Microsimulation Modelling of Port Junction and Spencer / Clarendon Corridor

Client // Fishermans Bend Taskforce
Office // VIC
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Draft Report

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Quality Record

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Executive Summary

The Fishermans Bend Urban Renewal Area (FBURA) is approximately 485 hectares of land located to the south-west of the Melbourne CBD. The State Government is currently completing the draft framework for the area which will outline the strategic direction of the project. This framework will be supported in part by an Integrated Transport Plan which will shape the transport network. Trams have been identified as a key mode to provide a connection to the CBD.

GTA Consultants have been engaged by the Department of Environment, Land, Water & Planning (DELWP) to investigate opportunities for future light rail options that operate through the Port Junction Intersection (Clarendon Street / Whiteman Street / Normanby Road). In the first instance, this involves assessing the current operation of the Junction and the ability for the intersection to cater for additional trams.

The analysis of the junction was undertaken using microsimulation in VISSIM for the years 2016 and 2031. The model extended from Flinders Street / Spencer Street to Clarendon Street / City Road and was used to assess the impacts of additional trams to both tram operation and private vehicle operation in the network. Analysis of existing conditions found that trams operate with minimal delays through the network, with delays occurring mainly at signalised intersections. Private vehicles experience congestion in the peak direction along Clarendon Street and Flinders Street.

Future year modelling indicates that the junction is able to accommodate more trams than currently operating, however, delays to private vehicles increased when more trams were added to the network. The analysis found that by 2031 an additional 93 trams would travel along Clarendon Street and this increase would cause unacceptable delays to both trams and private vehicles with long tram queues at the Crown Casino stop expected.

The modelling results also showed:

- The signal phasing at the Junction is currently performing at peak efficiency with trams receiving enough green time to clear the intersection, delays to trams are typically caused by tram in front delays.
- In the future, traffic demands are expected to increase by up to 60% in some movements on Clarendon Street,
- Port Junction is able to accommodate light rail demands as of up to 124 trams travelling through the intersection, however, as the signal phasing favours tram movements along the corridor, there is less green time available to private vehicle movements and delays are experienced for private vehicles as a result of reduced green time, and
- Infrastructure upgrades would need to be considered at the Junction and Crown Casino intersection to cater for the tram demands in scenario 3a, this is outside the scope of this study.

In summary, the Port Junction currently operates well and operationally has the ability to accommodate more than double the number of trams already experienced, albeit at the expense of private vehicle journey time and throughput.

It is noted that the analysis presented in this report does not have consideration for capacity constraints at the Collins Street and Spencer Street intersection or the intersections ability to handle these high numbers of trams and that further investigations may be required to test the ability for the intersection to accommodate any increased demand.

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1. Introduction

1.1 Background

The Fishermans Bend Urban Renewal Area (FBURA) is the largest urban renewal area in Australia with an expected 80,000 residents and 60,000 jobs to be located within the area in the next 35 years. Given the congestion and constraints of the current road network in Fishermans Bend, many of the new residents and employees will be reliant on alternative modes of transport.

In response to recommendations by the Fishermans Bend Advisory Committee, the Fishermans Bend Taskforce has requested an investigation be undertaken for future light rail options for the area. One of the options currently being investigated is the possibility of operating a rail spur on the existing Route 109 light rail line into Fishermans Bend.

One of the key intersections on the route is the Clarendon Street / Normanby Road / Whiteman Street intersection, also known as the Port Junction.

GTA have been engaged to assess both the current performance of the Clarendon Street corridor and the Port Junction intersection and the implications of additional future light rail services.

1.2 Purpose of this Report

GTA Consultants has been commissioned by the Department of Environment, Land, Water & Planning (DELWP) to undertake microsimulation modelling to assess the capacity of the Port Junction and Spencer Street / Clarendon Street corridor to cater for additional light rail services associated with the Fishermans Bend redevelopment.

Models have been developed and tested for the following scenarios:

- Changes to tram routes and frequencies as part of the Melbourne Metro project.
- Construction of a light rail spur from the existing Route 109 into Fishermans Bend.

These options have been tested for the years 2016 and 2031.

The models have been developed using SCATSIM as the signal control to provide a model that closely resembles on-site conditions and to allow for signal optimisation testing in the scenarios.

2. Project Overview

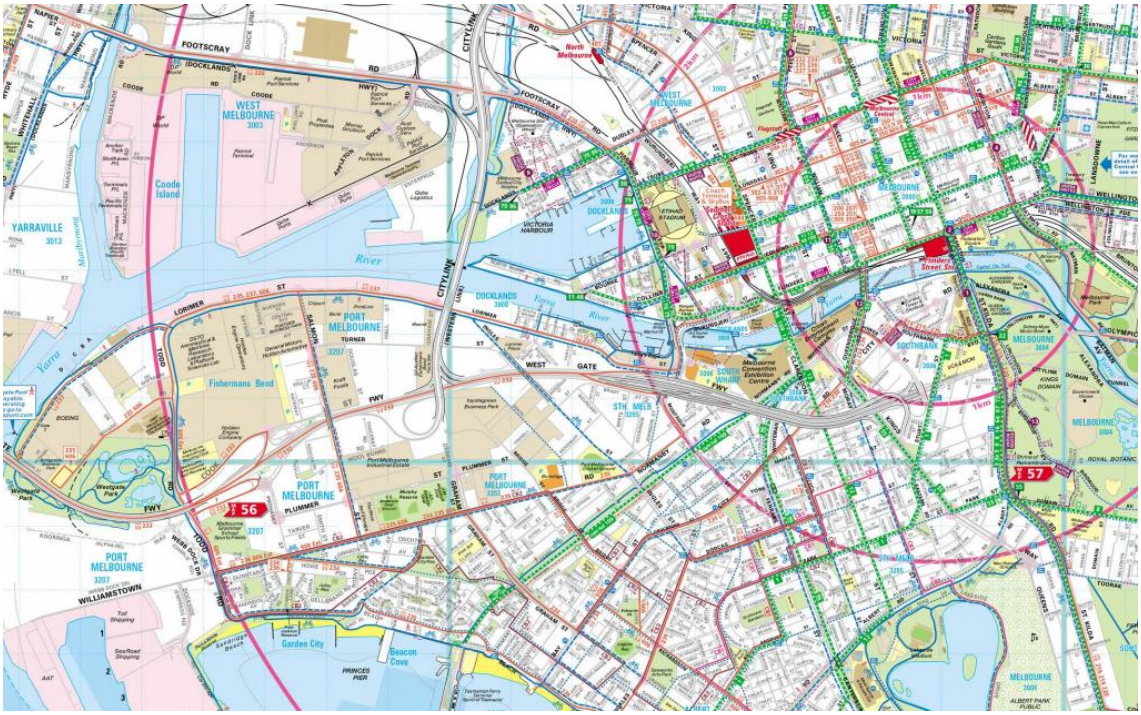
2.1 Fishermans Bend Overview

Fishermans Bend is located south of the Yarra River and north of Port Melbourne near the Melbourne city centre. It currently comprises over 450 hectares of industrial and commercial land with limited access to public transport. The rezoning of Fishermans Bend includes transforming the four existing precincts into urban renewal areas and the creation of a Fishermans Bend Employment Precinct.

2.2 Current Public Transport

The current transport arrangements for the Fishermans Bend area have been created by its use as an industrial area and port. Figure 2.1 shows the public and active transport options available in Fishermans Bend and the Melbourne CBD. Compared to the CBD which has access to multiple railway stations, tram lines and buses, the Fishermans Bend area has only a handful of bus routes that operate through the precincts.

Figure 2.1: Map of Public Transport in Melbourne (source: Melbourne.vic.gov.au)



2.3 Transport Planning for Fishermans Bend

As part of the 2013 Draft Vision and Design Guidelines for Fishermans Bend, a number of reports were prepared that examined both the current transport in the area and future options for the area. A Light Rail Transport Alignment Options report was completed by Aurecon which included multiple options that involved crossing the Yarra River and one which was a spur from the route 109 tram line. This study included no modelling of the road network but viewed likely impacts to the road network of operating a spur line as not preferred.

The introduction of the Employment Precinct into Fishermans Bend in 2015 created the need for an additional tram line to connect the precincts north of the West Gate Freeway (Lorimer and Employment Precinct). The Fishermans Bend Taskforce working in partnership with the Department of Economic Development, Jobs, Transport and Resources (DEDJTR), Public Transport Victoria, VicRoads and Transport for Victoria (TfV) are undertaking additional transport planning as part of the Fishermans Bend Recast to understand the impacts of a larger area with high growth potential.

3. Data Collection

3.1 Overview

In order to ensure the model reflects current conditions a series of data sets were collected. Data was collected from multiple sources including VicRoads, Yarra Trams, historic reports, and on site collection. A summary of the data that was collected is presented in Table 3.1.

Table 3.1: Table title, GTA Heading Table style

Data Type	Source	Survey Date(s)[1]	Survey Times [2]	Description
Historic Report	AECOM	Tuesday 27 March 2012 and Wednesday 28 March 2012	24/7	Turning movement counts of Port Junction intersection for AM and PM peak periods. 24/7 counts of tram boarding and alighting times at the tram stops at the Port Junction intersection.
SCATS Traffic Volumes	VicRoads	Month of February 2016 and March 2016 and week from 10th August 2016 to 17th August 2016	24/7	SCATS traffic volume data requested at all signalised intersections within the study area.
SCATS Signal Information	VicRoads	Wednesday 17th August	AM: 7:30am to 9:30am PM: 4:30pm to 6:30pm	SCATS signal information (operation sheets, intersection diagnostic monitor data) at signalised intersections within the study area.
Car Travel Time Surveys	GTA	Wednesday 17th August	AM: 7:45am to 9:15am PM: 4:45pm to 6:15pm	GPS and video method using car runs. Travel time routes as shown in Figure 2.1.
Tram Dwell Time Surveys	GTA	Wednesday 17th August Tuesday 23rd August	AM: 7:30am to 9:30am PM: 4:30pm to 6:30pm	Stopwatch method with staff boarding and alighting trams on routes 109,96, and 12.
Site Observations	GTA	Wednesday 17th August Tuesday 23rd August	AM: 7:45 am to 9:30am PM: 4:30pm to 6:30pm	Observe existing conditions operation including queue lengths, road geometry and characteristics, driver behaviour, public transport operation etc.

3.2 Traffic Data Analysis

In order to confirm the critical peak hour and day that would be modelled, SCATS detector volume data was analysed for the week of August 10th to August 17th for the network intersections. Figure 3.1 shows the average hourly traffic volumes for the Port Junction intersection for both trams and vehicles, while Figure 3.2 shows the 15-minute combined volume for the road network in the study area. It shows that the peak hours occur from 8am to 9am and 5pm to 6pm.

Figure 3.1: Hourly Average Traffic Volumes for Vehicles and Trams at the Port Junction Intersection

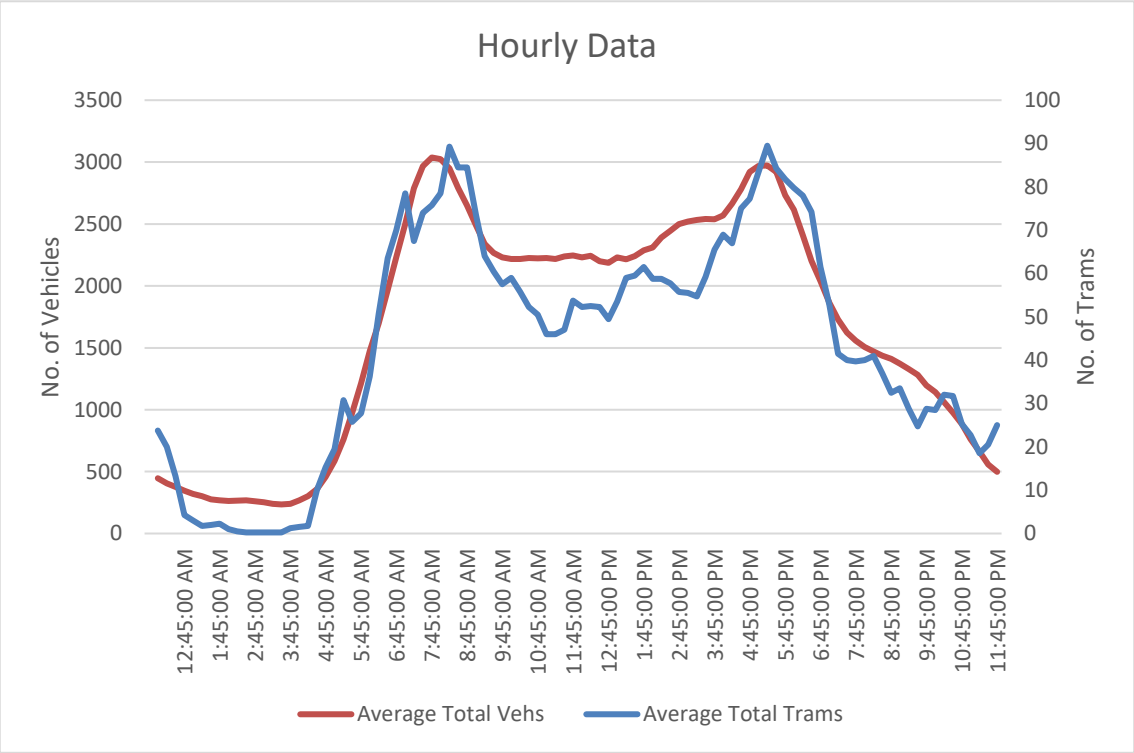


Figure 3.2: Combined 15 minute Volumes for Network

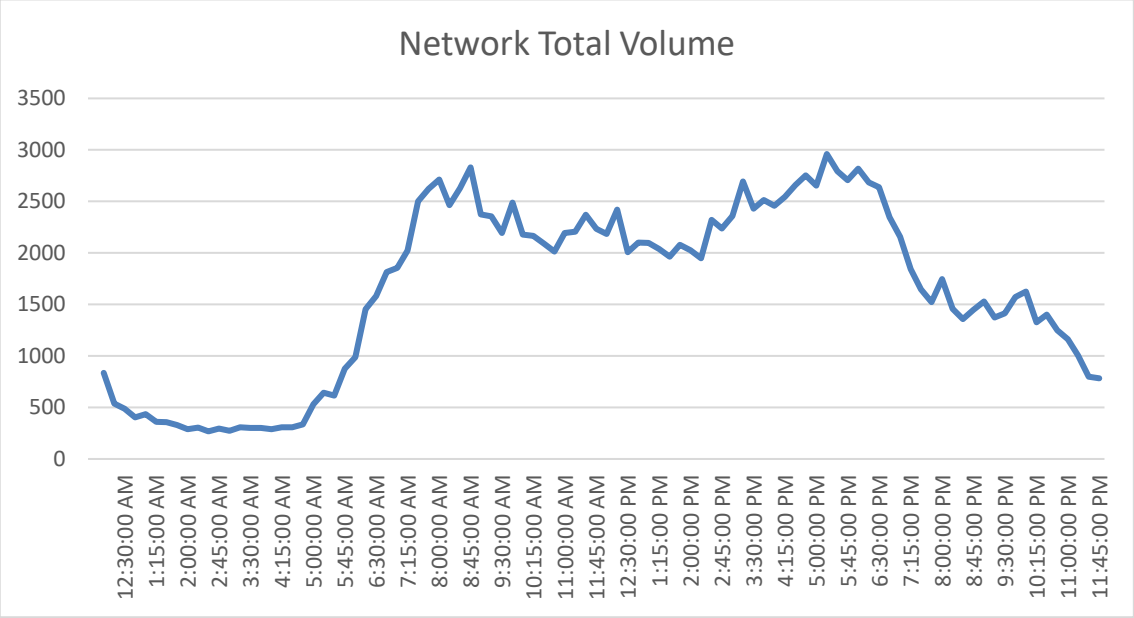


Figure 3.3: Road Network Peak Period Volumes

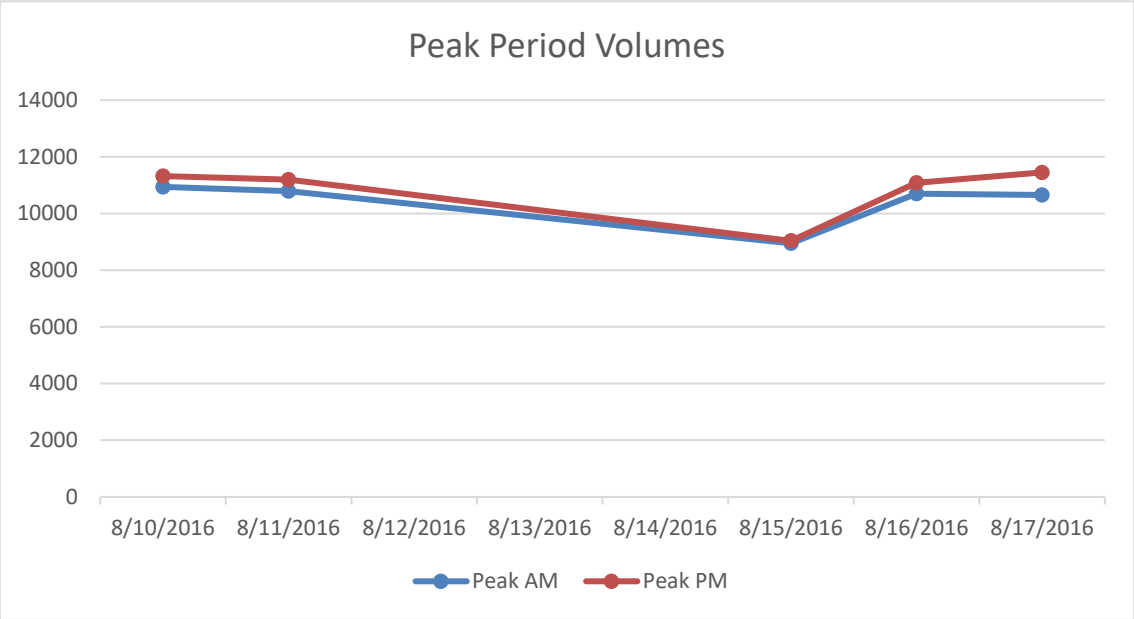


Figure 3.3 shows the peak volumes for the road network for each day, showing that 17th August 2016 is a representative day of the week. This figure also shows that there is minimal variation in the peak volumes in both AM and PM.

4. Assessment Methodology

4.1 Introduction

To assess the capacity of the Junction, a microsimulation model was built in VISSIM covering the Spencer / Clarendon Street corridor from Flinders Street to City Road. VISSIM microsimulation modelling is a computer software package that has the ability to individually model each vehicle, including buses, taxis, trains, trams, etc. within a road network. It enables a realistic representation of driver behaviour such as overtaking and lane changing and can also illustrate network performance. VISSIM is a particularly useful tool in modelling congested road networks where over-saturation and resulting vehicle queuing impacts on upstream intersections, as is the case Clarendon Street corridor.

4.1.1 Model Platform

The model was built using VISSIM 8.00-04 with the signal control being SCATS. Version 6.9.1 of SCATS and the relevant supporting programs (i.e. Wintraff, Simhub, and SCATS Access) were configured and used in the model.

4.1.2 Model Extent

The model study area coded into VISSIM is shown in Figure 4.1 below. The study area includes the intersections of City Road and Clarendon Street and Flinders Street and Spencer Street to model the upstream and downstream conditions.

4.1.3 Time Period

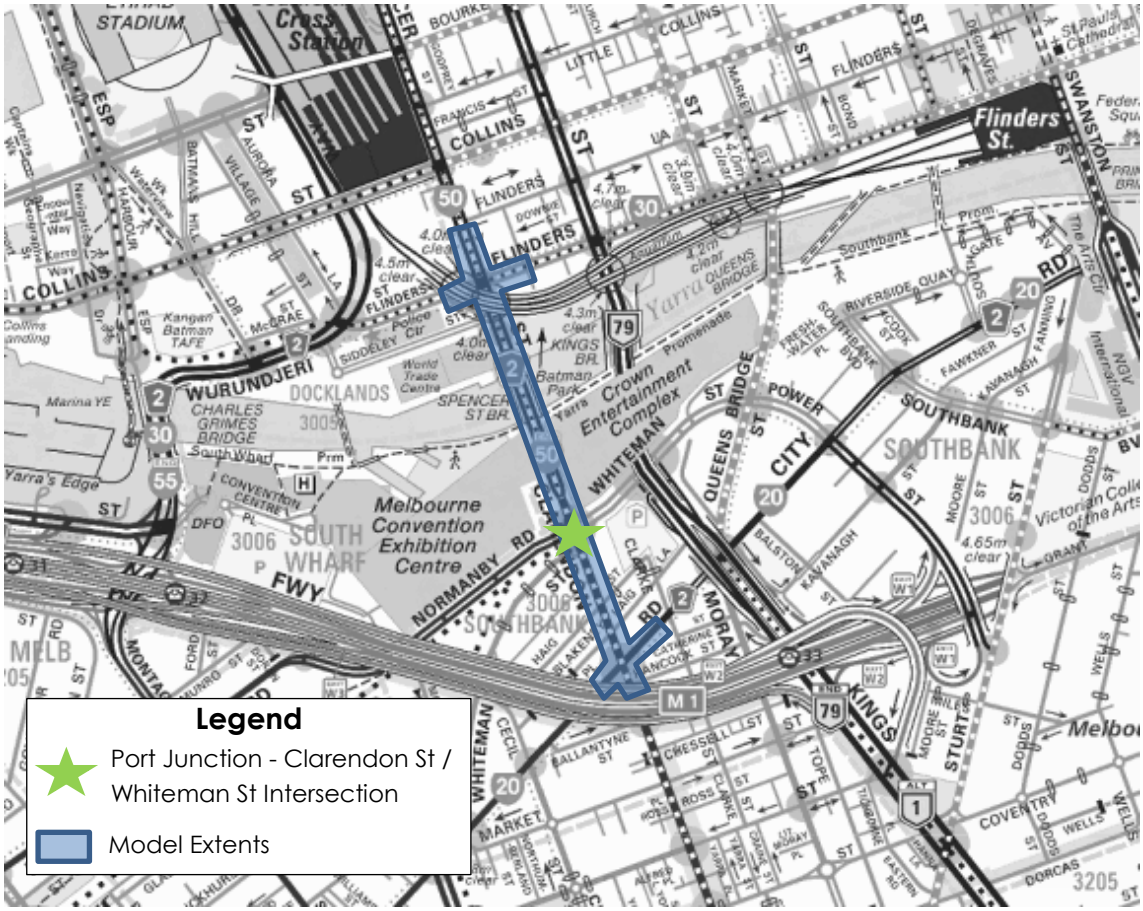
The VISSIM model was developed to represent the following peak periods, ensuring peak periods identified through data collection were covered:

- AM peak period – 7:45am to 9:15am
- PM peak period – 4:45pm to 6:15pm

4.1.4 Signal Control

All signalised intersections within the model are controlled by SCATS (Sydney Coordinated Adaptive Traffic System) which allows for adaptive phase times, cycle times and offsets that respond to fluctuating traffic conditions, public transport demands and improve the efficiency of individual intersections.

Figure 4.1: Model Extents



4.2 Model Assumptions

As part of the modelling assessment, a number of assumptions were made and agreed with by DELWP, VicRoads or PTV. The key assumptions are listed below:

- Bus routes and timetables will remain unchanged in 2031.
- No changes will be made to the signalised intersections within the model.
- All tram models remain the same on the tram routes.
- Pedestrians were added to the model based on general on-site observations and signal timings.
- The tram timetables for new tram routes are based on fixed headways.

4.3 Model Limitations

The extents of the model exclude the Collins Street and Spencer Street intersection which experiences high tram and traffic volumes and congestion. It is unclear as to the level of available capacity for tram movements that exist at this junction and inclusion of this intersection into the analysis would assist in determining the ability for the network as a whole to respond to additional services to Fisherman's Bend.

5. Calibration and Validation

5.1 Overview

This section provides a summary of the calibration and validation of the model, thus demonstrating its suitability for use as part of this study.

A Calibration and Validation report (dated 22/09/2016), was prepared for the base model and submitted to VicRoads. The base model was approved by VicRoads on September 22, 2016.

5.2 Criteria

The calibration and validation process was carried out in accordance with the criteria set out in the Roads and Maritime Services, Traffic Modelling Guidelines, dated March 2013. These guidelines represent the latest comprehensive set of guidelines released in Australia. Table 7.1 lists the targets that are set out within the guidelines.

Table 5.1: Microsimulation Modelling Calibration and Validation Criteria

Item	Criteria
Turn Volumes	Tolerance limits for turn volumes: ○ 85% of individual link or turn volumes to have a GEH ≤ 5 ○ All individual link and turn volumes should have GEH ≤ 10 Plots of observed versus modelled hourly flows: ○ Slope value to be included with plots ○ R2 value to be included with plots and be > 0.9
Travel Time Average	○ Average modelled travel time to be within 15% or one minute (whichever is greater) of average observed journey time for full length of route. ○ Average modelled travel time to be within 15% of average observed travel time for individual sections. ○ Average and 95% confidence intervals to be plotted for observed and modelled travel times for each journey time route (to modellers and RMS satisfaction).
Visual Checks	Key locations to review in terms queuing, pedestrian movements and vehicle-pedestrian interaction.

5.3 Peak Hour Calibration and Validation

5.3.1 Turn Flow Calibration

The calibration results for the turn volumes are shown in Table 7.2 for both the AM and PM peak hours.

Table 5.2: Turn Flow Calibration Results – AM and PM Peak Hour

Criteria	GEH less than 5	GEH less than 10	R2
Target	**>85% of cases**	**100% of cases**	**>0.90**
8:00 – 9:00	95%	98%	0.923
5:00 – 6:00	100%	100%	0.988

The turn flows show a good level of calibration with only one turn during the AM peak hour exceeding a GEH of 10. While this does not meet the guidelines, it is considered acceptable as this turn is not critical to the performance of the Junction. This is further discussed in the

Calibration and Validation report. The scatter plots of the modelled versus observed traffic volumes are shown in Figure 5.1 and Figure 5.2 with both peak periods achieving an R^2 value of 0.9 or higher.

Figure 5.1: Turn Flow Comparison – AM Peak (8am – 9am)

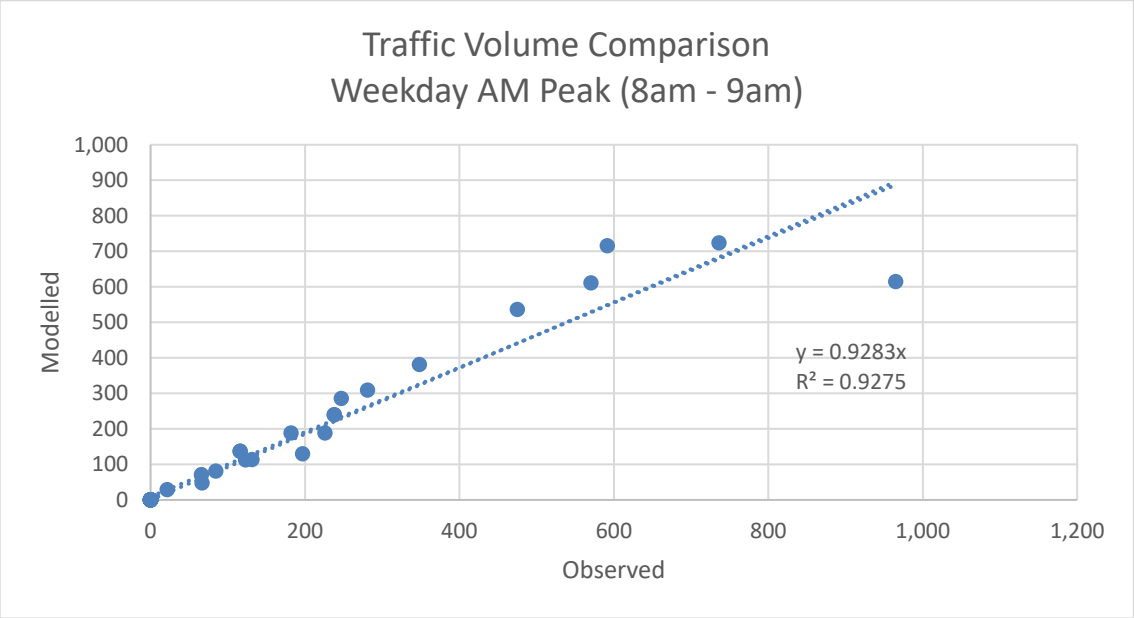
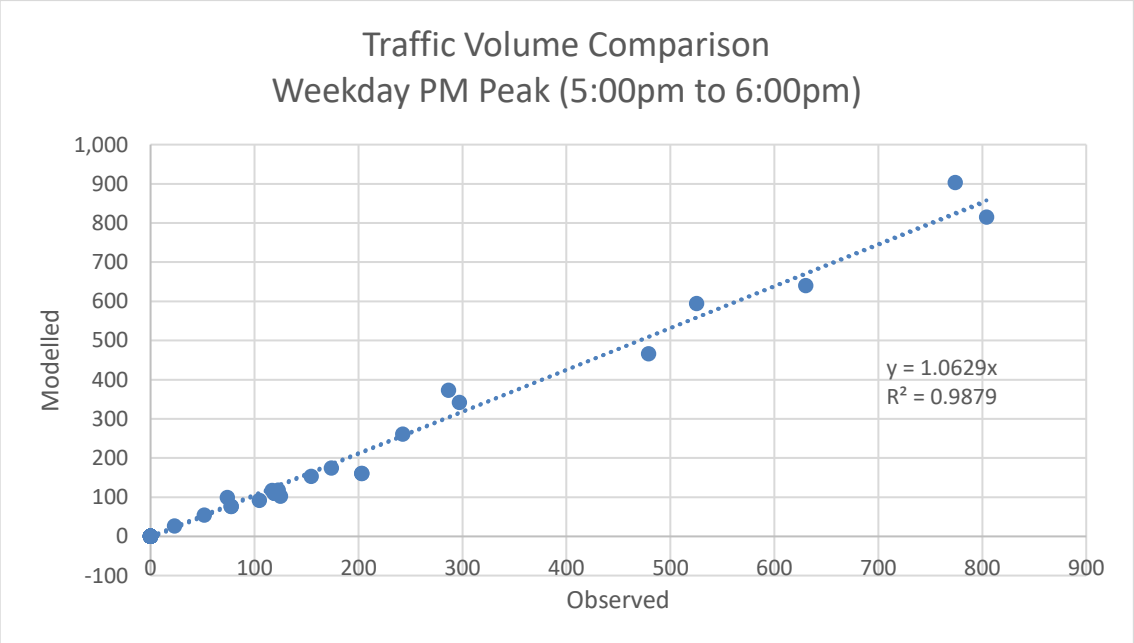


Figure 5.2: Turn Flow Comparison – PM Peak (5pm – 6pm)



5.3.2 Travel Time Validation

The modelled journey times should aim to be within 15% of the observed journey time. The results for the travel time validation are shown in Table 5.3 which demonstrate that the travel times are within 15% for all routes during both peak periods.

Table 5.3: Model Travel Time Summary - Cars

Route	Data	AM Peak 8:00am – 9:00am		PM Peak 5:00pm-6:00pm	
		Observed Journey Time (seconds)	Modelled Journey Time (seconds)		
Northbound	Average (secs)	411	379	Northbound	Average (secs)
	Actual Difference (secs)	-32		-17	
	Percentage Difference	**8%**		**4%**	
Southbound	Average (secs)	228	216	Southbound	Average (secs)
	Actual Difference (secs)	-11		3	
	Percentage Difference	**5%**		**1%**	

5.4 Summary

The calibration and validation results show that the model demonstrates an excellent 'goodness of fit' with the observed traffic conditions indicating that the model performs well at the network wide level.

The traffic volume comparisons for each of the peaks indicate a high level of correlation between the modelled and observed traffic flows with all targets being met.

The travel time analysis illustrates a reasonably high level of correlation between the modelled and observed travel times, with any discrepancies considered to be justifiable as indicated in the context of this report.

6. Scenario Assessment

6.1 Overview

A total of 10 scenarios were tested for both the AM and PM peak periods. The scenarios included a range of time table, signal control changes as well as future year on road traffic increases. Table 6.1 outlines the different scenarios that have been assessed as part of the base year and future year analysis.

Table 6.1: Model Testing Scenarios

		Current PT Network	Melbourne Metro PT changes	New Tram Route	Current Signal phasing	Optimised signal phasing[1]	Increased Frequency of trams
Base Year 2016	Existing	✔			✔		
	Scenario 1a		✔		✔		
	Scenario 1b		✔				
	Scenario 2a		✔	✔	✔		
	Scenario 2b		✔	✔			
Future Year 2031	Scenario 1a		✔		✔		
	Scenario 1b		✔				
	Scenario 2a		✔	✔	✔		
	Scenario 2b		✔	✔			
	Scenario 3a		✔	✔	✔		✔

1. The Scenarios with optimised signal phasing did not proceed, more information is provided in section 6.2 below.

6.2 Melbourne Metro PT Changes

There are a number of changes to the light rail routes as part of the Melbourne Metro project including diverting routes that impact on construction down alternative routes. As part of these diversions, the route 86 is to be diverted down Normanby Road and through Port Junction and routes 5 and 63/64 are to be diverted down the former Port Melbourne Rail Line and through Port Junction. In addition, the route 109 tram is to be diverted via Docklands and will no longer travel through Port Junction. A summary of the changes is presented in Table 6.2.

Table 6.2: Melbourne Metro Changes

Route	Changes
109	Re-routed to Docklands via Collins Street, will not travel down the Clarendon Street corridor.
86	Re-routed to Port Melbourne via Spencer Street and Port Junction.
5	Re-routed down Spencer Street, travels through Port Junction along Clarendon Street.
63	Re-routed down Spencer Street, travels through Port Junction along Clarendon Street.

6.3 New Tram Route

The additional tram route that has been modelled in scenarios 2a, 2b and 3a is the route 11 which is to form a spur to Fishermans Bend.

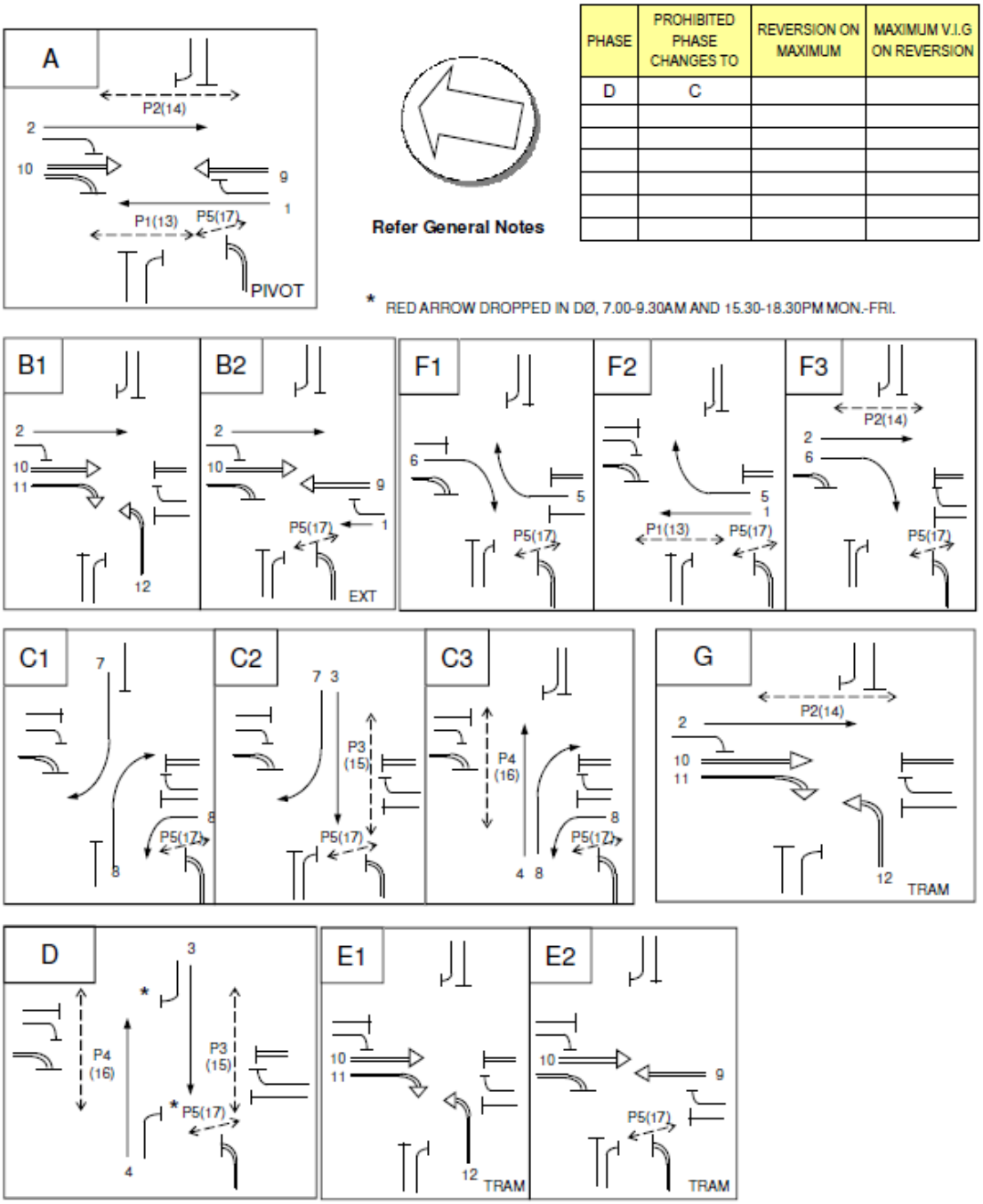
6.4 Increased Frequency of Trams

This scenario included route 109 travelling through Port Junction on its current path and an increase in the frequency of route 11 trams by four per hour. All changes to routes 86, 63 and 5 were maintained in this option.

6.5 Signal Optimisation

The project scope included optimising the signals at the intersection of Clarendon Street / Whiteman Street / Normanby Road to improve the operation for trams turning. The current signal phasing for the intersection is shown in Figure 6.1.

Figure 6.1: Clarendon Street / Whiteman Street / Normanby Road Signal phasing



The signal operation and intersection layout were analysed and a number of proposals were considered, these are listed in Table 6.3.

Table 6.3: Intersection Improvement options

Option	Description	Consequences / issues
1	Currently, if B and E phase run then G phase does not run. This option proposes to allow trams to run during G phase even if B and E have run.	The cycle time may not be sufficient to fit all phases in. This will take time away from the south approach
2	Reduce D phase to the minimum time required for pedestrians to cross and allocate to the tram phases (B phase or E phase)	Pedestrian level of service will be impacted. Less time to Normanby Avenue and Whiteman Street may result in queueing.
3	Allocate more time to B phase at the expense of A phase	South approach may experience delays. Trams may not always need the additional time.

The options for signal improvement have been discussed with the project team and it was ultimately decided that these signal optimisation options would provide little benefit to tram operations and would also have an impact on pedestrian and/or vehicle movements. It was agreed with the project team to proceed with the current signal phasing options only.

A description of the scenarios tested are provided in the following sections.

6.6 Future Year Light Rail Demands

Table 6.4 summarises the peak hour frequencies for each tram route in the different scenarios, these numbers were supplied by PTV.

Table 6.4: Tram Route Hourly Frequencies in Both Directions

		11	12	96	109	86	5	63/64	Total
Base Year 2016	Existing		15	20	20				55
	Scenario 1a		16	20		20	12	16	84
	Scenario 1b		16	20		20	12	16	84
	Scenario 2a	16	16	20		20	12	16	100
	Scenario 2b	16	16	20		20	12	16	100
Future Year 2031	Scenario 1a		20	24		24	12	24	104
	Scenario 1b		20	24		24	12	24	104
	Scenario 2a	20	20	24		24	12	24	124
	Scenario 2b	20	20	24		24	12	24	124
	Scenario 3a	24	20	24	24	24	12	24	148

The tram routes in each scenario are also shown in Figure 6.2 to Figure 6.5.

Figure 6.2: Existing Tram Routes

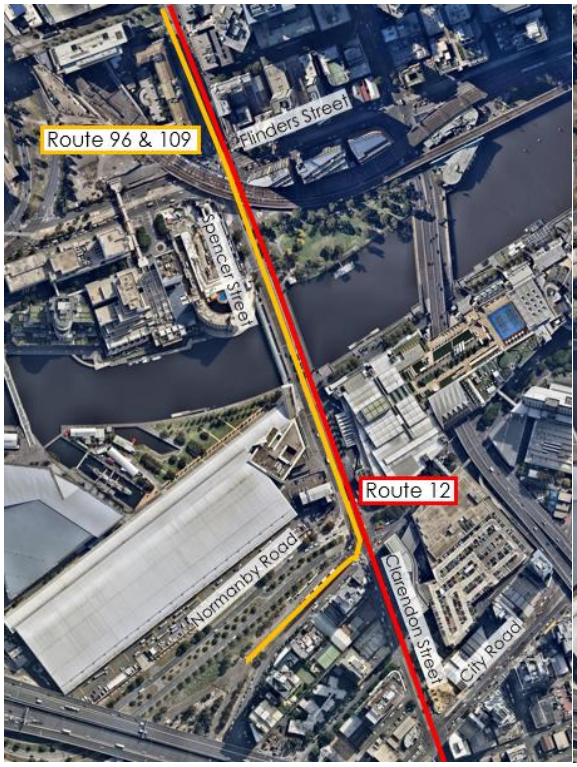


Figure 6.3: Scenario 1a & 1b Tram Routes

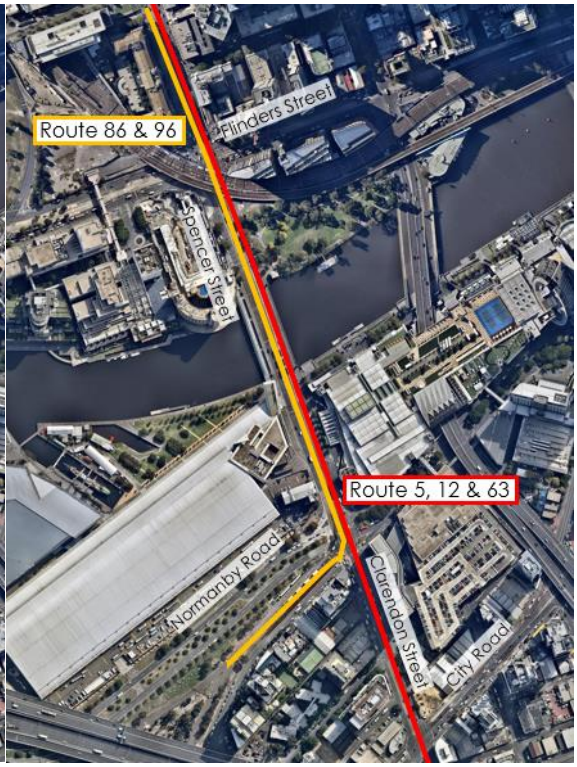


Figure 6.4: Scenario 2a & 2b Tram Routes

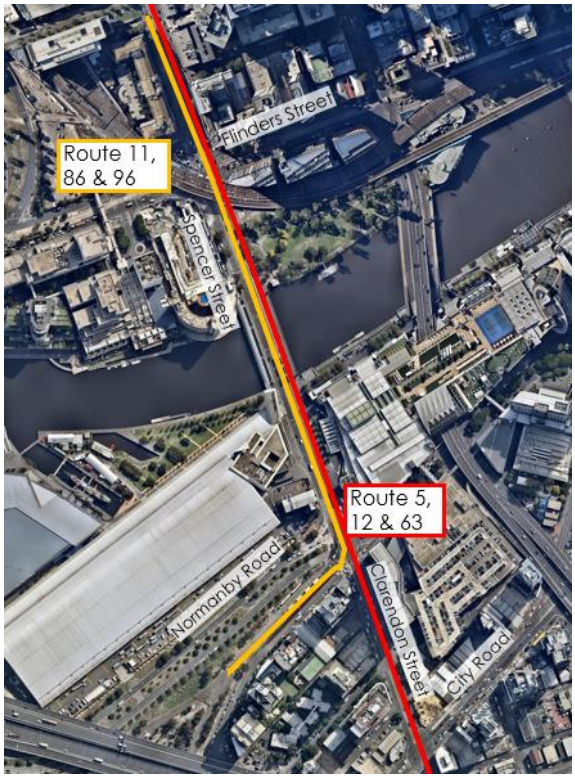


Figure 6.5: Scenario 3a Tram Routes

Table 6.5 lists the route descriptions for the light rail routes included in the model.

Table 6.5: Tram Route Descriptions

Route Number	Route Description 2016	Route Description 2031
11	West Preston – Vic Harbour Docklands via Collins St	West Preston – Fishermans Bend (Plummer St) via Collins St / Spencer / Port Junction
12	Victoria Gardens – St Kilda via La Trobe St / Spencer St / Clarendon St	
96	East Brunswick – St Kilda via Bourke St / Spencer St / Port Junction	
109	Box Hill – Port Melbourne via Collins St / Spencer St / Port Junction	**Scenario 1a to 2b -** Box Hill – Vic Harbour Docklands via Collins St
		Scenario 3a - Box Hill – Port Melbourne via Collins St / Spencer St / Port Junction
86	Bundoora – Waterfront City Docklands via Bourke St / Spencer St / La Trobe St	Bundoora – Port Melbourne via Bourke St / Spencer St / Port Junction
5	Melbourne University – Malvern via St Kilda Rd	Waterfront City Docklands – Malvern via La Trobe St / Spencer St / Clarendon St
63/64	(64) Melbourne University – East Brighton via St Kilda Rd	(63) Waterfront City Docklands – Malvern Station via La Trobe St / Spencer St / Clarendon St

6.7 Future Year Private Vehicle Demands

Traffic growth rates were obtained from the reference case of the Victorian Integrated Transport Model (VITM) for the year 2016 and 2031 for key roads in the model area. A growth factor was calculated between the volumes for each major road in the model and this growth factor was applied to the traffic volumes used in the model. In some cases, the growth factor was considered to be larger than reasonably expected. In these cases, the numeric difference between the 2016 and 2031 volumes was adopted. The adopted growth factors and future year volumes for the volume input links are shown in Table 6.6 and

Table 6.7 for the AM and PM peak period.

Table 6.6: AM Peak Traffic Growth

Road Input	2016 Peak Volume	Growth Factor	Future Year 2031 Peak Volume	% Increase
Spencer Street North	3,515	1.19	4,167	19
Flinders Street East	1,992	1.33	2,656	33
Flinders Street West	3,617	1.21	4,361	21
Normanby Road	3,688	1.39	5,113	39
Whiteman Street (east of Clarendon St)	1,680	1.34	2,244	34
City Road West	3,817	1.21	4,610	21
City Road East	3,752	1.44	5,414	44
Clarendon Street South	3,303	1.04	3,425	4

Table 6.7: PM Peak Traffic Growth

Road Input	2016 Peak Volume	Growth Factor	Growth Factor Future Year 2031 Peak Volume	% Increase
Spencer Street North	4,940	1.04	5,160	4
Flinders Street East	2,412	1.11	2,676	11
Flinders Street West	3,412	1	3,412	0
Normanby Road	4,116	1.15	4,737	15
Whiteman Street (east of Clarendon St)	1,288	1.50	1,936	50
City Road West	3,716	1.22	4,519	22
City Road East	3,480	1.27	4,434	27
Clarendon Street South	2,084	1.60	3,333	60

7. Results

7.1 Overview

The results below provide a comparative analysis between the base case and future year scenarios. The following assessment criteria were agreed upon:

- Network performance
- Point to point travel times (light rail and private vehicles)
- Travel time reliability for light rail vehicles
- Light Rail headway
- Intersection level of service (LoS)
- Delay for both passenger vehicles and public transport
- Average speed (light rail and private vehicle)

Each of the various results are summarised in the following sections.

7.2 Network Performance

The key network performance parameters that have been reported on include the following:

- the average speed of vehicles within the models for the respective period
- total vehicles kilometres travelled (VKT) for each vehicle for the modelled peak
- total vehicle hours travelled (VHT) for each vehicle for the modelled peak
- number of stops (a number of occasions where a vehicle reaches a standstill speed of 0 km/h)
- total number of completed trips in the simulated period
- total number of vehicles remaining in the network at the end of the simulation
- total number of unreleased vehicles (latent demand) at the end of the simulation

Table 7.1 and Table 7.2 present the key network performance parameters for the AM and PM peak hours, respectively.

Table 7.1: Network Performance Results – AM Peak

Network Statistic	2016						2031					
	Existing		1a		2a		1a		2a		3a	
	Vehs	Trams	Vehs	Trams	Vehs	Trams	Vehs	Trams	Vehs	Trams	Vehs	Trams
VKT	5,024	80	5,058	117	5,067	132	5,711	148	5,685	169	5,680	195
VHT	375	6	322	8	350	11	580	11	587	13	569	20
Av. Speed (s)	13.4	13.7	15.7	13.9	14.5	12.5	9.8	13.5	9.7	12.9	10.0	10.0
Number of Stops	21,715	155	16,525	261	18,107	382	36,114	307	37,040	423	34,971	1,004
Completed trips	5,995	84	6,069	113	6,107	128	6,905	148	6,889	171	6,903	195
Incomplete trips	412	5	369	7	371	10	676	14	643	15	724	21
Latent demand	40	0	47	0	36	0	559	0	720	0	547	0

Table 7.2: Network Performance Results – PM Peak

Network Statistic	2016						2031					
	Existing		1a		2a		1a		2a		3a	
	Vehs	Trams	Vehs	Trams	Vehs	Trams	Vehs	Trams	Vehs	Trams	Vehs	Trams
VKT	5401	86	5181	120	5191	136	5365	155	5425	174	5578	202
VHT	485	7	462	9	492	11	758	12	753	14	746	19
Av. Speed (s)	11.1	13.0	11.2	13.4	10.6	12.8	7.1	13.4	7.2	12.4	7.5	10.6
Number of Stops	31624	167	28361	283	29996	365	48225	344	48740	460	46546	886
Completed trips	6416	94	6209	121	6231	138	6470	158	6555	179	6700	206
Incomplete trips	419	7	474	9	484	9	820	11	800	12	808	18
Latent demand	111	0	142	0	231	0	884	0	795	0	632	0

The results indicate that during both peak hours, there is a decline in the performance of the road network as more vehicles and trams are added to the network. A noticeable decline can be seen in the 2031 3a scenario for both vehicles and trams, although, the trams experience a larger decline in conditions. More congestion is experienced during the PM peak as shown in the large latent demands and high VHT results.

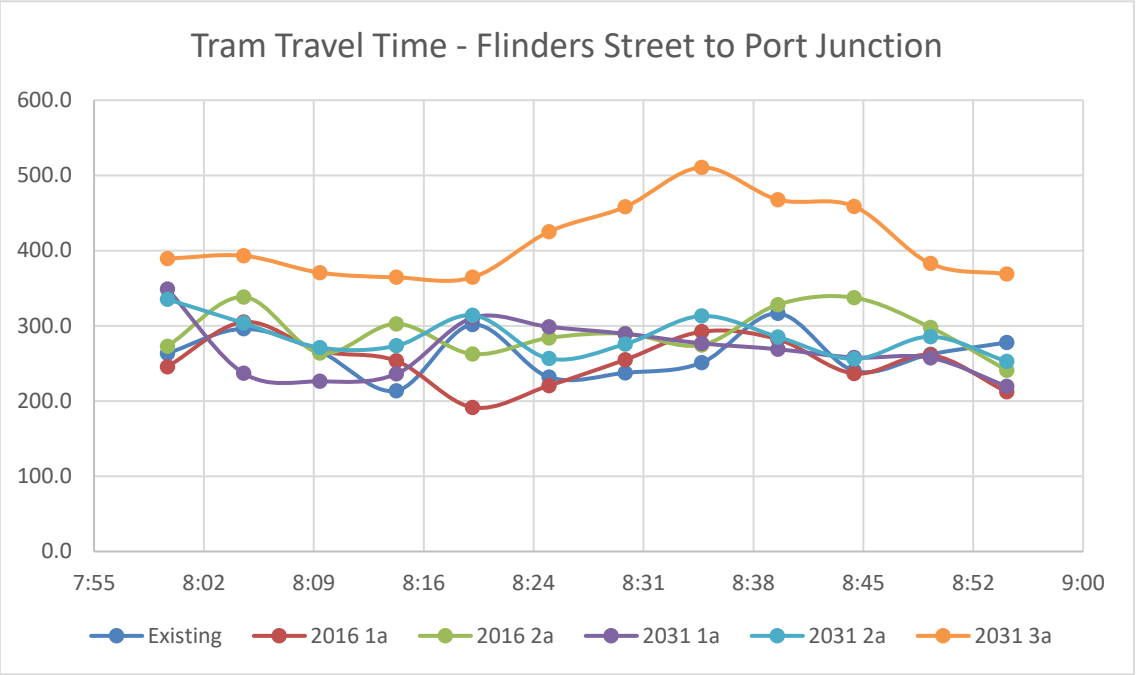
7.3 Travel Times

Travel Times from the model have been obtained for the southbound route from Flinders Lane (start of model) to clear of the junction and for the northbound route from Normanby Road to Flinders Street. The results are shown in Table 7.3 to Table 7.6, while the time variation over the simulation periods are shown graphically in Figure 7.1 to Figure 7.4

Table 7.3: AM Travel Times (s) – Flinders Street to Port Junction

Scenario	Average	Minimum	Maximum
Base Year 2016	263	214	318
2016 1a	252	192	336
2016 2a	291	205	362
2031 1a	269	200	349
2031 2a	285	224	348
2031 3a	413	296	569

Figure 7.1: Average Tram Travel Time – AM Flinders Street to Port Junction

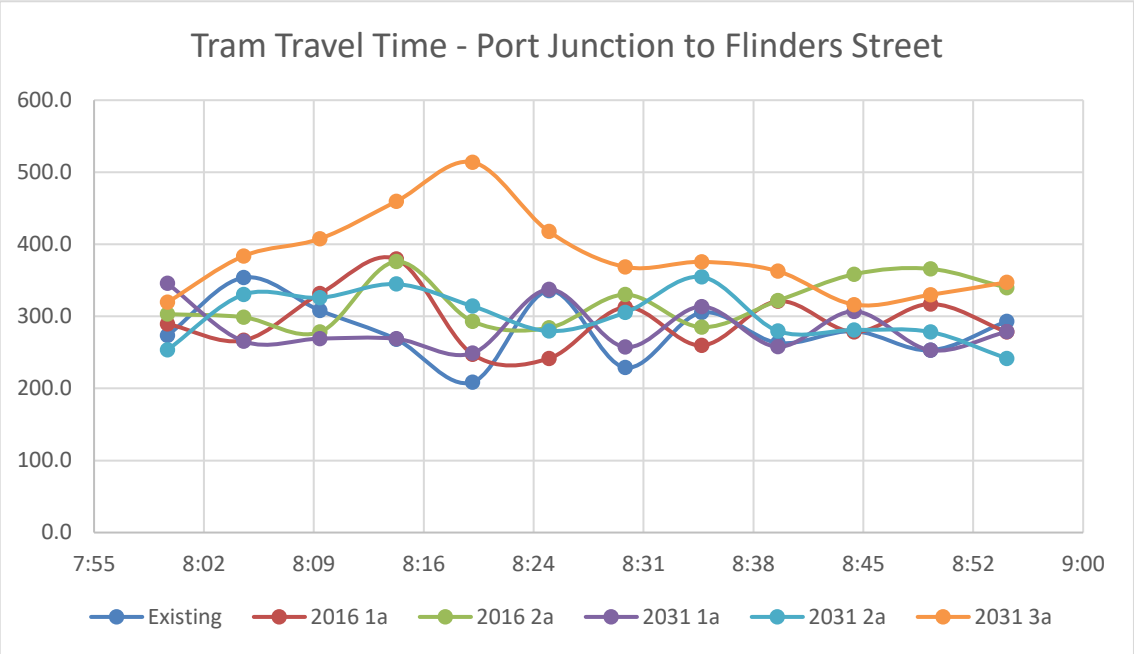


A significant increase in the travel time from Flinders Street to Port Junction can be seen during 2031 scenario 3a for the entire AM peak period. The maximum travel time experienced during this scenario also increases significantly from an average of 281 seconds in the base year to 384 seconds in scenario 3a.

Table 7.4: AM Travel Times (s) – Port Junction to Flinders Street

Scenario	Average	Minimum	Maximum
Base Year 2016	281	202	432
2016 1a	294	228	409
2016 2a	320	234	414
2031 1a	284	219	378
2031 2a	299	218	389
2031 3a	384	261	574

Figure 7.2: Average Tram Travel Time – AM Port Junction to Flinders Street

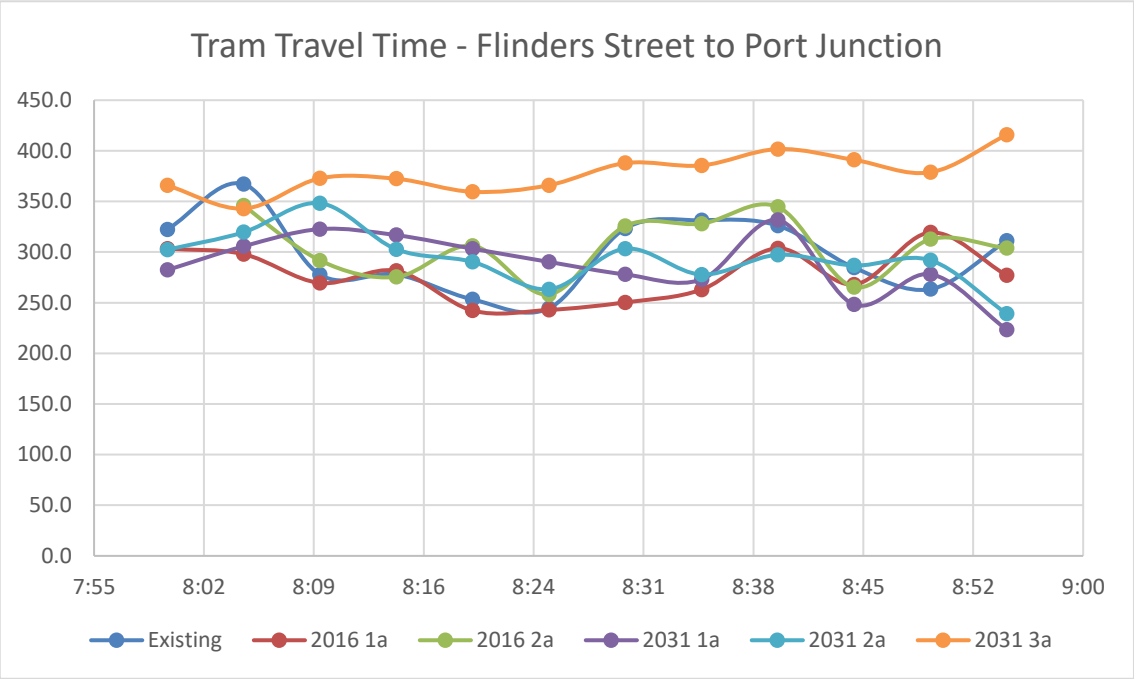


The travel time from Port Junction to Flinders Street experiences a significant increase during 2031 3a, however, it is not to the same extent as the Flinders Street to Port Junction travel times. Scenario 2016 2a also experiences an increase in most travel time metrics, this is due to the increase in tram demand and the signal phasing. As can be seen in Figure 7.2, there is some variance in tram travel times due to the different arrival patterns of the trams and the SCATSIM control.

Table 7.5: PM Travel Times (s) – Flinders Street to Port Junction

Scenario	Average	Minimum	Maximum
Base Year 2016	266	243	387
2016 1a	259	217	319
2016 2a	287	220	415
2031 1a	294	208	343
2031 2a	298	213	380
2031 3a	434	312	464

Figure 7.3: Average Tram Travel Times – PM Flinders Street to Port Junction

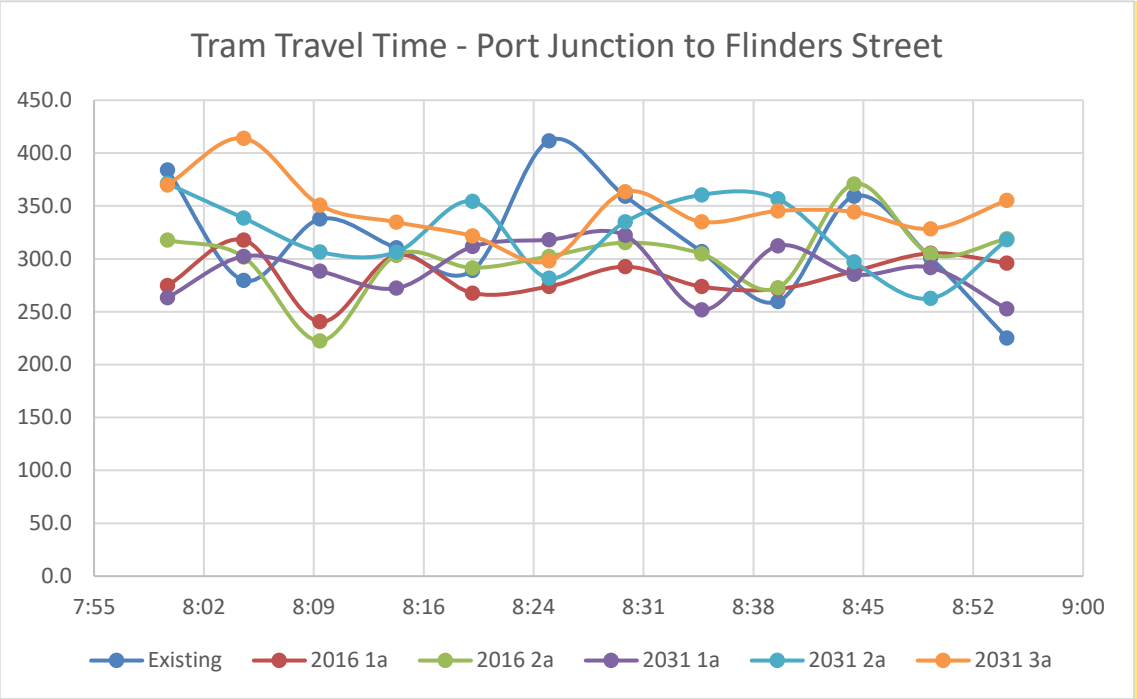


Scenario 2031 3a has the most significant increase in travel times during the PM peak with increases from 295 seconds to 381 seconds on average. The PM has a larger increase when compared to the existing travel times and the 2031 scenarios which show an increase.

Table 7.6: PM Travel Times (s) – Port Junction to Flinders Street

Scenario	Average	Minimum	Maximum
Base Year 2016	295	225	435
2016 1a	286	230	343
2016 2a	302	206	378
2031 1a	304	220	354
2031 2a	313	257	402
2031 3a	381	264	441

Figure 7.4: Average Tram Travel Times – PM Port Junction to Flinders Street



The travel times in the PM from Port Junction to Flinders Street do not show the same separation between scenario 2031 3a and the other scenarios that was seen previously, although, there is an increase in average travel time during 2031 3a.

7.4 Light Rail Headway

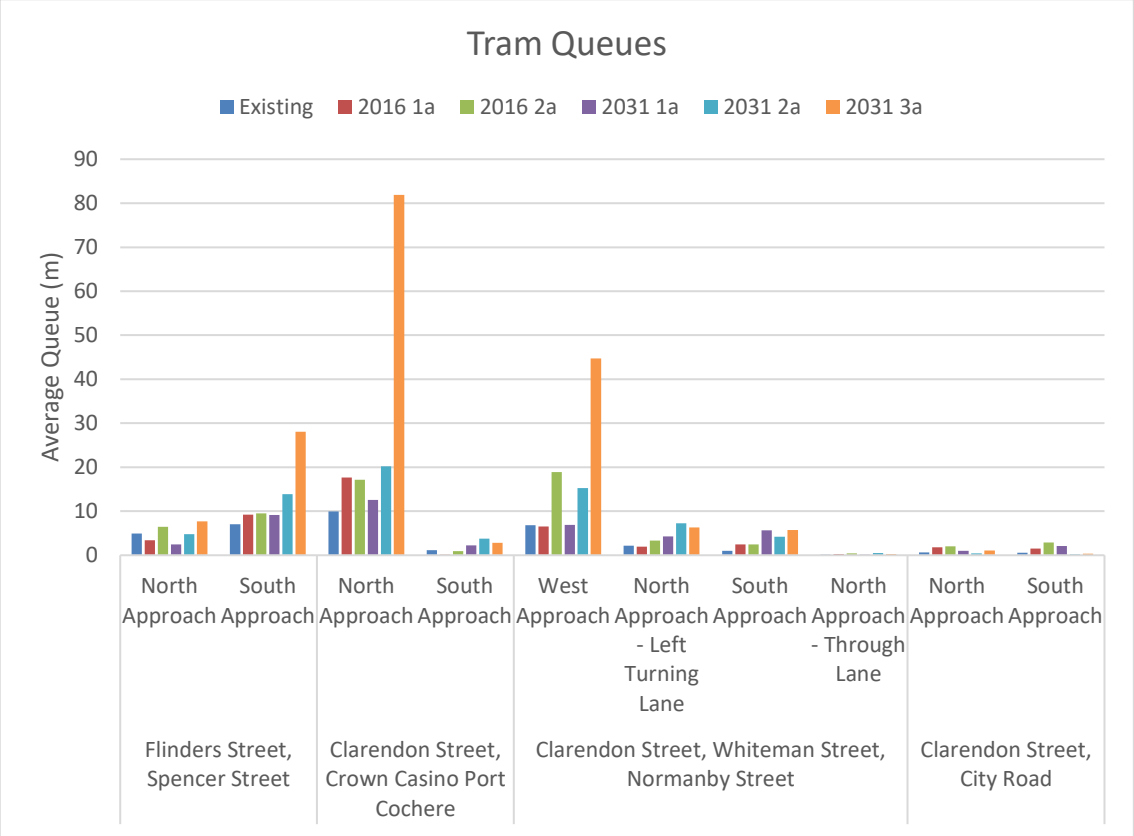
Tram headways were graphed to identify instances when a preceding tram delays the next tram. These delays are caused by traffic signals or stop dwell times which impact on the headway. The headway graphs are attached in Appendix B.

In general, there is headway between trams. As the number of trams operating along the Spencer Street corridor is increased, the headway is smaller and there are a few instances of trams bunching, particularly at the beginning of the model and at the Casino stop.

7.5 Queues

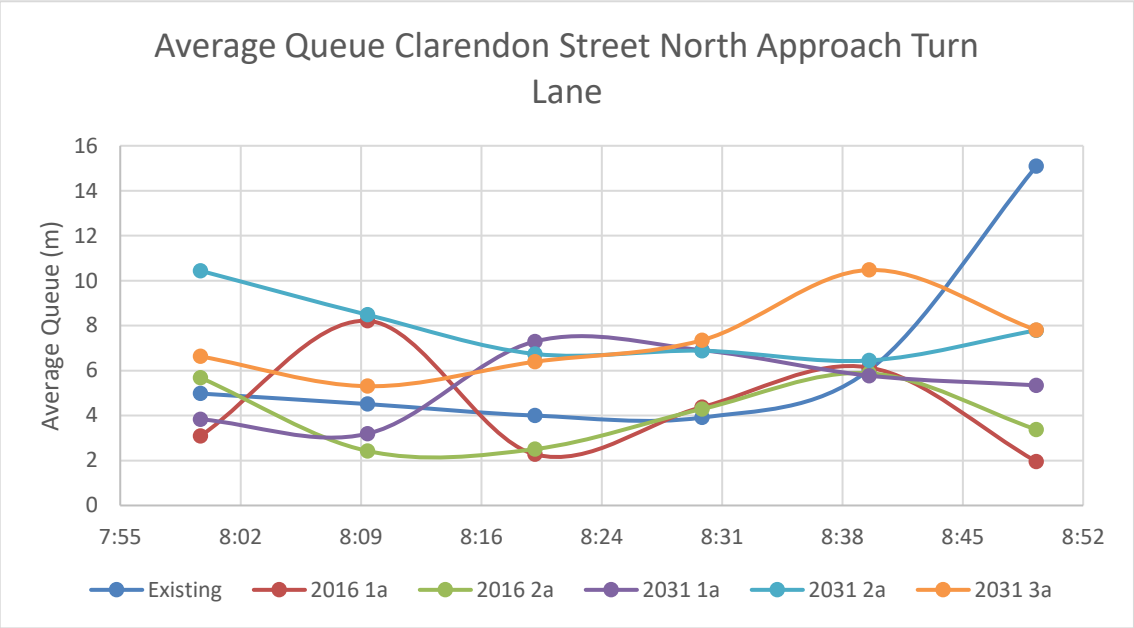
The average queue was recorded for trams at each intersection in the model, the critical movements were identified as the turn lane on the north approach of Clarendon Street at the Junction and the north approach at the casino intersection. The results for each intersection and for the critical movements during the simulation period are shown in Figure 7.5 to Figure 7.10 for the AM and PM peak.

Figure 7.5: Average Tram Queues - AM



The results show that most queues are typically less than one tram length, the exception to this is the north approach at the Crown Casino Port Cochere in 2031 scenario 3a and the west approach at the Junction in 2031 scenario 3a which both experience a sharp increase in queue length. The Junction north approach turning lane and the Crown Casino intersection north approach queues have been graphed over the AM peak hour as shown in Figure 7.6 and Figure 7.7 below.

Figure 7.6: Tram Average Queue at Clarendon Street North Approach Right Turn Lane – AM



The results shown in Figure 7.6 show no significant difference in the average queues on Clarendon Street North approach right turn lane. There is some variance shown in the queues within the scenarios, particularly towards the end of the peak hour in the existing scenario. This is due to the timetable and timings of trams approaching this intersection and is not significant.

Figure 7.7: Tram Average Queue at Casino Stop North Approach – AM

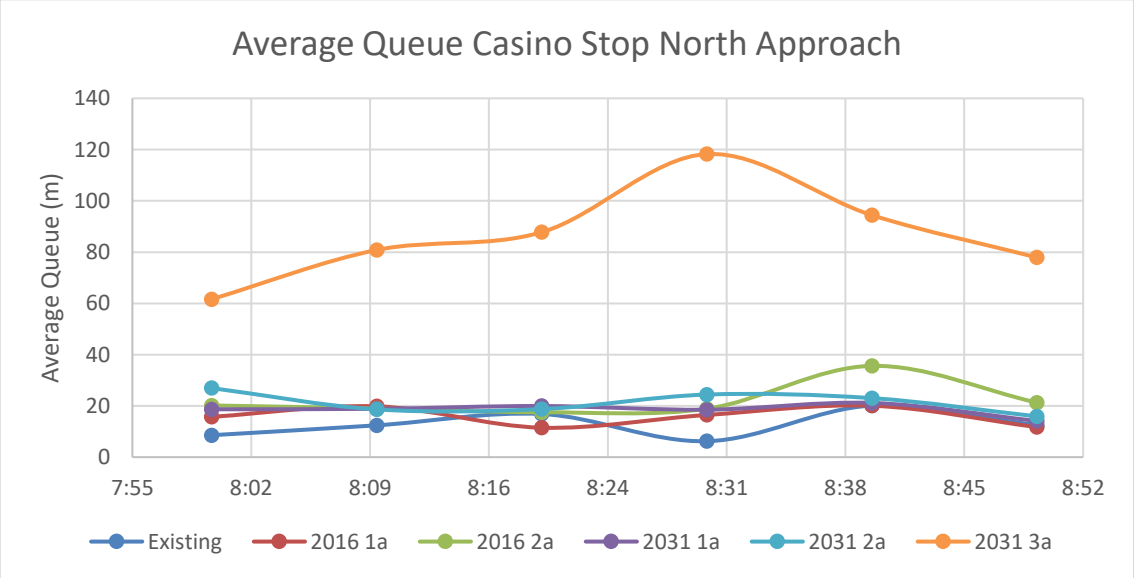


Figure 7.8: Average Tram Queue - PM

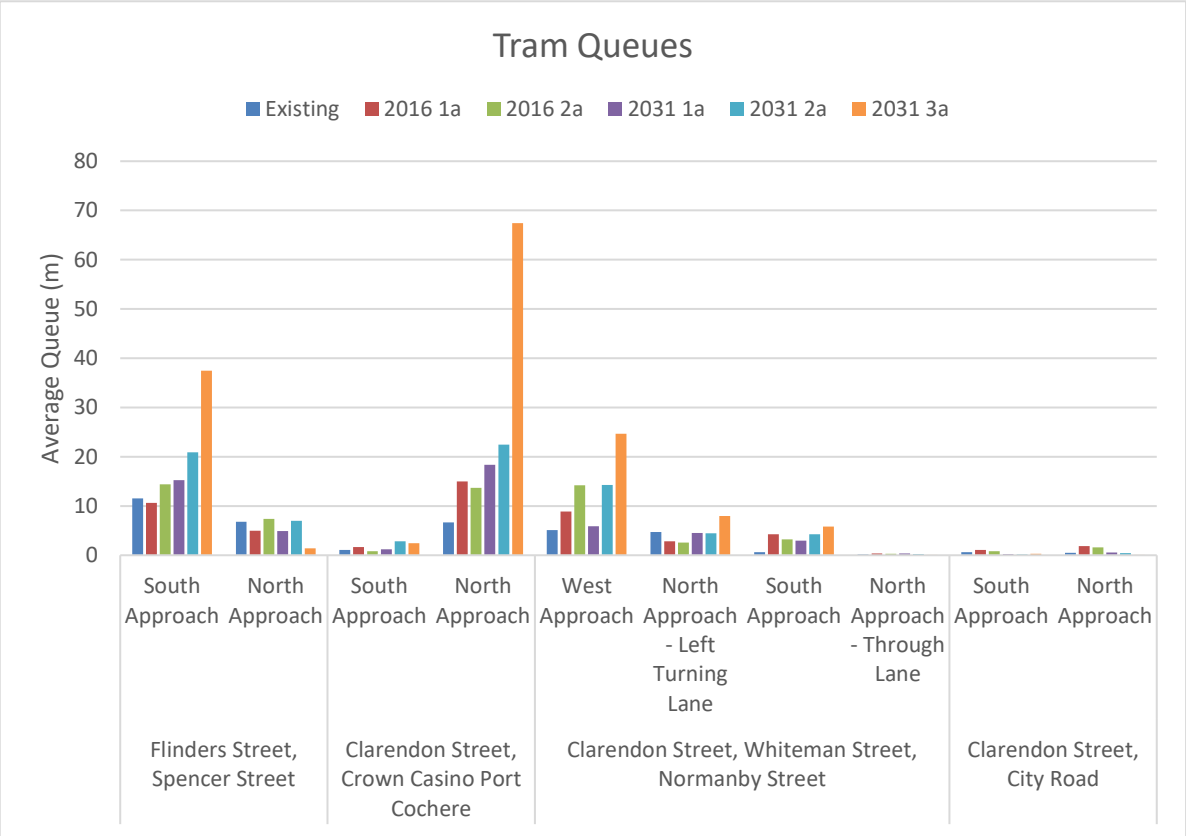


Figure 7.9: Average Tram Queue at Clarendon Street North Approach Right Turn Lane - PM

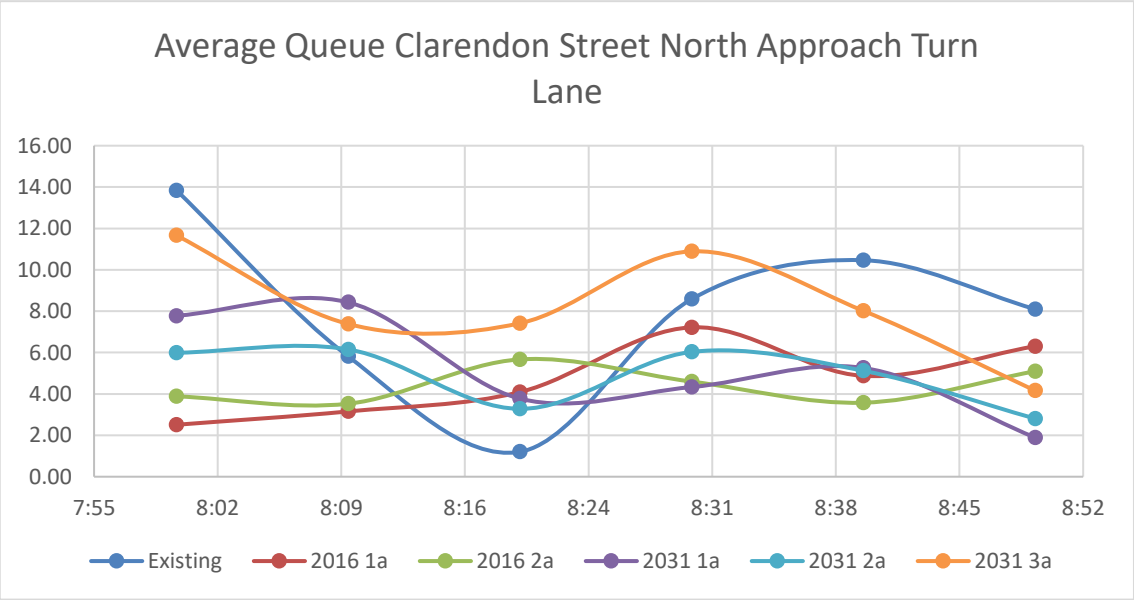
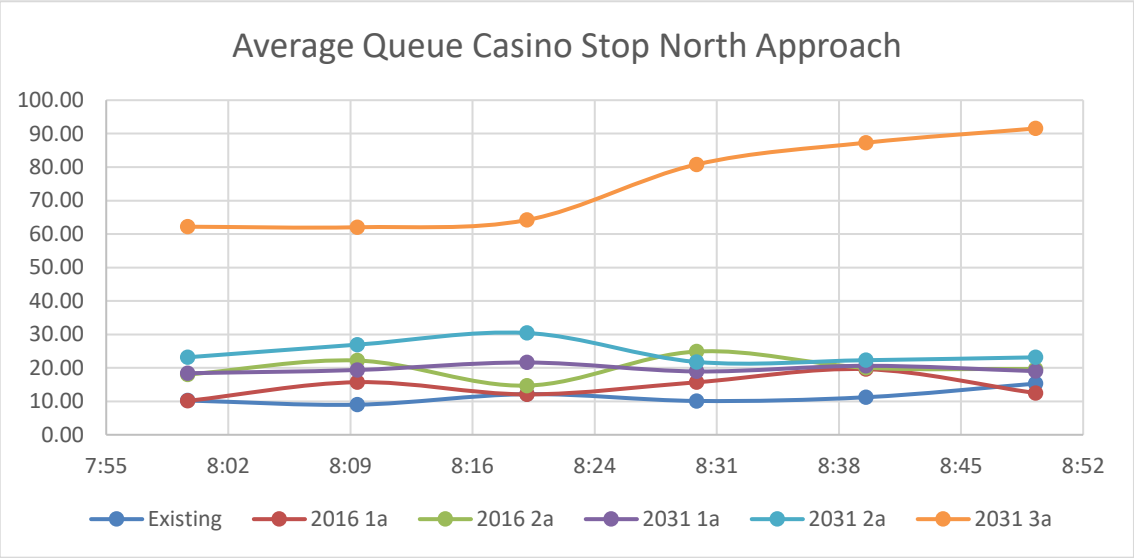


Figure 7.10: Average Tram Queue Casino Stop North Approach - PM



The results show that there is an increase in the queue lengths on most intersection approaches for all scenarios compared to existing in the PM peak. The north approach at the Crown Casino signals experiences the largest increase in queues in scenario 2031 3a and this is supported by the graphs of the average queue for this approach over the PM peak hour.

7.6 Delays to Trams

The Clarendon Street Corridor and Normanby Road provide dedicated tram lanes with an additional lane provided at the north approach to the junction for right turning trams. Therefore, the main delays occur at signalised intersections with larger delays experienced where a tram stop is located directly upstream or downstream of an intersection. The average delay for trams at the signalised intersections for each peak period are shown in Figure 7.11 to Figure 7.13.

Figure 7.11: Delay by Approach at Flinders Street and Crown Casino – AM Peak

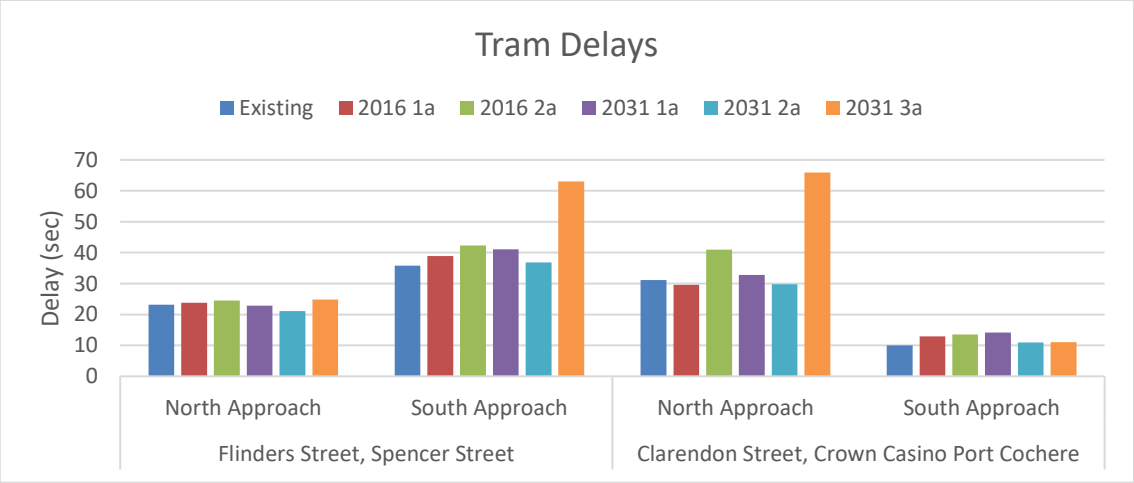


Figure 7.12: Delay by Approach at Port Junction – AM Peak

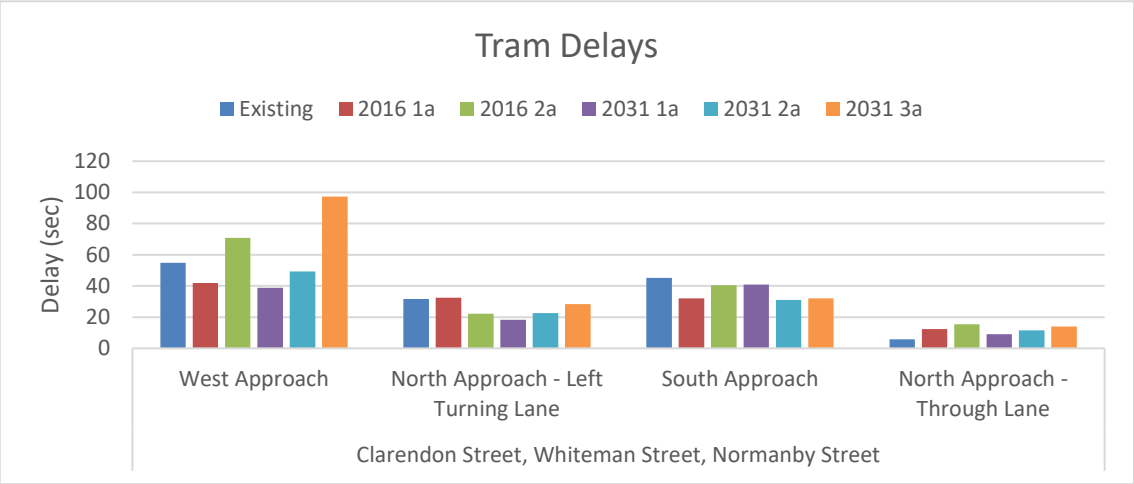


Figure 7.13: Delay by Approach at Flinders Street and Crown Casino– PM Peak

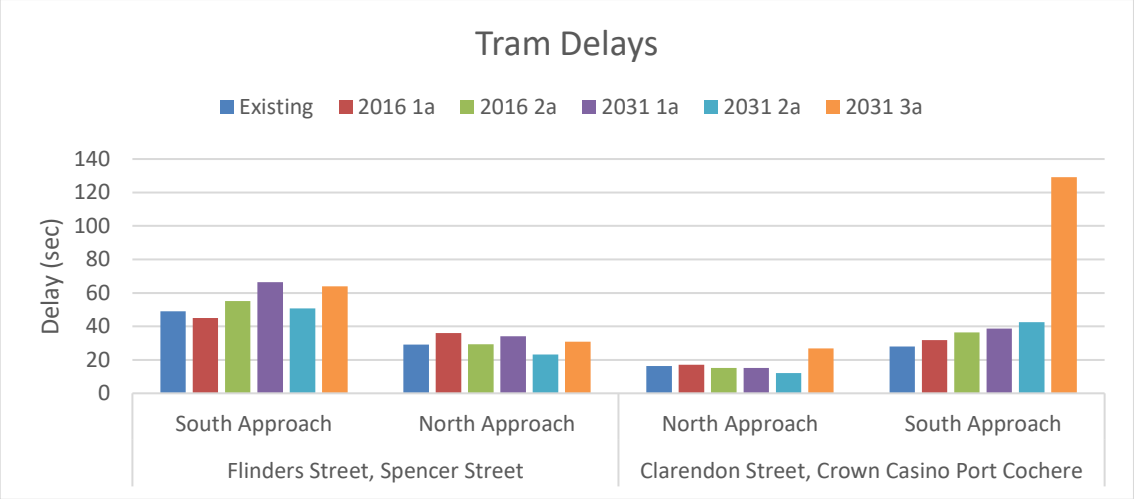
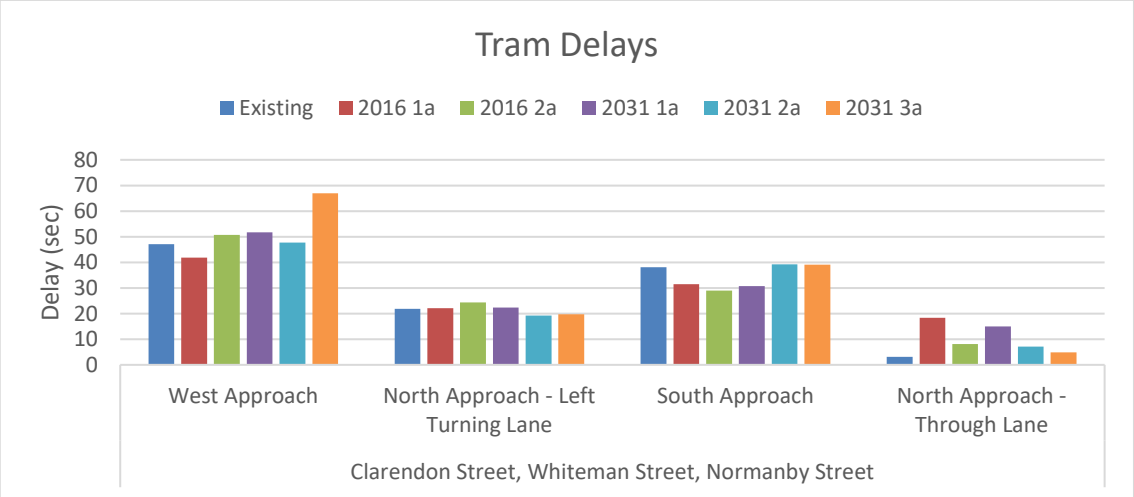


Figure 7.14: Delay by Approach at Port Junction– PM Peak



The most significant increase in delays is observed during scenario 2031 3a for both peak periods.

7.7 Average Speed

The average speed for trams and private vehicles is shown in Figure 7.15 to Figure 7.18 for the AM and PM peak.

Figure 7.15: Tram Average Speed - AM

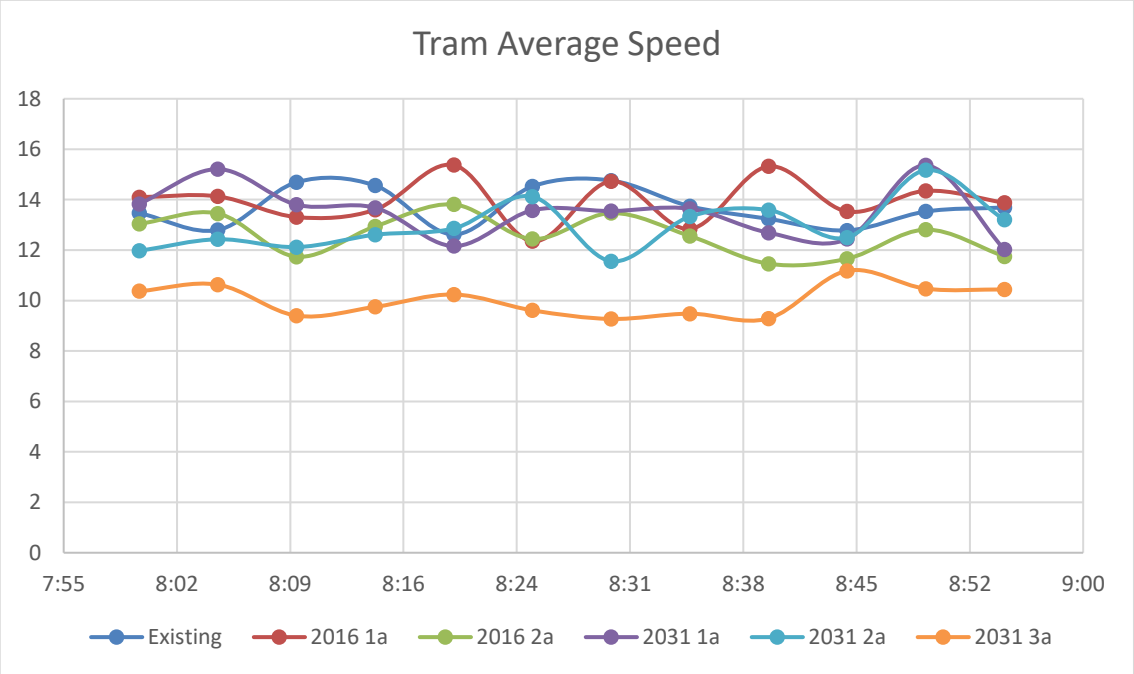


Figure 7.16: Vehicle Average Speed – AM

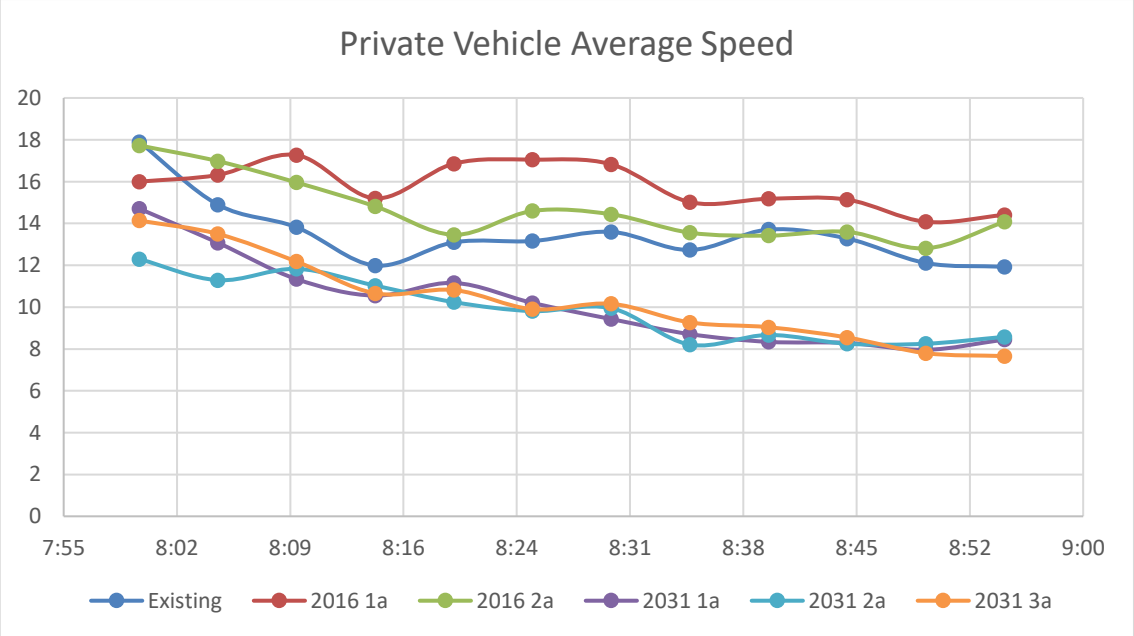


Figure 7.17: Tram Average Speed - PM

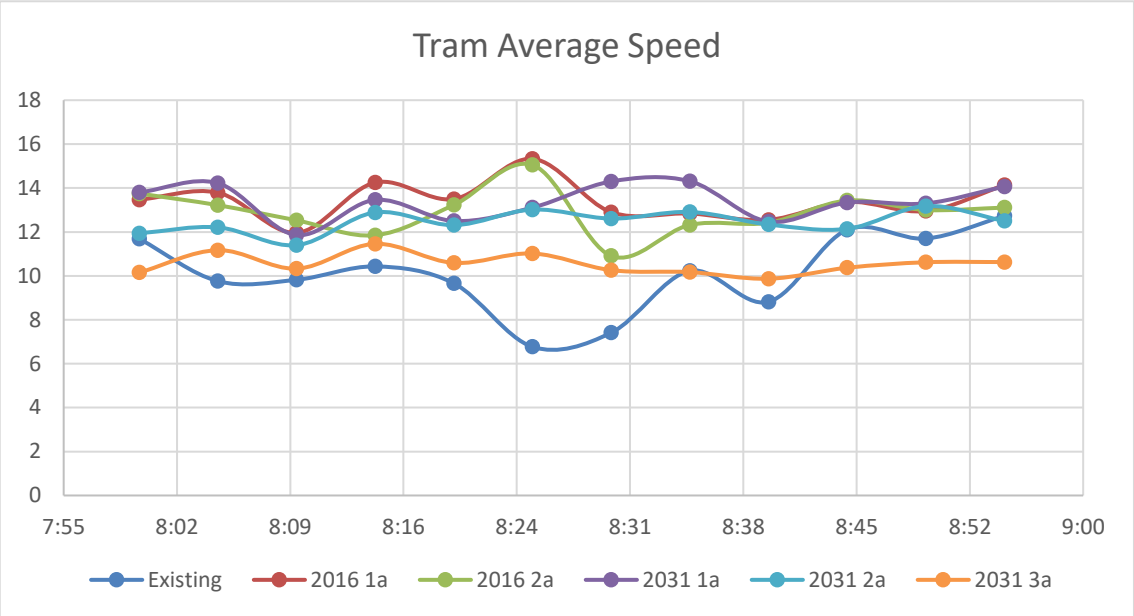
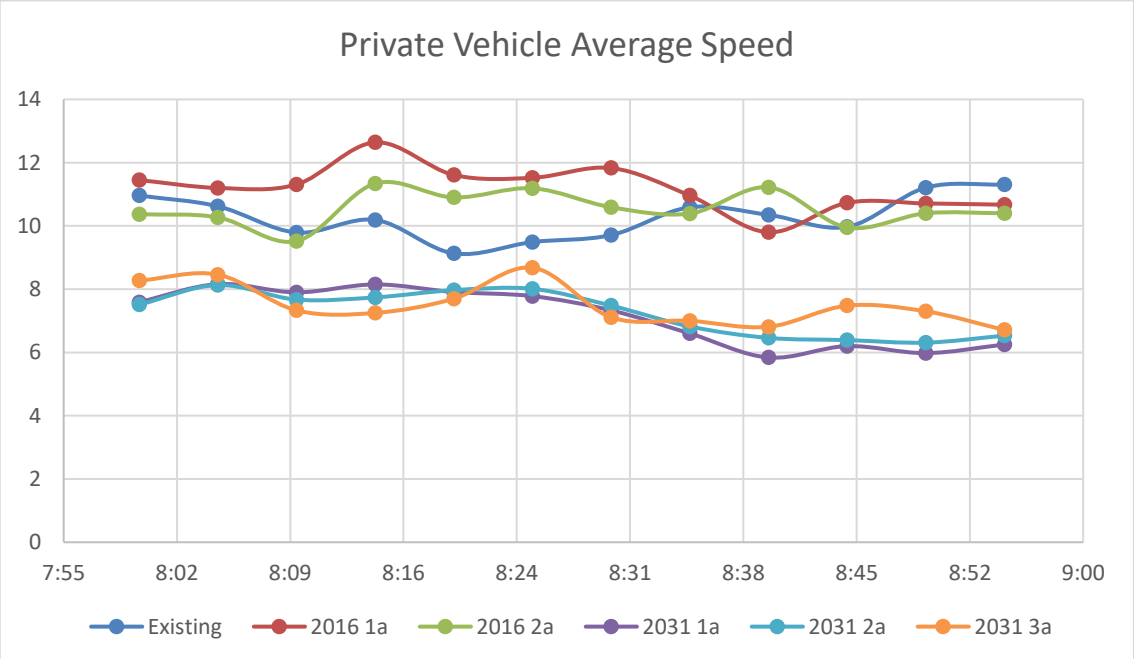


Figure 7.18: Vehicle Average Speed - PM



For trams, the average speed lowers in scenario 2031 3a for both peaks with a greater drop in speed experienced during the AM peak. For private vehicles, a drop in speeds is experienced in all 2031 scenarios as congestion worsens.

8. Conclusion

This report outlines the development of the microsimulation model of the Spencer Street / Clarendon Street corridor and the Port Junction to test the ability for the network to cater for additional light rail services that may be required as a result of additional development in Fisherman's Bend.

The modelling results provided a range of outputs that are able to support the following comments and conclusions:

- There are currently 55 trams travelling through the Junction during the peak period,
- In the future, traffic demands are expected to increase by up to 60% in some movements on Clarendon Street,
- Port Junction is able to accommodate light rail demands as outlined in scenarios 1a and 2a for years 2016 and 2031, which represent up to 124 trams travelling through the intersection, however, as the signal phasing favours tram movements along the corridor, there is less green time available to private vehicle movements and delays are experienced for private vehicles as a result of less green time,
- Scenario 3a includes the addition of the route 109 tram to the corridor and increase in frequency of the Route 11 tram. This scenario includes 148 trams travelling through the Junction during the 2031 peak period,
- Scenario 3a would cause significant delays, queueing, and travel times to trams with increases in queueing occurring at the Crown Casino north approach and the Junction West approach for trams,
- The signal phasing at the Junction is currently performing at peak efficiency with trams receiving enough green time to clear the intersection, delays to trams are typically caused by tram in front delays.
- Infrastructure upgrades would need to be considered at the Junction and Crown Casino intersection to cater for the tram demands in scenario 3a, this is outside the scope of this study.

In summary, the Port Junction currently operates well and operationally has the ability to accommodate more than double the number of trams already experienced, albeit at the expense of private vehicle journey time and throughput. Scenario 3a, which includes up to 148 trams through the intersection fails, causing unacceptable delays to both trams and vehicles on the road network. These results do not have consideration for capacity constraints at the Collins Street and Spencer Street intersection or the intersections ability to handle these high numbers of trams.

Appendix A

Calibration and Validation Report

Microsimulation Modelling of Port Junction Intersection and Spencer / Clarendon Corridor Calibration and Validation Report

Client // Department of Environment, Land, Water & Planning
Office // VIC
Reference // V103140
Date // 22/09/16

Microsimulation Modelling of Port Junction Intersection and Spencer / Clarendon Corridor

Calibration and Validation Report

Issue: B 22/09/16

Client: Department of Environment, Land, Water & Planning
Reference: V103140
GTA Consultants Office: VIC

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	09/09/2016	Final	Joanna Jellie	Reece Humphreys	Reece Humphreys	Original signed
B	22/09/2016	Final	Joanna Jellie	Reece Humphreys	Reece Humphreys	

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1. Introduction

1.1 Background & Proposal

It is understood that as part of the State Governments recast of the plans for the Fishermans Bend precinct, the Fishermans Bend taskforce has requested an investigation into the opportunities for a future light rail line into Fishermans Bend.

GTA have been engaged to assess both the current performance of the Clarendon Street corridor and the Port Junction intersection and the implications of additional future light rail services.

1.2 Microsimulation Modelling

VISSIM microsimulation modelling is a computer software package that has the ability to individually model each vehicle, including buses, taxis, trains, trams, etc. within a road network. It enables a realistic representation of driver behaviour such as overtaking and lane changing and can also illustrate network performance. VISSIM is a particularly useful tool in modelling congested road networks where over-saturation and resulting vehicle queuing impacts on upstream intersections. It also allows testing of how the method of control and signal timings can be modified to ensure that more effective congestion management strategies can be designed and tested.

Microsimulation models are generally prepared in cases where an existing network is already over-saturated or a proposed scheme is likely to over-saturate the study network. In such cases what is of interest is the impact of over-saturation on upstream intersections and how their method of control and timing plans be modified to make sure that effective strategies can be designed and tested.

VicRoads does not have an official set of modelling guidelines, as such the model has been calibrated and validated in accordance with the criteria set out in the Roads and Maritime Services NSW (RMS) Traffic Modelling Guidelines, February 2013.

1.3 Purpose of this Report

The purpose of this report is to present the development of the existing conditions VISSIM models and the outcomes of the calibration and validation for the weekday AM and PM peak period models. The report covers the following topics:

i transport data collection
ii model development
iii calibration and validation methodology and outcomes.

2. Transport Data Collection

2.1 Overview

Data was collected from multiple sources including VicRoads, Yarra Trams, historic reports, and on site collection. A summary of the data that was collected for the development of the existing conditions model is presented in Table 2.1.

Table 2.1: Transport Data Collection Summary

Data Type	Source	Survey Date(s)[1]	Survey Times [2]	Description
Historic Report	AECOM	Tuesday 27 March 2012 and Wednesday 28 March 2012	24/7	Turning movement counts of Port Junction intersection for AM and PM peak periods. 24/7 counts of tram boarding and alighting times at the tram stops at the Port Junction intersection.
SCATS Traffic Volumes	VicRoads	Month of February 2016 and March 2016 and week from 10th August 2016 to 17th August 2016	24/7	SCATS traffic volume data requested at all signalised intersections within the study area.
SCATS Signal Information	VicRoads	Wednesday 17th August	AM: 7:30am to 9:30am PM: 4:30pm to 6:30pm	SCATS signal information (operation sheets, intersection diagnostic monitor data) at signalised intersections within the study area.
Car Travel Time Surveys	GTA	Wednesday 17th August	AM: 7:45am to 9:15am PM: 4:45pm to 6:15pm	GPS and video method using car runs. Travel time routes as shown in Figure 2.1.
Tram Dwell Time Surveys	GTA	Wednesday 17th August Tuesday 23rd August	AM: 7:30am to 9:30am PM: 4:30pm to 6:30pm	Stopwatch method with staff boarding and alighting trams on routes 109,96, and 12.
Site Observations	GTA	Wednesday 17th August Tuesday 23rd August	AM: 7:45 am to 9:30am PM: 4:30pm to 6:30pm	Observe existing conditions operation including queue lengths, road geometry and characteristics, driver behaviour, public transport operation etc.

2.2 Site Observations

A site visit was undertaken on the Wednesday 17th August and Tuesday 23rd August to observe the operating conditions of the site. Some key items are detailed as follows:

Table 2.2: Key Site Observations

Peak Period	Key Observations
AM Peak	Queues observed on the Clarendon Street south approach to the Clarendon Street / Normanby Road intersection that queue past City Road intersection. The queue is slow moving and extends to York Street.
	Congestion eases on Clarendon Street past the Clarendon Street / Normanby Road intersection with queues of approximately 100 metres observed on the Clarendon Street south approach of the Flinders Street / Spencer Street intersection.
	Queues of approximately 50 metres were observed on the Clarendon Street north approach at the Crown Casino signals.
	Queues extending to the next intersection were observed on City Road west approach at the Clarendon Street / City Road intersection.
	Minimal delays to trams observed with only a few instances where a tram was delayed by a tram in front as it approached the Port Junction intersection.

Peak Period	Key Observations
PM Peak	Long queues on the right turn to Clarendon Street from Flinders Street eastbound at the intersection of Flinders Street and Spencer Street.
	Long queues were observed on Clarendon Street north approach at the Flinders Street / Spencer Street intersection. The queue extends past Collins Street.
	Queues were observed on Clarendon Street south approach at the Crown Casino signals that extend to approximately 100 metres from the Junction.
	Queues were observed on Clarendon Street south approach from the Junction to City Road.
	Minimal delays to trams were observed with only a few instances where a tram was delayed by a preceding tram as it approached the Junction.

2.3 SCATS Data

SCATS data for signalised intersections within the study area was obtained from VicRoads. The data included detector volume data, layout data and signal phasing and timing data. The SCATS data provided is summarised in the following sub-sections.

2.3.1 SCATS Detector Volume Data

SCATS detector volume data was obtained for all signalised intersections within the study area. This data was obtained for a one-week (7 days) period covering the dates and times of the intersections counts specified above. This data was used to cross-check the classified turning movement data collected as well as check lane utilisation was appropriately modelled.

In addition, the SCATS detector volume data was also used to justify the appropriateness of the day of the survey as compared to other days of the week. This analysis is presented in Section 2.7.2.

2.3.2 SCATS Signal Data

The SCATS controller operation specification sheets was obtained from VicRoads to assist with the coding signalised intersections as well as understand the current operation of each intersection in full detail. This data provides information on the following:

- lane configuration
- phasing
- detector locations and numbers
- signal groups

2.3.3 SCATSIM Data Files

As will be discussed later in this report, SCATS signal control has been used as part of the modelling assessment in order to best reflect current intersection operation. As such, the following data was obtained from VicRoads to supplement the SCATSIM module:

- The latest version of the SCATS Central database file (SCMS.mdb)
- SCATS LX files for SCATS region(s) within the study area
- SCATS personality (.sft) files for all intersections within the study area
- SCATS time of day command files – sys.tc
- SCATS sys.prom file

2.4 Peak Periods

In order to confirm the critical peak hour and day that would be modelled, SCATS detector volume data was analysed for the week of August 10th to August 17th for the network

intersections. Figure 2.1 shows the average hourly traffic volumes for the Port Junction intersection for both trams and vehicles, while Figure 2.2 shows the 15-minute combined volume for the road network. It shows that the peak hours occur from 8am to 9am and 5pm to 6pm. Figure 2.3 shows the peak volumes for the road network for each day, showing that 17th August 2016 is a representative day of the week.

Figure 2.1: Hourly Average Traffic Volumes for Vehicles and Trams at the Port Junction Intersection

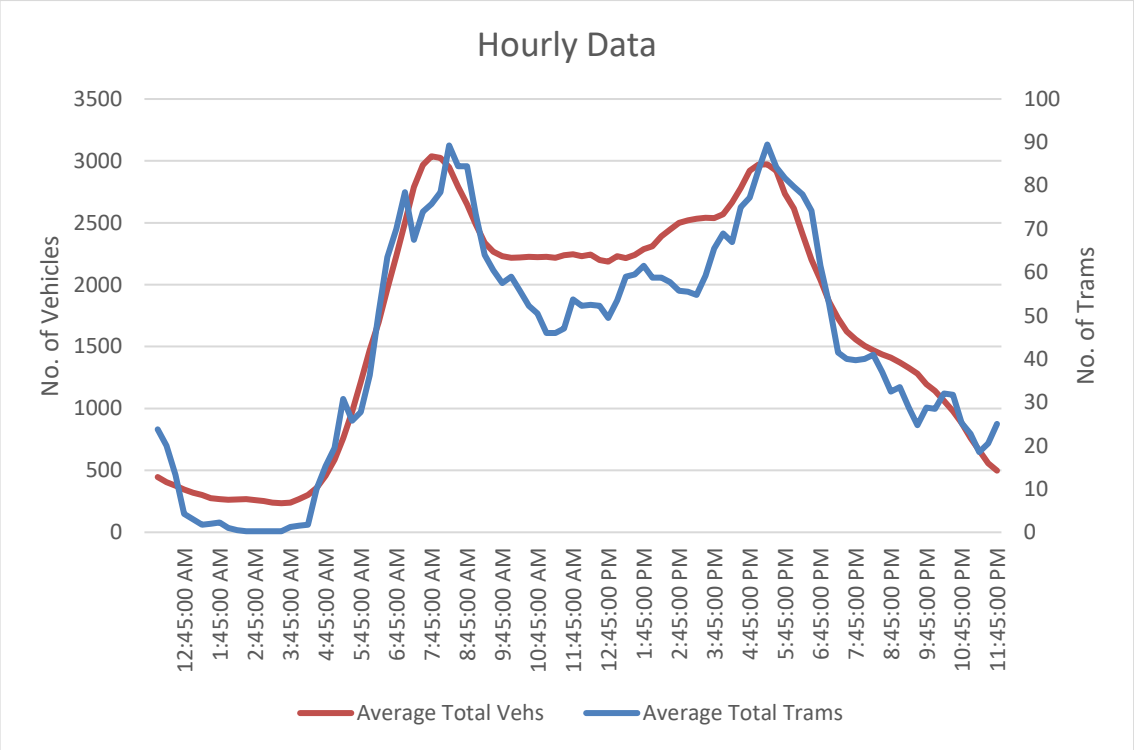


Figure 2.2: Combined 15 minute Volumes for Network

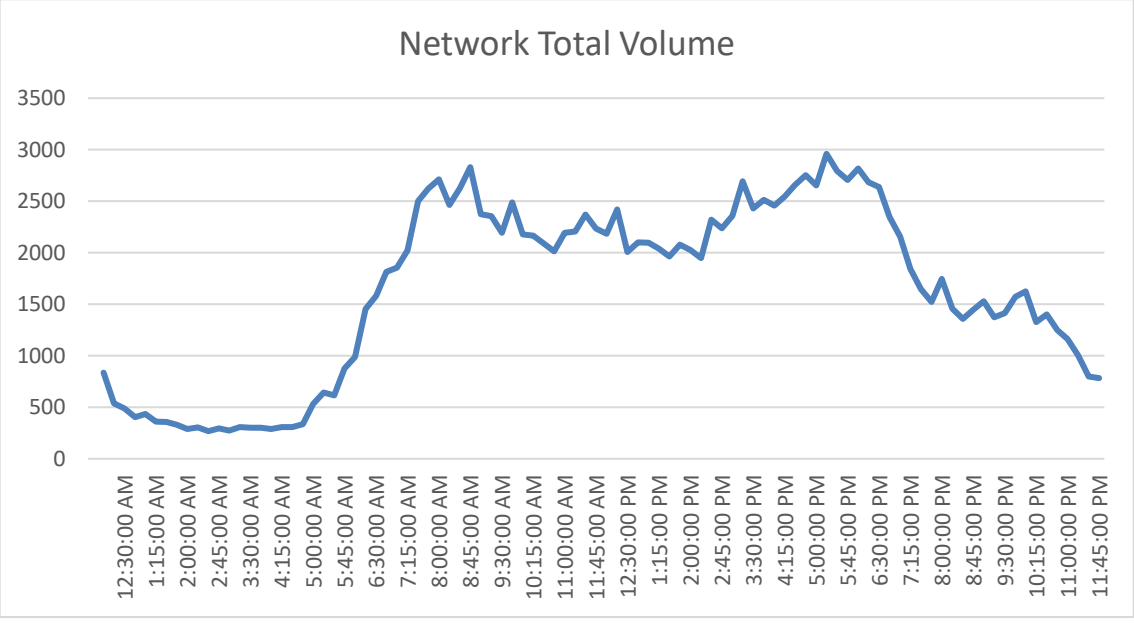
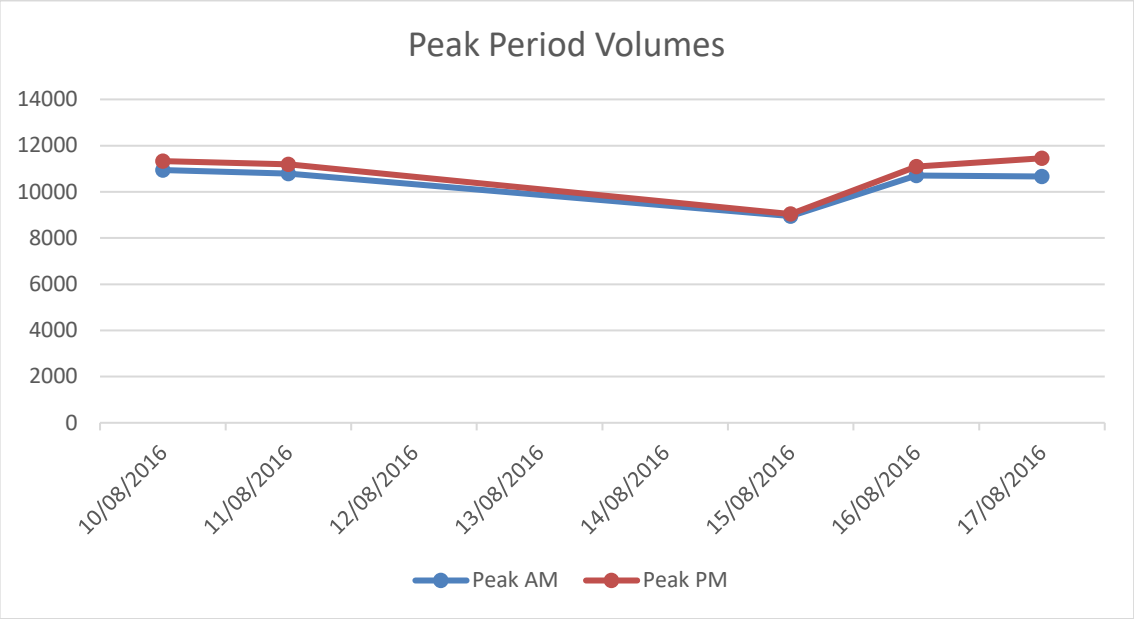


Figure 2.3: Road Network Peak Period Volumes



2.5 Comparison with AECOM Data

To determine if the AECOM data was suitable for use, the volumes recorded in the 2012 surveys were compared to the SCATS detector volumes for Wednesday 17th August during both peak periods with the results shown in Figure 2.4 and Figure 2.5.

Figure 2.4: AM Peak Comparison of Volumes

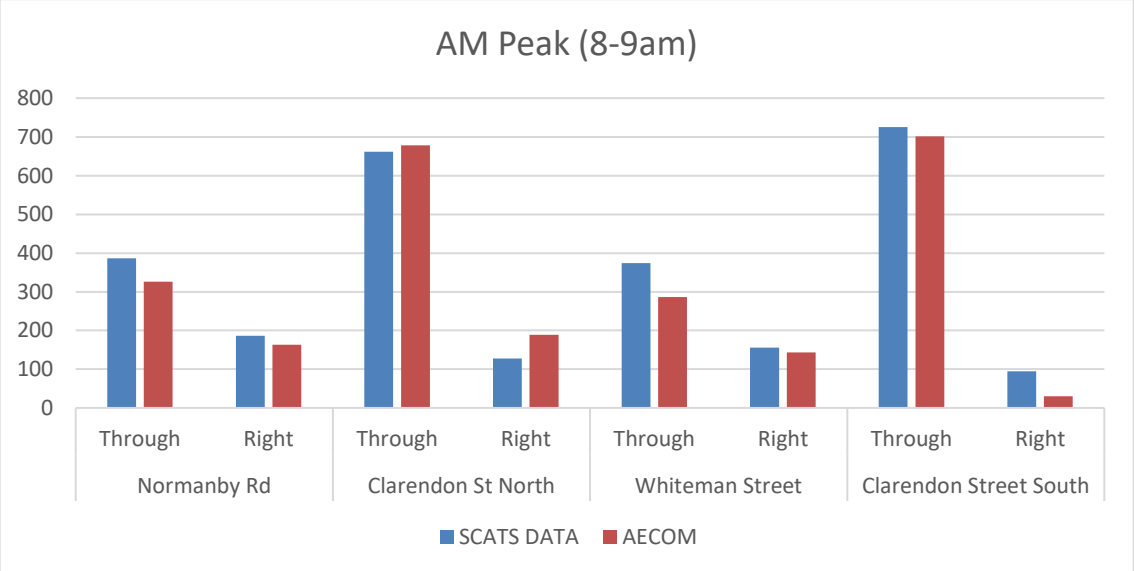
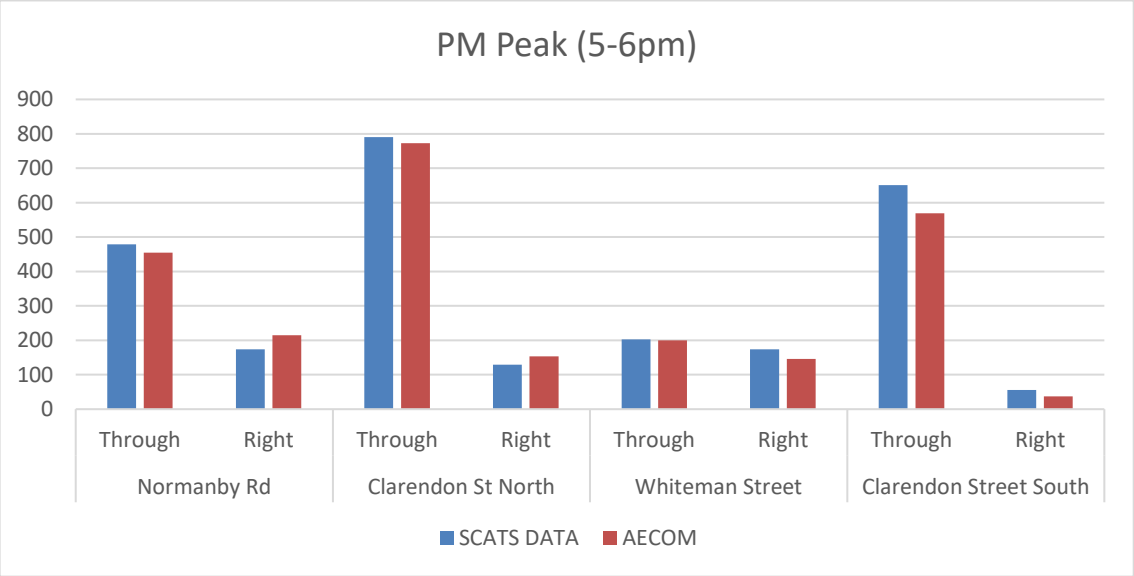


Figure 2.5: PM Peak Comparison of Volumes



The volumes were found to be comparable and it was therefore considered appropriate to use the AECOM traffic counts to determine left turn percentages to apply to the SCATS data.

2.6 Travel Time Surveys

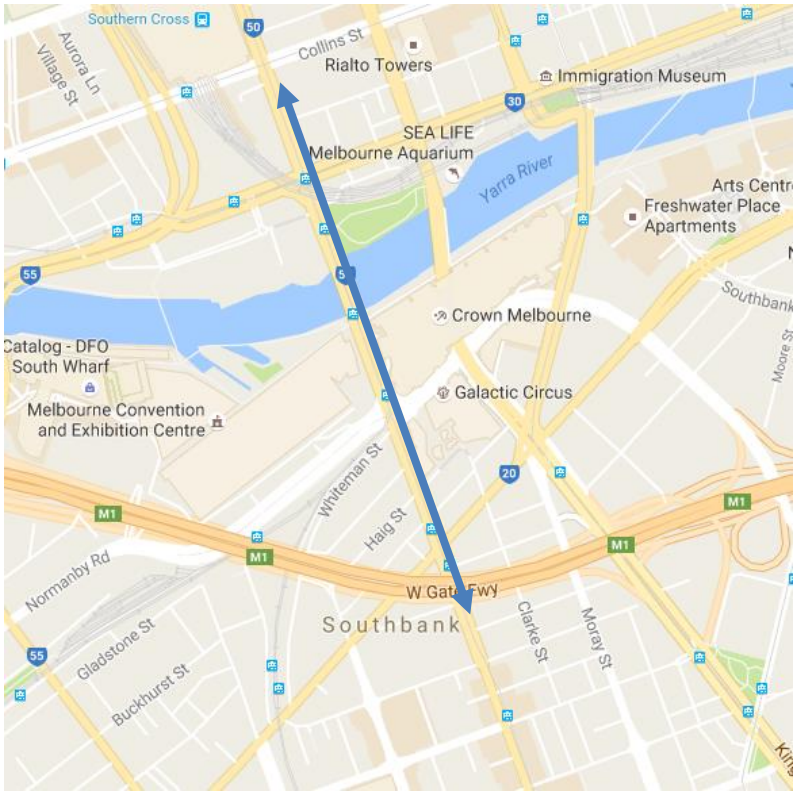
Travel times surveys were undertaken on the same days as the traffic volume data collection along the Clarendon Street corridor from Flinders Street to City Road during the following peak times:

- AM peak (7:45am to 9:15am)
- PM peak (4:45pm to 6:15pm)

Travel times were recorded using a GPS device and video camera in each vehicle travelling along the specified route.

The travel time survey route is shown graphically in Figure 2.6:

Figure 2.6: Travel Time Survey Route



A summary of the travel time survey results is provided in Table 2.2.

Table 2.3: Summary of Travel Time Survey Results

	Time	Route	No. of Runs	Travel Time (seconds)		
				Avg	Min	Max
Peak	8:45 am to 9:15am	Northbound	2	228	216	239
		Southbound	2	411	389	432
	4:45pm to 6:15pm	Northbound	1	405	405	405
		Southbound	2	456	322	590

3. Model Development

3.1 Software

The model was built using VISSIM 8.00-04 with the signal control being SCATS. Version 6.9.1 of SCATS and the relevant supporting programs (i.e. Wintraff, Simhub, and SCATS Access) were configured and used in the model.

3.2 Overlay

An aerial photograph (sourced from Nearmap, dated 20 March 2016) was used as a template for which to build the model. This provided a scaled template of the road geometry and ensured that the road network is spatially accurate.

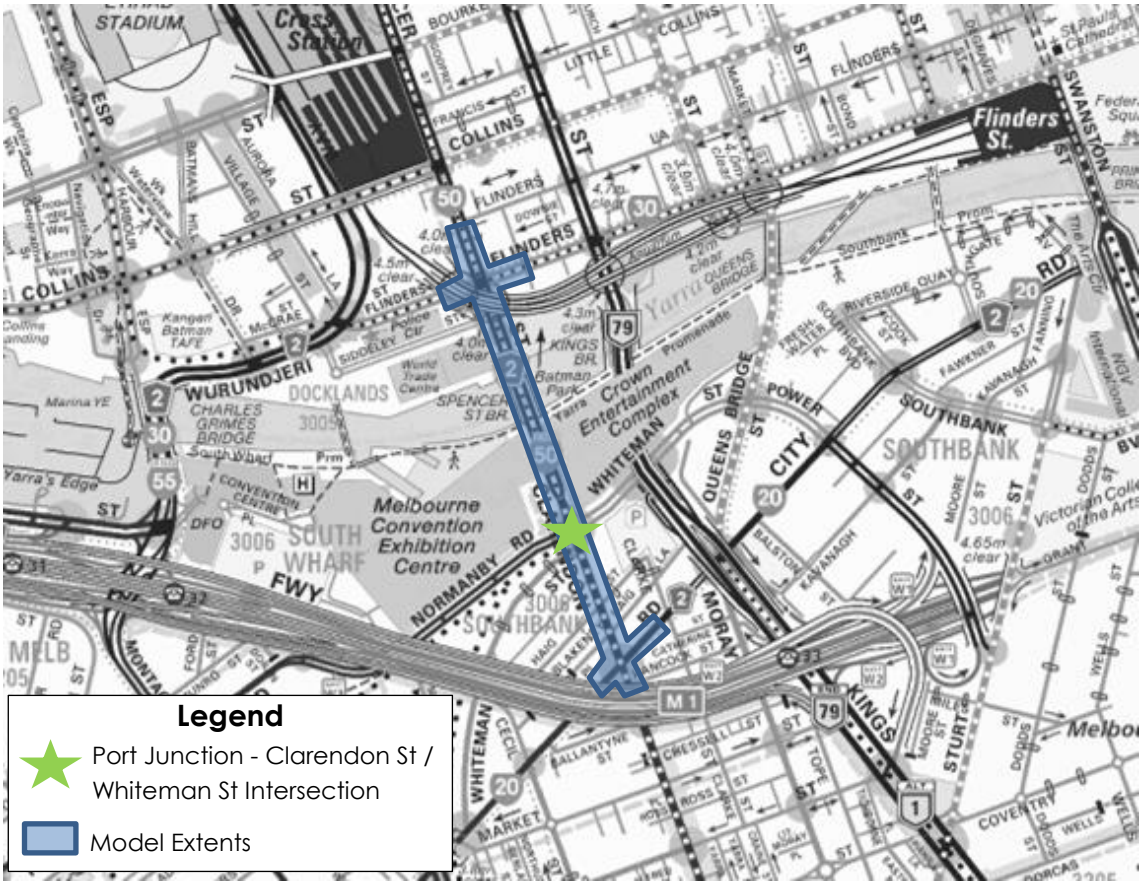
3.3 Model Extents

The VISSIM model included the following intersections as well as their approaches:

- Flinders Street / Spencer Street (signalised intersection)
- Clarendon Street / Crown Casino (pedestrian operated signals)
- Clarendon Street / Whiteman Street / Normanby Road (signalised intersection)
- Clarendon Street / City Road (signalised intersection)

Figure 3.1 presents the extents of the study area.

Figure 3.1: Model Extents



All approaches to the intersections were extended to a suitable point whereby all queue lengths were captured.

3.4 Temporal Coverage

The existing conditions model covers the weekday AM and PM peak periods augmented by warm up and cool down periods as follows:

AM Peak

- AM warm up period 7:45am to 8:00am
- AM peak hour 8:00am to 9:00am
- AM cool down period 9:00am to 9:15am

PM Peak

- PM warm up period 4:45pm to 5:00pm
- PM peak hour 5:00pm to 6:00pm
- PM cool down period 6:00pm to 6:15pm

3.5 Code Links and Connectors

Links and connectors were coded to match the existing road network including the correct orientation and lane numbers.

"Urban" type of link was used to construct most links in the VISSIM model to reflect the existing characteristics and drivers' behaviour. "Urban" links are linked to the driving behaviour based on the Wiedemann model with the assumption that a driver can be in one of the four driving modes:

- free driving
- approaching
- following
- braking

For each mode, the acceleration is described as a result of speed, speed difference, distance and individual characteristics of driver and vehicle.

3.6 SCATSIM Model

An interface between the SCATS program and the VISSIM program has been designed to allow the simulation model to be used in place of the real world to test new signal plans. The Plugin displays the state of all loop detectors and signal groups as the simulation progresses. The Plugin extracts loop detector data from the VISSIM model and passes it to SCATS. SCATS makes decisions based on the loop data, and passes signal information back to the model to control the flow of traffic, just as it would in a "live" system.

Utilisation of the SCATS plugin required input from VicRoads staff in order to provide relevant SCATS material such as SCATS/Sim data, detector grouping and use of the WINTRAFF Emulator utility.

The SCATS model characteristics for detector location, numbering information and the appropriate intersection numbers (TCS Numbers) has been coded into the models during the model build process to assist when the model is to include the SCATSIM software.

The introduction of the SCATS interface required input and liaison with VicRoads staff to ensure that the building and operation of SCATS was prepared appropriately.

The process involved in undertaking the SCATSIM modelling is as follows, and is summarised in Figure 3.2:

i Obtain Central and Regional Manager licenses and dongles from VicRoads and configure the following:

- The SCATS Central Manager
- The SCATS Regional Manager
- Simhub
- Wintraff.

ii Obtain all the following site specific files used in SCATS from VicRoads:

- SCATS LX files for SCATS region(s) within the study area
- SCATS personality (.sft) files for all intersections within the study area
- SCATS time of day command files – sys.tc
- SCATS sys.prom file
- mdb files – which contain the SCATS graphics so that you can watch the SCATS operation during simulation playback.

iii Code model accordingly to include all SCATS information such as detectors, numbering etc.

iv Code phases, groups and other signal information.

v Calibrate existing conditions model to observed conditions. A minimum of five seed runs are run through and the average is taken for network statistics.

Figure 3.2: SCATS Process (Generic)

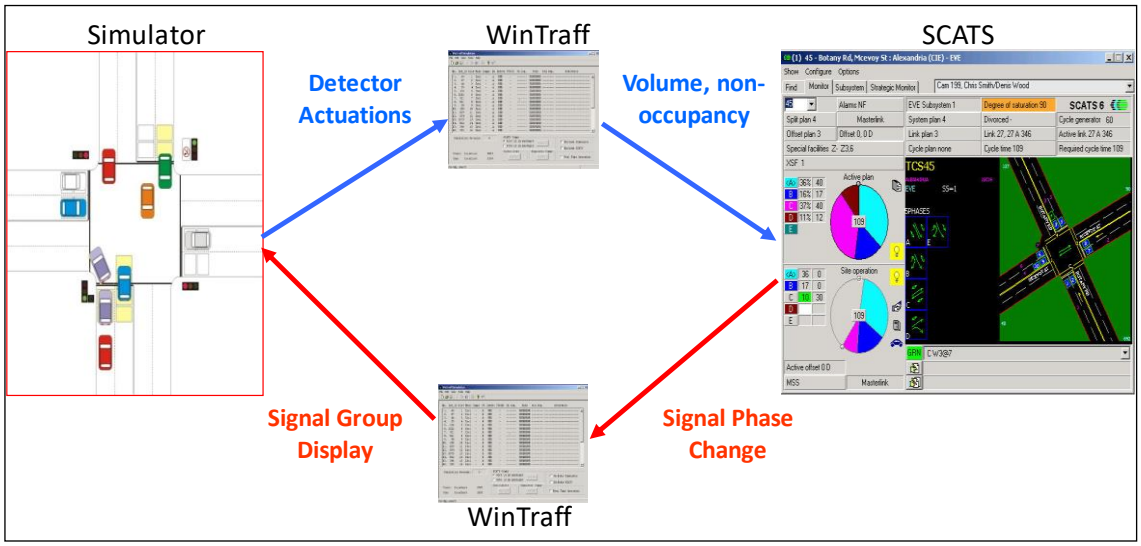
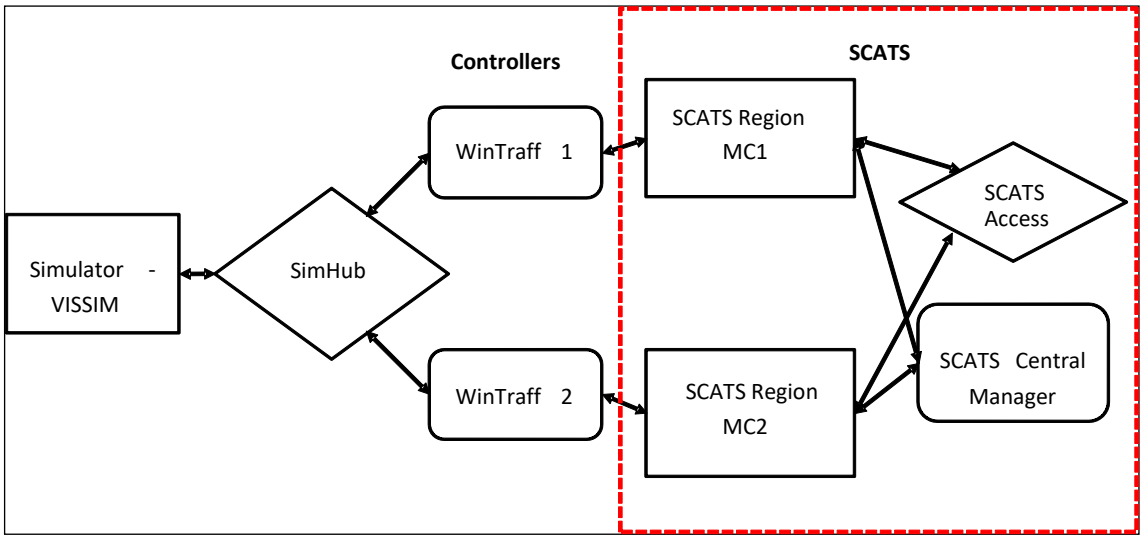


Figure 3.3: SCATSIM Setup



3.7 Develop Initial Assignment Parameters

Vehicles in the microsimulation model were assigned route based turning movements at intersections. The VISSIM static routing decisions module has been utilised for this component to ensure vehicle travel patterns reflect the existing operating conditions.

A demand profile of 15 minutes has been adopted, which has been based on the available traffic counts. This resulted in a more useful model that reflects existing road conditions by including the small peaks and troughs in demand that occur within the peak commuter periods.

Pedestrian crossing demands have also been included in the model. IDM data was used to understand the frequency of pedestrian activation at the signalised intersections and demands were coded accordingly.

3.8 Coding Public Transport Stops and Routes

Following the development of the road network structure, public transport routes have also been incorporated. The process relied on a number of sources as follows:

- Public transport routes and timetable – PTV website
- Public transport stops – Aerial photography and site observations.

The dwell times for trams at each stop are shown in Table 3.1 and Table 3.2. These values were taken from on-site surveys detailed in section 2.1 and were coded into the model.

Table 3.1: AM Peak Tram Dwell Times

Tram Stop/Route	Average dwell time (s)	Min dwell time (s)	Max dwell time (s)
Batman Hill Stop – Route 109 Northbound	22.0	17.8	24.2
Batman Hill Stop – Route 109 Southbound	21.3	19.0	23.6
Batman Hill Stop – Route 96 Northbound	28.1	27.2	29.3
Batman Hill Stop – Route 96 Southbound	20.3	17.6	20.1
Batman Hill Stop – Route 12 Northbound	16.8	16.8	16.8

Tram Stop/Route	Average dwell time (s)	Min dwell time (s)	Max dwell time (s)
Batman Hill Stop – Route 12 Southbound	27.7	27.7	27.7
Crown Casino Stop – Route 109 Northbound	21.8	21.0	22.3
Crown Casino Stop – Route 109 Southbound	23.0	20.4	25.6
Crown Casino Stop – Route 96 Northbound	26.5	15.2	45.8
Crown Casino Stop – Route 96 Southbound	30.4	27.7	32.7
Crown Casino Stop – Route 12 Northbound	16.5	16.5	16.5
Crown Casino Stop – Route 12 Southbound	No tram dwell times recorded in survey period		
Port Junction Stop – Route 109 Northbound	41.3	24.4	1:04.9
Port Junction Stop – Route 109 Southbound	25.9	25.9	25.9
Port Junction Stop – Route 96 Northbound	34.6	30.2	39
Port Junction Stop – Route 96 Southbound	23.5	21.0	28.0
City Road Stop – Route 12 Northbound	56.5	56.5	56.5
City Road Stop – Route 12 Southbound	25.6	25.6	25.6

Table 3.2: PM Peak Tram Dwell Times

Tram Stop/Route	Average dwell time (s)	Min dwell time (s)	Max dwell time (s)
Batman Hill Stop – Route 109 Northbound	27.5	22.1	31.7
Batman Hill Stop – Route 109 Southbound	22.0	21.4	22.5
Batman Hill Stop – Route 96 Northbound	33.1	29.6	36
Batman Hill Stop – Route 96 Southbound	23.3	21.8	25.9
Batman Hill Stop – Route 12 Northbound	21.3	21.3	21.3
Batman Hill Stop – Route 12 Southbound	24.0	24.0	24.0
Crown Casino Stop – Route 109 Northbound	26.1	22.6	30.6
Crown Casino Stop – Route 109 Southbound	23.1	22.3	24.0
Crown Casino Stop – Route 96 Northbound	34.1	28.6	48.6
Crown Casino Stop – Route 96 Southbound	29.3	26.0	32.7
Crown Casino Stop – Route 12 Northbound	24.0	24.0	24.0
Crown Casino Stop – Route 12 Southbound	23.5	23.5	23.5
Port Junction Stop – Route 109 Northbound	33.3	24.4	40.2

Tram Stop/Route	Average dwell time (s)	Min dwell time (s)	Max dwell time (s)
Port Junction Stop – Route 109 Southbound	29.8	26.0	33.6
Port Junction Stop – Route 96 Northbound	39.8	39.0	40.5
Port Junction Stop – Route 96 Southbound	25.9	25	27.1
City Road Stop – Route 12 Northbound	32.3	32.3	32.3
City Road Stop – Route 12 Southbound	26.4	26.4	26.4

3.9 Traffic Composition

Characteristics of vehicles have been specified for the model which includes physical parameters such as length, width, height and weight as well as performance parameters such as maximum speed, acceleration and deceleration rates. Tram specifications were taken from Yarra Trams (http://vicsig.net/trams/class/) with the length, speed, and passenger capacity coded into the model. The vehicles adopted for this project include the following vehicle classifications:

- private car
- service vehicle (HGV)
- trams on fixed routes.
- Buses

VicRoads traffic volume data was sourced to determine an average percentage of heavy vehicles that use the roads included in the model which are as follows:

- 2% service vehicles on Clarendon Street South input.
- 3% service vehicles on Spencer Street North input, Normanby Road, Whiteman Street, and City Road.
- 5% service vehicles on Flinders Street.

3.10 Pedestrians

In the absence of pedestrian surveys, pedestrian movements were estimated based on on-site observations and the IDM pedestrian activation information. The model was observed to ensure that the queues and delays caused by pedestrian crossings was representative of on-site observations.

3.11 Seed Runs

Traffic conditions vary from day-to-day as a result of random driver behaviour, e.g. speed selection, lane changing and driver route choice. The microsimulation traffic model attempts to replicate this day-to-day random variability by basing simulated driver decision on a set of random numbers. This set of random numbers is generated from an initial "seed" value, which is specified at the start of a microsimulation run. A single set of random numbers, generated by a single seed value therefore represents one potential result, or one particular day of traffic operation.

A total of five seed runs were undertaken for each of the models in this analysis (seed numbers 1 (42), 2 (292), 3 (542), 4 (792) and 5 (1042)).

Notwithstanding the above, the latest set of Traffic Modelling Guidelines developed by Roads and Maritime Services (RMS) in March 2013, indicates that the median seed from five seed runs, based on the Vehicle Hours Travelled (VHT), should be reported on. This is consistent with recent work completed by GTA for VicRoads. The process of determining the appropriate median seed is discussed further in Section 4.2.

3.12 Modelling Details and Assumptions

The following assumptions were made with regard to the development and calibration of the model:

- Lane change adjustments were made on links with merge points to reflect the actual behaviour of drivers observed on-site.
- Reduced speed areas were applied on turning movements to reflect driver behaviour.

4. Existing Model Calibration and Validation

4.1 Calibration and Validation Guidelines

The aim of the microsimulation modelling is to obtain the best possible match between the model results and the field measurements. Calibration and validation targets were developed based on the performance requirements.

The calibration and validation process was carried out in accordance with the criteria set out in the Roads and Maritime Services, Traffic Modelling Guidelines, dated March 2013. These guidelines represent the latest comprehensive set of guidelines released in Australia.

Specifically, the targets set out in the guidelines are shown in Table 4.1.

Table 4.1: Microsimulation Modelling Calibration and Validation Criteria

Item	Criteria
Turn Volumes	Tolerance limits for turn volumes: ○ 85% of individual link or turn volumes to have a GEH ≤ 5 ○ All individual link and turn volumes should have GEH ≤ 10 Plots of observed versus modelled hourly flows: ○ Slope value to be included with plots ○ R2 value to be included with plots and be > 0.9
Travel Time Average	○ Average modelled travel time to be within 15% or one minute (whichever is greater) of average observed journey time for full length of route. ○ Average modelled travel time to be within 15% of average observed travel time for individual sections. ○ Average and 95% confidence intervals to be plotted for observed and modelled travel times for each journey time route (to modellers and RMS satisfaction).
Visual Checks	Key locations to review in terms queuing, pedestrian movements and vehicle-pedestrian interaction.

The turn volumes set out in Table 4.1 were utilised to calibrate the model, whilst the travel times visual audits were used to validate the model.

4.2 Model Stability

As simulation models are stochastic, they can produce different outcomes depending on their starting conditions. Due to this stochastic behaviour, it is necessary to assess how the model behaves under a variety of starting conditions (referred as seeds) using the same input parameters. The ability of a model to produce consistent results for a number of seed values is referred as the model stability.

In order to assess the model stability and to establish an appropriate seed run for reporting purposes, a total of five seed runs were undertaken. The following sections provide scatter plot results for the vehicle hours travelled (VHT), whilst the descriptive statistical results for each of the peaks are also presented.

Figure 4.1: AM Peak (8-9am) – Plot of Vehicle Hours Travelled (VHT) Results

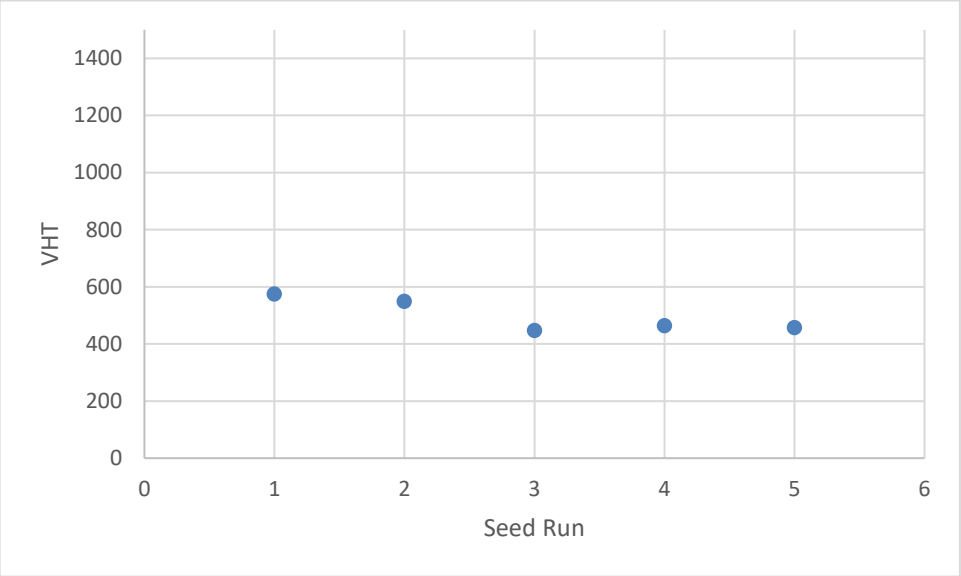


Table 4.2: AM Peak – Descriptive Statistical Results for VHT

Statistic	Results
Number of Runs	5
Mean	499
Standard Deviation	59
Range	128
Minimum	447
Maximum	575
95% Confidence Limit	52
Lower Confidence Limit	550
Upper Confidence Limit	447
Median	465

For the AM peak period the median seed of 792 (seed run 4) was adopted. The variation of VHT shown in Figure 4.1 is not uncommon for SCATS controlled models and is considered acceptable.

Figure 4.2: PM Peak (5-6pm) – Plot of VHT Results

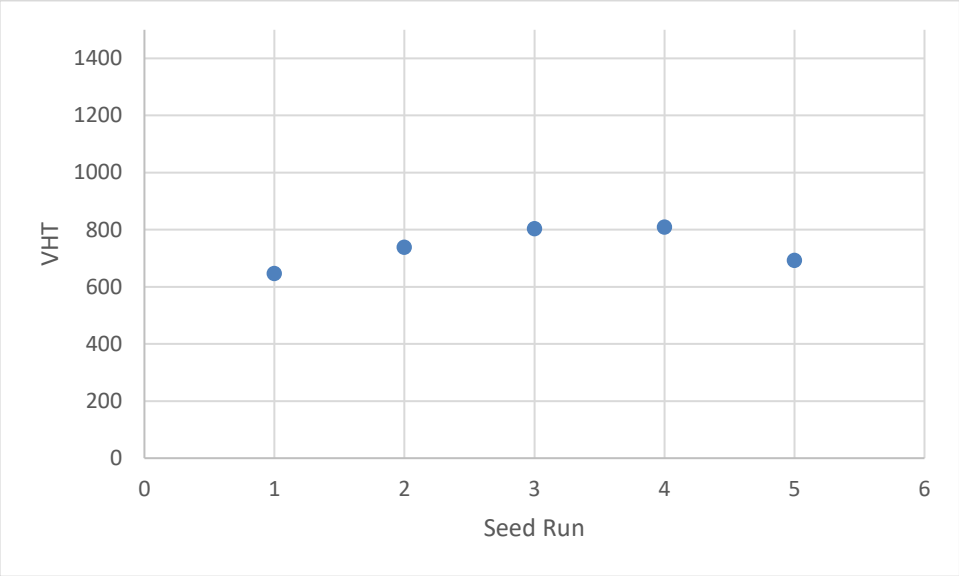


Table 4.3: Weekday PM Peak – Descriptive Statistical Results for VHT

Statistic	Results
Number of Runs	5
Mean	738
Standard Deviation	70
Range	163
Minimum	646
Maximum	809
95% Confidence Limit	62
Lower Confidence Limit	800
Upper Confidence Limit	676
Median	738

For the PM peak period the median seed of 292 (seed run 2) was adopted.

4.3 Model Calibration Results

The following is a summary of the modelled turn flows against the observed turning movement counts and how well they meet the network wide criteria. A full list of the turning movement calibration results is provided in Appendix B.

Table 4.4: Model Flow Calibration Summary – AM and PM Peak

Criteria	GEH less than 5	GEH less than 10	R2
Target	**>85% of cases**	**100% of cases**	**>0.90**
8:00 – 9:00	95%	98%	0.923
5:00 – 6:00	100%	100%	0.988

Table 4.4 indicates that the modelled flows for the AM and PM peak periods generally meet the criterion set in the RMS guidelines. The only outlier was the AM peak period is one movement that had a GEH greater than 10. This movement is the through movement from City Road West

approach to Clarendon Street. Upon review of the model, the discrepancy is due to the level of green time that SCATS is affording this movement in the model compared to observed signal data, which is discussed further in section 4.4.3. Tests were undertaken to increase this flow however the throughput was limited to the green time available. As this movement does not impact on traffic arriving at the Port Junction or along the Clarendon Street corridor, it is considered that this will not impact on the outcomes of the modelling results. As such, it is considered that the calibration results of traffic flows are appropriate.

In addition, a modelled versus observed traffic volume comparison has been undertaken in the form of a R^2 and scatter plot analysis for each of the peak hours. It is typically recommended that an R^2 value greater than 0.95 be achieved before a model is considered to be calibrated appropriately, whilst the guidelines recommend a value greater than 0.9. Figure 4.3 and Figure 4.4 present the modelled versus observed traffic volume plots for the AM and PM peaks, which indicate that the modelled traffic volumes have been calibrated against observed volumes to a suitable standard with all R^2 values above 0.95 for both peak hours.

Figure 4.3: Turn Flow Comparison – AM Peak (8-9am)

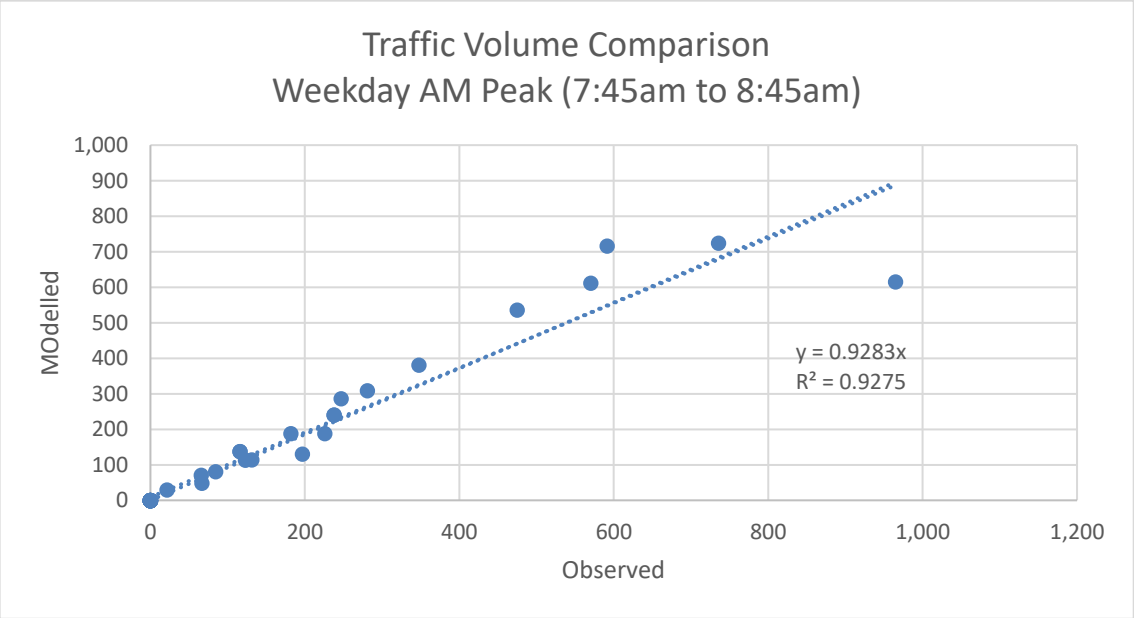
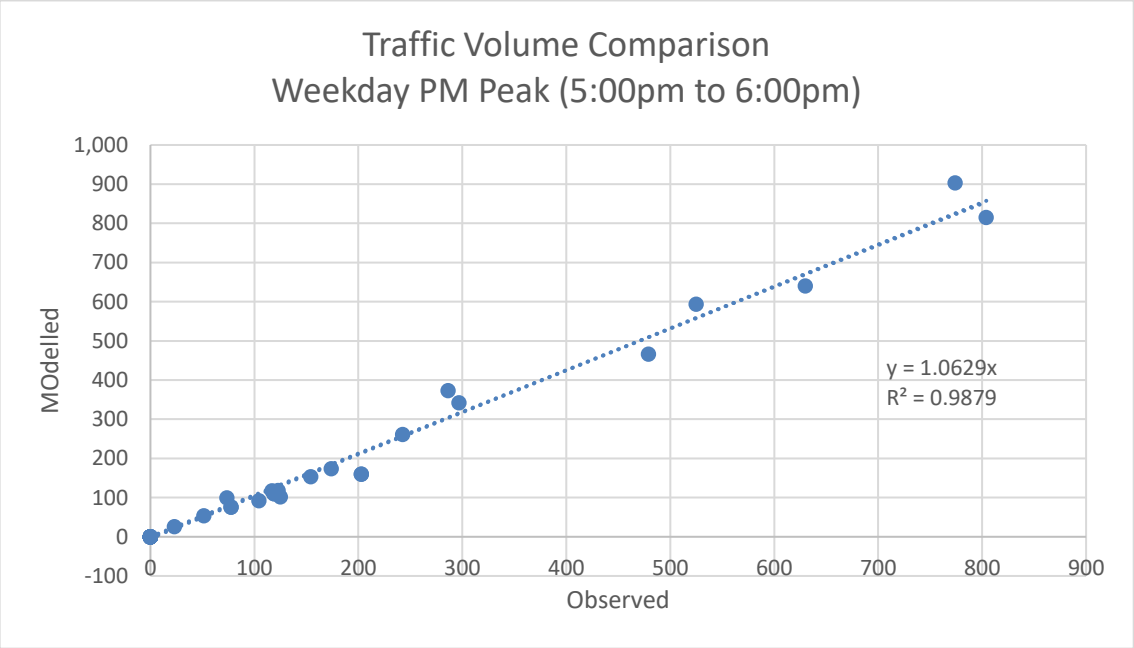


Figure 4.4: Turn Flow Comparison – PM Peak (5-6pm)



The results of the turn flow calibration are therefore considered satisfactory for all peak periods and meet the network wide calibration criteria.

4.4 Model Validation Results

4.4.1 Vehicle Travel Times

The model utilised the same travel time routes as those for the fixed time model. As described earlier, typically, the average of all VISSIM recorded values should aim to be within 15% of the observed values.

A comparison between the VISSIM travel time results of the SCATSIM model and the data recorded on site for the AM and PM peaks has been summarised in Table 4.5.

Table 4.5: Model Travel Time Summary – Cars

Route	Data	AM Peak 8:00am – 9:00am		PM Peak 5:00pm-6:00pm	
		Observed Journey Time (seconds)	Modelled Journey Time (seconds)	Observed Journey Time (seconds)	Modelled Journey Time (seconds)
Northbound	Average (secs)	411	379	456	439
	Actual Difference (secs)	-32		-17	
	Percentage Difference	**8%**		**4%**	
Southbound	Average (secs)	228	216	405	408
	Actual Difference (secs)	-11		3	
	Percentage Difference	**5%**		**1%**	

The results show that for all routes during the AM and PM peak periods, the modelled travel times for cars are within 15% of the actual observed travel times.

In addition, the following figures present a comparison of the modelled and observed travel times for the travel time routes.

Figure 4.5: AM Peak Southbound Travel Time

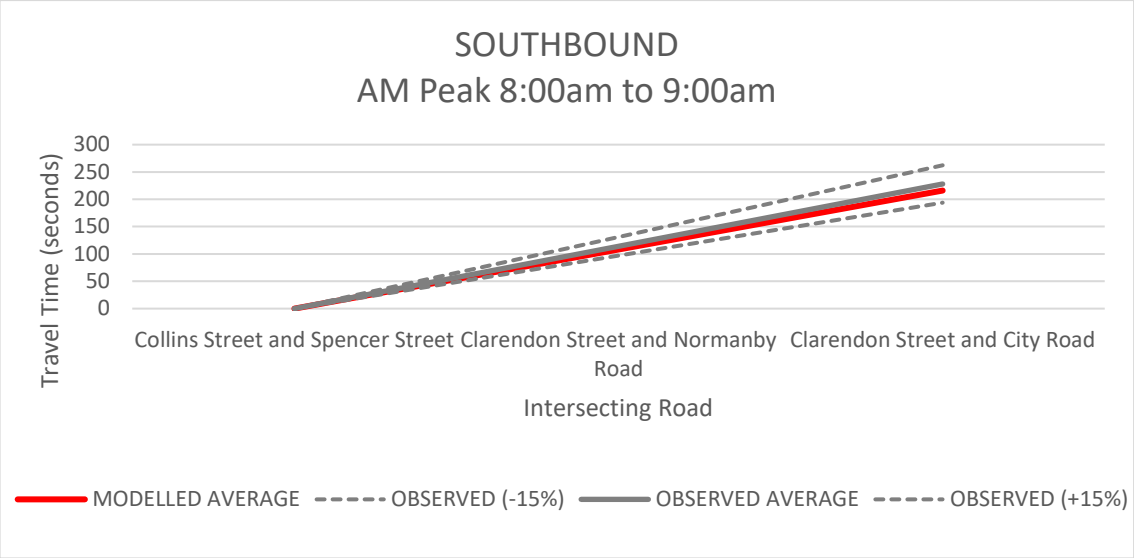


Figure 4.6: AM Peak Northbound Travel Time

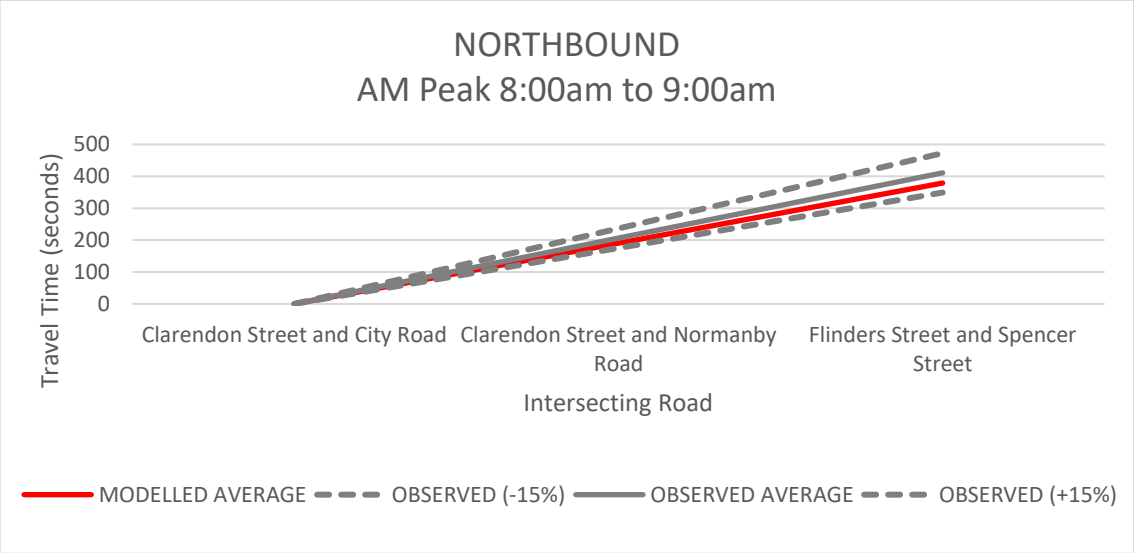


Figure 4.7: PM Peak Southbound Travel Time

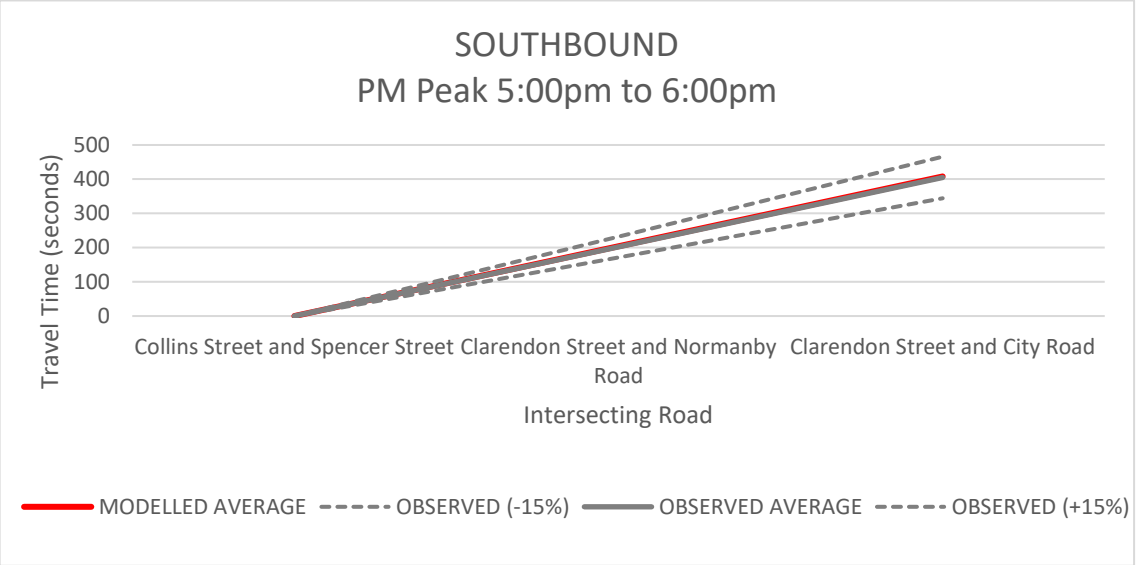
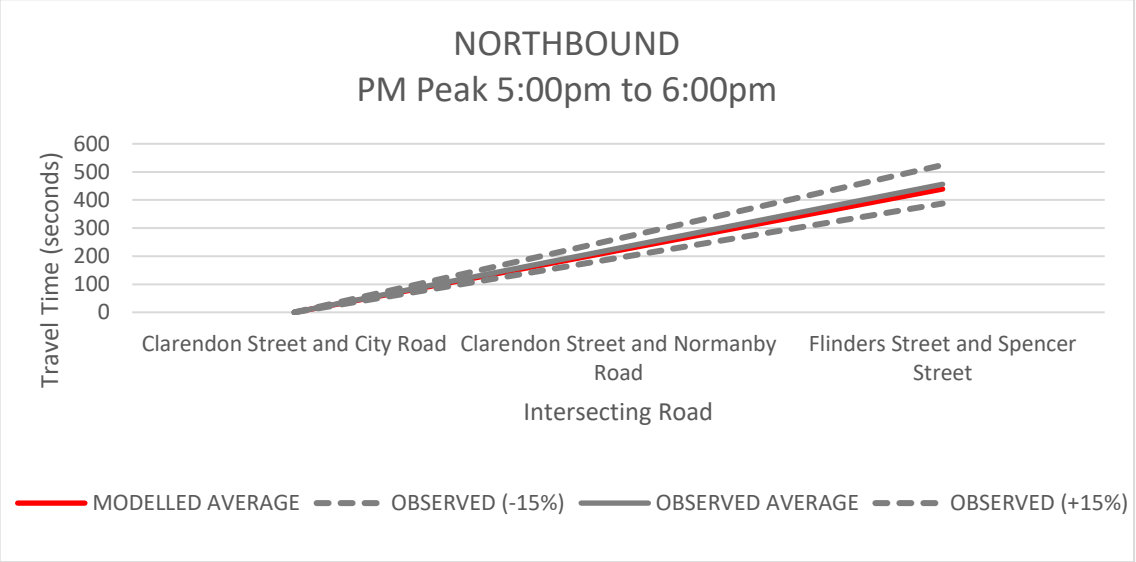


Figure 4.8: PM Peak Northbound Travel Time



4.4.2 Tram Data

Tram travel times and queues are not a specific validation requirement and were not checked within the model as tram travel surveys were not collected. Instead the tram travel times and queue results will be used as a comparison during the options testing. The recorded travel times within the model are shown in Table 4.6 with the routes shown in Figure 4.9.

Figure 4.9: Tram Travel Time Routes

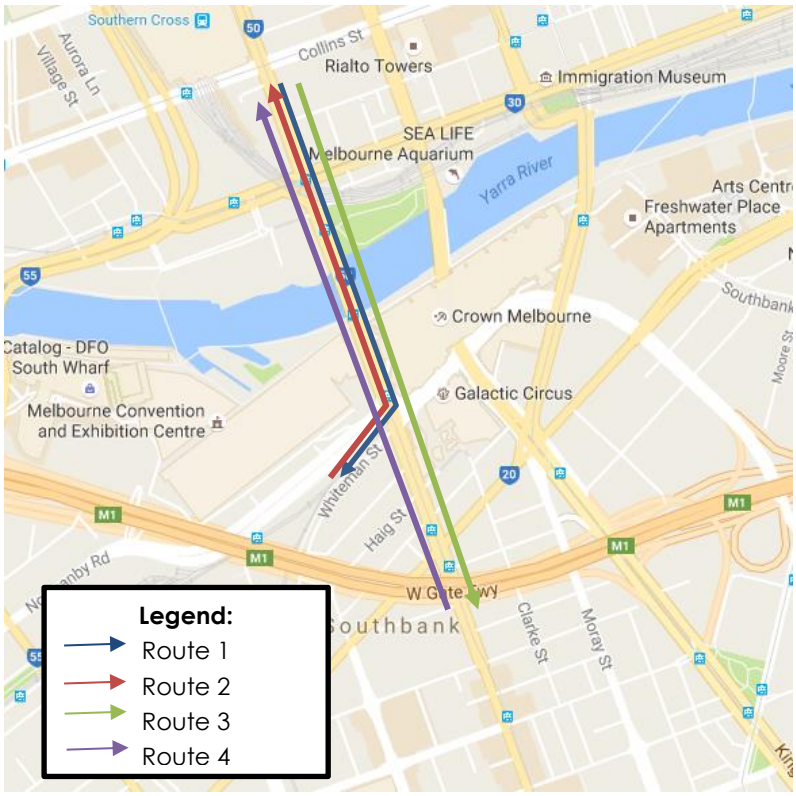


Table 4.6: Modelled Tram Travel Time Summary

Route	Data	AM Peak 8:00am – 9:00am	PM Peak 5:00pm-6:00pm
Past Flinders Street to Port Junction Stop	Average (secs)	228	268
Port Junction Stop to past Flinders Street	Average (secs)	269	284
Past Flinders Street to past City Road	Average (secs)	236	259
Past City Road to past Flinders Street	Average (secs)	276	278

The tram travel times show that on average, trams take between four and five minutes travelling through the model. In addition to the travel times, the average and maximum queues at the Junction are shown in Table 4.7.

Table 4.7: Tram Queue Lengths (metres)

Location	Average Queue		Maximum Queue	
	AM	PM	AM	PM
Clarendon Street North Approach	3	4	40	40
Normanby Road Approach	7	5	73	73

The average queues are the averages taken over the hour period, whilst the maximum queues are reflective of a single point within the simulation period that trams queued.

4.4.3 Signal Timings

Whilst not a specific validation criteria, it is considered important that signal times adopted in the model reflect the current operating conditions, particularly given the use of SCATS signal control. As such, SCATS Access has been set up to record intersection diagnostic monitor (IDM) data during the simulation period for each signalised intersection and compared to the actual SCATS outputs from the day of the surveys.

The following tables summarise the signal timing comparison for the intersections based on the peak hour times. Full results are provided in Appendix C.

Table 4.8: AM Peak Signal Timing Comparison

Intersection	Phase	SCATS History Phase Times (sec) Observed Data				SCATS IDM Phase Times (sec) Modelled Data			
		Freq.	Avg	Min	Max	Freq.	Avg	Min	Max
Pedestrian Signals near Flinders Street	A	-	-	-	-	33	27	11	34
	B	-	-	-	-	33	53	43	59
	C	-	-	-	-	33	26	26	26
Flinders Street / Spencer Street	A	31	35	1	48	29	44	36	71
	D	31	19	2	21	29	19	16	20
	E	32	23	3	34	29	25	17	35
	F	25	14	9	15	17	14	14	14
	G	31	27	5	29	29	27	20	28
Crown Casino / Clarendon Street	A	26	37	14	54	25	40	23	55
	B	15	16	8	22	13	20	9	23
	C	26	32	16	36	25	32	31	36
	D	26	21	11	32	25	23	20	26
	E	16	10	8	22	14	15	9	23
	F	25	32	7	36	25	32	30	33
Clarendon Street / Whiteman Street / Normanby Road	A	26	45	20	70	25	44	35	83
	B	23	18	8	21	25	21	10	22
	C	25	13	13	18	23	13	13	13
	D	26	31	4	36	25	33	32	34
	E	19	17	4	19	24	19	18	19
	F	25	18	3	36	25	16	15	26
	G	3	16	16	16	1	16	16	16
City Road / Clarendon Street	A	30	35	27	51	32	43	25	65
	B	7	10	10	11	-	-	-	-
	C	31	38	5	66	32	27	16	40
	D	28	17	13	23	31	19	13	28
	E	11	10	2	12	4	12	11	12
	F	31	21	2	34	32	25	17	44

Table 4.9: PM Peak Signal Timing Comparison

Intersection	Phase	SCATS History Phase Times (sec) Observed Data				SCATS IDM Phase Times (sec) Modelled Data			
		Freq.	Avg	Min	Max	Freq.	Avg	Min	Max
Pedestrian Signals near Flinders Street	A	-	-	-	-	27	38	33	43
	B	-	-	-	-	27	66	63	67
	C	-	-	-	-	27	26	26	26
Flinders Street / Spencer Street	A	30	29	6	34	27	34	33	37
	D	29	20	3	22	27	23	23	23
	E	28	27	19	36	27	26	12	35
	F	19	14	9	14	13	14	10	14
	G	28	39	39	40	27	40	40	40
Crown Casino / Clarendon Street	A	26	36	17	53	25	36	23	52
	B	10	16	8	22	11	22	10	23
	C	26	33	7	37	25	32	31	36
	D	26	21	8	25	25	22	20	26
	E	17	12	8	22	21	14	9	23
	F	26	33	10	36	25	32	31	36
Clarendon Street / Whiteman Street / Normanby Road	A	27	42	1	66	25	43	19	61
	B	24	18	9	21	20	21	18	22
	C	26	14	13	18	25	14	13	16
	D	25	34	24	36	25	33	27	37
	E	21	17	2	23	22	18	18	19
	F	25	17	13	32	25	19	14	31
	G	-	-	-	-	3	16	16	16
City Road / Clarendon Street	A	30	35	28	59	32	37	18	50
	B	12	10	3	11	1	10	10	10
	C	30	38	33	60	32	34	27	42
	D	26	16	13	20	31	17	13	22
	E	14	10	1	12	5	12	11	12
	F	31	21	5	32	32	25	14	37

The signal timing comparison shows indicates that the average, minimum and maximum modelled phase times closely reflect the actual signal data recorded on site. The only notable differences are that the B phase (tram extension phase) and E phase (tram phase) do not run as often at the City Road intersection. This could be due to the extent of the model and the exclusion of the intersection of Clarendon / Ballantyne meaning that there is no transfer of the tram demand from this intersection. Alternatively, the trams may be all arriving and clearing during the A phase which runs for a longer time than observed.

In addition and at the same intersection, the C phase (City road through movements) was modelled with less time than the observed data indicates, this is considered to be the reason the modelled traffic volumes on the City Road west approach did not reflect the observed volumes.

4.4.4 Average Speed Validation

Figure 4.6 and Figure 4.7 plot the the average speed for all vehicles within the network over the duration of the simulation period.

Figure 4.10: AM Peak Hour Average Speed

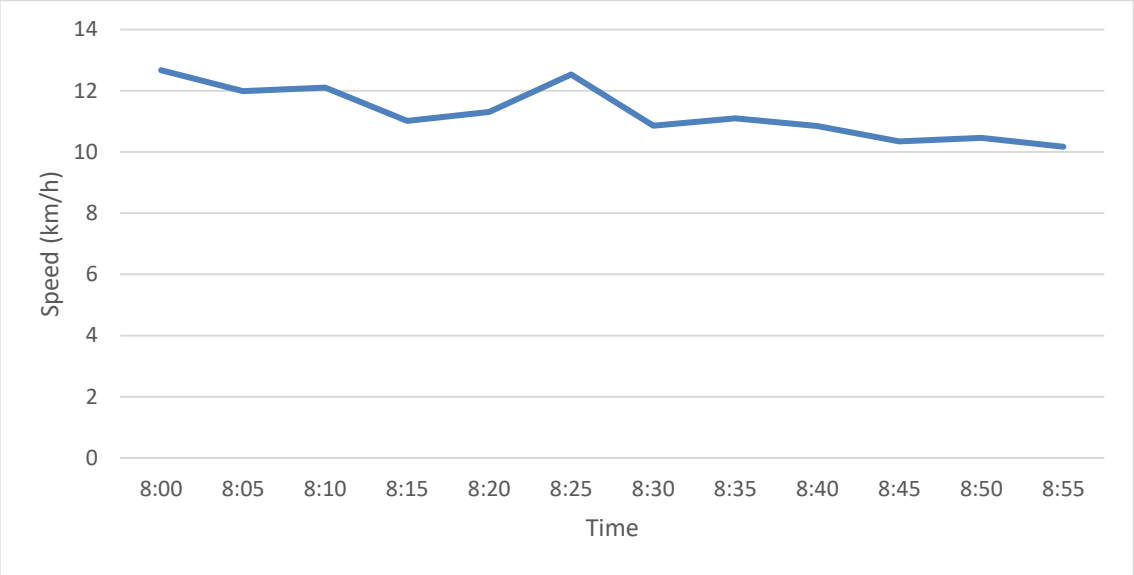
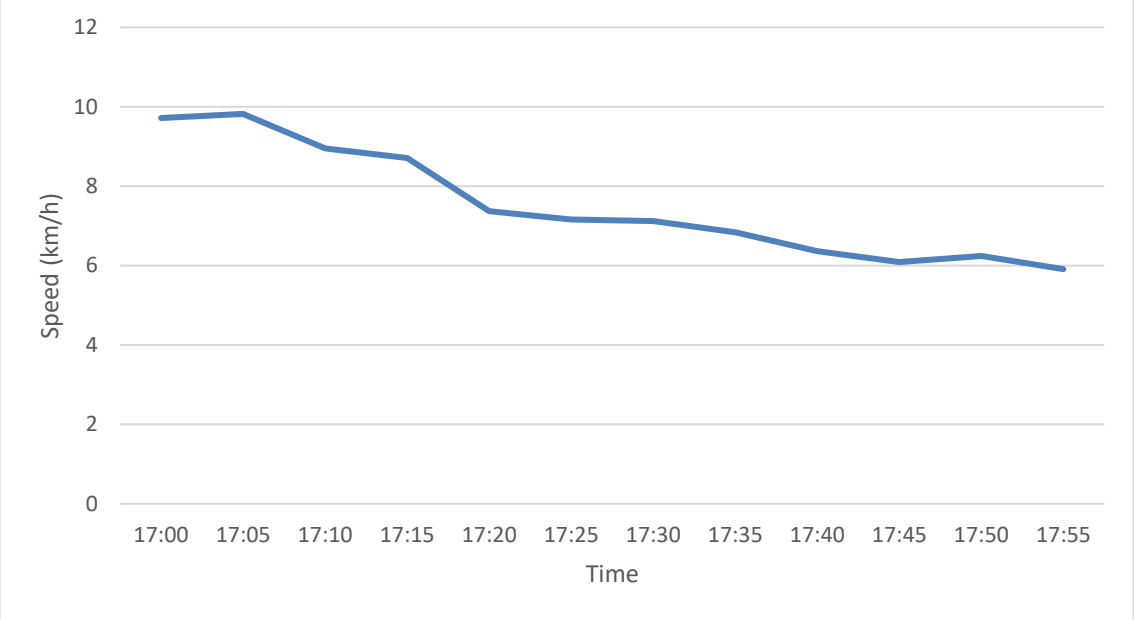


Figure 4.11: PM Peak Average Speed



The graphs show that the level of congestion increases as the simulation period progresses with speeds reducing substantially. Both of the profiles are consistent with on-site observations as well as the general observation that the PM peak operates worse than the AM peak.

5. Conclusion

This report has presented and discussed the calibration and validation results of the VISSIM microsimulation model of the Port Junction Intersection and Clarendon Street corridor.

The calibration topics that were covered include:

- data collection
- existing traffic conditions
- development of the base model network
- model calibration and validation
- calibration and validation results.

The results presented in this report show that the model demonstrates an excellent 'goodness of fit' with the observed traffic conditions indicating that the model performs well at the network wide level.

The traffic volume comparisons for each of the peaks indicate a high level of correlation between the modelled and observed traffic flows with all targets being met.

The travel time analysis illustrates a reasonably high level of correlation between the modelled and observed travel times, with any discrepancies considered to be justifiable as indicated in the context of this report.

It is our view that the model was successfully developed and is fit for its intended purpose, which is to assess the capacity of the Port Junction intersection for increased tram volumes.

Appendix A

AECOM Report

AECOM

Route 96 Corridor Development Project
Concept Design
Yarra Trams
5 June 2012
Document No. 1344tpe

Port Junction Existing Conditions Tram and Traffic Analysis

Continuous Video Survey and VISSIM Microsimulation Modelling

Port Junction Existing Conditions Tram and Traffic Analysis

Continuous Video Survey and VISSIM Microsimulation Modelling

Work Package 6 - Port Junction Redevelopment

Prepared for

Yarra Trams

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AECOM in Australia and New Zealand is certified to the latest version of ISO9001 and ISO14001.

Quality Information

Document Port Junction Existing Conditions Tram and Traffic Analysis

Ref 60248376

Date 5 June 2012

Prepared by Daniel North

Reviewed by Christian Bode

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
0	27-April -2012	Draft Report	Christian Bode Associate Director	
A	5-June-2012	Final Report	Christian Bode Associate Director	

Executive Summary

AECOM was commissioned by Yarra Trams as part of the Route 96 Corridor Development Project to assess traffic and tram operations at Port Junction. The initiative forms part of Tram Procurement Program which will provide E Class trams for the networks busiest corridors.

The investigation at Port Junction forms part of a broader planning study which will maximise tram priority and reliability along the entire route, provide improved accessibility and Disability Discrimination Act (DDA) compliance, increase passenger safety and maximise intermodal connectivity.

Tram delay, at Port Junction, can effectively be separated into two categories; delay due to boarding/alighting of passengers and intersection delay. Boarding/alighting delay, to a large extent is a function of tram stop infrastructure, vehicle technology and ticketing systems. Intersection delay incorporates the configuration of the signal program, positioning of detectors, phase sequence and timing.

Extensive manual and video surveys were commissioned for this study stretching over a 48 hour period. The collation of this data facilitated an appreciation of current tram delays at each of the three tram stops and on approach to the intersection. The survey data is summarised in Table 1 which provides average and maximum delay for each service.

Table 1 Total tram delay by service number – Wednesday 28 March 2012 (24 hours 0000-2359)

Service number	Average delay (includes intersection delay and boarding/alighting delay) [h:mm:ss]	Standard Deviation	Max delay (includes intersection delay and boarding/alighting delay) [h:mm:ss]	Time max delay occurred
Stop 124B (Clarendon Street outbound) - Routes 96, 109 & 112				
96	0:01:08	0:00:28	0:03:46	17:53:48
109	0:01:03	0:00:27	0:03:11	10:20:35
112	0:00:54	0:00:36	0:04:56	19:54:50
Stop 125 (Clarendon Street inbound) - Route 112				
112	0:00:50	0:00:33	0:02:18	22:57:42
Stop 125 Port Junction (Normanby Road inbound) - Routes 96,109 and Tramcar Restaurant				
96	0:01:15	0:00:43	0:06:46	17:52:07
109	0:01:13	0:00:33	0:03:41	17:57:42
Colonial Tramcar Restaurant (CTR)	0:03:46	0:02:35	0:07:01	17:50:32

A key objective of the study was to measure the impact of the Colonial Tramcar Restaurant (CTR) on regular services (109 and 96) which currently share a single two-way track through Port Junction. Survey video footage observed on Normanby Road indicates CTR services cause substantial delays to regular service trams. However the delay was observed intermittently and was a dependant on the arrival time of CTR vehicles. The average delay to regular services caused by CTR services exceeded four minutes.

A comparative assessment of signal data and tram/traffic volumes was undertaken for the Australian Grand Prix versus a nominal weekday. Although tram phases were called an addition 9 times in the morning peak period and 12 times in the evening peak period there was minimal impact on average cycle times.

Microsimulation modelling of existing conditions indicate the intersection is operating within capacity on all arms. Although congestion was present on some arms, most notably inbound on Clarendon Street, traffic progression through the intersection is within acceptable bounds and travel times are minimal.

Table of Contents

1.0 Introduction

This assessment focuses on Work Package 6 – Port Junction Redevelopment Project. The assessment specifically focuses on existing tram and traffic operations at the intersection of Clarendon Street / Whiteman Street / Normanby Road.

1.1 Goals of this Assessment

The overarching objective of the analysis at Port Junction is to:

- Quantify existing tram and traffic operations at the intersection and identify opportunities to reduce or eliminate tram delay and maximise reliability.
- Explore the potential to provide improved tram priority through Port junction
- Support the design component of this project and provide a platform for testing of the proposed schemes

1.2 Report Structure

The majority of tasks undertaken in this analysis essentially fall into the following four categories:

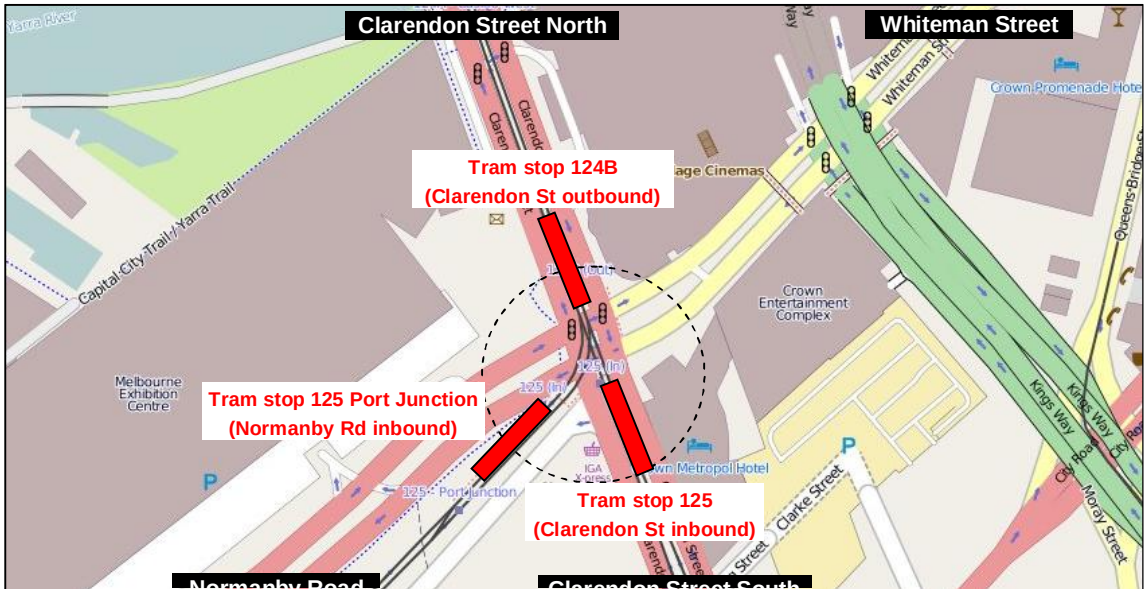
1) Data collection and extraction – commissioning of continuous video surveys and site observations;
2) Collation and interpretation of data – preparation of survey data for input to the traffic model;
3) Construction of a Base Case VISSIM microsimulation traffic model of Clarendon Street / Whiteman Street / Normanby Road; and
4) Summary of findings and suggested of design considerations.

1.3 Port Junction Focus Area

This assessment focuses on the intersection of Clarendon Street / Whiteman Street / Normanby Road including tram stops 125 (Clarendon Street inbound), 124B (Clarendon Street outbound) and 125 – Port Junction (Normanby Road inbound) and Colonial Tramcar Restaurant (CTR) Stop. The microsimulation modelling will focus on tram and traffic operations at this intersection in isolation. Figure 1 shows the intersection of Clarendon Street / Whiteman Street / Normanby Road and the location of the tram stops. The labelling of roads and tram stops shown in Figure 1 will be used throughout the report.

Figure 1 Port Junction focus area (intersection of Clarendon Street / Whiteman Street / Normanby Road)

Source: Open Street Map



2.0 Data Collection

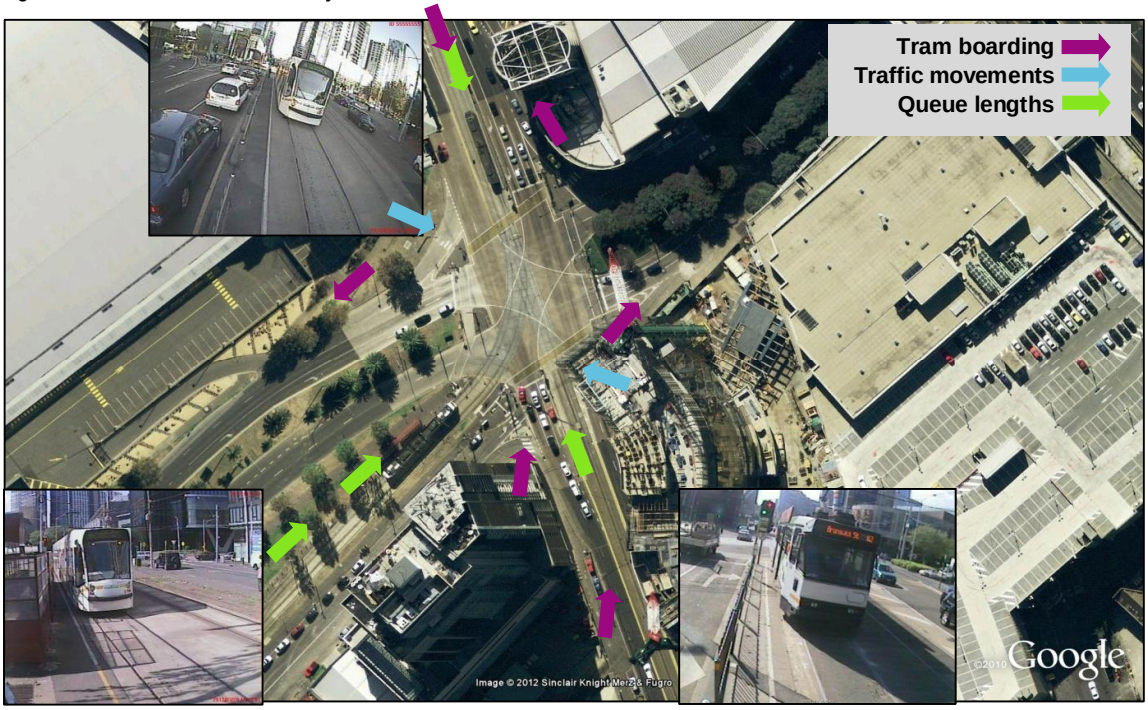
2.1 Continuous Video Survey

Two full days (48 hours) of continuous video survey footage was captured from 12 camera locations on the following dates:

- Tuesday 27 March 2012 from 0000 - 2400 hours; and
- Wednesday 28 March 2012 from 0000–2400 hours.

Video footage was captured over a full 48 hour period to ensure all possible causes of tram delay were captured. Equally, two separate weekdays were observed in order to capture a range of traffic. It should be noted that a State Funeral was held on day one of the video survey at 1.30pm for Jim Stynes. Although this did not affect tram operations, some vehicle trips may potentially have diverted to avoid delay. For this reason, modelling data was sourced from day two of the survey (Wednesday 28th March 2012), which was more representative of a typical weekday.

Figure 2 Port Junction Video survey camera locations



Source: Google Earth

2.2 VicRoads SCATS Operational Traffic Data

Traffic data has been sourced from VicRoads SCATS (Sydney Coordinated Adaptive Traffic Control System) database. SCATS is a computerised traffic management system maintained by VicRoads and used to control and coordinate traffic signals across the network.

2.2.1 Port Junction Signal Controller Phasing Diagram and Operation Specification

The phasing diagram and controller operation specification has been sourced from VicRoads for the intersection of Clarendon Street / Whiteman Street / Normanby Road (Signal Controller 4878). The specification provides an insight into the design of the signal controller and the SCATS operation. The following information is derived from the specification:

- Positioning of SCATS loop detectors facilitating derivation of SCATS link volumes;
- Phase diagram indicating phase run sequence under normal operation; and

- Inter-green matrices and pedestrian clearance time allocations.

The full VicRoads controller specification for the intersection of Clarendon Street / Whiteman Street / Normanby Road is provided in Appendix B.

2.2.2 Recorded Intersection Diagnostic Monitor Signal Data

Intersection Diagnostic Monitor files (IDM) show detailed SCATS intersection signal operation for every phase across a specified observation period. IDM files represent the actual operation of the signals onsite during the specified time slice including signal actuation by vehicle, pedestrian and tram. IDM files were recorded for the following dates and time periods:

- Friday 16 March 0000–2359 hours (2012 Australian Grand Prix Day 2);
- Saturday 17 March 0000–2359 hours (2012 Australian Grand Prix Day 3);
- Tuesday 27 March 0000–2359 hours (Continuous Video Survey Day 1); and
- Wednesday 28 March 0000–2359 hours (Continuous Video Survey Day 2).

2.2.3 SCATS Traffic Volumes

SCATS traffic volumes have also been sourced for the intersection of Clarendon Street / Whiteman Street / Normanby Road for the dates and times specified above. SCATS traffic volumes are collected automatically by the SCATS computer system which registers vehicles passing over loop detectors beneath the pavement, as defined on the detector map in Appendix B. It should be noted not all traffic movements can be captured by SCATS due to the absence of loop detectors at some locations. This is particularly relevant on slip lanes since these movements are priority controlled. For this reason SCATS traffic volumes are used as a guide only to determine peak periods and compare traffic flow profiles.

3.0 Collation and Interpretation of Data

3.1 Comparison of SCATS Traffic Data - Grand Prix vs. Typical Weekday

3.1.1 SCATS Tram and Traffic Link Volumes – Derivation of Peak Periods

Figure 3 and Figure 4 show traffic flow profiles over a 24 hour period for Friday 16 March 2012 (Grand Prix day 2) and Wednesday 28 March 2012 (video survey day 2) respectively. Peak periods correspond with those derived from observed traffic flow. Traffic data and analysis, for this assessment, focuses on the following peak periods as well as data over a 24 hour period:

- AM peak hour – 0800-0900 hours;
- PM peak hour – 1700-1800 hours; and
- Off-peak hour – 1330-1430 hours.

As shown in both Figure 3 and Figure 4 the Clarendon Street north approach carries the highest traffic volumes throughout the day, peaking late in the PM peak period at approximately 900 vehicles per hour.

Figure 3 24 hour SCATS traffic flow profile (Friday 16 March 2012 – Grand Prix Day 2)

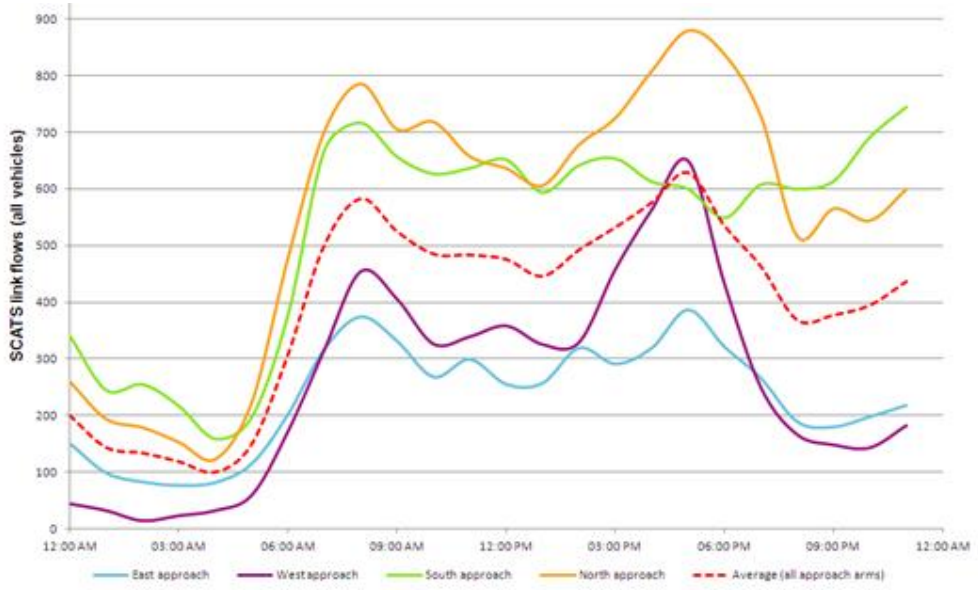
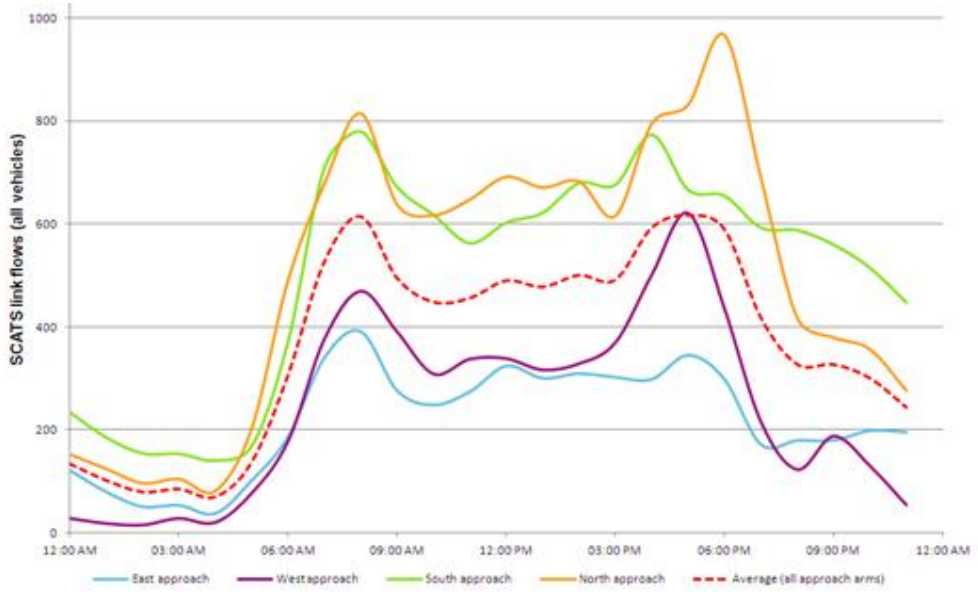


Figure 4 24 hour SCATS traffic flow profile (Wednesday 28 March 2012 – survey Day 2)



3.1.2 Signal Operation – Grand Prix Day 2 versus Survey Day 1

SCATS Intersection Diagnostic Monitor (IDM) data and phasing diagrams have been obtained from VicRoads for 'Port Junction' for Friday 16 March 2012 (Grand Prix Day) and Wednesday 28 March 2012 (nominal weekday conditions). The data has been gathered to compare how the signal timings at the intersection are altered due to the increase in tram headways to facilitate the Australian Grand Prix.

The IDM data has been distilled to summarise timings during each of the assessed peak periods; the morning peak (0800-0900), the evening peak (1700-1800) and off-peak (1330-1430). Data for these time periods is provided in Appendix C.

When comparing signal operation during the Australian Grand Prix versus normal operation the following observation can be made:

- Daily (0000-2359) signal operation
  - Over the entire day the average cycle time (CT) at the intersection is increased by approximately 12 seconds from 95s CT to 107s CT on a grand prix day; and
  - Phases B and E (tram actuated phases) are called an additional 165 times on a grand prix day due to the increased headway of trams, resulting in phase A (which caters for through traffic and trams along Clarendon Street being called 104 times less throughout the day.
- Morning (0800-0900) and evening peak periods (1700-1800) signalised operation
  - There is little or no difference in operation during the morning and evening peak periods with tram phases B and E only being called an additional 9 times during each period on the grand prix day; and
  - The average CT times are comparable.
- Off-peak period (1330-1430) signal operation
  - During the off-peak period the average CT is increased by approximately 12 seconds from 131s CT to 143s CT; and
  - Phases B and E (tram actuated phases) are called an additional 20 times on a grand prix day due to the increased headway of trams. The time for these phases is gained from the increased CT and by reducing the frequency of all other phases on average by -2 seconds.

3.2 Surveyed Traffic Data

Survey data has been extracted from video surveys on both Tuesday 27 and Wednesday 28 March over a 48 hour period from 0000-2359 hours.

3.2.1 Tram Frequency by Service Number

Tram service numbers were recorded from video footage for the AM peak hour, PM peak hour, Off-peak hour and over the full 24 hour period. The results are listed in Table 2 through Table 5 and indicate tram frequencies are relatively consistent across all peak hours. As shown in Table 5, the number of trams passing through stop 124B (Clarendon Street outbound) is effectively equal with routes 96, 109 and 112 all registering approximately 130 arrivals over a 24 hour period on both Tuesday 27 and Wednesday 28 March.

Interestingly, although the CTR recorded on average 12 arrivals across the 24 hour period, none of these occurred during the AM peak period on Tuesday or Wednesday. Four passed through the intersection during the PM peak on Tuesday but none were observed during the PM peak on Wednesday.

Table 2 Tram Frequency AM Peak Period (0800-0900)

Service Number	Stop 125 (Clarendon Street inbound) - Route 112 only		Stop 124B (Clarendon Street outbound)		Stop 125 (Normanby Road inbound)	
	Tuesday	Wednesday	Tuesday	Wednesday	Tuesday	Wednesday
96	0	0	8	8	11	10
109	0	0	9	11	13	13
112	10	9	11	11	0	1
NIS	0	0	0	1	0	1
CTR	0	0	0	0	0	0

Table 3 Tram Frequency PM Peak Period (1700-1800)

Service Number	Stop 125 (Clarendon Street inbound) - Route 112 only		Stop 124B (Clarendon Street outbound)		Stop 125 (Normanby Road inbound)	
	Tuesday	Wednesday	Tuesday	Wednesday	Tuesday	Wednesday
96	0	0	8	9	9	8
109	0	0	12	13	13	14
112	8	7	8	8	3	1
NIS	0	0	1	3	0	2
CTR	0	0	4	0	4	0

Table 4 Tram Frequency Off-peak Period (1330-1430)

Service Number	Stop 125 (Clarendon Street inbound) - Route 112 only		Stop 124B (Clarendon Street outbound)		Stop 125 (Normanby Road inbound)	
	Tuesday	Wednesday	Tuesday	Wednesday	Tuesday	Wednesday
96	0	0	7	8	8	8
109	0	0	8	7	8	8
112	7	7	7	7	0	1
NIS	0	0	0	1	0	1
CTR	0	0	0	0	0	0

Table 5 Tram Frequency 24 Hour Period (0000-2359)

Service Number	Stop 125 (Clarendon Street inbound) - Route 112 only		Stop 124B (Clarendon Street outbound)		Stop 125 (Normanby Road inbound)	
	Tuesday	Wednesday	Tuesday	Wednesday	Tuesday	Wednesday
96	0	0	117	128	119	125
109	0	0	122	127	131	10
112	124	118	135	123	13*	127
NIS	0	2	16	27	8	19
CTR	6	7	10	11	12	12

**Video survey shows 112 trams travelling through stop 125. It is assumed that this is an empty movement to/from the Southbank Depot.*

3.2.2 Observed Tram Delay

The time delay at all three stops were recorded from the survey video footage and are summarised for service numbers 96,109 and 112 for Tuesday and Wednesday in Table 6 to Table 9. The following delay measures were extracted:

- Average delay – tram arrival time to the time the tram clears the opposite side of the intersection, average across all entries 0000-2359;
- Maximum delay – tram arrival time to the time the tram clears the opposite side of the intersection, maximum for all entries 0000-2359;
- Average signal cycles – average number of traffic signal cycles required for the tram to clear the intersection;
- Maximum signal cycles – maximum number of traffic signal cycles required for the tram to clear the intersection; and
- Average boarding and alighting delay – time recorded from opening of tram doors to closing of trams doors.

Boarding and Alighting Time Delay

Table 6 Boarding and alighting tram delay by service number – Tuesday 27 March 2012 (24 hours 0000-2359)

Service number	Average boarding/alighting delay (h:mm:ss)	Standard Deviation	Max boarding/alighting delay (h:mm:ss)	Time max boarding/alighting delay occurred
Stop 124B (Clarendon Street outbound) - Routes 96, 109 & 112				
96	0:00:16	0:00:17	0:02:42	19:26:42
109	0:00:17	0:00:18	0:01:49	15:06:39
112	0:00:19	0:00:25	0:03:23	19:25:12
Stop 125 (Clarendon Street inbound) - Route 112				
112	0:00:20	0:00:25	0:02:27	14:38:07
Stop 125 Port Junction (Normanby Road inbound) - Routes 96,109 and Tramcar Restaurant				
96	0:00:29	0:00:24	0:02:38	14:45:15
109	0:00:28	0:00:23	0:02:11	8:19:29
Tramcar	0:04:18	0:01:03	0:06:02	19:19:42

Table 7 Boarding and alighting tram delay by service number – Wednesday 28 March 2012 (24 hours 0000-2359)

Service number	Average boarding/alighting delay (h:mm:ss)	Standard Deviation	Max boarding/alighting delay (h:mm:ss)	Time max boarding/alighting delay occurred
Stop 124B (Clarendon Street outbound) - Routes 96, 109 & 112				
96	0:00:18	0:00:16	0:01:16	17:53:48
109	0:00:16	0:00:14	0:01:07	11:51:49
112	0:00:16	0:00:17	0:01:16	12:07:13
Stop 125 (Clarendon Street inbound) - Route 112				
112	0:00:23	0:00:23	0:01:45	22:57:42
Stop 125 Port Junction (Normanby Road inbound) - Routes 96,109 and Tramcar Restaurant				
96	0:00:30	0:00:38	0:05:47	17:52:07
109	0:00:31	0:00:27	0:02:27	13:06:46
Tramcar	0:04:01	0:00:56	0:05:33	17:57:21

Total Delay (boarding/alighting delay plus intersection delay)

Table 8 Total tram delay by service number – Tuesday 27 March 2012 (24 hours 0000-2359)

Service number	Average delay (includes intersection delay and boarding/alighting delay) [h:mm:ss]	Standard Deviation	Max delay (includes intersection delay and boarding/alighting delay) [h:mm:ss]	Time max delay occurred
Stop 124B (Clarendon Street outbound) - Routes 96, 109 & 112				
96	0:01:08	0:00:39	0:05:41	6:50:40
109	0:01:08	0:00:26	0:02:20	15:06:39
112	0:00:50	0:00:32	0:03:50	19:25:12
Stop 125 (Clarendon Street inbound) - Route 112				
112	0:00:48	0:00:35	0:02:50	14:40:51
Stop 125 Port Junction (Normanby Road inbound) - Routes 96,109 and Tramcar Restaurant				
96	0:01:17	0:00:30	0:03:44	14:45:15
109	0:01:13	0:00:29	0:02:49	8:19:29
Tramcar	0:03:07	0:02:26	0:06:25	20:35:33

Table 9 Total tram delay by service number – Wednesday 28 March 2012 (24 hours 0000-2359)

Service number	Average delay (includes intersection delay and boarding/alighting delay) [h:mm:ss]	Standard Deviation	Max delay (includes intersection delay and boarding/alighting delay) [h:mm:ss]	Time max delay occurred
Stop 124B (Clarendon Street outbound) - Routes 96, 109 & 112				
96	0:01:08	0:00:28	0:03:46	17:53:48
109	0:01:03	0:00:27	0:03:11	10:20:35
112	0:00:54	0:00:36	0:04:56	19:54:50
Stop 125 (Clarendon Street inbound) - Route 112				
112	0:00:50	0:00:33	0:02:18	22:57:42
Stop 125 Port Junction (Normanby Road inbound) - Routes 96,109 and Tramcar Restaurant				
96	0:01:15	0:00:43	0:06:46	17:52:07
109	0:01:13	0:00:33	0:03:41	17:57:42
Tramcar	0:03:46	0:02:35	0:07:01	17:50:32

Table 10 Traffic signal cycles required for tram services to clear the intersection

Service number	Average signal cycles	Maximum signal cycles
Stop 124B (Clarendon Street outbound) - Routes 96, 109 & 112		
96	0	2
109	0	0
112	0	0
Stop 125 (Clarendon Street inbound) - Route 112		
112	0	0
Stop 125 Port Junction (Normanby Road inbound) - Routes 96,109 and Tramcar Restaurant		
96	0	2
109	0	1
Tramcar	3	6

Note: An average or maximum cycle time of 0 indicates a tram arrived at the stop and waited until the next tram phase before clearing the intersection. An average or maximum cycle time of 1 indicates a tram arrived at the stop but was not able to proceed through the intersection on the next available tram phase due to delay caused by an upstream tram or loading.

A complete listing of tram delay observations over the 24 hour period from 0000-2359 on Wednesday 28 March 2012 is provided in Appendix D. Appendix E contains tram delay observations observation for Tuesday 27 March 2012.

Tram Delay Resulting from Colonial Tramcar Restaurant

Survey video footage observed on Normanby Road indicates CTR services cause substantial delays to regular service trams. However the delay was observed intermittently and was a dependant on the arrival time of CTR vehicles. For example, although CTR services did operate on Tuesday 27 March, no significant delay was observed to regular services and all vehicles were able to progress through the intersection at the next available tram phase. Regular tram services (96 and 109) did experience substantial delays on Wednesday 28 March

where on six occasions boarding and alighting from CTR resulted in extended delays. These occurrences and the resultant delays are listed in Table 11. The average delay across all services was 4 minutes and 10 seconds.

Table 11 Tram Delay caused by CTR - Wednesday 28 March 2012

Delay event	Service number	Arrival time	Total Delay (h:mm:ss)	Boarding/alighting delay (h:mm:ss)	Cycles to clear intersection
1	96	13:03:47	0:04:48	0:03:21	2
	109	13:06:46	0:03:04	0:02:27	2
2	96	17:52:07	0:06:46	0:05:47	4
	109	17:56:54	0:03:10	0:02:06	2
	109	17:57:42	0:03:41	0:02:00	2
3	Service number not visible	20:40:09	0:03:59	0:03:21	3

Plate 1 displays an excerpt from video footage recorded Wednesday 28 March 2012 indicating delay to the Route 96 service resulting from boarding and alighting of an evening CTR service. Two CTR vehicles often arrive at stop 125 Port Junction (Normanby Road inbound) together which can result in delays in excess of five minute to regular services.

Plate 1 Video excerpt showing delay to Route 96 caused at tram stop by Colonial Tram Car Restaurant

Delay to Route 96 and 109 at Stop 124B (Clarendon Street outbound) held by Route 112

Through tram services (Route 112) at stop 124B (Clarendon Street outbound) were not found to cause substantial delay to tram services on route 96 or 109 on either of the survey days. Throughout the observation period trams following route 112 services were able to progress through the intersection at the next available tram phase on the majority of occasions. There were only two occasions where delays extended beyond a single cycle; this was caused by interaction between passengers and the tram driver.

Table 12 Tuesday 27 March 2012 – Outbound tram delay at stop 124B due to route 112 services

Average boarding delay (h:mm:ss)	Max cycles to clear	Average total delay (boarding and intersection)	Max total delay (boarding and intersection)
0:00:18	1	0:01:09	0:03:48

Table 13 Wednesday 28 March 2012 – Outbound tram delay at stop 124B due to route 112 services

Average boarding delay (h:mm:ss)	Max cycles to clear	Average total delay (boarding and intersection)	Max total delay (boarding and intersection)
0:00:14	1	0:01:01	0:03:11

3.2.3 Classified Vehicle Turning Movement Counts

Turning movement diagrams for light vehicles, heavy vehicles, trams, pedestrians and cyclists recorded for the AM, PM, Off-peak periods as well as over the full 24 hour period from 0000-2359 hours for Wednesday 28 March 2012 are provided in Appendix A.

- AM Peak Period 0800-0900 hours
    - The dominant traffic flow is north-south along Clarendon Street with almost 700 vehicles performing this manoeuvre in each direction. Traffic progression through the intersection was somewhat restricted on the south approach and resulted in the development of a short queue, these conditions are reflected in Plate 2;
    - 139 vehicles turned right from Normanby Road and 183 from Clarendon Street north. Vehicles were generally able to progress through the intersection at the next available phase and minimal queuing was observed in the AM peak period as a result; and
    - Whiteman Street is the most lightly trafficked approach and was observed operating within capacity throughout the AM peak period.
- PM Peak Period 1700-1800 hours
    - Traffic volumes overall were higher in the PM peak period than during the AM peak;
    - The through volume from Clarendon Street north represented the highest single movement at 759 vehicles per hour;
    - Interestingly, the left and right-turning movements from Clarendon Street north were reduced from the AM peak. The pedestrian crossing north of the intersection on Clarendon Street was found to meter some traffic and assist southbound progression at the intersection of Clarendon Street / Whiteman Street / Normanby Road;
    - On one occasion traffic from Normanby Road was observed queuing through the intersection, this was caused by the downstream intersection at City Road and is shown impacting the Normanby Road right-turn in Plate 3; and
    - Clarendon Street south approach remains heavy during the PM peak period although throughput and queue extents are reduced marginally.

Plate 2 Clarendon Street (south approach) AM peak period 0800-0900 hours

Plate 3 Clarendon Street (south exit) PM peak period 1700-1800

3.2.4 Queue Lengths

As previously outlined, traffic surveys were undertaken for 'Port Junction' on Tuesday 27 and Wednesday 28 March 2012. This included a queue survey of all approach arms to the signalised intersection. This data has been analysed to give the following periods:

- Average and Maximum queues over the entire survey day (0600-2300;
- Average and Maximum queues during the morning peak period (0800-0900);
- Average and Maximum queues during the evening peak period (1700-1800); and
- Average and Maximum queues during the off-peak period (1330-1430).

The above analysis has been surmised in Table 14 and Table 15 for the aforementioned time periods.

Table 14 Average and Maximum 'Port Junction' Signalised Intersection Queues (Vehicles) – Tuesday 27 March 2012

Arm	Lane	Average and Maximum Queues in Vehicles by Time Period							
		Survey Day (0600-2300)		AM Peak Period (0800-0900)		PM Peak Period (1700-1800)		Off-Peak Period (1330-1430)	
		Av. Q	Max. Q	Av. Q	Max. Q	Av. Q	Max. Q	Av. Q	Max. Q
Clarendon Street south	1	10	18	14	18	14	15	9	14
	2	11	21	16	21	16	18	11	14
	3	2	7	2	5	2	3	2	4
Whiteman Street	1	1	4	1	2	2	3	2	3
	2	2	7	4	7	4	7	2	5
	3	5	11	7	11	6	9	6	11
	4	6	12	6	8	8	12	7	10
Clarendon Street north	1	1	4	0	2	2	4	1	3
	2	6	17	6	11	11	17	7	14
	3	8	18	7	13	13	17	8	14
	4	5	14	8	14	8	13	6	7
Normandy Road	1	2	12	6	12	4	8	1	3
	2	2	8	3	6	5	8	2	2
	3	5	11	7	10	8	11	7	10
	4	5	10	6	9	7	9	5	8

Notes: ***Queues*** *are in Vehicles,* ***Av*** *= Average,* ***Q*** *= Queue,* ***Lane '1'*** *is the nearside lane, all other lanes following from this sequentially*

The following can be noted from the queue survey undertaken on Tuesday 27 March 2012:

- Clarendon Street south consistently has vehicles queuing through all periods of the day with lanes 1 and 2 rarely dropping on average below 10 vehicles (approximately 60 metres assuming an average vehicle length of 6 metres);
- Consistent queue lengths were observed on Clarendon Street north through the day. Queue lengths extended in lanes 2 and 3 during the evening peak period when traffic was departing the CBD; and
- Whiteman Street and Normandy Road queue lengths were relatively minimal and consistent across all assessed time periods.

Table 15 Average and Maximum 'Port Junction' Signalised Intersection Queues (Vehicles) – Wednesday 28 March 2012

Arm	Lane	Average and Maximum Queues in Vehicles by Time Period							
		Survey Day (0600-2300)		AM Peak Period (0800-0900)		PM Peak Period (1700-1800)		Off-Peak Period (1330-1430)	
		Av. Q	Max. Q	Av. Q	Max. Q	Av. Q	Max. Q	Av. Q	Max. Q
Clarendon Street south	1	10	18	13	17	15	17	12	15
	2	12	19	16	19	16	17	13	15
	3	2	6	2	4	3	5	2	3
Whiteman Street	1	2	5	1	3	3	5	1	3
	2	2	8	6	8	4	7	2	3
	3	5	12	7	11	7	12	5	9
	4	7	13	7	9	8	10	10	12
Clarendon Street north	1	1	3	0	2	1	2	0	1
	2	6	15	7	11	6	11	6	10
	3	8	23	11	15	11	23	8	14
	4	6	18	10	18	7	11	6	10
Normandy Road	1	2	10	4	9	6	8	1	4
	2	3	8	5	8	5	6	2	4
	3	6	15	10	15	13	14	6	10
	4	6	13	8	11	11	13	6	8

Notes: ***Queues*** *are in Vehicles,* ***Av*** *= Average,* ***Q*** *= Queue,* ***Lane '1'*** *is the nearside lane, all other lanes following from this sequentially*

The queue survey on Wednesday 28 March 2012 is comparable to the observations made during the queue survey undertaken on Tuesday 27 March 2012 with only some minor increases in maximum queues recorded.

3.2.5 Pedestrian Survey Data

Pedestrian movements were observed between the points indicated on Figure 5 over 24 hours for both days. Table 16 shows a matrix of pedestrian movements on Wednesday 28 March 2012. The greatest pedestrian flow occurred between point A and F across Normanby Road. A breakdown of pedestrian flows during the peak periods is provided in Appendix A.

Figure 5 Pedestrian movement diagram indicating dwell points

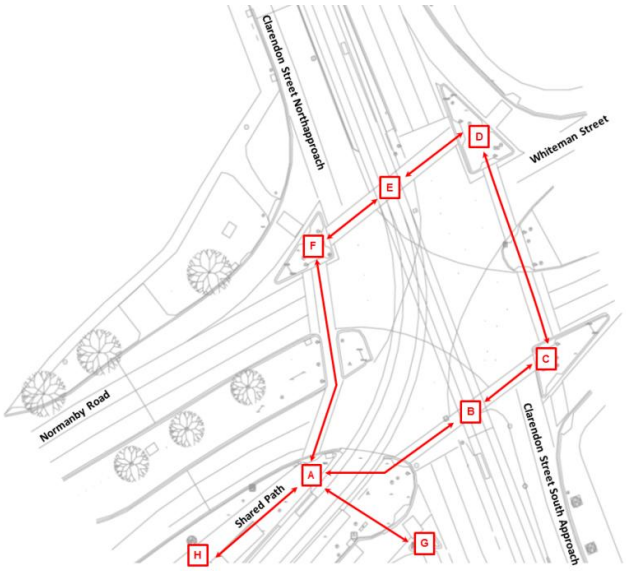


Table 16 Matrix of pedestrian movements 24 hours 0000-2359 Wednesday 28 March 2012

	A	B	C	D	E	F	G
A		61	614			1073	531
B	60		22				
C	730	85		1149			
D			1096		82	497	
E				446		291	
F	1239			411	33		1010
G	776					700	

3.2.6 Cyclist Survey Data

On-road bicycle survey data is shown in Figure 6 for the AM peak, PM peak and over 24 hours on Wednesday 28 March 2012. Bicycle movements are relatively low with the peak flow occurring north-south along Clarendon Street. It is clear that the off-road shared bicycle path between Normanby Road carries the majority of flow from this arm with 81 cyclists travelling inbound during the AM peak hour 0800-0900 173 returning in the PM peak hour 1700-1800. All approach arms to the intersection of Clarendon Street / Whiteman Street / Normanby Road are listed on the PBN (Principle Bicycle Network). The west approach from Normanby Road is a key route into the city from the bay-side suburbs of City of Port Phillip.

Daily bicycle volumes observed on paths and crossings for Wednesday 28 March 2012 are listed in Table 17. When compared to on-road cycle volumes, shown in Figure 6, the flows are relatively low apart from two main movements. Daily volumes outbound on the shared bicycle/pedestrian path were observed at 662 bicycles. This represents the peak cycle flow at Port Junction and is significantly higher than the inbound flow at 443 bicycles. High bicycle volumes were also observed on the Normanby Road pedestrian crossing indicating the majority of cyclists are destined for or originate from the CBD (Central Business District).

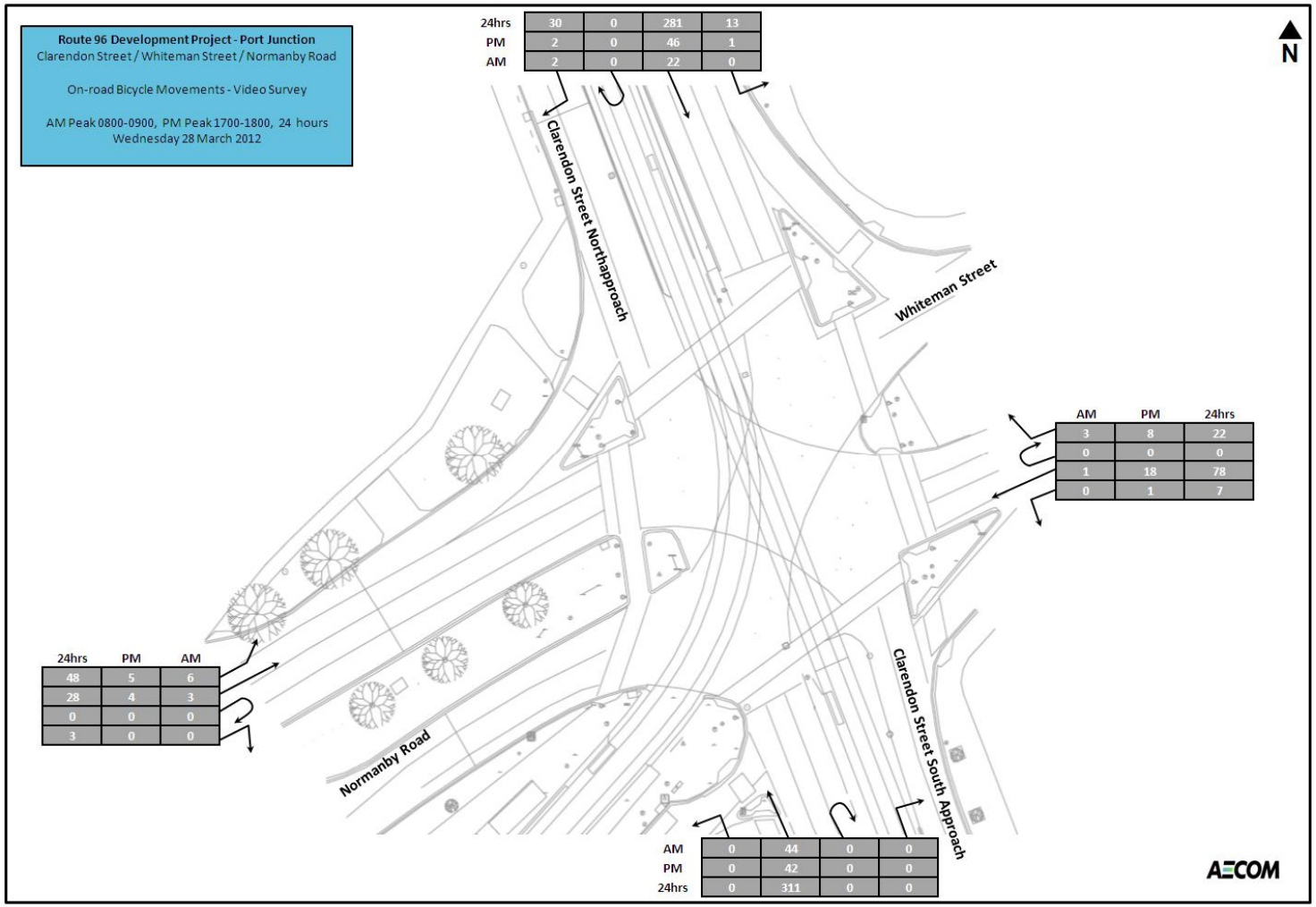
Table 17 Matrix of pedestrian movements 24 hours 0000-2359 Wednesday 28 March 2012

	A	B	C	D	E	F	G	H
A		0	34			495	49	662
B	0		0					
C	22	0		36				
D			28		0	33		
E				1		6		
F	603			10	0		33	
G	52					52		
H	443							

The lack of formal cycle provision connecting the shared path with Clarendon Street north results in high usage of the Normanby Road pedestrian crossing by cyclists. Plate 4 shows a cyclist performing this movement which represents the high cycle flow, greater than any on-road movement.

Plate 4 Cyclist utilising Normanby Road pedestrian crossing from shared path

Figure 6 Surveyed on-road bicycle movements – Wednesday 28 March 2012



4.0 Base Case VISSIM Microsimulation Traffic Modelling

VISSIM was selected as a modelling package because of its adaptive nature and ability to represent the exact physical nature and operational characteristics of the Clarendon Street / Whiteman Street / Normanby Road intersection. VISSIM is also capable of modelling tram operations to a very precise, microscopic level and can replicate actuated signal control for all transport modes.

Signal sequencing and phase timings have been coded into the model to represent the operation of the intersection as shown on the VicRoads operation sheet provided in Appendix B and the phase times derived from SCATS IDM data summarised in Appendix C.

Tram and traffic operations were modelled at the intersection for Wednesday 28 March 2012 independently for the following peak periods:

- AM peak period 0800-0900 hours;
- PM Peak period 1700-1800 hours; and
- Off-peak period 1330-1430 hours.

4.1 VISSIM Model Calibration

A basic calibration of the base models for each of the peak periods has been undertaken to ensure the model is representative of the applied traffic demand, the results are shown below in Table 18 to Table 19. A close agreement between modelled and observed traffic volumes on exit arms of the intersection indicate the vast majority of vehicles are able to progress through the intersection within the modelled period. Figure 7 below shows the VISSIM model layout measurement points for the modelled versus observed flow comparison.

Figure 7 VISSIM model intersection layout and entry/exit observation points

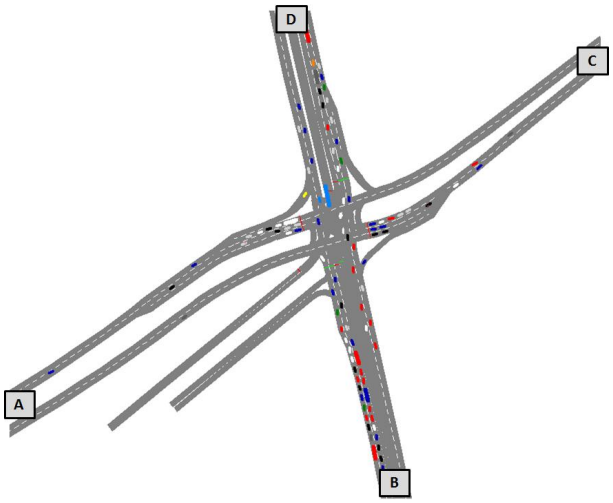


Table 18 AM peak period (0800-0900) modelled versus observed origin/destination traffic volumes

	A		B		C		D	
	Modelled	Observed	Modelled	Observed	Modelled	Observed	Modelled	Observed
Entry	772	773	838	838	542	541	1057	1059
Exit	560	588	908	920	515	518	1125	1125

Table 19 PM peak period (1700-1800) modelled versus observed origin/destination traffic volumes

	A		B		C		D	
	Modelled	Observed	Modelled	Observed	Modelled	Observed	Modelled	Observed
Entry	968	970	773	773	706	709	1135	1138
Exit	512	525	1086	1111	531	534	1042	1061

Table 20 Off-peak period (1330-1430) modelled versus observed origin/destination traffic volumes

	A		B		C		D	
	Modelled	Observed	Modelled	Observed	Modelled	Observed	Modelled	Observed
Entry	462	462	760	760	438	434	905	907
Exit	466	489	828	816	469	472	843	851

4.2 Modelled Travel Times and Delay through the Intersection

The time taken for vehicles to travel through the intersection was measured at cross-sections defined between origin/destination points within the model. Markers are defined from the model entry point to immediately through the intersection.

The results indicate that although some movements carry a high traffic demand and show some signs of congestion this does not necessarily translate to an extensive delay due to the allocation of green time lane configuration. Travel times through the intersection for the heavy north-south movement on Clarendon Street average approximately one minute whereas some movements from Normanby Road and Whiteman Street extend beyond that. Table 21 and Table 22 show modelled travel times through the intersection for the AM and PM peak periods respectively.

Table 21 VISSIM modelled travel times AM peak period 0800-0900 hours

VISSIM ID	Travel time cross-section description	Modelled travel time (m:ss)
1	Normanby Road to Clarendon Street inbound	0:07
2	Normanby Road to Whiteman Street	4:53
3	Normanby Road to Clarendon Street outbound	1:24
4	Normanby Road to Normanby Road	1:20
5	Clarendon Street south to Clarendon Street inbound	0:53
6	Clarendon Street south to Whiteman Street	1:17
7	Clarendon Street south to Normanby Road	0:50
8	Clarendon Street south to Clarendon Street outbound (u-turn)	-
9	Whiteman Street to Normanby Road	1:03
10	Whiteman Street to Clarendon Street outbound	1:03
11	Whiteman Street to Clarendon Street inbound	2:21
12	Whiteman Street to Whiteman Street (u-turn)	2:35
13	Clarendon Street north to Whiteman Street	0:12
14	Clarendon Street north to Clarendon Street outbound	0:48
15	Clarendon Street north to Normanby Road	1:09
16	Clarendon Street north to Clarendon Street inbound	1:12

Table 22 VISSIM modelled travel times PM peak period 01700-1800 hours

VISSIM ID	Travel time cross-section description	Modelled travel time (m:ss)
1	Normanby Road to Clarendon Street northbound	0:10
2	Normanby Road to Whiteman Street	4:54
3	Normanby Road to Clarendon Street southbound	2:14
4	Normanby Road to Normanby Road	1:48
5	Clarendon Street south approach to Clarendon Street northbound	0:50
6	Clarendon Street south approach to Whiteman Street	1:23
7	Clarendon Street south approach to Normanby Road	0:57
8	Clarendon Street south approach to Clarendon Street southbound	-
9	Whiteman Street to Normanby Road	0:48
10	Whiteman Street to Clarendon Street southbound	0:09
11	Whiteman Street to Clarendon Street northbound	1:47
12	Whiteman Street to Whiteman Street	1:35
13	Clarendon Street north approach to Whiteman Street	0:25
14	Clarendon Street north approach to Clarendon Street outbound	1:03
15	Clarendon Street north approach to Normanby Road	1:03
16	Clarendon Street north approach to Clarendon Street inbound (u-turn)	-

5.0 Conclusions and Recommendations

Continuous video surveys were completed at the intersection of Clarendon Street / Whiteman Street / Normanby Road on Tuesday 27 and Wednesday 28 March 2012, recording all traffic movements through the junction over the period including trams, vehicles, pedestrians and cyclists. The results were used to inform an assessment of the operation and capacity of the intersection under normal loading conditions for both tram and general traffic. A VISSIM microsimulation traffic model was compiled to represent and measure observed traffic conditions during the AM peak, PM peak and Off-peak periods on both days.

A key objective of the study was to measure the impact of the Colonial Tramcar Restaurant (CTR) on regular services (109 and 96) which currently share a single two-way track through Port Junction. Survey video footage observed on Normanby Road indicates CTR services cause substantial delays to regular service trams. However the delay was observed intermittently and was a dependant on the arrival time of CTR vehicles. The average delay to regular services caused by CTR services exceeded four minutes.

A comparative assessment of signal data and tram/traffic volumes was undertaken for the Australian Grand Prix versus a nominal weekday. Although tram phases were called an addition 9 times in the morning peak period and 12 times in the evening peak period there was minimal impact on average cycle times.

Passenger boarding and alighting is the main cause of tram delay that results in trams not progressing through the intersection at the next available tram phase, although this does generally not extend more than a few minutes. Tram delay also occurs when two or more trams arrive at the stop concurrently. On occasions this results in a delay which extends beyond the first available tram phase but generally the tram is able to proceed on the following tram phase. Table 23 summarises tram delay through the intersection for Wednesday 28 March 2012 and provides average and maximum delay for all tram services operating through Port Junction.

Table 23 Total tram delay by service number – Wednesday 28 March 2012 (24 hours 0000-2359)

Service number	Average delay (includes intersection delay and boarding/alighting delay) [h:mm:ss]	Standard Deviation	Max delay (includes intersection delay and boarding/alighting delay) [h:mm:ss]	Time max delay occurred
Stop 124B (Clarendon Street outbound) - Routes 96, 109 & 112				
96	0:01:08	0:00:28	0:03:46	17:53:48
109	0:01:03	0:00:27	0:03:11	10:20:35
112	0:00:54	0:00:36	0:04:56	19:54:50
Stop 125 (Clarendon Street inbound) - Route 112				
112	0:00:50	0:00:33	0:02:18	22:57:42
Stop 125 Port Junction (Normanby Road inbound) - Routes 96,109 and Tramcar Restaurant				
96	0:01:15	0:00:43	0:06:46	17:52:07
109	0:01:13	0:00:33	0:03:41	17:57:42
Tramcar	0:03:46	0:02:35	0:07:01	17:50:32

The information presented in this report provides an appreciation of the existing operation of the intersection at Clarendon Street / Whiteman Street / Normanby Road and summarises tram delay at Port Junction and its principle causes. Based on this analysis the following improvement schemes provide potential to reduce tram delay and provide improved reliability:

Relocation of tram stop 124B (Clarendon Street outbound)

This option would allow boarding/alighting of the 112 service on the southern side of the intersection. Boarding/alighting of the 109 and 96 services would take place at a redeveloped stop 125 (Normanby Road). This would allow installation of a downstream tram detector to provide advanced call of the tram phase. This would decrease outbound tram waiting times at the stop line.

Revised signal operation, including possible removal of right-turn manoeuvre from Clarendon Street south to Whiteman Street

Traffic surveys indicate there is minimal demand for the right-turn manoeuvre from Clarendon Street south to Whiteman Street. Approximately 30 vehicles perform this manoeuvre during peak periods. There is potential to reroute this traffic via an alternate path thereby eliminate the need to call the phase permit the movement (F2). This would result in a reduced delay from the point the tram phase is called on some occasions.

Increased tram frequency (similar to tram operation during the Australian Grand Prix)

The analysis of IDM data sourced during the Australian Grand Prix indicates there is potential to increase the frequency of tram services through Port Junction. SCATS traffic volumes suggest the intersection operates at similar capacity to regular weekday operation. However, as manual surveys were not conducted during this period the full extent of tram and traffic impact cannot be quantified.

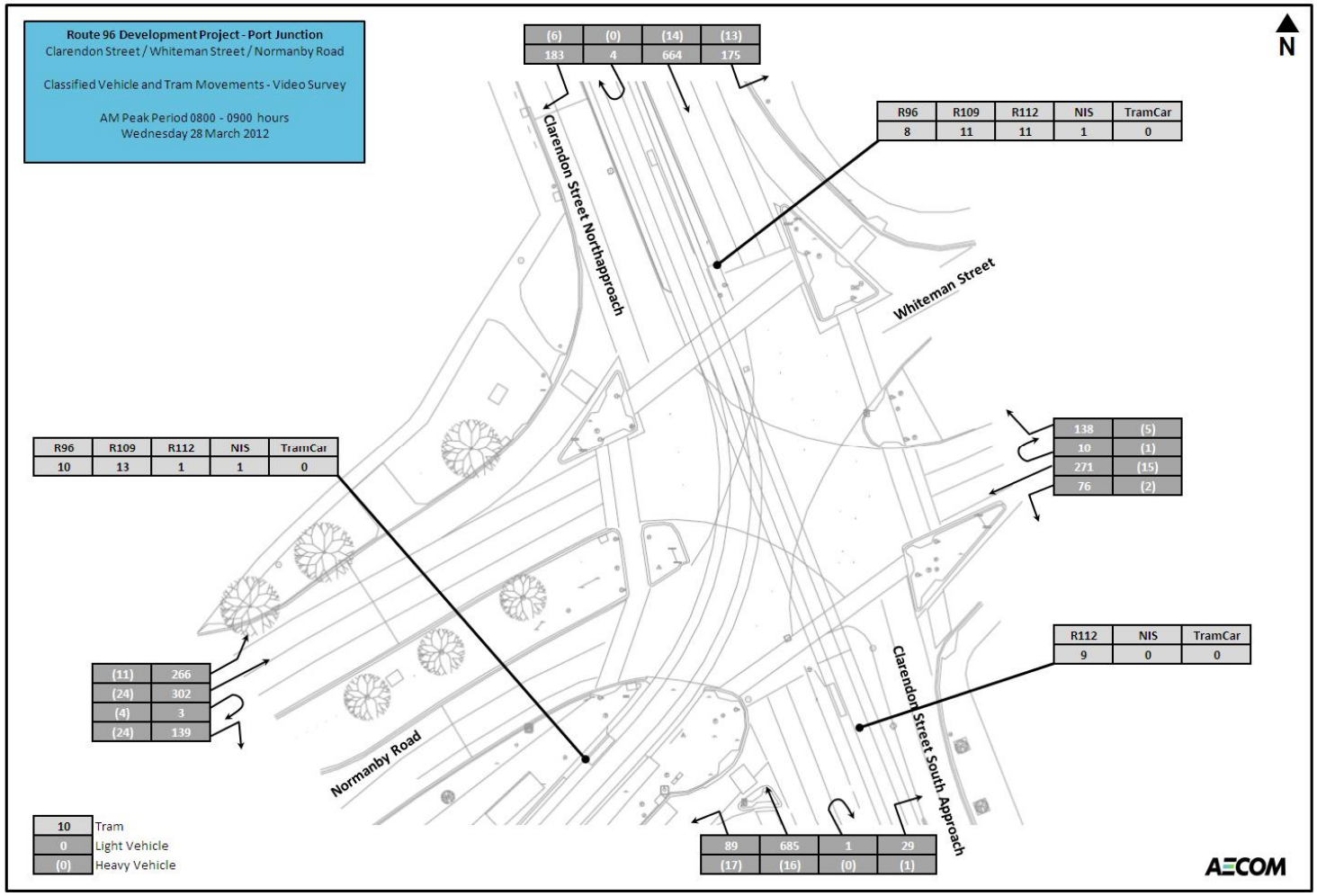
Separation of CTR services through the provision of a third track

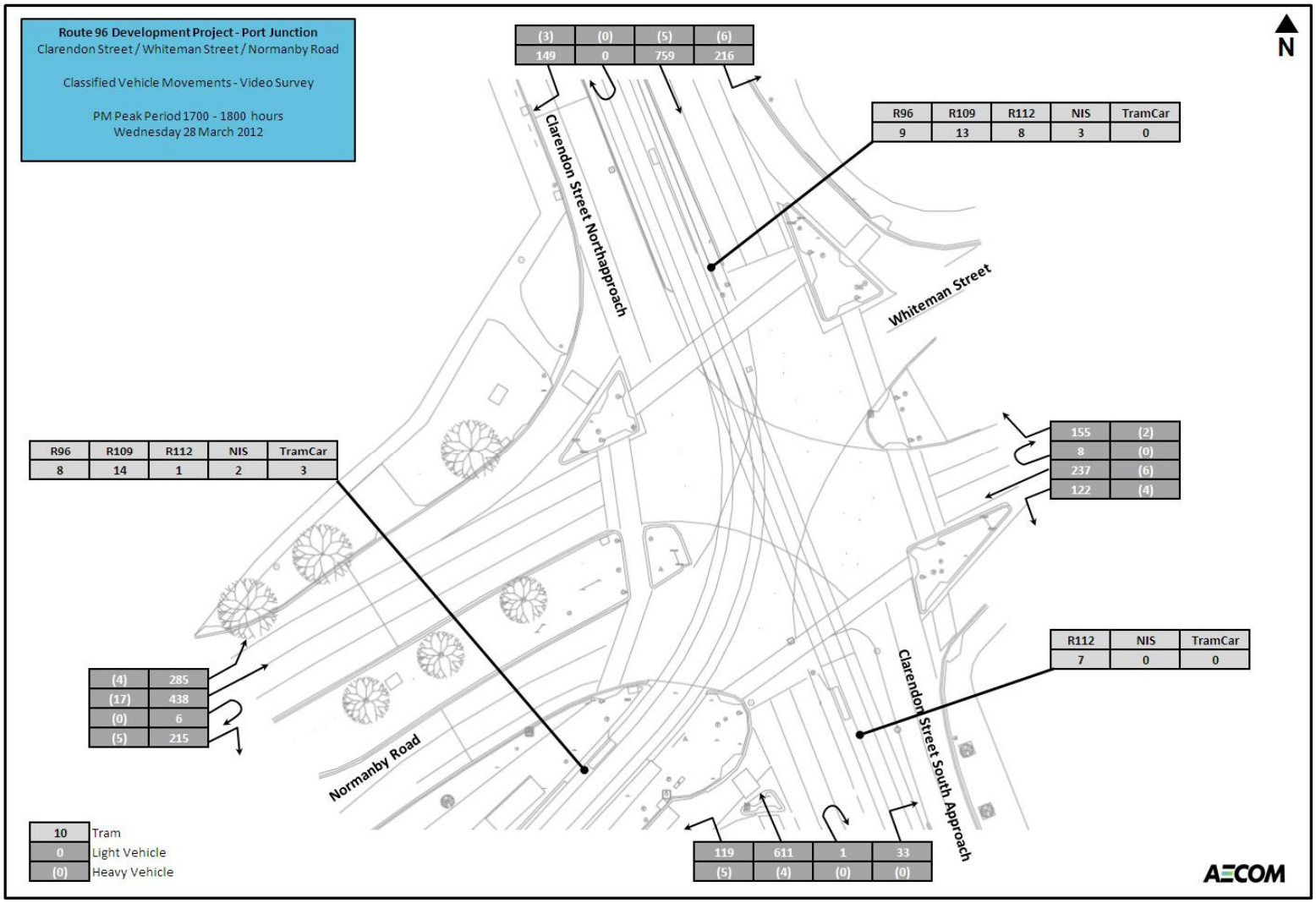
It is clear from the analysis that CTR services result in the longest (single event) delay to regular tram services at Port Junction. Survey data suggests delay due to CTR services is dependent on arrival times and therefore somewhat sporadic. The separation of the CTR service through the provision of a third track should eliminate this delay and improve progression of regular services through the intersection.

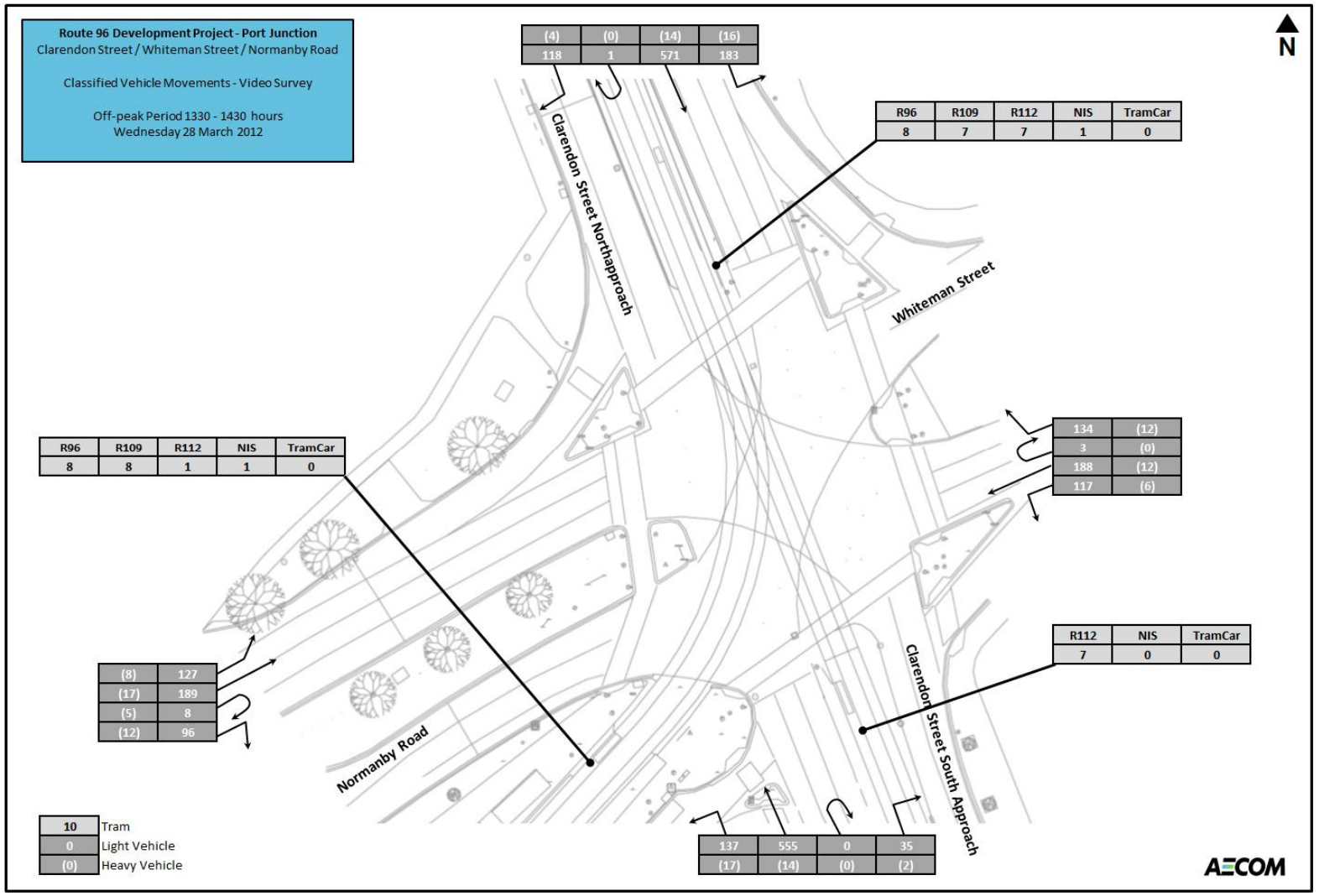
Appendix A

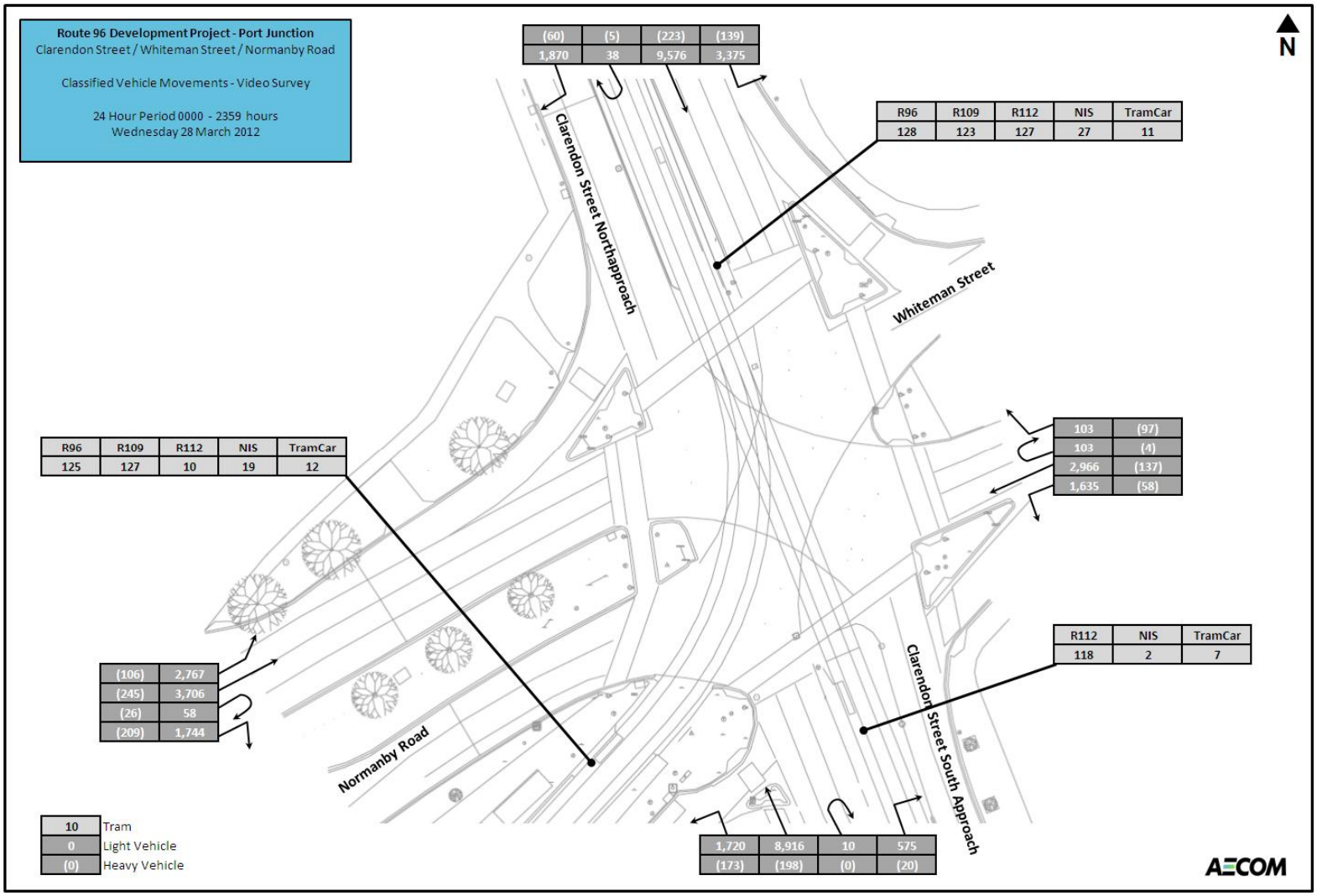
Surveyed Tram and Traffic Volumes

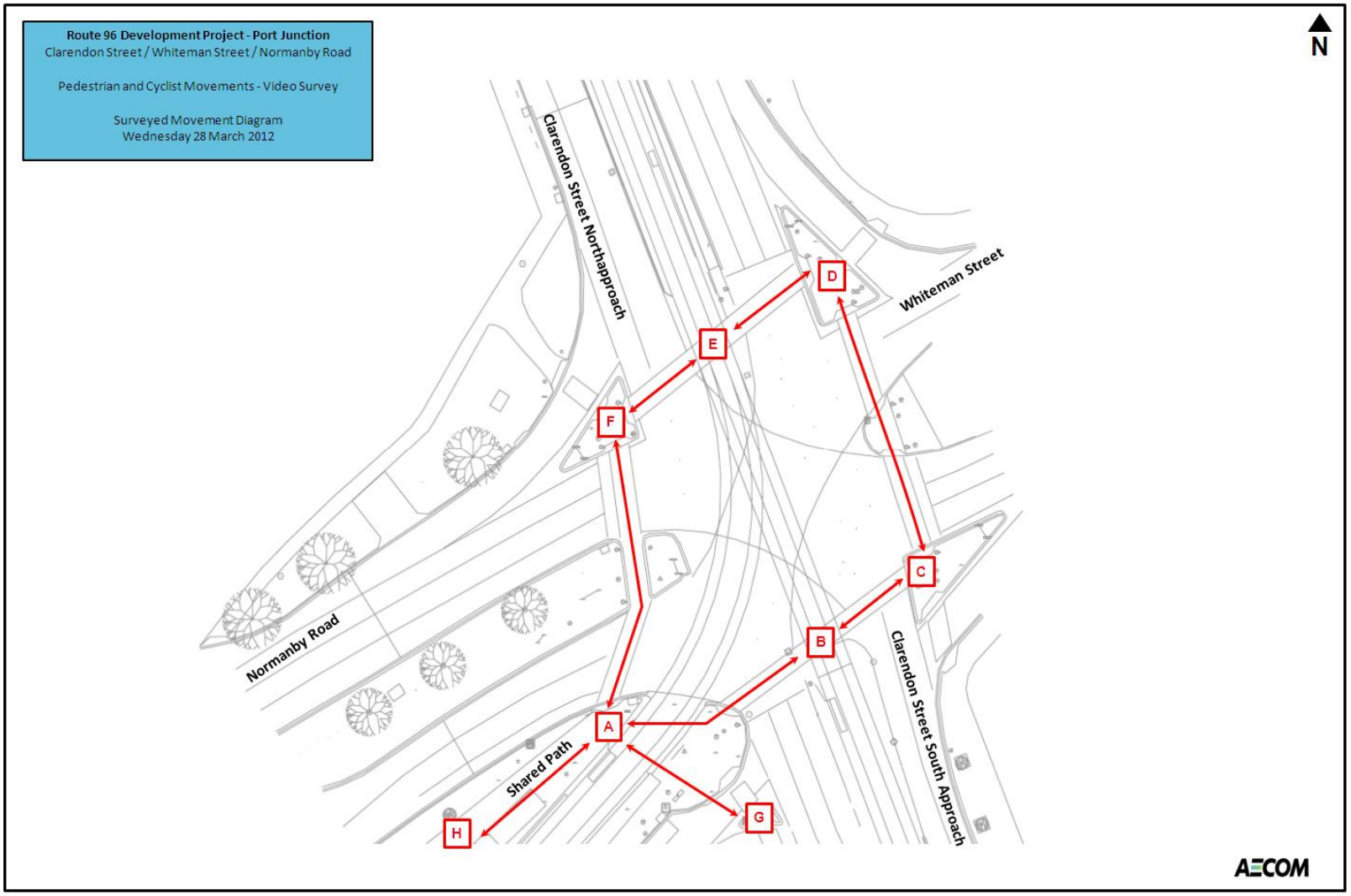
Appendix A Surveyed Tram and Traffic Volumes




Route 96 Development Project - Port Junction
Clarendon Street / Whiteman Street / Normanby Road
Classified Vehicle Movements - Video Survey
PM Peak Period 1700 - 1800 hours
Wednesday 28 March 2012
N
(3) (0) (5) (6)
149 0 759 216
Clarendon Street Northapproach
R96 R109 R112 NIS TramCar
9 13 8 3 0
Whiteman Street
155 (2)
8 (0)
237 (6)
122 (4)
R96 R109 R112 NIS TramCar
8 14 1 2 3
R112 NIS TramCar
7 0 0
(4) 285
(17) 438
(0) 6
(5) 215
Clarendon Street South Approach
Normanby Road
10 Tram
0 Light Vehicle
(0) Heavy Vehicle
119 611 1 33
(5) (4) (0) (0)
AECOM


Route 96 Development Project - Port Junction
Clarendon Street / Whiteman Street / Normanby Road
Classified Vehicle Movements - Video Survey
Off-peak Period 1330 - 1430 hours
Wednesday 28 March 2012
N
(4) (0) (14) (16)
118 1 571 183
R96 R109 R112 NIS TramCar
8 7 7 1 0
Clarendon Street Northapproach
Whiteman Street
R96 R109 R112 NIS TramCar
8 8 1 1 0
134 (12)
3 (0)
188 (12)
117 (6)
R112 NIS TramCar
7 0 0
(8) 127
(17) 189
(5) 8
(12) 96
Normanby Road
Clarendon Street South Approach
10 Tram
0 Light Vehicle
(0) Heavy Vehicle
137 555 0 35
(17) (14) (0) (2)
AECOM


Route 96 Development Project - Port Junction
Clarendon Street / Whiteman Street / Normanby Road
Classified Vehicle Movements - Video Survey
24 Hour Period 0000 - 2359 hours
Wednesday 28 March 2012
N
(60) (5) (223) (139)
1,870 38 9,576 3,375
R96 R109 R112 NIS TramCar
128 123 127 27 11
Clarendon Street Northapproach
Whiteman Street
R96 R109 R112 NIS TramCar
125 127 10 19 12
103 (97)
103 (4)
2,966 (137)
1,635 (58)
(106) 2,767
(245) 3,706
(26) 58
(209) 1,744
R112 NIS TramCar
118 2 7
Normanby Road
Clarendon Street South Approach
10 Tram
0 Light Vehicle
(0) Heavy Vehicle
1,720 8,916 10 575
(173) (198) (0) (20)
AECOM


Route 96 Development Project - Port Junction
Clarendon Street / Whiteman Street / Normanby Road
Pedestrian and Cyclist Movements - Video Survey
Surveyed Movement Diagram
Wednesday 28 March 2012
N
Clarendon Street Northapproach
Whiteman Street
Normanby Road
Clarendon Street South Approach
Shared Path
A
B
C
D
E
F
G
H
AECOM

AM Peak 1800-1900

Pedestrians

	A	B	C	D	E	F	G
A		5	82			114	33
B	7		3				
C	28	3		92			
D			89		5	29	
E				79		15	
F	28			25	2		105
G	55					114	

Cyclists

	A	B	C	D	E	F	G	H
A		0	10			94	4	41
B	0		0					
C	1	0		8				
D			2		0	0		
E				0		0		
F	33			0	0		14	
G	13					18		
H	81							

Off Peak 1330-1430

Pedestrians

	A	B	C	D	E	F	G
A		0	20			60	14
B	3		5				
C	30	4		94			
D			48		2	67	
E				25		8	
F	26			20	0		38
G	37					70	

Cyclists

	A	B	C	D	E	F	G	H
A		0	0			18	4	11
B	0		0					
C	2	0		1				
D			2		0	0		
E				0		1		
F	12			1	0		0	
G	3					2		
H	15							

PM Peak 1700-1800

Pedestrians

	A	B	C	D	E	F	G
A		7	64			112	23
B	4		2				
C	110	9		114			
D			115		8	48	
E				16		37	
F	216			31	7		149
G	55					73	

Cyclists

	A	B	C	D	E	F	G	H
A		0	0			55	3	173
B	0		0					
C	3	0		6				
D			6		0	3		
E				0		0		
F	156			2	0		0	
G	3					0		
H	52							

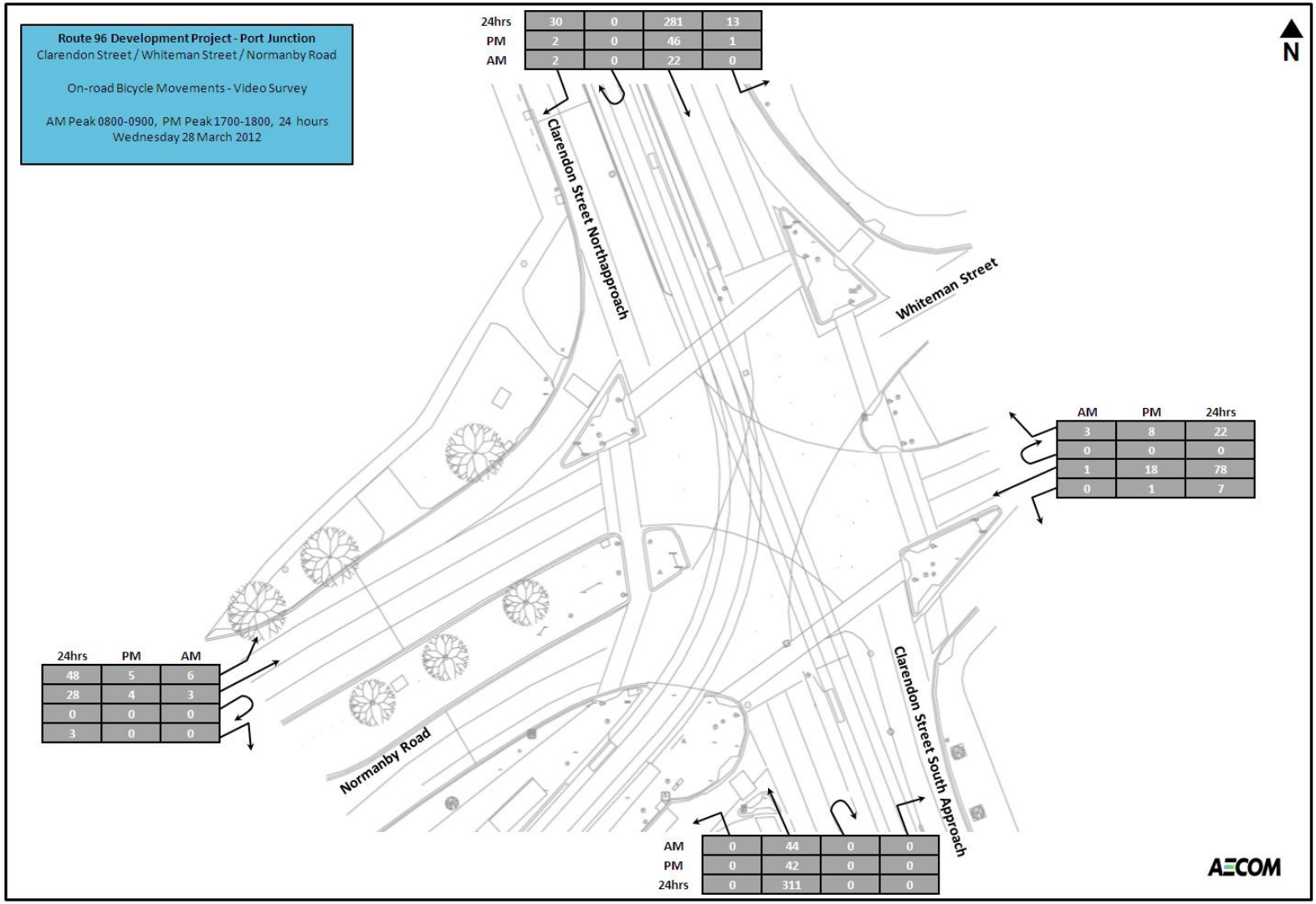
24hrs 0000-2359

Pedestrians

	A	B	C	D	E	F	G
A		61	614			1073	531
B	60		22				
C	730	85		1149			
D			1096		82	497	
E				446		291	
F	1239			411	33		1010
G	776					700	

Cyclists

	A	B	C	D	E	F	G	H
A		0	34			495	49	662
B	0		0					
C	22	0		36				
D			28		0	33		
E				1		6		
F	603			10	0		33	
G	52					52		
H	443							


Route 96 Development Project - Port Junction
Clarendon Street / Whiteman Street / Normanby Road
On-road Bicycle Movements - Video Survey
AM Peak 0800-0900, PM Peak 1700-1800, 24 hours
Wednesday 28 March 2012
N
24hrs 30 0 281 13
PM 2 0 46 1
AM 2 0 22 0
Clarendon Street Northapproach
Whiteman Street
AM PM 24hrs
3 8 22
0 0 0
1 18 78
0 1 7
24hrs PM AM
48 5 6
28 4 3
0 0 0
3 0 0
Normanby Road
Clarendon Street South Approach
AM 0 44 0 0
PM 0 42 0 0
24hrs 0 311 0 0
AECOM

Appendix B

VicRoads Controller Operation Specification (SC4878)

Appendix B VicRoads Controller Operation Specification (SC4878)

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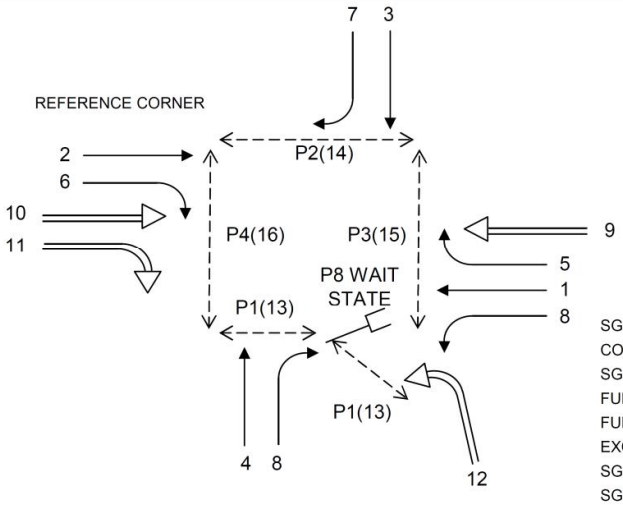
CONTROLLER OPERATION SPECIFICATION

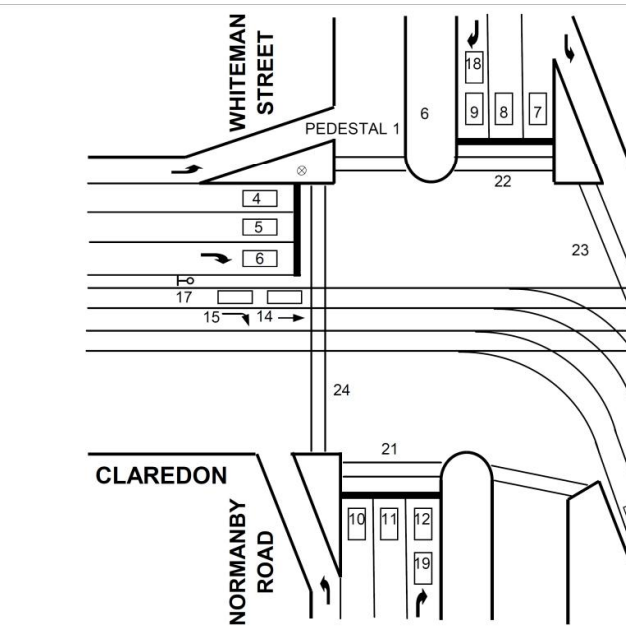
SITE NAME	**CLARENDON ST/WHITEMAN ST/NORMANBY RD**			SITE NO.	**4878**
MUNICIPALITY	MELBOURNE	DESIGNED BY	DARREN VAUGHAN	DATE	11/03/09
PLAN NO.	434495B	DESIGN CHECKED		DATE	
CONTROLLER TYPE	PSC 2002	PROM CHECKED		DATE	

GROUP ALLOCATION



SG5 & SG6 ARE 3-ASPECT (R/Y/G) FULLY CONTROLLED TURNS
SG7 & SG8 ARE 3-ASPECT (R/Y/G) PART TIME FULLY CONTROLLED TURNS (CONDITIONAL RED)
FULLY CONTROLLED RT'S OPERATE AT ALL TIMES EXCEPT 07.00-09.30 & 15.30-18.30 MON-FRI
SG9 & SG12 ARE 3-ASPECT (R/Y/W) TRAM DISPLAYS
SG10 IS A 2-ASPECT (Y/W) TRAM DISPLAY
SG11 IS A 3-ASPECT (R/Y/W) TRAM TURN
P8 WAIT STATE DRIVES LED 'GWTP' SIGN

DETECTOR MAP



DET 14 IS A TRAM AUTO POINTS FOR THROUGH TRAMS
DET 15 IS A TRAM AUTO POINTS FOR RIGHT TURN TRAM
DET 17 IS A TRAM BACK-UP PUSH BUTTON FOR RIGHT TURN TRAMS
DET 13 & 16 ARE VEHICLE DETECTORS FOR TRAMS
DET 21-24 ARE PEDESTRIAN PUSH BUTTONS

V:\Network Operations\Traffic Operations (MNW)\Ops\Opsheets\METRO_NW\[4878Tram.xls]Group Allocation

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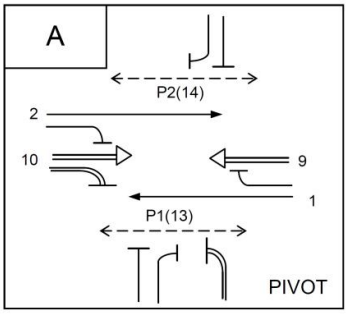
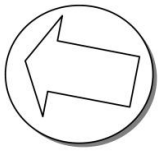
SITE NAME **CLARENDON ST/WHITEMAN ST/NORMANBY RD** SITE NO. **4878**

PHASING DIAGRAM

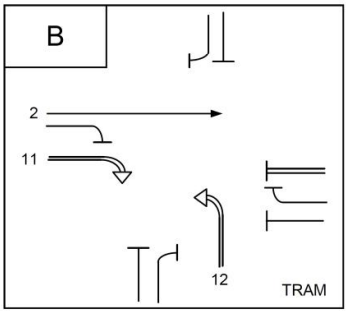


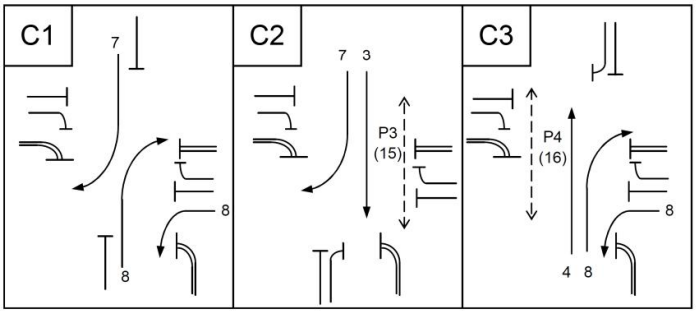


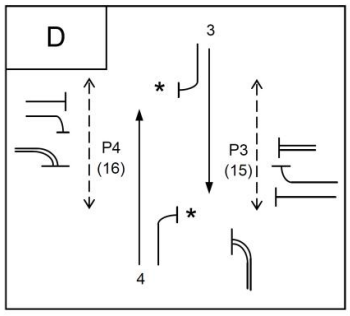
Refer General Notes

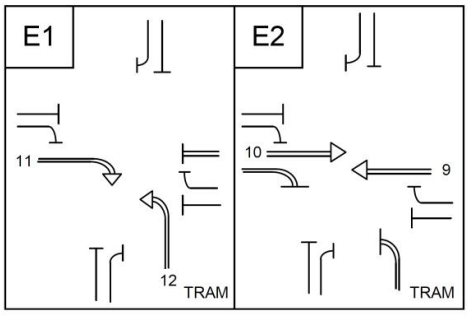
PHASE	PROHIBITED PHASE CHANGES TO	REVERSION ON MAXIMUM	MAXIMUM V.I.G ON REVERSION
D	C		

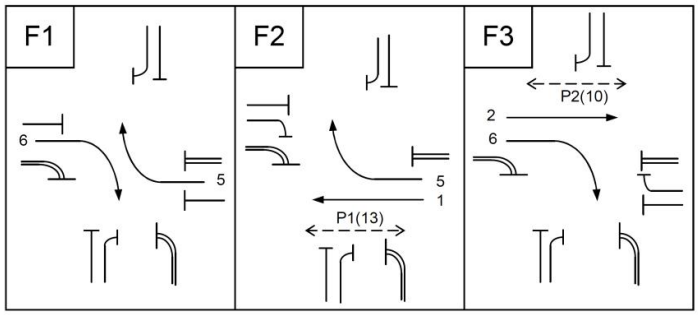
* RED ARROW DROPPED IN DØ, 7.00-9.30AM AND 15.30-18.30PM MON.-FRI.











V.A. SEQUENCE ABCDF

DESIGNED BY: DARREN VAUGHAN DATE 11/03/09

V:\Network Operations\Traffic Operations (MNW)\Ops\Opsheets\METRO_NW\[4878Tram.xls]Phasing

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SITE NAME **CLARENDON ST/WHITEMAN ST/NORMANBY RD** SITE NO. **4878**

CONTROLLER TIMESETTINGS - 1

PHASE TIMESETTINGS Front Panel Command: Phase No.Timesetting No (e.g. 3.2 accesses C phase late start)

DESCRIPTION	Timesetting No	PHASE						
		A (1)	B (2)	C (3)	D (4)	E (5)	F (6)	G (7)
RED / YELLOW	1	-	-	-	-	-	-	-
LATE START	2	1			2		1	
MINIMUM GREEN	3	9	8	6	7	8	5	
INCREMENT	4							
MAXIMUM INITIAL GREEN*	5							
MAXIMUM EXTENSION GREEN	6	35	4	9	12	0	16	
EARLY CUT OFF	7				4.0			
YELLOW	8	4.0	4.0	3.0	4.0	3.0	3.0	
ALL RED	9	3.0	4.0	3.5	2.5	4.0	3.5	
SPECIAL ALL RED	10	1.5					4.5	
GAP 1	11	2.5	0.5	2.5	2.5	0.5	2.5	
GAP 2	12	2.5	0.5	2.5	2.5	0.5	2.5	
GAP 3	13	0.5		2.5				
GAP 4	14	0.5		2.5				
HEADWAY 1	15	0.6	5.0	1.2	0.6	5.0	1.2	
HEADWAY 2	16	0.6	5.0	1.2	0.6	5.0	1.2	
HEADWAY 3	17	5.0		1.2				
HEADWAY 4	18	5.0		1.2				
WASTE 1	19	7	50	7	7	50	7	
WASTE 2	20	7	50	7	7	50	7	
WASTE 3	21	50		7				
WASTE 4	22	50		7				

* Maximum Initial Green = Minimum Green + V.I.G.

PEDESTRIAN TIMESETTINGS Front Panel Command: Pedestrian No.Timesetting No (e.g. 18.2 accesses P2 walk)

DESCRIPTION	Timesetting No	PEDESTRIAN							
		P1 (17)	P2 (18)	P3 (19)	P4 (20)	P5 (21)	P6 (22)	P7 (23)	P8 (24)
DELAY	1	-	-	-	-	-	-	-	-
WALK*	2	8.0	8.0	8.0	8.0				
CLEARANCE 1	3	19.0	17.0	17.0	17.0				
CLEARANCE 2	4	3.0	3.0	2.0	2.0				

* Minimum walk time - used in Isolated and Flexilink operation

For walk times in Masterlink operation, refer to slot data.

DESIGNED BY: DARREN VAUGHAN DATE 11/03/09

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Appendix C

IDM Signal Data Comparison (Grand Prix versus Survey Day)

Appendix C IDM Signal Data Comparison (Grand Prix versus Survey Day)

PORT JUNCTION - DAILY SIGNAL TIMINGS

NORMAL WEEKDAY DAILY SIGNAL TIMINGS
28th March 2012

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	879	10	93	38	39%	33821	841	472	217
B	308	16	22	18	7%	5658	308		
C	709	13	25	15	13%	11312	709		
D	677	15	36	29	23%	19716	677		
E	331	15	18	16	6%	5397	331		
F	638	12	43	16	12%	10348	638		
Act Cycle	879	10	180	98					
Nom. Cycle	879	48	145	95					

PORT JUNCTION - DAILY SIGNAL TIMINGS

GRAND PRIX DAY DAILY SIGNAL TIMINGS
16th March 2012

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	775	16	96	37	34%	29202	771	372	104
B	405	16	36	23	11%	9503	405		
C	698	12	23	16	13%	11312	698		
D	681	16	34	28	23%	19713	681		
E	399	14	18	16	8%	6532	399		
F	637	12	36	15	12%	10146	637		
Act Cycle	775	17	187	111					
Nom. Cycle	775	48	145	107					

PORT JUNCTION - DAILY SIGNAL TIMINGS

Differance in Signal Timings Operations between 'grand prix' day and 'normal' day

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	-104	6	3	-1	-5%	-4619	-70	-100	-113
B	97	0	14	5	4%	3845	97		
C	-11	-1	-2	1	0%	0	-11		
D	4	1	-2	-1	0%	-3	4		
E	68	-1	0	0	2%	1135	68		
F	-1	0	-7	-1	0%	-202	-1		
Act Cycle	-104	7	7	13					
Nom. Cycle	-104	0	0	12					

PORT JUNCTION - MORNING PEAK PERIOD (0800-0900)SIGNAL TIMINGS

NORMAL WEEKDAY SIGNAL TIMINGS
28th March 2012

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	26	34	62	43	30%	1132	26	9	
B	18	17	22	20	10%	366	18		
C	25	14	22	17	12%	428	25		
D	26	32	36	33	23%	873	26		
E	22	15	18	16	10%	367	22		
F	26	13	40	21	15%	552	26		
Act Cycle	26	119	167	143					
Nom. Cycle	26	131	145	142					

PORT JUNCTION - MORNING PEAK PERIOD (0800-0900)SIGNAL TIMINGS

GRAND PRIX DAY SIGNAL TIMINGS
16th March 2012

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	26	34	67	39	27%	1030	26	6	
B	25	17	36	24	16%	615	25		
C	26	13	17	15	11%	396	26		
D	26	26	34	31	22%	830	26		
E	24	15	17	16	10%	393	24		
F	26	13	31	19	13%	506	26		
Act Cycle	26	113	175	145					
Nom. Cycle	26	143	145	144					

PORT JUNCTION - MORNING PEAK PERIOD (0800-0900)SIGNAL TIMINGS

Differance in Signal Timings Operations between 'grand prix' day and 'normal' day

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	0	0	5	-4	-3%	-102	0	-3	0
B	7	0	14	4	6%	249	7		
C	1	-1	-5	-2	-1%	-32	1		
D	0	-6	-2	-2	-1%	-43	0		
E	2	0	-1	0	0%	26	2		
F	0	0	-9	-2	-2%	-46	0		
Act Cycle	0	-6	8	2					
Nom. Cycle	0	12	0	2					

PORT JUNCTION - EVENING PEAK PERIOD (1700-1800) SIGNAL TIMINGS

NORMAL WEEKDAY SIGNAL TIMINGS
28th March 2012

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	25	34	62	41	29%	1031	25	5	
B	22	17	22	20	12%	444	22		
C	25	13	23	18	13%	471	25		
D	25	33	36	34	24%	868	25		
E	20	15	17	16	9%	333	20		
F	25	13	18	18	13%	463	25		
Act Cycle	25	119	167	144					
Nom. Cycle	25	138	145	144					

PORT JUNCTION - EVENING PEAK PERIOD (1700-1800) SIGNAL TIMINGS

GRAND PRIX DAY SIGNAL TIMINGS
16th March 2012

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	26	33	71	35	25%	935	26	1	
B	25	17	35	27	18%	689	25		
C	26	13	17	15	11%	406	26		
D	26	32	33	32	23%	848	26		
E	26	16	17	16	11%	428	26		
F	26	13	29	17	12%	447	26		
Act Cycle	26	114	180	144					
Nom. Cycle	26	145	145	145					

PORT JUNCTION - EVENING PEAK PERIOD (1700-1800) SIGNAL TIMINGS

Differance in Signal Timings Operations between 'grand prix' day and 'normal' day

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	1	-1	9	-6	-4%	-96	1	-4	0
B	3	0	13	7	6%	245	3		
C	1	0	-6	-3	-2%	-65	1		
D	1	-1	-3	-2	-1%	-20	1		
E	6	1	0	0	2%	95	6		
F	1	0	11	-1	-1%	-16	1		
Act Cycle	1	-5	13	0					
Nom. Cycle	1	7	0	1					

PORT JUNCTION - OFF-PEAK (1330-1430) SIGNAL TIMINGS

NORMAL WEEKDAY SIGNAL TIMINGS
28th March 2012

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	29	24	67	43	33%	1257	29	16	
B	15	17	21	18	7%	273	15		
C	29	15	21	18	14%	527	29		
D	29	21	36	32	25%	930	29		
E	16	16	18	16	7%	266	16		
F	29	12	28	17	14%	521	29		
Act Cycle	29	90	160	130					
Nom. Cycle	29	120	145	131					

PORT JUNCTION - OFF-PEAK (1330-1430) SIGNAL TIMINGS

GRAND PRIX DAY SIGNAL TIMINGS
16th March 2012

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	27	33	56	35	25%	967	27	2	
B	26	17	36	23	16%	623	26		
C	27	15	22	20	14%	540	27		
D	27	27	34	32	22%	866	27		
E	24	15	17	16	10%	396	24		
F	27	13	27	17	12%	475	27		
Act Cycle	27	119	167	143					
Nom. Cycle	27	131	145	143					

PORT JUNCTION - OFF-PEAK (1330-1430) SIGNAL TIMINGS

Differance in Signal Timings Operations between 'grand prix' day and 'normal' day

Phase	Freq	Min	Max	Average Time	Average %	Total Time	MX	FG	RT
A	-2	9	-11	-8	-8%	-290	-2	-14	0
B	11	0	15	5	9%	350	11		
C	-2	0	1	2	0%	13	-2		
D	-2	6	-2	0	-3%	-64	-2		
E	8	-1	-1	0	3%	130	8		
F	-2	1	-1	0	-2%	-46	-2		
Act Cycle	-2	29	7	13					
Nom. Cycle	-2	11	0	12					

Appendix D

Observed Tram Delay – Wednesday 28 March 2012

Appendix D Observed Tram Delay – Wednesday 28 March 2012

Tram stop 125 (Clarendon Street inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
6:09:14	112				6:09:17	6:09:24	0	0:00:10	
6:21:27	112	6:21:30	6:21:37	0:00:07	6:21:44	6:21:51	0	0:00:24	
6:35:00	112	6:35:03	6:35:07	0:00:04	6:36:05	6:36:14	0	0:01:14	
6:49:59	112				6:51:32	6:51:38	0	0:01:39	
6:58:25	112	6:58:28	6:58:32	0:00:04	6:58:50	6:58:57	0	0:00:32	
7:06:56	112	7:06:58	7:07:07	0:00:09	7:07:20	7:07:29	0	0:00:33	
7:14:10	112				7:15:27	7:15:33	0	0:01:23	
7:26:03	112	7:26:05	7:26:40	0:00:35	7:27:48	7:27:54	0	0:01:51	
7:29:59	112				7:30:01	7:30:08	0	0:00:09	
7:39:31	112	7:39:33	7:39:40	0:00:07	7:39:48	7:39:56	0	0:00:25	
7:47:55	112	7:47:56	7:48:07	0:00:11	7:48:13	7:48:20	0	0:00:25	
7:54:46	112	7:54:47	7:55:32	0:00:45	7:55:42	7:55:50	0	0:01:04	
8:05:32	112	8:05:33	8:05:37	0:00:04	8:05:46	8:05:51	0	0:00:19	
8:12:39	112	8:12:40	8:12:46	0:00:06	8:12:54	8:13:00	0	0:00:21	
8:19:34	112	8:19:35	8:19:45	0:00:10	8:19:53	8:19:59	0	0:00:25	
8:29:48	112	8:29:49	8:30:07	0:00:18	8:31:14	8:31:23	0	0:01:35	
8:31:41	112				8:31:41	8:31:47	0	0:00:06	
8:40:03	112	8:40:04	8:40:16	0:00:12	8:40:47	8:40:55	0	0:00:52	
8:42:13	112	8:42:15	8:42:22	0:00:07	8:43:13	8:43:21	0	0:01:08	
8:51:53	112	8:51:54	8:52:27	0:00:33	8:52:53	8:52:59	0	0:01:06	
8:54:11	112	8:54:13	8:54:27	0:00:14	8:54:42	8:54:49	0	0:00:38	
9:01:59	112	9:02:00	9:02:18	0:00:18	9:02:26	9:02:31	0	0:00:32	
9:08:32	112	9:08:34	9:08:42	0:00:08	9:09:26	9:09:32	0	0:01:00	
9:14:02	112	9:14:04	9:14:08	0:00:04	9:14:42	9:14:48	0	0:00:46	
9:21:41	112	9:21:43	9:21:50	0:00:07	9:21:59	9:22:07	0	0:00:26	
9:22:29	112	9:22:31	9:23:35	0:01:04	9:24:15	9:24:24	0	0:01:55	
9:29:29	112				9:29:31	9:29:39	0	0:00:10	
9:29:43	112				9:31:26	9:31:34	0	0:01:51	
9:39:59	112	9:40:01	9:40:40	0:00:39	9:40:51	9:40:58	0	0:00:59	
9:43:42	112	9:44:25	9:44:34	0:00:09	9:45:04	9:45:11	0	0:01:29	
9:54:32	112	9:54:34	9:55:25	0:00:51	9:56:17	9:56:25	0	0:01:53	
10:02:55	112	10:02:56	10:04:09	0:01:13	10:04:18	10:04:24	0	0:01:29	
10:04:23	112				10:04:25	10:04:35	0	0:00:12	

Tram stop 125 (Clarendon Street inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
10:10:08	112	10:10:09	10:10:13	0:00:04	10:10:21	10:10:28	0	0:00:20	
10:17:48	112	10:17:49	10:17:56	0:00:07	10:18:13	10:18:19	0	0:00:31	
10:25:43	112	10:25:44	10:26:36	0:00:52	10:26:50	10:26:57	0	0:01:14	
10:33:52	112	10:33:55	10:34:01	0:00:06	10:34:19	10:34:25	0	0:00:33	
10:41:14	112				10:41:15	10:41:22	0	0:00:08	
10:49:10	112	10:49:11	10:49:19	0:00:08	10:49:26	10:49:32	0	0:00:22	
10:58:35	112				10:58:37	10:58:41	0	0:00:06	
11:04:35	112	11:04:36	11:05:52	0:01:16	11:06:09	11:06:17	0	0:01:42	
11:14:01	112	11:14:02	11:14:12	0:00:10	11:14:31	11:14:39	0	0:00:38	
11:21:44	112	11:21:45	11:22:48	0:01:03	11:23:06	11:23:14	0	0:01:30	
11:26:54	112	11:26:55	11:27:08	0:00:13	11:27:51	11:28:00	0	0:01:06	
11:36:40	112	11:36:41	11:37:37	0:00:56	11:37:46	11:37:51	0	0:01:11	
11:43:41	112	11:43:42	11:43:49	0:00:07	11:44:14	11:44:21	0	0:00:40	
11:49:42	112				11:50:17	11:50:21	0	0:00:39	
12:00:05	112	12:00:06	12:00:15	0:00:09	12:00:23	12:00:28	0	0:00:23	
12:05:34	112	12:05:35	12:05:41	0:00:06	12:05:57	12:06:02	0	0:00:28	
12:14:52	112	12:14:54	12:14:58	0:00:04	12:15:06	12:15:14	0	0:00:22	
12:22:29	112	12:22:30	12:22:42	0:00:12	12:22:49	12:22:54	0	0:00:25	
12:31:16	112				12:32:05	12:32:11	0	0:00:55	
12:40:22	112	12:40:23	12:40:36	0:00:13	12:41:14	12:41:20	0	0:00:58	
12:44:40	112	12:44:41	12:45:35	0:00:54	12:45:45	12:45:53	0	0:01:13	
12:54:05	112	12:54:06	12:54:15	0:00:09	12:54:28	12:54:35	0	0:00:30	
13:00:27	112	13:00:39	13:00:49	0:00:10	13:01:42	13:01:48	0	0:01:21	
13:14:53	112	13:14:54	13:15:36	0:00:42	13:15:44	13:15:50	0	0:00:57	
13:15:51	112				13:15:53	13:15:58	0	0:00:07	
13:27:03	112	13:27:05	13:27:36	0:00:31	13:27:56	13:28:02	0	0:00:59	
13:35:36	112	13:35:38	13:35:53	0:00:15	13:36:49	13:36:55	0	0:01:19	
13:43:16	112	13:43:17	13:43:22	0:00:05	13:43:44	13:43:51	0	0:00:35	
13:51:26	112				13:51:53	13:51:59	0	0:00:33	
14:03:35	112	14:03:36	14:03:47	0:00:11	14:05:06	14:05:14	0	0:01:39	
14:08:49	112	14:08:50	14:09:08	0:00:18	14:09:19	14:09:26	0	0:00:37	
14:16:12	112	14:16:13	14:16:19	0:00:06	14:16:26	14:16:30	0	0:00:18	
14:24:06	112	14:24:07	14:24:15	0:00:08	14:24:22	14:24:29	0	0:00:23	
14:30:27	112				14:31:01	14:31:07	0	0:00:40	
14:38:28	112	14:38:30	14:39:14	0:00:44	14:39:24	14:39:33	0	0:01:05	

Tram stop 125 (Clarendon Street inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
14:46:10	112	14:46:11	14:46:16	0:00:05	14:46:25	14:46:30	0	0:00:20	
14:58:39	112	14:58:40	14:58:46	0:00:06	14:58:54	14:58:59	0	0:00:20	
15:00:27	112	15:00:28	15:00:34	0:00:06	15:00:41	15:00:49	0	0:00:22	
15:02:44	04 (Red)				15:02:48	15:02:57	0	0:00:13	
15:14:03	112	15:14:04	15:15:29	0:01:25	15:16:12	15:16:18	0	0:02:15	
15:19:57	112	15:19:58	15:20:16	0:00:18	15:20:25	15:20:32	0	0:00:35	
15:23:20	112				15:24:46	15:24:51	0	0:01:31	
15:46:25	112	15:46:28	15:46:33	0:00:05	15:46:43	15:46:49	0	0:00:24	
15:46:54	112	15:46:56	15:47:31	0:00:35	15:48:03	15:48:11	0	0:01:17	
15:50:37	112	15:50:38	15:50:47	0:00:09	15:50:55	15:51:00	0	0:00:23	
16:00:26	112	16:00:27	16:00:32	0:00:05	16:00:39	16:00:45	0	0:00:19	
16:09:02	112	16:09:05	16:10:27	0:01:22	16:10:35	16:10:42	0	0:01:40	
16:14:14	112	16:14:16	16:14:43	0:00:27	16:14:52	16:14:57	0	0:00:43	
16:24:42	112	16:24:44	16:25:03	0:00:19	16:25:46	16:25:52	0	0:01:10	
16:30:47	112				16:30:51	16:30:55	0	0:00:08	
16:38:34	112	16:38:47	16:39:43	0:00:56	16:40:04	16:40:10	0	0:01:36	
16:48:30	112	16:48:31	16:48:46	0:00:15	16:49:11	16:49:17	0	0:00:47	
16:56:14	112	16:56:17	16:56:22	0:00:05	16:56:35	16:56:41	0	0:00:27	
17:04:09	112	17:04:11	17:04:22	0:00:11	17:06:05	17:06:11	0	0:02:02	
17:12:56	112				17:13:00	17:13:05	0	0:00:09	
17:21:31	112	17:21:33	17:22:00	0:00:27	17:22:13	17:22:20	0	0:00:49	
17:29:20	112	17:29:22	17:29:28	0:00:06	17:30:03	17:30:08	0	0:00:48	
17:39:16	112	17:39:18	17:39:34	0:00:16	17:39:46	17:39:51	0	0:00:35	
17:44:42	112	17:44:44	17:44:51	0:00:07	17:44:58	17:45:04	0	0:00:22	
17:57:23	112	17:57:25	17:58:22	0:00:57	17:59:02	17:59:08	0	0:01:45	
18:03:39	112	18:03:41	18:03:48	0:00:07	18:03:56	18:04:03	0	0:00:24	
18:09:28	112	18:09:30	18:10:29	0:00:59	18:10:37	18:10:43	0	0:01:15	
18:14:10	112				18:14:11	18:14:16	0	0:00:06	
18:23:05	112	18:23:07	18:23:12	0:00:05	18:23:20	18:23:27	0	0:00:22	
18:34:29	112	18:34:31	18:35:25	0:00:54	18:35:33	18:35:40	0	0:01:11	
18:37:53	112	18:37:55	18:38:00	0:00:05	18:38:07	18:38:14	0	0:00:21	
18:48:21	112	18:48:23	18:48:49	0:00:26	18:49:42	18:49:49	0	0:01:28	
18:54:08	112				18:54:10	18:54:14	0	0:00:06	
18:55:55	NIS				18:56:30	18:56:37	0	0:00:42	
19:05:09	112	19:05:11	19:05:29	0:00:18	19:05:44	19:05:50	0	0:00:41	

Tram stop 125 (Clarendon Street inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
19:15:31	05 (Red)				19:18:59	19:19:14	1	0:03:43	Tram Driver talking with the behind Red Tram Driver
19:16:18	04 (Red)				19:19:03	19:19:19	0	0:03:01	
19:19:11	04 (Red)				19:19:17	19:19:30	0	0:00:19	
19:23:06	112	19:23:09	19:23:36	0:00:27	19:23:51	19:23:56	0	0:00:50	
19:25:40	112	19:25:43	19:25:51	0:00:08	19:26:35	19:26:42	0	0:01:02	
19:27:12	112				19:28:41	19:28:47	0	0:01:35	
19:42:40	112	19:42:44	19:42:51	0:00:07	19:44:31	19:44:42	0	0:02:02	
19:45:34	NIS	19:46:02	19:46:06	0:00:04	19:46:17	19:46:23	0	0:00:49	
19:50:47	112				19:50:53	19:50:59	0	0:00:12	
20:04:10	112	20:04:13	20:04:26	0:00:13	20:04:43	20:04:48	0	0:00:38	
20:16:46	112	20:16:48	20:17:34	0:00:46	20:17:39	20:17:45	0	0:00:59	
20:26:43	112	20:26:45	20:26:55	0:00:10	20:27:39	20:27:47	0	0:01:04	
20:35:51	112	20:35:53	20:37:13	0:01:20	20:37:19	20:37:25	0	0:01:34	
20:50:12	112				20:50:14	20:50:18	0	0:00:06	
20:57:34	112				20:58:09	20:58:16	0	0:00:42	
21:17:26	112				21:17:28	21:17:33	0	0:00:07	
21:37:49	112				21:38:17	21:38:22	0	0:00:33	
21:55:58	112				21:56:01	21:56:08	0	0:00:10	
22:15:44	112	22:15:47	22:15:53	0:00:06	22:16:12	22:16:18	0	0:00:34	
22:38:39	112	22:38:42	22:38:58	0:00:16	22:39:42	22:39:49	0	0:01:10	
22:42:52	05 (Red)				22:43:20	22:43:30	0	0:00:38	
22:44:20	04 (Red)				22:45:26	22:45:39	0	0:01:19	
22:47:35	05 (Red)				22:47:53	22:48:07	0	0:00:32	
22:57:42	112	22:57:44	22:59:29	0:01:45	22:59:53	23:00:00	0	0:02:18	
							Average Delay	0:00:52	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
6:02:18	96	6:02:21	6:02:30	0:00:09	6:03:17	6:03:27	0	0:01:09	
6:04:20	112	6:04:22	6:04:27	0:00:05	6:05:12	6:05:17	0	0:00:57	
6:06:33	109	6:06:35	6:06:40	0:00:05	6:07:21	6:07:31	0	0:00:58	
6:07:41	112				6:07:55	6:08:00	0	0:00:19	
6:18:00	109	6:18:02	6:18:07	0:00:05	6:18:29	6:18:38	0	0:00:38	
6:19:21	96	6:19:23	6:19:25	0:00:02	6:20:16	6:20:27	0	0:01:06	
6:19:53	112	6:20:34	6:20:36	0:00:02	6:21:17	6:21:22	0	0:01:29	
6:25:09	109	6:25:11	6:25:16	0:00:05	6:25:29	6:25:41	0	0:00:32	
6:35:04	96	6:35:05	6:35:15	0:00:10	6:35:43	6:35:54	0	0:00:50	
6:35:55	112	6:35:55	6:35:58	0:00:03	6:36:09	6:36:14	0	0:00:19	
6:36:21	109	6:36:22	6:36:25	0:00:03	6:36:43	6:36:54	0	0:00:33	
6:36:59	112	6:37:00	6:37:04	0:00:04	6:37:48	6:37:53	0	0:00:54	
6:49:13	109	6:49:14	6:49:21	0:00:07	6:49:59	6:50:09	0	0:00:56	
6:50:15	112				6:51:04	6:51:09	0	0:00:54	
6:52:44	112				6:53:13	6:53:18	0	0:00:34	
6:54:27	96	6:54:30	6:54:34	0:00:04	6:54:54	6:55:06	0	0:00:39	
6:59:26	109	6:59:29	6:59:33	0:00:04	7:00:04	7:00:14	0	0:00:48	
7:01:41	112	7:01:43	7:01:51	0:00:08	7:02:19	7:02:24	0	0:00:43	
7:03:06	96	7:03:08	7:03:11	0:00:03	7:04:11	7:04:24	0	0:01:18	
7:05:21	109	7:05:22	7:05:24	0:00:02	7:06:03	7:06:14	0	0:00:53	
7:10:57	109	7:10:58	7:11:02	0:00:04	7:12:09	7:12:21	0	0:01:24	
7:12:55	112	7:12:56	7:13:01	0:00:05	7:13:28	7:13:33	0	0:00:38	
7:14:07	96	7:14:09	7:14:26	0:00:17	7:15:03	7:15:14	0	0:01:07	
7:16:06	112	7:16:10	7:16:18	0:00:08	7:17:11	7:17:16	0	0:01:10	
7:22:58	109	7:23:02	7:23:06	0:00:04	7:23:18	7:23:28	0	0:00:30	
7:24:30	109	7:04:33	7:24:40	0:20:07	7:25:15	7:25:26	0	0:00:56	
7:26:56	112	7:26:59	7:27:13	0:00:14	7:27:25	7:27:30	0	0:00:34	
7:28:38	96	7:28:40	7:28:51	0:00:11	7:29:19	7:29:29	0	0:00:51	
7:32:17	96	7:32:20	7:32:27	0:00:07	7:33:00	7:33:10	0	0:00:53	
7:36:08	109	7:36:11	7:36:19	0:00:08	7:36:25	7:36:37	0	0:00:29	
7:36:57	112	7:37:00	7:37:05	0:00:05	7:37:28	7:37:33	0	0:00:36	
7:38:20	109				7:39:20	7:39:31	0	0:01:11	
7:40:07	96	7:40:09	7:40:20	0:00:11	7:40:31	7:40:41	0	0:00:34	
7:40:46	112				7:41:27	7:41:52	0	0:01:06	
7:42:50	109	7:42:52	7:42:54	0:00:02	7:43:37	7:43:49	0	0:00:59	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
7:48:45	112	7:48:47	7:48:50	0:00:03	7:48:54	7:49:01	0	0:00:16	
7:50:13	109				7:50:28	7:50:43	0	0:00:30	
7:51:15	96	7:51:17	7:51:29	0:00:12	7:51:41	7:51:50	0	0:00:35	
7:51:59	112				7:52:52	7:52:57	0	0:00:58	
7:54:17	96	7:54:19	7:54:30	0:00:11	7:55:08	7:55:16	0	0:00:59	
7:58:40	109	7:58:43	7:58:49	0:00:06	7:58:57	7:59:07	0	0:00:27	
8:00:00	112	8:00:04	8:00:29	0:00:25	8:00:36	8:00:41	0	0:00:41	
8:02:05	109	8:02:07	8:02:17	0:00:10	8:02:25	8:02:39	0	0:00:34	
8:02:45	96	8:02:47	8:03:01	0:00:14	8:03:35	8:03:48	0	0:01:03	
8:04:15	109	8:04:17	8:04:31	0:00:14	8:04:47	8:04:57	0	0:00:42	
8:06:25	112	8:06:27	8:06:38	0:00:11	8:07:17	8:07:22	0	0:00:57	
8:07:16	109	8:07:19	8:07:29	0:00:10	8:08:28	8:08:42	0	0:01:26	
8:15:57	109	8:16:00	8:16:39	0:00:39	8:16:50	8:16:59	0	0:01:02	
8:17:12	112				8:17:27	8:17:32	0	0:00:20	
8:18:14	112	8:18:17	8:18:47	0:00:30	8:18:54	8:18:59	0	0:00:45	
8:19:13	96	8:19:15	8:19:29	0:00:14	8:20:32	8:20:43	0	0:01:30	
8:20:45	109	8:20:47	8:21:08	0:00:21	8:21:41	8:21:52	0	0:01:07	
8:22:55	112	8:23:06	8:23:31	0:00:25	8:24:09	8:24:14	0	0:01:19	
8:25:20	109	8:25:23	8:25:37	0:00:14	8:26:16	8:26:30	0	0:01:10	
8:29:45	109	8:29:49	8:30:48	0:00:59	8:31:54	8:32:04	0	0:02:19	
8:32:04	96	8:32:08	8:32:37	0:00:29	8:33:02	8:33:10	0	0:01:06	
8:34:30	109	8:34:35	8:34:55	0:00:20	8:35:17	8:35:27	0	0:00:57	
8:35:34	96	8:35:37	8:36:17	0:00:40	8:36:49	8:36:59	0	0:01:25	
8:38:04	112	8:38:08	8:39:11	0:01:03	8:40:20	8:40:24	0	0:02:20	
8:42:57	112	8:43:02	8:43:07	0:00:05	8:43:23	8:43:29	0	0:00:32	
8:45:15	109	8:45:19	8:46:00	0:00:41	8:46:18	8:46:28	0	0:01:13	
8:46:29	96	8:46:31	8:47:19	0:00:48	8:47:33	8:47:40	0	0:01:11	
8:47:43	112	8:47:47	8:47:56	0:00:09	8:48:04	8:48:12	0	0:00:29	
8:48:00	96	8:48:24	8:48:42	0:00:18	8:48:49	8:49:03	0	0:01:03	
8:48:58	109	8:49:03	8:49:12	0:00:09	8:49:59	8:50:09	0	0:01:11	
8:50:17	112	8:50:19	8:50:28	0:00:09	8:50:37	8:50:43	0	0:00:26	
8:51:05	96	8:51:09	8:52:14	0:01:05	8:52:26	8:52:36	0	0:01:31	
8:54:54	96	8:54:57	8:55:42	0:00:45	8:56:01	8:56:11	0	0:01:17	
8:56:08	109	8:56:11	8:56:44	0:00:33	8:57:10	8:57:20	0	0:01:12	
8:56:18	112	8:56:19	8:57:31	0:01:12	8:57:48	8:57:53	0	0:01:35	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
8:57:28	112	8:57:31	8:57:36	0:00:05	8:57:54	8:58:00	0	0:00:32	
8:58:07	NIS				8:58:21	8:58:31	0	0:00:24	
9:02:35	109	9:02:37	9:02:53	0:00:16	9:03:15	9:03:25	0	0:00:50	
9:03:25	96	9:03:28	9:03:50	0:00:22	9:04:28	9:04:38	0	0:01:13	
9:04:43	112	9:04:46	9:04:54	0:00:08	9:05:01	9:05:06	0	0:00:23	
9:05:07	112	9:05:09	9:05:15	0:00:06	9:05:24	9:05:31	0	0:00:24	
9:06:11	96	9:06:13	9:06:28	0:00:15	9:07:07	9:07:17	0	0:01:06	
9:14:01	96	9:14:05	9:14:17	0:00:12	9:14:26	9:14:36	0	0:00:35	
9:14:15	109	9:14:37	9:15:13	0:00:36	9:15:22	9:15:32	0	0:01:17	
9:15:02	96	9:15:06	9:15:14	0:00:08	9:16:40	9:16:50	0	0:01:48	
9:16:52	112	9:16:56	9:17:38	0:00:42	9:17:43	9:17:49	0	0:00:57	
9:18:59	109	9:19:04	9:19:23	0:00:19	9:20:02	9:20:12	0	0:01:13	
9:20:17	112				9:21:14	9:21:20	0	0:01:03	
9:21:31	96	9:21:33	9:22:10	0:00:37	9:22:33	9:22:43	0	0:01:12	
9:22:45	109	9:22:48	9:22:57	0:00:09	9:23:47	9:23:57	0	0:01:12	
9:24:23	96	9:24:27	9:24:34	0:00:07	9:24:59	9:25:09	0	0:00:46	
9:26:09	112				9:26:39	9:26:45	0	0:00:36	
9:30:42	109	9:30:45	9:30:52	0:00:07	9:30:59	9:31:09	0	0:00:27	
9:31:16	96	9:31:18	9:31:52	0:00:34	9:32:09	9:32:19	0	0:01:03	
9:32:26	112	9:32:28	9:33:16	0:00:48	9:33:21	9:33:26	0	0:01:00	
9:33:37	NIS				9:34:28	9:34:38	0	0:01:01	
9:35:37	112				9:36:54	9:37:04	0	0:01:27	
9:37:06	109	9:37:09	9:37:48	0:00:39	9:38:09	9:38:19	0	0:01:13	
9:38:20	96	9:38:24	9:38:33	0:00:09	9:39:22	9:39:32	0	0:01:12	
9:41:24	112	9:41:27	9:41:36	0:00:09	9:42:40	9:42:45	0	0:01:21	
9:42:51	96	9:42:53	9:43:05	0:00:12	9:43:30	9:43:40	0	0:00:49	
9:43:43	96	9:43:52	9:44:20	0:00:28	9:44:43	9:44:51	0	0:01:08	
9:46:02	96	9:46:05	9:46:13	0:00:08	9:46:59	9:47:09	0	0:01:07	
9:47:09	109	9:47:12	9:47:54	0:00:42	9:48:01	9:48:13	0	0:01:04	
9:48:13	112	9:48:15	9:48:21	0:00:06	9:49:09	9:49:12	0	0:00:59	
9:51:58	109	9:52:01	9:52:10	0:00:09	9:52:20	9:52:31	0	0:00:33	
9:55:04	112				9:55:48	9:55:58	0	0:00:54	
9:57:23	112	9:57:27	9:57:38	0:00:11	9:57:46	9:57:51	0	0:00:28	
9:58:54	96	9:58:57	9:59:07	0:00:10	9:59:46	9:59:56	0	0:01:02	
10:01:27	109	10:01:38	10:01:45	0:00:07	10:01:57	10:02:09	0	0:00:42	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
10:02:44	96	10:02:46	10:02:53	0:00:07	10:03:56	10:04:06	0	0:01:22	
10:04:08	96				10:04:59	10:05:13	0	0:01:05	
10:05:24	112				10:05:56	10:06:02	0	0:00:38	
10:06:22	109	10:06:26	10:06:34	0:00:08	10:06:58	10:07:10	0	0:00:48	
10:14:16	109	10:14:18	10:14:35	0:00:17	10:15:20	10:15:32	0	0:01:16	
10:15:55	112	10:15:57	10:16:02	0:00:05	10:17:00	10:17:05	0	0:01:10	
10:19:37	112				10:22:32	10:22:38	0	0:03:01	
10:20:35	109	10:22:41	10:23:18	0:00:37	10:23:35	10:23:46	1	0:03:11	Tram in front/Passengers boarding
10:22:48	96	10:22:50	10:23:11	0:00:21	10:24:48	10:24:59	0	0:02:11	
10:24:54	96				10:25:44	10:25:56	0	0:01:02	
10:25:57	112	10:26:00	10:26:03	0:00:03	10:26:53	10:26:58	0	0:01:01	
10:26:04	112	10:26:06	10:26:14	0:00:08	10:27:24	10:27:29	0	0:01:25	
10:28:18	109	10:28:21	10:28:32	0:00:11	10:28:44	10:28:57	0	0:00:39	
10:30:06	NIS				10:30:16	10:30:22	0	0:00:16	
10:33:39	96	10:33:41	10:33:52	0:00:11	10:35:05	10:35:16	0	0:01:37	
10:35:00	96	10:35:20	10:35:31	0:00:11	10:36:13	10:36:25	0	0:01:25	
10:35:55	109	10:36:44	10:37:04	0:00:20	10:37:21	10:37:32	0	0:01:37	
10:37:06	112	10:37:08	10:37:26	0:00:18	10:38:27	10:38:31	0	0:01:25	
10:41:09	112	10:41:11	10:41:15	0:00:04	10:41:24	10:41:29	0	0:00:20	
10:42:13	96	10:42:15	10:42:29	0:00:14	10:42:39	10:42:51	0	0:00:38	
10:42:49	109	10:42:52	10:43:24	0:00:32	10:43:36	10:43:45	0	0:00:56	
10:49:50	96	10:49:53	10:50:00	0:00:07	10:50:11	10:50:23	0	0:00:33	
10:54:27	112	10:54:28	10:54:38	0:00:10	10:54:49	10:54:53	0	0:00:26	
10:54:59	109	10:56:00	10:56:04	0:00:04	10:56:57	10:57:09	0	0:02:10	
10:58:37	96	10:58:38	10:58:48	0:00:10	10:58:58	10:59:09	0	0:00:32	
11:02:04	112				11:02:19	11:02:24	0	0:00:20	
11:03:12	109	11:03:14	11:03:25	0:00:11	11:04:03	11:04:15	0	0:01:03	
11:04:16	96	11:04:18	11:04:31	0:00:13	11:05:05	11:05:17	0	0:01:01	
11:05:19	112	11:05:42	11:05:47	0:00:05	11:06:14	11:06:19	0	0:01:00	
11:07:50	109	11:07:52	11:08:06	0:00:14	11:08:31	11:08:45	0	0:00:55	
11:12:37	96	11:12:39	11:12:51	0:00:12	11:13:31	11:13:43	0	0:01:06	
11:13:09	112	11:13:12	11:13:24	0:00:12	11:14:37	11:14:41	0	0:01:32	
11:17:42	96	11:17:45	11:17:57	0:00:12	11:18:48	11:19:02	0	0:01:20	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
11:19:11	112				11:19:18	11:19:24	0	0:00:13	
11:20:20	NIS				11:21:05	11:21:21	0	0:01:01	
11:23:09	109	11:23:11	11:23:18	0:00:07	11:24:17	11:24:30	0	0:01:21	
11:24:27	109	11:24:29	11:24:37	0:00:08	11:25:27	11:25:39	0	0:01:12	
11:26:18	96	11:26:20	11:26:32	0:00:12	11:27:30	11:27:43	0	0:01:25	
11:27:44	112	11:27:45	11:27:59	0:00:14	11:28:06	11:28:11	0	0:00:27	
11:31:49	96	11:31:52	11:32:05	0:00:13	11:32:27	11:32:38	0	0:00:49	
11:36:07	109	11:36:09	11:36:21	0:00:12	11:36:39	11:36:51	0	0:00:44	
11:38:07	112	11:38:10	11:38:31	0:00:21	11:39:45	11:39:50	0	0:01:43	
11:39:55	109	11:39:57	11:40:01	0:00:04	11:40:27	11:40:54	0	0:00:59	
11:41:07	112				11:41:57	11:42:02	0	0:00:55	
11:42:09	96	11:42:11	11:42:23	0:00:12	11:43:03	11:43:15	0	0:01:06	
11:47:25	96	11:47:27	11:47:36	0:00:09	11:47:56	11:48:06	0	0:00:41	
11:51:49	109	11:51:50	11:52:57	0:01:07	11:53:08	11:53:24	0	0:01:35	
11:53:14	112	11:53:32	11:54:05	0:00:33	11:54:23	11:54:29	0	0:01:15	
11:56:43	96	11:56:45	11:56:54	0:00:09	11:58:01	11:58:13	0	0:01:30	
11:58:32	109	11:58:34	11:58:53	0:00:19	11:59:13	11:59:27	0	0:00:55	
11:59:53	112	11:59:55	11:59:59	0:00:04	12:00:08	12:00:13	0	0:00:20	
12:06:42	109	12:06:45	12:06:50	0:00:05	12:06:59	12:07:11	0	0:00:29	
12:07:13	112	12:07:20	12:08:36	0:01:16	12:08:48	12:08:51	0	0:01:38	
12:10:00	96	12:10:02	12:10:15	0:00:13	12:10:59	12:11:13	0	0:01:13	
12:13:03	96	12:13:06	12:14:15	0:01:09	12:14:27	12:14:27	0	0:01:24	
12:14:40	NIS				12:16:33	12:16:45	0	0:02:05	
12:16:44	109	12:16:46	12:17:53	0:01:07	12:18:14	12:18:24	0	0:01:40	
12:18:37	112	12:18:39	12:18:47	0:00:08	12:19:16	12:19:21	0	0:00:44	
12:19:56	109	12:19:59	12:20:17	0:00:18	12:20:49	12:21:01	0	0:01:05	
12:21:09	112	12:21:21	12:21:27	0:00:06	12:22:02	12:22:06	0	0:00:57	
12:22:46	96	12:22:48	12:22:57	0:00:09	12:23:08	12:23:21	0	0:00:35	
12:27:50	96	12:27:52	12:28:03	0:00:11	12:28:15	12:28:26	0	0:00:36	
12:29:07	109	12:29:12	12:29:18	0:00:06	12:30:12	12:30:26	0	0:01:19	
12:32:53	96	12:32:59	12:33:06	0:00:07	12:33:17	12:33:32	0	0:00:39	
12:38:57	96	12:39:00	12:39:13	0:00:13	12:39:37	12:39:51	0	0:00:54	
12:39:48	109	12:39:51	12:40:10	0:00:19	12:40:51	12:41:02	0	0:01:14	
12:41:31	112	12:41:35	12:41:42	0:00:07	12:41:54	12:41:59	0	0:00:28	
12:41:42	112	12:41:46	12:41:55	0:00:09	12:43:32	12:43:37	0	0:01:55	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
12:47:17	96	12:47:20	12:47:33	0:00:13	12:48:12	12:48:23	0	0:01:06	
12:48:28	109	12:48:30	12:48:41	0:00:11	12:49:22	12:49:34	0	0:01:06	
12:51:51	112	12:51:53	12:52:05	0:00:12	12:52:21	12:52:26	0	0:00:35	
12:52:49	96	12:52:52	12:52:57	0:00:05	12:53:08	12:53:21	0	0:00:32	
12:54:58	109	12:55:00	12:55:15	0:00:15	12:55:23	12:55:35	0	0:00:37	
12:59:00	112				12:59:18	12:59:23	0	0:00:23	
13:00:11	96	13:00:14	13:00:26	0:00:12	13:01:18	13:01:29	0	0:01:18	
13:01:24	109	13:01:26	13:01:56	0:00:30	13:02:22	13:02:34	0	0:01:10	
13:09:37	109				13:09:48	13:10:02	0	0:00:25	
13:09:58	112	13:10:01	13:10:07	0:00:06	13:10:47	13:10:52	0	0:00:54	
13:11:05	96	13:11:06	13:11:18	0:00:12	13:12:00	13:12:13	0	0:01:08	
13:12:26	03 (Red)				13:13:08	13:13:14	0	0:00:48	
13:13:20	NIS				13:14:13	13:14:24	0	0:01:04	
13:16:26	96	13:16:30	13:16:40	0:00:10	13:17:20	13:17:34	0	0:01:08	
13:19:12	109	13:19:15	13:19:24	0:00:09	13:19:32	13:19:43	0	0:00:31	
13:21:30	112	13:21:32	13:21:52	0:00:20	13:22:13	13:22:18	0	0:00:48	
13:22:14	112				13:22:21	13:22:26	0	0:00:12	
13:22:33	NIS				13:22:47	13:23:05	0	0:00:32	
13:24:30	96				13:24:46	13:24:57	0	0:00:27	
13:25:36	109	13:25:38	13:25:50	0:00:12	13:25:59	13:26:10	0	0:00:34	
13:29:48	112				13:30:19	13:30:24	0	0:00:36	
13:32:56	96	13:32:58	13:33:10	0:00:12	13:34:07	13:34:20	0	0:01:24	
13:36:43	112	13:36:47	13:36:51	0:00:04	13:36:58	13:37:03	0	0:00:20	
13:40:24	96	13:40:26	13:40:38	0:00:12	13:41:13	13:41:25	0	0:01:01	
13:43:49	109	13:43:56	13:44:12	0:00:16	13:44:37	13:44:48	0	0:00:59	
13:44:45	109	13:44:46	13:44:54	0:00:08	13:45:44	13:45:57	0	0:01:12	
13:46:48	96				13:46:56	13:47:09	0	0:00:21	
13:47:11	112				13:47:59	13:48:04	0	0:00:53	
13:54:10	96	13:54:12	13:54:24	0:00:12	13:55:03	13:55:15	0	0:01:05	
13:55:22	112	13:55:26	13:55:30	0:00:04	13:56:07	13:56:12	0	0:00:50	
13:56:22	NIS				13:57:01	13:57:12	0	0:00:50	
13:57:15	109	13:57:17	13:57:29	0:00:12	13:58:14	13:58:25	0	0:01:10	
14:00:22	109	14:00:25	14:00:29	0:00:04	14:01:17	14:01:29	0	0:01:07	
14:01:26	96	14:01:29	14:02:07	0:00:38	14:02:27	14:02:39	0	0:01:13	
14:03:04	109				14:03:32	14:03:44	0	0:00:40	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
14:04:40	112	14:04:48	14:05:10	0:00:22	14:05:25	14:05:30	0	0:00:50	
14:06:51	112	14:06:53	14:06:58	0:00:05	14:07:13	14:07:18	0	0:00:27	
14:12:28	109				14:13:26	14:13:38	0	0:01:10	
14:13:41	96	14:13:43	14:13:55	0:00:12	14:14:45	14:15:00	0	0:01:19	
14:16:45	96	14:16:48	14:17:00	0:00:12	14:17:51	14:18:02	0	0:01:17	
14:18:53	109	14:18:54	14:19:05	0:00:11	14:20:05	14:20:24	0	0:01:31	
14:20:39	112	14:20:42	14:21:11	0:00:29	14:21:55	14:22:00	0	0:01:21	
14:23:57	96	14:23:59	14:24:43	0:00:44	14:24:57	14:25:09	0	0:01:12	
14:26:30	112	14:26:33	14:26:52	0:00:19	14:27:00	14:27:05	0	0:00:35	
14:31:46	112				14:31:50	14:31:55	0	0:00:09	
14:33:08	96	14:33:16	14:33:29	0:00:13	14:33:58	14:34:10	0	0:01:02	
14:34:05	109	14:34:07	14:34:19	0:00:12	14:35:02	14:35:17	0	0:01:12	
14:36:29	109	14:36:30	14:36:38	0:00:08	14:36:58	14:37:09	0	0:00:40	
14:40:10	96	14:40:12	14:40:24	0:00:12	14:41:03	14:41:16	0	0:01:06	
14:43:30	112	14:43:33	14:43:38	0:00:05	14:43:48	14:43:53	0	0:00:23	
14:44:31	109	14:44:33	14:45:21	0:00:48	14:45:28	14:45:39	0	0:01:08	
14:45:38	112	14:45:41	14:45:49	0:00:08	14:46:02	14:46:07	0	0:00:29	
14:47:12	96	14:47:14	14:47:25	0:00:11	14:47:45	14:47:57	0	0:00:45	
14:52:32	109	14:52:35	14:52:40	0:00:05	14:53:27	14:53:38	0	0:01:06	
14:54:45	96	14:54:47	14:55:22	0:00:35	14:55:35	14:55:49	0	0:01:04	
15:02:18	112	15:02:21	15:02:26	0:00:05	15:02:48	15:02:55	0	0:00:37	
15:05:36	109	15:05:38	15:05:57	0:00:19	15:06:28	15:06:38	0	0:01:02	
15:07:00	96	15:07:02	15:07:27	0:00:25	15:07:35	15:07:45	0	0:00:45	
15:07:20	04 (Red)				15:08:29	15:08:29	0	0:01:09	
15:08:02	05 (Red)				15:08:40	15:08:50	0	0:00:48	
15:08:10	112	15:08:13	15:08:55	0:00:42	15:09:06	15:09:12	0	0:01:02	
15:08:55	109	15:08:59	15:09:02	0:00:03	15:10:03	15:10:13	0	0:01:18	
15:09:24	96	15:09:27	15:09:36	0:00:09	15:11:17	15:11:27	0	0:02:03	
15:14:11	112	15:14:14	15:14:25	0:00:11	15:16:21	15:16:26	0	0:02:15	
15:15:12	96	15:15:14	15:15:22	0:00:08	15:16:52	15:17:02	0	0:01:50	
15:17:58	109	15:18:00	15:18:35	0:00:35	15:18:49	15:19:00	0	0:01:02	
15:19:46	112	15:19:49	15:19:52	0:00:03	15:20:01	15:20:09	0	0:00:23	
15:23:35	109	15:23:38	15:23:43	0:00:05	15:24:22	15:24:35	0	0:01:00	
15:25:38	96	15:25:41	15:25:50	0:00:09	15:26:42	15:26:52	0	0:01:14	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
15:33:13	112	15:33:20	15:34:08	0:00:48	15:34:25	15:34:34	0	0:01:21	
15:35:01	109	15:35:03	15:35:16	0:00:13	15:35:23	15:35:31	0	0:00:30	
15:36:27	96	15:36:30	15:37:05	0:00:35	15:37:43	15:37:53	0	0:01:26	
15:38:00	112	15:38:03	15:38:44	0:00:41	15:39:02	15:39:08	0	0:01:08	
15:38:54	109	15:38:58	15:39:05	0:00:07	15:39:54	15:40:04	0	0:01:10	
15:40:02	96	15:40:17	15:40:19	0:00:02	15:41:03	15:41:13	0	0:01:11	
15:44:24	NIS				15:44:40	15:44:50	0	0:00:26	
15:46:48	112	15:46:51	15:47:34	0:00:43	15:48:07	15:48:14	0	0:01:26	
15:49:14	109				15:49:22	15:49:32	0	0:00:18	
15:50:00	96	15:50:02	15:50:14	0:00:12	15:50:26	15:50:36	0	0:00:36	
15:51:35	112	15:51:39	15:51:40	0:00:01	15:52:14	15:52:24	0	0:00:49	
15:53:40	96	15:53:42	15:53:53	0:00:11	15:54:13	15:54:24	0	0:00:44	
15:58:02	109	15:58:05	15:58:43	0:00:38	15:59:01	15:59:10	0	0:01:08	
16:00:19	112	16:00:22	16:00:26	0:00:04	16:00:33	16:00:40	0	0:00:21	
16:03:14	96	16:03:17	16:03:25	0:00:08	16:03:44	16:03:54	0	0:00:40	
16:04:39	109	16:04:42	16:04:48	0:00:06	16:04:56	16:05:05	0	0:00:26	
16:07:21	112	16:07:23	16:07:32	0:00:09	16:07:41	16:07:46	0	0:00:25	
16:12:00	96	16:12:03	16:12:13	0:00:10	16:13:25	16:13:35	0	0:01:35	
16:13:36	109	16:13:39	16:13:58	0:00:19	16:14:32	16:14:39	0	0:01:03	
16:16:58	112	16:17:00	16:17:04	0:00:04	16:17:15	16:17:20	0	0:00:22	
16:17:47	96	16:17:51	16:18:00	0:00:09	16:18:46	16:18:55	0	0:01:08	
16:19:24	109	16:19:27	16:19:33	0:00:06	16:19:50	16:20:00	0	0:00:36	
16:19:44	109				16:20:56	16:21:06	0	0:01:22	
16:24:17	96	16:24:21	16:24:54	0:00:33	16:25:20	16:25:30	0	0:01:13	
16:25:32	NIS				16:26:42	16:26:53	0	0:01:21	
16:26:15	112	16:26:19	16:26:36	0:00:17	16:27:35	16:27:45	0	0:01:30	
16:32:16	96				16:32:42	16:32:52	0	0:00:36	
16:33:18	112	16:33:21	16:33:26	0:00:05	16:33:34	16:33:40	0	0:00:22	
16:36:55	109	16:36:57	16:37:05	0:00:08	16:38:23	16:38:33	0	0:01:38	
16:38:15	96	16:38:35	16:39:17	0:00:42	16:39:36	16:39:46	0	0:01:31	
16:39:47	112	16:39:51	16:40:00	0:00:09	16:40:08	16:40:14	0	0:00:27	
16:39:55	109	16:39:56	16:40:02	0:00:06	16:40:46	16:40:56	0	0:01:01	
16:40:22	109	16:40:25	16:40:32	0:00:07	16:41:49	16:41:59	0	0:01:37	
16:41:56	109	16:42:00	16:42:12	0:00:12	16:42:59	16:43:10	0	0:01:14	
16:44:02	96	16:44:05	16:44:13	0:00:08	16:44:22	16:44:31	0	0:00:29	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
16:45:35	109	16:45:38	16:45:55	0:00:17	16:46:34	16:46:44	0	0:01:09	
16:49:58	96	16:50:02	16:50:12	0:00:10	16:51:20	16:51:30	0	0:01:32	
16:54:23	112	16:54:25	16:54:33	0:00:08	16:54:44	16:54:50	0	0:00:27	
16:55:30	109	16:55:33	16:55:53	0:00:20	16:56:11	16:56:22	0	0:00:52	
16:56:24	112	16:56:26	16:56:40	0:00:14	16:56:44	16:56:51	0	0:00:27	
16:58:41	0 (Green)				16:58:47	16:58:57	0	0:00:16	
16:59:03	96	16:59:07	16:59:16	0:00:09	16:59:40	16:59:50	0	0:00:47	
17:03:09	109	17:03:13	17:03:53	0:00:40	17:04:24	17:04:34	0	0:01:25	
17:05:42	96	17:05:47	17:05:51	0:00:04	17:06:53	17:07:03	0	0:01:21	
17:07:11	35 (Green)				17:08:06	17:08:16	0	0:01:05	
17:09:01	112	17:09:03	17:10:00	0:00:57	17:10:15	17:10:20	0	0:01:19	
17:10:27	109	17:10:30	17:10:37	0:00:07	17:11:24	17:11:34	0	0:01:07	
17:11:35	109	17:11:39	17:11:51	0:00:12	17:12:38	17:12:48	0	0:01:13	
17:14:13	112	17:14:17	17:14:23	0:00:06	17:15:01	17:15:07	0	0:00:54	
17:15:16	109	17:15:45	17:15:55	0:00:10	17:16:21	17:16:31	0	0:01:15	
17:15:20	96	17:15:22	17:15:32	0:00:10	17:17:37	17:17:47	0	0:02:27	
17:16:40	NIS				17:18:44	17:18:54	0	0:02:14	
17:17:53	109	17:17:57	17:18:04	0:00:07	17:18:53	17:19:03	0	0:01:10	
17:19:00	109	17:19:03	17:19:17	0:00:14	17:20:03	17:20:13	0	0:01:13	
17:19:16	112	17:19:18	17:20:00	0:00:42	17:20:34	17:20:40	0	0:01:24	
17:20:50	109	17:20:52	17:21:00	0:00:08	17:21:13	17:21:25	0	0:00:35	
17:23:23	96	17:23:25	17:23:48	0:00:23	17:24:52	17:25:02	0	0:01:39	
17:25:04	109	17:25:06	17:25:23	0:00:17	17:25:55	17:26:05	0	0:01:01	
17:26:03	96	17:26:07	17:27:03	0:00:56	17:27:15	17:27:25	0	0:01:22	
17:27:05	109	17:27:29	17:27:53	0:00:24	17:28:29	17:28:39	0	0:01:34	
17:29:44	112	17:29:47	17:29:58	0:00:11	17:30:11	17:30:18	0	0:00:34	
17:30:54	112	17:30:58	17:31:13	0:00:15	17:32:02	17:32:08	0	0:01:14	
17:32:51	109	17:32:54	17:33:06	0:00:12	17:33:16	17:33:26	0	0:00:35	
17:37:17	96	17:37:20	17:37:55	0:00:35	17:38:10	17:38:20	0	0:01:03	
17:40:24	96				17:40:37	17:40:47	0	0:00:23	
17:41:44	109	17:41:47	17:42:02	0:00:15	17:42:51	17:43:01	0	0:01:17	
17:43:03	112	17:43:07	17:43:30	0:00:23	17:44:41	17:44:46	0	0:01:43	
17:44:20	96	17:44:57	17:45:14	0:00:17	17:45:26	17:45:36	0	0:01:16	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
17:47:56	35 (Green)				17:48:06	17:48:16	0	0:00:20	
17:52:23	109	17:52:27	17:52:36	0:00:09	17:52:47	17:52:57	0	0:00:34	
17:53:48	96	17:53:50	17:55:06	0:01:16	17:57:24	17:57:34	1	0:03:46	Tram in front/Passengers boarding
17:57:38	112				17:58:40	17:58:45	0	0:01:07	
17:57:44	112	17:57:47	17:57:53	0:00:06	17:58:08	17:58:12	0	0:00:28	
17:59:20	96	17:59:22	17:59:42	0:00:20	17:59:49	17:59:59	0	0:00:39	
17:59:56	109	18:00:00	18:00:29	0:00:29	18:01:03	18:01:13	0	0:01:17	
18:01:13	30 (Green)				18:02:10	18:02:26	0	0:01:13	
18:01:21	03 (Red)				18:03:32	18:03:39	0	0:02:18	
18:02:47	03 (Red)				18:04:09	18:04:15	0	0:01:28	
18:04:14	04 (Red)				18:04:21	18:04:27	0	0:00:13	
18:04:18	96	18:04:35	18:05:29	0:00:54	18:06:02	18:06:12	0	0:01:54	
18:07:12	112	18:07:16	18:07:39	0:00:23	18:08:22	18:08:28	0	0:01:16	
18:08:36	109	18:08:40	18:08:49	0:00:09	18:09:24	18:09:34	0	0:00:58	
18:10:42	109	18:10:44	18:10:52	0:00:08	18:11:52	18:12:02	0	0:01:20	
18:12:11	112	18:12:12	18:12:22	0:00:10	18:13:04	18:13:10	0	0:00:59	
18:16:26	35 (Green)				18:16:40	18:16:47	0	0:00:21	
18:20:29	30 (Green)				18:21:33	18:21:33	0	0:01:04	
18:21:18	30 (Green)				18:22:47	18:22:56	0	0:01:38	
18:23:34	112	18:23:37	18:23:52	0:00:15	18:24:03	18:24:07	0	0:00:33	
18:23:53	109	18:24:07	18:24:47	0:00:40	18:25:07	18:25:17	0	0:01:24	
18:26:44	96	18:26:47	18:27:32	0:00:45	18:27:42	18:27:52	0	0:01:08	
18:27:52	112	18:27:55	18:28:35	0:00:40	18:28:45	18:28:50	0	0:00:58	
18:28:54	96	18:28:57	18:29:21	0:00:24	18:30:03	18:30:13	0	0:01:19	
18:30:09	96	18:30:11	18:30:19	0:00:08	18:31:23	18:31:33	0	0:01:24	
18:30:17	109	18:30:20	18:30:28	0:00:08	18:31:35	18:31:45	0	0:01:28	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
18:31:41	96	18:31:43	18:32:17	0:00:34	18:32:44	18:32:54	0	0:01:13	
18:32:56	30 (Green)				18:33:46	18:33:56	0	0:01:00	
18:37:19	96	18:37:23	18:37:35	0:00:12	18:38:29	18:38:39	0	0:01:20	
18:38:44	35 (Green)				18:39:42	18:39:52	0	0:01:08	
18:38:51	96	18:38:53	18:40:04	0:01:11	18:40:53	18:41:03	0	0:02:12	
18:41:04	112				18:41:52	18:42:03	0	0:00:59	
18:41:15	109	18:41:18	18:41:49	0:00:31	18:43:03	18:43:13	0	0:01:58	
18:42:03	30 (Green)				18:43:12	18:43:24	0	0:01:21	
18:43:28	112	18:43:31	18:44:11	0:00:40	18:44:20	18:44:25	0	0:00:57	
18:44:29	109	18:44:32	18:44:54	0:00:22	18:45:24	18:45:36	0	0:01:07	
18:45:39	96	18:45:41	18:45:52	0:00:11	18:46:44	18:46:54	0	0:01:15	
18:48:52	109	18:48:54	18:49:01	0:00:07	18:49:12	18:49:22	0	0:00:30	
18:49:40	30 (Green)				18:50:17	18:50:24	0	0:00:44	
18:50:57	112	18:51:00	18:51:30	0:00:30	18:51:57	18:52:03	0	0:01:06	
18:51:02	112				18:52:07	18:52:13	0	0:01:11	
18:52:28	35 (Green)				18:52:48	18:52:58	0	0:00:30	
18:55:13	96	18:55:15	18:55:33	0:00:18	18:56:11	18:56:21	0	0:01:08	
18:59:05	112				18:59:50	19:00:00	0	0:00:55	
19:00:39	96	19:00:42	19:00:51	0:00:09	19:01:10	19:01:20	0	0:00:41	
19:01:51	96				19:02:23	19:02:32	0	0:00:41	
19:03:08	112	19:03:11	19:03:24	0:00:13	19:03:31	19:03:37	0	0:00:29	
19:03:51	35 (Green)				19:04:40	19:04:50	0	0:00:59	
19:06:35	109	19:06:37	19:06:47	0:00:10	19:07:00	19:07:08	0	0:00:33	
19:10:43	112	19:10:45	19:10:51	0:00:06	19:10:56	19:11:02	0	0:00:19	
19:12:25	96	19:12:27	19:12:37	0:00:10	19:13:16	19:13:26	0	0:01:01	
19:14:13	109	19:14:16	19:14:21	0:00:05	19:14:27	19:14:36	0	0:00:23	
19:16:21	96	19:16:24	19:16:30	0:00:06	19:17:31	19:17:41	0	0:01:20	
19:17:50	112	19:17:53	19:18:26	0:00:33	19:18:34	19:18:41	0	0:00:51	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
19:25:11	96	19:25:13	19:25:36	0:00:23	19:27:12	19:27:22	0	0:02:11	
19:27:24	96				19:28:25	19:28:35	0	0:01:11	
19:27:41	04 (Red)				19:29:01	19:29:11	0	0:01:30	
19:28:53	03 (Red)				19:29:17	19:29:27	0	0:00:34	
19:29:09	05 (Red)				19:29:31	19:29:41	0	0:00:32	
19:29:50	109	19:29:53	19:30:42	0:00:49	19:31:53	19:32:03	0	0:02:13	
19:31:17	96	19:31:19	19:32:35	0:01:16	19:33:23	19:33:31	0	0:02:14	
19:34:23	96	19:34:26	19:34:51	0:00:25	19:35:46	19:35:56	0	0:01:33	
19:37:45	112	19:37:48	19:37:58	0:00:10	19:38:23	19:38:28	0	0:00:43	
19:43:42	109	19:43:45	19:43:58	0:00:13	19:44:08	19:44:18	0	0:00:36	
19:46:26	96	19:46:29	19:46:40	0:00:11	19:46:55	19:47:05	0	0:00:39	
19:47:15	112	19:47:19	19:47:25	0:00:06	19:48:01	19:48:07	0	0:00:52	
19:49:39	112				19:50:28	19:50:38	0	0:00:59	
19:53:27	96	19:53:28	19:53:36	0:00:08	19:53:55	19:54:07	0	0:00:40	
19:54:50	112	19:54:53	19:55:10	0:00:17	19:59:41	19:59:46	2	0:04:56	Passengers boarding
19:57:52	109	19:57:54	19:58:21	0:00:27	20:00:09	20:00:20	0	0:02:28	
20:07:44	112	20:07:47	20:07:55	0:00:08	20:08:37	20:08:42	0	0:00:58	
20:09:37	96	20:09:39	20:09:51	0:00:12	20:10:28	20:10:38	0	0:01:01	
20:11:19	109	20:11:21	20:11:34	0:00:13	20:12:40	20:12:50	0	0:01:31	
20:20:43	112	20:20:46	20:21:21	0:00:35	20:21:34	20:21:39	0	0:00:56	
20:22:34	96	20:22:36	20:22:49	0:00:13	20:23:27	20:23:37	0	0:01:03	
20:22:45	NIS				20:24:17	20:24:27	0	0:01:42	
20:32:15	109	20:32:18	20:32:27	0:00:09	20:32:41	20:32:52	0	0:00:37	
20:46:24	112	20:46:27	20:46:35	0:00:08	20:46:43	20:46:48	0	0:00:24	
20:47:09	96	20:47:11	20:47:22	0:00:11	20:47:47	20:47:57	0	0:00:48	
20:54:14	109	20:54:17	20:54:24	0:00:07	20:54:43	20:54:53	0	0:00:39	
20:55:06	96	20:55:08	20:55:18	0:00:10	20:55:50	20:56:00	0	0:00:54	
21:03:29	112	21:03:31	21:03:40	0:00:09	21:04:19	21:04:24	0	0:00:55	
21:05:47	96	21:05:49	21:05:58	0:00:09	21:06:17	21:06:27	0	0:00:40	
21:11:08	109	21:11:11	21:11:19	0:00:08	21:11:51	21:12:01	0	0:00:53	
21:22:18	112	21:22:21	21:22:26	0:00:05	21:22:44	21:22:49	0	0:00:31	
21:23:03	96	21:23:05	21:23:17	0:00:12	21:23:49	21:23:59	0	0:00:56	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
21:23:58	NIS				21:24:57	21:25:07	0	0:01:09	
21:31:00	06 (Red)				21:32:01	21:32:15	0	0:01:15	
21:33:00	03 (Red)				21:34:04	21:34:19	0	0:01:19	
21:33:40	109	21:33:42	21:33:58	0:00:16	21:34:52	21:35:03	0	0:01:23	
21:35:19	96	21:35:22	21:35:39	0:00:17	21:36:02	21:36:14	0	0:00:55	
21:40:06	112	21:40:10	21:41:20	0:01:10	21:41:57	21:42:02	0	0:01:56	
21:50:10	96				21:50:59	21:51:10	0	0:01:00	
21:51:18	109				21:52:07	21:52:18	0	0:01:00	
21:58:58	112	21:59:00	21:59:06	0:00:06	22:00:04	22:00:09	0	0:01:11	
22:02:56	NIS				22:03:54	22:04:02	0	0:01:06	
22:06:22	96	22:06:24	22:06:32	0:00:08	22:06:43	22:06:53	0	0:00:31	
22:09:29	109	22:09:31	22:09:35	0:00:04	22:09:45	22:09:55	0	0:00:26	
22:21:18	112	22:21:20	22:21:32	0:00:12	22:21:40	22:21:45	0	0:00:27	
22:22:33	96	22:22:35	22:22:46	0:00:11	22:23:24	22:23:33	0	0:01:00	
22:24:55	112				22:25:16	22:25:26	0	0:00:31	
22:31:17	109	22:31:20	22:31:23	0:00:03	22:31:38	22:31:49	0	0:00:32	
22:37:24	112	22:37:27	22:37:35	0:00:08	22:37:53	22:37:58	0	0:00:34	
22:44:03	96	22:44:05	22:44:16	0:00:11	22:44:28	22:44:38	0	0:00:35	
22:52:09	112	22:52:13	22:52:17	0:00:04	22:52:35	22:52:45	0	0:00:36	
22:57:39	112	22:57:42	22:57:57	0:00:15	22:58:10	22:58:15	0	0:00:36	
							Average Delay	0:01:01	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
6:00:11	96	6:00:13	6:00:23		6:01:08	6:01:19	0	0:01:08	
6:00:51	30 (Green)				6:02:22	6:02:32	1	0:01:41	Another Tram immediately in front
6:05:52	35 (Green)				6:06:17	6:06:29	0	0:00:37	
6:13:29	96	6:13:32	6:13:38		6:14:16	6:14:26	0	0:00:57	
6:16:45	96	6:16:49	6:16:58		6:17:54	6:18:03	0	0:01:18	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
6:19:52	96	6:19:55	6:19:58		6:20:22	6:20:33	0	0:00:41	
6:27:22	96	6:27:27	6:27:37		6:28:05	6:28:15	0	0:00:53	
6:29:03	109	6:29:08	6:29:14		6:30:01	6:30:13	0	0:01:10	
6:30:17	112				6:31:02	6:31:12	0	0:00:55	
6:31:54	96				6:32:55	6:33:04	0	0:01:10	
6:40:36	96	6:40:40	6:40:49		6:41:11	6:41:22	0	0:00:46	
6:41:14	109	6:41:18	6:41:24		6:42:16	6:42:26	0	0:01:12	
6:43:13	30 (Green)				6:44:08	6:44:20	0	0:01:07	
6:44:36	112				6:45:14	6:45:24	0	0:00:48	
6:45:06	112				6:46:15	6:46:24	0	0:01:18	
6:47:56	96	6:48:10	6:48:14		6:48:57	6:49:08	0	0:01:12	
6:50:32	109	6:50:35	6:50:41		6:51:10	6:51:20	0	0:00:48	
6:53:30	96	6:53:34	6:53:41		6:53:56	6:54:08	0	0:00:38	
7:00:09	109	7:00:12	7:00:18		7:01:15	7:01:25	0	0:01:16	
7:07:23	96	7:07:25	7:07:53		7:08:07	7:08:16	0	0:00:53	
7:09:20	33 (Green)				7:10:08	7:10:19	0	0:00:59	
7:10:11	109	7:10:15	7:10:20		7:11:08	7:11:18	0	0:01:07	
7:10:53	96	7:10:57	7:11:54		7:12:17	7:12:29	1	0:01:36	Tram in front/Passengers boarding
7:14:18	96	7:14:23	7:14:33		7:15:04	7:15:14	0	0:00:56	
7:17:40	109	7:17:44	7:18:00		7:18:16	7:18:25	0	0:00:45	
7:19:24	96	7:19:29	7:19:43		7:20:23	7:20:34	0	0:01:10	
7:26:00	96	7:26:03	7:26:15		7:26:27	7:26:37	0	0:00:37	
7:26:42	109	7:26:45	7:27:13		7:27:26	7:27:38	0	0:00:56	
7:33:49	109	7:33:52	7:34:15		7:34:25	7:34:35	0	0:00:46	
7:34:38	96	7:34:42	7:35:07		7:35:26	7:35:35	0	0:00:57	
7:36:20	96	7:36:26	7:36:41		7:37:34	7:37:45	0	0:01:25	
7:40:40	96	7:40:45	7:41:09		7:41:35	7:41:45	0	0:01:05	
7:41:20	109	7:41:23	7:42:14		7:42:37	7:42:49	0	0:01:29	
7:44:51	96	7:44:53	7:45:34		7:45:47	7:45:57	0	0:01:06	
7:48:29	96	7:48:33	7:48:54		7:49:21	7:49:30	0	0:01:01	
7:49:03	109	7:49:07	7:51:33		7:51:46	7:51:57	1	0:02:54	Passengers

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
									boarding
7:54:28	109	7:54:32	7:54:47		7:55:12	7:55:22	0	0:00:54	
7:55:54	109	7:55:59	7:56:10		7:56:31	7:56:43	0	0:00:49	
7:58:24	96	7:58:29	7:58:46		7:59:01	7:59:11	0	0:00:47	
8:00:03	30 (Green)				8:01:15	8:01:24	0	0:01:21	
8:02:20	96	8:02:23	8:03:26		8:03:43	8:03:54	0	0:01:34	
8:02:33	109	8:02:36	8:04:14		8:04:53	8:05:03	1	0:02:30	Tram in front/Passengers boarding
8:04:31	96	8:04:35	8:05:58		8:06:11	8:06:23	1	0:01:52	Tram in front/Passengers boarding
8:07:03	109	8:07:06	8:07:18		8:07:30	8:07:40	0	0:00:37	
8:12:51	109	8:12:55	8:13:13		8:13:22	8:13:31	0	0:00:40	
8:14:05	96	8:14:07	8:14:29		8:14:40	8:14:51	0	0:00:46	
8:18:55	96	8:18:58	8:20:15		8:20:39	8:20:49	0	0:01:54	
8:19:29	109	8:20:45	8:21:07		8:21:42	8:21:54	1	0:02:25	Tram in front/Passengers boarding
8:22:22	109	8:22:25	8:22:54		8:23:07	8:23:17	0	0:00:55	
8:25:20	96	8:25:24	8:26:00		8:26:16	8:26:25	0	0:01:05	
8:27:14	109	8:27:16	8:28:01		8:28:35	8:28:46	0	0:01:32	
8:28:38	96	8:28:42	8:29:22		8:29:42	8:29:52	0	0:01:14	
8:35:20	109	8:35:23	8:35:50		8:36:51	8:37:03	0	0:01:43	
8:35:27	109	8:35:29	8:36:00		8:36:59	8:37:09	0	0:01:42	
8:37:04	109	8:37:07	8:37:49		8:38:00	8:38:09	0	0:01:05	
8:41:58	96	8:42:02	8:42:28		8:42:44	8:42:55	0	0:00:57	
8:45:19	109	8:45:21	8:46:09		8:46:22	8:46:32	0	0:01:13	
8:46:25	96	8:46:29	8:46:56		8:47:33	8:47:45	0	0:01:20	
8:49:54	109	8:49:59	8:50:50		8:51:17	8:51:27	0	0:01:33	
8:50:46	96	8:50:48	8:52:16		8:52:29	8:52:38	1	0:01:52	Tram in front/Passengers boarding
8:56:36	109	8:56:40	8:57:04		8:57:15	8:57:26	0	0:00:50	
8:58:06	96	8:58:10	8:58:28		8:58:40	8:58:50	0	0:00:44	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
8:58:56	112				8:59:41	8:59:53	0	0:00:57	
8:59:27	109	8:59:31	9:00:15		9:00:50	9:01:00	0	0:01:33	
9:07:16	109	9:07:19	9:08:19		9:08:29	9:08:38	0	0:01:22	
9:10:11	96	9:10:14	9:10:41		9:10:52	9:11:03	0	0:00:52	
9:11:02	35 (Red)				9:12:04	9:12:14	0	0:01:12	
9:11:20	109	9:11:22	9:13:05		9:13:17	9:13:29	1	0:02:09	Tram in front/Passengers boarding
9:13:07	96	9:13:22	9:13:33		9:14:22	9:14:32	0	0:01:25	
9:16:57	109	9:16:58	9:17:34		9:17:44	9:17:53	0	0:00:56	
9:24:33	109	9:24:35	9:24:55		9:25:06	9:25:17	0	0:00:44	
9:26:48	96	9:26:52	9:27:08		9:27:23	9:27:33	0	0:00:45	
9:28:11	109	9:28:14	9:28:24		9:28:37	9:28:49	0	0:00:38	
9:29:37	96	9:29:40	9:30:32		9:30:58	9:31:08	0	0:01:31	
9:32:25	109	9:32:28	9:33:15		9:33:25	9:33:34	0	0:01:09	
9:33:45	35 (Green)				9:34:32	9:34:43	0	0:00:58	
9:37:36	35 (Green)				9:38:12	9:38:22	0	0:00:46	
9:38:22	96	9:38:24	9:38:45		9:39:26	9:39:38	0	0:01:16	
9:39:29	109	9:39:41	9:40:14		9:40:26	9:40:36	0	0:01:07	
9:45:00	96	9:45:03	9:45:54		9:47:00	9:47:11	1	0:02:11	Passengers boarding
9:48:03	109	9:48:06	9:48:31		9:49:12	9:49:23	0	0:01:20	
9:54:31	96	9:54:33	9:55:48		9:56:01	9:56:11	1	0:01:40	Passengers boarding
9:58:53	109	9:58:56	9:59:44		9:59:53	10:00:05	0	0:01:12	
9:59:11	109	9:59:58	10:00:40		10:00:52	10:01:02	1	0:01:51	Tram in front/Passengers boarding
10:01:32	96	10:01:35	10:01:48		10:02:02	10:02:11	0	0:00:39	
10:05:31	109	10:05:33	10:05:49		10:05:59	10:06:10	0	0:00:39	
10:08:28	96	10:08:31	10:08:48		10:09:03	10:09:13	0	0:00:45	
10:12:35	109	10:12:38	10:12:52		10:13:12	10:13:24	0	0:00:49	
10:14:06	96	10:14:09	10:14:20		10:15:26	10:15:36	0	0:01:30	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
10:15:58	NIS				10:16:38	10:16:47	0	0:00:49	
10:20:32	NIS				10:21:30	10:21:41	0	0:01:09	
10:21:17	109	10:21:20	10:22:20		10:22:33	10:22:43	0	0:01:26	
10:23:01	96	10:23:04	10:23:32		10:23:43	10:23:55	0	0:00:54	
10:29:07	109	10:29:10	10:29:26		10:30:16	10:30:26	0	0:01:19	
10:32:06	96	10:32:09	10:32:25		10:32:46	10:32:55	0	0:00:49	
10:36:52	109	10:36:55	10:37:15		10:37:24	10:37:35	0	0:00:43	
10:39:16	96	10:39:20	10:39:29		10:40:15	10:40:25	0	0:01:09	
10:43:45	109	10:43:47	10:44:34		10:44:46	10:44:58	0	0:01:13	
10:53:07	109	10:53:10	10:53:27		10:54:48	10:54:58	0	0:01:51	
10:57:58	96	10:58:01	10:58:52		10:59:05	10:59:14	0	0:01:16	
11:00:47	109	11:00:49	11:00:59		11:01:53	11:02:04	0	0:01:17	
11:04:25	96	11:04:28	11:04:54		11:05:11	11:05:21	0	0:00:56	
11:06:33	96	11:06:37	11:07:11		11:07:25	11:07:37	0	0:01:04	
11:08:33	109	11:08:36	11:08:51		11:10:21	11:10:31	0	0:01:58	
11:11:18	96	11:11:22	11:12:05		11:12:20	11:12:29	0	0:01:11	
11:15:48	109	11:15:50	11:16:05		11:16:51	11:17:02	0	0:01:14	
11:17:47	96	11:17:51	11:17:58		11:18:53	11:19:03	0	0:01:16	
11:19:19	96	11:19:22	11:19:31		11:19:56	11:20:08	0	0:00:49	
11:23:45	NIS				11:24:23	11:24:33	0	0:00:48	
11:23:56	109	11:24:00	11:24:17		11:25:30	11:25:39	1	0:01:43	Tram in front/Passengers boarding
11:26:22	NIS				11:27:35	11:27:46	0	0:01:24	
11:28:20	96	11:28:24	11:28:44		11:29:32	11:29:42	0	0:01:22	
11:29:48	109	11:29:53	11:30:25		11:30:36	11:30:48	0	0:01:00	
11:34:30	96	11:34:32	11:35:09		11:35:34	11:35:44	0	0:01:14	
11:41:07	109	11:41:10	11:41:23		11:41:59	11:42:08	0	0:01:01	
11:42:38	96	11:42:41	11:42:53		11:43:08	11:43:19	0	0:00:41	
11:46:21	NIS				11:46:55	11:47:05	0	0:00:44	
11:47:40	109	11:47:43	11:47:52		11:48:01	11:48:13	0	0:00:33	
11:50:20	96	11:50:23	11:50:34		11:51:02	11:51:12	0	0:00:52	
11:52:24	109	11:52:26	11:52:37		11:53:06	11:53:15	0	0:00:51	
11:54:58	96	11:55:01	11:55:51		11:56:48	11:57:00	1	0:02:02	Passengers

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
									boarding
12:01:35	109	12:01:37	12:01:58		12:02:46	12:02:56	0	0:01:21	
12:03:53	96	12:03:56	12:04:19		12:04:58	12:05:10	0	0:01:17	
12:11:23	96	12:11:25	12:12:35		12:13:25	12:13:37	1	0:02:14	Passengers boarding
12:13:27	109	12:13:30	12:14:18		12:14:30	12:14:39	0	0:01:12	
12:17:49	109	12:17:52	12:18:11		12:18:20	12:18:31	0	0:00:42	
12:18:35	96	12:18:38	12:18:50		12:19:19	12:19:29	0	0:00:54	
12:26:19	109	12:26:23	12:27:00		12:27:13	12:27:25	0	0:01:06	
12:27:19	109	12:27:23	12:27:39		12:28:14	12:28:24	0	0:01:05	
12:33:42	96	12:33:45	12:34:12		12:34:28	12:34:37	0	0:00:55	
12:33:55	109	12:34:46	12:35:18		12:35:30	12:35:41	0	0:01:46	
12:41:33	109	12:41:38	12:41:56		12:42:06	12:42:16	0	0:00:43	
12:43:14	96	12:43:17	12:44:00		12:44:18	12:44:30	0	0:01:16	
12:49:45	96	12:49:49	12:50:19		12:50:36	12:50:46	0	0:01:01	
12:50:42	109	12:50:45	12:51:20		12:51:48	12:51:57	0	0:01:15	
12:57:21	109	12:57:24	12:57:42		12:57:51	12:58:02	0	0:00:41	
12:59:07	96	12:59:12	12:59:23		13:00:05	13:00:15	0	0:01:08	
13:02:38	03 (Red)	13:02:43	13:05:55		13:07:13	13:07:25	2	0:04:47	Passengers boarding
13:02:49	04 (Red)	13:02:51	13:05:37		13:07:20	13:07:30	2	0:04:41	Tram in front/Passengers boarding
13:03:47	96	13:03:49	13:07:10		13:08:26	13:08:35	2	0:04:48	Tram in front/Passengers boarding
13:06:46	109	13:06:48	13:09:15		13:09:39	13:09:50	2	0:03:04	Tram in front/Passengers boarding
13:13:10	109	13:13:13	13:14:09		13:14:20	13:14:30	0	0:01:20	
13:14:04	96	13:14:07	13:14:18		13:15:24	13:15:36	0	0:01:32	
13:18:38	96	13:18:41	13:18:59		13:19:32	13:19:42	0	0:01:04	
13:20:57	109	13:20:58	13:21:34		13:21:47	13:21:56	0	0:00:59	
13:25:43	96	13:25:46	13:26:09		13:27:00	13:27:11	0	0:01:28	
13:30:19	109	13:30:22	13:30:36		13:30:48	13:30:58	0	0:00:39	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
13:32:22	96	13:32:25	13:32:40		13:32:56	13:33:08	0	0:00:46	
13:35:38	NIS				13:36:16	13:36:26	0	0:00:48	
13:38:59	109	13:39:01	13:39:51		13:40:03	13:40:12	0	0:01:13	
13:39:48	96	13:39:51	13:40:17		13:41:16	13:41:27	1	0:01:39	Tram in front/Passengers boarding
13:45:59	109	13:46:01	13:46:43		13:46:56	13:47:06	0	0:01:07	
13:48:42	96	13:48:45	13:48:57		13:49:11	13:49:23	0	0:00:41	
13:54:28	109	13:54:31	13:54:49		13:55:06	13:55:16	0	0:00:48	
13:56:29	96	13:56:33	13:56:47		13:57:10	13:57:19	0	0:00:50	
14:01:01	109	14:01:03	14:01:12		14:01:26	14:01:37	0	0:00:36	
14:03:23	96	14:03:27	14:03:38		14:04:49	14:05:01	1	0:01:38	Passengers boarding
14:13:31	96	14:13:34	14:13:51		14:14:53	14:15:05	0	0:01:34	
14:13:59	109				14:15:53	14:16:03	1	0:02:04	Another Tram immediately infront
14:18:32	96	14:18:35	14:18:43		14:18:57	14:19:06	0	0:00:34	
14:18:35	109	14:18:39	14:19:30		14:20:02	14:20:13	1	0:01:38	Tram in front/Passengers boarding
14:24:16	112	14:24:18	14:24:32		14:25:01	14:25:11	0	0:00:55	
14:26:19	109	14:26:23	14:26:36		14:27:15	14:27:27	0	0:01:08	
14:27:45	96	14:27:48	14:28:00		14:28:32	14:28:42	0	0:00:57	
14:31:52	96	14:31:56	14:32:09		14:32:57	14:33:06	0	0:01:14	
14:33:36	109	14:33:41	14:33:54		14:34:05	14:34:16	0	0:00:40	
14:40:53	96	14:40:56	14:41:18		14:42:14	14:42:24	0	0:01:31	
14:42:52	109	14:42:55	14:43:08		14:43:22	14:43:34	0	0:00:42	
14:52:06	96	14:52:10	14:52:30		14:53:31	14:53:41	0	0:01:35	
14:52:34	109	14:52:36	14:52:46		14:53:39	14:53:48	0	0:01:14	
14:56:21	96	14:56:23	14:56:35		14:56:46	14:56:57	0	0:00:36	
14:59:02	109	14:59:04	14:59:16		14:59:29	14:59:39	0	0:00:37	
15:04:59	96	15:05:03	15:05:17		15:05:31	15:05:43	0	0:00:44	
15:06:48	109	15:06:51	15:07:24		15:07:37	15:07:47	0	0:00:59	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
15:10:36	96	15:10:39	15:10:51		15:11:19	15:11:28	0	0:00:52	
15:18:51	109	15:18:54	15:19:45		15:20:02	15:20:13	0	0:01:22	
15:20:07	96	15:20:10	15:20:58		15:21:11	15:21:21	0	0:01:14	
15:21:18	96	15:21:22	15:21:32		15:22:17	15:22:29	0	0:01:11	
15:22:19	109	15:22:23	15:22:52		15:23:19	15:23:29	0	0:01:10	
15:26:55	NIS				15:27:57	15:28:06	0	0:01:11	
15:27:15	96	15:27:17	15:27:59		15:28:57	15:29:08	1	0:01:53	Tram in front/Passengers boarding
15:29:12	109	15:29:13	15:29:35		15:30:22	15:30:32	0	0:01:20	
15:36:14	96	15:36:17	15:36:27		15:36:41	15:36:53	0	0:00:39	
15:36:22	109	15:36:46	15:36:57		15:37:44	15:37:54	0	0:01:32	
15:40:26	96	15:40:29	15:40:54		15:41:09	15:41:18	0	0:00:52	
15:45:48	109	15:45:51	15:46:23		15:47:06	15:47:17	0	0:01:29	
15:48:11	96	15:48:14	15:48:35		15:49:21	15:49:31	0	0:01:20	
15:51:08	NIS				15:52:21	15:52:33	0	0:01:25	
15:57:10	109	15:57:15	15:57:30		15:58:05	15:58:15	0	0:01:05	
15:57:14	109	15:58:12	15:58:54		15:59:08	15:59:17	1	0:02:03	Tram in front/Passengers boarding
16:01:03	NIS				16:01:16	16:01:27	0	0:00:24	
16:01:50	109	16:01:54	16:02:06		16:02:25	16:02:35	0	0:00:45	
16:02:43	96	16:02:46	16:02:56		16:03:47	16:03:59	0	0:01:16	
16:08:40	109	16:08:42	16:08:59		16:10:03	16:10:13	1	0:01:33	Passengers boarding
16:12:11	30 (Green)				16:12:16	16:12:25	0	0:00:14	
16:15:09	96	16:15:13	16:15:27		16:15:42	16:15:53	0	0:00:44	
16:16:26	96	16:16:30	16:16:41		16:17:51	16:18:01	0	0:01:35	
16:17:56	109	16:17:58	16:18:40		16:18:51	16:19:03	0	0:01:07	
16:25:07	96	16:25:10	16:25:19		16:26:49	16:27:01	1	0:01:54	Passengers boarding
16:25:25	109	16:25:27	16:26:25		16:26:57	16:27:06	0	0:01:41	
16:29:00	96	16:29:03	16:29:52		16:30:26	16:30:37	1	0:01:37	Passengers boarding

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
16:32:55	109	16:32:57	16:33:19		16:33:44	16:33:54	0	0:00:59	
16:36:07	96	16:36:10	16:37:01		16:37:14	16:37:26	0	0:01:19	
16:40:34	109	16:40:37	16:41:40		16:41:50	16:42:00	0	0:01:26	
16:41:58	96	16:42:01	16:42:54		16:43:05	16:43:14	0	0:01:16	
16:43:48	109	16:43:51	16:44:04		16:44:17	16:44:28	0	0:00:40	
16:46:39	96	16:46:42	16:47:05		16:47:47	16:47:57	0	0:01:18	
16:51:46	96	16:51:50	16:52:04		16:52:38	16:52:50	0	0:01:04	
16:53:25	109	16:53:27	16:53:39		16:53:47	16:53:57	0	0:00:32	
16:56:58	109	16:57:00	16:57:16		16:57:25	16:57:34	0	0:00:36	
16:59:00	96	16:59:03	16:59:13		16:59:42	16:59:53	0	0:00:53	
17:00:50	109	17:00:52	17:01:48		17:02:00	17:02:10	0	0:01:20	
17:04:13	96	17:04:15	17:04:40		17:06:51	17:07:03	2	0:02:50	Tram waited for unknown reason
17:07:00	109	17:07:02	17:07:41		17:08:05	17:08:15	0	0:01:15	
17:10:56	109	17:10:58	17:11:17		17:11:27	17:11:39	0	0:00:43	
17:13:18	96	17:13:20	17:13:32		17:13:59	17:14:10	0	0:00:52	
17:16:15	96	17:16:17	17:17:18		17:17:45	17:17:58	1	0:01:43	Passengers boarding
17:17:58	109	17:18:00	17:18:39		17:18:50	17:19:00	0	0:01:02	
17:22:38	109	17:22:39	17:23:25		17:23:40	17:23:51	0	0:01:13	
17:25:47	96	17:25:50	17:26:03		17:26:13	17:26:23	0	0:00:36	
17:26:22	109	17:26:24	17:27:07		17:27:18	17:27:30	0	0:01:08	
17:27:08	NIS				17:28:29	17:28:40	0	0:01:32	
17:29:15	109	17:29:17	17:29:30		17:29:41	17:29:51	0	0:00:36	
17:30:47	96	17:30:50	17:30:59		17:32:08	17:32:18	0	0:01:31	
17:31:32	109	17:31:34	17:33:04		17:33:17	17:33:30	1	0:01:58	Tram in front/Passengers boarding
17:33:34	112	17:33:36	17:34:20		17:34:32	17:34:42	0	0:01:08	
17:34:52	35 (Green)				17:35:17	17:35:29	0	0:00:37	
17:36:40	109	17:36:42	17:36:52		17:38:07	17:38:18	0	0:01:38	
17:38:21	96	17:38:23	17:39:14		17:39:30	17:39:40	0	0:01:19	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
17:42:05	109	17:42:07	17:42:18		17:42:52	17:43:02	0	0:00:57	
17:43:36	109	17:43:38	17:43:48		17:44:11	17:44:22	0	0:00:46	
17:44:35	96	17:44:37	17:44:48		17:45:28	17:45:38	0	0:01:03	
17:48:17	109	17:48:19	17:48:50		17:49:15	17:49:25	0	0:01:08	
17:50:12	03 (Red)				17:55:03	17:55:14	3	0:05:02	Tram in front/Passengers boarding
17:50:32	04 (Red)	17:50:34	17:56:07		17:57:21	17:57:33	4	0:07:01	Tram in front/Passengers boarding
17:51:00	05 (Red)	17:51:01	17:55:36		17:57:32	17:57:44	4	0:06:44	Tram in front/Passengers boarding
17:52:07	96	17:52:09	17:57:56		17:58:43	17:58:53	4	0:06:46	Tram in front/Passengers boarding
17:56:54	109	17:57:01	17:59:07		17:59:52	18:00:04	2	0:03:10	Another Tram immediately infront
17:57:42	109	17:57:44	17:59:44		18:01:10	18:01:23	2	0:03:41	Another Tram immediately infront
18:01:20	96	18:01:22	18:02:07		18:02:21	18:02:32	0	0:01:12	
18:05:40	109	18:05:42	18:05:52		18:06:03	18:06:13	0	0:00:33	
18:06:06	96	18:06:08	18:06:19		18:07:07	18:07:17	0	0:01:11	
18:11:22	109	18:11:24	18:11:44		18:11:58	18:12:09	0	0:00:47	
18:17:05	96	18:17:07	18:17:42		18:17:57	18:18:07	0	0:01:02	
18:19:12	109	18:19:14	18:20:05		18:20:20	18:20:32	0	0:01:20	
18:23:37	96	18:23:39	18:23:59		18:24:12	18:24:23	0	0:00:46	
18:25:18	109	18:25:20	18:26:20		18:26:29	18:26:39	0	0:01:21	
18:33:34	96	18:33:36	18:34:14		18:35:06	18:35:18	1	0:01:44	Passengers boarding
18:35:14	109	18:35:16	18:35:30		18:36:13	18:36:24	0	0:01:10	
18:41:24	109	18:41:26	18:41:37		18:41:55	18:42:05	0	0:00:41	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
18:42:17	96	18:42:19	18:42:59		18:43:14	18:43:26	0	0:01:09	
18:50:51	109	18:50:53	18:51:10		18:51:31	18:51:42	0	0:00:51	
18:57:06	96	18:57:08	18:57:21		18:57:46	18:57:56	0	0:00:50	
19:01:09	109	19:01:11	19:01:48		19:02:29	19:02:39	0	0:01:30	
19:04:05	109	19:04:07	19:04:27		19:04:42	19:04:53	0	0:00:48	
19:11:26	96	19:11:29	19:11:58		19:12:11	19:12:21	0	0:00:55	
19:13:05	109	19:13:07	19:13:14		19:14:26	19:14:38	1	0:01:33	Passengers boarding
19:16:23	96	19:16:25	19:16:39		19:17:33	19:17:44	0	0:01:21	
19:26:45	109	19:26:47	19:27:06		19:27:17	19:27:27	0	0:00:42	
19:34:34	96	19:34:36	19:35:27		19:35:41	19:35:51	0	0:01:17	
19:35:28	05 (Red)								Tram returned back
19:35:59	03 (Red)	19:36:06	19:41:20				4		Tram returned back after the passengers alighted
19:36:07	(Red)	19:36:09	19:39:56				3		Tram returned back after the passengers alighted
19:42:58	109	19:43:02	19:43:16		19:44:08	19:44:19	0	0:01:21	
19:48:35	96	19:48:38	19:48:55		19:49:22	19:49:32	0	0:00:57	
19:52:22	109	19:52:24	19:52:48		19:53:57	19:54:07	0	0:01:45	
20:01:33	96	20:01:36	20:01:51		20:02:08	20:02:19	0	0:00:46	
20:08:00	112	20:08:03	20:08:32		20:08:43	20:08:53	0	0:00:53	
20:11:01	109	20:11:03	20:11:17		20:11:35	20:11:47	0	0:00:46	
20:17:35	96	20:17:37	20:18:48		20:19:02	20:19:13	0	0:01:38	
20:26:29	112	20:26:33	20:26:44		20:27:21	20:27:31	0	0:01:02	
20:31:45	109	20:31:47	20:32:12		20:32:46	20:32:56	0	0:01:11	
20:35:09	96	20:35:12	20:35:23		20:35:40	20:35:51	0	0:00:42	
20:36:16	05 (Red)				20:40:22	20:40:34	3	0:04:18	Tram in front/Pas

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
									sengers boarding
20:36:26	03 (Red)	20:36:29	20:39:44		20:41:26	20:41:40	4	0:05:14	Tram in front/Passengers boarding
20:36:57	04 (Red)	20:36:58	20:40:47		20:42:52	20:43:05	4	0:06:08	Tram in front/Passengers boarding
20:40:09	112	20:40:29	20:43:50		20:43:55	20:44:08	3	0:03:59	Tram in front/Passengers boarding
20:46:39	112	20:46:41	20:47:18		20:47:51	20:48:01	0	0:01:22	
20:47:55	96	20:47:57	20:48:41		20:48:53	20:49:04	0	0:01:09	
20:49:06	109	20:49:08	20:49:17		20:49:58	20:50:08	0	0:01:02	
20:50:01	109	20:50:03	20:50:26		20:51:32	20:51:44	0	0:01:43	
21:00:20	96	21:00:23	21:02:01		21:02:27	21:02:38	1	0:02:18	Passengers boarding
21:12:48	109	21:12:51	21:13:08		21:13:45	21:13:55	0	0:01:07	
21:22:41	96	21:22:44	21:22:55		21:23:51	21:24:01	0	0:01:20	
21:28:09	109	21:28:12	21:28:21		21:28:38	21:28:49	0	0:00:40	
21:38:33	96	21:38:36	21:39:17		21:40:05	21:40:15	0	0:01:42	
21:50:14	109	21:50:18	21:50:36		21:51:03	21:51:15	0	0:01:01	
22:01:24	96	22:01:27	22:01:39		22:02:05	22:02:16	0	0:00:52	
22:11:05	109	22:11:09	22:11:25		22:11:38	22:11:48	0	0:00:43	
22:21:32	96	22:21:34	22:22:10		22:22:23	22:22:33	0	0:01:01	
22:30:04	96	22:30:06	22:30:25		22:30:36	22:30:47	0	0:00:43	
22:41:17	96	22:41:21	22:41:53		22:42:25	22:42:35	0	0:01:18	
22:50:24	109	22:50:29	22:51:00		22:51:36	22:51:48	0	0:01:24	
							Average Delay	0:01:21	

Appendix E

Observed Tram Delay – Tuesday 27 March 2012

Appendix E Observed Tram Delay – Tuesday 27 March 2012

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
6:01:41	96				6:02:03	6:02:14	0	0:00:33	
6:03:53	109				6:04:39	6:04:50	0	0:00:57	
6:05:44	112				6:05:50	6:05:55	0	0:00:11	
6:08:33	112	6:08:34	6:08:40	0:00:06	6:09:05	6:09:09	0	0:00:36	
6:09:28	112				6:09:33	6:09:37	0	0:00:09	
6:10:01	112				6:10:53	6:11:06	0	0:01:05	
6:16:28	109	6:16:29	6:16:34	0:00:05	6:17:07	6:17:20	0	0:00:52	
6:19:02	96	6:19:04	6:19:10	0:00:06	6:19:39	6:19:52	0	0:00:50	
6:20:29	112	6:20:30	6:20:36	0:00:06	6:20:44	6:20:49	0	0:00:20	
6:25:04	109	6:25:05	6:25:11	0:00:06	6:26:02	6:26:16	0	0:01:12	
6:35:21	96	6:35:22	6:35:29	0:00:07	6:36:11	6:36:21	0	0:01:00	
6:36:23	109	6:36:25	6:36:31	0:00:06	6:37:14	6:37:26	0	0:01:03	
6:38:26	112	6:38:28	6:38:33	0:00:05	6:38:46	6:38:50	0	0:00:24	
6:39:38	112	6:39:52	6:39:56	0:00:04	6:40:30	6:40:36	0	0:00:58	
6:47:01	112				6:47:27	6:47:32	0	0:00:31	
6:49:41	109	6:49:42	6:49:58	0:00:16	6:50:58	6:51:11	0	0:01:30	
6:50:40	96	6:50:43	6:50:52	0:00:09	6:56:06	6:56:21	2	0:05:41	Tram infront
6:56:22	112	6:56:23	6:56:34	0:00:11	6:57:21	6:57:26	0	0:01:04	
7:03:36	109	7:03:38	7:03:44	0:00:06	7:04:26	7:04:31	0	0:00:55	
7:04:35	112				7:05:31	7:05:43	0	0:01:08	
7:05:17	112	7:05:25	7:05:35	0:00:10	7:06:02	7:06:07	0	0:00:50	
7:06:45	96	7:06:47	7:06:53	0:00:06	7:07:30	7:07:43	0	0:00:58	
7:07:44	109	7:07:47	7:07:51	0:00:04	7:08:18	7:08:31	0	0:00:47	
7:10:11	112	7:10:12	7:10:17	0:00:05	7:10:28	7:10:33	0	0:00:22	
7:11:25	109	7:11:26	7:11:30	0:00:04	7:12:29	7:12:45	0	0:01:20	
7:12:55	96	7:12:56	7:13:07	0:00:11	7:13:24	7:13:34	0	0:00:39	
7:18:45	112	7:18:46	7:18:55	0:00:09	7:19:43	7:19:48	0	0:01:03	
7:20:45	109	7:20:46	7:20:54	0:00:08	7:21:52	7:22:08	0	0:01:23	
7:23:44	96	7:23:46	7:23:55	0:00:09	7:24:22	7:24:35	0	0:00:51	
7:25:24	109	7:25:25	7:25:42	0:00:17	7:26:38	7:26:50	0	0:01:26	
7:27:15	112	7:27:16	7:27:21	0:00:05	7:27:32	7:27:37	0	0:00:22	
7:28:34	109				7:29:53	7:30:07	0	0:01:33	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
7:32:38	96	7:32:40	7:32:50	0:00:10	7:33:30	7:33:44	0	0:01:06	
7:33:48	112				7:35:04	7:35:09	0	0:01:21	
7:39:06	109	7:39:07	7:39:11	0:00:04	7:39:25	7:39:37	0	0:00:31	
7:40:18	96	7:40:20	7:40:29	0:00:09	7:41:28	7:41:40	0	0:01:22	
7:43:14	109	7:43:15	7:43:19	0:00:04	7:43:39	7:43:52	0	0:00:38	
7:44:44	112	7:44:45	7:44:48	0:00:03	7:44:53	7:44:58	0	0:00:14	
7:46:54	112				7:47:04	7:47:09	0	0:00:15	
7:48:55	96	7:48:56	7:49:03	0:00:07	7:50:03	7:50:14	0	0:01:19	
7:50:15	109	7:50:16	7:50:18	0:00:02	7:51:15	7:51:27	0	0:01:12	
7:56:54	109	7:56:55	7:57:05	0:00:10	7:57:22	7:57:34	0	0:00:40	
7:59:36	109	7:59:37	7:59:42	0:00:05	8:00:36	8:00:51	0	0:01:15	
8:01:00	96	8:01:02	8:01:14	0:00:12	8:01:52	8:02:06	0	0:01:06	
8:02:08	112	8:02:09	8:02:20	0:00:11	8:02:58	8:03:03	0	0:00:55	
8:02:18	112	8:02:19	8:02:58	0:00:39	8:03:29	8:03:34	0	0:01:16	
8:03:40	96	8:03:43	8:03:54	0:00:11	8:04:05	8:04:17	0	0:00:37	
8:03:53	109	8:03:54	8:04:02	0:00:08	8:05:08	8:05:23	0	0:01:30	
8:10:27	109	8:10:28	8:10:39	0:00:11	8:11:24	8:11:39	0	0:01:12	
8:11:23	112	8:11:45	8:11:49	0:00:04	8:11:55	8:12:00	0	0:00:37	
8:12:48	96	8:12:50	8:13:01	0:00:11	8:13:47	8:14:01	0	0:01:13	
8:14:52	109	8:14:54	8:14:58	0:00:04	8:15:59	8:16:11	0	0:01:19	
8:15:31	112	8:16:17	8:16:21	0:00:04	8:16:35	8:16:40	0	0:01:09	
8:19:00	112	8:19:01	8:19:20	0:00:19	8:19:37	8:19:42	0	0:00:42	
8:20:58	96	8:20:59	8:21:25	0:00:26	8:22:00	8:22:14	0	0:01:16	
8:22:12	109	8:22:14	8:22:20	0:00:06	8:23:14	8:23:25	0	0:01:13	
8:26:36	96	8:26:38	8:26:49	0:00:11	8:26:58	8:27:09	0	0:00:33	
8:29:17	112	8:29:21	8:29:30	0:00:09	8:30:28	8:30:33	0	0:01:16	
8:29:50	109	8:29:51	8:30:10	0:00:19	8:31:41	8:31:55	0	0:02:05	
8:31:52	109	8:31:53	8:31:59	0:00:06	8:32:50	8:33:04	0	0:01:12	
8:34:38	112	8:34:39	8:34:45	0:00:06	8:35:24	8:35:29	0	0:00:51	
8:35:36	109				8:36:33	8:36:44	0	0:01:08	
8:36:45	96	8:36:48	8:36:59	0:00:11	8:37:50	8:38:02	0	0:01:17	
8:38:02	112				8:38:18	8:38:23	0	0:00:21	
8:39:18	112	8:39:19	8:39:25	0:00:06	8:40:10	8:40:15	0	0:00:57	
8:43:41	96	8:43:42	8:44:00	0:00:18	8:45:03	8:45:14	0	0:01:33	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
8:49:03	109	8:49:04	8:49:30	0:00:26	8:49:43	8:49:56	0	0:00:53	
8:49:50	109	8:49:52	8:50:16	0:00:24	8:50:55	8:51:07	0	0:01:17	
8:51:15	96	8:51:17	8:51:29	0:00:12	8:52:10	8:52:23	0	0:01:08	
8:57:21	112	8:57:22	8:57:29	0:00:07	8:57:45	8:57:50	0	0:00:29	
8:58:36	112	8:58:37	8:58:46	0:00:09	8:59:15	8:59:20	0	0:00:44	
9:00:11	33 (Green)				9:00:28	9:00:39	0	0:00:28	
9:01:36	109	9:01:37	9:01:48	0:00:11	9:02:53	9:03:04	0	0:01:28	
9:03:06	112				9:04:03	9:04:08	0	0:01:02	
9:03:09	112	9:04:16	9:04:37	0:00:21	9:05:08	9:05:19	0	0:02:10	
9:04:19	96	9:04:21	9:05:07	0:00:46	9:06:21	9:06:33	0	0:02:14	
9:05:25	96	9:05:27	9:05:44	0:00:17	9:07:26	9:07:36	0	0:02:11	
9:08:54	96	9:08:55	9:09:05	0:00:10	9:09:51	9:10:04	0	0:01:10	
9:12:43	112				9:13:24	9:13:29	0	0:00:46	
9:13:41	96	9:13:43	9:13:53	0:00:10	9:14:38	9:14:48	0	0:01:07	
9:14:44	109	9:14:45	9:14:53	0:00:08	9:15:49	9:16:00	0	0:01:16	
9:14:52	112	9:14:53	9:15:12	0:00:19	9:16:21	9:16:26	0	0:01:34	
9:16:59	96	9:17:01	9:18:00	0:00:59	9:18:25	9:18:37	0	0:01:38	
9:17:56	109	9:18:36	9:18:38	0:00:02	9:19:25	9:19:36	0	0:01:40	
9:20:09	109	9:20:10	9:20:16	0:00:06	9:20:41	9:20:50	0	0:00:41	
9:23:19	112	9:23:20	9:23:24	0:00:04	9:23:36	9:23:41	0	0:00:22	
9:24:16	109	9:24:17	9:24:21	0:00:04	9:25:23	9:25:34	0	0:01:18	
9:25:37	96	9:25:38	9:25:50	0:00:12	9:26:45	9:26:55	0	0:01:18	
9:29:04	96	9:29:06	9:29:18	0:00:12	9:29:55	9:30:08	0	0:01:04	
9:29:14	30 (Green)				9:31:02	9:31:12	0	0:01:58	
9:30:29	96	9:31:18	9:31:30	0:00:12	9:32:18	9:32:29	0	0:02:00	
9:32:40	112	9:32:43	9:32:48	0:00:05	9:33:10	9:33:15	0	0:00:35	
9:32:58	112	9:32:59	9:33:08	0:00:09	9:33:20	9:33:25	0	0:00:27	
9:35:18	109	9:35:19	9:35:23	0:00:04	9:36:27	9:36:40	0	0:01:22	
9:37:23	96	9:37:25	9:37:37	0:00:12	9:38:38	9:38:50	0	0:01:27	
9:38:53	112				9:39:40	9:39:52	0	0:00:59	
9:40:42	112	9:40:43	9:40:50	0:00:07	9:40:59	9:41:04	0	0:00:22	
9:41:25	112	9:41:26	9:41:30	0:00:04	9:42:26	9:42:36	0	0:01:11	
9:42:32	NIS	9:42:35	9:42:44	0:00:09	9:43:24	9:43:34	0	0:01:02	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
9:42:44	109	9:43:37	9:44:04	0:00:27	9:44:36	9:44:48	0	0:02:04	
9:43:42	112	9:43:43	9:43:57	0:00:14	9:45:05	9:45:10	0	0:01:28	
9:45:37	109	9:45:38	9:45:44	0:00:06	9:46:48	9:47:00	0	0:01:23	
9:51:16	112	9:51:17	9:52:02	0:00:45	9:52:58	9:53:04	0	0:01:48	
9:56:22	109				9:56:39	9:56:50	0	0:00:28	
9:57:47	96	9:57:49	9:58:01	0:00:12	9:58:43	9:58:53	0	0:01:06	
9:58:54	96	9:58:56	9:59:08	0:00:12	9:59:58	10:00:08	0	0:01:14	
10:00:59	109	10:01:01	10:01:08	0:00:07	10:01:17	10:01:27	0	0:00:28	
10:03:35	112	10:03:36	10:03:40	0:00:04	10:04:30	10:04:35	0	0:01:00	
10:04:41	96	10:04:43	10:04:55	0:00:12	10:05:35	10:05:46	0	0:01:05	
10:04:47	96				10:06:49	10:07:00	0	0:02:13	
10:05:52	109				10:06:57	10:07:08	0	0:01:16	
10:08:58	96	10:08:59	10:09:11	0:00:12	10:10:22	10:10:32	0	0:01:34	
10:10:45	112	10:10:46	10:10:51	0:00:05	10:11:36	10:11:41	0	0:00:56	
10:14:37	109				10:15:05	10:15:16	0	0:00:39	
10:14:45	112				10:16:16	10:16:27	0	0:01:42	
10:16:32	112				10:16:55	10:17:00	0	0:00:28	
10:19:23	109	10:19:25	10:19:30	0:00:05	10:19:43	10:19:54	0	0:00:31	
10:20:41	96	10:20:43	10:20:50	0:00:07	10:21:52	10:22:02	0	0:01:21	
10:22:09	112	10:22:11	10:22:15	0:00:04	10:22:55	10:23:00	0	0:00:51	
10:26:26	96	10:26:28	10:26:36	0:00:08	10:27:10	10:27:22	0	0:00:56	
10:28:30	112	10:28:31	10:28:35	0:00:04	10:29:18	10:29:23	0	0:00:53	
10:29:43	109	10:29:45	10:30:22	0:00:37	10:30:36	10:30:47	0	0:01:04	
10:30:46	112	10:30:47	10:30:52	0:00:05	10:31:38	10:31:43	0	0:00:57	
10:34:45	96	10:34:47	10:34:59	0:00:12	10:35:32	10:35:42	0	0:00:57	
10:35:44	109				10:36:36	10:36:47	0	0:01:03	
10:40:26	96	10:40:29	10:40:36	0:00:07	10:40:57	10:41:08	0	0:00:42	
10:43:00	112	10:43:01	10:43:05	0:00:04	10:43:55	10:44:00	0	0:01:00	
10:44:07	109	10:44:08	10:44:16	0:00:08	10:45:13	10:45:24	0	0:01:17	
10:49:27	112	10:49:28	10:49:39	0:00:11	10:49:56	10:50:06	0	0:00:39	
10:50:51	112	10:50:52	10:50:57	0:00:05	10:51:05	10:51:10	0	0:00:19	
10:51:38	109	10:51:40	10:51:56	0:00:16	10:52:06	10:52:17	0	0:00:39	
10:55:18	112	10:55:19	10:55:23	0:00:04	10:55:57	10:56:02	0	0:00:44	
10:58:40	96	10:58:42	10:58:52	0:00:10	10:59:14	10:59:24	0	0:00:44	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
11:01:21	109	11:01:22	11:01:58	0:00:36	11:02:17	11:02:27	0	0:01:06	
11:03:52	112	11:03:53	11:04:01	0:00:08	11:04:13	11:04:18	0	0:00:26	
11:05:10	96				11:06:13	11:06:24	0	0:01:14	
11:10:23	96	11:10:24	11:10:37	0:00:13	11:11:07	11:11:18	0	0:00:55	
11:11:57	112	11:11:58	11:12:08	0:00:10	11:12:25	11:12:30	0	0:00:33	
11:20:37	96	11:20:40	11:20:51	0:00:11	11:21:39	11:21:50	0	0:01:13	
11:21:48	108	11:21:49	11:22:00	0:00:11	11:22:44	11:22:57	0	0:01:09	
11:22:23	109	11:22:27	11:22:35	0:00:08	11:23:47	11:23:59	0	0:01:36	
11:23:14	112				11:24:51	11:24:56	0	0:01:42	
11:25:03	109	11:25:04	11:25:15	0:00:11	11:26:27	11:26:39	0	0:01:36	
11:26:58	96	11:27:00	11:27:12	0:00:12	11:27:34	11:27:45	0	0:00:47	
11:33:15	96	11:33:17	11:33:29	0:00:12	11:34:06	11:34:18	0	0:01:03	
11:34:24	112	11:34:25	11:34:30	0:00:05	11:34:37	11:34:42	0	0:00:18	
11:36:48	112	11:36:50	11:37:34	0:00:44	11:38:23	11:38:28	0	0:01:40	
11:37:53	109	11:37:54	11:38:07	0:00:13	11:39:25	11:39:38	0	0:01:45	
11:38:55	96	11:38:57	11:39:06	0:00:09	11:40:36	11:40:48	0	0:01:53	
11:39:42	109	11:39:43	11:40:00	0:00:17	11:41:14	11:41:41	0	0:01:59	
11:45:06	112	11:45:07	11:45:13	0:00:06	11:45:19	11:45:24	0	0:00:18	
11:50:08	96	11:50:10	11:50:20	0:00:10	11:51:15	11:51:26	0	0:01:18	
11:51:21	109	11:51:22	11:52:00	0:00:38	11:52:19	11:52:30	0	0:01:09	
11:52:41	112	11:52:42	11:52:47	0:00:05	11:52:54	11:52:59	0	0:00:18	
11:56:31	96	11:56:33	11:56:44	0:00:11	11:57:16	11:57:27	0	0:00:56	
11:59:07	109	11:59:08	11:59:15	0:00:07	11:59:23	11:59:35	0	0:00:28	
12:01:50	112	12:01:51	12:02:03	0:00:12	12:02:31	12:02:36	0	0:00:46	
12:03:37	109				12:04:14	12:04:25	0	0:00:48	
12:04:52	96	12:04:53	12:05:05	0:00:12	12:05:21	12:05:32	0	0:00:40	
12:10:16	96	12:10:19	12:10:28	0:00:09	12:11:08	12:11:20	0	0:01:04	
12:12:08	112	12:12:09	12:12:17	0:00:08	12:12:40	12:12:45	0	0:00:37	
12:14:59	109	12:15:00	12:15:15	0:00:15	12:16:19	12:16:30	0	0:01:31	
12:16:30	112	12:16:31	12:16:43	0:00:12	12:16:52	12:16:57	0	0:00:27	
12:18:02	96	12:18:04	12:18:14	0:00:10	12:19:26	12:19:37	0	0:01:35	
12:24:39	109	12:24:40	12:24:50	0:00:10	12:25:45	12:25:57	0	0:01:18	
12:27:48	96	12:27:50	12:27:56	0:00:06	12:28:07	12:28:17	0	0:00:29	
12:30:30	96	12:30:32	12:30:43	0:00:11	12:31:31	12:31:42	0	0:01:12	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
12:32:36	109	12:32:38	12:32:45	0:00:07	12:33:30	12:33:43	0	0:01:07	
12:33:47	112	12:33:49	12:34:01	0:00:12	12:34:37	12:34:42	0	0:00:55	
12:35:00	112				12:35:03	12:35:08	0	0:00:08	
12:36:05	96	12:36:07	12:36:21	0:00:14	12:36:40	12:36:52	0	0:00:47	
12:37:41	112	12:37:42	12:37:50	0:00:08	12:38:33	12:38:38	0	0:00:57	
12:39:46	109	12:39:47	12:39:58	0:00:11	12:40:32	12:40:42	0	0:00:56	
12:45:45	112	12:45:46	12:46:15	0:00:29	12:47:37	12:47:49	0	0:02:04	
12:48:07	109	12:48:08	12:48:17	0:00:09	12:49:47	12:49:58	0	0:01:51	
12:49:59	112	12:50:00	12:50:44	0:00:44	12:51:03	12:51:08	0	0:01:09	
12:51:28	109	12:51:30	12:51:36	0:00:06	12:52:43	12:52:54	0	0:01:26	
12:52:55	96	12:52:57	12:53:09	0:00:12	12:53:45	12:53:55	0	0:01:00	
12:57:05	96				12:57:25	12:57:36	0	0:00:31	
12:59:25	112	12:59:26	12:59:33	0:00:07	13:00:30	13:00:35	0	0:01:10	
13:05:03	109	13:05:04	13:05:13	0:00:09	13:06:11	13:06:22	0	0:01:19	
13:06:33	112	13:06:34	13:06:55	0:00:21	13:07:14	13:07:19	0	0:00:46	
13:08:11	96	13:08:13	13:08:25	0:00:12	13:09:16	13:09:28	0	0:01:17	
13:09:55	109	13:09:57	13:10:04	0:00:07	13:10:18	13:10:32	0	0:00:37	
13:14:48	112				13:15:07	13:15:12	0	0:00:24	
13:15:43	96	13:15:45	13:15:53	0:00:08	13:16:18	13:16:33	0	0:00:50	
13:19:03	109				13:19:34	13:19:44	0	0:00:41	
13:20:08	112	13:20:08	13:20:13	0:00:05	13:20:21	13:20:26	0	0:00:18	
13:24:16	96	13:24:18	13:24:28	0:00:10	13:24:39	13:24:50	0	0:00:34	
13:24:50	109	13:24:51	13:25:28	0:00:37	13:25:52	13:26:02	0	0:01:12	
13:28:47	96	13:28:49	13:29:00	0:00:11	13:29:13	13:29:23	0	0:00:36	
13:29:28	112	13:29:29	13:30:02	0:00:33	13:30:22	13:30:27	0	0:00:59	
13:32:30	109	13:32:32	13:33:21	0:00:49	13:33:37	13:33:48	0	0:01:18	
13:37:20	112	13:37:21	13:37:30	0:00:09	13:37:37	13:37:42	0	0:00:22	
13:39:14	96	13:39:16	13:39:25	0:00:09	13:39:35	13:39:46	0	0:00:32	
13:39:50	109	13:39:51	13:40:01	0:00:10	13:40:42	13:40:53	0	0:01:03	
13:48:07	96	13:48:09	13:48:33	0:00:24	13:49:01	13:49:11	0	0:01:04	
13:50:57	112	13:50:58	13:51:12	0:00:14	13:51:33	13:51:38	0	0:00:41	
13:51:53	96	13:51:55	13:52:02	0:00:07	13:52:12	13:52:13	0	0:00:20	
13:53:11	112	13:53:12	13:53:20	0:00:08	13:53:38	13:53:43	0	0:00:32	
13:55:20	109	13:55:21	13:55:34	0:00:13	13:56:16	13:56:26	0	0:01:06	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
13:56:32	109	13:56:34	13:56:46	0:00:12	13:57:25	13:57:37	0	0:01:05	
13:57:52	112				13:57:56	13:58:01	0	0:00:09	
13:59:21	96	13:59:22	13:59:53	0:00:31	14:00:24	14:00:36	0	0:01:15	
14:03:01	109	14:03:02	14:03:13	0:00:11	14:03:24	14:03:34	0	0:00:33	
14:08:30	96	14:08:33	14:09:05	0:00:32	14:09:54	14:10:05	0	0:01:35	
14:13:19	112	14:13:20	14:13:31	0:00:11	14:13:42	14:13:47	0	0:00:28	
14:14:30	96	14:14:32	14:14:43	0:00:11	14:14:52	14:15:02	0	0:00:32	
14:15:23	109	14:15:27	14:15:36	0:00:09	14:15:56	14:16:06	0	0:00:43	
14:16:30	112	14:16:31	14:16:34	0:00:03	14:16:41	14:16:46	0	0:00:16	
14:22:52	96	14:22:54	14:23:01	0:00:07	14:23:35	14:23:46	0	0:00:54	
14:23:50	112	14:23:51	14:24:04	0:00:13	14:24:51	14:24:56	0	0:01:06	
14:24:40	109	14:24:41	14:25:56	0:01:15	14:26:05	14:26:15	0	0:01:35	
14:26:57	109	14:26:59	14:27:14	0:00:15	14:28:16	14:28:17	0	0:01:20	
14:33:22	112	14:33:23	14:33:35	0:00:12	14:33:45	14:33:51	0	0:00:29	
14:34:27	96	14:34:29	14:35:18	0:00:49	14:36:44	14:36:54	0	0:02:27	
14:36:59	96	14:37:01	14:37:12	0:00:11	14:37:55	14:38:06	0	0:01:07	
14:39:46	112	14:39:47	14:39:53	0:00:06	14:40:17	14:40:22	0	0:00:36	
14:41:00	109	14:41:01	14:41:09	0:00:08	14:41:23	14:41:34	0	0:00:34	
14:43:05	109	14:43:06	14:43:34	0:00:28	14:43:51	14:44:01	0	0:00:56	
14:44:38	112	14:44:39	14:44:50	0:00:11	14:45:02	14:45:14	0	0:00:36	
14:47:25	NIS				14:48:42	14:48:53	0	0:01:28	
14:51:09	112	14:51:10	14:51:21	0:00:11	14:51:43	14:51:48	0	0:00:39	
14:52:01	96	14:52:03	14:52:15	0:00:12	14:52:58	14:53:10	0	0:01:09	
14:53:12	109	14:53:13	14:53:22	0:00:09	14:54:12	14:54:22	0	0:01:10	
14:59:01	109	14:59:02	14:59:12	0:00:10	14:59:48	14:59:59	0	0:00:58	
14:59:59	96	15:00:00	15:00:18	0:00:18	15:01:02	15:01:13	0	0:01:14	
15:01:18	112	15:01:19	15:01:26	0:00:07	15:01:34	15:01:39	0	0:00:21	
15:01:39	112				15:01:46	15:01:51	0	0:00:12	
15:06:11	96	15:06:15	15:06:36	0:00:21	15:07:41	15:07:53	0	0:01:42	
15:06:39	109	15:06:50	15:08:39	0:01:49	15:08:49	15:08:59	0	0:02:20	
15:14:03	112	15:14:05	15:14:27	0:00:22	15:15:41	15:15:46	0	0:01:43	
15:16:16	96	15:16:18	15:16:27	0:00:09	15:16:48	15:16:59	0	0:00:43	
15:17:27	109				15:17:54	15:18:05	0	0:00:38	
15:20:26	112	15:20:27	15:20:32	0:00:05	15:20:38	15:20:43	0	0:00:17	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
15:21:32	96	15:21:34	15:21:58	0:00:24	15:22:59	15:23:10	0	0:01:38	
15:23:12	109	15:23:13	15:23:21	0:00:08	15:24:05	15:24:17	0	0:01:05	
15:28:13	112	15:28:14	15:29:54	0:01:40	15:30:06	15:30:11	0	0:01:58	
15:31:05	96	15:31:07	15:31:19	0:00:12	15:31:43	15:31:55	0	0:00:50	
15:31:58	109	15:31:59	15:32:12	0:00:13	15:32:48	15:32:58	0	0:01:00	
15:33:14	112				15:35:41	15:35:46	0	0:02:32	
15:37:05	96	15:37:07	15:37:19	0:00:12	15:38:01	15:38:12	0	0:01:07	
15:39:03	109	15:39:04	15:39:17	0:00:13	15:39:53	15:40:05	0	0:01:02	
15:42:56	112	15:42:57	15:43:28	0:00:31	15:43:39	15:43:44	0	0:00:48	
15:47:17	96	15:47:19	15:47:31	0:00:12	15:47:58	15:48:10	0	0:00:53	
15:48:05	109	15:48:06	15:48:37	0:00:31	15:48:56	15:49:06	0	0:01:01	
15:50:32	112	15:50:33	15:51:45	0:01:12	15:51:51	15:51:56	0	0:01:24	
15:52:28	96	15:52:30	15:52:43	0:00:13	15:53:00	15:53:12	0	0:00:44	
15:56:51	109	15:56:52	15:57:03	0:00:11	15:57:11	15:57:21	0	0:00:30	
15:59:35	112	15:59:36	15:59:53	0:00:17	16:00:07	16:00:12	0	0:00:37	
16:06:43	109	16:06:44	16:06:53	0:00:09	16:07:05	16:07:15	0	0:00:32	
16:08:06	96	16:08:07	16:08:16	0:00:09	16:09:12	16:09:23	0	0:01:17	
16:10:25	112	16:10:26	16:10:58	0:00:32	16:11:06	16:11:11	0	0:00:46	
16:12:35	109	16:12:57	16:13:09	0:00:12	16:14:02	16:14:14	0	0:01:39	
16:15:05	109	16:15:06	16:15:18	0:00:12	16:16:28	16:16:40	0	0:01:35	
16:20:07	96	16:20:08	16:20:42	0:00:34	16:21:10	16:21:22	0	0:01:15	
16:21:27	112	16:21:28	16:21:53	0:00:25	16:22:14	16:22:19	0	0:00:52	
16:21:29	109	16:21:30	16:22:37	0:01:07	16:23:35	16:23:46	0	0:02:17	
16:23:54	112	16:23:55	16:24:05	0:00:10	16:24:46	16:24:51	0	0:00:57	
16:24:35	96	16:24:37	16:24:47	0:00:10	16:26:00	16:26:08	0	0:01:33	
16:31:30	96	16:31:31	16:31:43	0:00:12	16:31:54	16:32:05	0	0:00:35	
16:36:08	112	16:36:09	16:36:16	0:00:07	16:36:41	16:36:46	0	0:00:38	
16:36:57	96	16:36:59	16:37:13	0:00:14	16:37:22	16:37:31	0	0:00:34	
16:37:45	109	16:37:46	16:38:03	0:00:17	16:38:24	16:38:34	0	0:00:49	
16:38:30	109	16:38:31	16:39:08	0:00:37	16:39:27	16:39:37	0	0:01:07	
16:39:43	112	16:39:44	16:40:00	0:00:16	16:40:34	16:40:39	0	0:00:56	
16:40:20	109	16:40:21	16:40:36	0:00:15	16:41:47	16:41:58	0	0:01:38	
16:43:29	109	16:43:30	16:43:40	0:00:10	16:43:54	16:44:07	0	0:00:38	
16:44:08	112	16:44:10	16:45:01	0:00:51	16:45:11	16:45:23	0	0:01:15	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
16:48:11	96	16:48:13	16:48:35	0:00:22	16:48:43	16:48:53	0	0:00:42	
16:50:20	112	16:50:21	16:50:30	0:00:09	16:50:38	16:50:42	0	0:00:22	
16:51:22	109	16:51:23	16:51:35	0:00:12	16:51:50	16:52:00	0	0:00:38	
16:52:15	109	16:52:16	16:52:33	0:00:17	16:53:00	16:53:12	0	0:00:57	
16:55:13	96	16:55:14	16:56:12	0:00:58	16:56:38	16:56:48	0	0:01:35	
16:57:21	109	16:57:22	16:57:31	0:00:09	16:57:45	16:57:55	0	0:00:34	
16:59:43	112	16:59:44	16:59:48	0:00:04	16:59:57	17:00:02	0	0:00:19	
17:00:52	109	17:00:54	17:01:04	0:00:10	17:01:18	17:01:29	0	0:00:37	
17:02:06	109	17:02:07	17:02:18	0:00:11	17:02:44	17:02:56	0	0:00:50	
17:06:45	96	17:06:48	17:07:05	0:00:17	17:07:20	17:07:31	0	0:00:46	
17:07:28	109	17:07:30	17:07:55	0:00:25	17:08:33	17:08:46	0	0:01:18	
17:09:11	112	17:09:12	17:09:36	0:00:24	17:09:44	17:09:49	0	0:00:38	
17:10:46	96	17:10:48	17:11:01	0:00:13	17:12:02	17:12:12	0	0:01:26	
17:12:08	109	17:12:10	17:12:57	0:00:47	17:13:06	17:13:18	0	0:01:10	
17:13:22	112	17:13:23	17:13:34	0:00:11	17:13:47	17:13:52	0	0:00:30	
17:14:06	35 (Red)	17:14:08	17:14:41	0:00:33	17:16:49	17:17:01	0	0:02:55	
17:17:03	112	17:17:04	17:17:54	0:00:50	17:18:01	17:18:06	0	0:01:03	
17:18:14	109	17:18:15	17:18:28	0:00:13	17:19:11	17:19:22	0	0:01:08	
17:19:18	96	17:19:20	17:19:37	0:00:17	17:20:26	17:20:38	0	0:01:20	
17:25:45	109	17:25:46	17:26:03	0:00:17	17:26:28	17:26:40	0	0:00:55	
17:26:38	96	17:26:40	17:26:52	0:00:12	17:27:41	17:27:52	0	0:01:14	
17:26:47	109	17:26:48	17:27:33	0:00:45	17:28:49	17:29:01	0	0:02:14	
17:28:11	109				17:30:07	17:30:19	0	0:02:08	
17:30:41	112				17:30:44	17:30:49	0	0:00:08	
17:32:07	109	17:32:08	17:33:27	0:01:19	17:33:36	17:33:46	0	0:01:39	
17:33:22	112	17:33:23	17:34:40	0:01:17	17:34:48	17:34:52	0	0:01:30	
17:40:24	96	17:40:26	17:41:04	0:00:38	17:42:11	17:42:21	0	0:01:57	
17:42:24	112	17:42:25	17:42:34	0:00:09	17:42:41	17:42:46	0	0:00:22	
17:42:31	96	17:42:56	17:43:08	0:00:12	17:43:23	17:43:25	0	0:00:54	
17:43:41	109	17:43:42	17:44:07	0:00:25	17:44:34	17:44:45	0	0:01:04	
17:44:47	112	17:44:48	17:45:31	0:00:43	17:45:45	17:45:50	0	0:01:03	
17:45:21	96	17:46:04	17:46:15	0:00:11	17:46:59	17:47:11	0	0:01:50	
17:50:04	96	17:50:06	17:50:17	0:00:11	17:50:33	17:50:43	0	0:00:39	
17:51:38	109	17:51:39	17:52:40	0:01:01	17:52:56	17:53:07	0	0:01:29	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
17:53:09	04 (Red)				17:54:06	17:54:11	0	0:01:02	
17:53:55	05 (Red)				17:54:12	17:54:17	0	0:00:22	
17:54:49	03 (Red)				17:54:53	17:54:58	0	0:00:09	
17:55:17	112	17:55:18	17:56:06	0:00:48	17:56:22	17:56:27	0	0:01:10	
17:56:10	109	17:56:11	17:57:30	0:01:19	17:57:39	17:57:50	0	0:01:40	
17:56:48	38 (Green)				17:58:42	17:58:52	0	0:02:04	
18:01:23	109	18:01:24	18:01:33	0:00:09	18:02:41	18:02:51	0	0:01:28	
18:02:50	96	18:02:51	18:03:12	0:00:21	18:03:52	18:04:03	0	0:01:13	
18:04:10	96	18:04:12	18:04:24	0:00:12	18:05:04	18:05:15	0	0:01:05	
18:05:18	112	18:05:19	18:06:00	0:00:41	18:06:17	18:06:22	0	0:01:04	
18:09:20	96	18:09:22	18:09:34	0:00:12	18:09:51	18:10:01	0	0:00:41	
18:11:02	109	18:11:03	18:11:12	0:00:09	18:12:18	18:12:30	0	0:01:28	
18:12:36	38 (Green)				18:13:33	18:13:43	0	0:01:07	
18:19:48	112	18:19:49	18:20:29	0:00:40	18:20:37	18:20:42	0	0:00:54	
18:20:51	96	18:20:52	18:21:37	0:00:45	18:21:53	18:22:06	0	0:01:15	
18:22:10	53 (Green)				18:22:59	18:23:09	0	0:00:59	
18:22:16	109	18:22:17	18:22:38	0:00:21	18:23:06	18:23:16	0	0:01:00	
18:23:33	96	18:23:35	18:23:47	0:00:12	18:24:08	18:24:18	0	0:00:45	
18:26:04	112	18:26:05	18:26:13	0:00:08	18:26:19	18:26:24	0	0:00:20	
18:26:41	112	18:26:42	18:27:28	0:00:46	18:27:38	18:27:43	0	0:01:02	
18:30:56	96	18:30:57	18:31:09	0:00:12	18:31:19	18:31:30	0	0:00:34	
18:32:56	33 (Green)				18:33:42	18:33:52	0	0:00:56	
18:33:27	35 (Red)				18:33:48	18:33:58	0	0:00:31	
18:34:37	109	18:34:38	18:34:48	0:00:10	18:35:43	18:35:53	0	0:01:16	
18:35:29	109	18:35:49	18:36:01	0:00:12	18:36:55	18:37:05	0	0:01:36	
18:37:20	96	18:37:22	18:37:54	0:00:32	18:38:06	18:38:17	0	0:00:57	
18:38:23	0 (Green)				18:39:20	18:39:29	0	0:01:06	
18:40:07	112	18:40:08	18:40:18	0:00:10	18:40:24	18:40:29	0	0:00:22	
18:43:25	109	18:43:26	18:43:37	0:00:11	18:43:58	18:44:07	0	0:00:42	
18:44:59	112	18:45:00	18:45:08	0:00:08	18:45:16	18:45:21	0	0:00:22	
18:45:40	96	18:45:41	18:45:53	0:00:12	18:46:30	18:46:38	0	0:00:58	
18:46:42	30				18:47:44	18:47:56	0	0:01:14	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
	(Green)								
18:50:50	109	18:50:51	18:50:57	0:00:06	18:51:10	18:51:21	0	0:00:31	
18:51:59	112	18:52:00	18:52:08	0:00:08	18:52:15	18:52:20	0	0:00:21	
18:53:04	96	18:53:06	18:53:17	0:00:11	18:53:28	18:53:38	0	0:00:34	
18:54:01	NIS				18:54:24	18:54:33	0	0:00:32	
18:55:33	35 (Red)				18:56:25	18:56:37	0	0:01:04	
18:59:07	96	18:59:08	18:59:18	0:00:10	18:59:29	18:59:38	0	0:00:31	
19:00:00	109	19:00:02	19:00:11	0:00:09	19:00:31	19:00:42	0	0:00:42	
19:00:21	NIS				19:01:41	19:01:51	0	0:01:30	
19:02:30	109	19:02:31	19:02:40	0:00:09	19:02:47	19:02:57	0	0:00:27	
19:03:16	112				19:03:45	19:03:56	0	0:00:40	
19:04:06	112	19:04:07	19:04:17	0:00:10	19:04:24	19:04:29	0	0:00:23	
19:04:15	35 (Green)	19:04:48	19:05:01	0:00:13	19:05:42	19:05:53	0	0:01:38	
19:07:24	96	19:07:26	19:07:39	0:00:13	19:08:28	19:08:38	0	0:01:14	
19:08:48	112	19:08:49	19:08:55	0:00:06	19:09:29	19:09:34	0	0:00:46	
19:10:52	109	19:10:53	19:11:07	0:00:14	19:11:25	19:11:34	0	0:00:42	
19:15:47	05 (Red)				19:16:03	19:16:19	0	0:00:32	
19:16:06	03 (Red)				19:16:11	19:16:26	0	0:00:20	
19:16:22	04 (Red)				19:17:16	19:17:30	0	0:01:08	
19:17:06	112	19:17:34	19:17:42	0:00:08	19:17:52	19:17:57	0	0:00:51	
19:18:19	96	19:18:21	19:18:30	0:00:09	19:18:39	19:18:50	0	0:00:31	
19:23:06	109	19:23:07	19:23:26	0:00:19	19:24:06	19:24:14	0	0:01:08	
19:25:12	112	19:25:15	19:28:38	0:03:23	19:28:57	19:29:02	1	0:03:50	Driver talking to a passenger
19:26:42	96	19:26:44	19:29:26	0:02:42	19:30:20	19:30:30	1	0:03:48	Tram infront
19:29:13	NIS	19:29:15	19:29:23	0:00:08	19:31:28	19:31:38	0	0:02:25	
19:33:06	96				19:33:23	19:33:33	0	0:00:27	
19:37:02	112	19:37:03	19:37:10	0:00:07	19:37:16	19:37:21	0	0:00:19	
19:38:56	112				19:39:12	19:39:21	0	0:00:25	
19:44:49	96	19:44:52	19:45:02	0:00:10	19:45:23	19:45:34	0	0:00:45	
19:45:07	112	19:45:08	19:45:14	0:00:06	19:45:52	19:45:57	0	0:00:50	
19:53:35	112	19:53:36	19:54:43	0:01:07	19:54:52	19:54:57	0	0:01:22	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
19:55:24	96	19:55:26	19:55:38	0:00:12	19:55:51	19:56:01	0	0:00:37	
19:55:38	112	19:55:40	19:55:44	0:00:04	19:56:58	19:57:08	0	0:01:30	
19:57:20	109	19:57:22	19:57:40	0:00:18	19:57:59	19:58:10	0	0:00:50	
20:04:40	112	20:04:42	20:04:48	0:00:06	20:05:38	20:05:42	0	0:01:02	
20:09:33	96	20:09:35	20:09:49	0:00:14	20:10:24	20:10:34	0	0:01:01	
20:10:38	109	20:10:39	20:10:55	0:00:16	20:11:22	20:11:32	0	0:00:54	
20:20:57	96	20:20:59	20:21:07	0:00:08	20:21:15	20:21:25	0	0:00:28	
20:21:21	NIS				20:22:22	20:22:32	0	0:01:11	
20:21:41	112	20:21:42	20:22:48	0:01:06	20:22:53	20:22:58	0	0:01:17	
20:32:24	109	20:32:36	20:32:42	0:00:06	20:32:51	20:33:02	0	0:00:38	
20:40:09	112	20:40:10	20:40:19	0:00:09	20:40:27	20:40:32	0	0:00:23	
20:48:44	96	20:48:46	20:48:58	0:00:12	20:49:53	20:50:04	0	0:01:20	
20:52:28	109	20:52:29	20:52:48	0:00:19	20:53:28	20:53:38	0	0:01:10	
20:56:49	96	20:56:51	20:57:02	0:00:11	20:58:00	20:58:09	0	0:01:20	
21:00:22	112	21:00:23	21:00:33	0:00:10	21:00:40	21:00:45	0	0:00:23	
21:05:59	96	21:06:00	21:06:13	0:00:13	21:07:12	21:07:23	0	0:01:24	
21:08:55	109	21:08:56	21:09:07	0:00:11	21:09:53	21:10:03	0	0:01:08	
21:19:50	112	21:19:51	21:20:40	0:00:49	21:20:53	21:20:58	0	0:01:08	
21:22:48	96	21:22:50	21:23:00	0:00:10	21:23:40	21:23:50	0	0:01:02	
21:24:04	03 (Red)				21:24:42	21:24:57	0	0:00:53	
21:29:07	109	21:29:07	21:29:35	0:00:28	21:30:03	21:30:13	0	0:01:06	
21:33:47	96	21:33:49	21:33:58	0:00:09	21:34:30	21:34:40	0	0:00:53	
21:42:25	112	21:42:27	21:42:38	0:00:11	21:43:16	21:43:21	0	0:00:56	
21:50:05	109	21:50:07	21:50:13	0:00:06	21:51:02	21:51:13	0	0:01:08	
21:55:10	96	21:55:12	21:55:20	0:00:08	21:55:30	21:55:38	0	0:00:28	
21:57:23	112	21:57:25	21:57:34	0:00:09	21:57:45	21:57:50	0	0:00:27	
22:03:43	96	22:03:45	22:03:51	0:00:06	22:04:42	22:04:52	0	0:01:09	
22:10:50	109	22:10:51	22:10:57	0:00:06	22:11:29	22:11:38	0	0:00:48	
22:18:50	112	22:18:52	22:19:21	0:00:29	22:20:17	22:20:22	0	0:01:32	
22:20:35	NIS				22:21:23	22:21:33	0	0:00:58	
22:23:05	96	22:23:07	22:23:15	0:00:08	22:23:45	22:23:53	0	0:00:48	
22:31:39	109	22:31:41	22:31:55	0:00:14	22:32:46	22:32:54	0	0:01:15	
22:37:21	112	22:37:23	22:37:55	0:00:32	22:38:23	22:38:28	0	0:01:07	
22:43:10	96	22:43:13	22:43:24	0:00:11	22:43:48	22:43:58	0	0:00:48	

Tram stop 124B (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
22:49:22	112	22:49:23	22:49:43	0:00:20	22:50:02	22:50:13	0	0:00:51	
22:57:16	112	22:57:17	22:57:25	0:00:08	22:57:34	22:57:39	0	0:00:23	
							Average Delay	0:01:02	

Tram stop 125 (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
6:11:48	112				6:11:50	6:11:58	0	0:00:10	
6:18:40	112				6:18:42	6:18:53	0	0:00:13	
6:37:20	112				6:38:20	6:38:27	0	0:01:07	
6:50:34	112				6:51:32	6:51:38	0	0:01:04	
6:57:44	112				6:59:06	6:59:12	0	0:01:28	
7:14:24	112				7:14:26	7:14:36	0	0:00:12	
7:15:35	112				7:15:44	7:15:54	0	0:00:19	
7:24:56	112	7:25:01	7:27:03	0:02:02	7:27:11	7:27:20	0	0:02:24	
7:29:11	112	7:29:12	7:29:14	0:00:02	7:29:22	7:29:29	0	0:00:18	
7:41:09	112	7:41:13	7:41:14	0:00:01	7:43:03	7:43:12	0	0:02:03	
7:45:30	112	7:45:31	7:45:35	0:00:04	7:45:43	7:45:53	0	0:00:23	
7:54:57	112	7:54:58	7:56:38	0:01:40	7:56:49	7:56:59	0	0:02:02	
8:05:09	112	8:05:10	8:05:18	0:00:08	8:05:42	8:05:52	0	0:00:43	
8:15:39	112				8:16:40	8:16:49	0	0:01:10	
8:21:40	112	8:21:43	8:22:48	0:01:05	8:23:53	8:23:59	0	0:02:19	
8:29:52	112	8:29:55	8:30:04	0:00:09	8:31:06	8:31:13	0	0:01:21	
8:37:53	112	8:37:57	8:38:05	0:00:08	8:38:23	8:38:28	0	0:00:35	
8:38:56	112	8:39:10	8:39:57	0:00:47	8:40:49	8:40:55	0	0:01:59	
8:51:16	112	8:51:19	8:51:26	0:00:07	8:52:44	8:52:50	0	0:01:34	
8:53:36	112				8:53:38	8:53:42	0	0:00:06	
8:56:27	112	8:56:28	8:56:55	0:00:27	8:57:15	8:57:22	0	0:00:55	
9:00:56	112	9:01:01	9:01:09	0:00:08	9:02:23	9:02:31	0	0:01:35	
9:07:49	112	9:07:51	9:07:59	0:00:08	9:08:39	9:08:46	0	0:00:57	
9:09:16	112				9:09:19	9:09:24	0	0:00:08	
9:15:09	112	9:15:11	9:15:32	0:00:21	9:16:22	9:16:28	0	0:01:19	
9:24:52	112	9:24:57	9:25:22	0:00:25	9:25:59	9:26:06	0	0:01:14	

Tram stop 125 (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
9:33:33	112	9:33:35	9:33:39	0:00:04	9:34:22	9:34:28	0	0:00:55	
9:34:33	00	9:34:34	9:34:38	0:00:04	9:34:45	9:34:54	0	0:00:21	
9:36:52	112				9:36:58	9:37:05	0	0:00:13	
9:46:52	112	9:46:55	9:47:09	0:00:14	9:47:21	9:47:28	0	0:00:36	
10:02:45	112				10:02:46	10:02:55	0	0:00:10	
10:02:58	112				10:03:00	10:03:07	0	0:00:09	
10:03:07	112				10:03:09	10:03:15	0	0:00:08	
10:08:43	112				10:09:18	10:09:24	0	0:00:41	
10:19:08	112	10:19:09	10:19:16	0:00:07	10:19:22	10:19:28	0	0:00:20	
10:28:28	112	10:28:29	10:28:49	0:00:20	10:29:21	10:29:29	0	0:01:01	
10:44:31	112	10:44:32	10:44:40	0:00:08	10:44:49	10:44:57	0	0:00:26	
10:45:56	112	10:45:57	10:46:02	0:00:05	10:46:23	10:46:28	0	0:00:32	
10:49:59	112	10:50:00	10:50:13	0:00:13	10:50:29	10:50:34	0	0:00:35	
10:56:09	112	10:56:10	10:56:19	0:00:09	10:56:33	10:56:39	0	0:00:30	
11:04:56	112	11:04:58	11:06:25	0:01:27	11:06:39	11:06:45	0	0:01:49	
11:12:08	112				11:12:26	11:12:33	0	0:00:25	
11:20:20	112	11:20:21	11:20:57	0:00:36	11:21:06	11:21:14	0	0:00:54	
11:29:08	112	11:29:09	11:29:21	0:00:12	11:30:15	11:30:22	0	0:01:14	
11:32:23	112				11:32:41	11:32:48	0	0:00:25	
11:42:49	112	11:42:50	11:42:56	0:00:06	11:43:06	11:43:12	0	0:00:23	
11:54:09	112	11:54:10	11:54:25	0:00:15	11:54:50	11:54:54	0	0:00:45	
11:59:26	112				12:00:54	12:01:00	0	0:01:34	
12:03:49	112	12:03:50	12:03:53	0:00:03	12:04:03	12:04:07	0	0:00:18	
12:14:42	112	12:14:43	12:14:50	0:00:07	12:14:58	12:15:04	0	0:00:22	
12:22:39	112	12:22:41	12:22:47	0:00:06	12:22:54	12:23:00	0	0:00:21	
12:30:45	112				12:30:58	12:31:06	0	0:00:21	
12:40:10	112	12:40:12	12:40:17	0:00:05	12:41:00	12:41:05	0	0:00:55	
12:47:49	112	12:47:50	12:48:34	0:00:44	12:48:44	12:48:53	0	0:01:04	
12:53:13	112	12:53:14	12:53:20	0:00:06	12:53:28	12:53:34	0	0:00:21	
13:07:03	112	13:07:05	13:07:12	0:00:07	13:07:46	13:07:52	0	0:00:49	
13:08:36	112	13:08:39	13:09:44	0:01:05	13:09:51	13:09:57	0	0:01:21	
13:16:32	112	13:16:33	13:16:45	0:00:12	13:17:26	13:17:30	0	0:00:58	
13:28:33	112	13:28:34	13:28:43	0:00:09	13:28:50	13:28:57	0	0:00:24	
13:35:54	112	13:35:55	13:36:21	0:00:26	13:36:33	13:36:39	0	0:00:45	

Tram stop 125 (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
13:42:12	112	13:42:13	13:42:21	0:00:08	13:43:09	13:43:15	0	0:01:03	
13:49:13	112				13:49:31	13:49:36	0	0:00:23	
14:00:43	112				14:01:59	14:02:04	0	0:01:21	
14:10:08	112	14:10:09	14:10:27	0:00:18	14:10:38	14:10:44	0	0:00:36	
14:17:24	112	14:17:25	14:17:33	0:00:08	14:18:22	14:18:28	0	0:01:04	
14:23:00	112	14:23:01	14:23:11	0:00:10	14:23:17	14:23:23	0	0:00:23	
14:30:49	112	14:30:50	14:30:58	0:00:08	14:31:17	14:31:23	0	0:00:34	
14:38:07	112	14:38:08	14:40:35	0:02:27	14:40:51	14:40:57	0	0:02:50	
14:45:58	112	14:46:01	14:46:03	0:00:02	14:48:03	14:48:12	0	0:02:14	
14:54:12	112	14:54:14	14:54:36	0:00:22	14:54:44	14:54:49	0	0:00:37	
15:02:13	112	15:02:15	15:02:28	0:00:13	15:03:03	15:03:09	0	0:00:56	
15:11:49	112				15:11:53	15:12:01	0	0:00:12	
15:19:06	112	15:19:10	15:19:39	0:00:29	15:19:47	15:19:51	0	0:00:45	
15:27:56	112	15:27:58	15:28:37	0:00:39	15:29:52	15:29:58	0	0:02:02	
15:38:44	112				15:38:45	15:38:49	0	0:00:05	
15:41:51	112	15:41:55	15:42:05	0:00:10	15:42:17	15:42:22	0	0:00:31	
15:50:20	112				15:50:22	15:50:28	0	0:00:08	
16:00:18	112	16:00:21	16:00:32	0:00:11	16:00:38	16:00:44	0	0:00:26	
16:05:20	112	16:05:21	16:06:21	0:01:00	16:06:36	16:06:43	0	0:01:23	
16:15:23	112	16:15:24	16:15:33	0:00:09	16:15:41	16:15:49	0	0:00:26	
16:20:38	112	16:20:41	16:20:45	0:00:04	16:20:52	16:20:59	0	0:00:21	
16:33:12	112	16:33:17	16:33:58	0:00:41	16:34:05	16:34:09	0	0:00:57	
16:36:21	112	16:36:24	16:36:29	0:00:05	16:36:40	16:36:47	0	0:00:26	
16:46:46	112	16:46:48	16:47:10	0:00:22	16:47:20	16:47:26	0	0:00:40	
16:59:18	112	16:59:22	16:59:30	0:00:08	16:59:42	16:59:49	0	0:00:31	
17:02:20	112	17:02:23	17:02:25	0:00:02	17:02:33	17:02:40	0	0:00:20	
17:13:38	112	17:13:40	17:13:44	0:00:04	17:13:52	17:13:56	0	0:00:18	
17:21:09	112				17:21:11	17:21:18	0	0:00:09	
17:29:18	112	17:29:21	17:29:51	0:00:30	17:30:36	17:30:42	0	0:01:24	
17:39:17	112	17:39:20	17:39:32	0:00:12	17:40:18	17:40:24	0	0:01:07	
17:46:44	112	17:46:47	17:47:12	0:00:25	17:47:26	17:47:33	0	0:00:49	
17:53:53	112	17:53:56	17:54:06	0:00:10	17:54:46	17:54:53	0	0:01:00	
17:59:29	112				17:59:30	17:59:35	0	0:00:06	
18:09:16	112	18:09:21	18:09:27	0:00:06	18:09:40	18:09:46	0	0:00:30	

Tram stop 125 (Clarendon Street outbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
18:15:20	112	18:15:22	18:15:38	0:00:16	18:15:46	18:15:52	0	0:00:32	
18:24:46	112	18:24:48	18:25:07	0:00:19	18:25:50	18:26:00	0	0:01:14	
18:31:07	112	18:31:11	18:31:30	0:00:19	18:32:28	18:32:36	0	0:01:29	
18:39:13	112	18:39:15	18:39:42	0:00:27	18:39:52	18:39:58	0	0:00:45	
18:46:52	112	18:46:56	18:46:58	0:00:02	18:47:06	18:47:13	0	0:00:21	
18:56:59	112	18:57:02	18:57:20	0:00:18	18:57:29	18:57:36	0	0:00:37	
18:58:47	0	18:58:50	18:59:00	0:00:10	18:59:56	19:00:01	0	0:01:14	
19:04:00	112				19:04:18	19:04:24	0	0:00:24	
19:09:27	04 (Red)				19:09:30	19:09:41	0	0:00:14	
19:10:00	04 (Red)				19:10:04	19:10:16	0	0:00:16	
19:11:33	05 (Red)				19:11:52	19:12:04	0	0:00:31	
19:18:58	112	19:19:00	19:19:18	0:00:18	19:20:11	19:20:19	0	0:01:21	
19:25:10	112	19:25:13	19:25:18	0:00:05	19:26:44	19:26:54	0	0:01:44	
19:33:43	112	19:33:47	19:34:10	0:00:23	19:34:23	19:34:31	0	0:00:48	
19:39:38	112	19:39:41	19:39:46	0:00:05	19:39:55	19:40:04	0	0:00:26	
19:50:42	112				19:50:55	19:50:59	0	0:00:17	
19:51:00	112				19:51:03	19:51:09	0	0:00:09	
20:01:10	112	20:01:13	20:01:47	0:00:34	20:02:05	20:02:11	0	0:01:01	
20:17:07	112	20:17:10	20:17:34	0:00:24	20:18:35	20:18:43	0	0:01:36	
20:26:02	112	20:26:05	20:26:09	0:00:04	20:26:19	20:26:25	0	0:00:23	
20:35:31	112				20:35:34	20:35:39	0	0:00:08	
20:51:45	112	20:51:48	20:52:20	0:00:32	20:52:32	20:52:41	0	0:00:56	
20:55:05	112				20:55:08	20:55:14	0	0:00:09	
21:18:07	112				21:18:58	21:19:04	0	0:00:57	
21:36:51	112	21:36:55	21:37:02	0:00:07	21:37:18	21:37:25	0	0:00:34	
21:55:42	112	21:55:46	21:55:50	0:00:04	21:56:01	21:56:06	0	0:00:24	
22:17:50	112	22:17:52	22:18:06	0:00:14	22:18:22	22:18:28	0	0:00:38	
22:34:32	112	22:34:36	22:34:49	0:00:13	22:36:33	22:36:40	0	0:02:08	
22:42:19	05 (Red)				22:42:34	22:42:43	0	0:00:24	
22:42:39	05 (Red)				22:42:41	22:42:52	0	0:00:13	
22:43:50	04 (Red)				22:44:12	22:44:25	0	0:00:35	
22:53:53	112				22:54:01	22:54:09	0	0:00:16	
							Average Delay	0:00:47	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
6:00:10	109	6:00:11	6:00:31	0:00:20	6:01:14	6:01:23	0	0:01:13	
6:05:40	(Green)				6:05:56	6:06:07	0	0:00:27	
6:12:56	96	6:12:58	6:13:28	0:00:30	6:13:47	6:13:59	0	0:01:03	
6:16:44	109	6:16:46	6:16:54	0:00:08	6:17:11	6:17:24	0	0:00:40	
6:19:52	96	6:19:55	6:20:24	0:00:29	6:21:58	6:22:11	1	0:02:19	
6:27:57	96	6:27:59	6:28:16	0:00:17	6:28:49	6:29:05	0	0:01:08	
6:28:58	109	6:29:00	6:29:45	0:00:45	6:29:57	6:30:07	0	0:01:09	
6:33:49	96	6:33:52	6:34:25	0:00:33	6:35:10	6:35:21	0	0:01:32	
6:35:14	112				6:36:14	6:36:23	0	0:01:09	
6:41:14	96	6:41:16	6:41:39	0:00:23	6:42:07	6:42:17	0	0:01:03	
6:42:19	112				6:43:01	6:43:12	0	0:00:53	
6:42:40	109				6:43:10	6:43:20	0	0:00:40	
6:43:12	30 (Green)				6:45:04	6:45:13	0	0:02:01	
6:43:54	112				6:46:13	6:46:24	1	0:02:30	Tram infront
6:50:07	96	6:50:09	6:50:43	0:00:34	6:51:09	6:51:21	0	0:01:14	
6:51:14	109				6:52:06	6:52:15	0	0:01:01	
6:55:20	109	6:55:22	6:55:55	0:00:33	6:56:10	6:56:20	0	0:01:00	
6:57:41	112				6:58:04	6:58:15	0	0:00:34	
7:00:04	109				7:00:52	7:01:04	0	0:01:00	
7:02:41	96				7:03:08	7:03:19	0	0:00:38	
7:07:52	(Green)				7:08:22	7:08:31	0	0:00:39	
7:10:23	109	7:10:24	7:10:30	0:00:06	7:11:32	7:11:43	0	0:01:20	
7:16:00	96	7:16:02	7:16:27	0:00:25	7:16:41	7:16:50	0	0:00:50	
7:17:57	96	7:17:59	7:18:31	0:00:32	7:18:45	7:18:58	0	0:01:01	
7:18:59	96	7:19:34	7:20:41	0:01:07	7:20:54	7:21:03	1	0:02:04	Boarding/alighting
7:22:43	109	7:22:46	7:22:57	0:00:11	7:23:22	7:23:32	0	0:00:49	
7:25:39	109	7:25:40	7:25:59	0:00:19	7:26:40	7:26:51	0	0:01:12	
7:28:16	96	7:28:18	7:28:33	0:00:15	7:29:59	7:30:08	0	0:01:52	
7:34:03	109	7:34:08	7:34:27	0:00:19	7:34:39	7:34:51	0	0:00:48	
7:35:38	96	7:35:41	7:36:26	0:00:45	7:36:37	7:36:48	0	0:01:10	
7:38:29	96	7:38:30	7:39:07	0:00:37	7:39:25	7:39:37	0	0:01:08	
7:41:47	96	7:41:49	7:42:29	0:00:40	7:42:40	7:42:51	0	0:01:04	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
7:42:08	109	7:42:11	7:42:35	0:00:24	7:43:42	7:43:53	1	0:01:45	Tram infront
7:46:51	96	7:46:53	7:47:06	0:00:13	7:47:52	7:48:01	0	0:01:10	
7:46:59	109	7:47:01	7:47:14	0:00:13	7:48:53	7:49:04	1	0:02:05	Tram infront
7:48:41	96	7:48:43	7:49:58	0:01:15	7:50:14	7:50:23	1	0:01:42	Tram infront
7:55:01	109	7:55:02	7:55:18	0:00:16	7:55:52	7:56:04	0	0:01:03	
7:55:56	109	7:55:58	7:56:29	0:00:31	7:57:27	7:57:40	0	0:01:44	
7:59:01	30 (Green)				7:59:48	7:59:58	0	0:00:57	
8:01:58	96	8:02:00	8:02:47	0:00:47	8:03:07	8:03:19	0	0:01:21	
8:02:05	109	8:03:25	8:03:40	0:00:15	8:04:08	8:04:20	1	0:02:15	Tram infront
8:03:21	96	8:03:23	8:05:01	0:01:38	8:05:15	8:05:26	1	0:02:05	Tram infront
8:06:39	109	8:06:41	8:06:59	0:00:18	8:07:12	8:07:23	0	0:00:44	
8:07:36	96	8:07:39	8:08:00	0:00:21	8:08:22	8:08:34	0	0:00:58	
8:12:38	96	8:12:42	8:13:31	0:00:49	8:13:51	8:14:00	0	0:01:22	
8:13:09	109	8:14:11	8:14:53	0:00:42	8:15:02	8:15:14	1	0:02:05	Tram infront
8:19:21	96	8:19:24	8:19:42	0:00:18	8:20:53	8:21:04	0	0:01:43	
8:19:29	109	8:19:30	8:21:41	0:02:11	8:22:09	8:22:18	1	0:02:49	Tram infront
8:22:17	109	8:22:19	8:22:41	0:00:22	8:23:17	8:23:27	0	0:01:10	
8:23:20	96	8:23:22	8:24:18	0:00:56	8:24:31	8:24:42	0	0:01:22	
8:26:41	109	8:26:43	8:27:45	0:01:02	8:28:04	8:28:13	0	0:01:32	
8:29:29	109	8:29:31	8:30:05	0:00:34	8:30:34	8:30:45	0	0:01:16	
8:32:28	109	8:32:30	8:32:46	0:00:16	8:32:59	8:33:11	0	0:00:43	
8:36:12	109	8:36:14	8:36:35	0:00:21	8:36:46	8:36:59	0	0:00:47	
8:38:46	96	8:38:48	8:39:59	0:01:11	8:40:16	8:40:27	1	0:01:41	Boarding/alighting
8:40:24	96	8:40:24	8:40:52	0:00:28	8:41:26	8:41:38	0	0:01:14	
8:45:09	96	8:45:11	8:45:28	0:00:17	8:46:20	8:46:29	0	0:01:20	
8:45:17	109	8:45:19	8:47:08	0:01:49	8:47:34	8:47:45	1	0:02:28	Tram infront
8:50:01	109	8:50:02	8:50:19	0:00:17	8:51:00	8:51:09	0	0:01:08	
8:50:23	96	8:50:25	8:51:58	0:01:33	8:52:12	8:52:23	1	0:02:00	Tram infront

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
8:55:31	109	8:55:33	8:55:54	0:00:21	8:56:04	8:56:16	0	0:00:45	
8:59:17	96	8:59:19	8:59:22	0:00:03	8:59:38	8:59:51	0	0:00:34	
8:59:27	109	9:00:48	9:01:04	0:00:16	9:01:50	9:02:01	1	0:02:34	Tram infront
9:02:03	96	9:02:05	9:02:45	0:00:40	9:02:58	9:03:10	0	0:01:07	
9:08:41	109	9:08:43	9:09:43	0:01:00	9:09:59	9:10:08	0	0:01:27	
9:09:31	35 (Red)				9:11:04	9:11:15	1	0:01:44	Tram infront
9:12:07	109	9:12:09	9:12:19	0:00:10	9:12:30	9:12:39	0	0:00:32	
9:13:16	96	9:13:18	9:14:23	0:01:05	9:14:43	9:14:54	1	0:01:38	Boarding/alighting
9:17:15	35 (Green)				9:18:24	9:18:36	0	0:01:21	
9:17:49	96	9:17:51	9:18:39	0:00:48	9:19:34	9:19:47	1	0:01:58	Tram infront
9:18:34	109	9:18:41	9:18:53	0:00:12	9:20:47	9:20:58	1	0:02:24	Tram infront
9:29:45	96	9:29:47	9:30:09	0:00:22	9:31:12	9:31:24	1	0:01:39	Boarding/alighting
9:29:55	109	9:29:57	9:31:04	0:01:07	9:31:20	9:31:29	0	0:01:34	
9:34:06	109	9:34:08	9:35:02	0:00:54	9:35:22	9:35:33	0	0:01:27	
9:36:23	96	9:36:25	9:36:42	0:00:17	9:37:34	9:37:45	0	0:01:22	
9:40:25	96	9:40:27	9:40:38	0:00:11	9:42:29	9:42:42	1	0:02:17	
9:42:42	109	9:42:44	9:43:24	0:00:40	9:43:35	9:43:48	0	0:01:06	
9:43:46	96	9:43:47	9:44:30	0:00:43	9:44:44	9:44:55	0	0:01:09	
9:46:06	35 (Red)				9:46:55	9:47:06	0	0:01:00	
9:48:14	109	9:48:16	9:48:49	0:00:33	9:49:53	9:50:05	1	0:01:51	Boarding/alighting
9:55:48	96	9:55:49	9:56:26	0:00:37	9:56:40	9:56:52	0	0:01:04	
9:58:10	109	9:58:12	9:58:26	0:00:14	9:58:46	9:58:57	0	0:00:47	
10:02:47	109				10:03:24	10:03:33	0	0:00:46	
10:03:27	96	10:03:30	10:03:40	0:00:10	10:04:36	10:04:47	0	0:01:20	
10:04:39	109	10:04:42	10:04:51	0:00:09	10:05:41	10:05:53	0	0:01:14	
10:09:07	96	10:09:09	10:09:27	0:00:18	10:10:27	10:10:37	0	0:01:30	
10:12:34	109	10:12:36	10:12:47	0:00:11	10:12:57	10:13:08	0	0:00:34	
10:16:02	96	10:16:04	10:16:30	0:00:26	10:17:40	10:17:52	1	0:01:50	Boarding/alighti

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
									ng
10:21:11	109	10:21:12	10:21:32	0:00:20	10:21:54	10:22:03	0	0:00:52	
10:29:14	109	10:29:16	10:29:27	0:00:11	10:30:38	10:30:49	0	0:01:35	
10:30:03	96	10:30:06	10:31:23	0:01:17	10:31:44	10:31:53	1	0:01:50	Tram infront
10:32:27	96	10:32:29	10:32:43	0:00:14	10:33:37	10:33:48	0	0:01:21	
10:36:20	109	10:36:22	10:36:33	0:00:11	10:36:46	10:36:57	0	0:00:37	
10:40:23	96	10:40:25	10:40:35	0:00:10	10:41:01	10:41:14	0	0:00:51	
10:43:46	109	10:43:48	10:45:09	0:01:21	10:45:20	10:45:31	0	0:01:45	
10:46:50	96	10:46:52	10:47:07	0:00:15	10:47:19	10:47:31	0	0:00:41	
10:51:48	109	10:51:50	10:52:04	0:00:14	10:52:16	10:52:25	0	0:00:37	
10:55:04	109	10:55:06	10:55:35	0:00:29	10:57:19	10:57:30	1	0:02:26	
11:00:55	109	11:00:57	11:01:11	0:00:14	11:01:21	11:01:30	0	0:00:35	
11:05:18	96	11:05:21	11:05:34	0:00:13	11:06:12	11:06:23	0	0:01:05	
11:07:50	109	11:07:52	11:08:01	0:00:09	11:08:54	11:09:06	0	0:01:16	
11:12:55	96	11:12:58	11:13:07	0:00:09	11:13:26	11:13:39	0	0:00:44	
11:14:55	96				11:15:28	11:15:39	0	0:00:44	
11:16:08	109	11:16:10	11:17:24	0:01:14	11:17:35	11:17:47	1	0:01:39	Boarding/alighting
11:18:53	96	11:18:55	11:19:07	0:00:12	11:19:46	11:19:55	0	0:01:02	
11:24:24	109	11:24:26	11:26:12	0:01:46	11:26:30	11:26:41	1	0:02:17	
11:27:01	96	11:27:02	11:27:20	0:00:18	11:27:36	11:27:45	0	0:00:44	
11:31:40	109	11:31:42	11:32:03	0:00:21	11:32:18	11:32:29	0	0:00:49	
11:34:48	96	11:34:51	11:35:04	0:00:13	11:35:15	11:35:27	0	0:00:39	
11:40:54	96	11:40:56	11:41:10	0:00:14	11:41:42	11:41:55	0	0:01:01	
11:42:39	109	11:42:41	11:42:55	0:00:14	11:43:37	11:43:48	0	0:01:09	
11:45:45	109	11:45:56	11:46:04	0:00:08	11:46:27	11:46:39	0	0:00:54	
11:51:07	96	11:51:09	11:51:20	0:00:11	11:52:28	11:52:37	1	0:01:30	Boarding/alighting
11:53:14	109	11:53:18	11:53:25	0:00:07	11:53:36	11:53:47	0	0:00:33	
11:59:15	96	11:59:18	11:59:32	0:00:14	12:00:31	12:00:40	0	0:01:25	
12:00:17	109	12:00:36	12:01:25	0:00:49	12:01:36	12:01:47	1	0:01:30	Tram infront
12:03:15	96	12:03:17	12:03:28	0:00:11	12:04:18	12:04:30	0	0:01:15	
12:09:23	109	12:09:25	12:09:49	0:00:24	12:10:01	12:10:14	0	0:00:51	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
12:11:31	96	12:11:34	12:12:07	0:00:33	12:12:20	12:12:31	0	0:01:00	
12:17:21	109	12:17:23	12:17:34	0:00:11	12:18:20	12:18:32	0	0:01:11	
12:18:27	109	12:18:29	12:19:12	0:00:43	12:19:27	12:19:39	0	0:01:12	
12:25:47	96	12:25:50	12:26:28	0:00:38	12:26:57	12:27:08	0	0:01:21	
12:27:03	109	12:27:05	12:27:17	0:00:12	12:28:00	12:28:09	0	0:01:06	
12:31:22	NIS				12:31:39	12:31:50	0	0:00:28	
12:33:36	109	12:33:38	12:34:30	0:00:52	12:34:41	12:34:53	0	0:01:17	
12:35:18	96	12:35:20	12:35:30	0:00:10	12:35:42	12:35:55	0	0:00:37	
12:40:57	96	12:41:00	12:41:28	0:00:28	12:41:42	12:41:53	0	0:00:56	
12:41:17	109	12:41:18	12:41:34	0:00:16	12:42:46	12:42:58	1	0:01:41	Tram infront
12:48:54	109	12:48:56	12:49:29	0:00:33	12:49:54	12:50:03	0	0:01:09	
12:50:20	96	12:50:24	12:50:52	0:00:28	12:51:44	12:51:55	0	0:01:35	
12:55:55	96	12:55:57	12:56:07	0:00:10	12:56:26	12:56:35	0	0:00:40	
12:59:37	109	12:59:39	12:59:53	0:00:14	13:00:41	13:00:52	0	0:01:15	
13:04:54	96	13:05:04	13:05:14	0:00:10	13:06:16	13:06:28	0	0:01:34	
13:06:30	109	13:06:31	13:07:12	0:00:41	13:07:24	13:07:37	0	0:01:07	
13:09:02	96	13:09:05	13:09:17	0:00:12	13:10:22	13:10:33	1	0:01:31	Tram infront
13:12:20	109	13:12:22	13:13:03	0:00:41	13:13:16	13:13:28	0	0:01:08	
13:16:33	96	13:16:36	13:18:23	0:01:47	13:18:36	13:18:45	0	0:02:12	
13:20:58	109	13:21:00	13:21:28	0:00:28	13:21:39	13:21:50	0	0:00:52	
13:23:12	96	13:23:14	13:23:25	0:00:11	13:23:40	13:23:49	0	0:00:37	
13:30:12	96	13:30:15	13:30:35	0:00:20	13:31:35	13:31:46	0	0:01:34	
13:31:13	109	13:31:43	13:31:59	0:00:16	13:32:40	13:32:52	1	0:01:39	Tram infront
13:38:26	109	13:38:28	13:39:30	0:01:02	13:39:40	13:39:53	0	0:01:27	
13:39:49	96	13:39:51	13:40:15	0:00:24	13:40:52	13:41:03	0	0:01:14	
13:46:08	109	13:46:10	13:46:49	0:00:39	13:47:06	13:47:18	0	0:01:10	
13:49:37	96	13:49:40	13:50:05	0:00:25	13:50:17	13:50:26	0	0:00:49	
13:54:29	96	13:54:31	13:54:49	0:00:18	13:55:15	13:55:26	0	0:00:57	
13:54:35	109	13:54:38	13:55:06	0:00:28	13:56:15	13:56:24	1	0:01:49	Tram infront
14:00:24	109	14:00:26	14:00:36	0:00:10	14:01:35	14:01:46	0	0:01:22	
14:05:39	96	14:05:41	14:05:53	0:00:12	14:06:48	14:07:00	0	0:01:21	
14:10:37	96	14:10:40	14:10:55	0:00:15	14:11:54	14:12:07	0	0:01:30	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
14:12:52	109	14:12:54	14:13:21	0:00:27	14:13:47	14:13:58	0	0:01:06	
14:16:58	109	14:17:00	14:17:44	0:00:44	14:17:57	14:18:09	0	0:01:11	
14:18:09	96	14:18:12	14:18:49	0:00:37	14:19:02	14:19:11	0	0:01:02	
14:24:30	96	14:24:33	14:24:45	0:00:12	14:24:58	14:25:09	0	0:00:39	
14:25:18	109	14:25:20	14:25:44	0:00:24	14:26:06	14:26:15	0	0:00:57	
14:31:53	96	14:31:56	14:32:08	0:00:12	14:32:28	14:32:39	0	0:00:46	
14:33:38	109	14:33:53	14:33:58	0:00:05	14:34:38	14:34:50	0	0:01:12	
14:41:08	109	14:41:10	14:41:22	0:00:12	14:41:31	14:41:44	0	0:00:36	
14:41:38	96	14:41:40	14:42:07	0:00:27	14:42:42	14:42:53	0	0:01:15	
14:45:15	96	14:45:18	14:47:56	0:02:38	14:48:47	14:48:59	2	0:03:44	
14:50:20	109	14:50:22	14:50:33	0:00:11	14:50:43	14:50:52	0	0:00:32	
14:56:40	96	14:56:42	14:58:15	0:01:33	14:58:51	14:59:02	1	0:02:22	Boarding/alighting
14:58:55	109	14:58:57	14:59:16	0:00:19	14:59:56	15:00:05	0	0:01:10	
15:06:54	109	15:06:56	15:07:25	0:00:29	15:07:40	15:07:51	0	0:00:57	
15:07:23	96	15:07:25	15:07:37	0:00:12	15:07:52	15:08:04	0	0:00:41	
15:12:42	109	15:12:44	15:12:58	0:00:14	15:13:31	15:13:44	0	0:01:02	
15:13:34	96	15:13:36	15:13:47	0:00:11	15:14:40	15:14:51	0	0:01:17	
15:14:55	112				15:15:51	15:16:03	0	0:01:08	
15:20:12	109	15:20:14	15:20:27	0:00:13	15:20:54	15:21:03	0	0:00:51	
15:23:44	96	15:23:47	15:23:57	0:00:10	15:24:12	15:24:23	0	0:00:39	
15:26:17	112	15:26:18	15:26:33	0:00:15	15:28:20	15:28:29	1	0:02:12	Boarding/alighting
15:28:48	109	15:28:49	15:29:04	0:00:15	15:29:26	15:29:37	0	0:00:49	
15:31:50	96	15:31:52	15:32:38	0:00:46	15:32:58	15:33:10	0	0:01:20	
15:36:17	109	15:36:19	15:36:47	0:00:28	15:37:03	15:37:16	0	0:00:59	
15:39:08	96	15:39:10	15:39:30	0:00:20	15:39:59	15:40:10	0	0:01:02	
15:46:06	96	15:46:09	15:46:40	0:00:31	15:47:12	15:47:24	0	0:01:18	
15:47:25	109	15:47:27	15:47:46	0:00:19	15:48:02	15:48:11	0	0:00:46	
15:53:42	109	15:53:44	15:53:56	0:00:12	15:54:06	15:54:17	0	0:00:35	
15:55:35	109	15:55:37	15:55:49	0:00:12	15:56:10	15:56:19	0	0:00:44	
16:00:54	96	16:00:57	16:01:08	0:00:11	16:01:23	16:01:34	0	0:00:40	
16:02:11	109	16:02:12	16:02:29	0:00:17	16:03:14	16:03:26	0	0:01:15	
16:07:37	109	16:07:40	16:07:50	0:00:10	16:08:17	16:08:30	0	0:00:53	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
16:09:29	109	16:09:31	16:10:03	0:00:32	16:10:19	16:10:30	0	0:01:01	
16:12:31	30 (Green)				16:14:06	16:14:18	0	0:01:47	
16:16:58	96	16:17:00	16:17:16	0:00:16	16:17:48	16:17:57	0	0:00:59	
16:17:05	109	16:17:06	16:18:41	0:01:35	16:18:53	16:19:04	1	0:01:59	Tram infront
16:22:33	96	16:22:35	16:23:24	0:00:49	16:23:44	16:23:53	0	0:01:20	
16:26:08	109	16:26:10	16:26:37	0:00:27	16:27:13	16:27:24	0	0:01:16	
16:27:27	96	16:27:30	16:27:43	0:00:13	16:28:34	16:28:46	0	0:01:19	
16:34:00	109	16:34:01	16:34:18	0:00:17	16:35:11	16:35:24	0	0:01:24	
16:34:42	96	16:34:45	16:35:43	0:00:58	16:36:16	16:36:27	1	0:01:45	Tram infront
16:39:55	109	16:39:56	16:40:23	0:00:27	16:40:36	16:40:48	0	0:00:53	
16:41:20	96	16:41:22	16:41:40	0:00:18	16:41:53	16:42:02	0	0:00:42	
16:43:57	109	16:43:59	16:44:44	0:00:45	16:45:13	16:45:24	0	0:01:27	
16:48:22	96	16:48:24	16:49:14	0:00:50	16:50:48	16:50:57	2	0:02:35	Boarding/alighting for the first cycle
16:51:19	96	16:51:21	16:52:32	0:01:11	16:53:08	16:53:19	1	0:02:00	
16:53:27	109	16:53:29	16:54:02	0:00:33	16:54:09	16:54:21	0	0:00:54	
16:56:19	109	16:56:21	16:57:47	0:01:26	16:57:55	16:58:08	1	0:01:49	Boarding/alighting
17:01:59	96	17:02:01	17:02:21	0:00:20	17:02:51	17:03:02	0	0:01:03	
17:02:06	109	17:03:00	17:03:12	0:00:12	17:03:24	17:03:35	0	0:01:29	
17:06:00	109	17:06:03	17:06:13	0:00:10	17:06:25	17:06:34	0	0:00:34	
17:07:37	96	17:07:39	17:08:24	0:00:45	17:08:37	17:08:48	0	0:01:11	
17:10:36	109	17:10:37	17:10:49	0:00:12	17:10:59	17:11:08	0	0:00:32	
17:12:16	96	17:12:18	17:13:02	0:00:44	17:13:18	17:13:29	0	0:01:13	
17:15:50	109	17:15:52	17:16:11	0:00:19	17:16:54	17:17:06	0	0:01:16	
17:16:37	96	17:16:40	17:16:47	0:00:07	17:17:02	17:17:15	0	0:00:38	
17:20:17	109	17:20:20	17:21:30	0:01:10	17:21:38	17:21:49	1	0:01:32	Boarding/alighting
17:22:54	109	17:22:56	17:23:47	0:00:51	17:23:58	17:24:10	0	0:01:16	
17:23:30	96	17:23:33	17:24:01	0:00:28	17:25:09	17:25:18	1	0:01:48	Tram infront
17:26:23	112	17:26:25	17:27:31	0:01:06	17:27:44	17:27:55	0	0:01:32	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
17:27:25	109	17:27:28	17:28:49	0:01:21	17:29:04	17:29:13	1	0:01:48	Tram infront
17:30:18	96	17:30:20	17:30:57	0:00:37	17:31:17	17:31:28	0	0:01:10	
17:31:59	109	17:32:01	17:32:08	0:00:07	17:32:27	17:32:39	0	0:00:40	
17:35:48	112	17:35:53	17:36:05	0:00:12	17:37:18	17:37:31	1	0:01:43	Boarding/alighting
17:35:59	109	17:36:01	17:36:52	0:00:51	17:37:26	17:37:37	0	0:01:38	
17:38:45	96	17:38:47	17:39:14	0:00:27	17:39:41	17:39:53	0	0:01:08	
17:39:45	109	17:39:47	17:40:03	0:00:16	17:40:58	17:41:07	0	0:01:22	
17:43:30	112	17:43:32	17:44:09	0:00:37	17:44:37	17:44:48	0	0:01:18	
17:44:43	05 (Red)				17:49:19	17:49:31	3	0:04:48	Tram infront & boarding/alightin g
17:44:52	04 (Red)	17:45:18	17:49:04	0:03:46	17:49:30	17:49:41	3	0:04:49	Tram infront & boarding/alightin g
17:45:05	03 (Red)	17:45:07	17:49:29	0:04:22	17:50:32	17:50:44	4	0:05:39	Tram infront & boarding/alightin g
17:50:03	96	17:50:05	17:50:16	0:00:11	17:50:46	17:50:59	0	0:00:56	
17:50:48	109	17:51:06	17:51:31	0:00:25	17:51:50	17:52:01	0	0:01:13	
17:51:32	96	17:51:36	17:51:47	0:00:11	17:53:04	17:53:16	1	0:01:44	Tram infront
17:53:09	109	17:53:10	17:53:26	0:00:16	17:54:11	17:54:20	0	0:01:11	
17:53:16	35 (Red)				17:55:21	17:55:32	1	0:02:16	Tram infront
17:57:49	109	17:57:52	17:58:34	0:00:42	17:58:45	17:58:54	0	0:01:05	
18:00:27	96	18:00:30	18:00:56	0:00:26	18:01:38	18:01:49	0	0:01:22	
18:03:52	109	18:03:53	18:04:24	0:00:31	18:05:10	18:05:22	0	0:01:30	
18:04:31	96	18:04:35	18:04:43	0:00:08	18:06:23	18:06:36	1	0:02:05	Tram infront
18:13:32	109	18:13:34	18:14:05	0:00:31	18:14:49	18:15:00	0	0:01:28	
18:17:35	96	18:17:38	18:18:00	0:00:22	18:18:15	18:18:27	0	0:00:52	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
18:18:21	109	18:18:23	18:19:24	0:01:01	18:19:36	18:19:45	0	0:01:24	
18:23:43	96	18:23:46	18:23:58	0:00:12	18:24:17	18:24:28	0	0:00:45	
18:24:32	109	18:24:34	18:24:43	0:00:09	18:25:26	18:25:35	0	0:01:03	
18:30:31	96	18:30:33	18:30:57	0:00:24	18:31:23	18:31:34	0	0:01:03	
18:32:26	109	18:32:28	18:32:39	0:00:11	18:33:48	18:34:00	0	0:01:34	
18:40:31	96	18:40:34	18:40:48	0:00:14	18:41:54	18:42:07	1	0:01:36	Boarding/alighting
18:40:57	109	18:40:59	18:41:47	0:00:48	18:42:02	18:42:13	0	0:01:16	
18:51:05	109	18:51:07	18:51:29	0:00:22	18:52:14	18:52:26	0	0:01:21	
18:52:03	96	18:52:07	18:52:13	0:00:06	18:53:27	18:53:36	1	0:01:33	Tram infront
19:02:17	96	19:02:19	19:02:43	0:00:24	19:02:54	19:03:05	0	0:00:48	
19:02:19	109	19:02:21	19:02:47	0:00:26	19:03:50	19:03:59	1	0:01:40	Tram infront
19:05:01	109	19:05:03	19:05:24	0:00:21	19:05:46	19:05:57	0	0:00:56	
19:11:59	109	19:12:01	19:12:23	0:00:22	19:12:36	19:12:48	0	0:00:49	
19:18:12	96	19:18:15	19:18:29	0:00:14	19:18:41	19:18:54	0	0:00:42	
19:19:28	08 (Red)								Tram returned back
19:19:41	08 (Red)	19:20:06	19:23:37	0:03:31			6		Tram returned back after the passengers alighted
19:19:42	(Red)	19:20:27	19:26:29	0:06:02			6		Tram returned back after the passengers alighted
19:27:52	109	19:27:54	19:28:21	0:00:27	19:28:34	19:28:45	0	0:00:53	
19:34:25	96	19:34:27	19:34:38	0:00:11	19:35:58	19:36:07	0	0:01:42	
19:38:12	109				19:39:09	19:39:20	0	0:01:08	
19:48:50	96	19:48:53	19:49:02	0:00:09	19:50:00	19:50:12	0	0:01:22	
19:52:41	109	19:52:43	19:53:00	0:00:17	19:53:45	19:53:58	0	0:01:17	
20:02:00	96	20:02:03	20:02:55	0:00:52	20:03:16	20:03:27	0	0:01:27	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
20:07:30	112	20:07:32	20:08:02	0:00:30	20:08:23	20:08:35	0	0:01:05	
20:11:02	109	20:11:04	20:11:15	0:00:11	20:11:27	20:11:36	0	0:00:34	
20:16:19	96	20:16:21	20:16:35	0:00:14	20:16:50	20:17:01	0	0:00:42	
20:24:48	NIS				20:25:44	20:25:53	0	0:01:05	
20:32:43	96	20:32:45	20:33:26	0:00:41	20:34:03	20:34:14	0	0:01:31	
20:32:48	109	20:32:50	20:33:01	0:00:11	20:35:09	20:35:21	1	0:02:33	Tram infront
20:35:21	05 (Red)				20:39:37	20:39:52	3	0:04:31	Tram infront & boarding /alightin g
20:35:33	04 (Red)	20:35:35	20:40:47	0:05:12	20:41:47	20:41:58	4	0:06:25	Tram infront & boarding /alightin g
20:35:50	08 (Red)	20:35:51	20:38:48	0:02:57	20:41:55	20:42:07	4	0:06:17	Tram infront & boarding /alightin g
20:42:09	112				20:43:15	20:43:24	0	0:01:15	
20:46:01	112	20:46:03	20:46:14	0:00:11	20:46:54	20:47:05	0	0:01:04	
20:47:36	96	20:47:38	20:47:51	0:00:13	20:48:03	20:48:12	0	0:00:36	
20:48:52	109				20:49:58	20:50:09	0	0:01:17	
20:50:00	109				20:50:57	20:51:09	0	0:01:09	
20:51:22	112	20:51:30	20:51:34	0:00:04	20:52:01	20:52:14	0	0:00:52	
21:01:25	96	21:01:27	21:01:40	0:00:13	21:02:23	21:02:34	0	0:01:09	
21:10:31	109	21:10:33	21:10:50	0:00:17	21:11:03	21:11:15	0	0:00:44	
21:22:44	96	21:22:46	21:23:11	0:00:25	21:23:44	21:23:53	0	0:01:09	
21:28:12	109	21:28:14	21:28:22	0:00:08	21:29:05	21:29:16	0	0:01:04	
21:38:28	96	21:38:31	21:39:07	0:00:36	21:39:22	21:39:31	0	0:01:03	
21:49:37	109	21:49:39	21:49:54	0:00:15	21:50:03	21:50:14	0	0:00:37	
21:58:17	96	21:58:19	21:58:36	0:00:17	21:59:18	21:59:30	0	0:01:13	
22:10:54	109	22:10:56	22:11:12	0:00:16	22:11:35	22:11:48	0	0:00:54	
22:20:52	96	22:20:54	22:21:06	0:00:12	22:21:23	22:21:34	0	0:00:42	
22:30:48	109	22:30:50	22:31:04	0:00:14	22:31:45	22:31:57	0	0:01:09	
22:40:31	96	22:40:33	22:40:44	0:00:11	22:41:22	22:41:31	0	0:01:00	

Tram stop 125 Port Junction (Normanby Road inbound)									
Arrival Time	Ser. #	Doors Open	Doors Close	Boarding/Alighting Delay	Clears Stop-line	Clears Intersection	Cycles to Clear	Tram Delay	Reason
22:49:51	109	22:49:53	22:50:04	0:00:11	22:50:13	22:50:24	0	0:00:33	
22:59:52	96	22:59:55	23:00:06	0:00:11	23:01:15	23:01:24	0	0:01:32	
								0:01:20	

Appendix B

Turn Flow Calibration Results

AM Turn Flow Calibration

SITE No.	INTERSECTION	MOVEMENT SUMMARY		VISSIM REF	OBSERVED	MODELLED	VEHICLE DELAY	ABSOLUTE DIFFERENCE	RELATIVE DIFFERENCE	GEH
		Approach	Mvt							
8	Flinders Street, Spencer Street	North	Uturn							
		North	Right	8-N-W	**226**	**188**	**64**	-38	-17%	2.64
		North	Through	8-N-S	**571**	**611**	**39**	41	7%	1.67
		North	Left	8-N-O	**85**	**81**	**40**	-4	-4%	0.38
		South	Uturn			**0**	**0**			
		South	Right	8-S-O	**247**	**286**	**73**	39	16%	2.39
		South	Through	8-S-N	**475**	**536**	**40**	61	13%	2.71
		South	Left	8-SE-W	**281**	**309**	**16**	28	10%	1.63
		East	Uturn				**0**			
		East	Right				**0**			
		East	Through	8-O-W	**406**	**409**	**60**	3	1%	0.15
		East	Left	8-O-S	**92**	**97**	**29**	5	5%	0.51
		West	Uturn			**0**	**0**			
		West	Right	8-W-S	**173**	**161**	**318**	-12	-7%	0.93
		West	Through	8-W-O	**588**	**609**	**47**	21	4%	0.86
		West	Left	8-W-N	**100**	**105**	**59**	5	5%	0.49
13	Clarendon Street, Crown Casino Port Cochere	North	Uturn				**0**			
		North	Right				**0**			
		North	Through	13-N-S	**867**	**765**	**19**	-102	-12%	3.57
		North	Left	13-N-SE	**0**	**0**	**0**	0	0%	0.00
		South	Uturn				**0**			
		South	Right	13-S-SE	**66**	**71**	**25**	5	8%	0.60
		South	Through	13-S-N	**993**	**1,119**	**11**	126	13%	3.88
		South	Left		**0**	**0**	**0**			
		East	Uturn			**0**	**0**			
		East	Right			**0**	**0**			
		East	Through			**0**	**0**			
		East	Left			**0**	**0**			
		West	Uturn			**0**	**0**			
		West	Right			**0**	**0**			
		West	Through			**0**	**0**			
		West	Left			**0**	**0**			
5	Clarendon Street, Whiteman Street, Normanby Street	North	Uturn				**0**			
		North	Right	5-N-W	**143**	**127**	**163**	-16	-11%	1.38
		North	Through	5-N-S	**618**	**656**	**28**	38	6%	1.51
		North	Left	5-NW-O	**165**	**147**	**14**	-18	-11%	1.47
		South	Uturn				**0**			
		South	Right	5-SE-NE	**60**	**83**	**30**	23	38%	2.72
		South	Through	5-S-N	**697**	**711**	**8**	15	2%	0.55
		South	Left	5-S-W	**131**	**144**	**4**	14	10%	
		South	Left				**0**			
		East	Uturn				**0**			
		East	Right	5-NE-N	**116**	**137**	**64**	21	18%	1.87
		East	Through	5-NE-W	**238**	**240**	**55**	2	1%	0.13
		East	Left	5-NE-S	**67**	**48**	**15**			2.47
		West	Uturn			**0**	**0**	0		
		West	Right	5-SW-SE	**182**	**188**	**66**	6	3%	0.44
		West	Through	5-SW-NE	**348**	**381**	**65**	33	9%	1.73
		West	Left	5-SW-N	**307**	**343**	**37**	36	12%	2.02
		West	Left side				**0**			
20	Clarendon Street, Haig Street	North	Uturn				**0**			
		North	Right	20-N-SW	**0**	**0**	**0**	0	0%	
		North	Through	20-N-S	**670**	**799**	**3**	129	19%	4.76
		North	Left	20-N-NE	**114**	**97**	**2**	-17	-15%	1.66
		South	Uturn				**0**			
		South	Right				**0**			
		South	Through	20-S-N	**916**	**937**	**24**	22	2%	0.71
		South	Left	20-S-SW	**18**	**23**	**12**	5	28%	1.10
		South	Left				**0**			
		East	Uturn				**0**			
		East	Right	20-NE-N	**0**	**0**	**0**	0	0%	
		East	Through	20-NE-SW	**0**	**0**	**0**	0	0%	
		East	Left	20-NE-S	**0**	**0**	**0**			
		West	Uturn				**0**			
		West	Right	20-SW-S	**0**	**0**	**0**	0	0%	
		West	Through		**0**	**0**	**0**	0	0%	
		West	Left	20-SW-N	**0**	**0**	**0**			
		West	Left side			**0**	**0**			
3	Clarendon Street, City Road	North	Uturn				**0**			
		North	Right	3-N-SW	**125**	**159**	**40**	34	27%	2.85
		North	Through	3-N-S	**422**	**484**	**19**	62	15%	2.91
		North	Left	3-N-NE	**121**	**139**	**12**	18	15%	1.56
		South	Uturn				**0**			
		South	Right	3-S-NE	**103**	**142**	**99**	39	38%	3.52
		South	Through	3-S-N	**592**	**716**	**76**	125	21%	4.87
		South	Left	3-S-SW	**22**	**29**	**56**	8	35%	1.49
		East	Uturn				**0**			
		East	Right	3-NE-N	**123**	**113**	**104**	-10	-8%	0.92
		East	Through	3-NE-SW	**736**	**724**	**36**	-12	-2%	0.44
		East	Left	3-NE-S	**132**	**114**	**28**	-18	-13%	1.58
		West	Uturn				**0**			
		West	Right				**0**			
		West	Through	3-SW-NE	**965**	**615**	**119**	-350	-36%	12.45
		West	Left	3-SW-N	**197**	**130**	**93**	-67	-34%	5.24

PM Turn Flow Calibration

SITE No.	INTERSECTION	MOVEMENT SUMMARY		VISSIM REF	OBSERVED	MODELLED	VEHICLE DELAY	ABSOLUTE DIFFERENCE	RELATIVE DIFFERENCE	GEH
		Approach	Mvt							
8	Flinders Street, Spencer Street	North	Uturn							
		North	Right	8-N-W	**297**	**342**	**88**	45	15%	2.52
		North	Through	8-N-S	**774**	**903**	**76**	129	17%	4.45
		North	Left	8-N-O	**52**	**54**	**62**	2	5%	0.33
		South	Uturn			**0**	**0**			
		South	Right	8-S-O	**154**	**153**	**106**	-1	-1%	0.12
		South	Through	8-S-N	**525**	**594**	**90**	69	13%	2.91
		South	Left	8-SE-W	**243**	**261**	**53**	18	8%	1.16
		East	Uturn				**0**			
		East	Right				**0**			
		East	Through	8-O-W	**449**	**434**	**58**	-15	-3%	0.71
		East	Left	8-O-S	**154**	**170**	**38**	16	10%	1.26
		West	Uturn			**0**	**0**			
		West	Right	8-W-S	**201**	**194**	**274**	-7	-3%	0.50
		West	Through	8-W-O	**533**	**508**	**42**	-25	-5%	1.10
		West	Left	8-W-N	**119**	**125**	**58**	6	5%	0.54
13	Clarendon Street, Crown Casino Port Cochere	North	Uturn				**0**			
		North	Right				**0**			
		North	Through	13-N-S	**1,088**	**1,151**	**47**	63	6%	1.88
		North	Left	13-N-SE	**30**	**42**	**46**	12	40%	2.00
		South	Uturn				**0**			
		South	Right	13-S-SE	**74**	**99**	**28**	25	34%	2.72
		South	Through	13-S-N	**922**	**1,057**	**36**	135	15%	4.29
		South	Left		**0**	**0**	**0**			
		East	Uturn			**0**	**0**			
		East	Right			**0**	**0**			
		East	Through			**0**	**0**			
		East	Left			**0**	**0**			
		West	Uturn			**0**	**0**			
		West	Right			**0**	**0**			
		West	Through			**0**	**0**			
		West	Left			**0**	**0**			
5	Clarendon Street, Whiteman Street, Normanby Street	North	Uturn				**0**			
		North	Right	5-N-W	**129**	**147**	**106**	18	14%	1.53
		North	Through	5-N-S	**783**	**921**	**42**	138	18%	4.73
		North	Left	5-NW-O	**223**	**255**	**25**	32	14%	2.08
		South	Uturn				**0**			
		South	Right	5-SE-NE	**56**	**36**	**45**	-20	-36%	2.95
		South	Through	5-S-N	**549**	**649**	**10**	100	18%	4.07
		South	Left	5-S-W	**116**	**97**	**0**	-19	-16%	
		South	Left				**0**			
		East	Uturn				**0**			
		East	Right	5-NE-N	**119**	**110**	**233**	-9	-8%	0.84
		East	Through	5-NE-W	**203**	**160**	**61**	-43	-21%	3.19
		East	Left	5-NE-S	**104**	**92**	**33**			1.26
		West	Uturn			**0**	**0**	0		
		West	Right	5-SW-SE	**174**	**174**	**90**	0	0%	0.00
		West	Through	5-SW-NE	**479**	**466**	**85**	-13	-3%	0.60
		West	Left	5-SW-N	**327**	**421**	**56**	94	29%	4.88
		West	Left side				**0**			
20	Clarendon Street, Haig Street	North	Uturn				**0**			
		North	Right	20-N-SW	**0**	**0**	**0**	0	0%	
		North	Through	20-N-S	**917**	**1,032**	**37**	115	13%	3.68
		North	Left	20-N-NE	**144**	**167**	**18**	23	16%	1.82
		South	Uturn				**0**			
		South	Right				**0**			
		South	Through	20-S-N	**563**	**627**	**9**	65	11%	2.64
		South	Left	20-S-SW	**0**	**0**	**0**	0	0%	
		South	Left				**0**			
		East	Uturn				**0**			
		East	Right	20-NE-N	**78**	**76**	**18**	-2	-2%	0.18
		East	Through	20-NE-SW	**0**	**0**	**0**	0	0%	
		East	Left	20-NE-S	**0**	**0**	**0**			
		West	Uturn				**0**			
		West	Right	20-SW-S	**0**	**0**	**0**	0	0%	
		West	Through		**0**	**0**	**0**	0	0%	
		West	Left	20-SW-N	**69**	**66**	**14**	-3	-5%	0.39
		West	Left side			**0**	**0**			
3	Clarendon Street, City Road	North	Uturn				**0**			
		North	Right	3-N-SW	**189**	**211**	**40**	22	12%	1.56
		North	Through	3-N-S	**499**	**590**	**19**	91	18%	3.91
		North	Left	3-N-NE	**185**	**217**	**16**	32	17%	2.26
		South	Uturn				**0**			
		South	Right	3-S-NE	**124**	**136**	**54**	12	10%	1.05
		South	Through	3-S-N	**287**	**373**	**35**	87	30%	4.76
		South	Left	3-S-SW	**23**	**26**	**38**	3	12%	0.57
		East	Uturn				**0**			
		East	Right	3-NE-N	**117**	**117**	**54**	0	0%	0.00
		East	Through	3-NE-SW	**630**	**640**	**30**	10	2%	0.39
		East	Left	3-NE-S	**123**	**118**	**23**	-5	-4%	0.44
		West	Uturn				**0**			
		West	Right				**0**			
		West	Through	3-SW-NE	**804**	**815**	**54**	11	1%	0.39
		West	Left	3-SW-N	**125**	**102**	**35**	-23	-18%	2.16

Appendix C

Signal Timing Comparison

1045 Pedestrian Signals near Flinders Street on Spencer Street

Time Interval: 8:00 - 8:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A					8	24	22	30
B					8	52	49	56
C					8	26	26	26
D					0	0	0	0
E					0	0	0	0
F					0	0	0	0
G					0	0	0	0

Time Interval: 8:15 - 8:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A					9	25	11	34
B					9	52	43	58
C					9	26	26	26
D					0	0	0	0
E					0	0	0	0
F					0	0	0	0
G					0	0	0	0

Time Interval: 8:30 - 8:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A					8	28	23	34
B					8	55	51	58
C					8	26	26	26
D					0	0	0	0
E					0	0	0	0
F					0	0	0	0
G					0	0	0	0

Time Interval: 8:45-9:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A					8	29	25	34
B					8	55	53	59
C					8	26	26	26
D					0	0	0	0
E					0	0	0	0
F					0	0	0	0
G					0	0	0	0

1045 Pedestrian Signals near Flinders Street on Spencer Street

Time Interval: 17:00 - 17:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A					7	38	33	43
B					7	65	63	67
C					7	26	26	26
D					0	0	0	0
E					0	0	0	0
F					0	0	0	0
G					0	0	0	0

Time Interval: 17:15 - 17:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A					7	39	36	40
B					7	66	65	66
C					7	26	26	26
D					0	0	0	0
E					0	0	0	0
F					0	0	0	0
G					0	0	0	0

Time Interval: 17:30 - 17:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A					6	38	36	40
B					6	66	65	66
C					6	26	26	26
D					0	0	0	0
E					0	0	0	0
F					0	0	0	0
G					0	0	0	0

Time Interval: 17:45-18:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A					7	39	36	40
B					7	66	65	66
C					7	26	26	26
D					0	0	0	0
E					0	0	0	0
F					0	0	0	0
G					0	0	0	0

4567 Spencer Street / Flinders Street

Time Interval: 8:00 - 8:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	31	1	37	7	47	37	68
B	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0
D	8	17	2	21	7	19	17	20
E	8	23	21	27	7	28	22	35
F	7	14	14	15	6	14	14	14
G	8	28	27	29	7	26	22	28

Time Interval: 8:15 - 8:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	37	35	48	8	42	36	63
B	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0
D	8	19	14	20	8	19	16	20
E	8	23	3	32	8	23	17	27
F	4	14	14	14	3	14	14	14
G	7	28	27	29	8	27	20	28

Time Interval: 8:30 - 8:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	34	32	37	7	39	37	52
B	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0
D	7	19	18	20	7	20	19	20
E	8	25	22	34	7	25	22	34
F	7	14	14	14	4	14	14	14
G	8	27	23	28	7	28	28	28

Time Interval: 8:45-9:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	36	36	38	7	48	36	71
B	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0
D	8	20	20	20	7	20	20	20
E	8	19	4	27	7	25	22	34
F	7	13	9	14	4	14	14	14
G	8	25	5	28	7	28	26	28

4567 Spencer Street / Flinders Street

Time Interval: 17:00 - 17:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	32	32	32	7	34	33	37
B	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0
D	8	17	3	22	7	23	23	23
E	7	25	21	32	7	26	12	35
F	6	14	14	14	3	13	10	14
G	7	39	39	40	7	40	40	40

Time Interval: 17:15 - 17:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	31	30	32	6	34	33	35
B	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0
D	7	20	18	22	6	23	23	23
E	7	27	19	36	6	26	22	28
F	5	13	9	14	4	14	14	14
G	7	39	40	39	6	40	40	40

Time Interval: 17:30 - 17:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	27	6	34	7	34	33	37
B	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0
D	7	21	19	22	7	23	23	23
E	7	28	24	36	7	25	22	30
F	4	14	14	14	4	14	14	14
G	7	39	39	40	7	40	40	40

Time Interval: 17:45-18:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	27	6	34	7	34	33	35
B	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0
D	7	21	19	22	7	23	23	23
E	7	28	24	36	7	28	24	33
F	4	14	14	14	2	14	14	14
G	7	39	39	40	7	40	40	40

4726 Crown Casino / Clarendon Street

Time Interval: 8:00 - 8:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	38	14	50	6	39	23	52
B	3	12	8	22	4	18	9	23
C	6	33	30	36	6	33	31	36
D	6	22	20	26	6	22	20	24
E	4	12	8	22	3	17	10	23
F	7	30	7	36	6	32	31	33
G	0	0	0	0	0	0	0	0

Time Interval: 8:15 - 8:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	44	14	54	6	44	30	55
B	1	8	8	8	3	20	15	23
C	7	31	16	36	6	32	31	33
D	6	25	21	32	6	22	20	26
E	1	8	8	8	2	10	10	10
F	6	34	30	36	6	32	31	33
G	0	0	0	0	0	0	0	0

Time Interval: 8:30 - 8:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	6	30	21	39	6	35	30	45
B	6	19	9	22	4	21	15	23
C	7	29	20	36	6	32	31	33
D	7	19	11	21	6	22	20	24
E	6	9	9	11	5	14	9	23
F	6	33	30	36	6	31	30	33
G	0	0	0	0	0	0	0	0

Time Interval: 8:45-9:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	6	36	22	50	7	43	31	53
B	5	17	8	22	2	23	23	23
C	6	35	34	36	7	32	31	33
D	7	20	13	22	7	24	20	26
E	5	11	8	22	4	16	9	23
F	6	31	26	36	7	32	31	33
G	0	0	0	0	0	0	0	0

4726 Crown Casino / Clarendon Street

Time Interval: 17:00 - 17:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	6	35	28	52	6	36	23	50
B	2	22	22	22	2	23	22	23
C	6	35	34	36	6	32	31	33
D	7	19	8	24	6	23	20	26
E	6	12	8	22	4	16	9	23
F	7	31	25	36	6	33	31	36
G	0	0	0	0	0	0	0	0

Time Interval: 17:15 - 17:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	36	25	50	7	34	29	45
B	3	12	8	22	5	20	10	23
C	6	35	35	36	7	32	31	33
D	6	22	21	23	7	21	20	24
E	3	12	8	22	7	13	9	23
F	7	31	10	36	7	31	31	33
G	0	0	0	0	0	0	0	0

Time Interval: 17:30 - 17:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	35	17	53	6	41	32	52
B	3	17	8	22	2	23	23	23
C	7	30	7	36	6	33	31	36
D	6	22	21	25	6	22	20	26
E	4	11	8	22	4	13	9	23
F	6	35	33	36	6	32	31	33
G	0	0	0	0	0	0	0	0

Time Interval: 17:45-18:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	6	38	24	51	6	35	31	44
B	2	15	8	22	2	23	22	23
C	7	34	27	37	6	32	31	33
D	7	20	11	25	6	22	20	24
E	4	12	8	22	6	16	9	23
F	6	34	32	36	6	31	31	33
G	0	0	0	0	0	0	0	0

4878 Normanby Road / Clarendon Street

Time Interval: 8:00 - 8:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	47	40	56	6	49	37	83
B	5	19	18	21	6	20	10	22
C	6	13	13	13	5	13	13	13
D	6	32	32	36	6	33	32	34
E	4	18	17	19	6	19	18	19
F	7	15	3	20	6	16	15	18
G	1	16	16	16	0	0	0	0

Time Interval: 8:15 - 8:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	43	20	65	6	43	35	60
B	6	18	8	21	6	19	10	22
C	6	14	13	18	5	13	13	13
D	6	33	32	36	6	33	32	34
E	5	18	18	19	5	18	18	19
F	6	18	17	26	6	18	15	26
G	0	0	0	0	1	16	16	16

Time Interval: 8:30 - 8:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	6	39	33	47	6	44	40	46
B	7	17	13	20	6	21	18	22
C	7	13	13	18	6	13	13	13
D	7	28	4	33	6	33	32	33
E	4	18	18	19	6	18	18	19
F	6	23	17	36	6	16	15	17
G	2	16	16	16	0	0	0	0

Time Interval: 8:45-9:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	6	50	41	70	7	43	40	47
B	5	18	18	21	7	22	22	22
C	6	13	13	14	7	13	13	13
D	7	32	28	34	7	32	32	33
E	6	15	4	19	7	19	18	19
F	6	17	16	22	7	16	15	17
G	0	0	0	0	0	0	0	0

4878 Normanby Road / Clarendon Street

Time Interval: 17:00 - 17:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	6	50	39	66	6	43	19	58
B	6	17	9	21	4	21	18	22
C	6	14	13	18	6	13	13	14
D	7	32	24	36	6	35	33	37
E	5	15	2	19	5	18	18	18
F	6	18	14	22	6	20	14	31
G	0	0	0	0	1	16	16	16

Time Interval: 17:15 - 17:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	39	1	53	6	45	38	61
B	6	18	18	21	5	22	22	22
C	6	14	13	18	6	13	13	13
D	6	34	32	36	6	35	34	37
E	5	17	16	18	5	18	18	18
F	7	18	13	29	6	17	16	21
G	0	0	0	0	0	0	0	0

Time Interval: 17:30 - 17:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	44	29	52	7	42	20	60
B	5	19	18	21	6	21	18	22
C	7	13	13	18	7	15	13	16
D	6	35	33	36	7	32	27	37
E	5	18	18	18	6	18	18	18
F	6	17	13	32	7	21	16	26
G	0	0	0	0	1	16	16	16

Time Interval: 17:45-18:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	35	6	43	6	43	33	57
B	7	19	18	21	5	21	18	22
C	7	14	13	18	6	15	13	16
D	6	34	32	36	6	30	27	37
E	6	18	18	23	6	18	18	19
F	6	15	13	17	6	18	16	22
G	0	0	0	0	1	16	16	16

4883 City Road / Clarendon Street

Time Interval: 8:00 - 8:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	39	30	51	7	43	25	65
B	2	10	10	10	0	0	0	0
C	8	38	30	47	7	23	16	26
D	8	15	14	18	7	23	18	28
E	1	9	9	9	1	12	12	12
F	7	23	15	30	7	30	21	44
G	0	0	0	0	0	0	0	0

Time Interval: 8:15 - 8:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	33	28	40	8	45	33	55
B	2	11	11	11	0	0	0	0
C	8	34	5	45	8	26	20	34
D	7	17	13	23	8	19	13	27
E	3	8	2	12	1	11	11	11
F	8	23	13	28	8	26	18	37
G	0	0	0	0	0	0	0	0

Time Interval: 8:30 - 8:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	30	27	34	8	49	45	55
B	3	10	10	11	0	0	0	0
C	8	46	39	66	8	25	20	29
D	6	18	18	18	8	18	16	22
E	3	11	11	12	1	12	12	12
F	8	17	2	25	8	23	18	26
G	0	0	0	0	0	0	0	0

Time Interval: 8:45-9:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	37	30	50	9	35	26	50
B	0	0	0	0	0	0	0	0
C	7	35	34	38	9	32	25	40
D	7	17	13	20	8	17	16	20
E	4	12	12	12	1	12	12	12
F	8	21	17	34	9	21	17	30
G	0	0	0	0	0	0	0	0

4883 City Road / Clarendon Street

Time Interval: 17:00 - 17:15

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	41	32	59	9	39	35	49
B	1	11	11	11	0	0	0	0
C	7	42	33	60	9	32	27	41
D	4	16	14	20	8	16	13	19
E	1	12	12	12	0	0	0	0
F	8	22	18	29	9	24	16	30
G	0	0	0	0	0	0	0	0

Time Interval: 17:15 - 17:30

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	36	29	45	8	37	27	49
B	2	11	11	11	1	10	10	10
C	8	38	33	50	8	35	30	42
D	8	16	13	19	8	18	13	22
E	3	11	1	12	1	12	12	12
F	8	19	5	32	8	21	14	25
G	0	0	0	0	0	0	0	0

Time Interval: 17:30 - 17:45

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	8	31	28	41	7	32	18	48
B	6	9	3	11	0	0	0	0
C	7	37	33	47	7	35	30	40
D	6	14	13	18	7	17	13	18
E	5	11	11	12	3	12	11	12
F	8	22	18	30	7	27	19	34
G	0	0	0	0	0	0	0	0

Time Interval: 17:45-18:00

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	7	33	28	45	8	40	25	50
B	3	10	8	11	0	0	0	0
C	8	37	33	43	8	32	28	40
D	8	16	14	20	8	18	13	20
E	5	9	2	12	1	11	11	11
F	7	22	18	27	8	27	21	37
G	0	0	0	0	0	0	0	0

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Appendix B

Tram Headway Graphs

Figure B.1: Tram Headway – AM Peak 2016 1a

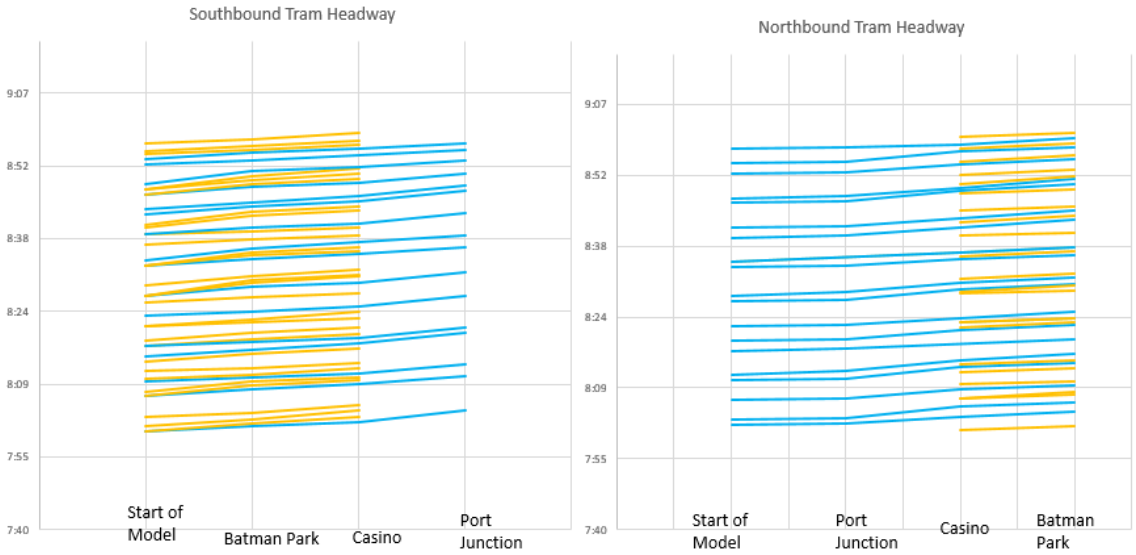


Figure B.2: Tram Headway – AM Peak 2016 2a

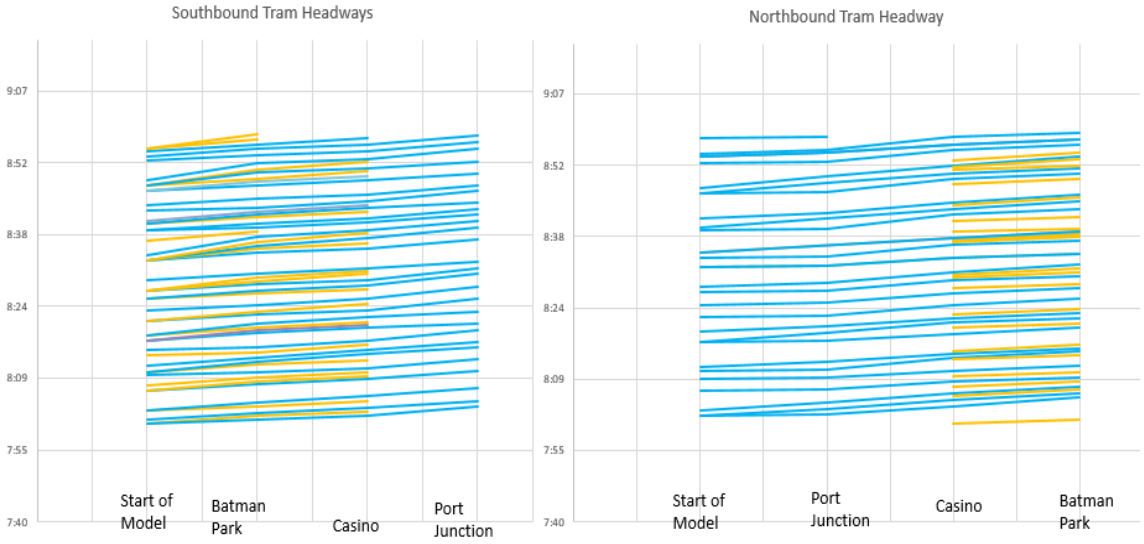


Figure B.3: Tram Headway – AM Peak 2031 1a

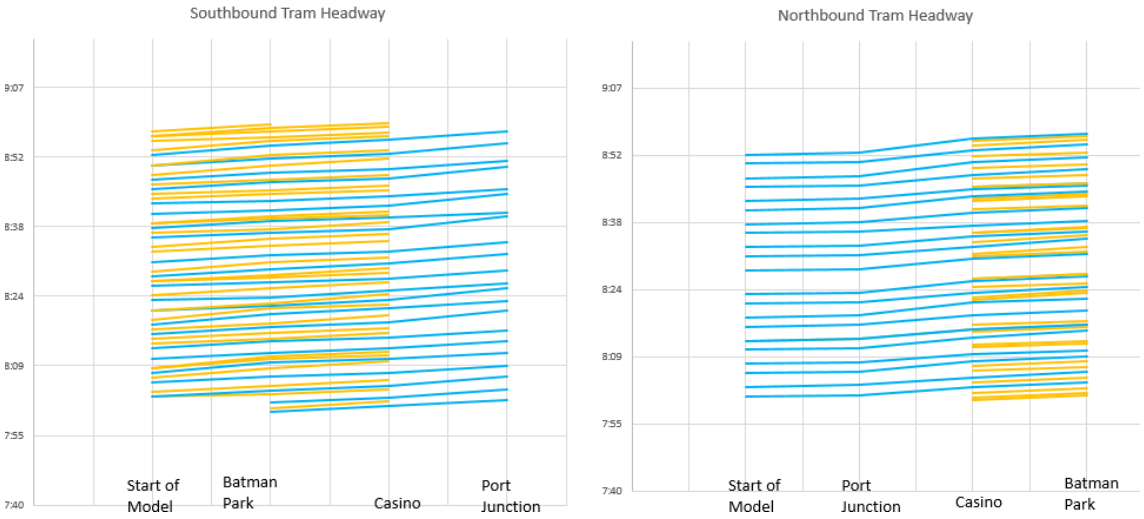


Figure B.4: Tram Headway – AM Peak 2031 2a

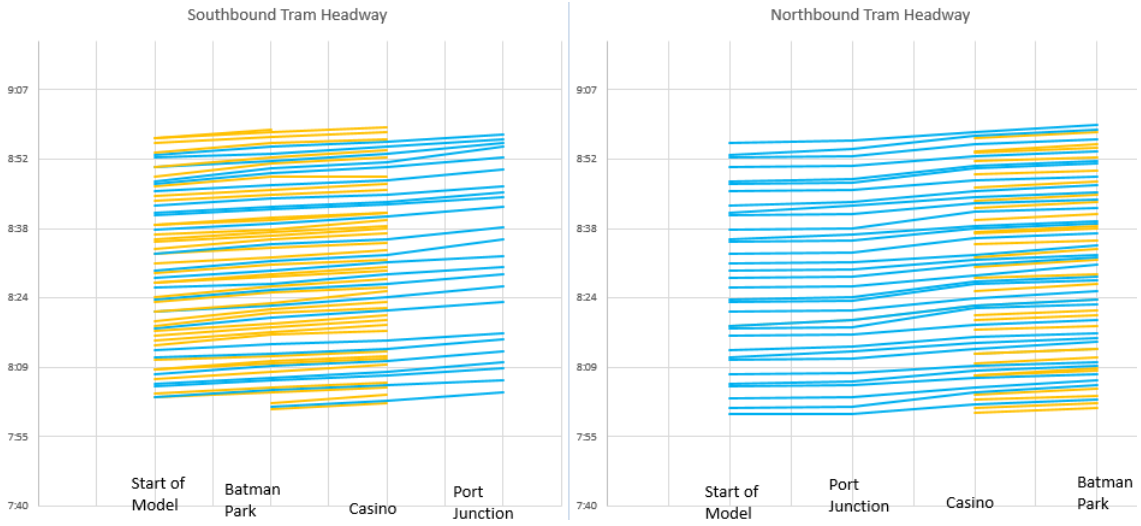


Figure B.5: Tram Headway – PM Peak 2016 1a

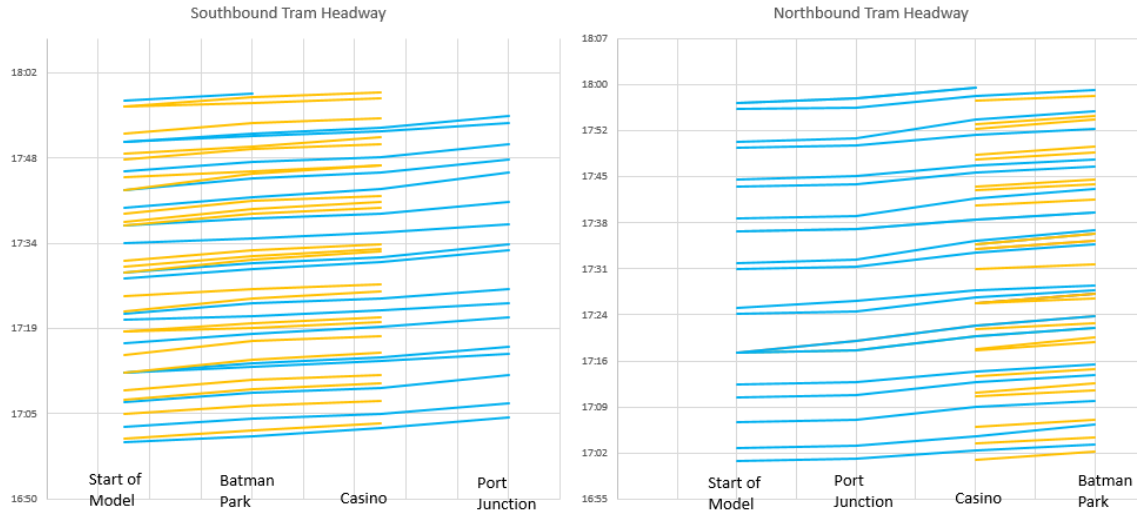


Figure B.6: Tram Headway – PM Peak 2016 2a

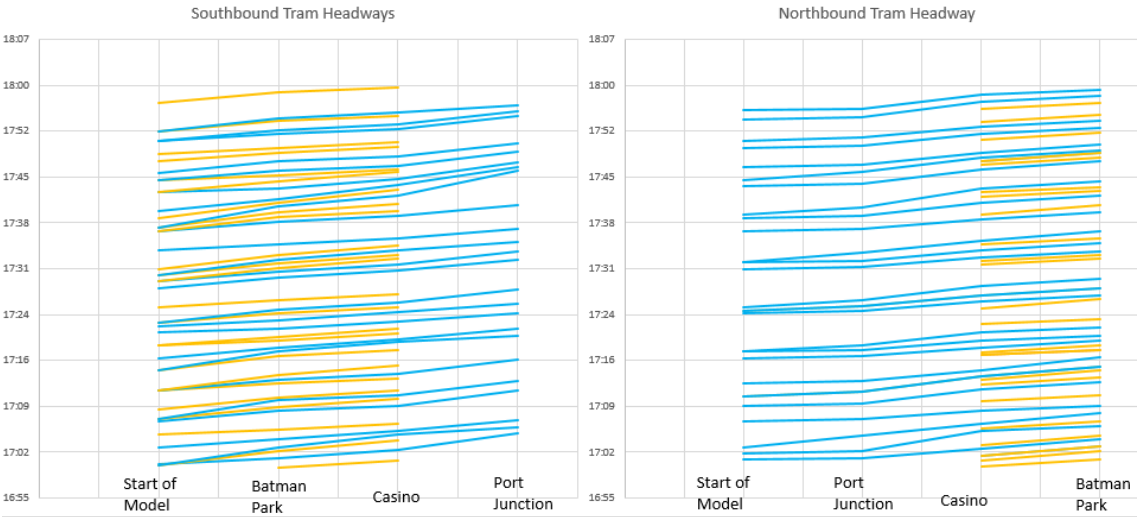
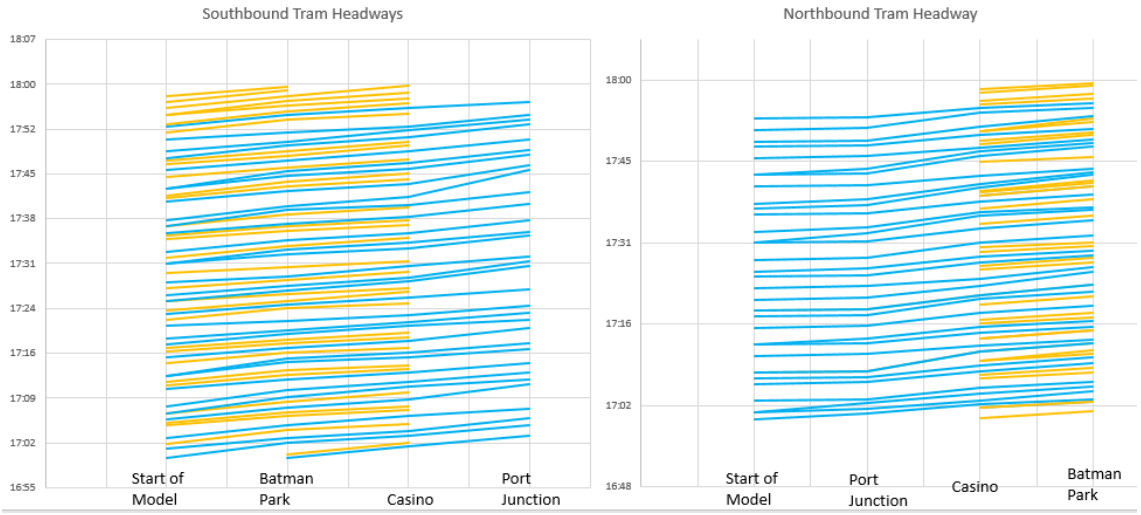


Figure B.7: Tram Headway – PM Peak 2031 1a

Figure B.8: Tram Headway – PM Peak 2031 2a



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