7am and 7pm. The traffic volume profiles for the eastbound and westbound directions are presented in Figure 13 and Figure 14 with the key findings including:

- A total of 19,030 vehicles (1% heavy vehicles) were recorded on Albert Road, west of Clarendon Street. 14,129 vehicles were recorded to travel in the eastbound direction and 14,306 vehicles were recorded to travel in the westbound direction.
- The proportion of heavy vehicles varies throughout the day however generally is no more than 5% heavy vehicles.
- For the eastbound direction, a total of 91 rigid trucks and 1 articulated truck were recorded during the survey period. The peak hour recorded for truck movements was between 11am and 12 noon where 16 rigid trucks were recorded. No truck movements were recorded between 5pm and 7pm.
- For the westbound direction, a total of 103 rigid trucks and 7 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 9am and 10am where 19 rigid trucks were recorded. No truck movements were

recorded between 5pm and 6pm and only 1 truck movement was recorded between 6pm and 7pm.

- The volume profile for the eastbound direction indicates the following:
 - There are two distinct peaks during the AM and PM peak periods.
 - The AM peak period recorded an hourly volume of 819 vehicles (1% heavy vehicles) between 8am and 9am.
 - The PM peak period recorded an hourly volume of 845 vehicles (0.1% heavy vehicles) between 5pm and 6pm.
 - The hourly traffic volumes for the inter-peak survey period generally ranged between 480 and 650 vehicles per hour.
 - The minimum hourly volume recorded was 495 between 10am and 11am.
- The volume profile for the westbound direction indicates the following:
 - There is a peak during both the AM and PM peak periods.
 - The AM peak period recorded an hourly volume of 863 vehicles (2% heavy vehicles) between 8am and 9am.
 - The PM peak period recorded an hourly volume of 886 vehicles (1% heavy vehicles) between 6pm and 7pm.
 - The hourly traffic volumes for the inter-peak survey period generally ranged between 500 and 700 vehicles per hour.
 - The minimum hourly volume recorded was 533 which occurred between 10am and 11am.

4.4.4 Site 24 – Park Street, west of Clarendon Street

Site 24 is located along Park Street west of Clarendon Street and forms part of the outer cordon of the survey.

Traffic data for Site 24 was collected on Wednesday 27th February for the 12 hour period between 7am and 7pm. The traffic volume profiles for the eastbound and westbound directions are presented in Figure 15 and Figure 16 with the key findings including:

- A total of 10,141 vehicles (3% heavy vehicles) were recorded on Park Street, west of Clarendon Street. 5,716 vehicles were recorded to travel in the eastbound direction and 4,425 vehicles were recorded to travel in the westbound direction.
- The proportion of heavy vehicles varies throughout the day however generally is no more than 10% heavy vehicles.
- For the eastbound direction, a total of 83 rigid trucks and 2 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 10am and 11am where 18 rigid trucks and no articulated trucks were recorded.
- For the westbound direction, a total of 83 rigid trucks and 8 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 10am and 11am where 15 rigid trucks and no articulated trucks were recorded.
- The volume profile for the eastbound direction indicates the following:
 - The volumes indicate a peak during the AM and PM peak periods.
 - The AM peak period recorded an hourly volume of 605 vehicles (2% heavy vehicles) between 8am and 9am.
 - The PM peak period recorded an hourly volume of 564 vehicles (2% heavy vehicles) between 5pm and 6pm.

- The hourly traffic volumes for the inter-peak survey period generally ranged between 380 and 500 vehicles per hour.

- The volume profile for the westbound direction indicates the following:
 - The recorded peak volume was 431 vehicles (3% heavy vehicles) and occurred between 12 noon and 1pm.
 - The volume throughout the survey period was relatively consistent with all hourly volumes expect for 7am - 8am recorded to be between 300 and 450 vehicles.

4.4.5 Site 25 – Dorcas Street, west of Clarendon Street

Site 25 is located along Dorcas Street west of Clarendon Street and forms part of the outer cordon of the survey.

Traffic data for Site 25 was collected on Wednesday 27th February for the 12 hour period between 7am and 7pm. The traffic volume profiles for the eastbound and westbound directions are presented in Figure 17 and Figure 18 with the key findings including:

- A total of 10,141 vehicles (3% heavy vehicles) were recorded on Dorcas Street, west of Clarendon Street. 2,972 vehicles were recorded to travel in the eastbound direction and 2,429 vehicles were recorded to travel in the westbound direction.
- The proportion of heavy vehicles varies throughout the day however generally is no more than 10% heavy vehicles.
- For the eastbound direction, a total of 81 rigid trucks and 1 articulated truck were recorded during the survey period. The peak hour recorded for truck movements was between 12 noon and 1pm where 19 rigid trucks and no articulated trucks were recorded.
- For the westbound direction, a total of 69 rigid trucks and 3 articulated trucks were recorded during the survey period. The peak hour recorded for truck movements was between 12 noon and 1pm and between 1pm and 2pm where 13 rigid trucks and no articulated trucks were recorded. Only two trucks were recorded to travel through the site in the southbound direction between 4pm and 7pm.
- The volume profile for the eastbound direction indicates the following:
 - The volumes indicate a peak during the AM and PM peak periods.
 - The AM peak period recorded an hourly volume of 404 vehicles (1% heavy vehicles) between 8am and 9am.
 - The PM peak period recorded an hourly volume of 325 vehicles (1% heavy vehicles) between 5pm and 6pm.
 - The hourly traffic volumes for the inter-peak survey period generally ranged between 180 and 230, except there was a peak for the hour between 12 noon and 1pm where the volume recorded was 261 vehicles.
- The volume profile for the westbound direction indicates the following:
 - The recorded peak volume was 294 vehicles (4% heavy vehicles) and occurred between 12 noon and 1pm.
 - The lowest hourly volume recorded was 132 (5% heavy vehicles) and was between 7am and 8am.
 - The volume throughout the survey period was relatively consistent with all hourly volumes, expect for the maximum and minimum hours, recorded to be between 180 and 230 vehicles.

4.5 Cyclist Volumes

Cyclist volumes were recorded for each site and for each direction of travel. Origins and destination surveys were not completed for cyclists as there is no way to consistently identify and match cyclists between survey points.

These cyclist volumes have been summarised in Figure 7 and key findings include:

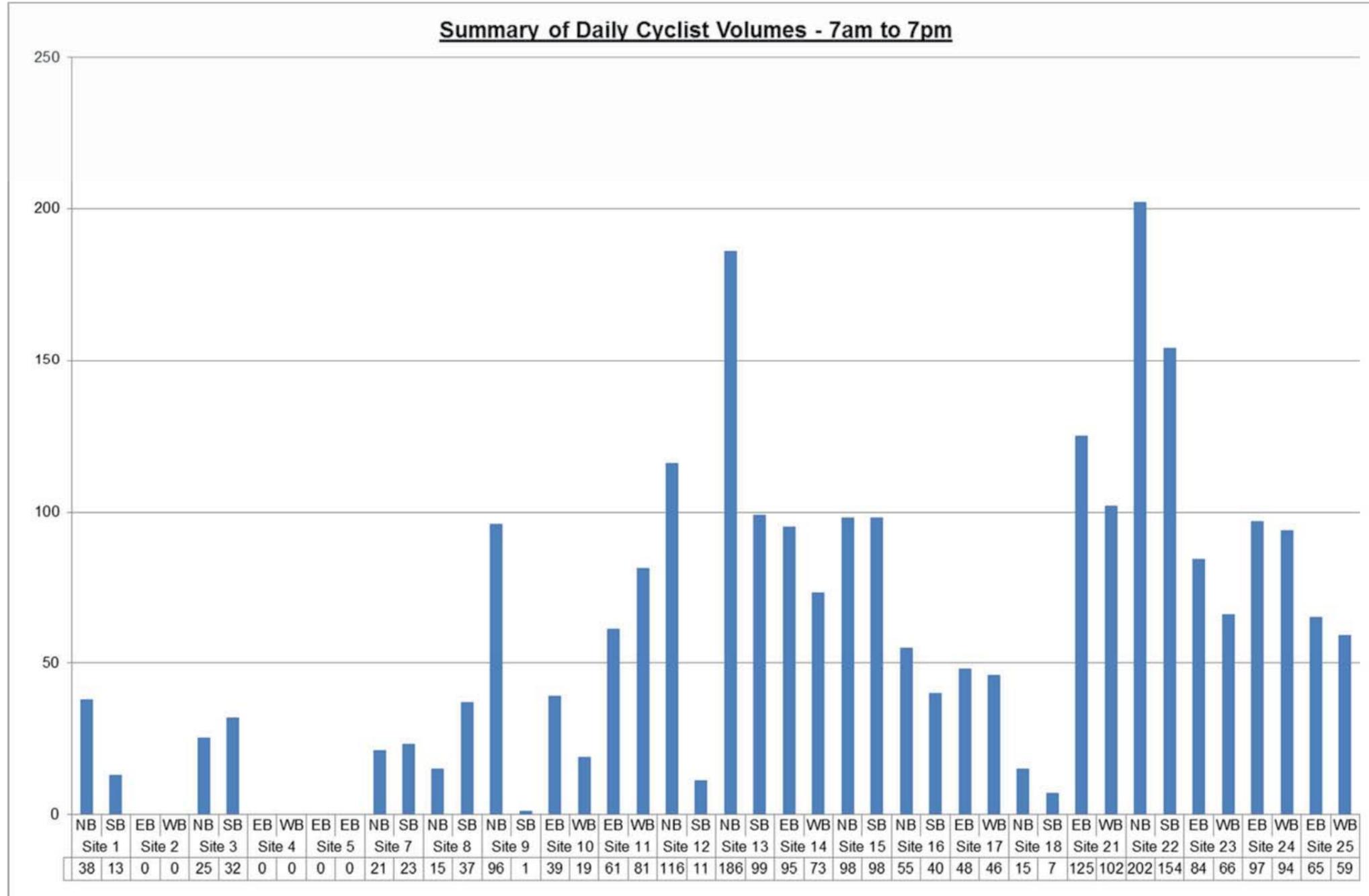
- The top three sites which recorded the greatest volumes include:
 - Site 22 (Canterbury Road) Northbound – 202 cyclists
 - Site 13 (Ferrars Street) Northbound – 186 cyclists
 - Site 22 (Canterbury Road) Southbound – 154 cyclists
- Majority of cyclists travelling through Site 22 (along Canterbury Road) in the northbound direction were recorded during the AM peak. While the majority of cyclists travelling in the southbound direction for this site were recorded during the PM peak. These volumes suggest this route is a key cyclist commuter route.
- No cyclists were recorded for Sites 2, 4 and 5 which were located on Williamstown Road, Westgate Freeway Link Road and Cook Street Off Ramp respectively.
- There were less than 100 cyclists recorded to be travelling through Site 17 along Williamstown Road during the survey period. The cyclist volumes recorded were relatively evenly split between both directions and across the duration of the survey period.
- Across all survey sites the 8am-9am hourly volume recorded was 481. This is significantly greater than all other hourly periods, with the second highest hour being between 5pm and 6pm where 294 cyclists were recorded.

4.6 Summary

Traffic volume data was collected in late February and early March 2013 within the Fishermans Bend precinct. The data has been analysed at each of the sites and the key findings include:

- The majority of traffic travelling through the precinct are cars. The data indicates 94% of vehicles recorded were cars.
- Site 9 (Montague Street) recorded the highest volume of vehicles in both directions.
- Site 12 (Cecil Street) in the northbound direction recorded the lowest one-way traffic volume.
- The site which recorded the greatest proportion of heavy vehicles was Site 2 (Williamstown Road) in the westbound direction.
- Williamstown Road carries a significantly greater volume of car traffic than Plummer Street.
- Plummer Street has a higher percentage of heavy vehicles but a lower volume of heavy vehicles compared to Williamstown Road.
- The data suggests that Plummer Street provides a role as an alternative truck route and is assisting to reduce the number of east-west truck movements along Williamstown Road.

Figure 7 Summary of Daily Cyclists Volumes



5. Origin Destination Analysis

5.1 Outer Cordon Traffic Movements

The outer cordon OD sites have been placed to assess the ways that vehicles travel to and from the Fishermans Bend precinct. The previous traffic volume assessment showed that vehicle flow are very tidal and as such, inbound volumes have been assessed for the AM peak and output volumes have been assessed for the PM peak.

Detailed analysis of each of the outer cordon survey locations is provided in Appendix C of the separate Fishermans Bend Appendix Report, with the summary of key movements as follows:

5.1.1 Inbound Traffic Movements

The analysis of inbound traffic movements focussed on the AM Peak period, between 7am and 10am. The following key results emerged from the analysis:

- At Site 21 northbound on Beaconsfield Parade 6,190 vehicles were observed in the AM peak period. The most common destinations were Site 18 northbound Graham Street (31%), local destinations (22%), Site 15 northbound Ingles Street (20%) and Site 1 northbound Todd Road (16%);
- At Site 22 northbound on Canterbury Road 3,686 vehicles were observed in the AM peak period. The most common destinations were local trips (67%) and Site 13 northbound Ferrars Street (20%);
- At Site 23 westbound on Albert Road 2,032 vehicles were observed in the AM peak period. Most vehicles (62%) were local trips. The most common inner cordon location was Site 15 northbound Ingles Street (14%);
- At Site 24 westbound on Park Street 999 vehicles were observed, of which 66% were destined for the local area. The most popular inner cordon location was Site 15 northbound Ingles Street (13%); and
- At Site 25 westbound located on Dorcas Street 543 vehicles were observed in the AM peak period. Most vehicles (66%) were destined for the local area with 20% observed at Site 15 northbound on Ingles Street.

An overview of the daily inbound destinations from Site 21, which carries the highest amount of traffic across the day of the outer cordon sites, is shown in figures 8 and 9. These figures also show the key destinations where the vehicles travelled after passing through Site 18 and Site 1 at the inner cordon. This assists in providing an indication of the origin and destinations of vehicles travelling through the Fishermans Bend Precinct.

Figure 8 shows that vehicles travelling from Beaconsfield Parade through Graham Street have a key destination along Salmon Street, north of the West Gate Freeway. However, only a small proportion of the articulated trucks recorded at Site 18 travel along Salmon Street. The highest proportion of trucks was recorded accessing the West Gate Freeway to travel west. While Figure 9 shows that vehicles travelling north via Todd Road are attempting to access the West Gate Freeway to travel west. No articulated trucks travelled along this route.

Figure 8 Daily Inbound Trips from Site 21 to Site 18 and Beyond

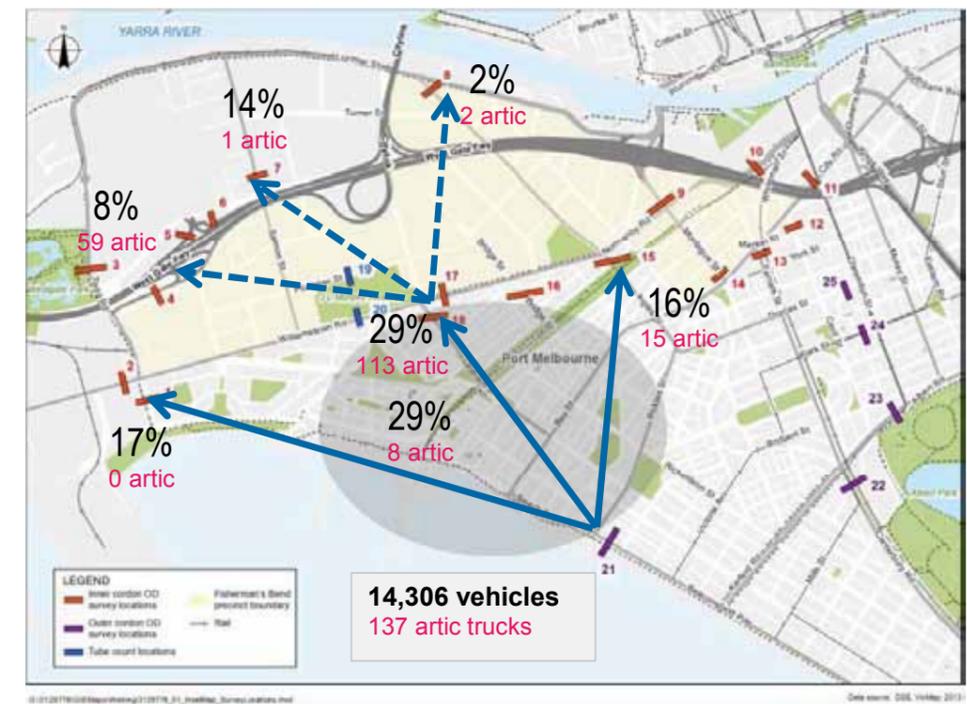
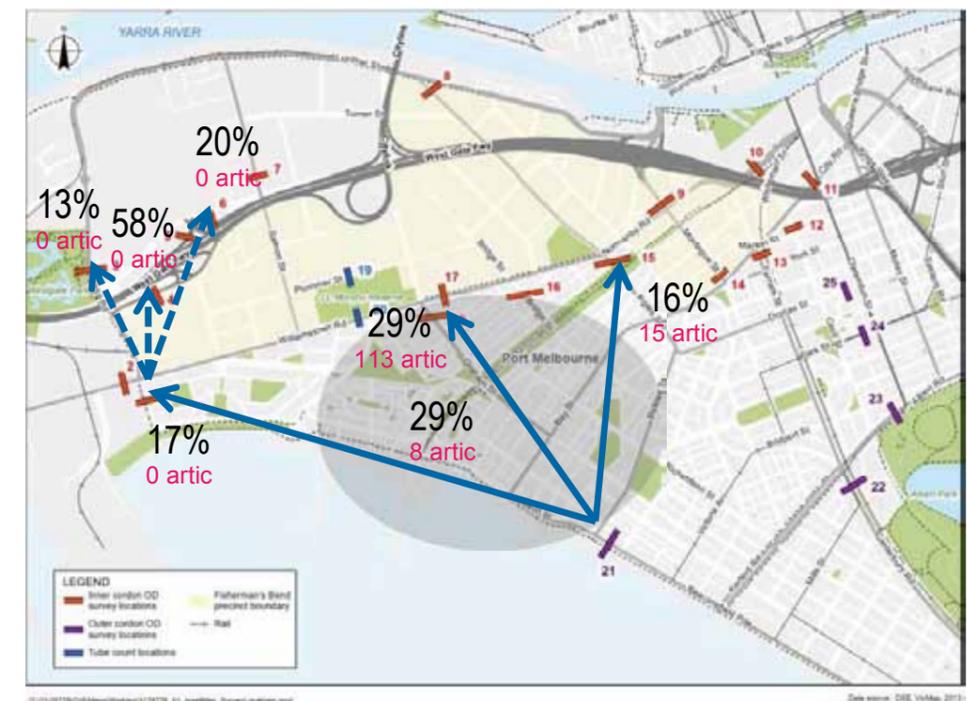


Figure 9 Daily Inbound Trips from Site 21 to Site 1 and Beyond



5.1.2 Outbound Traffic Movements

The analysis of inbound traffic movements focussed on the PM Peak period, between 4pm and 7pm. The following key results emerged from the analysis:

- At Site 1 southbound on Todd Road 1,019 vehicles were observed in the PM Peak. The majority of trips were to either Site 21 eastbound Beaconsfield Parade (68%) or to a local destination (28%);
- At Site 18 southbound on Graham Street 2,953 vehicles were observed in the PM Peak. The majority of trips were to Site 21 eastbound Beaconsfield Parade (52%) and to a local destination (42%);
- At Site 16 southbound on Bridge Street 1,005 vehicles were observed in the PM Peak. The large majority (75%) were local trips. The next most common destinations for vehicles in the outer cordon were Site 23 eastbound and Site 21 eastbound Beaconsfield Parade, where approximately 7% of vehicles were matched respectively;
- At Site 15 southbound on Ingles Street 3,459 vehicles were observed in the PM Peak. Trips were distributed across a wide range of locations. A total of 47% went to a local destination, 23% went to Site 21 eastbound Beaconsfield Parade and 9% went to Site 22 southbound Canterbury Road;
- At Site 14 eastbound on Montague Street 2,130 vehicles were observed during the PM Peak period. The large majority of trips (85%) were local trips. The next most common destinations in the outer cordon were Site 22 southbound Canterbury Road (5%), Site 23 eastbound Albert Road (4%) and Site 24 eastbound Park Street (4%);
- At Site 13 eastbound located on Ferrars Street 1,133 vehicles were observed in the PM Peak period. Most trips were to local destinations (47%). However a substantial proportion (43%) was observed at Site 22 southbound on Canterbury Road; and
- At Site 12 southbound located on Cecil Street 668 vehicles were observed in the PM Peak period, of which 656 were light vehicles. Most vehicles (67%) were local trips. The next most common outer cordon destinations were Site 22 southbound Canterbury Road (11%), Site 23 eastbound Albert Road (8%), and Site 24 eastbound Park Street (8%).

5.2 Inner Cordon Traffic Movements

The inner cordon sites have been placed to assess how vehicles travel within the Fishermans Bend precinct. These sites will also enable the assessment of how many vehicles travel through the site and those that had a local destination.

Detailed analysis of each of the inner cordon survey locations is provided in Appendix D of the separate Fishermans Bend Appendix Report, with the summary of key movements as follows:

- Across the 12 hour period from 7am to 7pm, approximately 90,000 trips pass through the precinct, whereas approximately 23,000 trips are attracted into the area during the same time period. The approximate 90,000 trips can be broken down as follows:
 - 80,121 light vehicles;
 - 4,871 rigid trucks;
 - 3,433 articulated trucks; and
 - 899 busesThe approximate 23,000 trips can be broken down as follows:
 - 21,944 light vehicles;
 - 311 rigid trucks;

- 153 articulated trucks; and
- 41 buses
- Across the same 12 hour period, approximately 16,000 trips were generated by the Fishermans Bend precinct. These trips can be broken down as follows:
 - 15,679 light vehicles;
 - 52 rigid trucks;
 - 426 articulate trucks; and
 - 3 buses.
- The highest volumes of heavy vehicles (both rigid and articulated trucks) were recorded at the Webb Dock location during the AM and inter-peak periods. The data clearly demonstrates that these vehicles are predominately destined for West Gate Freeway and utilise Todd Road to access the freeway;
- Vehicles recorded entering the precinct on Todd Road (southbound) are also predominately destined for West Gate Freeway, with only 28% of trips travelling through the network to alternate destinations;
- 46% of vehicles entering the precinct from West Gate Bridge travel through the precinct to the south, with Graham Street being the most common destination (accounting for 16% of the vehicles exiting West Gate Freeway at Cook St). Of the 2,300 vehicles travelling between West Gate Bridge to Graham Street (between 7am and 7pm), 15% of these vehicles are trucks;
- 44% of vehicles entering the precinct from the south via Graham Street (between 7am and 7pm) were recorded as local trips (3,319 vehicles), 8% of which were heavy vehicles (182 rigid trucks and 79 articulated trucks);
 - Whilst the data collected provides a good representation of trip distributions from Graham Street, it is noted that an OD camera was not placed at Prohasky Street which provides access to the West Gate Freeway via Plummer Street. Site 7 northbound on Salmon Street was also not recording data during the main survey, which is discussed in Section 6.The analysis in Section 6 shows that approximately 700 of these local trip vehicles exited the precinct by travelling northbound along Salmon Street (site 7). 97% of the 700 were light vehicles.
- It is possible that a number of the remaining local trips from Graham Street are accessing the freeway via Prohasky Street. However, it is not possible to accurately determine the number of vehicles that make this movement based on the data that has been obtained for this study.
- 55% of vehicles entering the precinct from the south via Ingles Street travel through the network to either Lorimer Street or Montague Street. Only 5% of these vehicles have a local destination within the Fishermans Bend area;
- Vehicles entering the cordon from the east via Normanby Road typically travel through the network to Montague Street (45%), and 21% had a local destination.

An overview of the daily destinations for vehicles travelling through Site 17 (Williamstown Road) is shown in Figures 10 and 11. These figures show the key origins and destinations of vehicles that were recorded travelling along Williamstown Road during the survey in an eastbound and westbound direction respectively. These figures show that the highest proportion of articulated trucks are travelling in a westbound direction towards Webb Dock.

Figure 10 Williamstown Road Volume Comparison

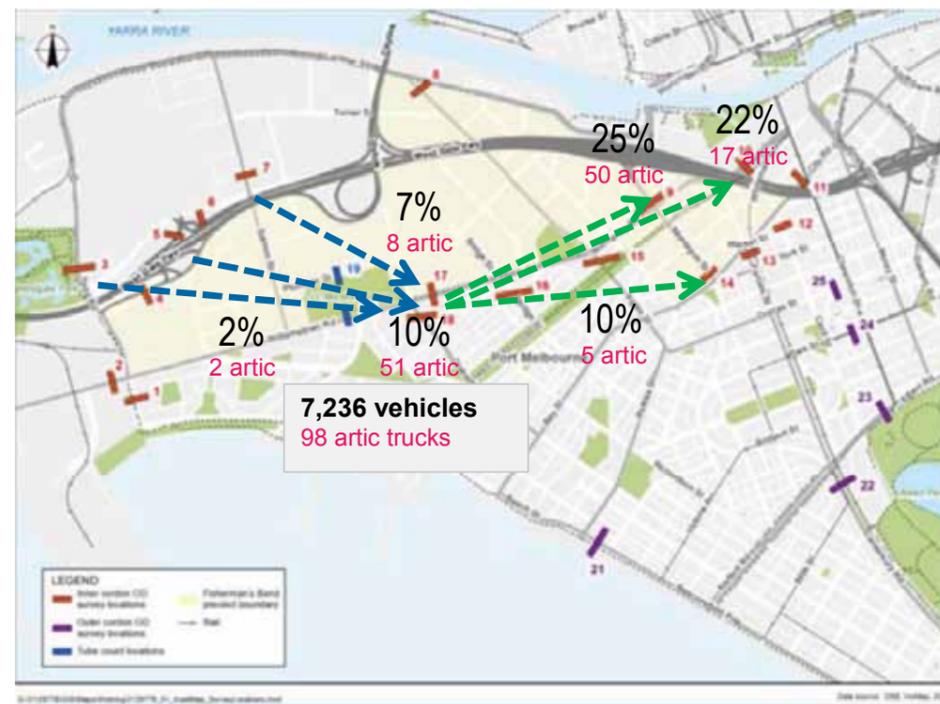
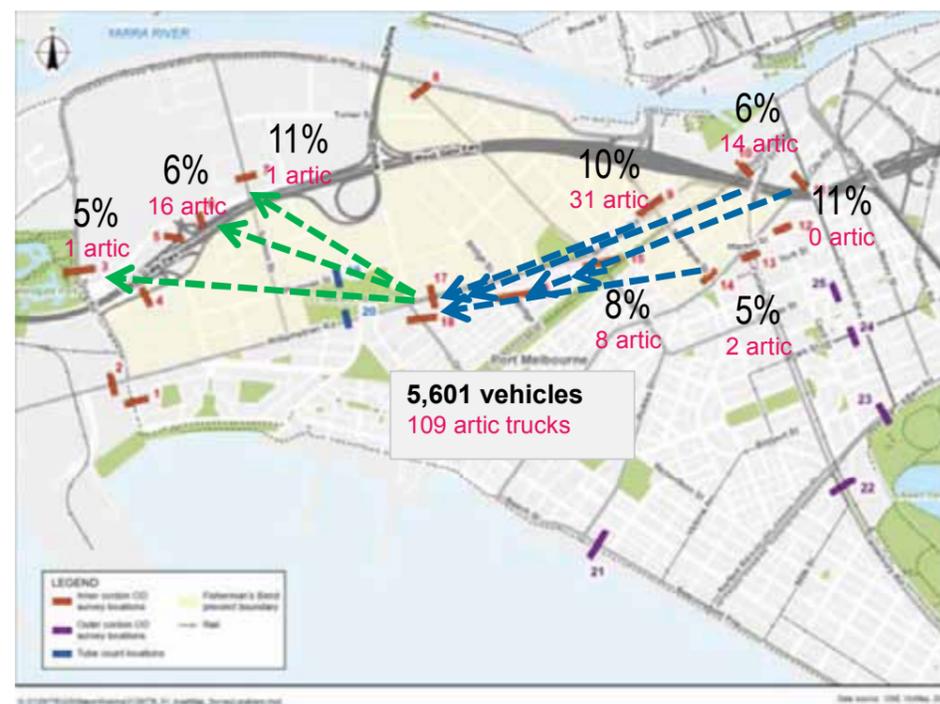


Figure 11 Williamstown Road Volume Comparison



6. Additional Survey Periods

Two additional surveys were required to supplement the data recorded on 27 February 2013 due to two cameras failing during the original survey. The two failed cameras locations were:

- Site 2 eastbound which had a corrupted memory card that could not be accessed for data analysis; and
- Site 7 northbound which was slightly moved after an inspection which resulted in it not being pointed in the correct direction.

The following discusses the implication of the lost camera data and the methodology used to supplement the data through new surveys or using existing data. Graphs presenting the data for Site 2 and Site 7 are located in Appendix E of the separate Fishermans Bend Appendix Report.

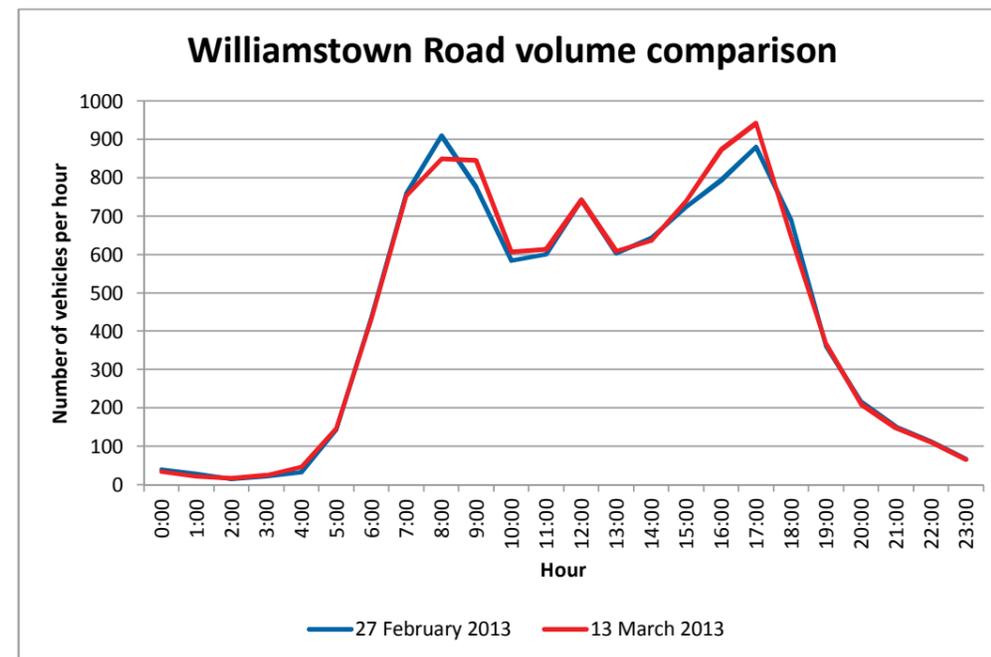
6.1 Site 2 Eastbound – Williamstown Road

Williamstown Road eastbound (Site 2) was considered a priority site as it was to record all the vehicles travelling from Webb Dock. Previous studies of traffic flow from this location showed that most vehicles were travelling north along Todd Road to the West Gate Freeway.

Due to the loss of this camera data on the main survey day, it was recommended to re-survey this location, focusing on the movement of vehicles to the West Gate Freeway. As such cameras were set up at Williamstown Road, Todd Road, West Gate Freeway westbound entry ramp, West Gate Freeway eastbound entry ramp and Normanby Road (Sites 2, 3, 4, 6 and 10), recording vehicles travelling east from Webb Dock towards the freeway.

The new survey was performed on 13 March 2013. Automatic tube counters were placed for eastbound traffic on Williamstown Road for this survey to determine the traffic conditions and compare if this new survey date had similar volumes to the original survey on 27 February 2013. Figure 12 shows the comparison of the traffic volumes on both survey days. It can be seen that traffic volumes were very similar and therefore this updated survey is considered representative of typical traffic conditions in the area.

Figure 12 Williamstown Road Volume Comparison



The surveys indicate that the highest traffic volumes were recorded in the inter-peak period with approximately 1,160 vehicles exiting the Webb Dock precinct. Of these vehicles, the majority of the trips were towards the West Gate Freeway via Site 4. Traffic volumes were approximately 400 and 320 in the AM and PM peak periods respectively.

Heavy vehicles made up the majority of vehicle movements in the AM and inter-peak periods, representing 76% and 52% of all trips respectively. However in the PM peak, heavy vehicle numbers were significantly lower, only representing 22% of trips.

Local destination trips were the greatest in the PM peak period, with over half of all local destination vehicle movements. During the AM peak period, only 4% of all vehicle trips were local trips, increasing to 16% in the inter-peak period.

6.2 Site 7 Northbound – Salmon Street

Site 7 northbound was located on Salmon Street and was used to assess the number of vehicles travelling over the West Gate Freeway between the light industrial areas. This location was not considered a priority location as its overall catchment area was limited and it is not expected to cater for significant through volumes.

Camera footage was lost for traffic exiting the precinct, travelling north along Salmon Street on Wednesday 27 February due to it being moved slightly after an inspection. Fortunately the cameras were recording on Tuesday 26 February but the analysis of this data was not performed due to heavy rain in the AM peak period. As such, it was recommended that the Tuesday data was utilised to supplement the lost Wednesday data.

The traffic volume comparison undertaken in Section 4.2 shows that the traffic volumes on both the Tuesday and Wednesday were similar, even with the heavy rain which can impact traffic flow. As the data was available and traffic volumes were similar, it was recommended to use this to supplement the lost information from the full survey on 27 February.

The OD analysis that has been performed for this site is assessing the traffic that is travelling to it, rather than travelling from it like the previous assessments in this report, as vehicles travelling from this station in a northbound direction are leaving the study area altogether and would not be captured at another camera site.

The survey data from 26 February showed that the highest volumes were recorded in the AM peak period with approximately 1,700 vehicles exiting the precinct to the north. Of these vehicles, 63% originated with the Fishermans Bend precinct (ie local origins). Traffic volumes decrease slightly in the inter-peak period to approximately 1,600 vehicles and further to 600 vehicles in the PM peak period. Trips originating locally represent 59% of trips in the inter-peak and 83% in the PM peak period.

Salmon Street provides a connection between two light industrial areas, however the survey data shows that the majority of vehicles that use this road are light vehicles. During the survey period, approximately 3,900 vehicles were recorded travelling north along Salmon Street. Of these vehicles, only 330 were heavy vehicles, which is approximately 9% of all trips. The highest proportion of heavy vehicles travelling north along Salmon Street was during the inter-peak period at 12% of all vehicles.

The main origin of vehicles travelling north along Salmon Street was from sites 17 and 18, with almost balanced flows from these origins across the survey.

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2	Tony Frodsham	Daniel Gregor		Daniel Gregor		05/07/13

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Department of Transport
 Fishermans Bend Traffic Study
 Appendices

July 2013

Appendices

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- Appendix B - Traffic Volume Analysis Outer Cordon Sites
- Appendix C - Origin/Destination Analysis Outer Cordon Sites
- Appendix D - Origin/Destination Analysis Inner Cordon Sites
- Appendix E - Additional Survey Periods

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Appendices

Appendix A - Traffic Volume Analysis Inner Cordon Sites

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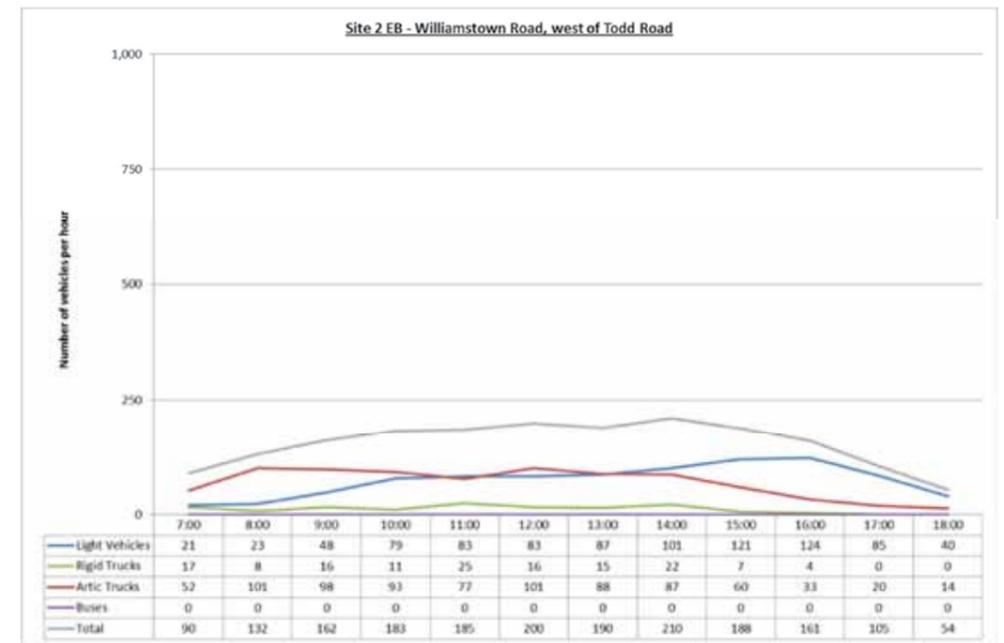


Figure 2 Site 2 Westbound Direction

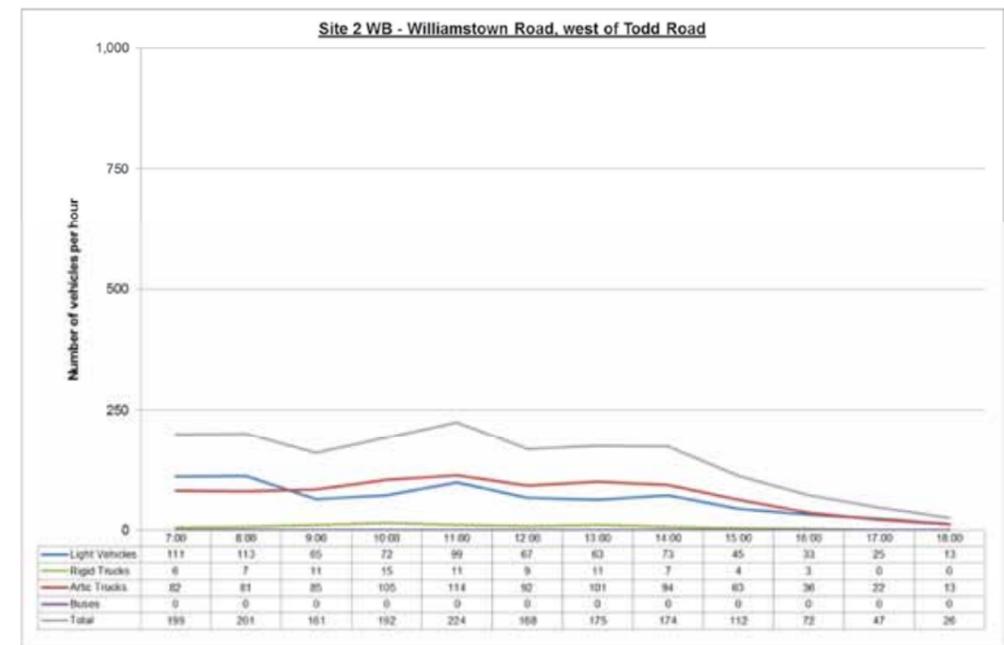


Figure 3 Site 9 Northbound Direction



Figure 4 Site 9 Southbound Direction

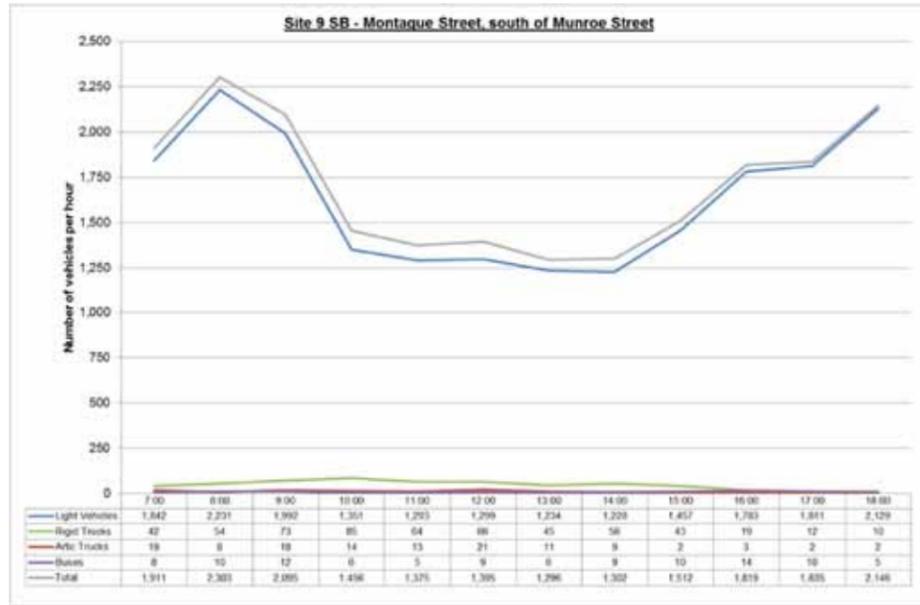


Figure 5 Site 11 Eastbound Direction

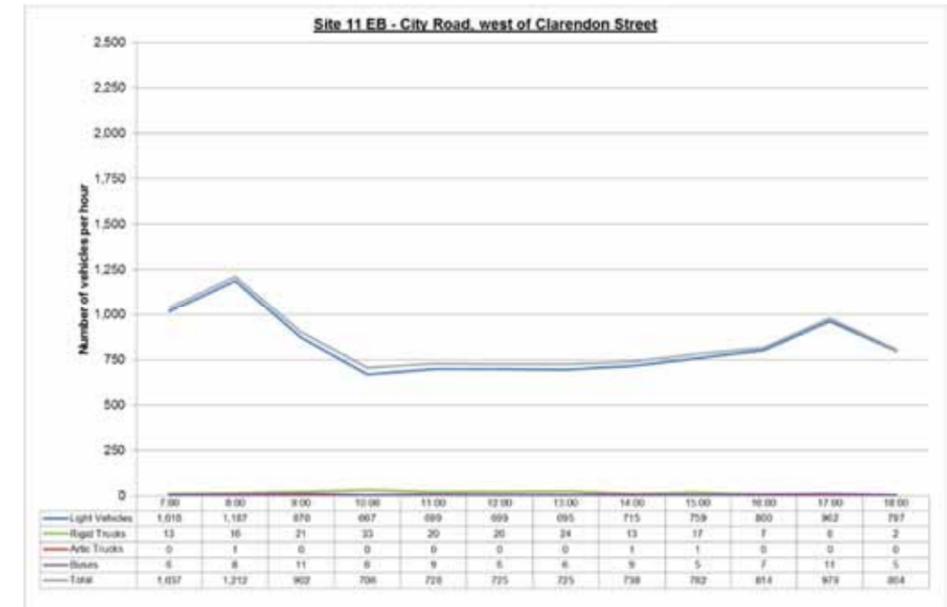


Figure 6 Site 11 Westbound Direction

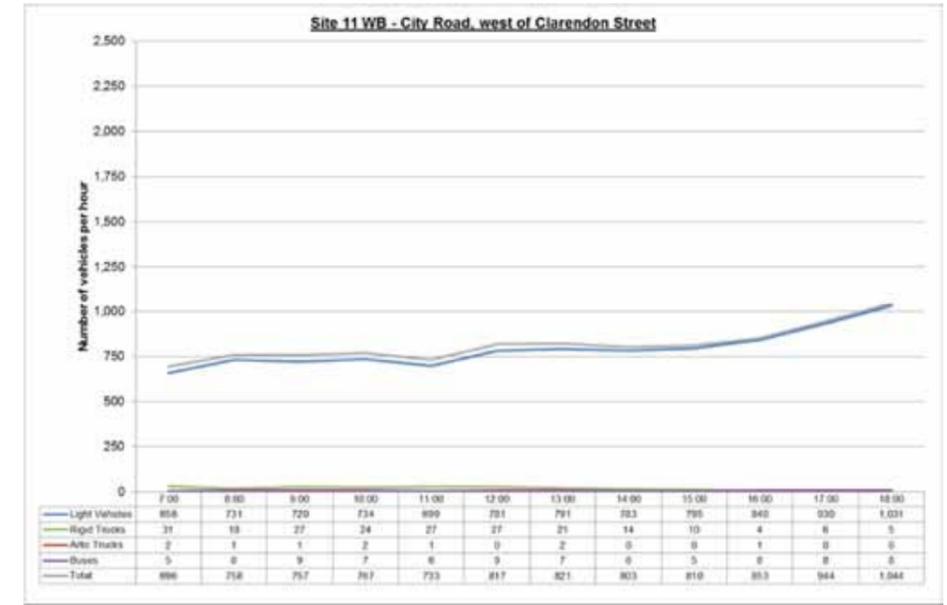


Figure 7 Site 14 Eastbound Direction

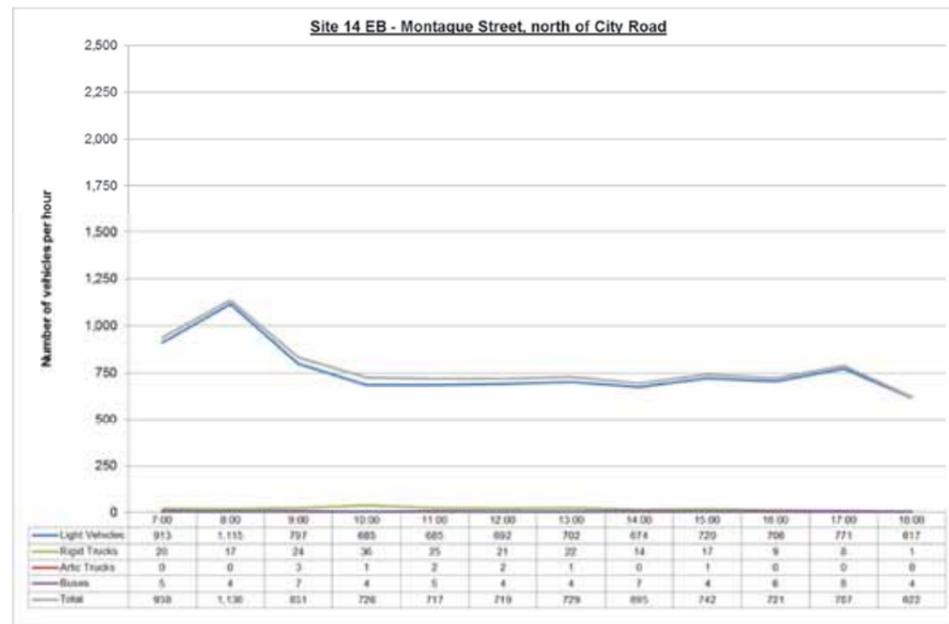
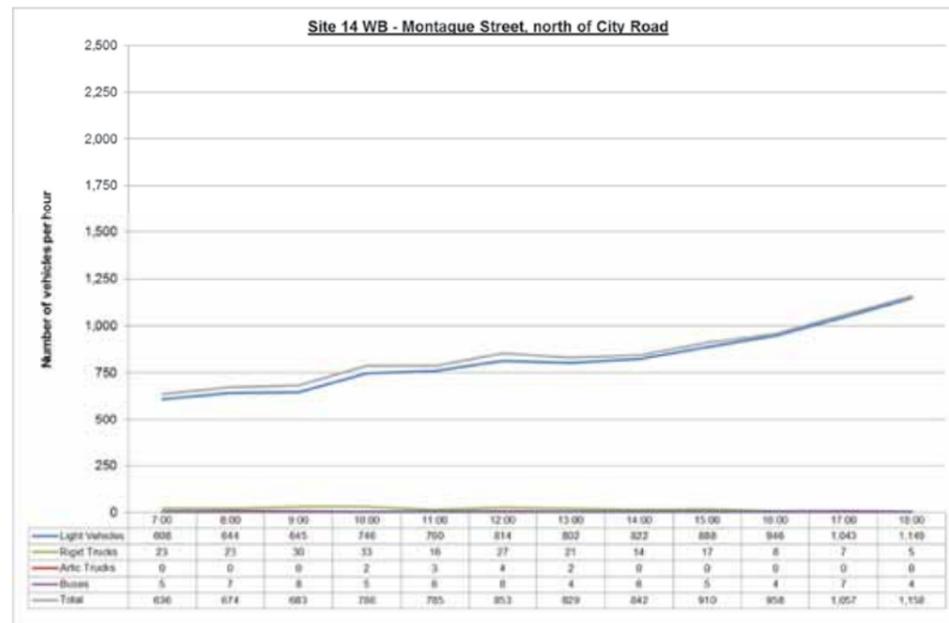


Figure 8 Site 14 Westbound Direction



Appendix B – Traffic Volume Analysis Outer Cordon Sites

Figure 9 Site 21 Eastbound Direction

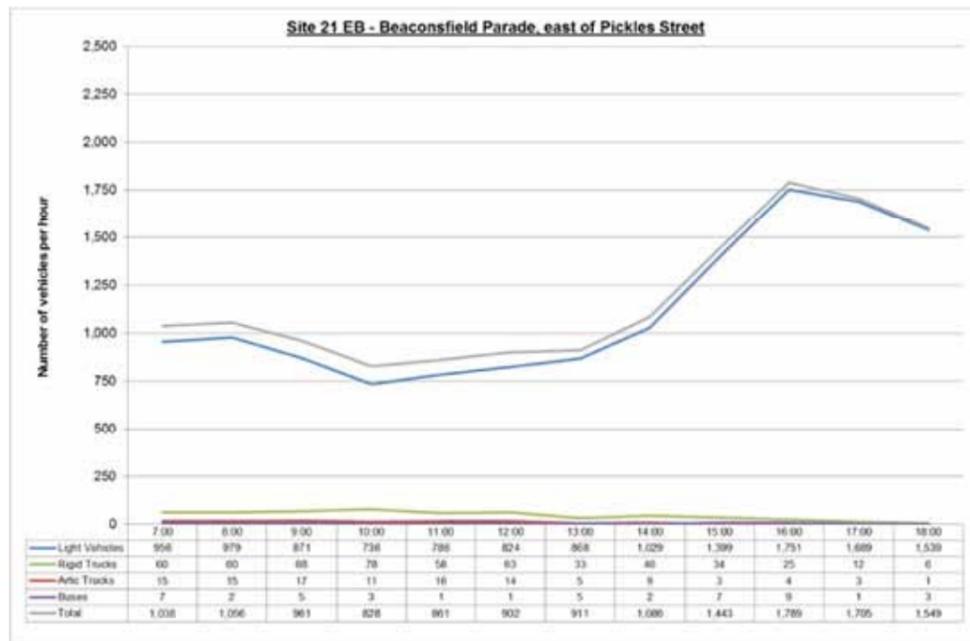


Figure 10 Site 21 Westbound Direction

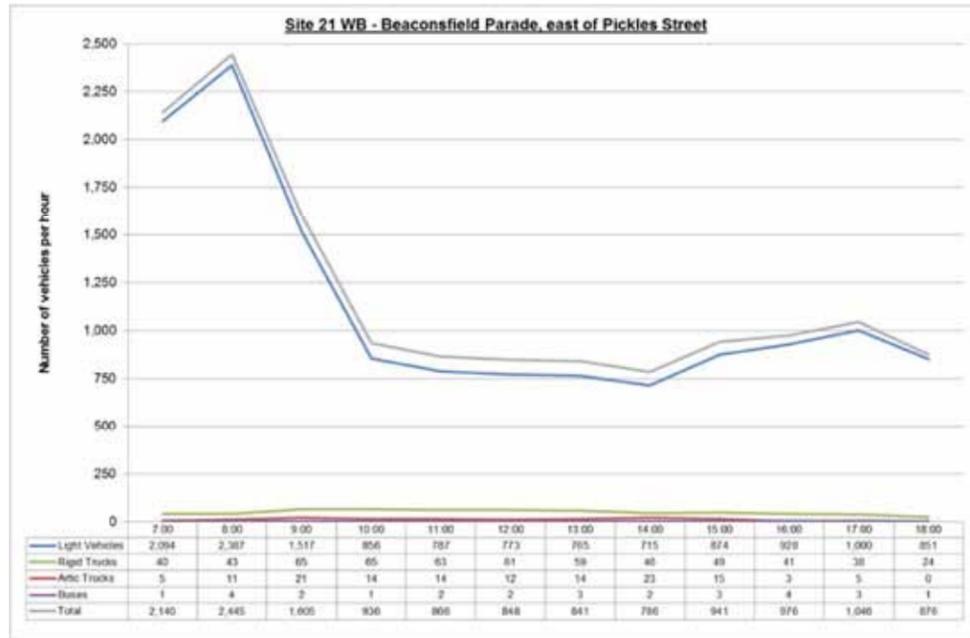


Figure 11 Site 22 Northbound Direction

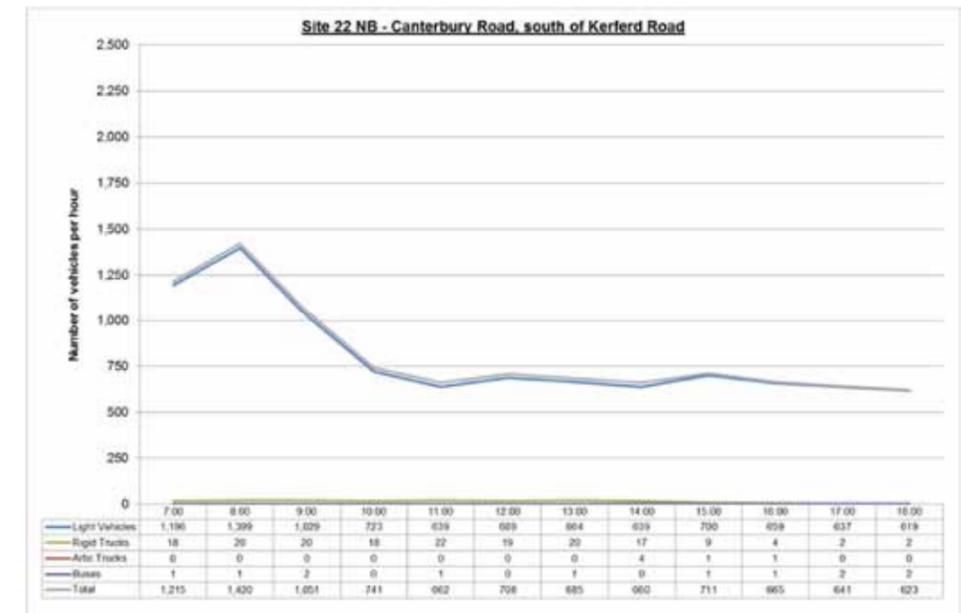


Figure 12 Site 22 Southbound Direction

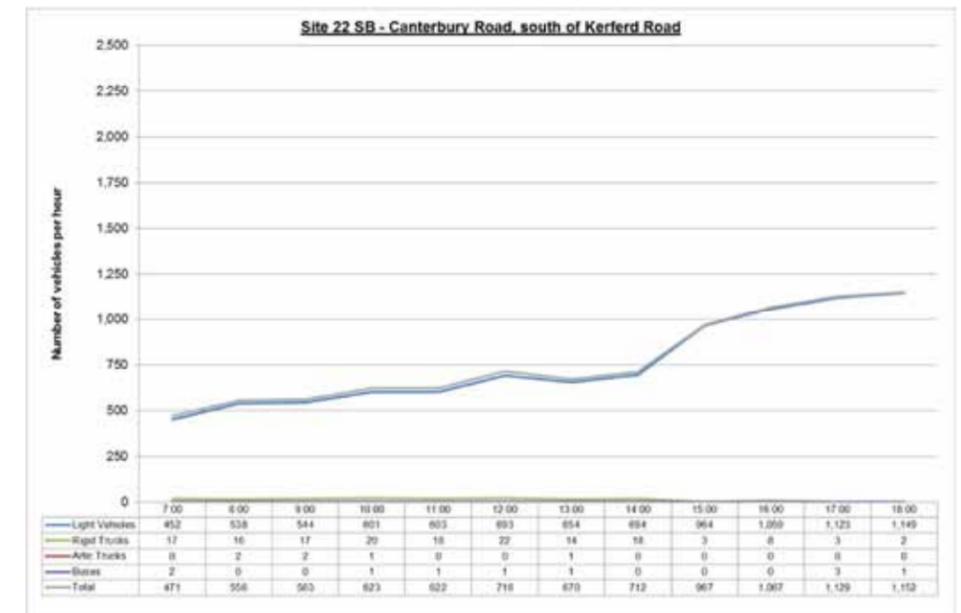


Figure 13 Site 23 Eastbound Direction

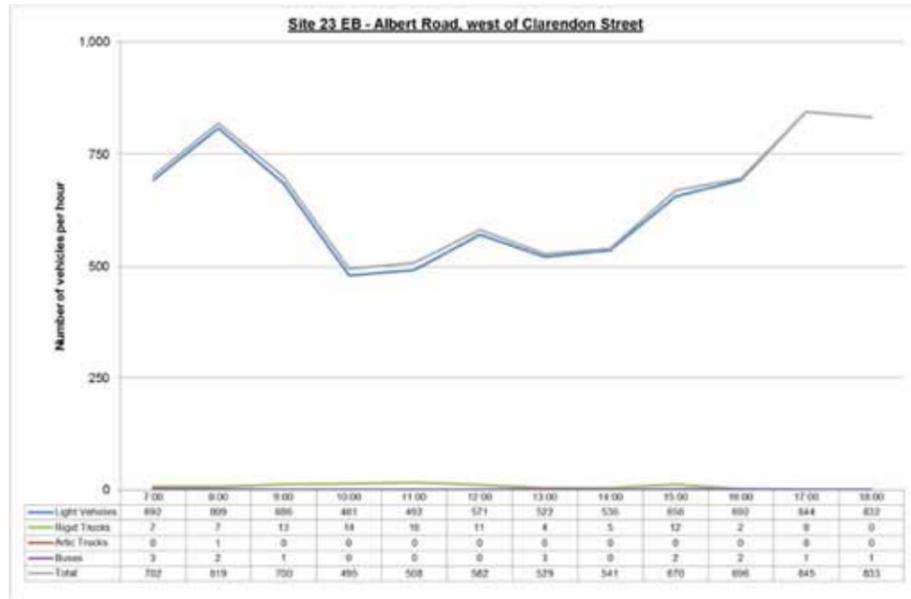


Figure 14 Site 23 Westbound Direction

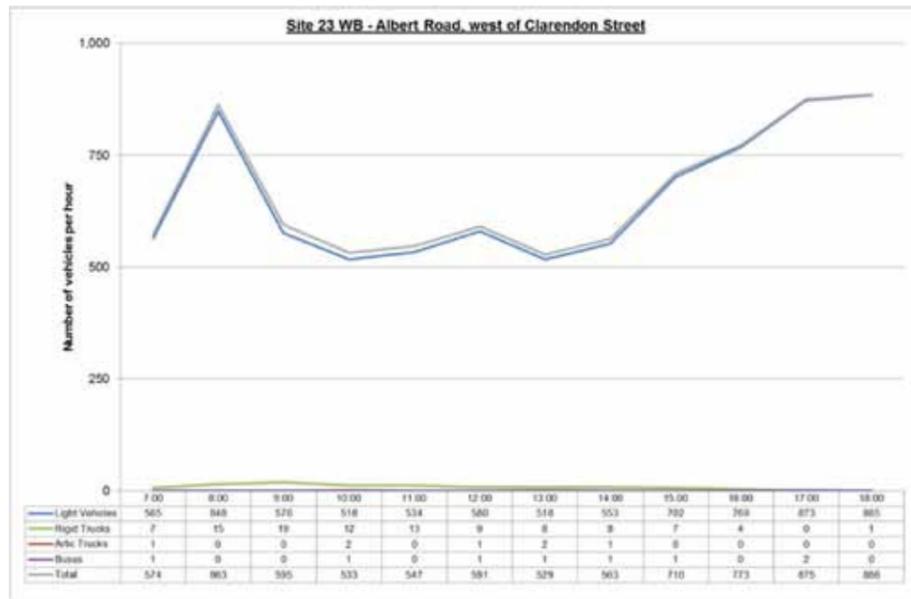


Figure 15 Site 24 Eastbound Direction

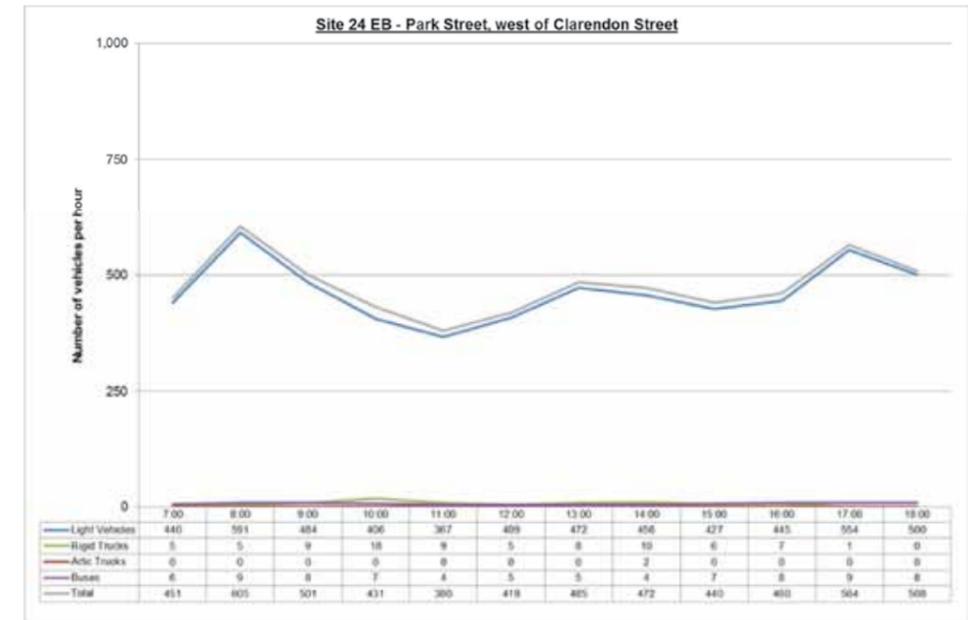


Figure 16 Site 24 Westbound Direction

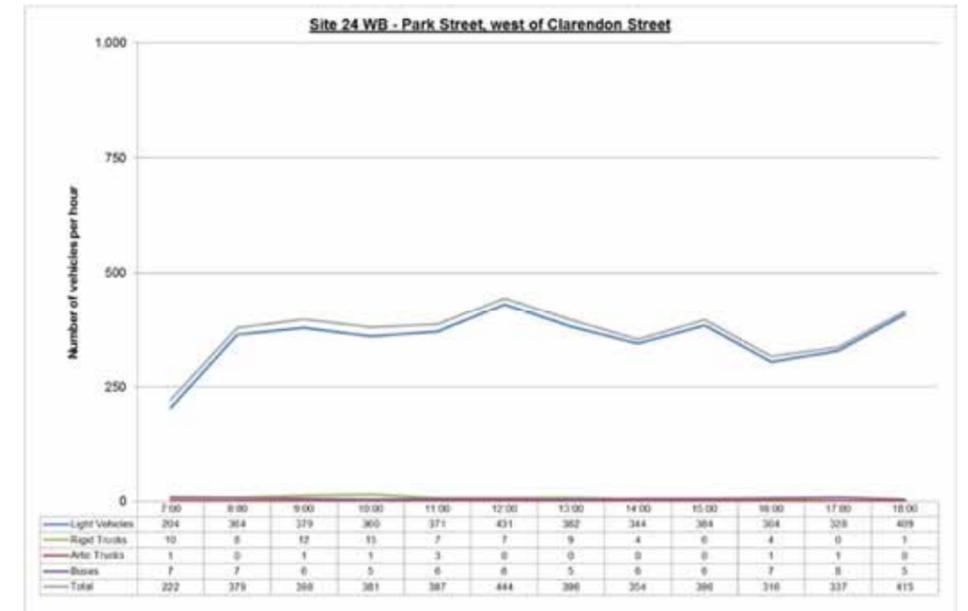


Figure 17 Site 25 Eastbound Direction

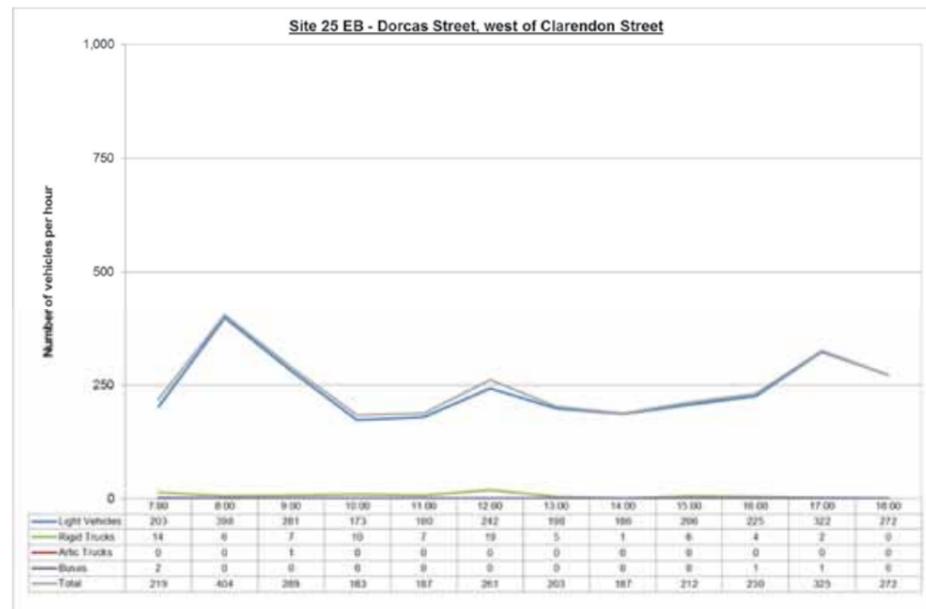
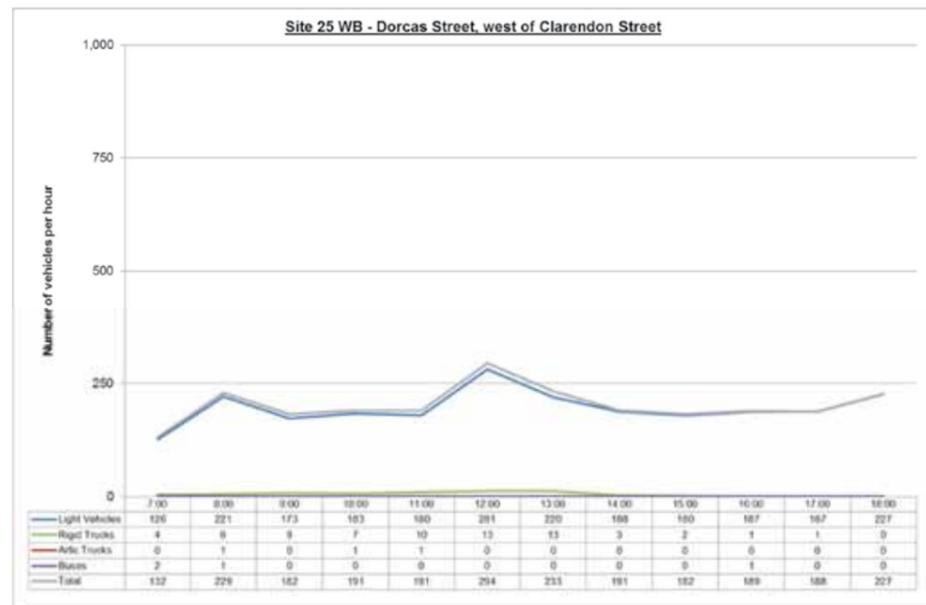


Figure 18 Site 25 Westbound Direction



Appendix C – Origin/Destination Analysis Outer Cordon Sites

Inbound Traffic Movements

Site 21– Beaconsfield Parade Westbound

The peak period for this location was the AM peak (7am-10am) as vehicles were travelling towards the city. During this period it can be seen that:

- Overall, at this site 6,190 vehicles were observed, of which the large majority (5,998 vehicles) were light vehicles;
- Approximately 22% of vehicles at this site were not matched at any point at a Fishermans Bend internal cordon survey location;
- Over 31% of vehicles were matched at Site 18 northbound on Graham Street. Potentially these vehicles could have used Beach Street and Bay Street in Port Melbourne to access Site 18 northbound;
- Approximately 20% of vehicles were matched at Site 15 northbound on Ingles Street. These vehicles could have used either Bay Street or Pickles Street to access this site; and
- Over 16% of vehicles were matched at Site 1 northbound on Todd Road. It is likely that these vehicles used Beach Street and The Boulevard to access this site.

Figure 19 Movements from Site 21 WB Beaconsfield Parade in AM Peak

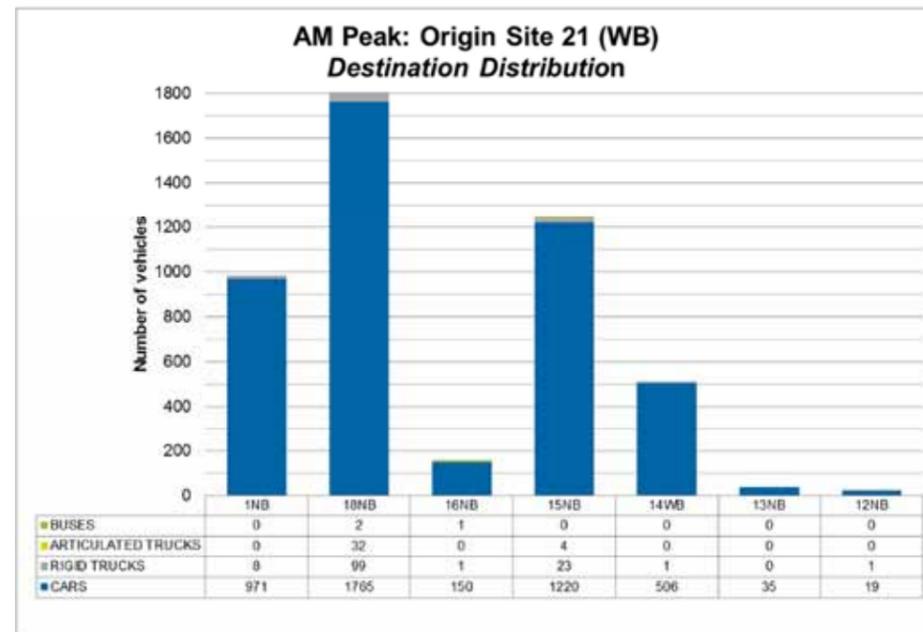


Figure 20 Movements from Site 21 WB Beaconsfield Parade in Inter Peak

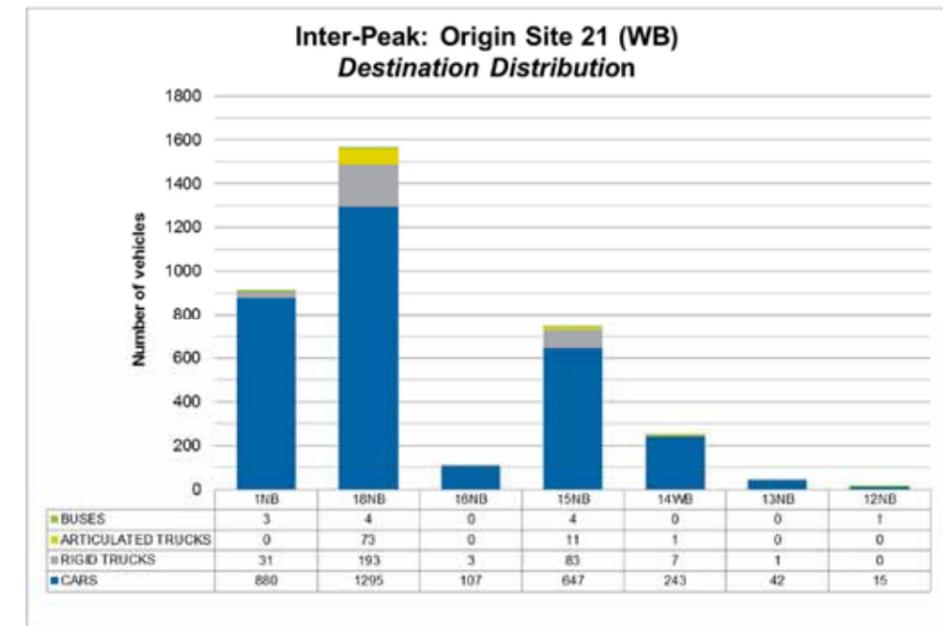
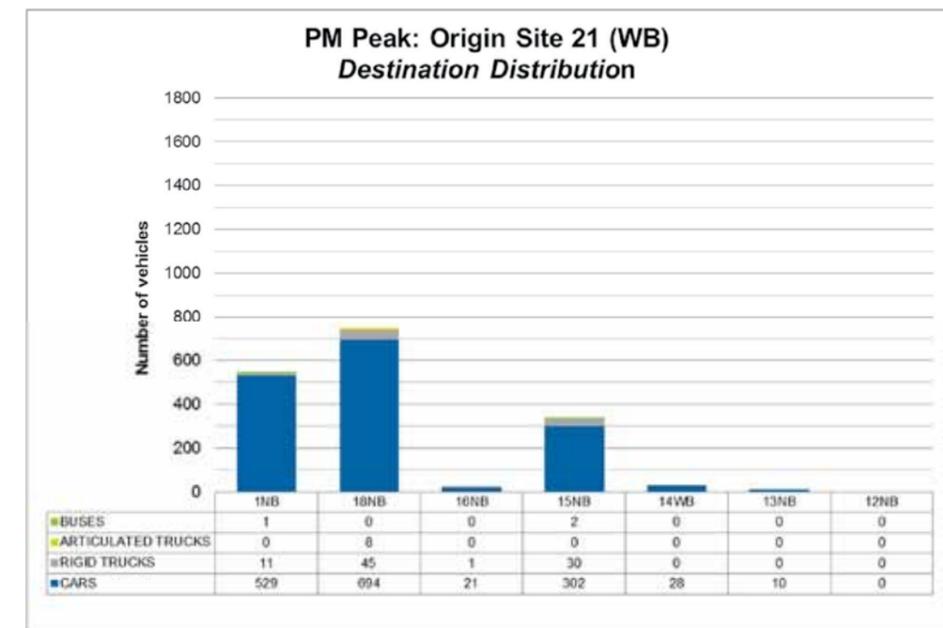


Figure 21 Movements from Site 21 WB Beaconsfield Parade in PM Peak



Site 22- Canterbury Road Northbound

The peak period for this location was the AM peak (7am-10am) as vehicles were travelling towards the city. During this period it can be seen that:

- Overall, 3,686 vehicles were counted at this location of which the vast majority (3,624 vehicles) were light vehicles. Only 58 rigid trucks were observed and no articulated trucks were observed;
- Non-Fishermans Bend trips were the major destination for vehicles at this site with 67% of vehicles not matched at a Fishermans Bend inner cordon survey location;
- Site 13 northbound was the main destination on the Fishermans Bend inner cordon with 20% of vehicles matched at this location on Ferrars Street; and
- Smaller proportions of vehicles were matched at other Fishermans Bend inner cordon locations such as Site 15 northbound Ingles Street (7%) and Site 14 northbound Montague Street (3%).

Figure 22 Movements from Site 22 NB Canterbury Road in AM Peak

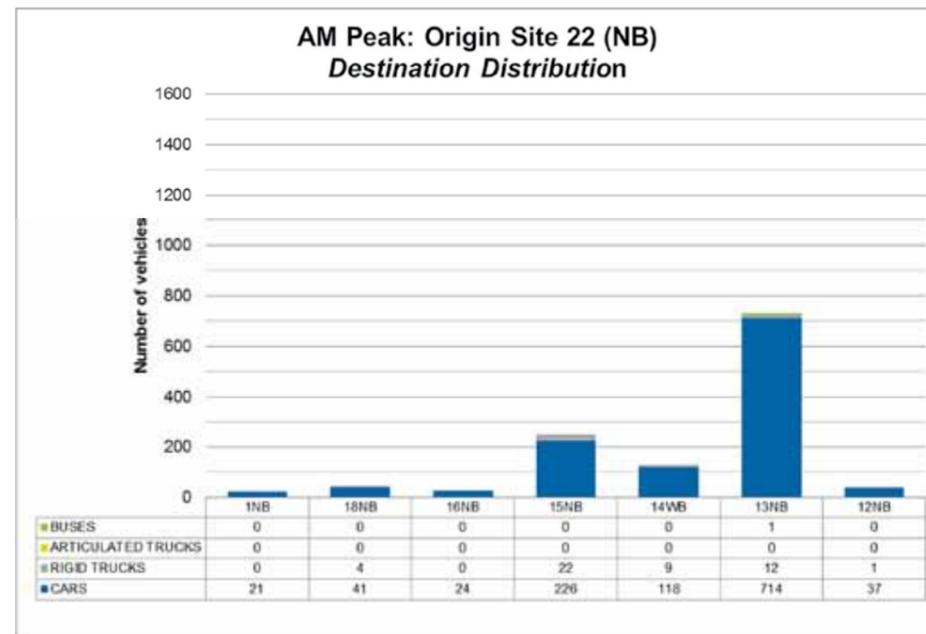


Figure 23 Movements from Site 22 NB Canterbury Road in Inter Peak

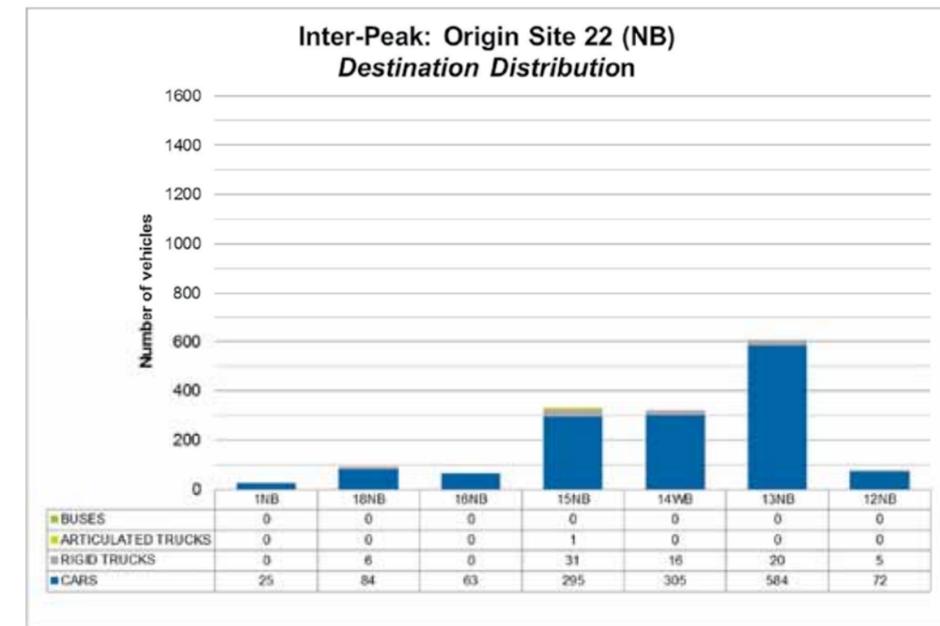
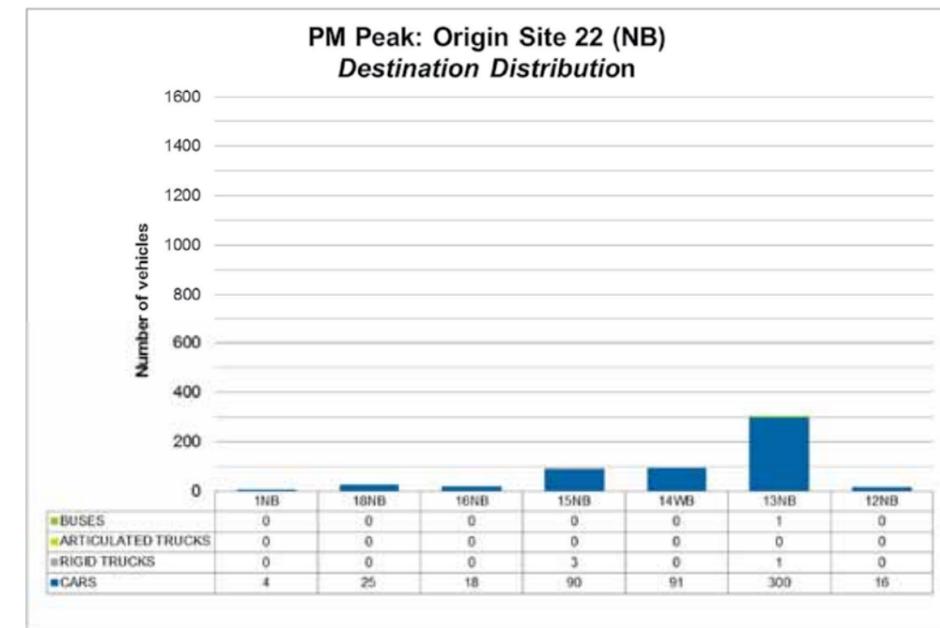


Figure 24 Movements from Site 22 NB Canterbury Road in PM Peak



Site 23– Albert Road Westbound

The peak period for this location was the AM peak (7am-10am) as vehicles were travelling towards the city. During this period it can be seen that:

- 2,032 vehicles were recorded at this site, of which 1,989 were light vehicles, 41 were rigid trucks. 1 was an articulated truck and 1 was a bus;
- Approximately 62% of vehicles were not matched at any of the Fishermans Bend inner cordon survey locations;
- The most common destination on the Fishermans Bend inner cordon was Site 15 NB (Ingles Street) where 14% of vehicles were matched. There are a variety of routes that vehicles could have used including Ferrars Street and Dorcas Street;
- Approximately 7% of vehicles were matched at Site 21 westbound, which is located on Beaconsfield Parade in Port Melbourne. Vehicles would most likely have used Kerferd Road to get to this destination; and
- Other locations on Fishermans Bend inner cordon were less common destinations for vehicles from this site (typically 5% or less of vehicles were matched per site).

Figure 25 Movements from Site 23 WB Albert Road in AM Peak

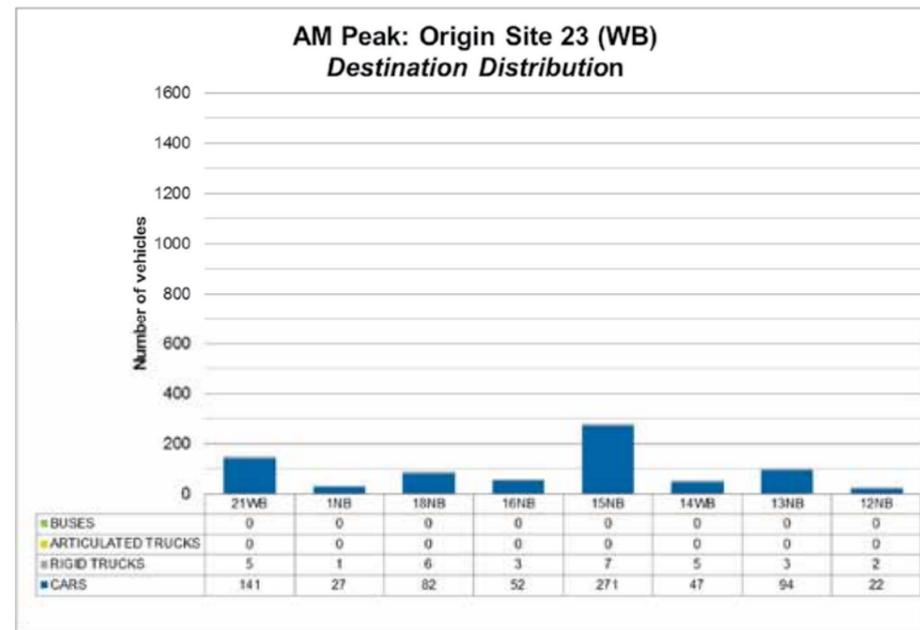


Figure 26 Movements from Site 23 WB Albert Road in Inter Peak

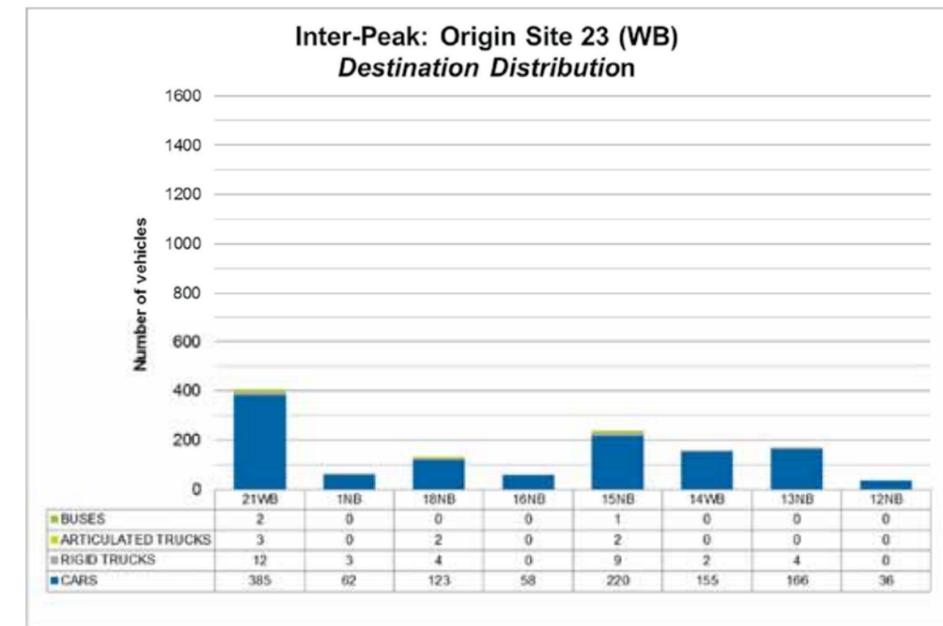
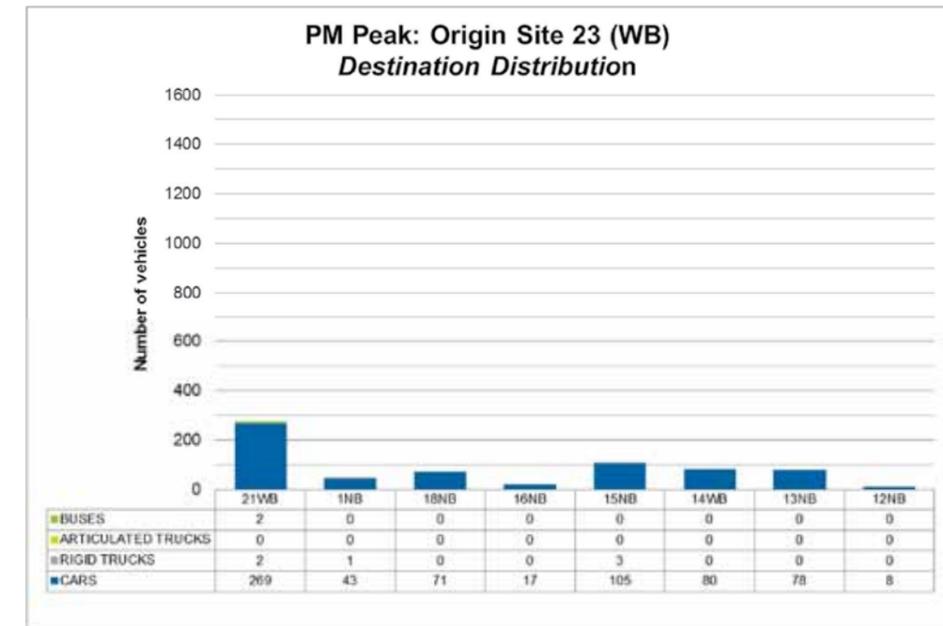


Figure 27 Movements from Site 23 WB Albert Road in PM Peak



Site 24 – Park Street Westbound

The peak period for this location was the AM peak (7am-10am) as vehicles were travelling towards the city. During this period it can be seen that:

- 999 vehicles were observed at this location, of which 947 were light vehicles;
- 66% of vehicles were not matched at a Fishermans Bend inner cordon survey location, meaning that these vehicles had a local or other trip;
- The most common matched destination was Site 15 northbound, which is located on Ingles Street. Most likely these vehicles used Dorcas Street and Ingles Street to get to Site 15 northbound. This location was the destination for 13% of vehicles observed at Site 24 westbound; and
- Other locations on Fishermans Bend inner cordon were less common destinations for vehicles from this site (typically 6% or less of vehicles were matched per site).

Figure 28 Movements from Site 24 WB Park Street in AM Peak

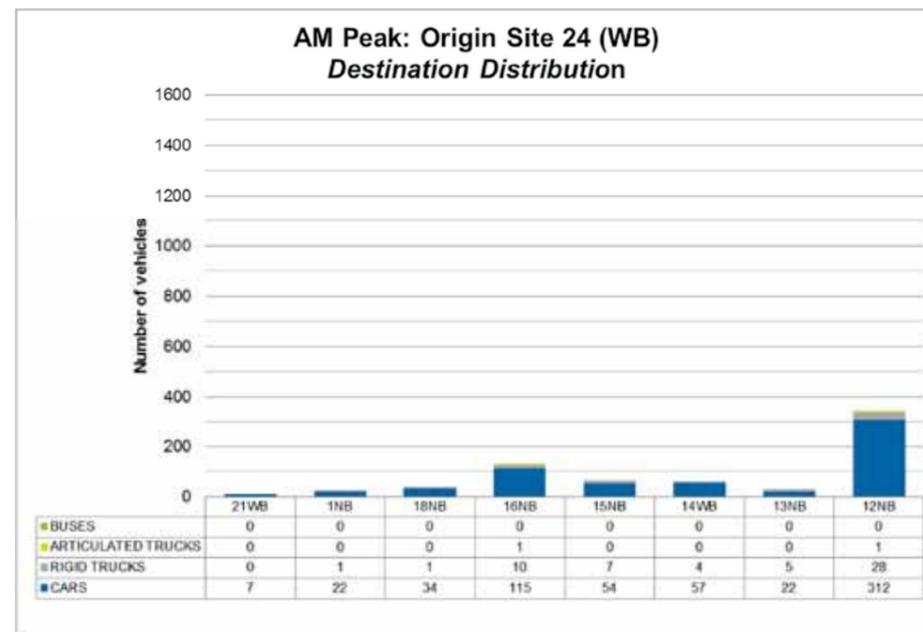


Figure 29 Movements from Site 24 WB Park Street in Inter Peak

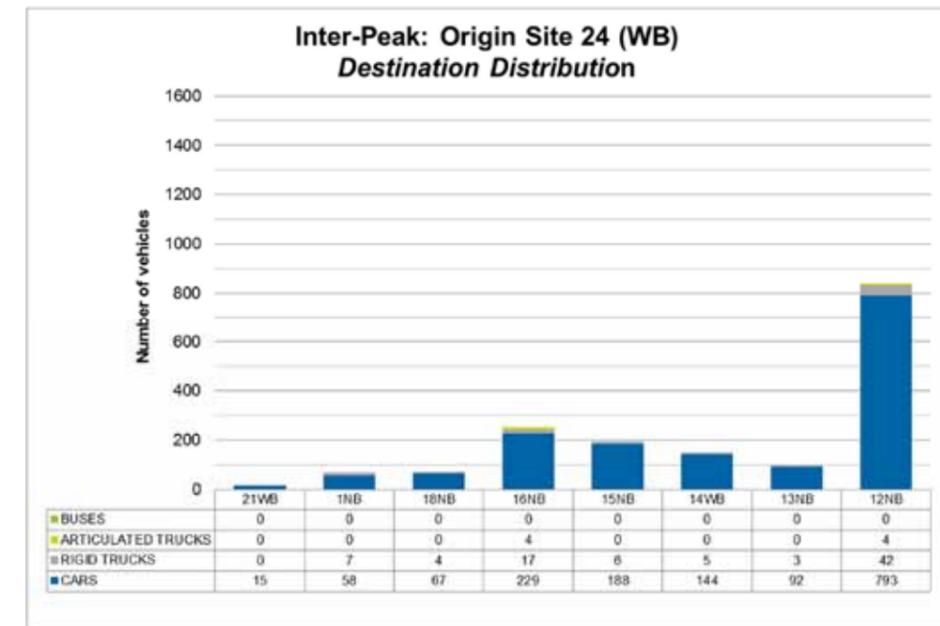
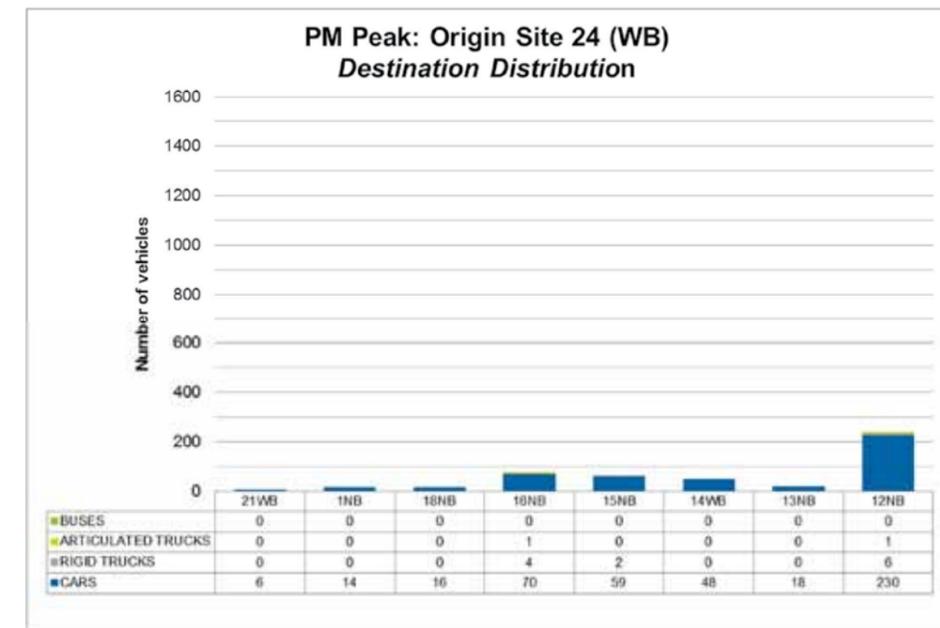


Figure 30 Movements from Site 24 WB Park Street in PM Peak



Site 25– Dorcas Street Westbound

The peak period for this location was the AM peak (7am-10am) as vehicles were travelling towards the city. During this period it can be seen that:

- 543 vehicles were recorded at this location. The large majority were light vehicles (520 vehicles);
- Non-Fishermans Bend trips were the most common trips recorded at this site with other 66% of trips being classed as a non-Fishermans Bend trip;
- The most common Fishermans Bend inner cordon survey destination was Site 15 northbound Ingles Street, where 20% of trips from Dorcas Street were destined, and;
- Trips to other Fishermans Bend inner cordon survey points were relatively low. Typically trips to the respective locations were 4% or less of total trips from Site 25 westbound.

Figure 31 Movements from Site 25 WB Dorcas Street in AM Peak

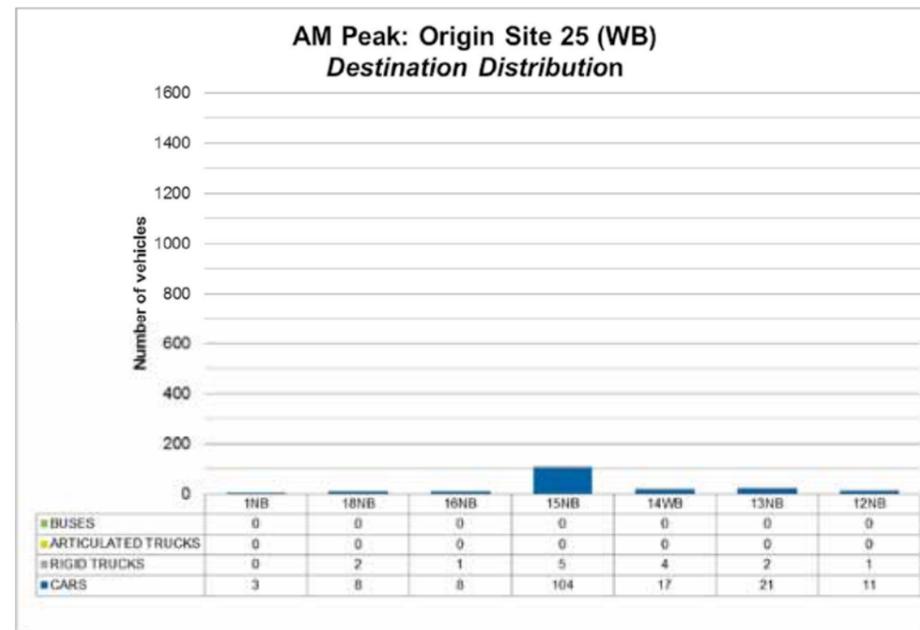


Figure 32 Movements from Site 25 WB Dorcas Street in Inter Peak

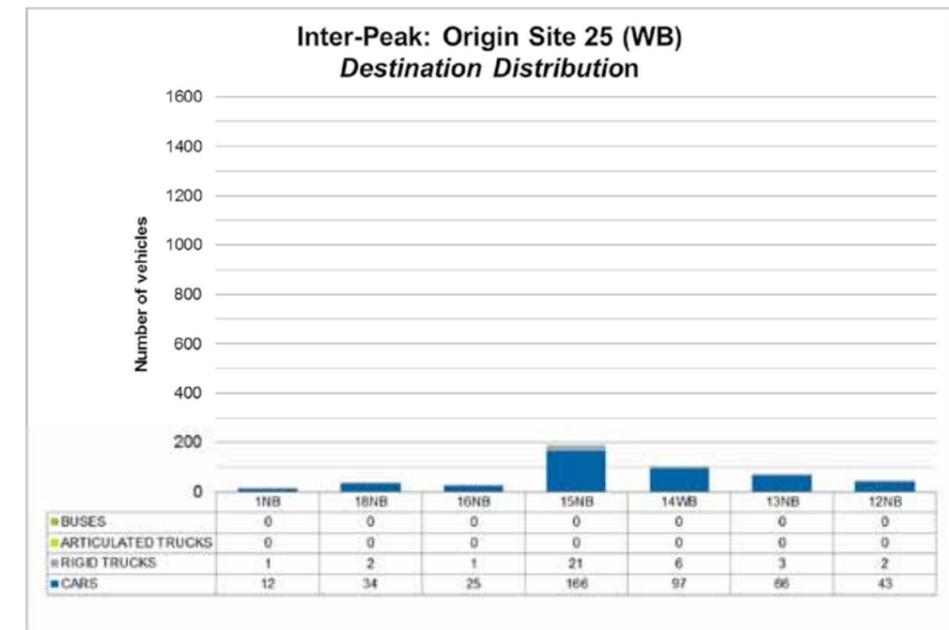
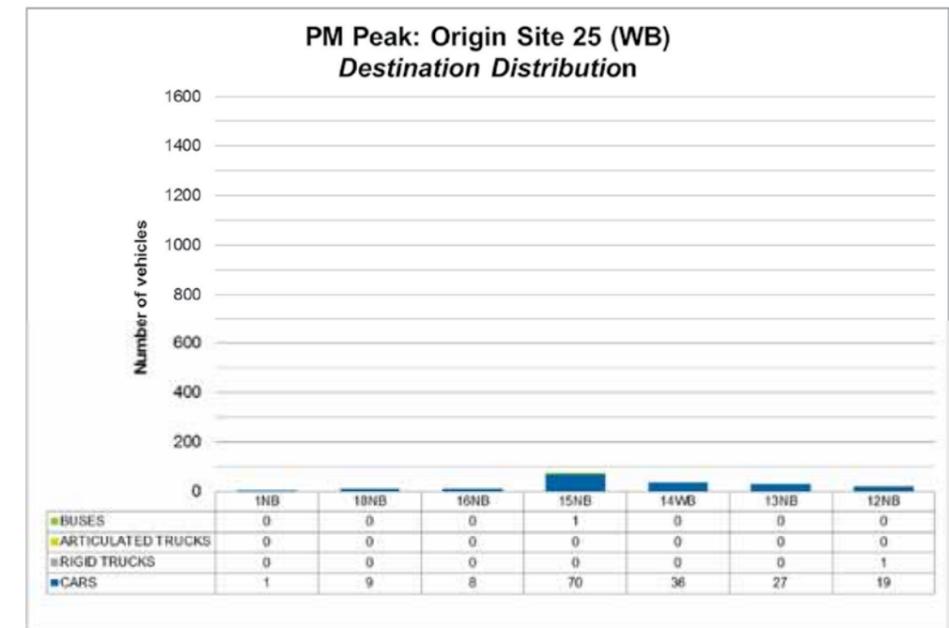


Figure 33 Movements from Site 25 WB Dorcas Street in PM Peak



Outbound Traffic Movements

Site 1– Todd Road Southbound

The peak period for this location was the PM peak (4pm-7pm) as vehicles were travelling away from the city. During this period it can be seen that:

- 1,019 vehicles were observed in this peak period, of which 1,004 were light vehicles. No articulated trucks were observed;
- The most common destination was Site 21 eastbound located on Beaconsfield Parade. Approximately 68% of vehicles observed at Site 1 southbound were then observed at Site 21 eastbound. Most likely these vehicles used The Boulevard and Beach Street on this route;
- A significant minority of trips (28%) were not matched at any of the outer cordon survey locations, indicating that these trips were to other destinations; and
- Movements to other outer cordon points were very low (typically 2% or less of movements from Site 1 southbound).

Figure 34 Movements from Site 1 SB Todd Road in AM Peak

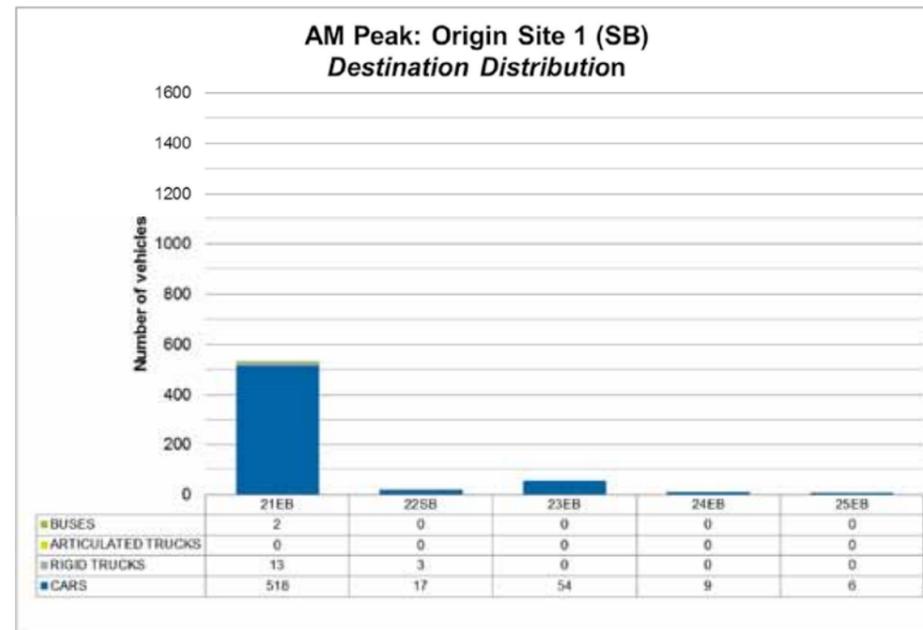


Figure 35 Movements from Site 1 SB Todd Road in Inter Peak

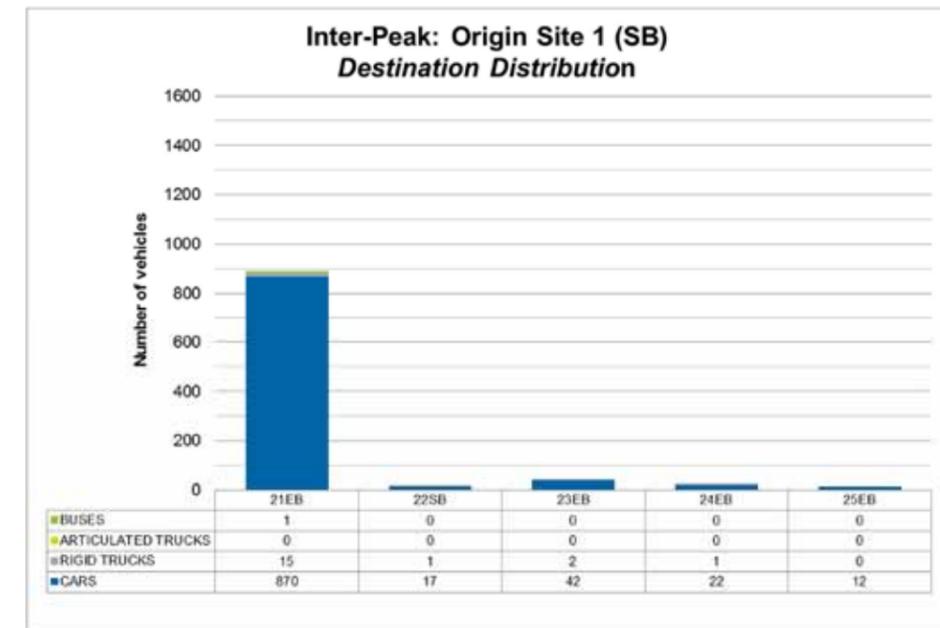
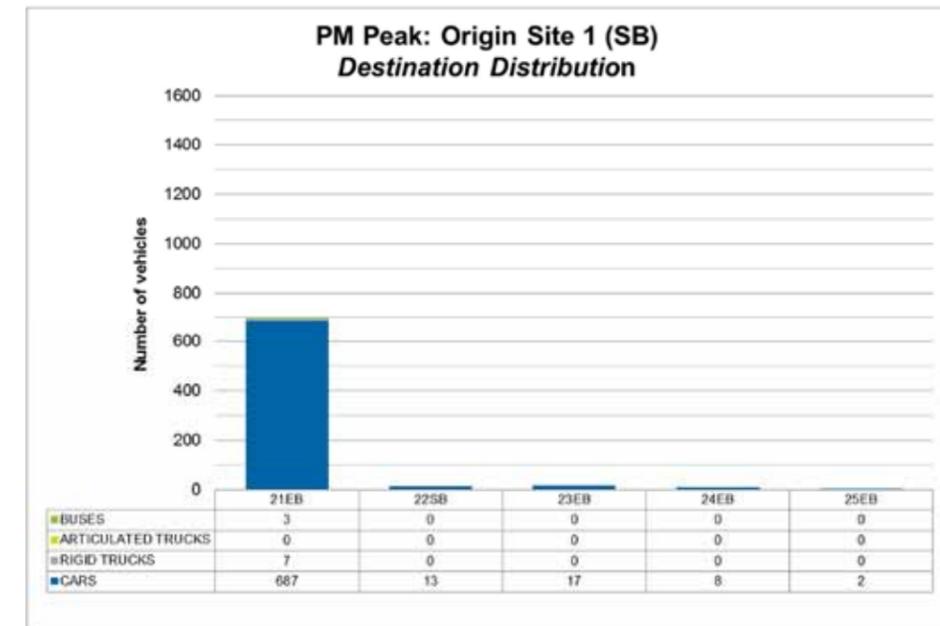


Figure 36 Movements from Site 1 SB Todd Road in PM Peak



Site 18– Graham Street Southbound

The peak period for this location was the PM peak (4pm-7pm) as vehicles were travelling away from the city. During this period it can be seen that:

- 2,953 vehicles were observed at this site travelling southbound in the PM Peak period. The large majority were light vehicles (2,877 vehicles);
- Site 21 WB (Beaconsfield Parade) was a key destination for trips from Site 18 southbound with 52% of trips ending up at this location. Potentially vehicles could have used either Bay Street or Pickles Street to access this location;
- 42% of vehicles at Site 18 southbound were not matched at any of the outer cordon survey locations, indicating that these trips were to another destination; and
- Very small proportions of vehicles were matched at the other outer cordon survey locations (typically less than 3% per site).

Figure 37 Movements from Site 18 SB Graham Street in AM Peak

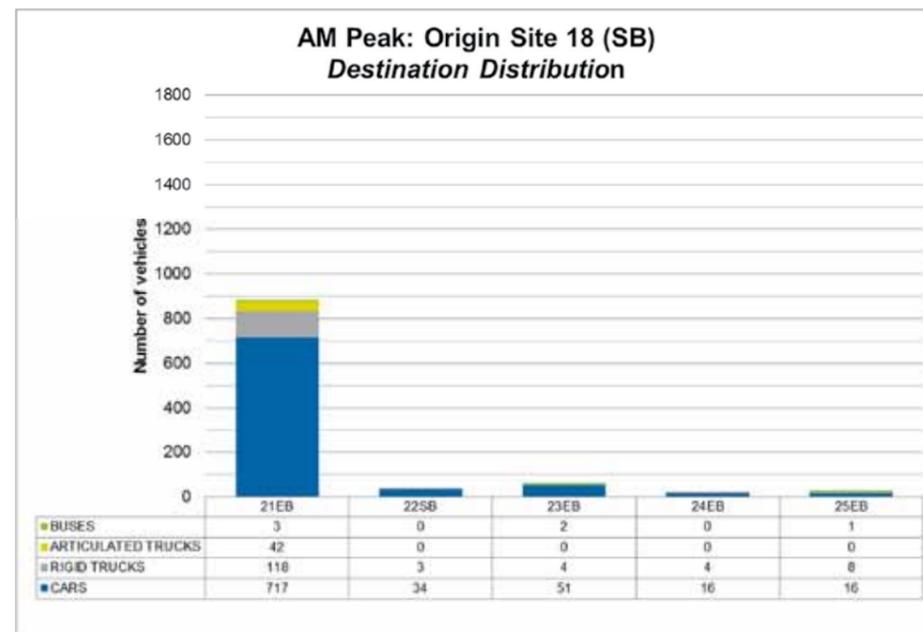


Figure 38 Movements from Site 18 SB Graham Street in Inter Peak

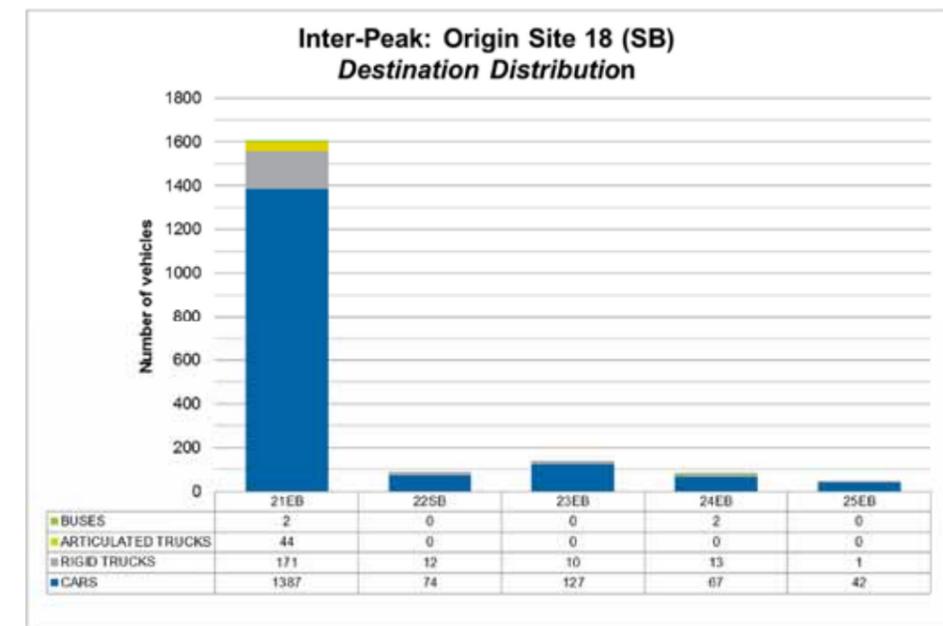
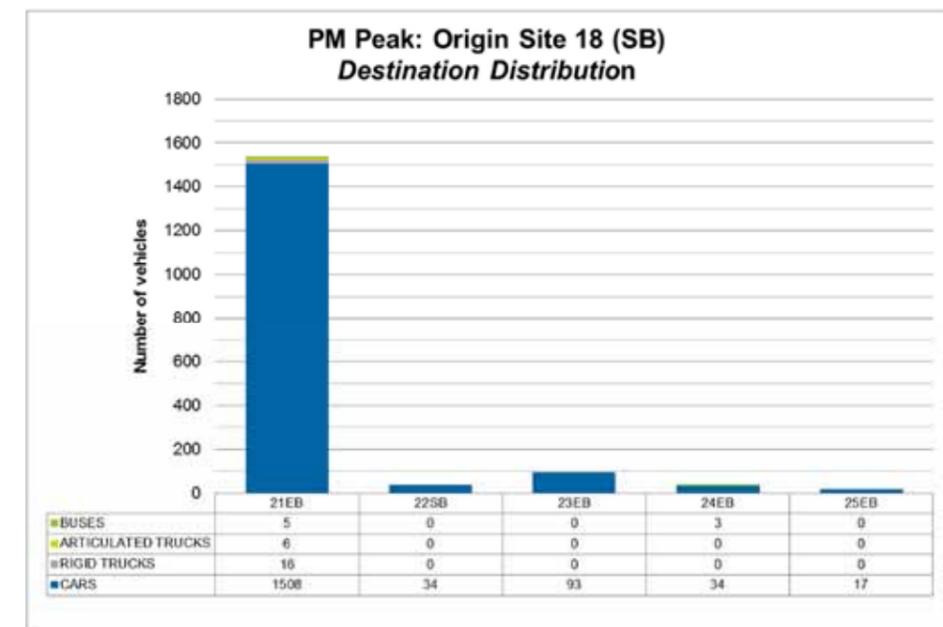


Figure 39 Movements from Site 18 SB Graham Street in PM Peak



Site 16– Bridge Street Southbound

The peak period for this location was the PM peak (4pm-7pm) as vehicles were travelling away from the city. During this period it can be seen that:

- 1,005 vehicles were observed at this site in the PM Peak period of which 996 were light vehicles;
- 75% of vehicles were not matched at an outer cordon survey location, indicating that a large proportion of trips were to local destinations. There are a variety of possible routes including Bay Street and Pickles Street that vehicles could have used; and
- The most common destinations for vehicles in the outer cordon were Site 23 eastbound and Site 21 southbound, where approximately 7% of vehicles were matched respectively.

Figure 40 Movements from Site 16 SB Bridge Street in AM Peak

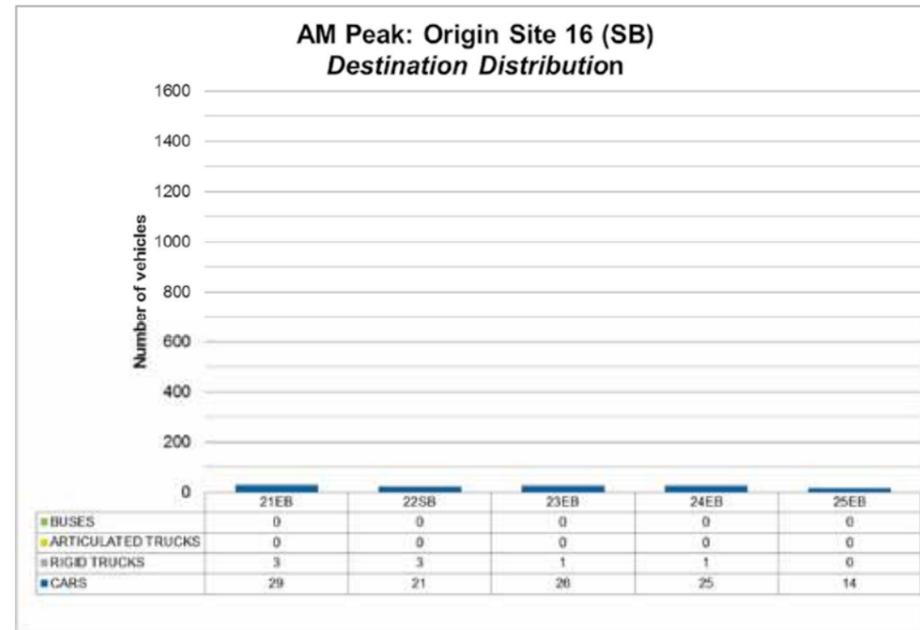


Figure 41 Movements from Site 16 SB Bridge Street in Inter Peak

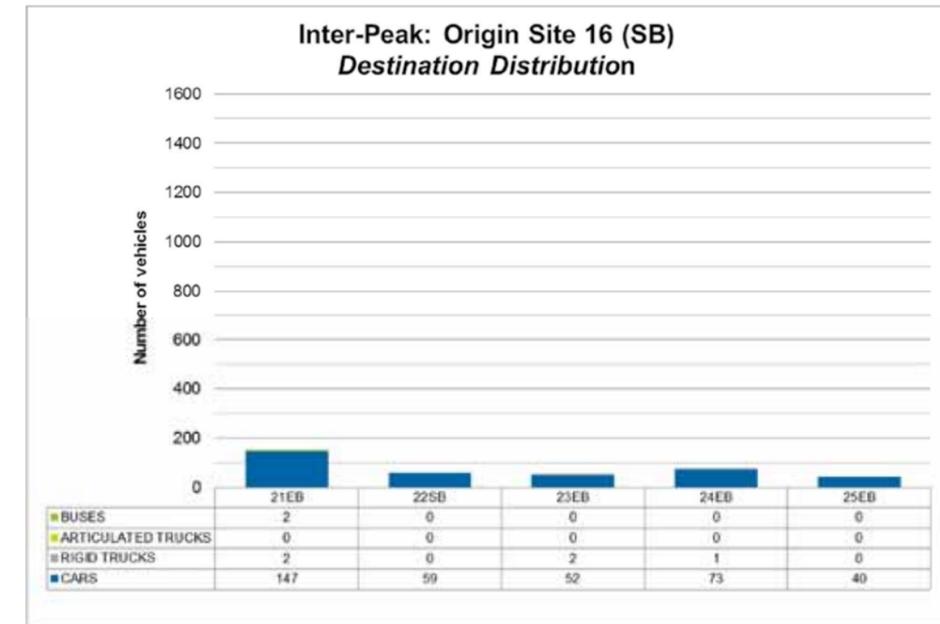
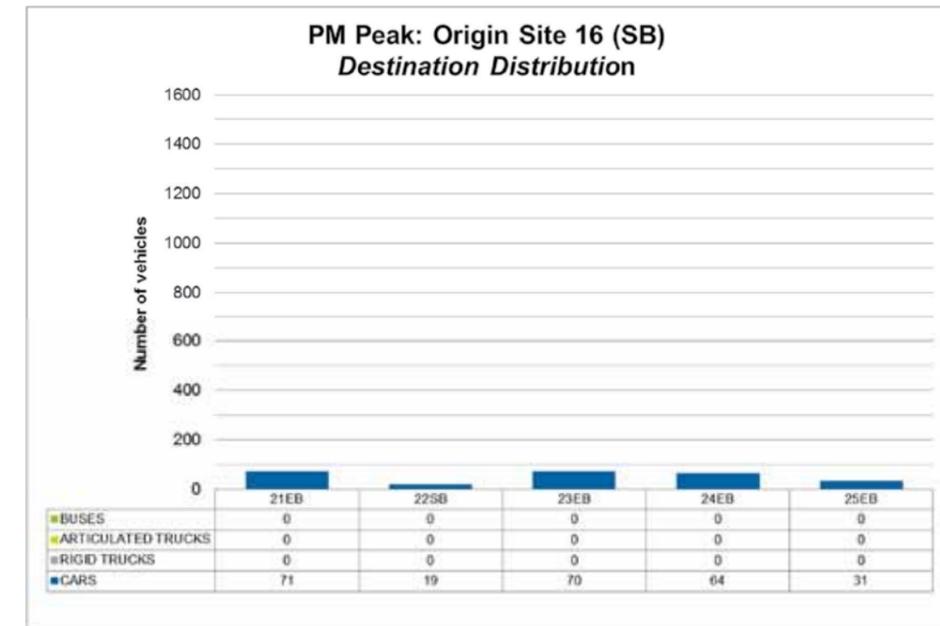


Figure 42 Movements from Site 16 SB Bridge Street in PM Peak



Site 15– Ingles Street Southbound

The peak period for this location was the PM peak (4pm-7pm) as vehicles were travelling away from the city. During this period it can be seen that:

- 3,459 vehicles were recorded at this site during this period of which 3,419 were light vehicles;
- A large minority of vehicles (47%) were not observed at any of the outer cordon survey locations;
- The most common destination in the outer cordon was Site 21 eastbound on Beaconsfield Parade, which accounted for 23% of trips from Site 15 SB. Routes between these locations could include Bay Street or Pickles Street; and
- Trips to other outer cordon destinations were relatively low, typically less than 9% of trips respectively for each outer cordon destination.

Figure 43 Movements from Site 15 SB Ingles Street in AM Peak

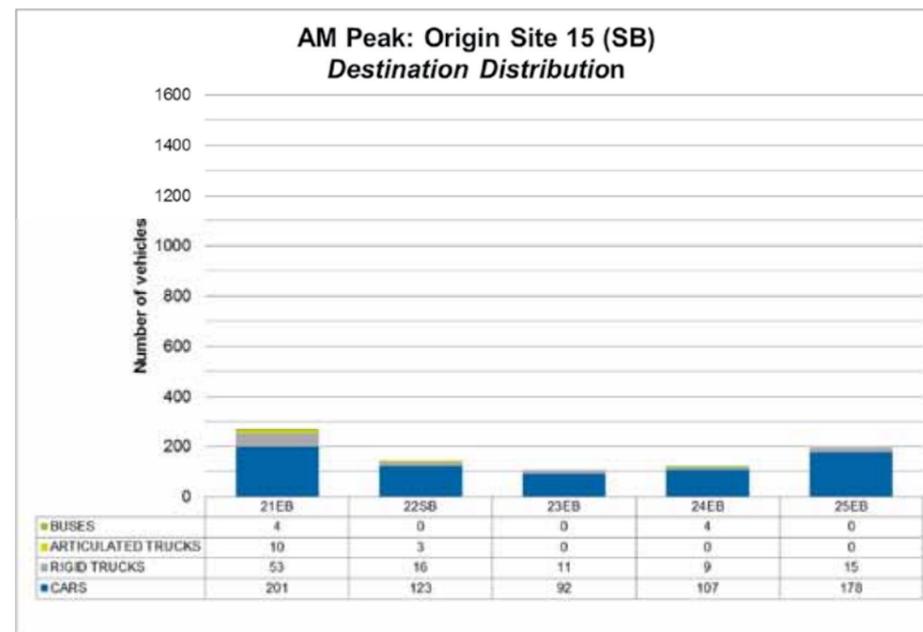


Figure 44 Movements from Site 15 SB Ingles Street in Inter Peak

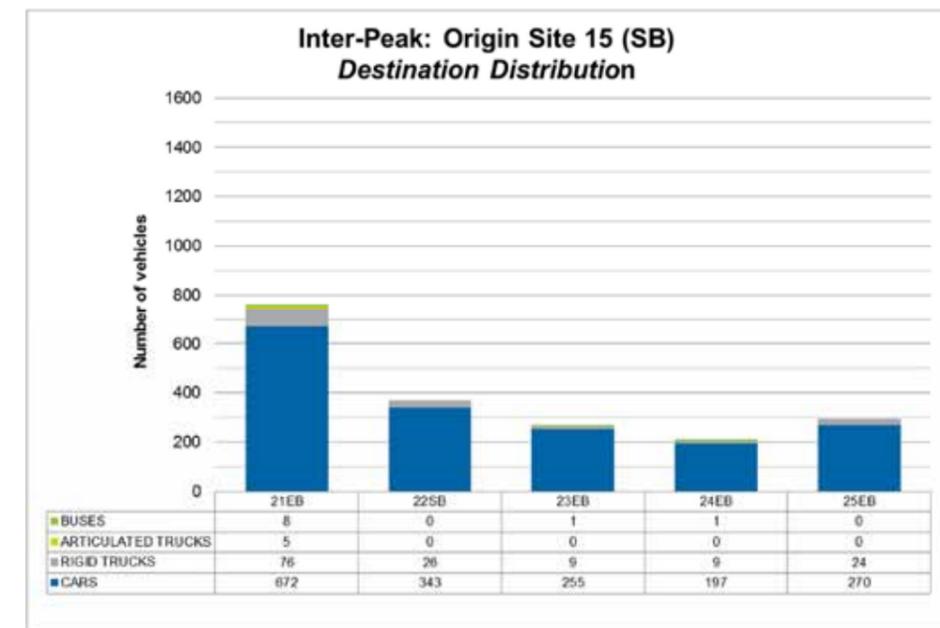
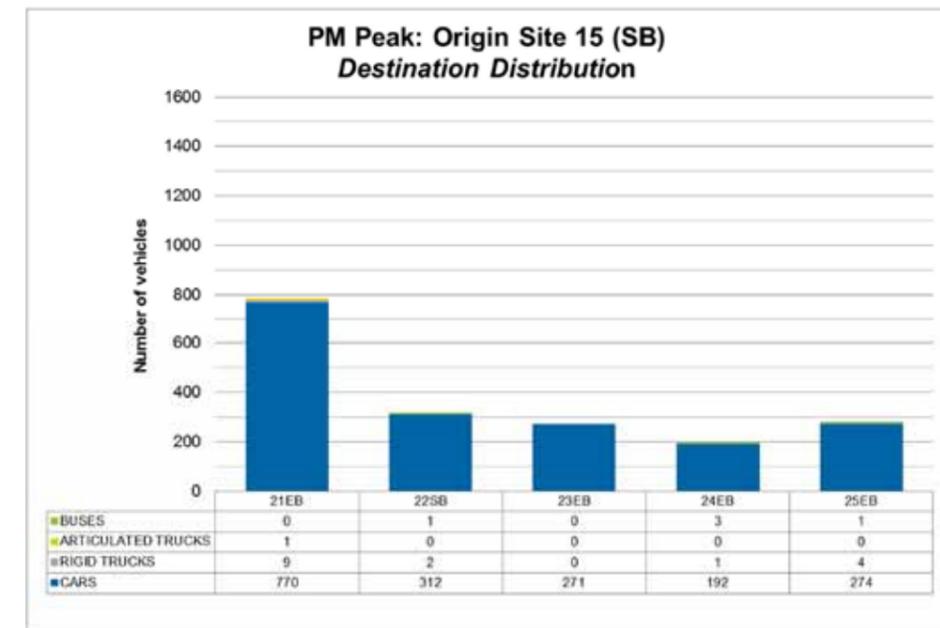


Figure 45 Movements from Site 15 SB Ingles Street in PM Peak



Site 14– Montague Street Eastbound

The peak period for this location was the PM peak (4pm-7pm) as vehicles were travelling away from the city. During this period it can be seen that:

- 2,130 vehicles were observed at this location. The vast majority (2,094) of vehicles were classed as light vehicles;
- A large majority of vehicles at this location (85%) were not matched at any of the outer cordon survey locations indicating a high proportion of local trips or trips to other destinations; and
- Trips to outer cordon points were very low relative to other trips. Most outer cordon points accounted for 5% or less of movements from Site 14 eastbound.

Figure 46 Movements from Site 14 EB Montague Street in AM Peak

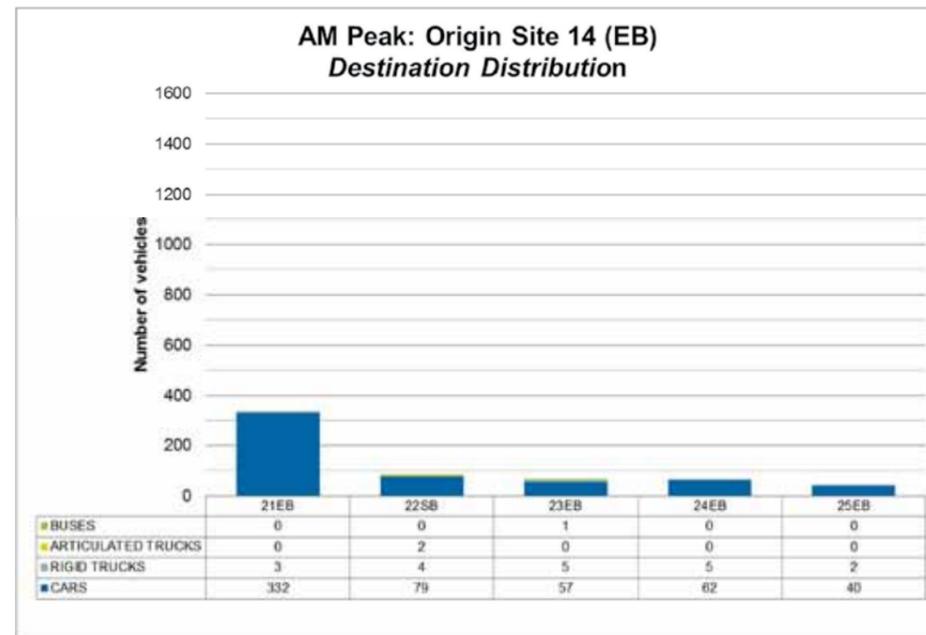


Figure 47 Movements from Site 14 EB Montague Street in Inter Peak

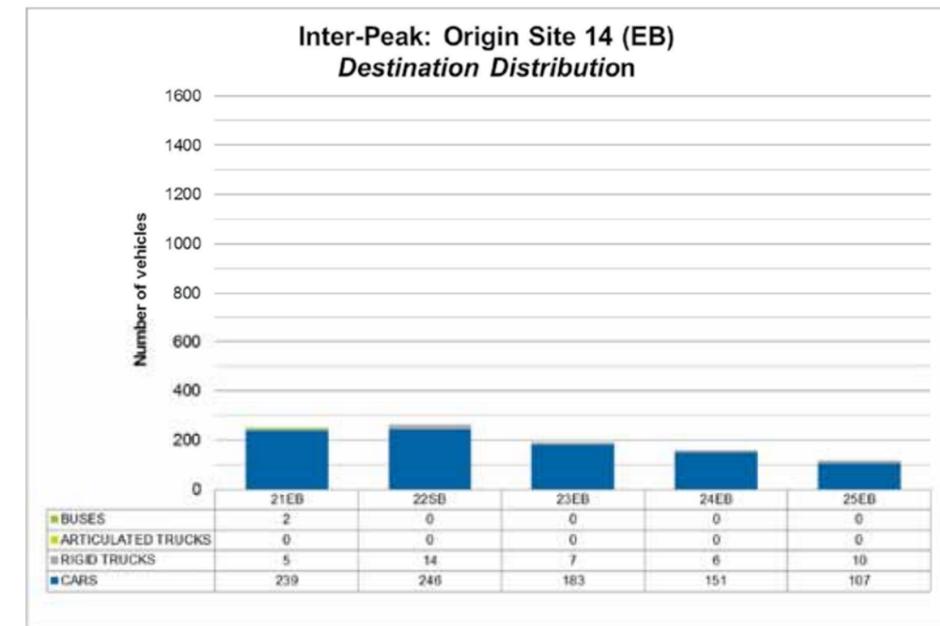
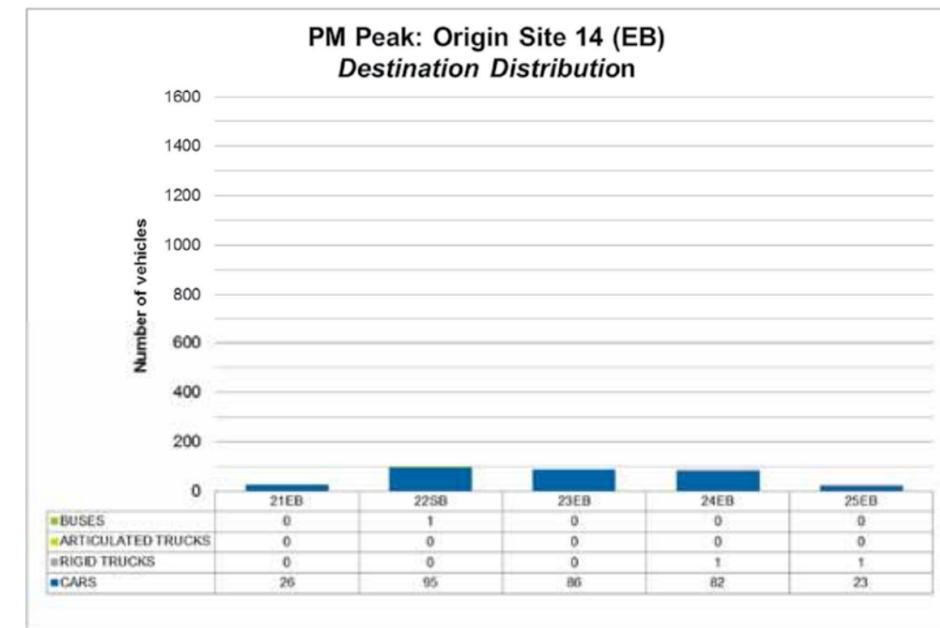


Figure 48 Movements from Site 14 EB Montague Street in PM Peak



Site 13- Ferrars Street Eastbound

The peak period for this location was the PM peak (4pm-7pm) as vehicles were travelling away from the city. During this period it can be seen that:

- 1,133 vehicles were observed, of which 1,130 were light vehicles;
- The most common destination in the outer cordon was Site 22 southbound (Canterbury Road). Approximately 43% of trips from Site 13 eastbound were matched at Site 22 southbound; and
- A large proportion (47%) of trips was to a destination other than a location on the outer cordon.

Figure 49 Movements from Site 13 EB Ferrars Street in AM Peak

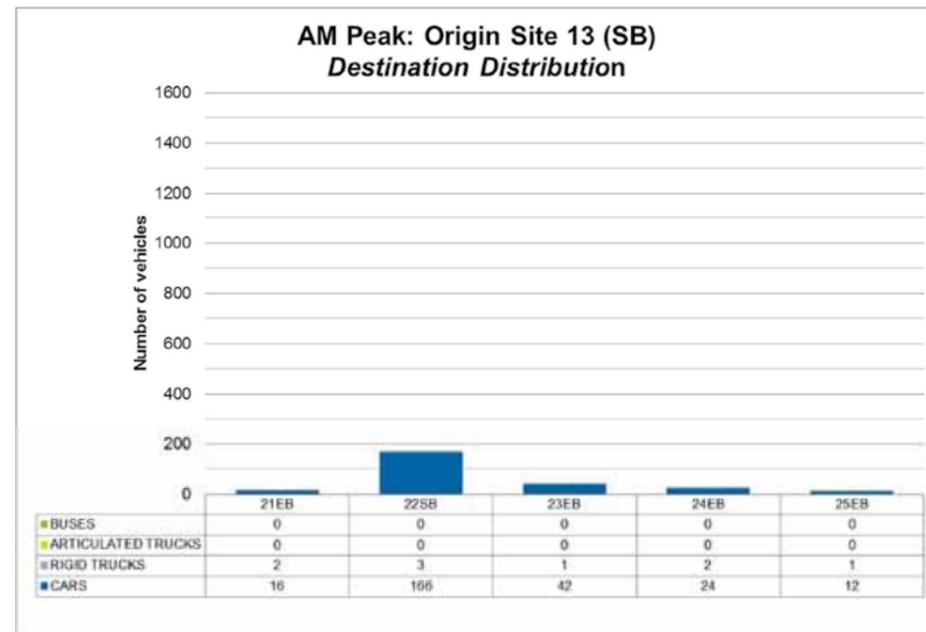


Figure 50 Movements from Site 13 EB Ferrars Street in Inter Peak

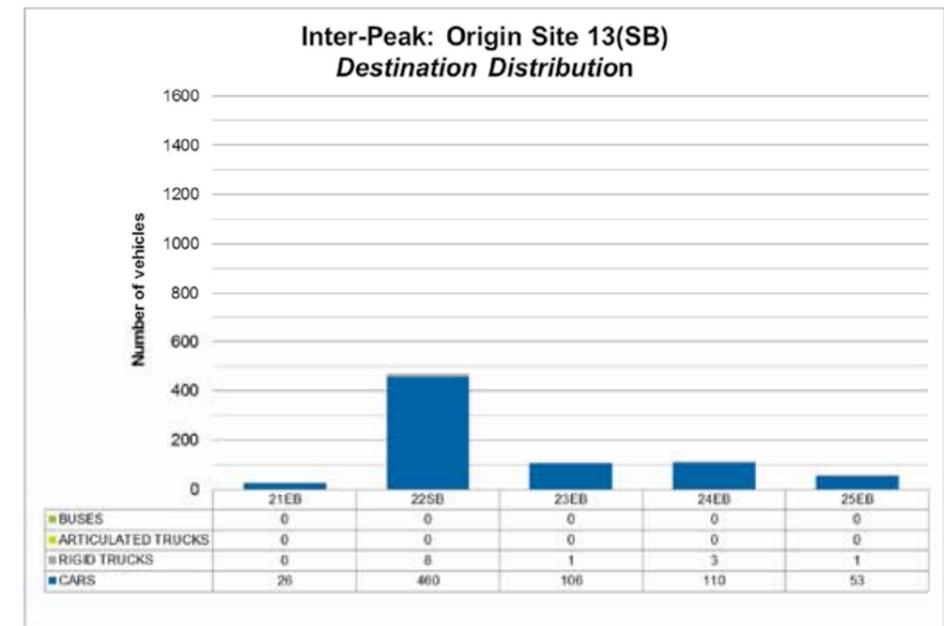
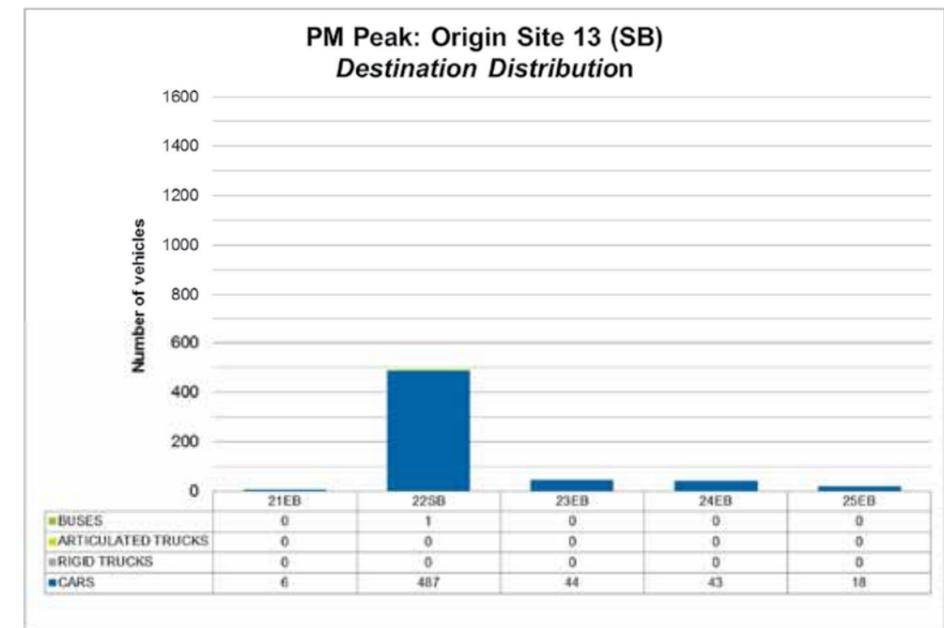


Figure 51 Movements from Site 13 EB Ferrars Street in PM Peak



Site 12- Cecil Street Southbound

The peak period for this location was the PM peak (4pm-7pm) as vehicles were travelling away from the city. During this period it can be seen that:

- A total of 668 vehicles were observed during this time period. The majority (656 vehicles) were light vehicles with no articulated trucks, and only 6 rigid trucks and buses respectively;
- Most trips (67%) were not matched at any of the outer cordon locations, indicating that these trips were to a local destination or another destination; and
- Other trips were split relatively evenly across each of the outer cordon locations. 11% of trips were to Site 22 southbound (Canterbury Road), 8% were to Site 23 eastbound (Albert Road) and 8% were to Site 24 eastbound (Park Street).

Figure 52 Movements from Site 12 SB Cecil Street in AM Peak

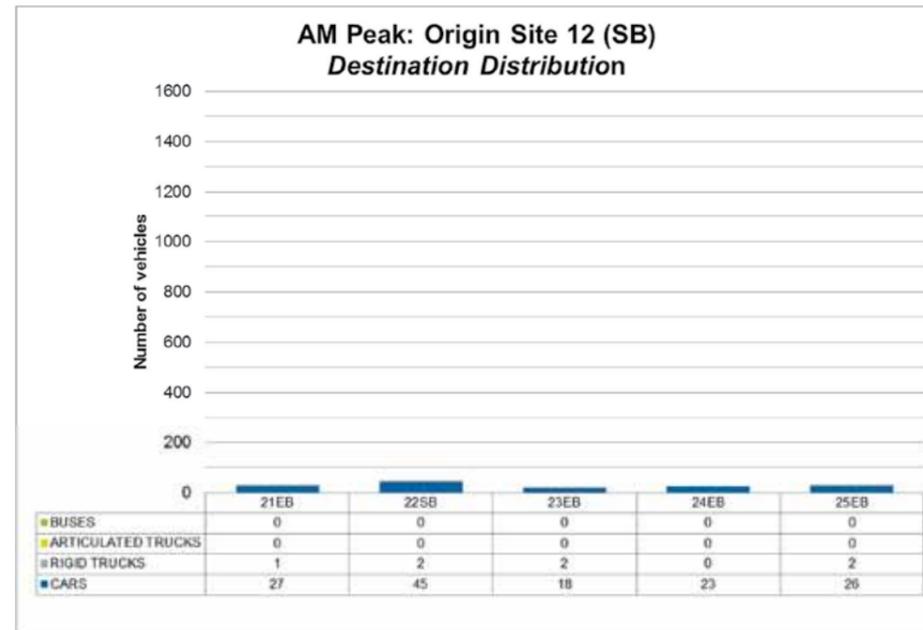


Figure 53 Movements from Site 12 SB Cecil Street in Inter Peak

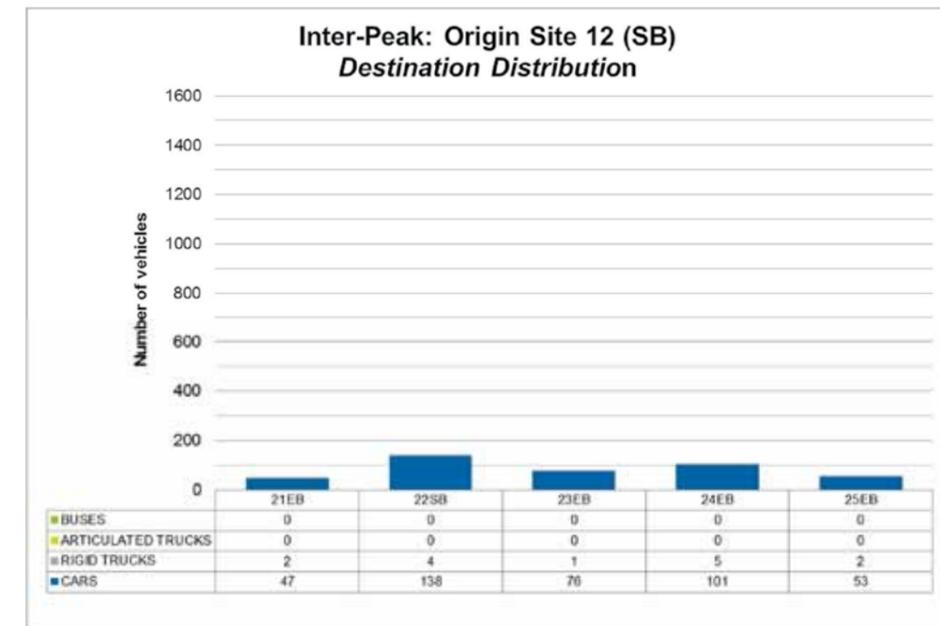
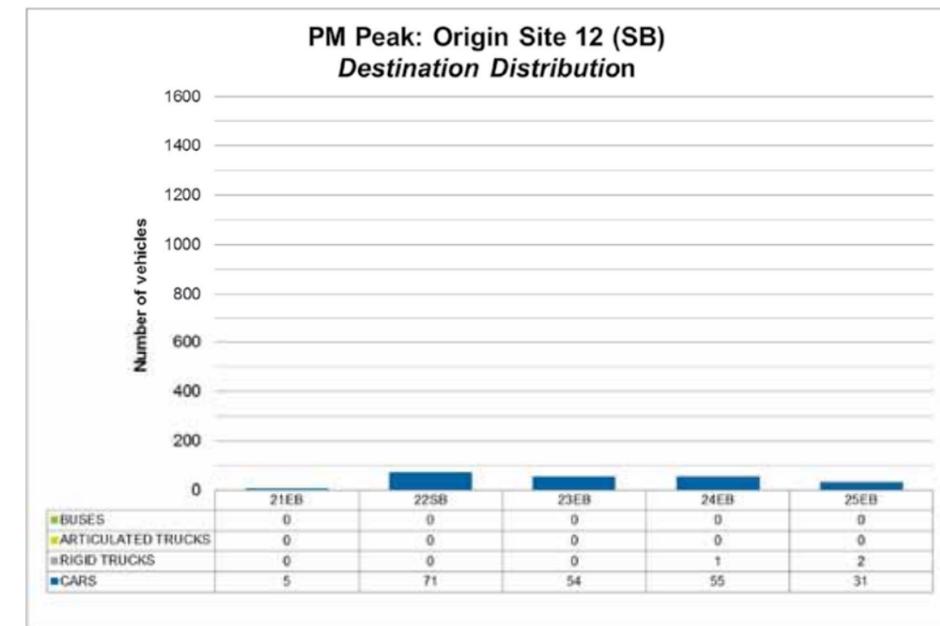


Figure 54 Movements from Site 12 SB Cecil Street in PM Peak



Appendix D – Origin/Destination Analysis Inner Cordon Sites

Site 1 NB – The Boulevard/Todd Road Northbound

Figure 55, Figure 56, and Figure 57 reveal that overwhelmingly the vast majority of vehicles entering the precinct via The Boulevard are destined for West Gate Freeway (both eastbound and westbound) or Todd Road northbound. This trend is consistent across the three time periods analysed. Only a small proportion of vehicles detected at this location were found to have an alternate destination. Accordingly, vehicles entering at this location are almost all through-trips utilising Todd Road. Also, almost all vehicles were found to be cars, with only a small proportion of trucks detected.

Figure 55 AM Peak Site 1NB (Todd Road northbound)

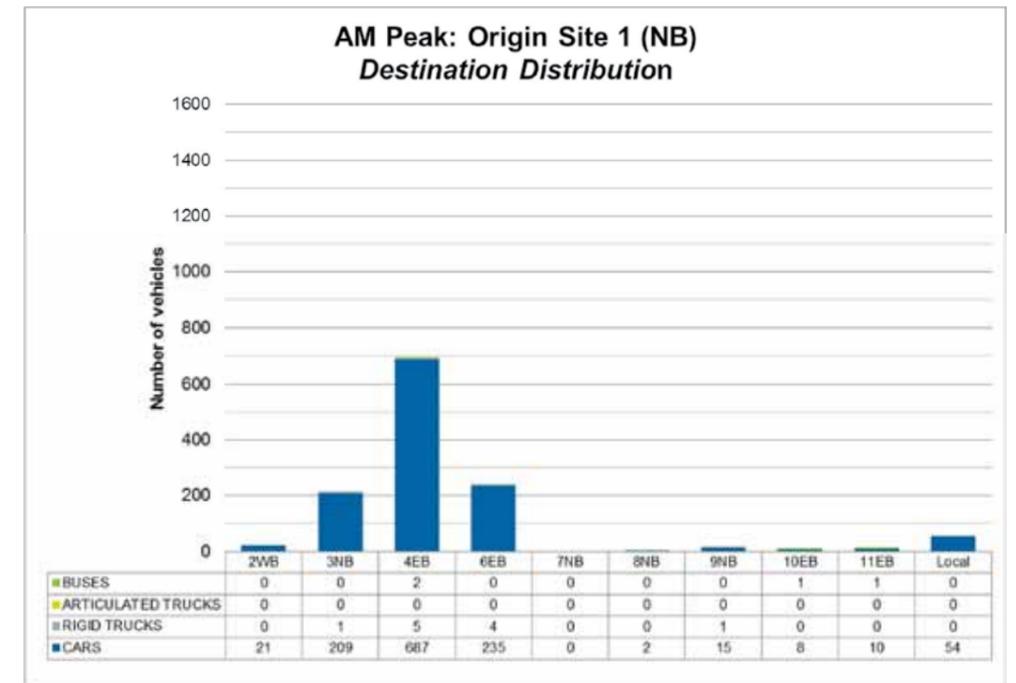


Figure 56 Inter-Peak Site 1NB (Todd Road northbound)

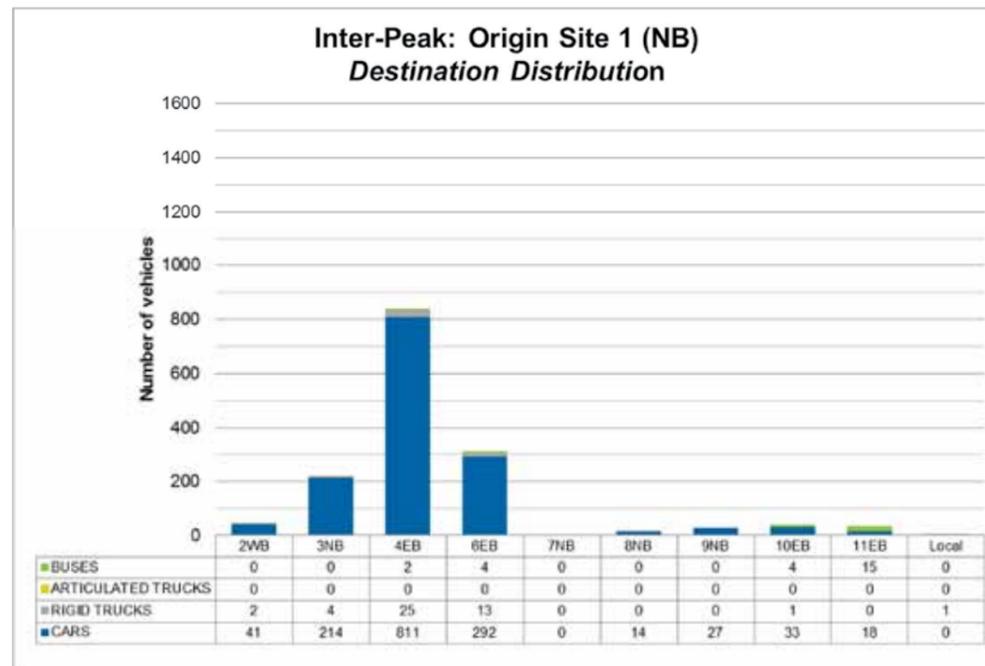
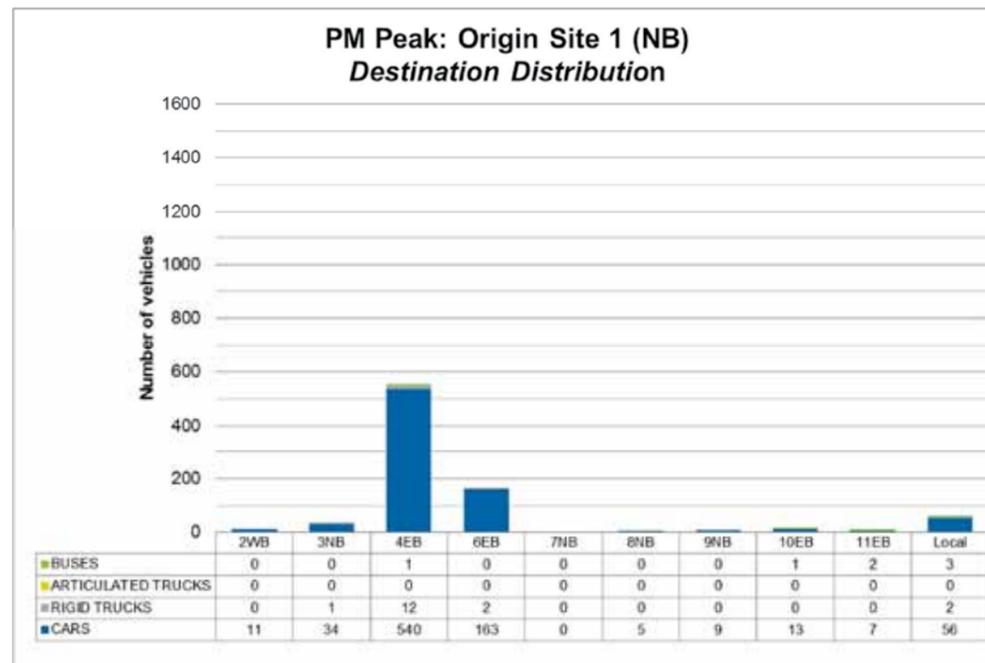


Figure 57 PM Peak Site 1NB (Todd Road northbound)



Site 3 SB – Todd Road Southbound

Figure 58, Figure 59 and Figure 60 demonstrates the following key trends for vehicles entering the precinct on Todd Road north of West Gate Freeway:

- Across the three survey periods, approximately 5,500 vehicles were recorded, however only 800 and 1,300 of these were during the AM peak and PM peak periods respectively;
- None of these trips were identified as having a Fishermans Bend destination;
- The majority of trips were bound for West Gate Freeway, approximately 60% across the three time periods. Heavy vehicles represent 13% of these trips on average;
- The proportion of trips travelling through the study network to Graham Street, Bridge Street and Ingles Street is approximately 9%, of which 10% are heavy vehicles.

Figure 58 AM Peak Site 3SB (Todd Road southbound)

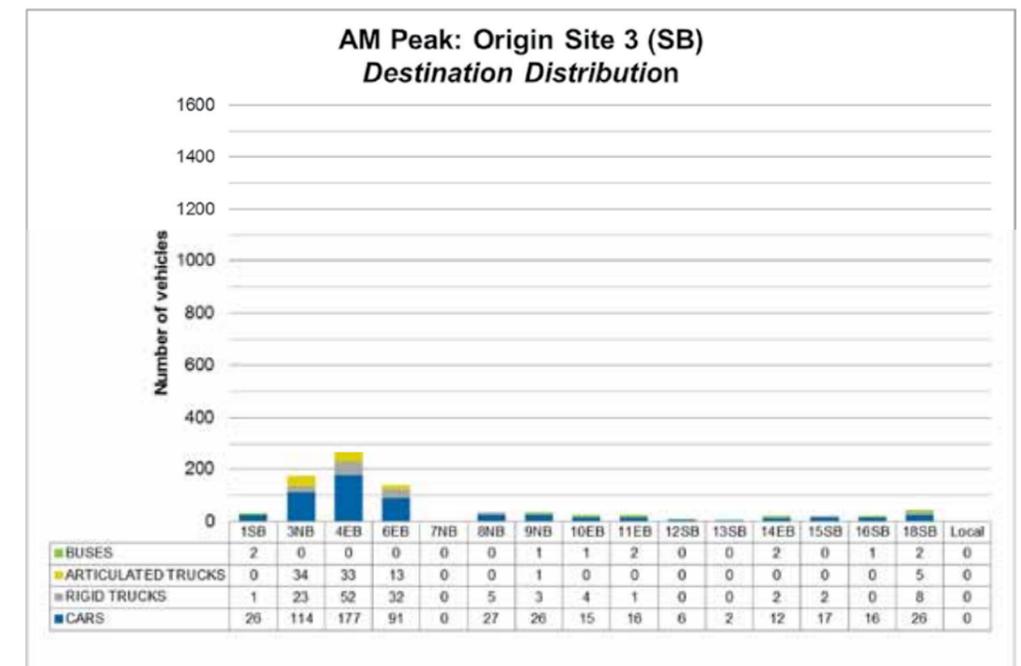


Figure 59 Inter-Peak Site 3SB (Todd Road southbound)

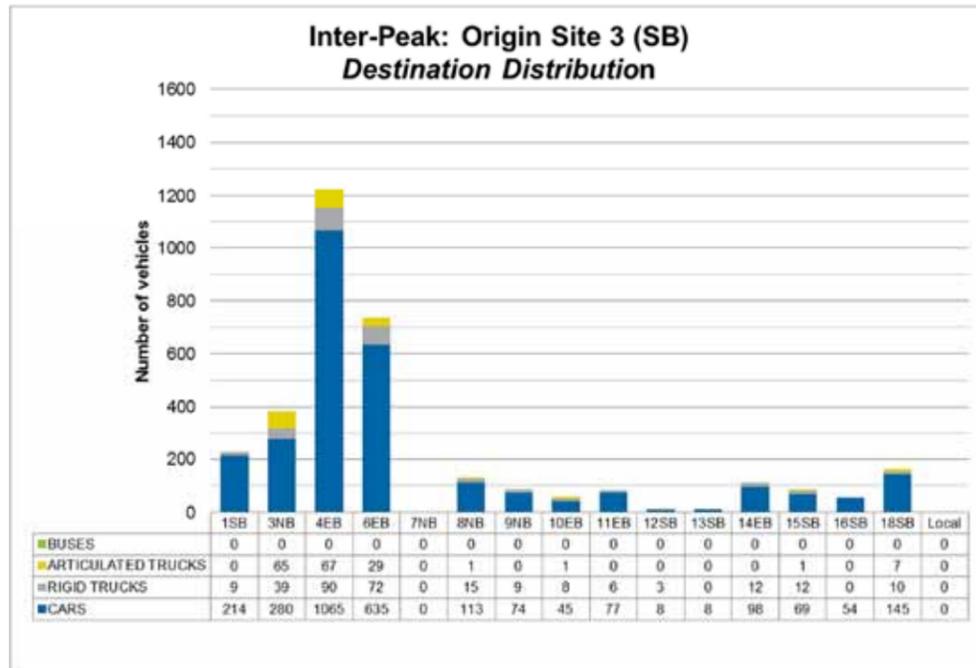
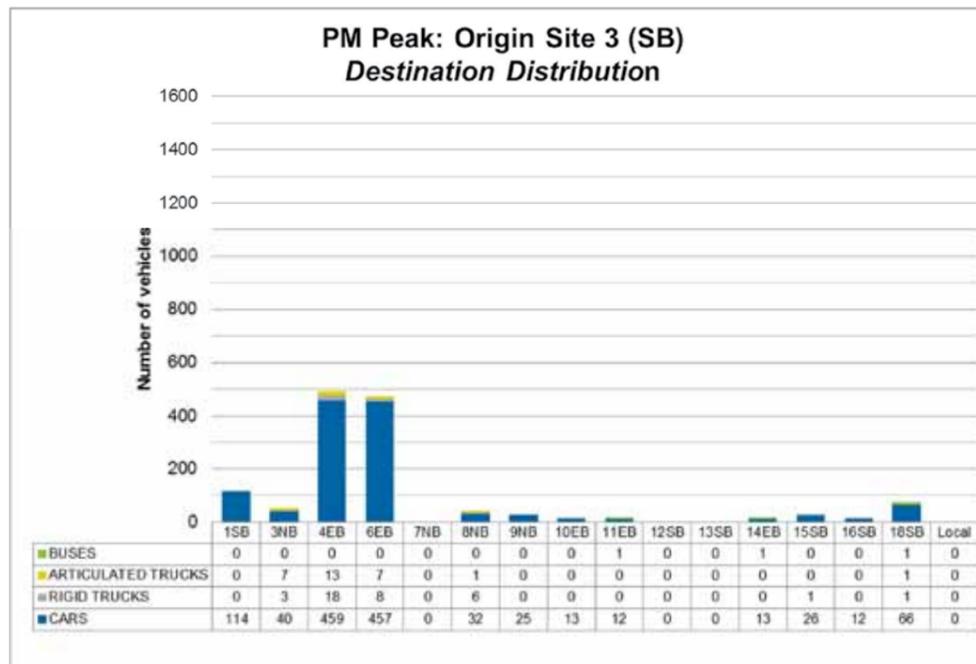


Figure 60 PM Peak Site 3SB (Todd Road southbound)



Site 4 WB – West Gate Freeway Westbound Exit

As presented in Figure 61, Figure 62 and Figure 63 the following trends were observed for vehicles entering the precinct via the West Gate Freeway westbound exit ramp:

- The surveys indicated approximately 2,100, 2100, and 380 vehicles during the AM peak, inter-peak, and PM peak respectively.
- Approximately one third of vehicles entering the precinct at this location ultimately exit the area back onto West Gate Freeway eastbound via Cook Street;
- Similarly, approximately one third of vehicles exiting the freeway were found to travel northbound on Todd Road. Of these vehicles heavy vehicle proportions were 15%, 33% and 20% for the AM peak, inter-peak and PM peak respectively;
- Very few vehicles were found to be unmatched;
- During the inter-peak period 250 vehicles were destined for Web Dock, of which 27% and 44% were rigid and articulated trucks respectively;
- During the AM peak period 120 vehicles were destined for Web Dock, 50% of which were heavy vehicles;
- The PM peak period revealed low traffic volumes (380 for the three hour duration), of which 140 (and all cars) were destined for The Boulevard connecting the residential and waterfront precincts.
- During the AM and inter-peak periods the proportion of vehicles found to be travelling through the network to Montague Street, Ingles Street, Bridge Street and Graham Street were 2%, 3%, 1% and 4% respectively. Of these four destinations (from West Gate Freeway westbound exit), 56 trucks were recorded between 7am and 4pm.

Figure 61 AM Peak Site 4WB (West Gate Westbound Exit)

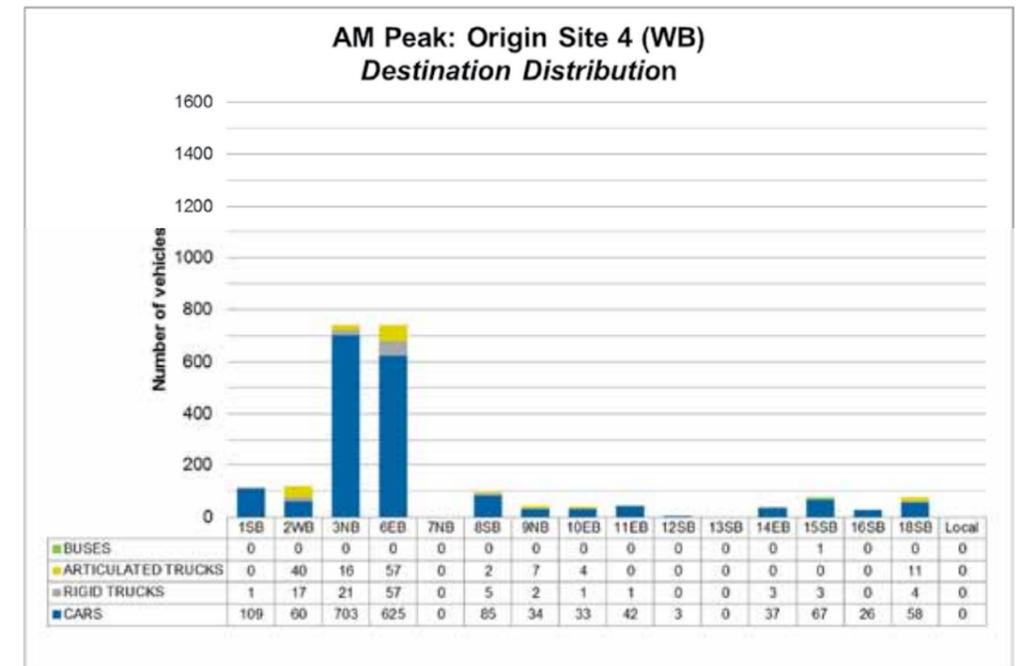


Figure 62 Inter-Peak Site 4WB (West Gate Westbound Exit)

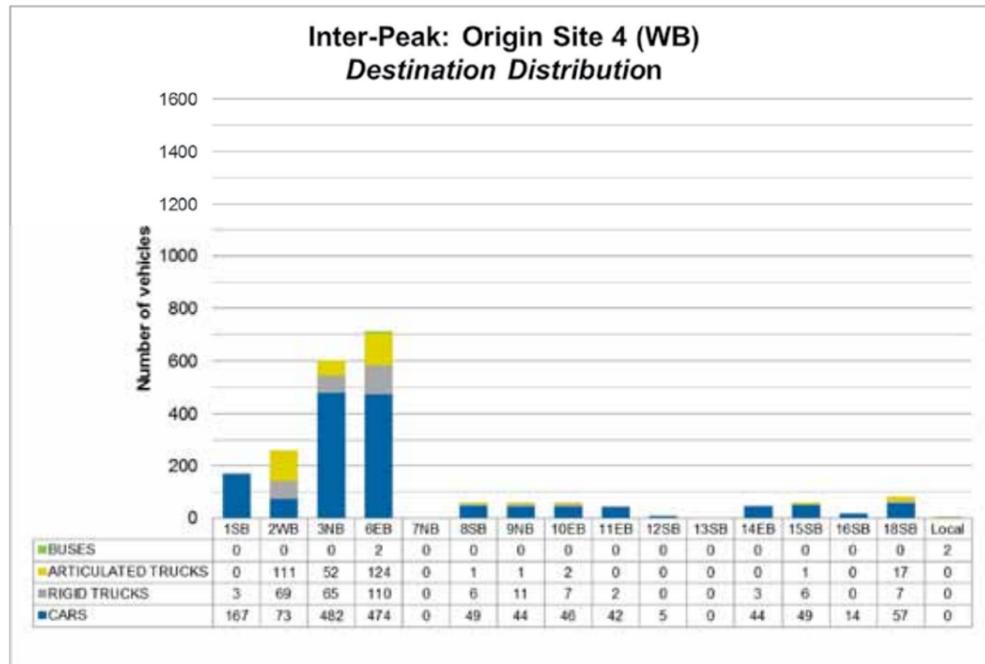
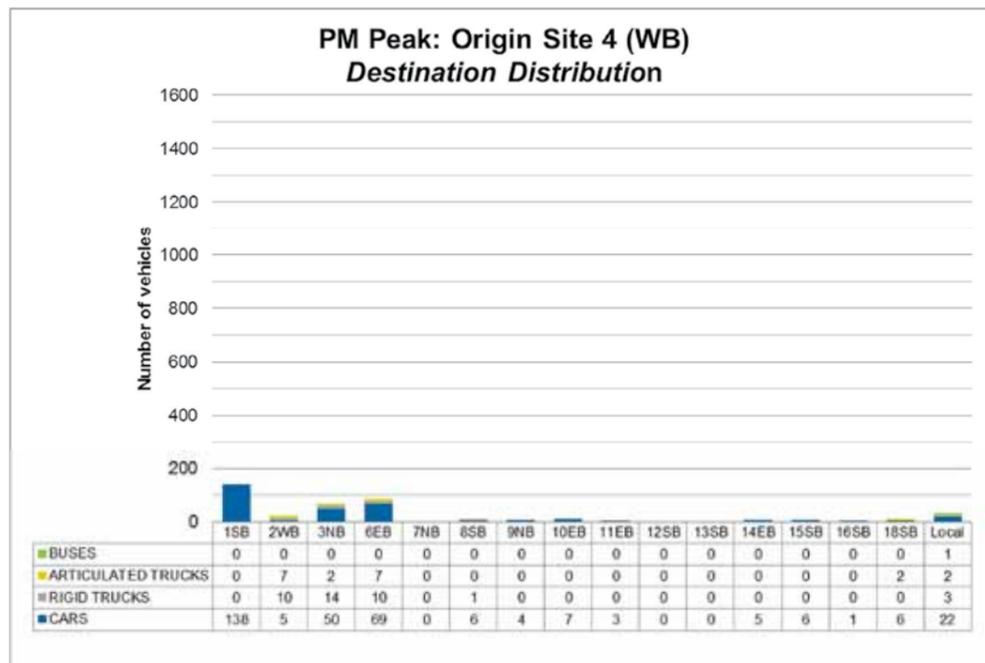


Figure 63 PM Peak Site 4WB (West Gate Westbound Exit)



Site 5 EB - West Gate Freeway Eastbound Exit

As presented in Figure 64, Figure 65 and Figure 66 the following trip patterns were observed at the West Gate Freeway eastbound exit ramp:

- The surveys indicate that approximately 5,200, 5,000 and 2,600 vehicles during AM peak, inter-peak, and PM peak respectively. Throughout the 12 hour survey period, approximately 12,800 vehicles were recorded travelling east along this exit ramp;
- Light vehicles represented 87% of all vehicles recorded at this location. The PM peak period recorded the highest proportion of light vehicles, representing 94% of all vehicles;
- A high proportion of vehicles in the AM and inter-peak periods travel through site 4, which provides access to the light industrial areas, possibly via Plummer Street;
- In the AM and inter-peak periods, 14% and 19% of all trips respectively travelled through the study area and exited at Site 18 on Graham Street.
- Other key through routes were Todd Road both north of the freeway and south of Williamstown Road, representing between 20%-30% of all trips in each peak period.
- There were no trips in the AM peak and inter-peak periods with a final destination with the Fishermans Bend precinct.

Figure 64 AM Peak Site 5EB (West Gate Freeway Eastbound)

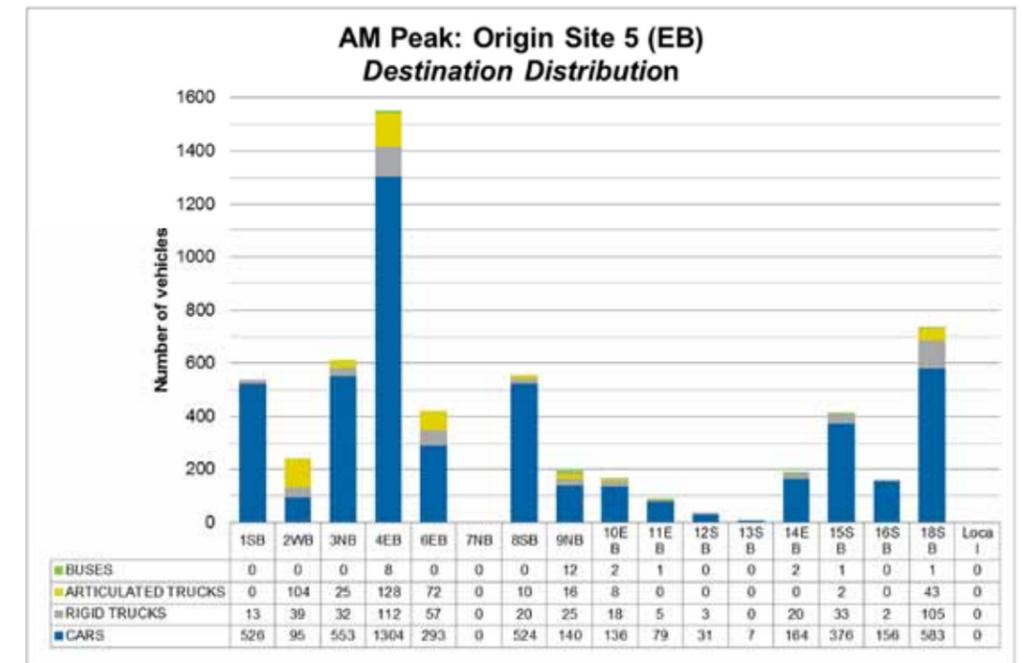


Figure 65 Inter-Peak Site 5EB (West Gate Freeway Eastbound)

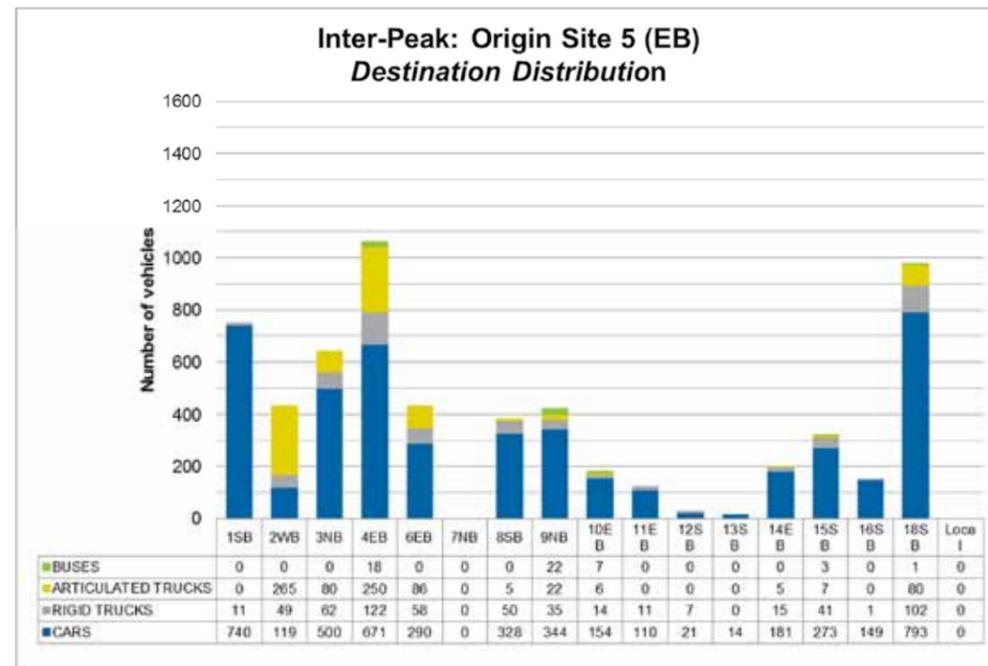
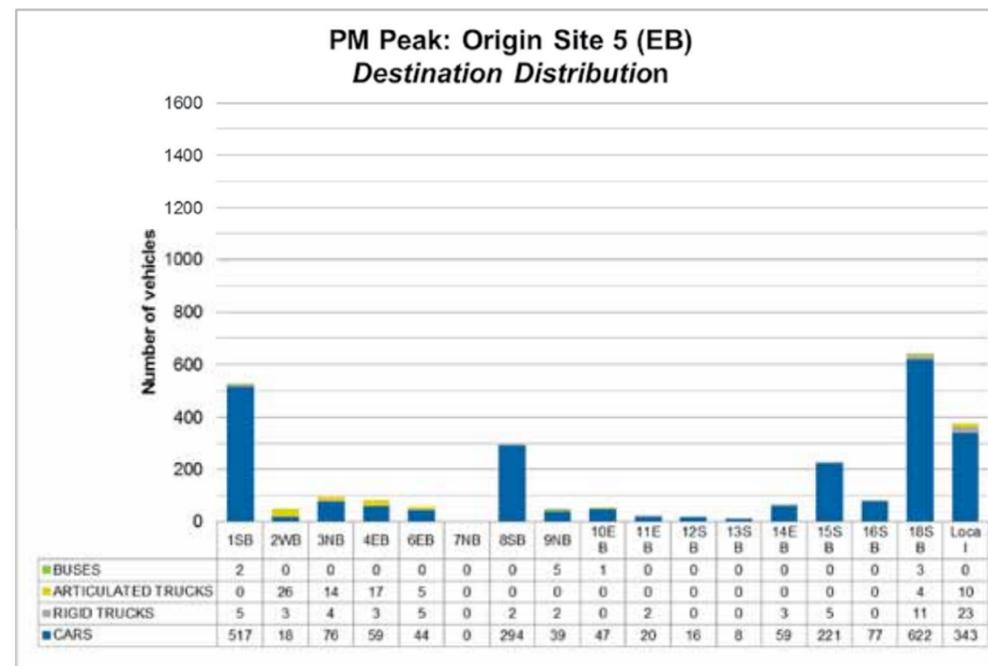


Figure 66 PM Peak Site 5EB (West Gate Freeway Eastbound)



Site 7 SB – Salmon Street Southbound

Analysis of the OD data for Site 7SB is shown in Figure 67, Figure 68 and Figure 69. Of the matched vehicles, the following trends were identified:

- The most prominent destination for vehicles travelling southbound on Salmon Street was found to be Graham Street. This movement represents north to south trips through the network with vehicles likely utilising either Plummer Street or Williamstown Road within the precinct;
- Total traffic volumes at this location were found to be approximately 800, 2,000 and 2,000 during the AM peak, inter-peak and PM peak periods respectively. Of these volumes 12% were heavy vehicles during the AM and inter-peak periods, whereas only 3% of vehicles were trucks during the PM peak.
- During the AM and inter-peak periods, approximately 20% of vehicles were bound for West Gate Freeway, with only 5% during the PM peak.
- The destinations of Montague Street, Ingles Street, and Bridge Street were each found to attract approximately 5% of vehicles travelling southbound on Salmon Street.

Figure 67 AM Peak Site 7SB (Salmon Street Southbound)

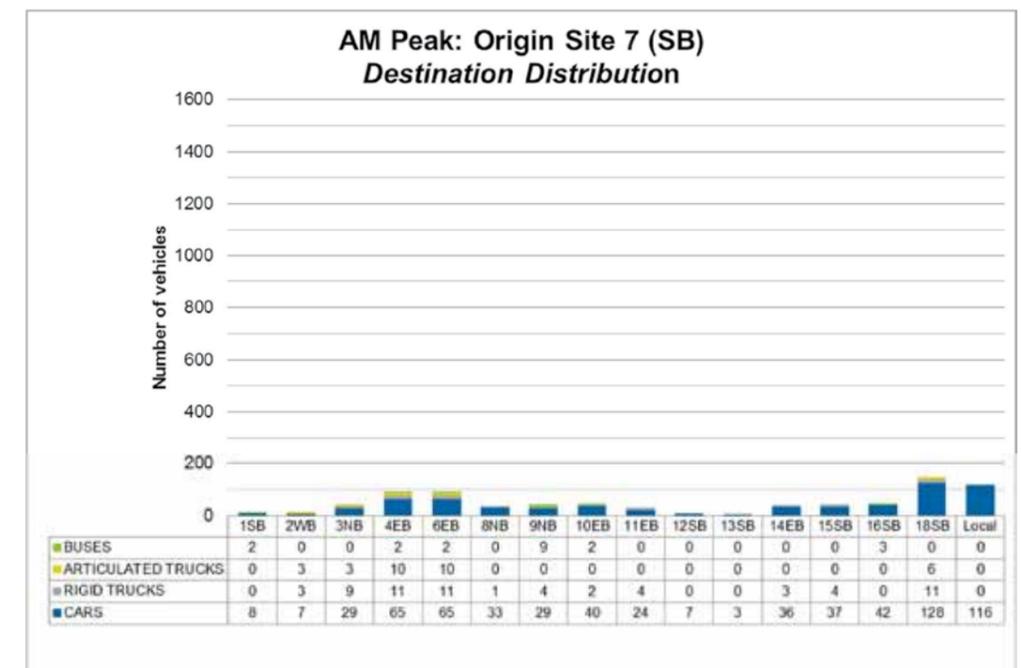


Figure 68 Inter-Peak Site 7SB (Salmon Street Southbound)

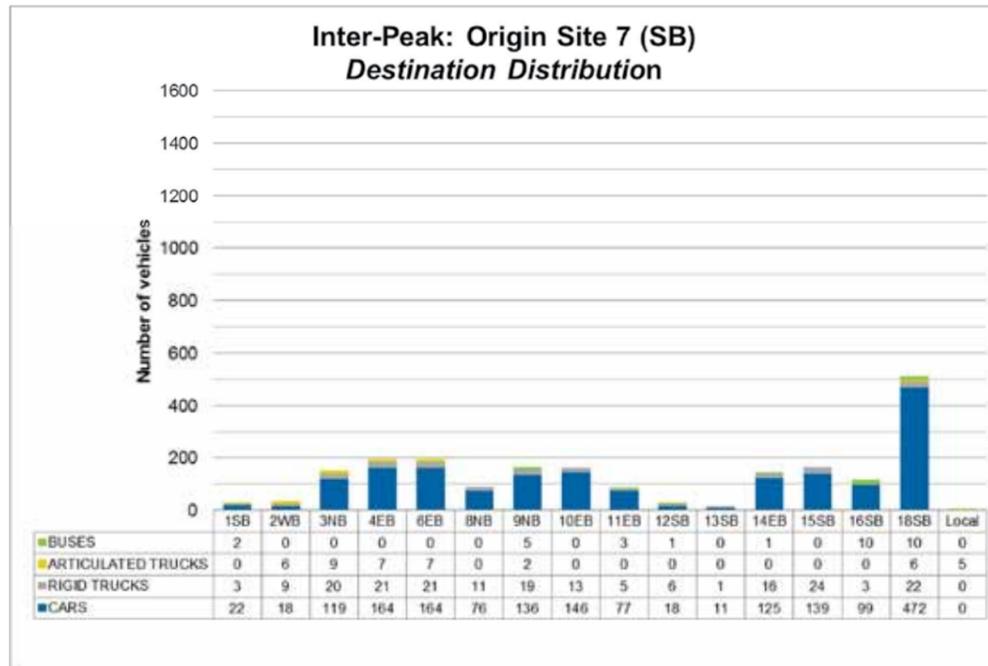
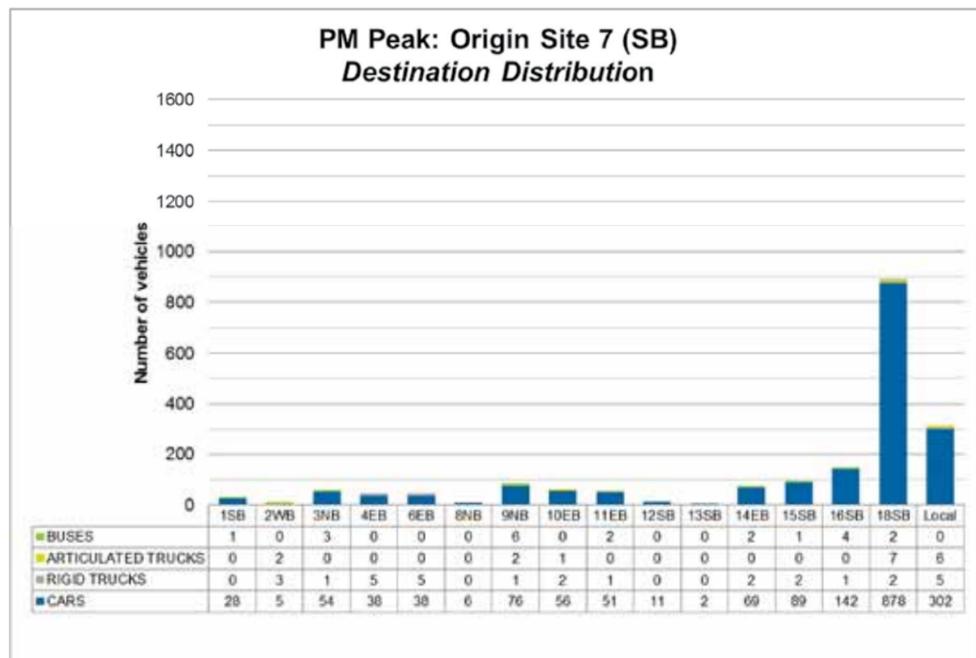


Figure 69 PM Peak Site 7SB (Salmon Street Southbound)



Site 8 SB – Ingles Street Southbound (south of Lorimer Street)

As presented in Figure 70, Figure 71 and Figure 72 the following trip patterns were observed:

- Recorded traffic volumes on Ingles Street southbound south of Lorimer Street were found to be approximately 1,500, 3000 and 2,400 during the AM peak, inter-peak and PM peak respectively;
- Heavy vehicles were found to represent approximately 6% of trips during the AM and inter-peak periods, however only 1% during the PM peak;
- A substantial proportion (approximately 50%) of vehicles recorded at this location were found to be travelling all the way through the precinct on Ingles Street;
- Other prominent destinations for vehicles travelling southbound on Ingles Street included Montague Street, Normanby Road, and City Road;
- During the AM peak approximately 100 vehicles were observed to be unmatched, however there were almost no unmatched trips during the remaining time periods.

Figure 70 AM Peak Site 8SB (Salmon Street Southbound)

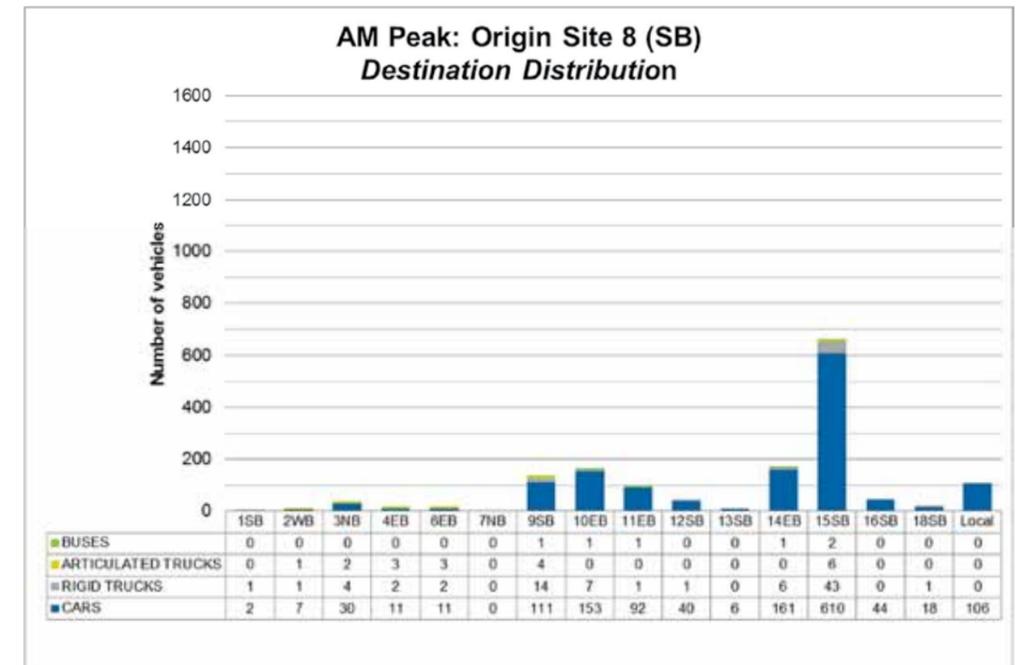


Figure 71 Inter-Peak Site 8SB (Salmon Street Southbound)

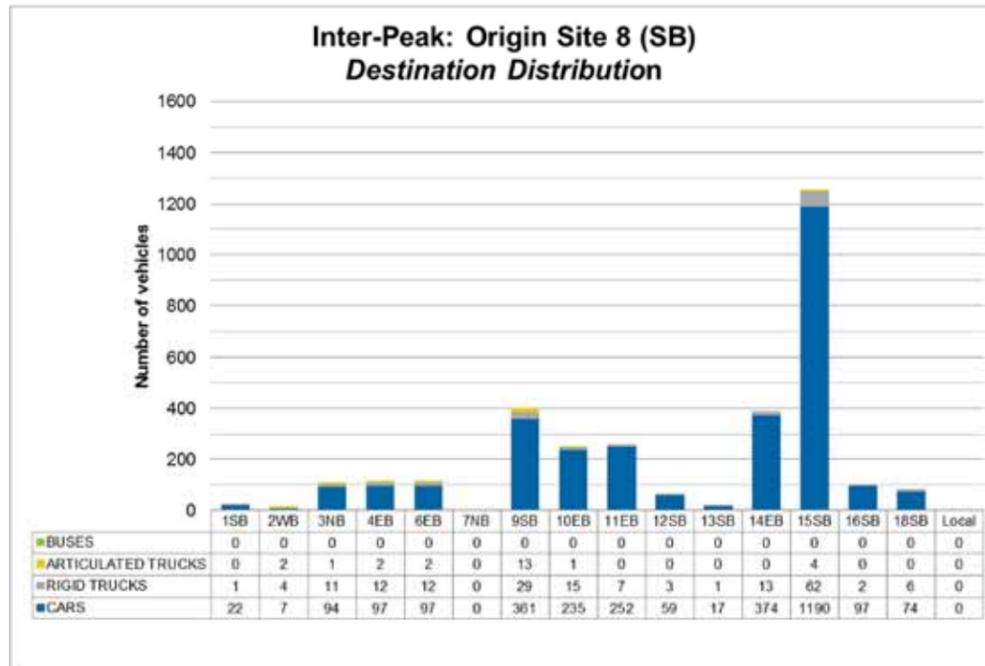
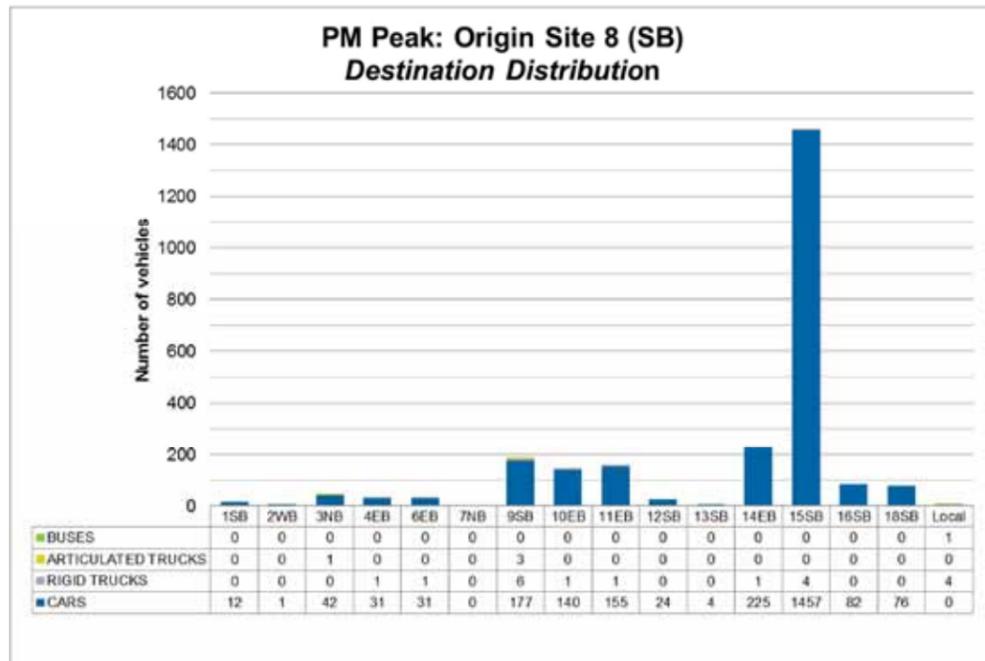


Figure 72 PM Peak Site 8SB (Salmon Street Southbound)



Site 9 SB – Montague Street Southbound

As presented in Figure 73, Figure 74 and Figure 75 the following trip patterns were observed:

- The dominate through movements of vehicles detected on Montague Street southbound destinations through to Normanby Road, City Road, Montague Street (south), and Ingles Street.
- Southbound volumes at this location remain relatively high throughout the duration of the day with approximately 6,300, 8,300 and 5,800 vehicles during the AM peak, inter-peak and PM peak periods respectively.
- The data suggests that 55% (3,500 vehicles), 43% (3,600 vehicles) and 61% (3,500 vehicles) during the AM peak, inter-peak and PM peak were unmatched. It should be noted that the cordon sites around the Montague Street area do not represent a completed closed network.
- Heavy vehicle proportions ranged from 1% during the PM peak to 5% during the inter-peak period. However, of the trips that we unmatched, between 0% - 1% of these vehicles were trucks.

Figure 73 AM Peak Site 9SB (Montague Street Southbound)

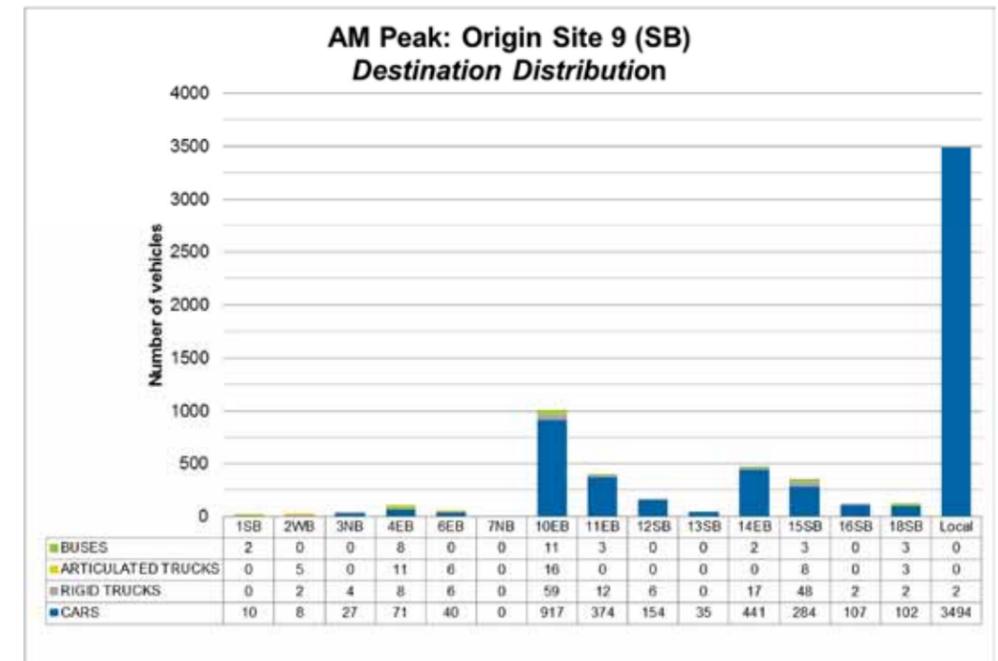


Figure 74 Inter-Peak Site 9SB (Montague Street Southbound)

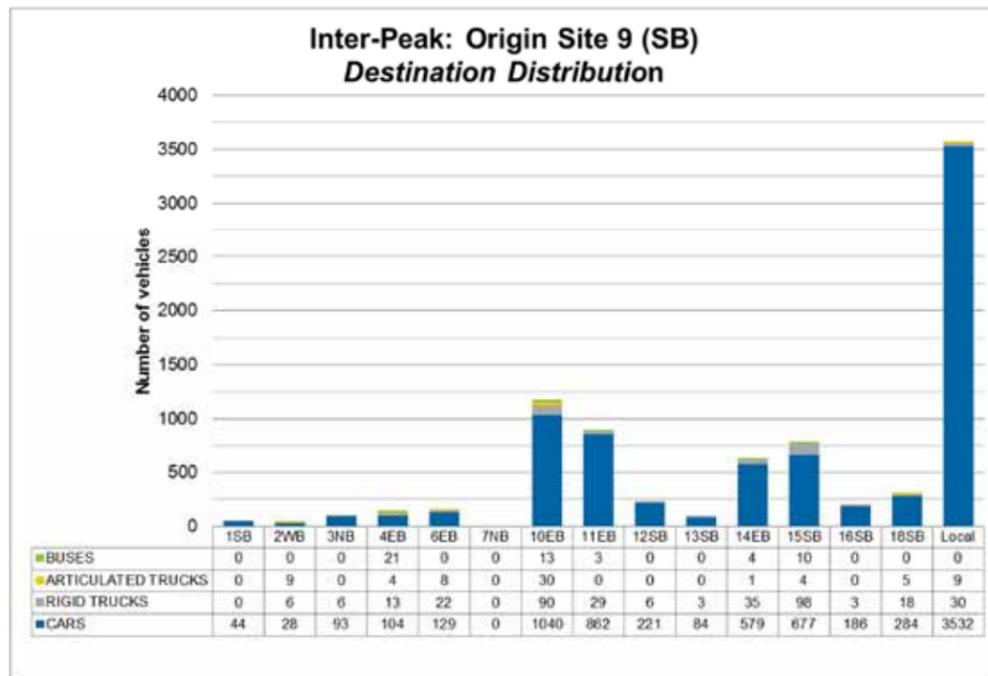
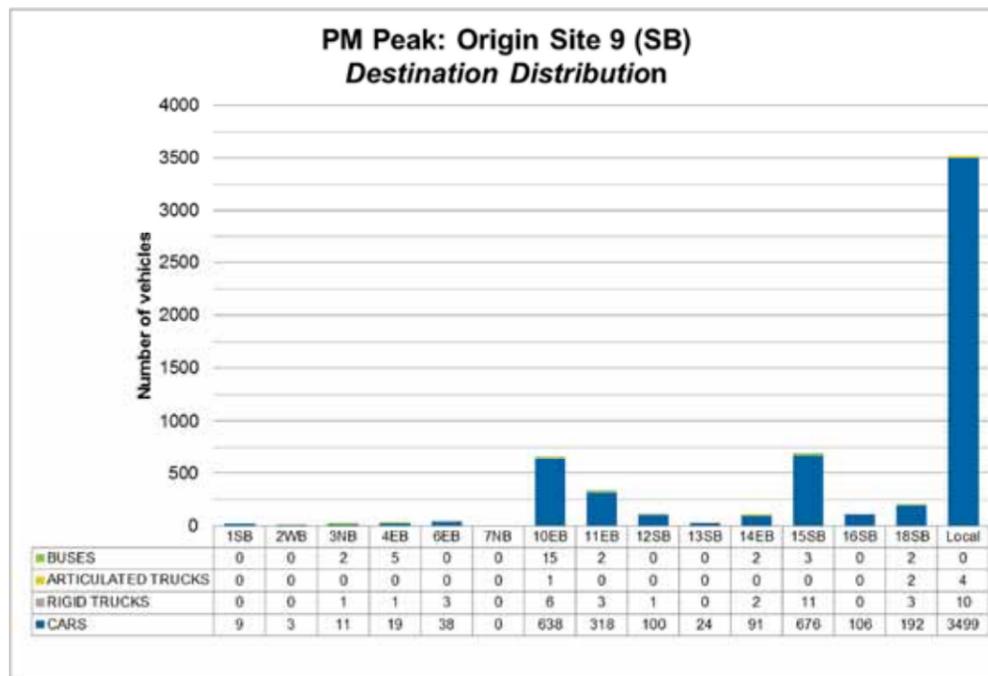


Figure 75 PM Peak Site 9SB (Montague Street Southbound)



Site 10 WB – Normanby Road Westbound

Analysis of the OD data for Site 10WB is shown in Figure 76, Figure 77 Figure 67and Figure 78. The following trends were identified:

- There were approximately 600 (44%), 280 (12%) and 170 (14%) trips originating from Normanby Road which were travelling to a local destination during the AM peak, inter-peak, and PM peak periods respectively. Of these trips up to 5% were identified as heavy vehicles.
- The prominent through movement path consisted of vehicles utilising Montague Street (northbound). To a lesser degree through movements also utilised Ingles Street, Montague Street (southbound), and City Road.
- Throughout the three survey periods, a total of 368 vehicles were observed to utilise Normanby Road to access Todd Road, Cook Street and Webb Dock.

Figure 76 AM Peak Site 10WB (Normanby Road Westbound)

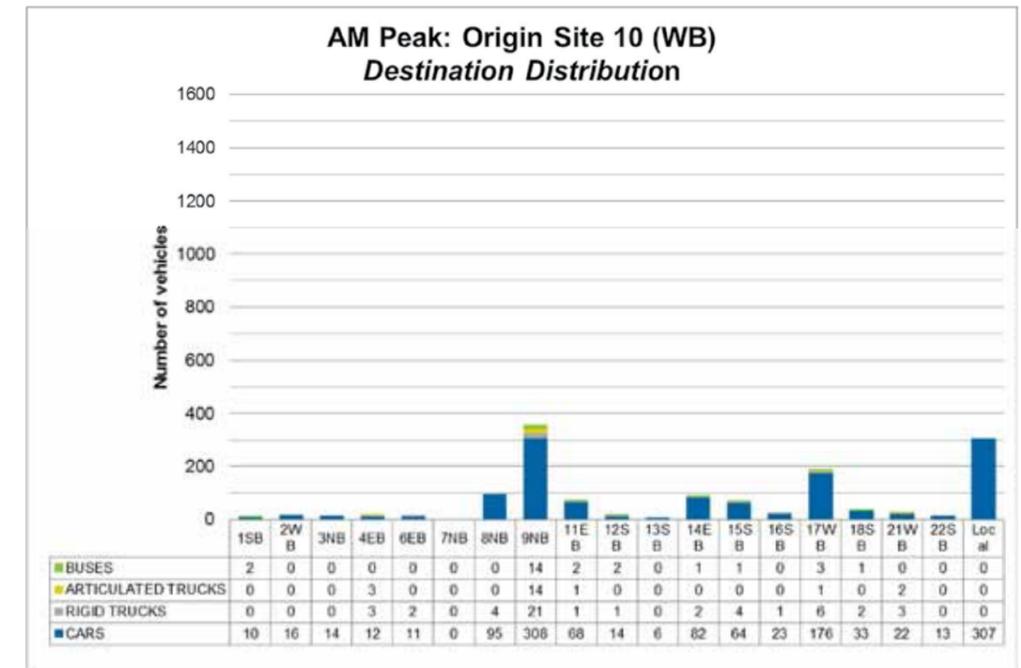


Figure 77 Inter-Peak Site 10WB (Normanby Road Westbound)

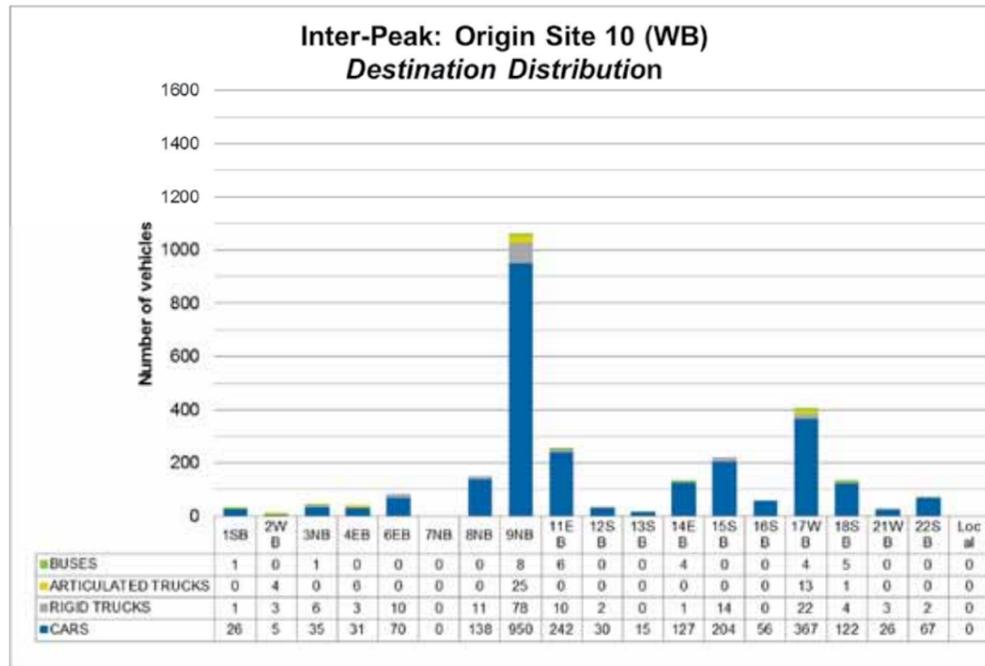
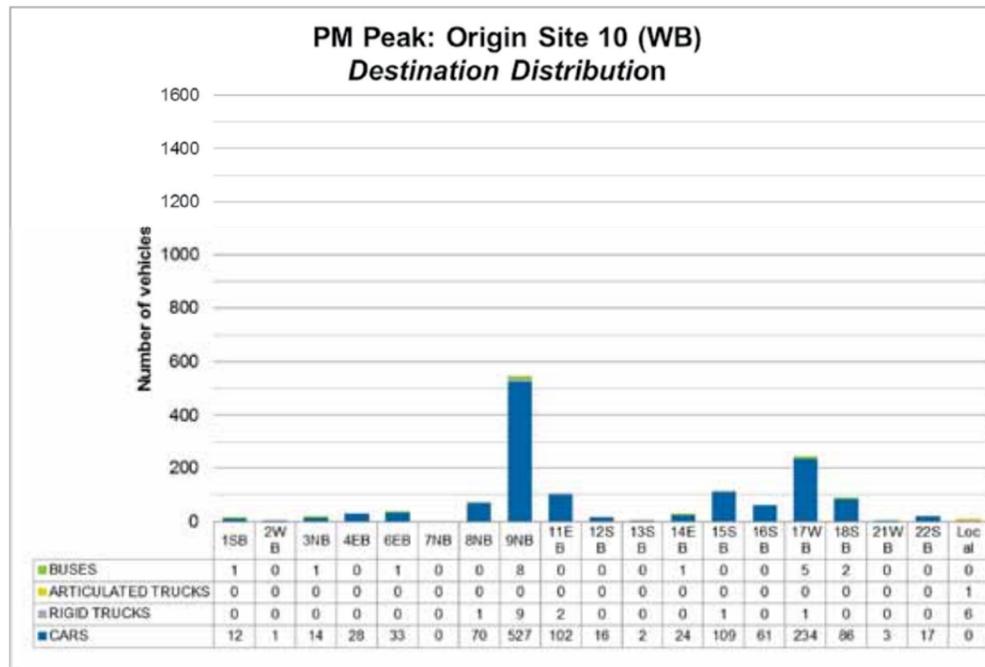


Figure 78 PM Peak Site 10WB (Normanby Road Westbound)



Site 11 WB – City Road Westbound

As presented in Figure 79, Figure 80 and Figure 81 the following trip patterns were observed:

- Vehicles entering via City Road were typically found to travel through the study area during the AM and inter-peak periods by utilising Montague Street, Ferrars Street, Cecil Street and Ingles Street;
- During the PM peak however, 22% (of the 2,800 vehicles surveyed) were not detected leaving the study area cordon. The dominant through movements during the PM period were to Ferrars Street and Montague Street.
- Truck volumes were up to 5% during the AM peak, but only 1% during the PM period, and 3% during the inter-peak duration;
- The volume of vehicles travelling from the eastern extent of the cordon (originating at City Road) to the western extent (i.e. Todd Road, Cooke Street or Webb Dock) were 103 (5% of total), 317 (7% of total), and 72 (3% of total) during the AM peak, inter-peak and PM peak respectively.

Figure 79 AM Peak Site 11WB (City Road Westbound)

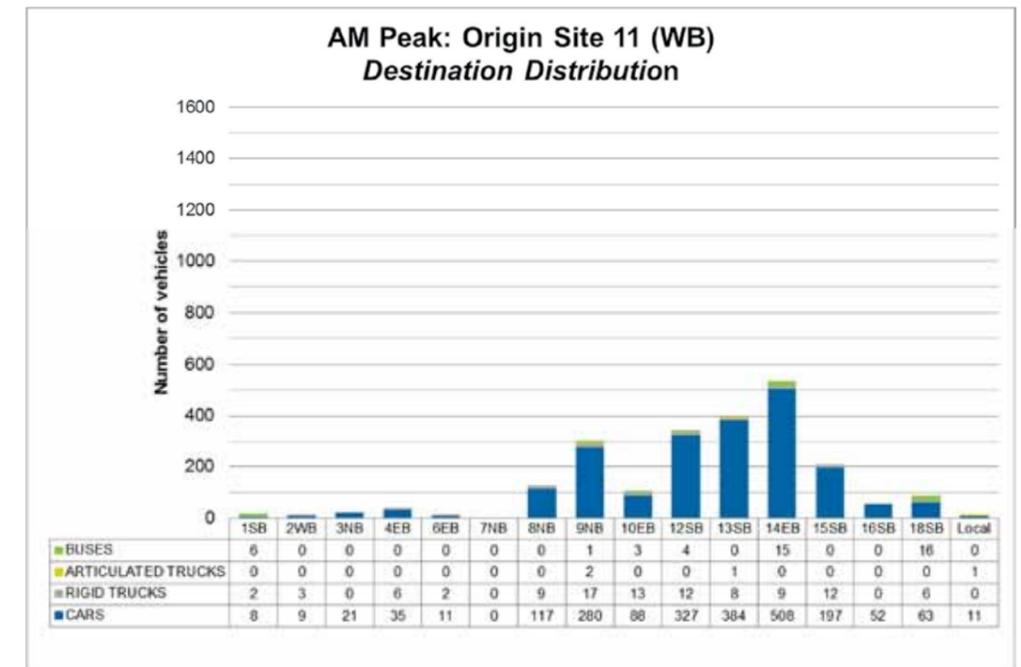


Figure 80 Inter-Peak Site 11WB (City Road Westbound)

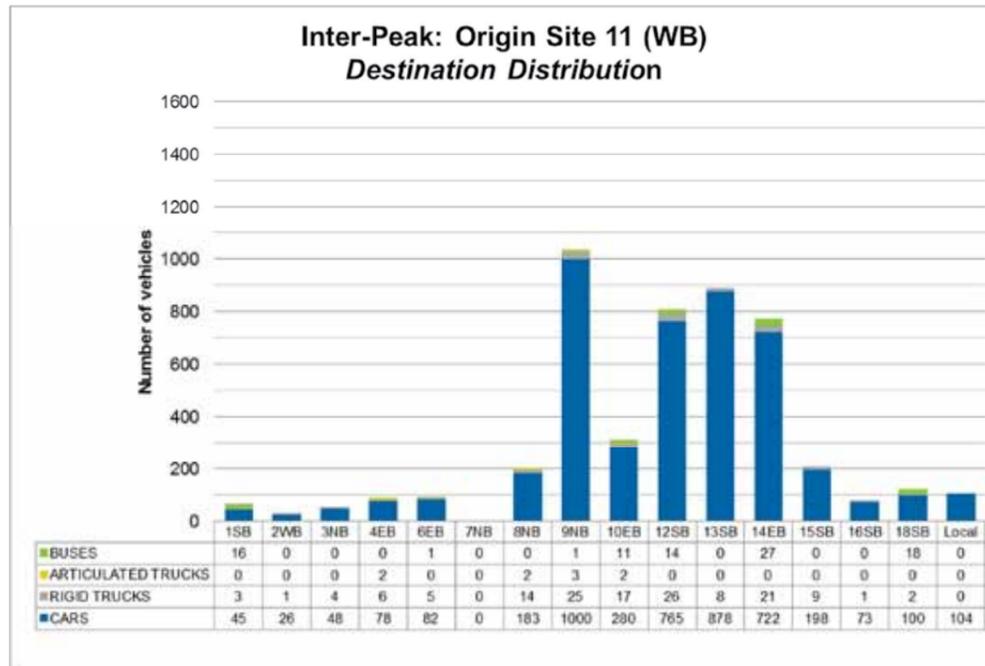
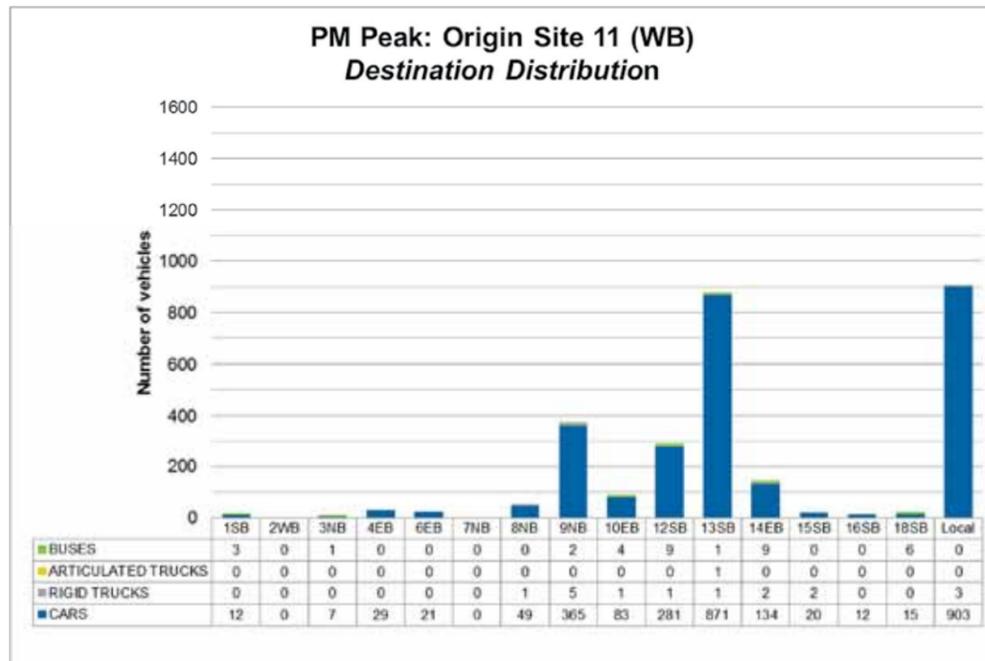


Figure 81 PM Peak Site 11WB (City Road Westbound)



Site 12 NB – Cecil Street Northbound

As presented in Figure 82, Figure 83 and Figure 84 the following trip patterns were observed:

- The data recorded for Cecil Street indicates 400 vehicles were recorded during the three hour AM peak period, 900 vehicles during the inter-peak period, and 350 vehicles during the PM peak period.
- Of the recorded vehicles, up to 3% of these had local destinations during the AM and inter-peak periods, whereas during the PM peak 29% of these vehicles were unmatched.
- The majority of through traffic was found to utilise City Road or Montague Street to exit the study area.
- Relatively low levels of heavy vehicles were recorded, that is, 6%, 4% and 1% heavy vehicles during the AM peak, inter-peak and PM peak respectively.

Figure 82 AM Peak Site 12NB (Cecil Street Northbound)

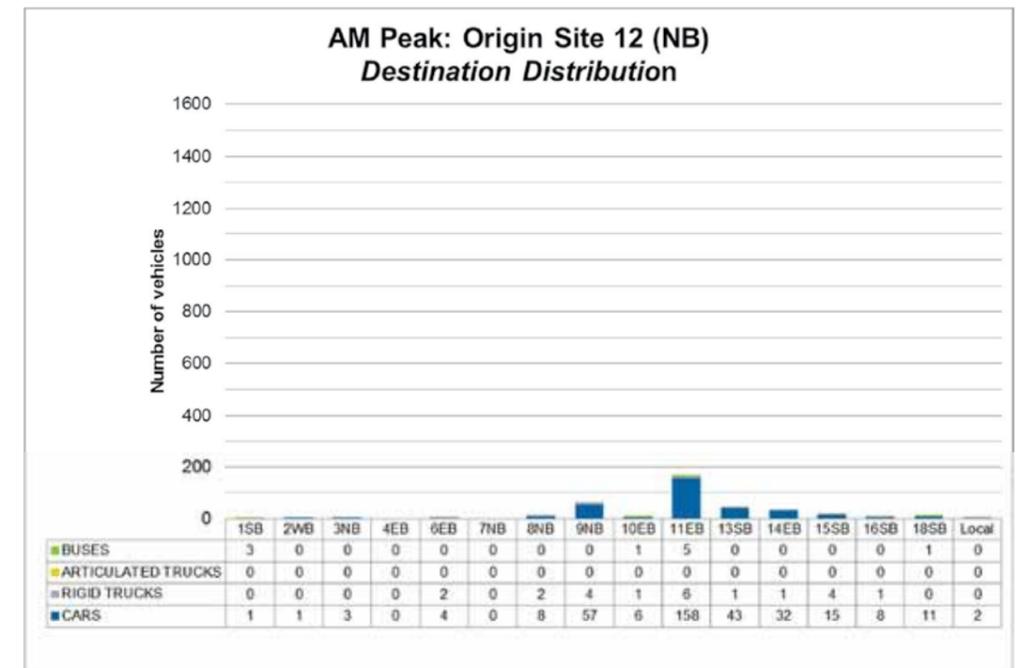


Figure 83 Inter-Peak Site 12NB (Cecil Street Northbound)

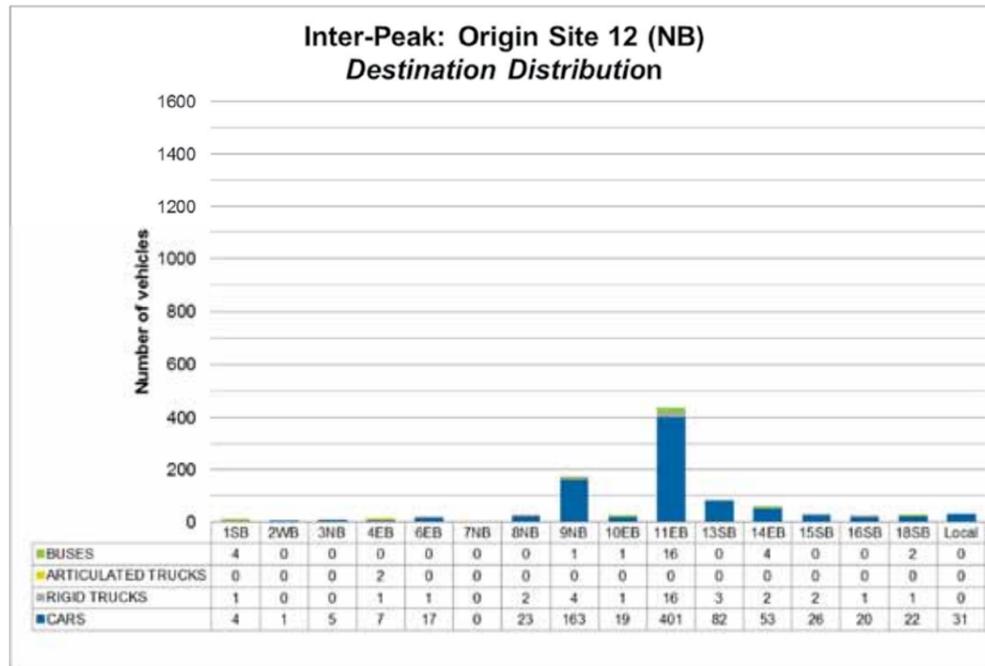
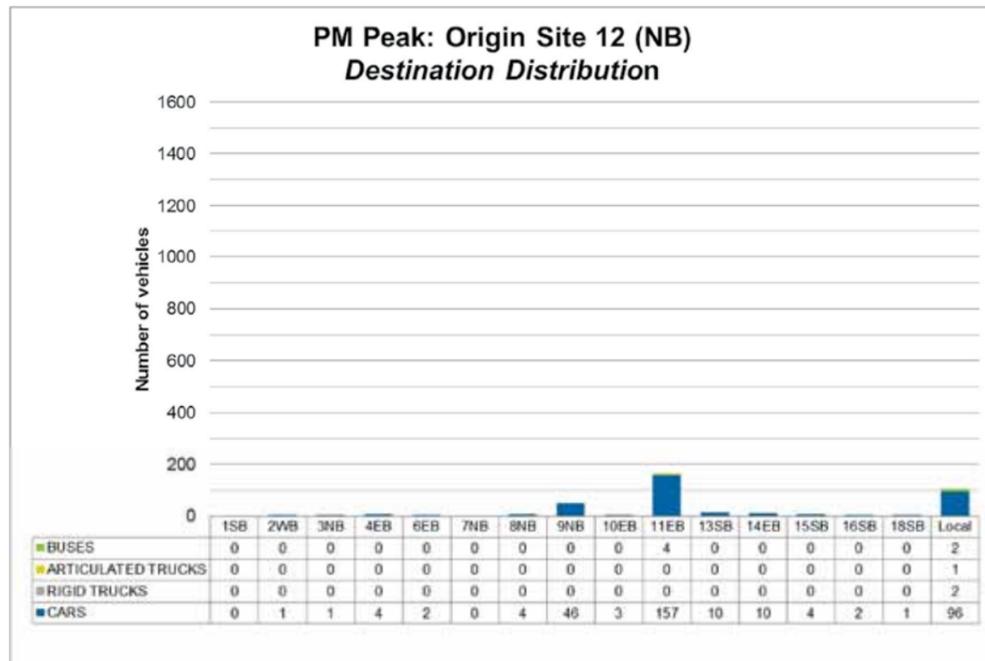


Figure 84 PM Peak Site 12NB (Cecil Street Northbound)



Site 13 NB – Ferrars Street Northbound

Analysis of the OD data for Site 13NB is shown in Figure 85, Figure 86 and Figure 87. The following trends were identified:

- The majority of vehicles entering the study area network on Ferrars Street continued through the network to City Road (67%, 57% and 62% during the AM peak, inter-peak and PM peak respectively);
- 13% of the 1,600 vehicles detected during the AM peak were unmatched, whilst during the PM peak this proportion increase to 18%;
- Heavy vehicle movements were consistently low across the various time periods, ranging from only 1% during the PM peak to 3% during the inter-peak period;
- Only 2% of vehicles on Ferrars Road would found to travel to the western extent of the study precinct, that is, Webb Dock or Todd Road.

Figure 85 AM Peak Site 13NB (Ferrars Street Northbound)

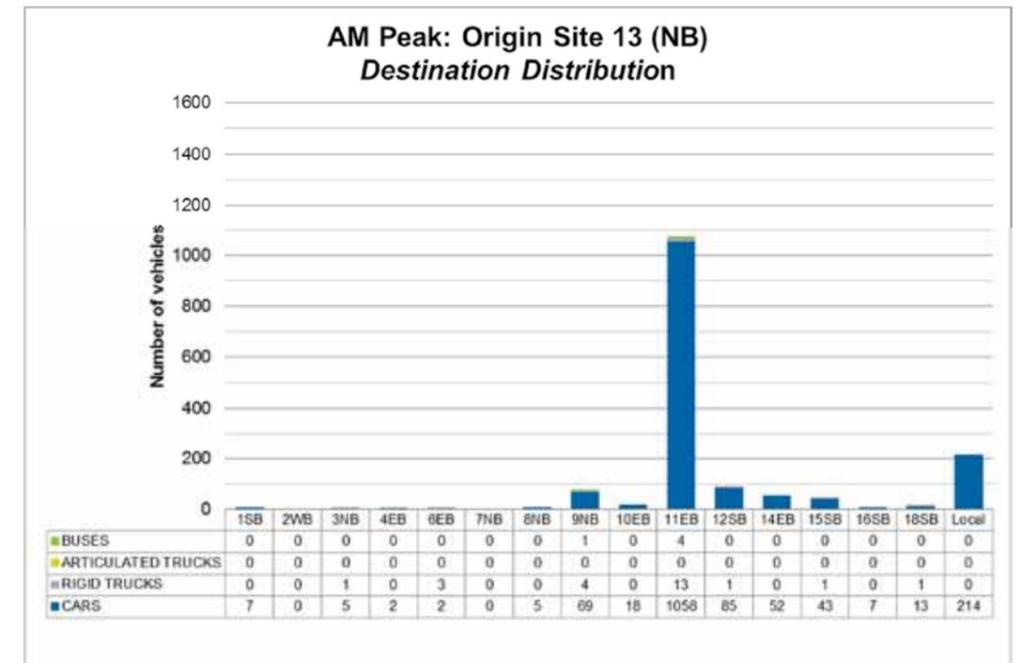


Figure 86 Inter-Peak Site 13NB (Ferrars Street Northbound)

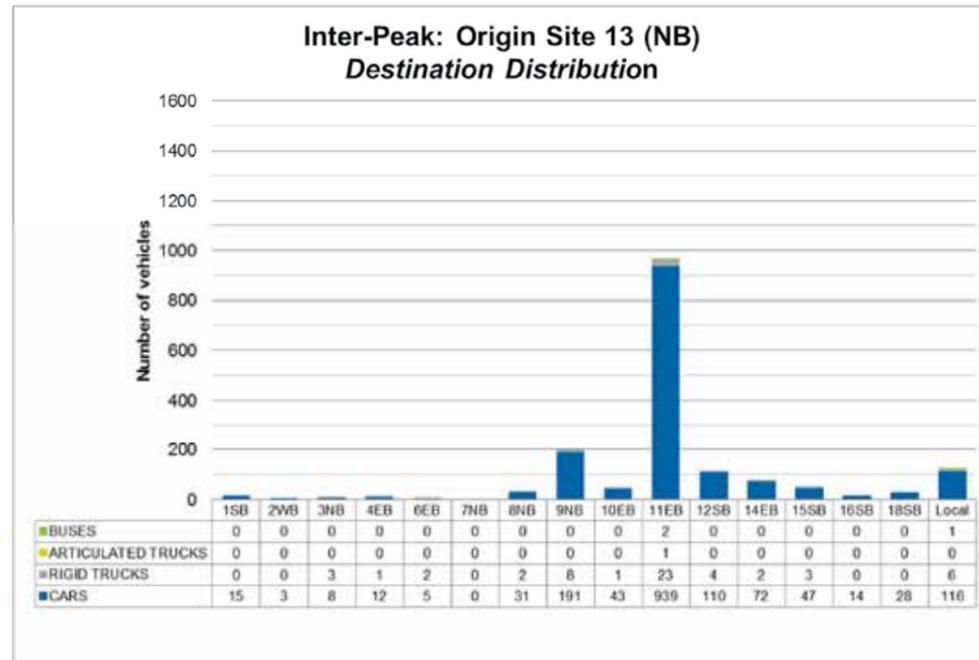
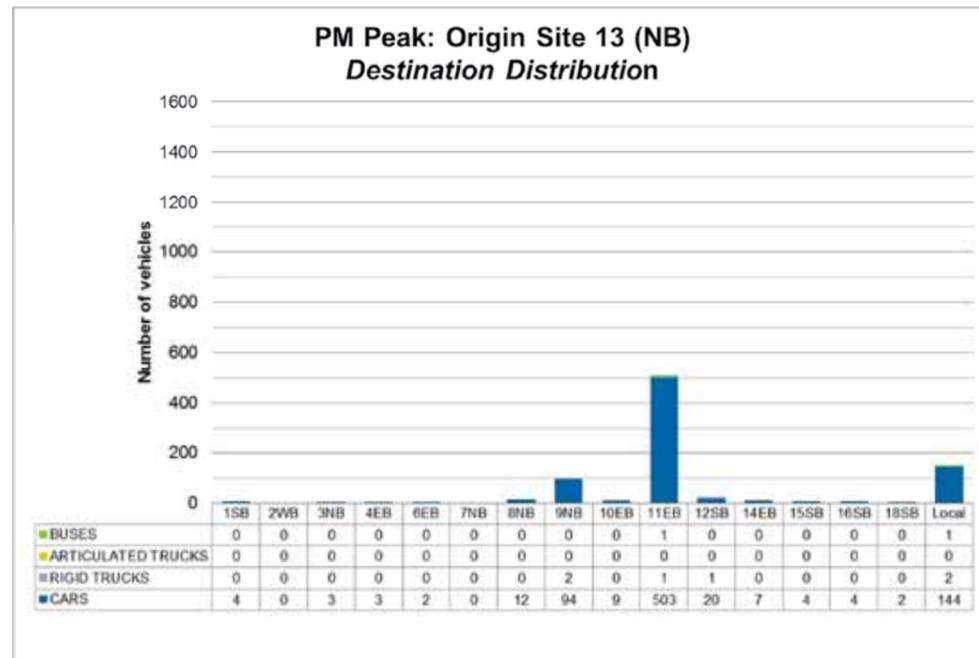


Figure 87 PM Peak Site 13NB (Ferrars Street Northbound)



Site 14 WB – Montague Street Northbound

As presented in Figure 88, Figure 89 and Figure 90 the following trip patterns were observed:

- The data suggests that during the AM peak 8% of trips originating on Montague Street northbound (resulting in 167) were unmatched. However, during the inter-peak and PM peak the proportion of unmatched trips increases to 36% (1,802 vehicles) and 78% (2,473 vehicles) respectively. (It is noted these figures seem high when compared to comparable locations).
- Of the through movement trips, the majority of vehicles utilise City Road, Montague Street or Ingles Street.
- Heavy vehicle proportions across the three time periods range from 1% to 5%, and for unmatched trips the heavy vehicle proportions are 1% or less.

Figure 88 AM Peak Site 14WB (Montague Street Northbound)

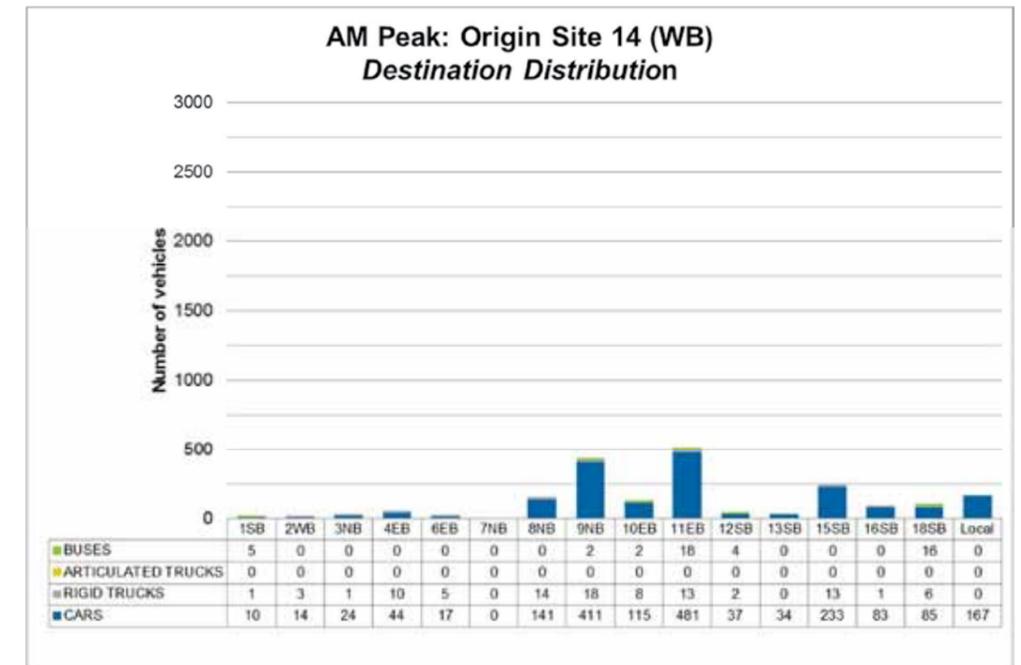


Figure 89 Inter-Peak Site 14WB (Montague Street Northbound)

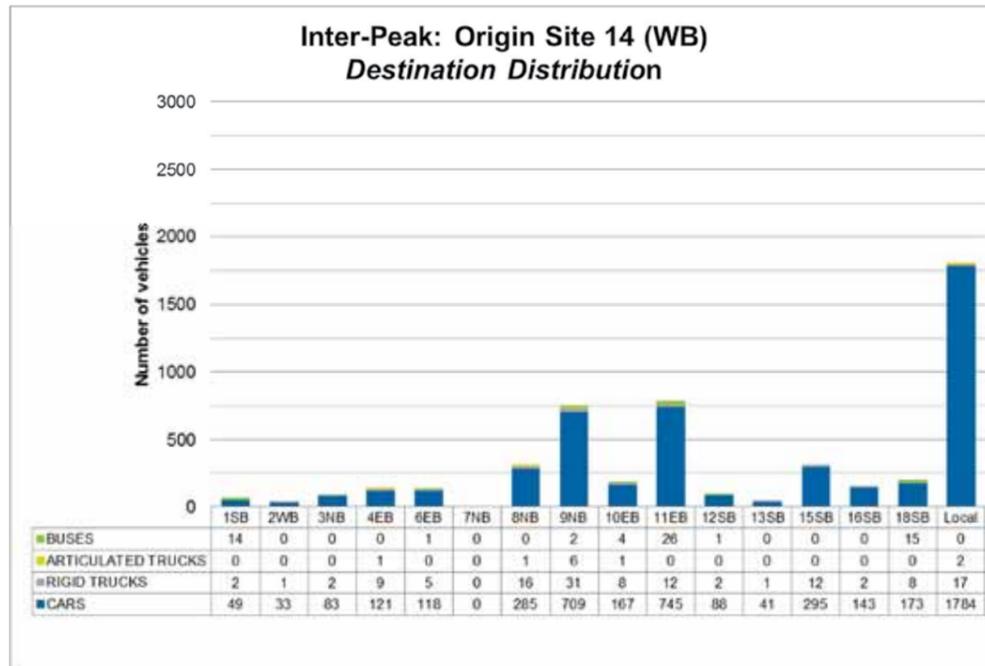
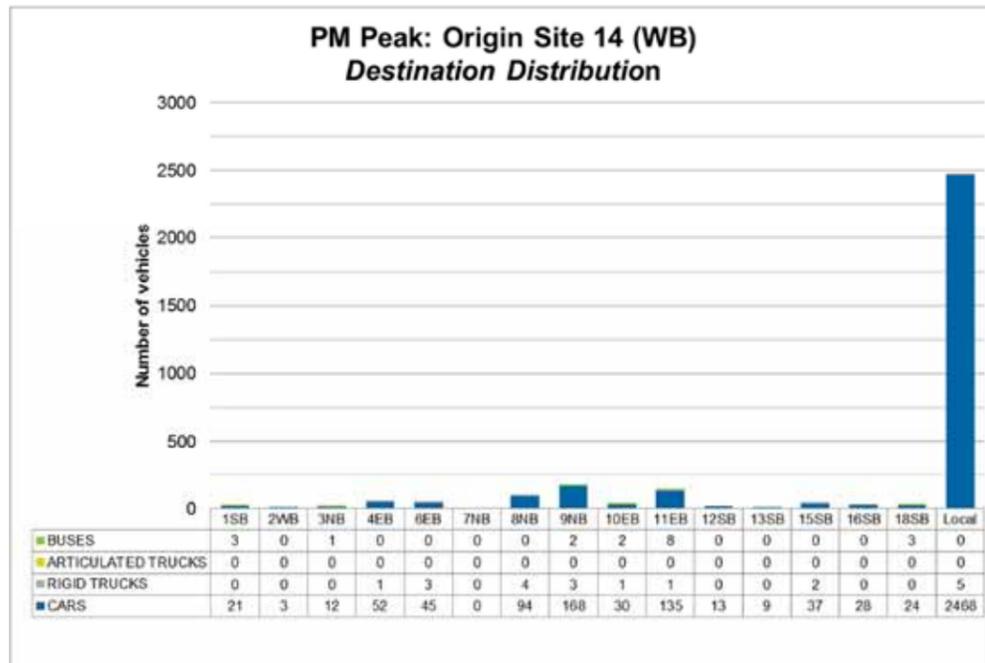


Figure 90 PM Peak Site 14WB (Montague Street Northbound)



Site 15 NB – Ingles Street Northbound

As presented in Figure 91, Figure 92 and Figure 93 the following trip patterns were observed:

- The survey data indicated Ingles Street carries a substantial volume of traffic throughout the surveyed time periods. Approximately 3,100, 3,600 and 1,600 vehicles were recorded during the AM peak, inter-peak and PM peak periods respectively.
- Heavy vehicle proportions during the AM and PM peak were approximately 5%, whilst during the 10am to 4pm period was 8%;
- The origin-destination data indicates that Ingles Street provides the through movement connection (from south to north) to access Lorimer Street for approximately 19 – 26% of vehicles on Ingles Street near Williamstown Road;
- A significant proportion of vehicles entering the precinct at Ingles Street are destined for Montague Street northbound. That is, vehicles utilise Ingles Street, Normanby Road and then Montague Street. This pattern is particularly prevalent during the PM peak period whereby 40% of the vehicles surveyed at this location travel to Montague Street northbound;
- Both the AM and PM periods exhibit approximately 10% of trips which were unmatched;
- Very few vehicles utilise Ingles Street which are destined for Todd Road or Web Dock.

Figure 91 AM Peak Site 15NB (Ingles Street Northbound)

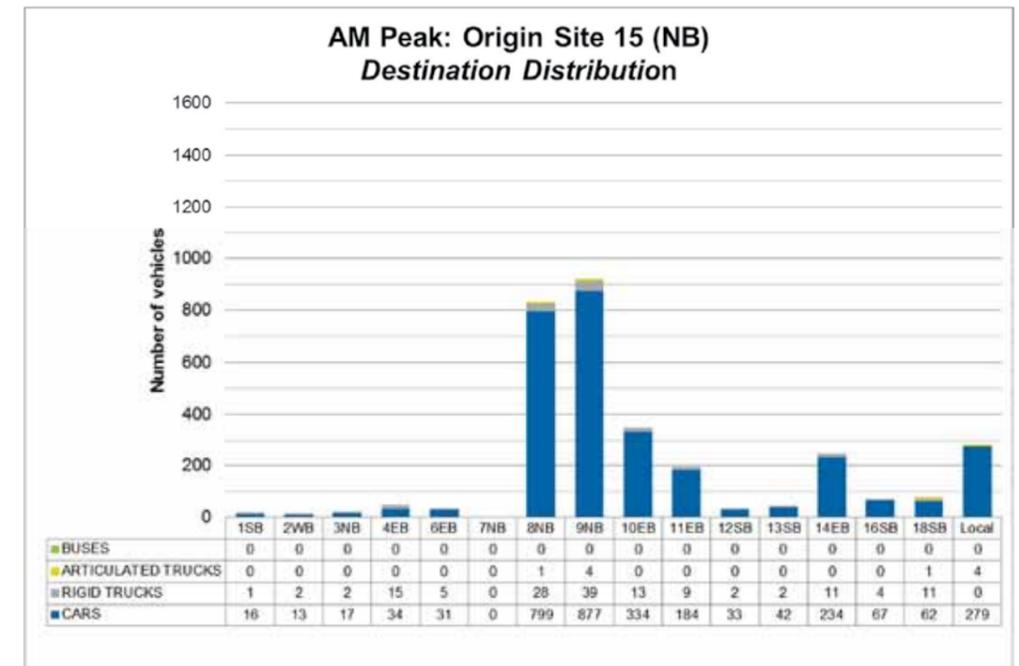


Figure 92 Inter-Peak Site 15NB (Ingles Street Northbound)

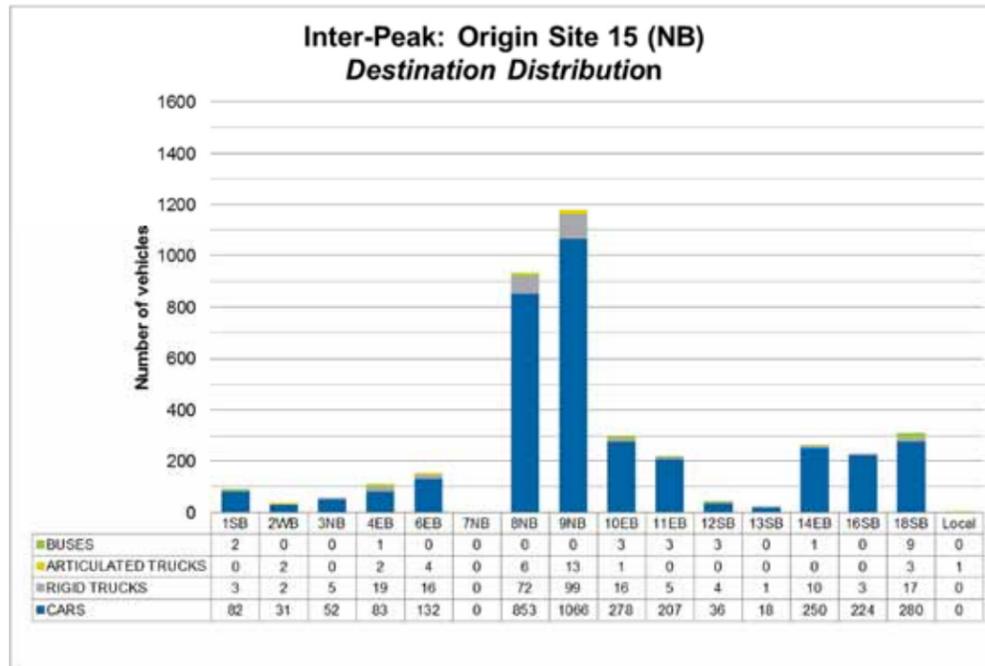
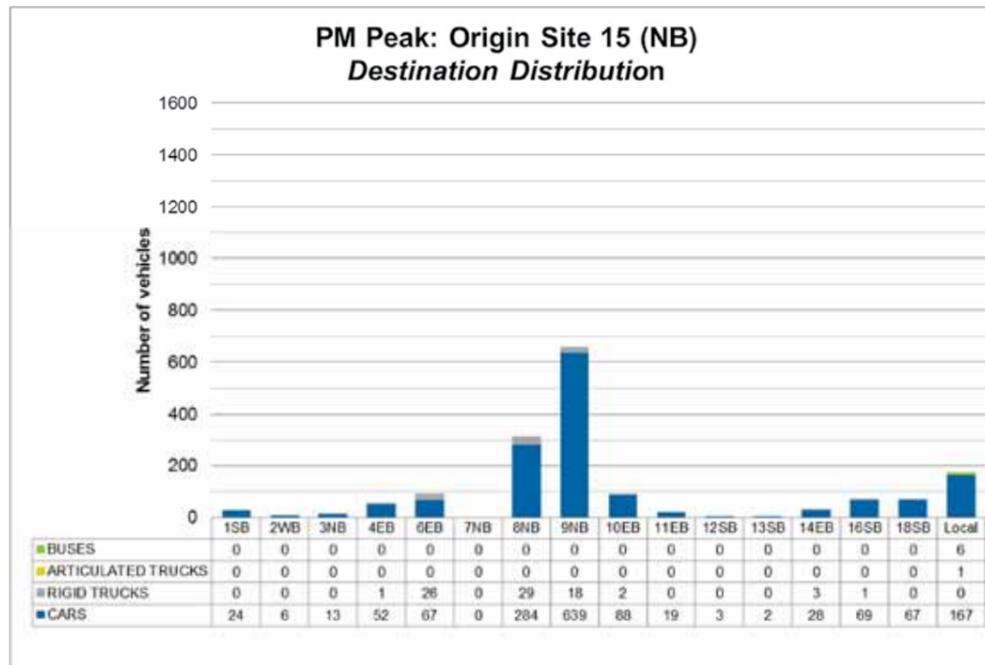


Figure 93 PM Peak Site 15NB (Ingles Street Northbound)



Site 16 NB – Bridge Street Northbound

Analysis of the OD data for Site 16NB is shown in Figure 94, Figure 95 and Figure 96. The following trends were identified:

- Bridge Street was found to carry approximately 800, 1,450 and 450 vehicles during the AM peak, inter-peak and PM peak periods respectively;
- Heavy vehicle movements were consistently low across the various time periods, ranging from 1% to 3%;
- During the PM peak period approximate 45% of vehicles were found to be unmatched;
- During the AM and inter-peak periods vehicle entering the precinct at Bridge Street would found to have a relatively even distribution of destinations across Ingles Street, Graham Street, Montague Street (both northbound and southbound), Normanby Road, and City Road.

Figure 94 AM Peak Site 16NB (Bridge Street Northbound)

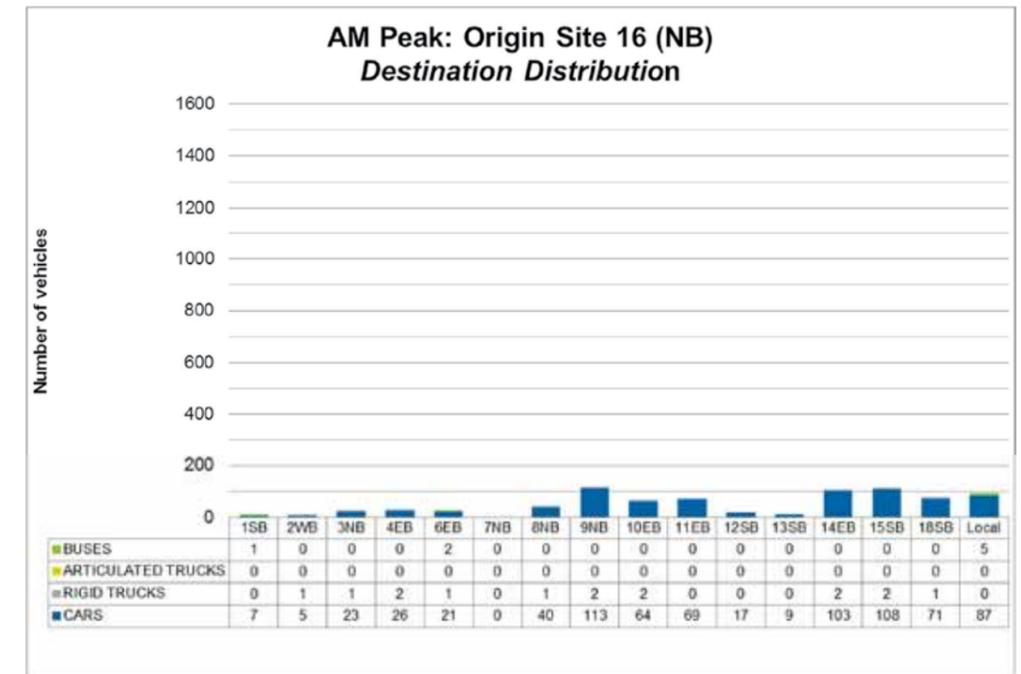


Figure 95 Inter-Peak Site 16NB (Bridge Street Northbound)

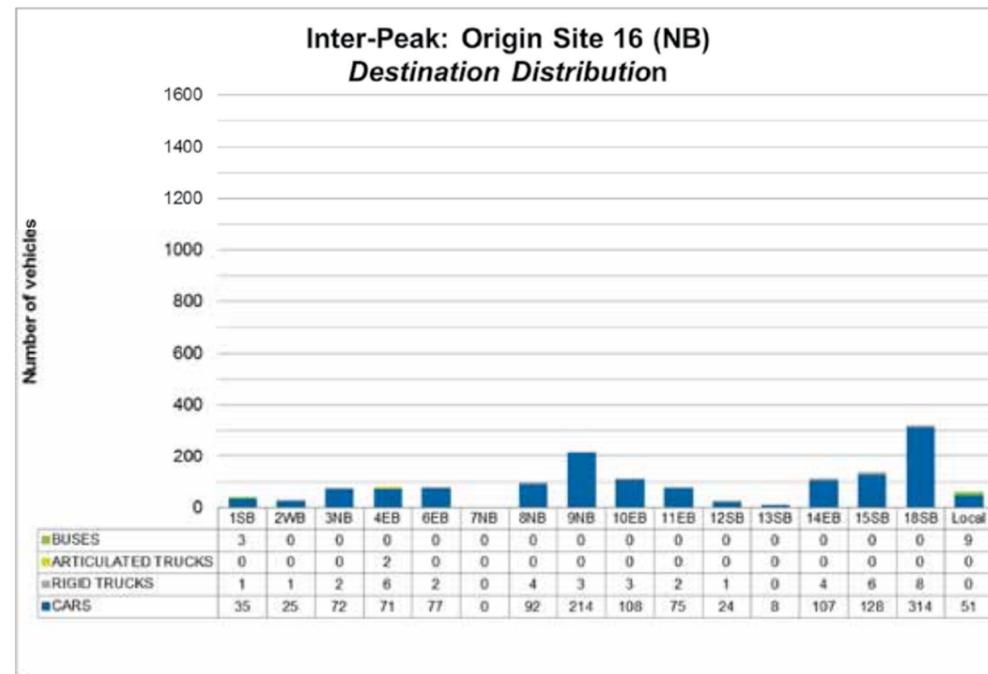
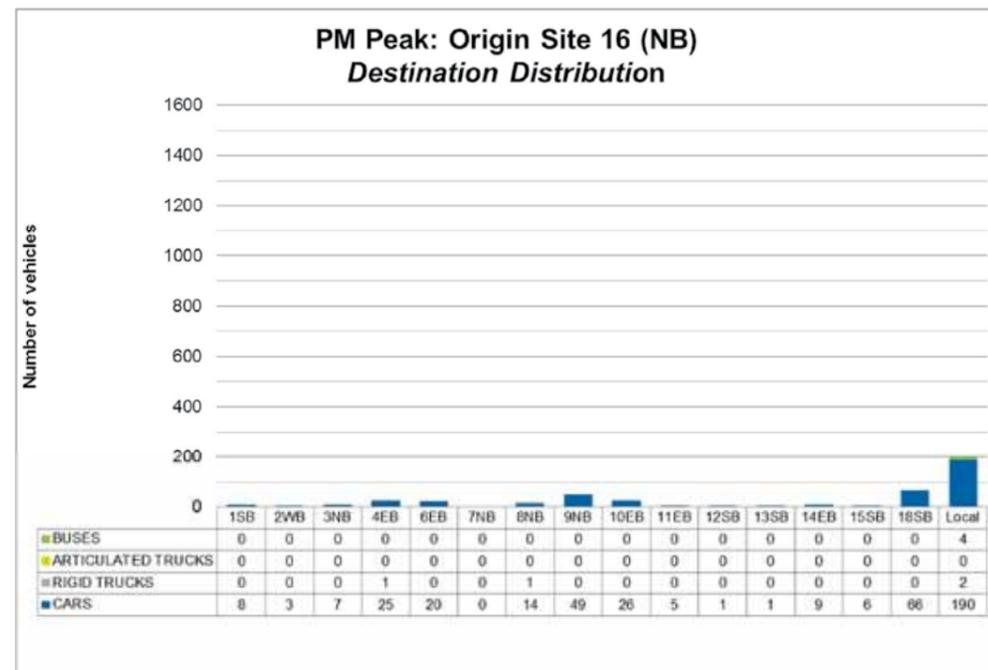


Figure 96 PM Peak Site 16NB (Bridge Street Northbound)



Site 17 WB – Williamstown Road Westbound

As presented in Figure 97, Figure 98 and Figure 99 the following trip patterns were observed:

- A significant proportion of vehicles remain within the precinct area; that is, many westbound vehicles were unmatched. During the AM peak 54% of vehicles did not leave the cordoned area, whilst during the inter-peak period and PM peak periods approximately 40% of vehicles were unmatched;
- Many vehicles exit the precinct area via Graham Street, specifically 688, 1,068 and 588 vehicles during the AM peak, inter-peak and PM peak periods respectively;
- The AM and inter-peak periods reveal approximately 7% heavy vehicles, whilst during the PM peak heavy vehicles comprise only 2% of the recorded vehicles;
- Vehicles destined for Webb Dock represent 5% of westbound traffic during the AM peak, 4% during the inter-peak and 1% during the PM peak.

Figure 97 AM Peak Site 17WB (Williamstown Road Westbound)

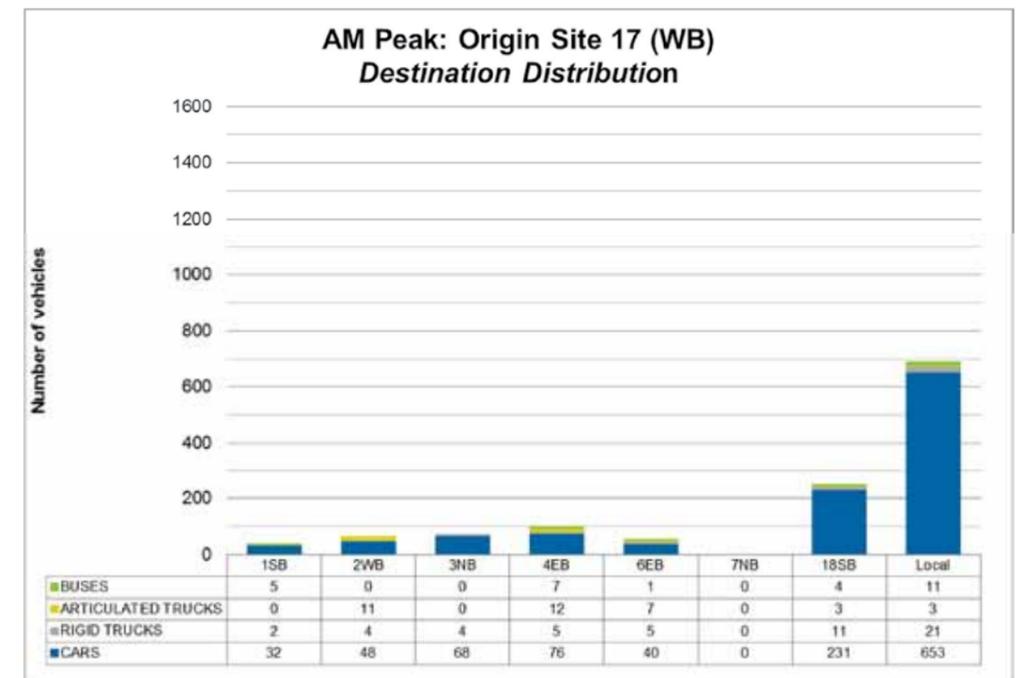


Figure 98 Inter-Peak Site 17WB (Williamstown Road Westbound)

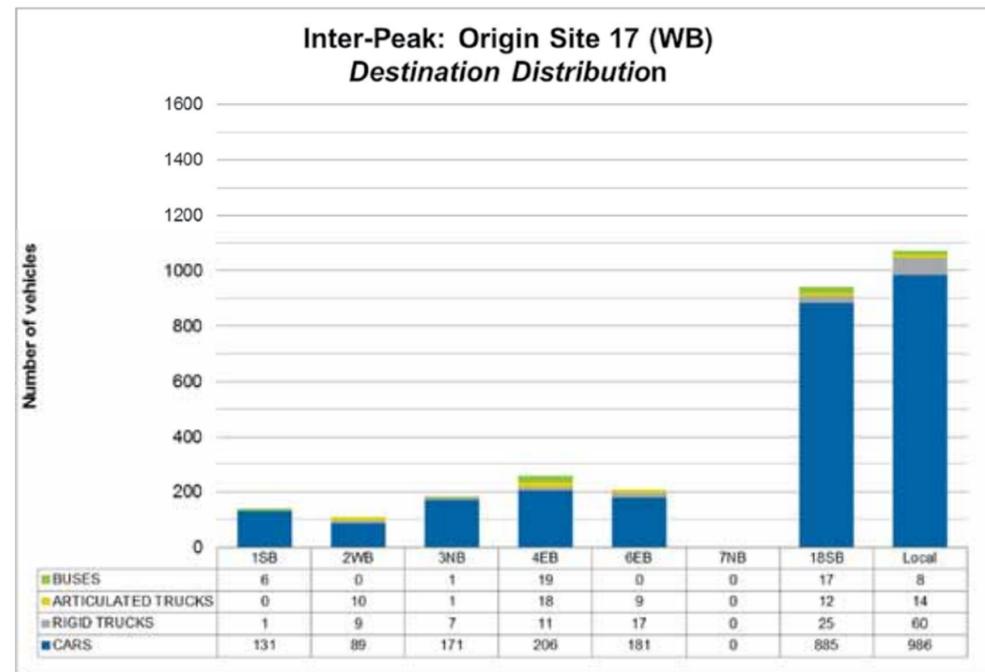
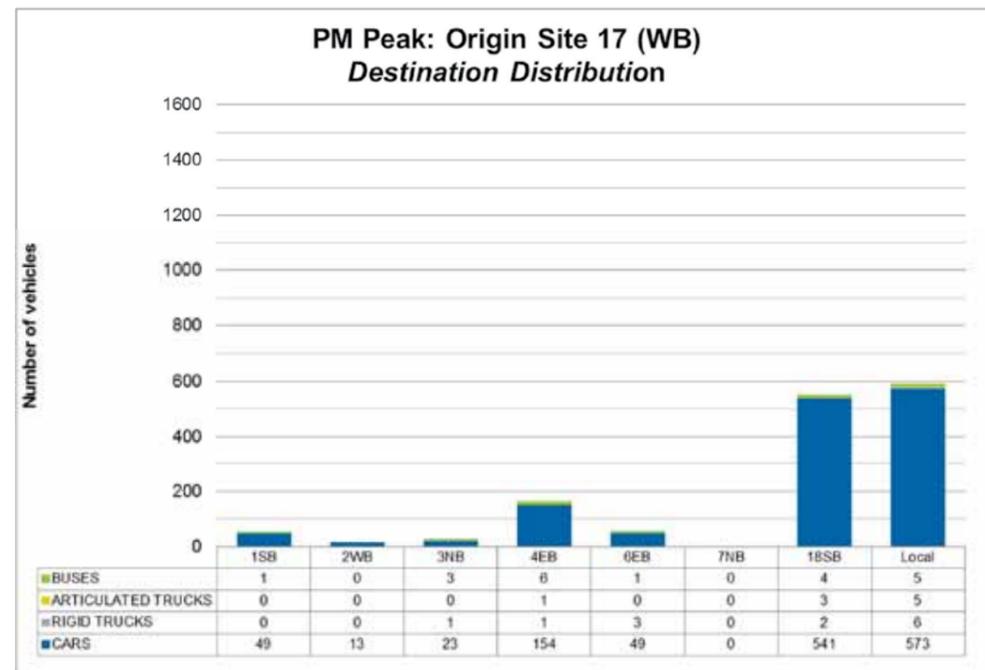


Figure 99 PM Peak Site 17WB (Williamstown Road Westbound)



Site 17 EB – Williamstown Road Eastbound

As presented in Figure 100, Figure 101 and Figure 102 the following trip patterns were observed:

- Approximately 20% of eastbound traffic on Williamstown Road was recorded as being unmatched during the AM and PM peaks, however, less than 1% of traffic during the inter-peak was surveyed as remaining within the precinct.
- Heavy vehicle proportions were comparable to those observed westbound, that is, 8% trucks were surveyed during the AM and inter-peak periods, but only approximately 3% during the PM peak.
- The most dominant through movements consisted of vehicles travelling to Ingles Street, Normanby Road, and Montague Street.
- Total eastbound traffic volumes were observed to be approximately 2,300, 3,250 and 1,750 vehicles during the AM peak, inter-peak and PM peak respectively.

Figure 100 AM Peak Site 17EB (Williamstown Road Eastbound)

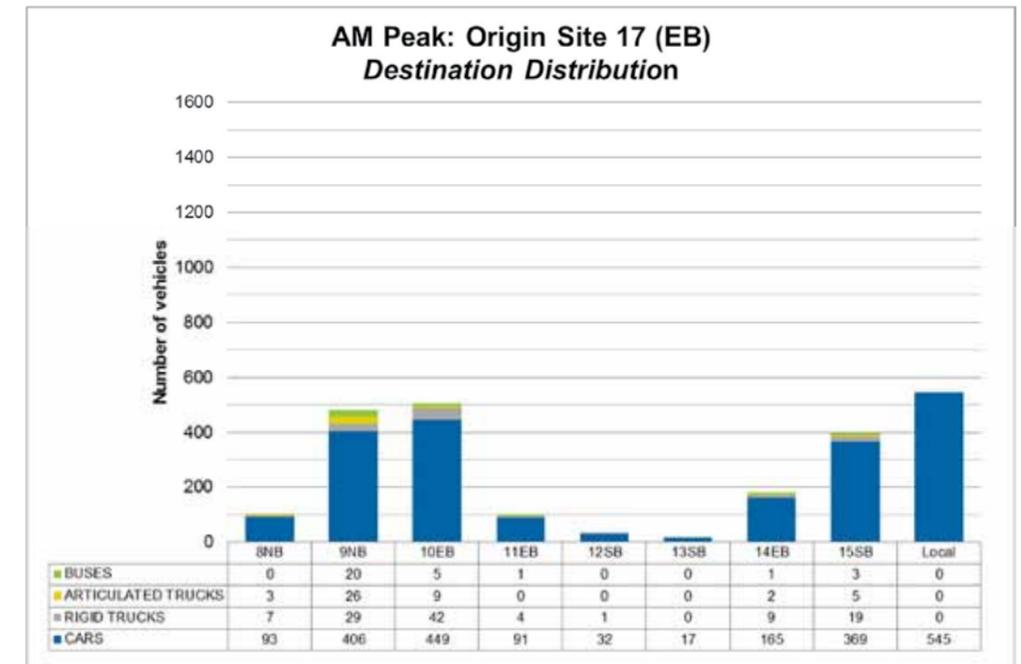


Figure 101 Inter-Peak Site 17EB (Williamstown Road Eastbound)

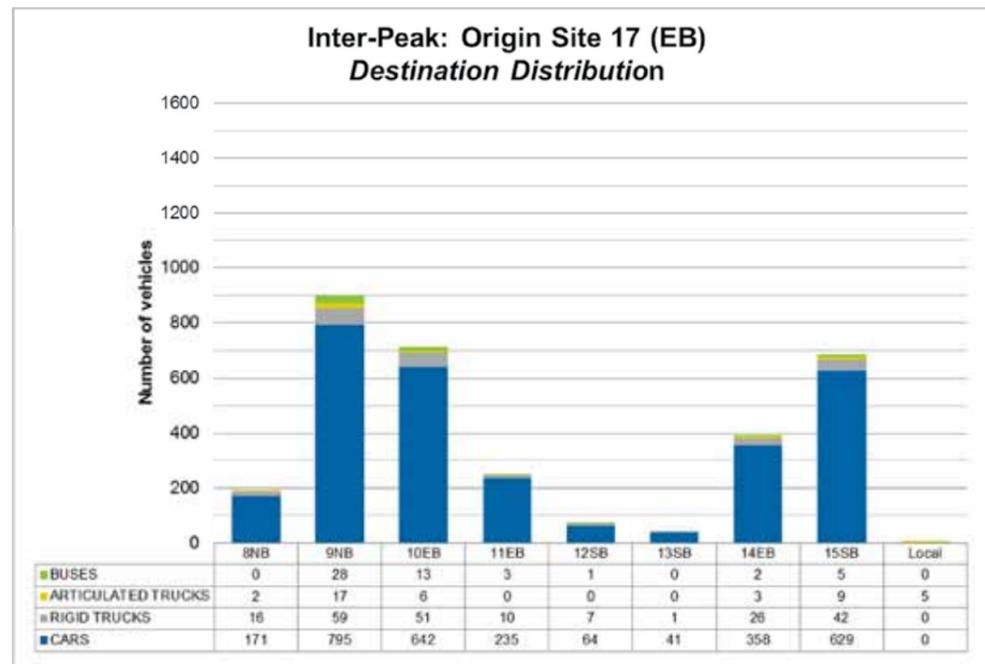
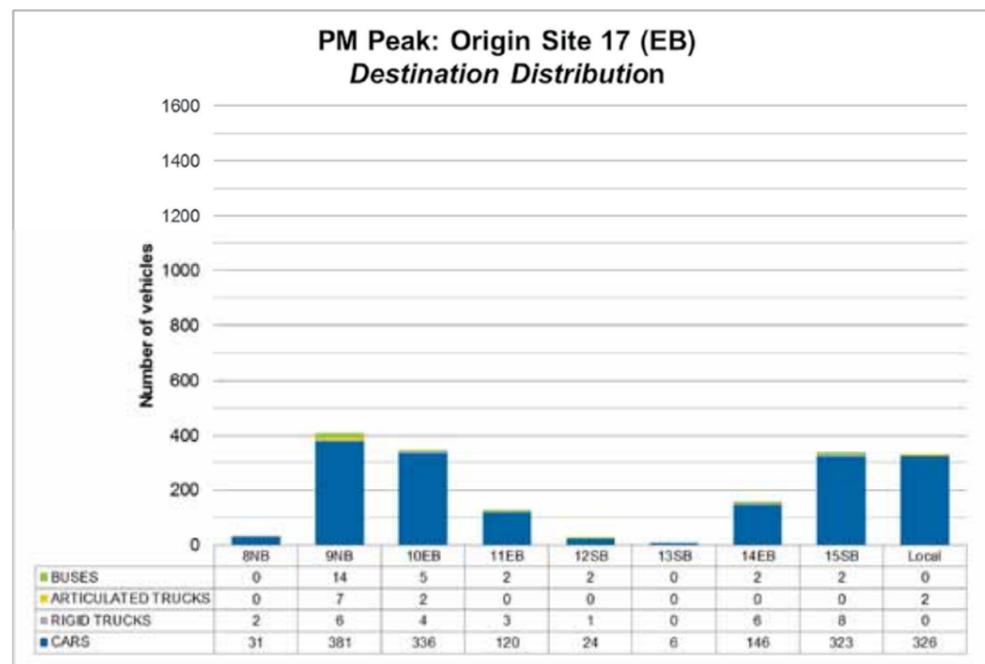


Figure 102 PM Peak Site 17EB (Williamstown Road Eastbound)



Site 18 NB – Graham Street Northbound

Analysis of the OD data for Site 16NB is shown in Figure 103, Figure 104 and Figure 105. The following trends were identified:

- Graham Street was found to carry approximately 3,100, 3,000 and 1,400 vehicles during the AM peak, inter-peak and PM peak periods respectively;
- Truck proportions during the AM and PM peak were approximately 6%, whilst during the 10am to 4pm period trucks represented approximately 13% of all vehicles;
- All three time periods exhibited a high proportion of trips with local destinations within the precinct;
- 44% of vehicles entering the precinct from Graham Street (between 7am and 7pm) were recorded as unmatched (3,319 vehicles), 8% of which were heavy vehicles (182 rigid trucks and 79 articulated trucks);
 - It is noted that an OD camera was not placed at Prohasky Street which provides access to the West Gate Freeway via Plummer Street. Site 7 northbound on Salmon Street was also not recording data during the main survey, which is discussed in Section 6 of the main report.
 - The analysis in Section 6 shows that approximately 700 of these unmatched vehicles exited the precinct by travelling northbound along Salmon Street (site 7). 97% of the 700 were light vehicles;
 - It is possible that a number of the remaining unmatched trips from Graham Street are accessing the freeway via Prohasky Street. However, it is not possible to accurately determine the number of vehicles that make this movement based on the data that has been obtained for this study.
- Of the vehicles conducting through movements, the destinations of West Gate Freeway (via Todd Road) and Montague Street northbound were identified as being popular; and
- 110 vehicles across all three time periods were found to be using Graham Street to access the Web Dock area.

Figure 103 AM Peak Site 18NB (Graham Street Northbound)

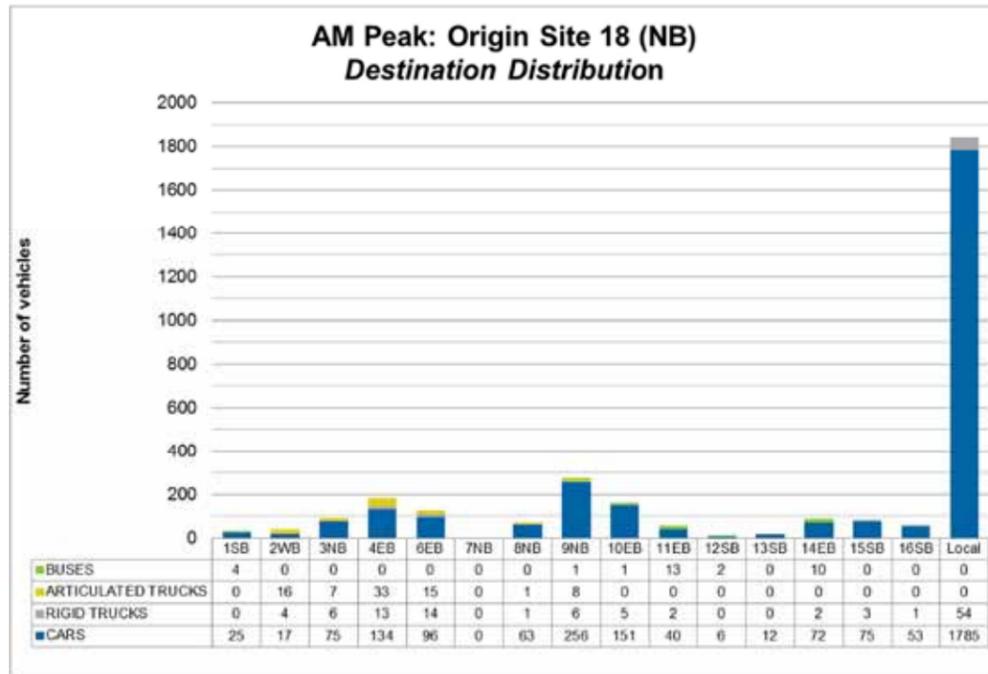


Figure 105 PM Peak Site 18NB (Graham Street Northbound)

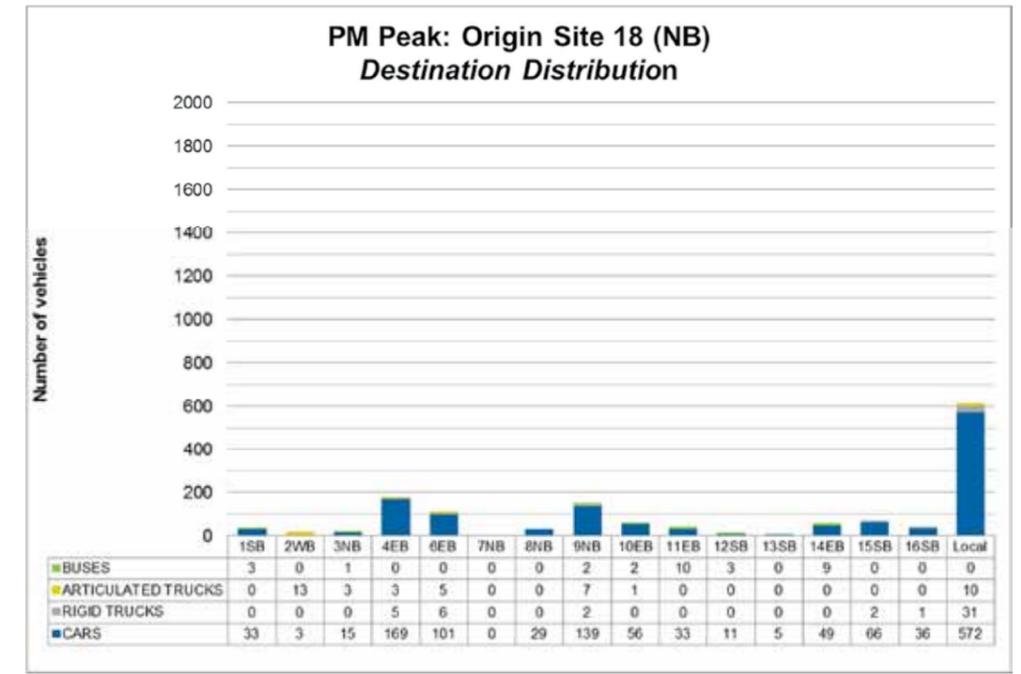
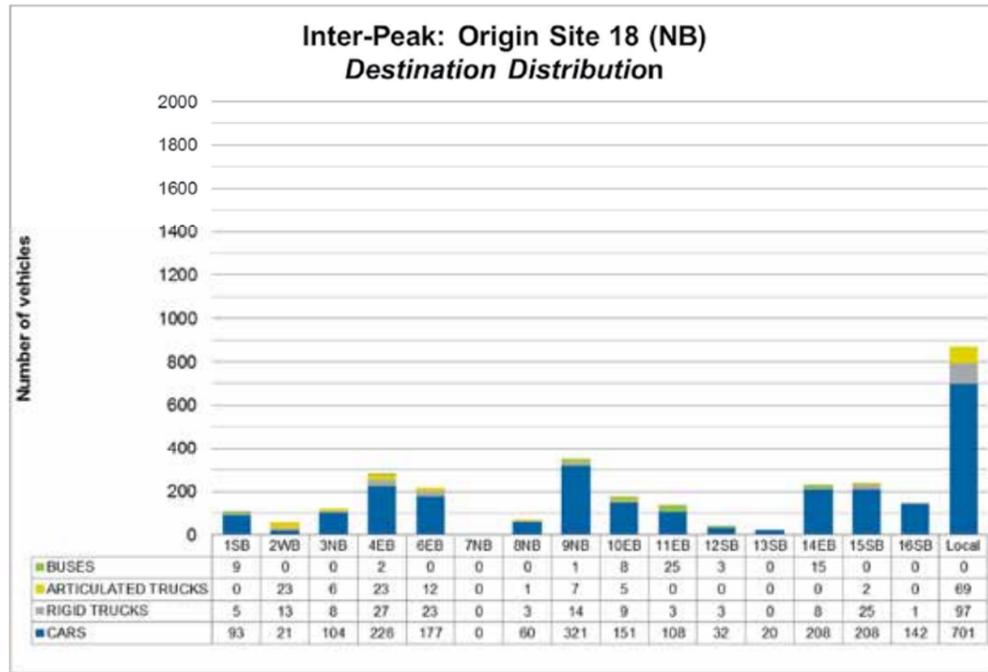


Figure 104 Inter-Peak Site 18NB (Graham Street Northbound)



Appendix E – Additional Survey Periods

Figure 106 AM Peak Site 2 Eastbound (Williamstown Road)

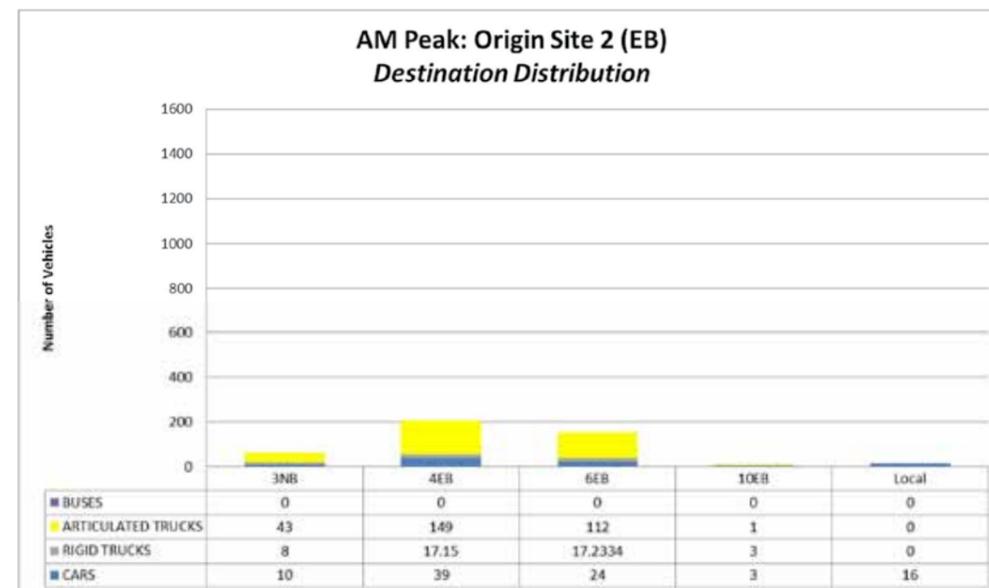


Figure 107 Inter-Peak Site 2 Eastbound (Williamstown Road)

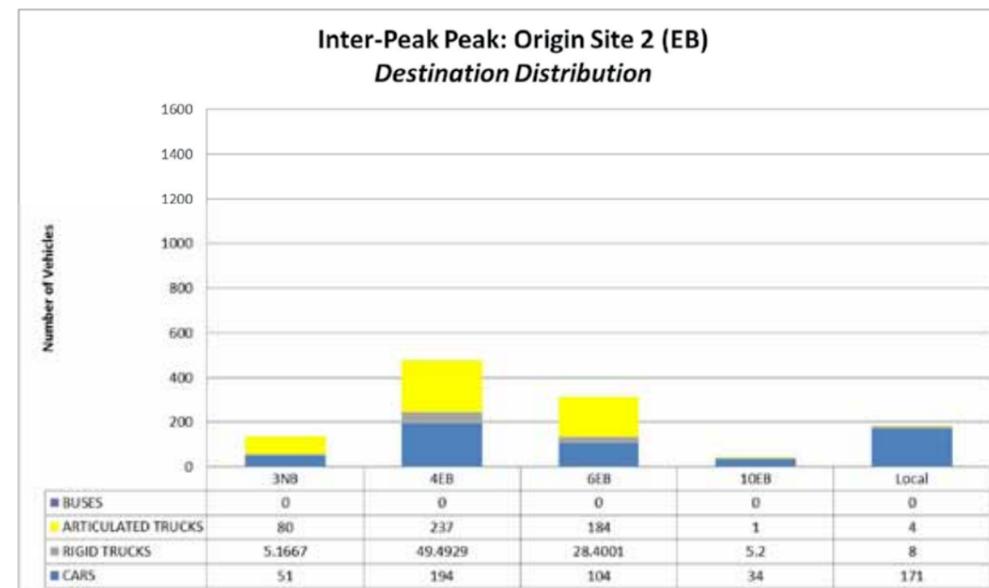


Figure 108 PM Peak Site 2 Eastbound (Williamstown Road)

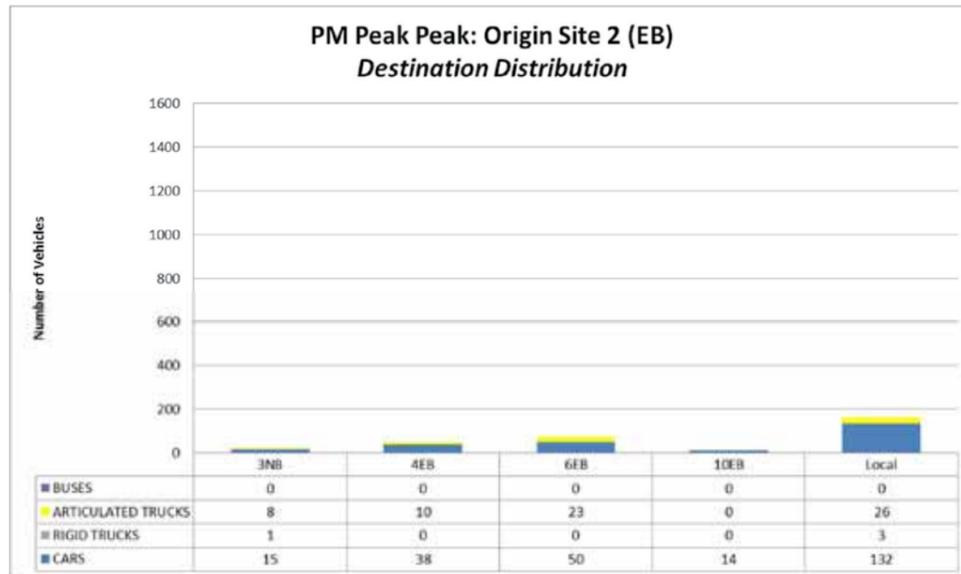


Figure 109 AM Peak Site 7 Northbound (Salmon Street)

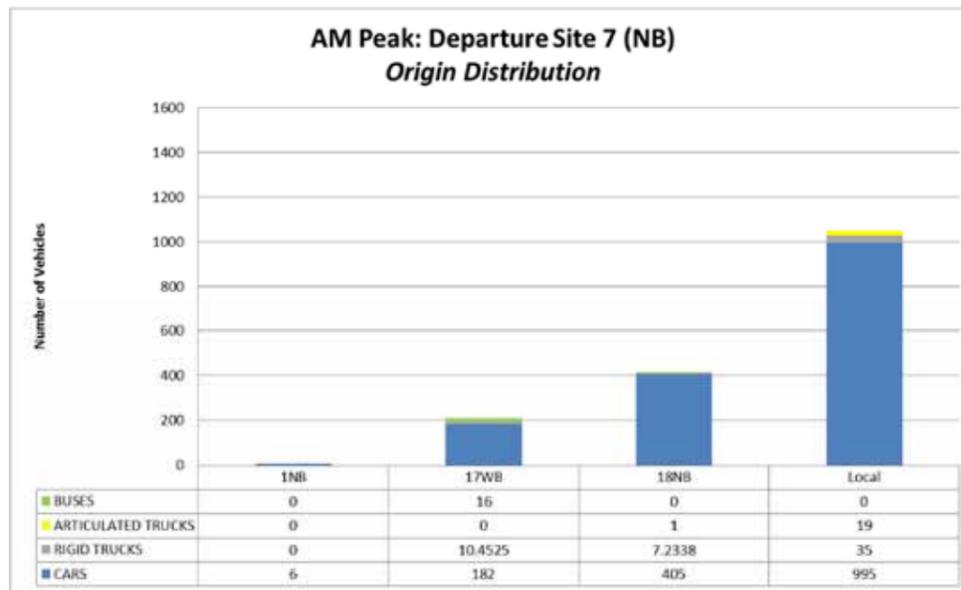


Figure 110 Inter-Peak Site 7 Northbound (Salmon Street)

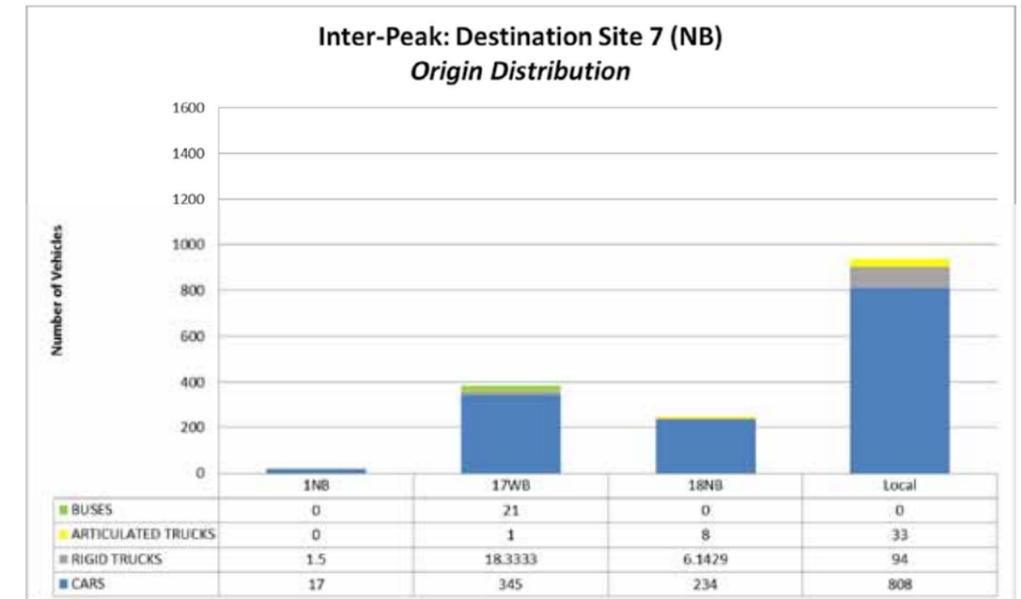
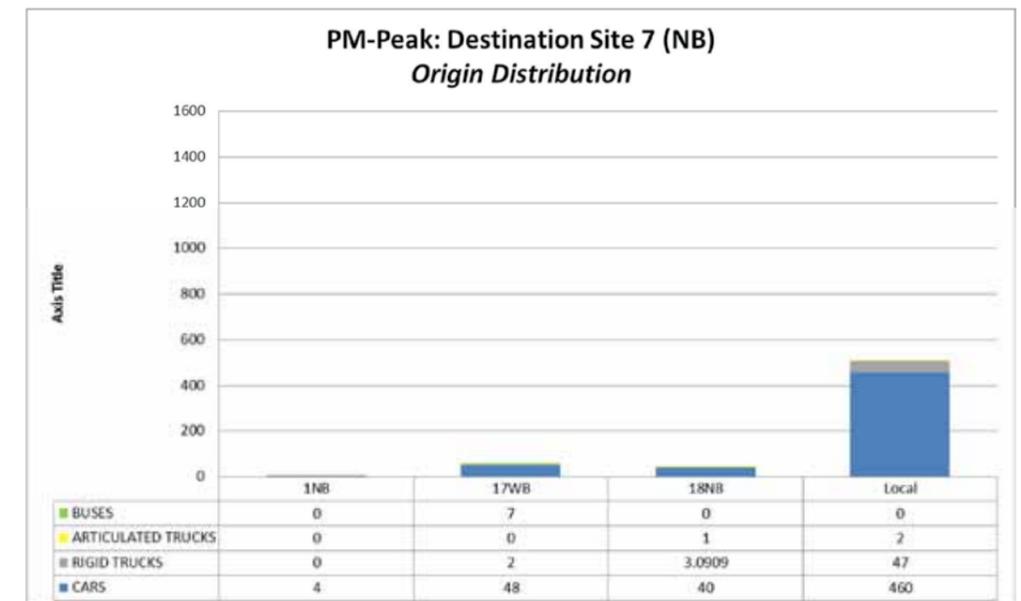


Figure 111 PM Peak Site 7 Northbound (Salmon Street)



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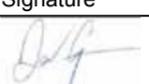
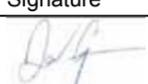
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