



[Double-click to insert client logo](#) Perth Commercial Vehicle Surveys

Report





## Perth Commercial Vehicle Surveys

### Report

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## Perth Commercial Vehicle Surveys

Report

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## Contents

1	INTRODUCTION .....	1
	Commercial Vehicle Surveys.....	1
	Classified Counts and Pedestrian Counts.....	1
2	METHODOLOGY .....	3
	Commercial Vehicle Surveys.....	3
	Full Classified Counts, Pedestrian and Cycle Counts .....	7
	Additional Pedestrian and Cycle Counts .....	7
	Additional Classified Turning Count .....	8
3	SURVEY RESULTS .....	9
	Commercial Vehicles .....	9
	Full Classified Counts, Pedestrian and Cycle Counts .....	15
	Additional Pedestrian and Cycle Counts .....	33
	Additional Classified Turning Count .....	37

## Tables and Figures

Figure 2.1	- Wider Perth Survey Locations .....	4
Figure 2.2	Inner Perth Survey Locations.....	5
Figure 3.1	Origin and destinations of commercial vehicle trips in Perth .....	11
Figure 3.2	- Main routes for commercial vehicles into Central Perth .....	12
Figure 3.3	Site 1 - A912 Dunkeld Road - All movements .....	13
Figure 3.4	Main routes for commercial vehicles from Central Perth.....	14
Figure 3.5	Percentage of Commercial Vehicles using main routes from Central Perth .....	14
Figure 3.6	Site 1 - A912 Dunkeld Road - All movements .....	16
Figure 3.7	Site 1 - A912 Dunkeld Road – OGV 1 and OGV 2 combined .....	16
Figure 3.8	Site 2 - Crieff Road – All movements.....	17
Figure 3.9	Site 2 - Crieff Road – OGV 1 and OGV 2 combined.....	17
Figure 3.10	Site 3 - A93 Glasgow Road – All movements.....	18
Figure 3.11	Site 3 - A912 Glasgow Road – OGV 1 and OGV 2 combined.....	18
Figure 3.12	Site 4 - A912 Edinburgh Road – All movements .....	19
Figure 3.13	Site 4 - A912 Edinburgh Road – OGV 1 and OGV 2 combined .....	19
Figure 3.14	Site 5 – A85, Dundee Road – All movements .....	20
Figure 3.15	Site 5 – A85, Dundee Road – OGV 1 and OGV 2 combined .....	20
Figure 3.16	Site 6 – A94, Angus Road – All movements.....	21
Figure 3.17	Site 6 - A94 Angus Road – OGV 1 and OGV 2 combined .....	21
Figure 3.18	Site 7 - A93 Isla Road – All movements .....	22
Figure 3.19	Site 7 - A93 Isla Road – OGV 1 and OGV 2 combined .....	22
Figure 3.20	Site 8 - A85 Barrack Street – All movements .....	23
Figure 3.21	Site 8 - A85 Barrack Street – OGV 1 and OGV 2 combined .....	23
Figure 3.22	Site 9 – A93 Glasgow Road – All movements .....	24
Figure 3.23	Site 9 – A93 Glasgow Road – OGV 1 and OGV 2 combined.....	24
Figure 3.24	Site 10 - A912 Edinburgh Road, at South Inch – All movements.....	25
Figure 3.25	Site 10 - A912 Edinburgh Road, at South Inch – OGV 1 and OGV 2 combined.....	25
Figure 3.26	Site 11 - Shore Road, south of Marshall Place – All movements .....	26
Figure 3.27	Site 11 - Shore Road, south of Marshall Place – OGV 1 and OGV 2 combined.....	26

<b>Figure 3.28 Site 12 - A85 Queen's Bridge – All movements</b> .....	27
<b>Figure 3.29 Site 12 - A85 Queen's Bridge– OGV 1 and OGV 2 combined</b> .....	27
Figure 3.30 Site 13 - A93 Perth Bridge – All movements .....	28
Figure 3.31 Site 13 - A93 Perth Bridge – OGV 1 and OGV 2 combined .....	28
Table 3.32 Perth Classified Counts - Weekly Summary .....	29
Table 3.33 Classified Counts by Euro Engine Classification .....	31
Figure 3.34 Pedestrian Site 1 – St Paul's Church View East.....	34
Figure 3.35 – Site P2 Pedestrian High Street near Kinnoull Street Junction .....	35
Figure 3.36 – Site P3 Pedestrian High Street – King Edward Street.....	36
Figure 3.37 – Site P4 Pedestrian High Street – St Johns Street Junction.....	37
Figure 3.38 Atholl Street / Melville Street Junction - View East.....	38
Figure 3.39 Atholl Street/Barossa Street/Kinnoull Street .....	39

## Appendices

APPENDIX A Vehicle Classifications

APPENDIX B Summary of Registration Plate Surveys

APPENDIX C Perth Full Classified Counts – Sites 1 to 13

APPENDIX D Pedestrian count data

APPENDIX E Additional Classified Counts – Atholl Street Sites Tabular Data



# 1 Introduction

- 1.1 This report documents the results from the surveys of commercial vehicles, pedestrians and turning movements in the Perth Urban Area which JMP and its survey partner MHTC were commissioned to undertake.

## Commercial Vehicle Surveys

- 1.2 Air quality concerns in Perth are the key driver for the survey of commercial vehicles which this report analyses in detail. Emphasis is being placed on improving air quality in urban areas at all levels of Government especially as the European Commission (EC) will be imposing fines on the Scottish Government based on the failings to meet air quality targets. The level of fine is not yet known and whether the responsibility for payment of the fine will be passed on to the Local Authorities. However the potential for large fines to be incurred places a fiscal incentive to find solutions to local air quality problems and subsequently providing the necessary funding to implement Air Quality Action Plans (AQAP).
- 1.3 Ongoing monitoring has shown there are still exceedences in and around Perth City Centre which lies within an Air Quality Management Area (AQMA). The AQAP is now in place and Perth and Kinross Council have received grant funding from the Scottish Government towards measures contained within the plan.
- 1.4 The AQAP contains a package of nineteen measures ranging from infrastructure improvements such as the Cross Tay Link where a full Environmental Appraisal has been carried out in the last twelve months to bus quality improvements, travel planning and local air quality marketing. Freight improvements are linked to the completion of a freight consolidation feasibility study and ongoing regional freight quality partnership initiatives.
- 1.5 The commercial vehicle surveys which this study report analyses will be used to better understand the:-
- Origin and destinations of commercial vehicle movements within the Perth area to differentiate between through movements and those with a destination in either the inner suburban area or the city centre.
  - The types of commercial vehicles using Perth's radial routes in order to establish euro engine classifications and axle type which can feed into calculations on their contribution towards emissions and particulate concentrations.
  - Relative volumes of commercial vehicles using different radial routes
- 1.6 Using this data will help in developing the evidence base to address nitrous oxide and particulates exceedences which are caused by diesel engine vehicles, principally lorries.

## Classified Counts and Pedestrian Counts

- 1.7 Classified counts and pedestrian counts have also been undertaken in Perth City Centre locations in order to enable the Council's Paramics traffic model to be updated. This is being used to develop the city's transport strategy which will plan transport measures to

address congestion and air quality issues, and will comprise some new road construction as well as improvements to the walking and cycling networks.

- 1.8 The turning counts in Atholl Street are to provide full information on traffic movements at the location where air pollution from traffic is at its highest. There is an air quality monitoring station between the two junctions.

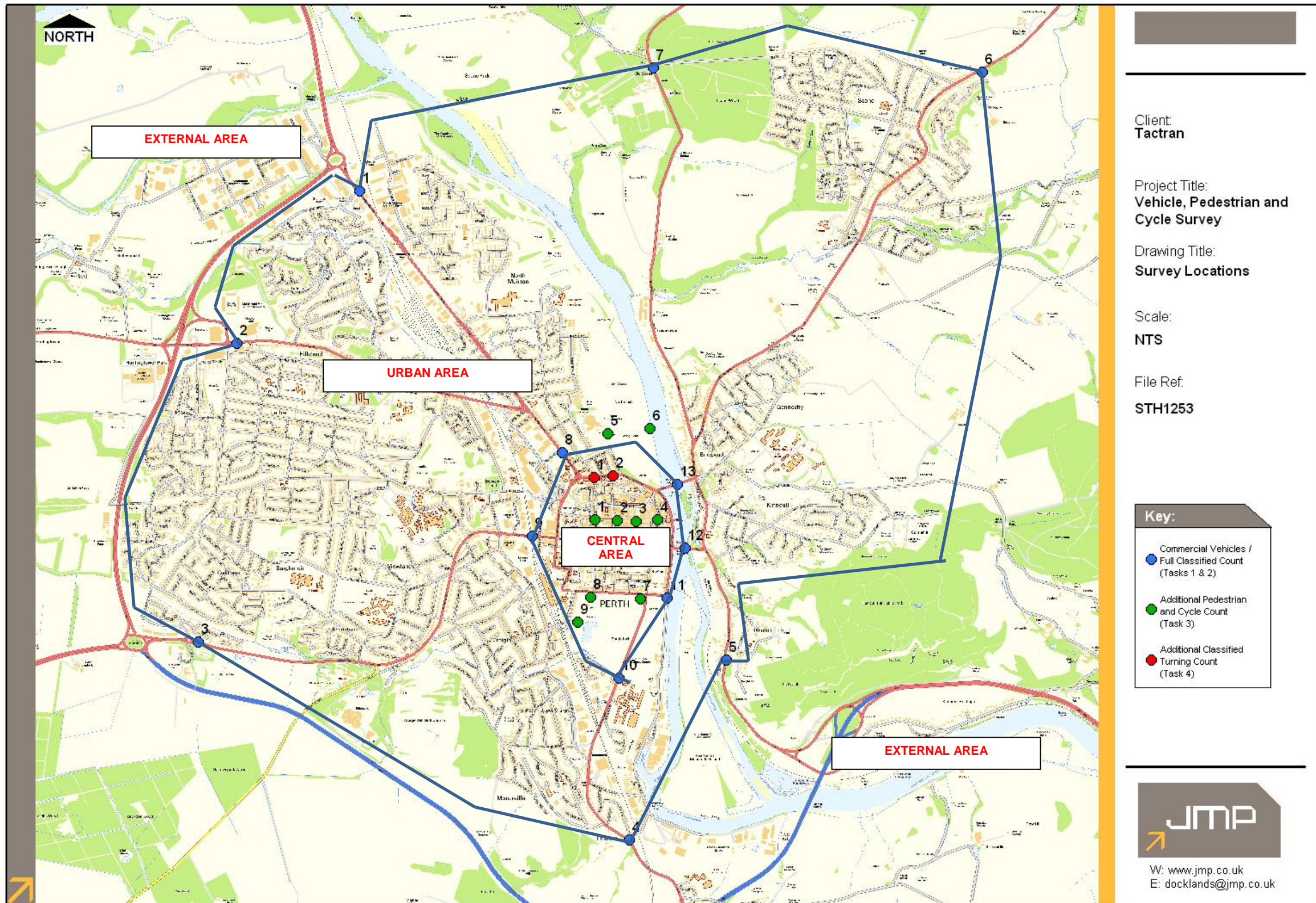
## 2 Methodology

### Commercial Vehicle Surveys

- 2.1 Counts were undertaken on Wednesday 16th March 2011 between 06:00 and 18:00 and broken down into 15 minute segments at two cordons – outer and inner Perth as specified below. Counts were undertaken for the inbound and outbound direction separately. For each vehicle observed, vehicle classification and registration were noted, including whether the vehicle was foreign registered.
- 2.2 The survey locations are shown in blue in Figures 2.1 and 2.2 below with locations 1 to 7 forming the outer cordon and 8 to 13 forming the inner cordon.
- 2.3 It should be noted that Figure 1 shows the wider Perth area with all the survey locations shown whilst Figure 2 shows the inner Perth area and provides a more detailed view of central Perth.



Figure 2.1 - Wider Perth Survey Locations



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Figure 2.2 Inner Perth Survey Locations



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- 2.4 Following site visits to commercial vehicle location 5, it was discussed and agreed with Tactran that this site be moved slightly further to the north in order to correspond with the start of the 30mph zone. In this way it was easier for enumerators to survey.
- 2.5 Vehicle classifications were discussed and agreed with Tactran with a balance struck between offering the level of disaggregation required for air quality calculations versus ensuring that the data collection requirements were not overtly complex for enumerators to record.
- 2.6 Consequently, the following classification was used which broadly accords with standard DfT vehicle classifications. These are shown in Appendix A and included:
- LGV
  - 2 axle rigid
  - 3 axle rigid
  - 3 axle articulated
  - 4 axle rigid
  - 4 axle articulated
  - 5+ articulated
- 2.7 These vehicle classifications are illustrated in Appendix A. Registration matching software was used to produce matrices in Excel format of vehicle origin and destination points including allowing for identifying vehicles making deliveries/uplifting in the central area for each vehicle classification type and engine classification type by hourly periods.
- 2.8 Matrices were aggregated to produce 12 hour results split by (i) LGV and HGV, (ii) Euro engine classification, and (iii) linked/unlinked trips for:
- External - external
  - External - urban area (excluding central area)
  - External - central area
  - Urban area (excluding central area) - external
  - Urban area (excluding central area) - urban area (excluding central area)
  - Urban area (excluding central area) - central area
  - Central area - external area
  - Central area - urban area (excluding central area)
- 2.9 For the avoidance of doubt:
- External is the area 'outside' the outer cordon
  - Urban area is the area between the outer cordon and the inner cordon; and
  - Central area is within the inner cordon

2.10 The central, inner and outer cordons are shown in Figure 1 with the Outer Cordon Count Locations as follows:

1. A912 Dunkeld Road, south of Inveralmond roundabout
2. A85 Crieff Road, east of Newhouse Road
3. A93 Glasgow Road, east of Broxden Avenue
4. A912 Edinburgh Road, south of Friarton Road
5. A85 Dundee Road, south of Island View
6. A94 Angus Road, Scone, at Park and Ride roundabout
7. A93, Isla Road, south of Old Scone,

2.11 The Inner Cordon Count Locations are listed below:-

8. A85 Barrack Street, south of St Catherine's Road
9. A93 Glasgow Road, on railway bridge
10. A912 Edinburgh Road, at South Inch
11. Shore Road, south of Marshall Place
12. A93 Queen's Bridge
13. A85 Perth Bridge

## Full Classified Counts, Pedestrian and Cycle Counts

2.12 Full classified counts, together with pedestrian counts (walking along footways) and cyclists on both carriageway and footway were also conducted at the locations listed above.

2.13 The counts were undertaken on Wednesday 16th March 2011 between 06:00 and 18:00 and broken down in to 15 minute segments at two cordons – outer and inner Perth as specified below (Same as Task 1). Counts are to be undertaken for the inbound and outbound direction separately.

## Additional Pedestrian and Cycle Counts

2.14 Additional pedestrian counts (walking along footways) and cyclists on both carriageway and footway were undertaken on Thursday 17<sup>th</sup> March 2011.

1. High Street outside St Paul's Church
  2. Pedestrianised High Street - near Kinnoull Street/Scott Street junction
  3. Pedestrianised High Street - King Edward Street junction
  4. Pedestrianised High Street - St Johns Street junction
- North Inch, south of Bells Sports Centre North - South paths either side of the playing fields

5. West path
6. East path  
South Inch, at Marshall Place end
7. SW-NE diagonal
8. SE-NW diagonal
9. N-S route (west of boating lake)

2.15 These locations are shown in green in Figures 2.1 and 2.2.

### **Additional Classified Turning Count**

2.16 A further classified count was undertaken on Thursday 17<sup>th</sup> March 2011 at the following locations:

1. Atholl Street/Melville Street/North Methven Street
2. Atholl Street/Barossa Street/Kinnoull Street

2.17 These locations are shown in red in Figures 2.1 and 2.2.



## 3 Survey Results

### Commercial Vehicles

3.1 The Commercial Vehicle surveys were undertaken on Wednesday 16<sup>th</sup> March 2011. In analysing the data for the surveys a number of issues were observed that could impact on the quality of the data. These can be broken down into incidents and traffic management issues.

#### Incidents

3.2 There was a truck broken down on Queen's Bridge (Site 12) on the outbound side, blocking one lane at approximately 08:00 on Wednesday 16<sup>th</sup> March. The vehicle was in situ for approximately 45 minutes but no significant affect on traffic volumes was observed.

3.3 Permanent Warning signs were activated at the junction of the A93/A94 for closure of the A93 north of site 7. It was assumed that this was to forewarn drivers of the roadworks detailed in paragraph 3.4. below.

3.4 The A93 (Road north of site 7) was closed during the off-peak period for work on a bridge. There was a diversion in place immediately to the north of site 7 directing traffic towards Site 6 (A94 Angus Road, Scone, at Park and Ride roundabout)

3.5 Diversionary signage was also in place at the A93/94 junction, although permanent warning signs were activated as mentioned above. This would have affected traffic in both directions at Site 7, resulting in lower flows than usual and higher flows at Site 6.

#### Traffic Management

3.6 At the A93 Perth Bridge (Site 13) there are weight restrictions in place on the bridge (< 7.5 t). Additionally, there is a turn restriction at the eastern end of bridge, i.e., it is not possible to turn south onto the A85 towards the Queen Bridge and A90/M90 ( sites 5 and 12).

3.7 In Perth city centre the route from Site 9 (A93 Glasgow Road) to Site 12 (Queens Bridge) along South Street is one-way in the eastbound direction only. .

3.8 At Site 1, A912 Dunkeld Road, south of Inveralmond roundabout there was a high degree of activity due to businesses located just inside the cordon (offices, industrial estate and petrol station) and an industrial estate just outside the cordon.

3.9 South of Site 4 (A912 Edinburgh Road, south of Friarton Road) there are restrictions at Junction 10 of M90. Only the north/southbound movements (to/from Edinburgh) are possible. This means that eastbound or westbound trips need to go to junction 9 of the M90 and then perform a u-turn.

3.10 The Port industrial area is located between sites 4 and 11.

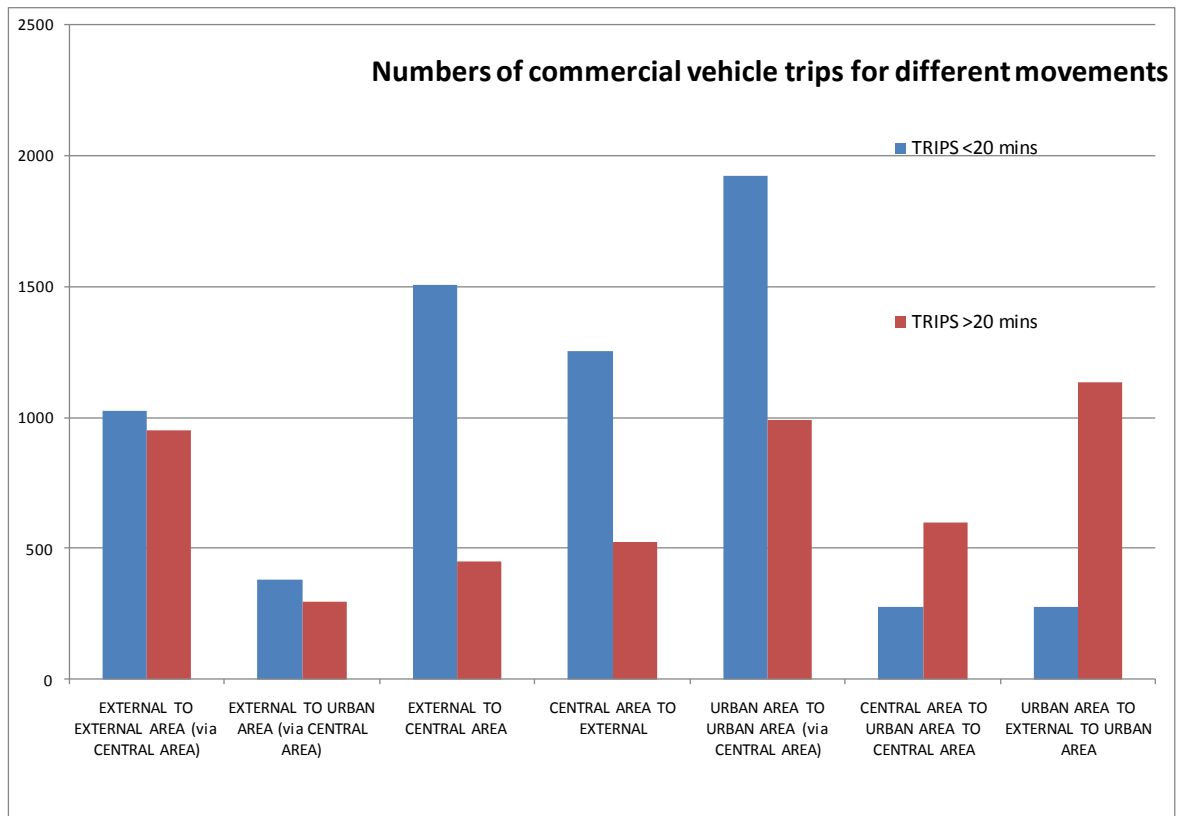
## Linked Trips / Unlinked Trips

- 3.11 A key aspect of the study is to understand whether vehicles are making deliveries / picking up goods or are travelling through Perth. In order to differentiate between these two types of movements, we have determined the amount of time it typically takes to cross Perth. Based on peak and inter peak journey time runs conducted as part of the surveys, it was agreed that a duration of 20 minutes or less between cordons would be assumed as constituting a trip where no intervening delivery activities would have been undertaken. Correspondingly, journeys over 20 minutes were assumed to have involved some level of delivery activity.

## Results

- 3.12 A summary of the results are contained in Appendix B for the aforementioned scenarios mentioned in paragraph 2.8. Raw data is being provided separately consisting of over 22,000 records.
- 3.13 Figure 3.1. below provides an overall summary of origin – destination movements across Perth. This shows that in terms of overall quantum the numbers of vehicles originating in the urban areas is similar to that for external areas when adding the different totals together.
- 3.14 Many of the external movements are either travelling to the central area or across to other areas external to Perth. However there are relatively few movements originating from outside Perth that are going to the urban areas (not central areas of Perth). Much of the traffic travelling to urban areas of Perth is actually from other urban areas of Perth and these are overwhelmingly undertaken by light goods vehicles reflecting the nature of activities that are undertaken by these vehicle types
- 3.15 Many of the cross town movements between cordon points were also for longer than 20 minutes suggesting that these trips are not simply passing through but are linked to delivery activities.

**Figure 3.1 Origin and destinations of commercial vehicle trips in Perth**



3.16 The following paragraphs provide some more detail on the different kinds of commercial vehicle movements in Perth and should be assessed within the context of the tables presented in Appendix B..

#### *External to External Trips*

3.17 These trips were recorded as entering and exiting the outer cordon from the external area. Almost two thirds of these trips left by a different cordon to that they entered suggesting that these are through trips. The remaining third entered and exited the same outer cordon. In other words these trips were made into the urban area or central area and then returned in the same direction from which they came from. This was particularly prevalent at Site 1, A912 Dunkeld Road because of the location of a petrol filling station and industrial estate just inside and outside the cordon.

3.18 The number of trips less than 20 minutes in duration constituted about half of all movements suggesting that there are a significant number of through trips.

#### *External to Urban Area*

3.19 These are routes from the external area to the urban area. Some of these movements pass the outer cordon and then the inner cordon twice. Eighty five per cent of these movements did not return in the same direction as they had arrived. The most popular routes with over 25 movements in the 12 hour period between 6am and 6pm were:-

- A85, Dundee Road - Queens Bridge - A912 Edinburgh Road

- A85, Dundee Road - Queens Bridge - Shore Road
- A94 Angus Road - Queens Bridge - Shore Road
- A94 Angus Road – Queens Bridge – A85 Barrack Street

3.20 The use of the Queens Bridge for much of these routes probably reflects the weight restrictions that have been imposed on the Perth Bridge and hence this is the preferred crossing point over the River Tay.

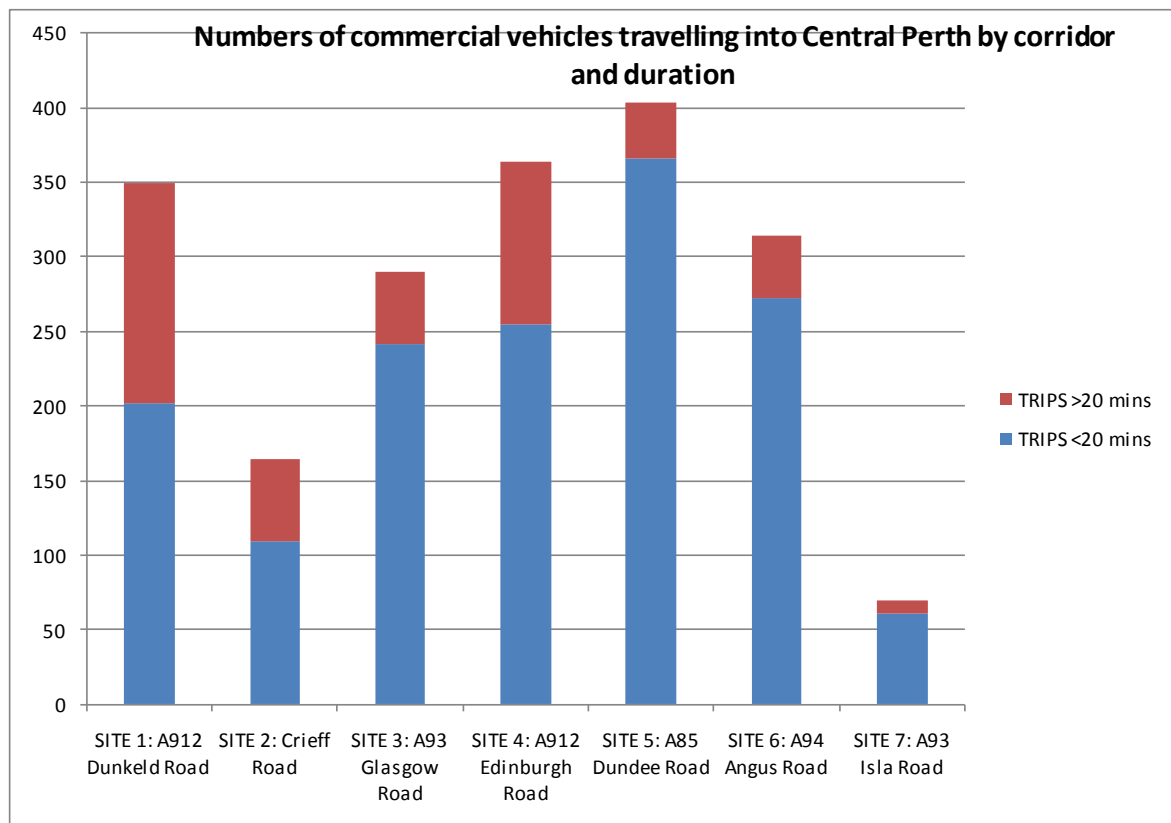
3.21 Other routes through the city particularly north – south were less well used particularly north – south routes given the proximity of the M90 / A9 route.

**External to Central Area**

3.22 These are vehicles which were seen passing the outer and inner cordon. These vehicles may also have been seen again, although the rest of their route is not included

3.23 Figure 3.2 shows the volumes of commercial vehicles using the main approach routes into Central Perth.

**Figure 3.2 - Main routes for commercial vehicles into Central Perth**

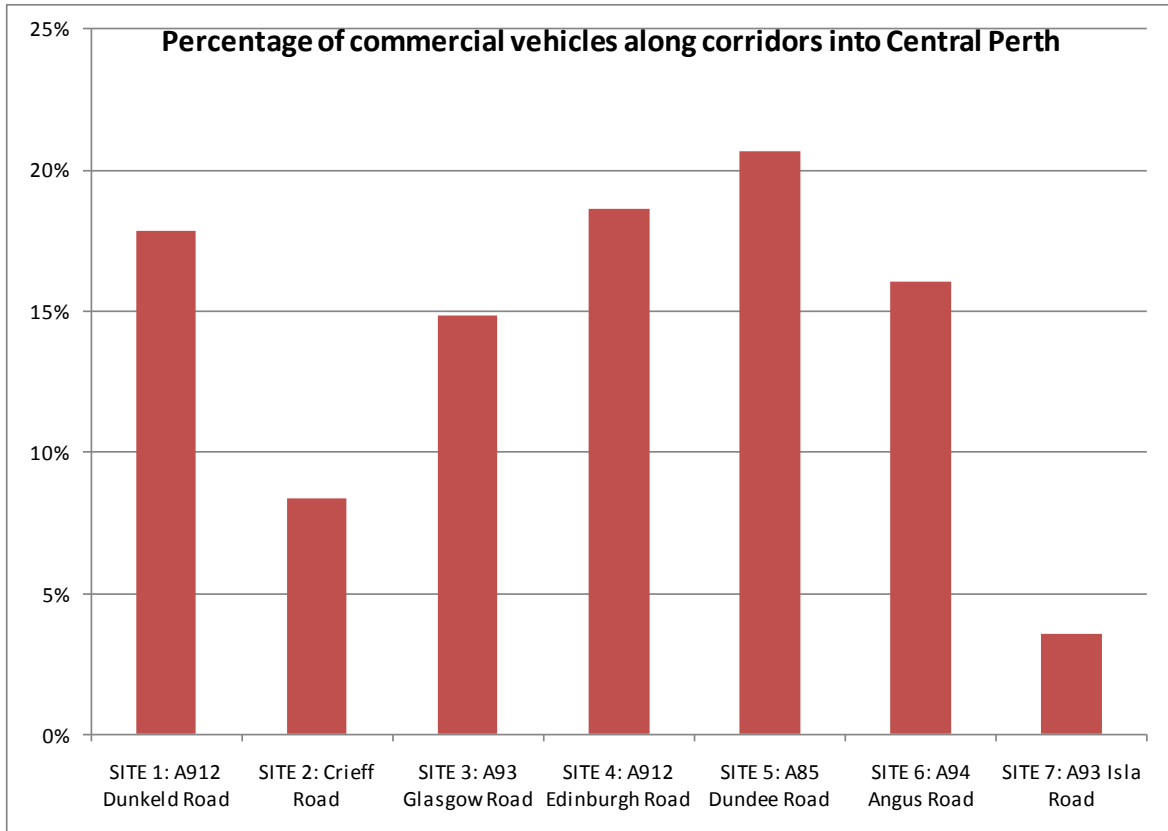


3.24 Figure 3.2 illustrates that the A85 Dundee Road followed by the A912 Edinburgh Road and A912 Dunkeld Road are the most popular routes into Perth. It should be noted that due to the roadworks on the A93 Isla Road, the actual movements on this route might be underrepresented compared to average conditions. Correspondingly the A94 Angus Road movements might be overrepresented. The results show the popularity of routes from the

main employment and population centres to the south of Perth but also the route from the Highlands (A9/A912).

3.25 Figure 3.3 provides the corresponding percentages with 4 of the 7 routes into Perth contributing to 74% of movements.

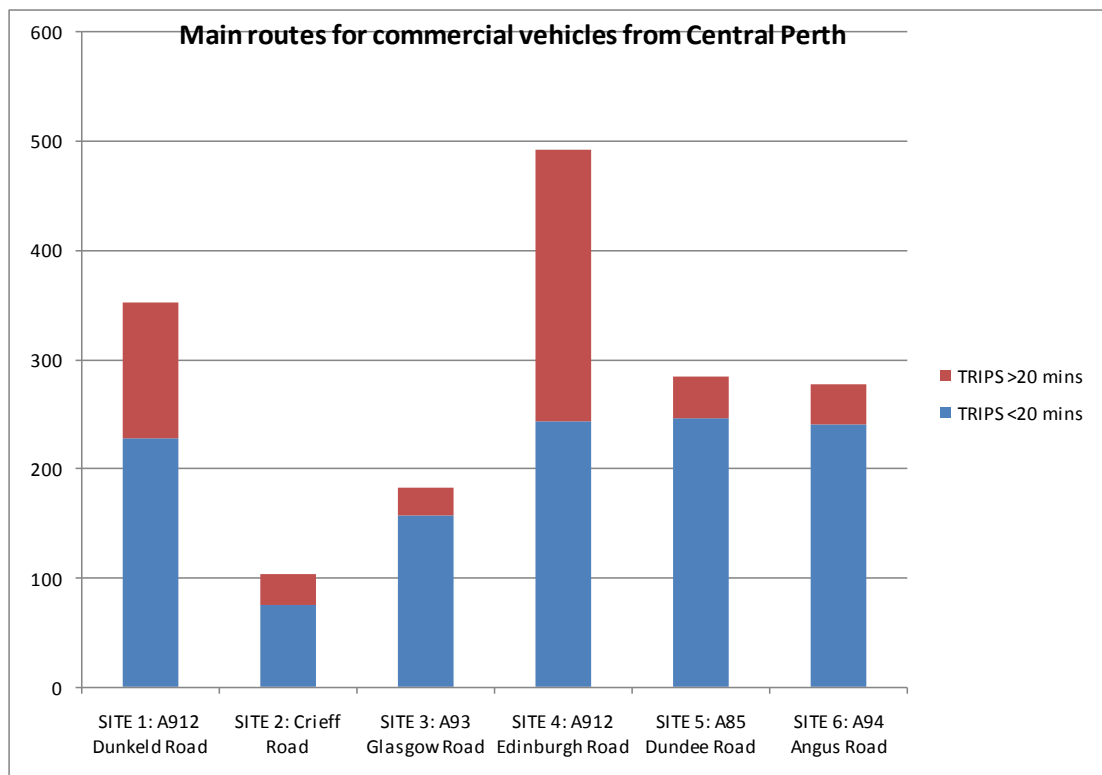
**Figure 3.3 Site 1 - A912 Dunkeld Road - All movements**



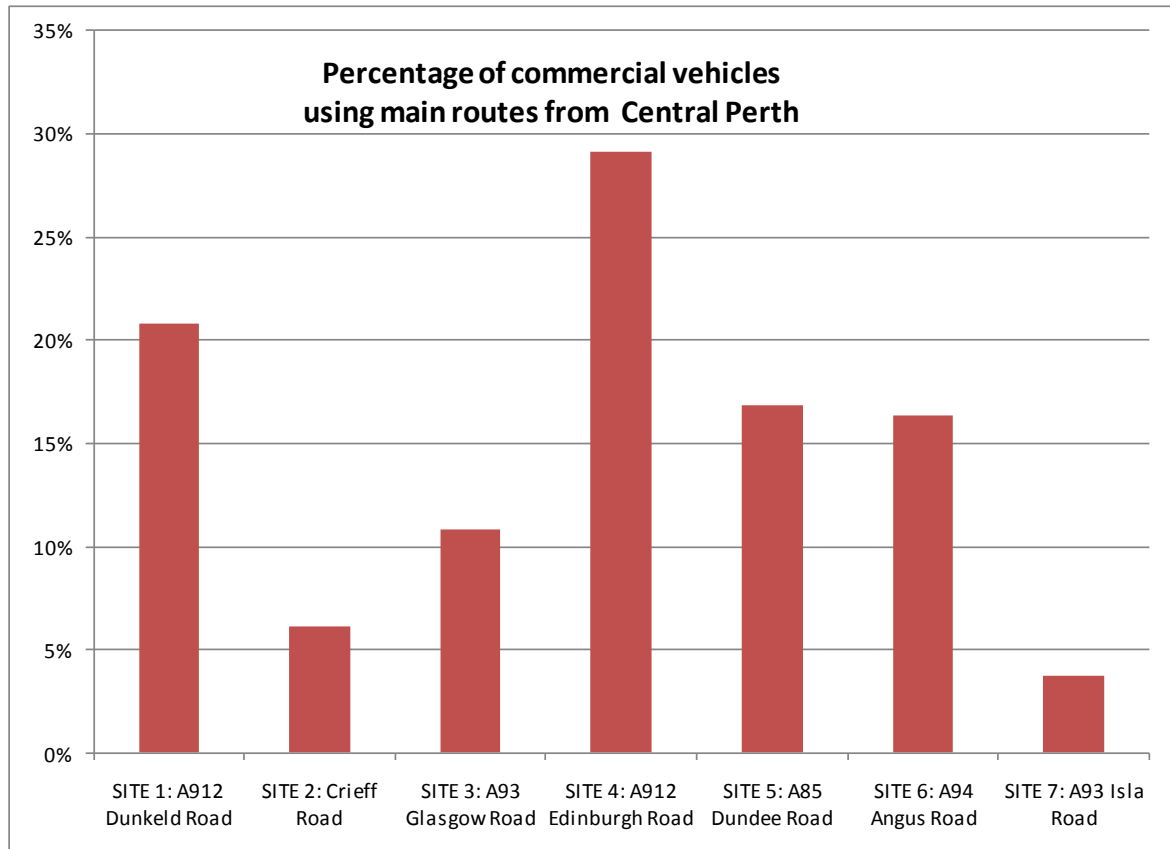
**Central to External Area**

3.26 Figures 3.4 and 3.5 show the corresponding movements from the central area to the external areas.

**Figure 3.4 Main routes for commercial vehicles from Central Perth**



**Figure 3.5 Percentage of Commercial Vehicles using main routes from Central Perth**



- 3.27 Figure 3.5 indicates that the approach routes that are used to access Central Perth are not necessarily the same routes that are used outbound. For example more commercial vehicles use the A912 Edinburgh Road to leave Perth rather than enter. This is probably due to the nature of access to the motorway network in that it is a shorter distance to reach the M90 in the southbound direction than in the northbound direction where commercial vehicles must pass through Bridge of Earn. Northbound movements into the city from the Edinburgh direction are therefore more likely to use junction 11 of the M90.

#### *Urban Area to Urban Area*

- 3.28 These are trips from one part of the urban area to another, via the central area (passes inner cordon inbound and outbound) and from the central area to the urban area. The tables in Appendix B do not show the continuation of any trip after it has passed from the urban area to the urban area.
- 3.29 The tables clearly illustrate the preponderance for east – west movements particularly across the Queens and Perth bridges

#### *Central Area to Urban Area to Central Area*

- 3.30 These movements are relatively low in number compared to other origin – destination movements. The main movement is from the port industrial area.

#### *Urban Area to External to Urban Area*

- 3.31 These are trips exiting the urban area (passing outer cordon) to the external area and re-entering the cordon.
- 3.32 The majority of these trips are longer distance duration trips reflecting the more dispersed nature of markets beyond the Perth urban boundary.

## **Full Classified Counts, Pedestrian and Cycle Counts**

- 3.33 Full classified counts, together with pedestrian and cycle counts were undertaken at the corresponding locations as those for the registration plate surveys identified above. The tabular information broken down by 15 minute time period is captured by inbound and outbound movements and is available at Appendix C.
- 3.34 Figures 3.6 to 3.31 below, graphically summarise the twelve hour, hourly profile of all inbound and outbound vehicular movements and then for OGV 1 and OGV 2 combined for the 13 sites that were assessed.
- 3.35 The results indicate that the outer cordon sites (sites 1 to 7) generally have higher levels of OGV1 and OGV2 movements compared to the inner cordon sites. The main routes to/ from the north (A912 Dunkeld Rd) and the south (A85 Dundee Road) appear to be the busiest for HGV movements in general peaking at around 50 movements in any given hour. The sites in the west (A85 Crieff Road) and A93 (Glasgow Road) have much smaller levels of HGV movement as does the A93 Isla Road although this could have been affected by the roadworks described earlier in this report.

Figure 3.6 Site 1 - A912 Dunkeld Road - All movements

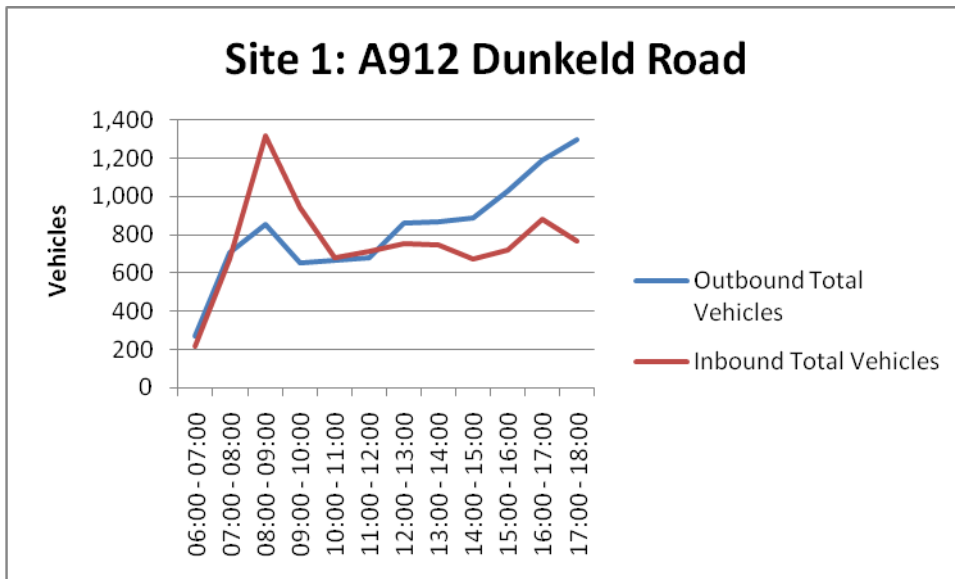


Figure 3.7 Site 1 - A912 Dunkeld Road – OGV 1 and OGV 2 combined

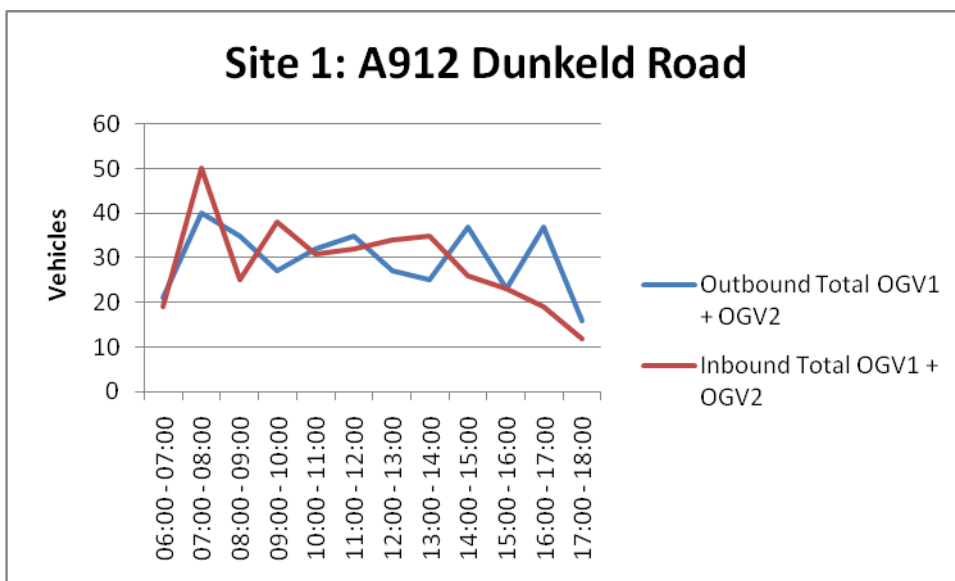




Figure 3.8 Site 2 - Crieff Road – All movements

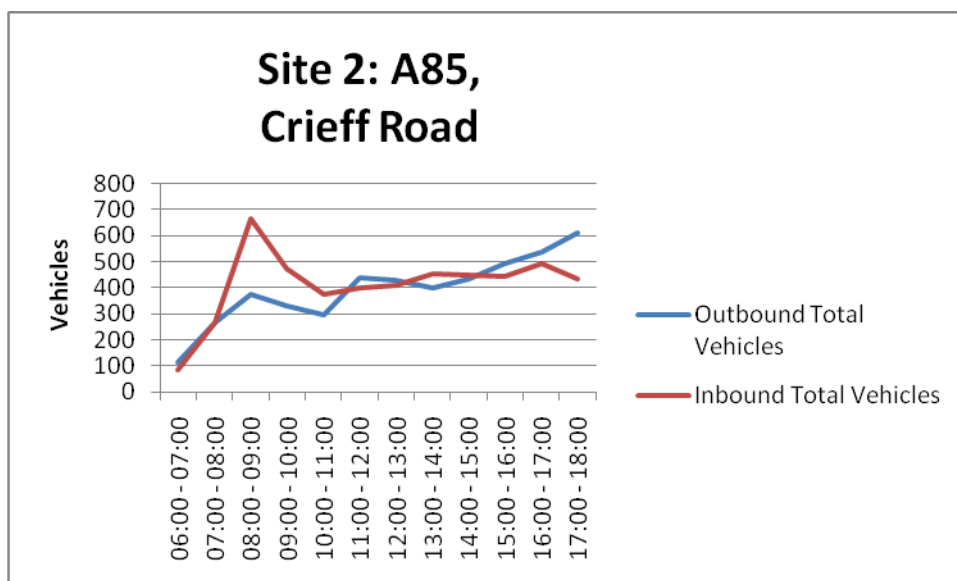


Figure 3.9 Site 2 - Crieff Road – OGV 1 and OGV 2 combined

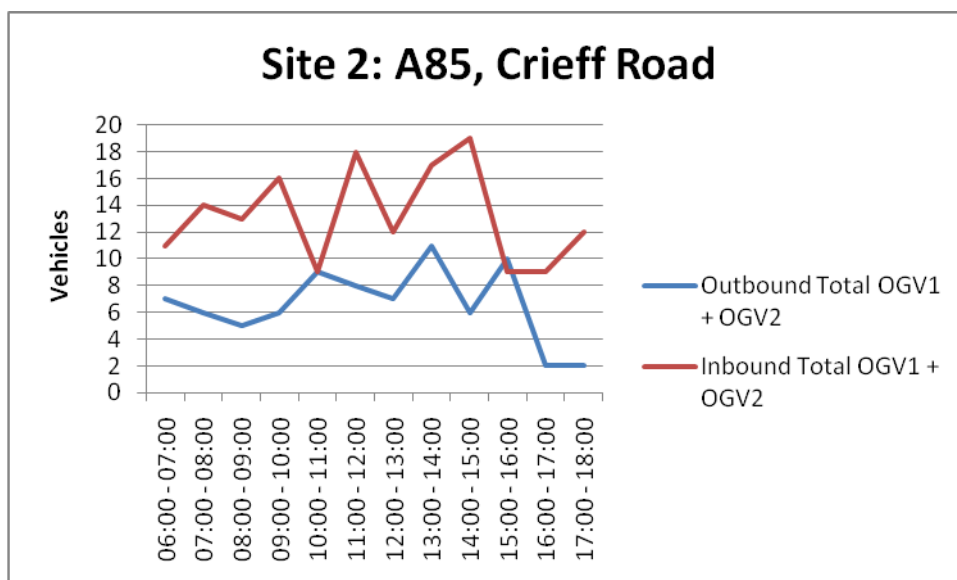


Figure 3.10 Site 3 - A93 Glasgow Road – All movements

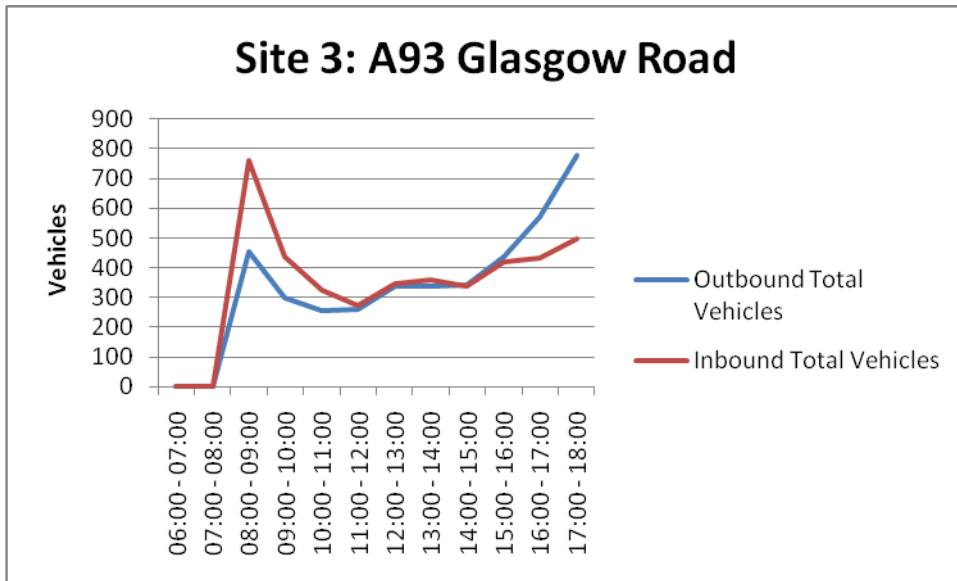


Figure 3.11 Site 3 - A912 Glasgow Road – OGV 1 and OGV 2 combined

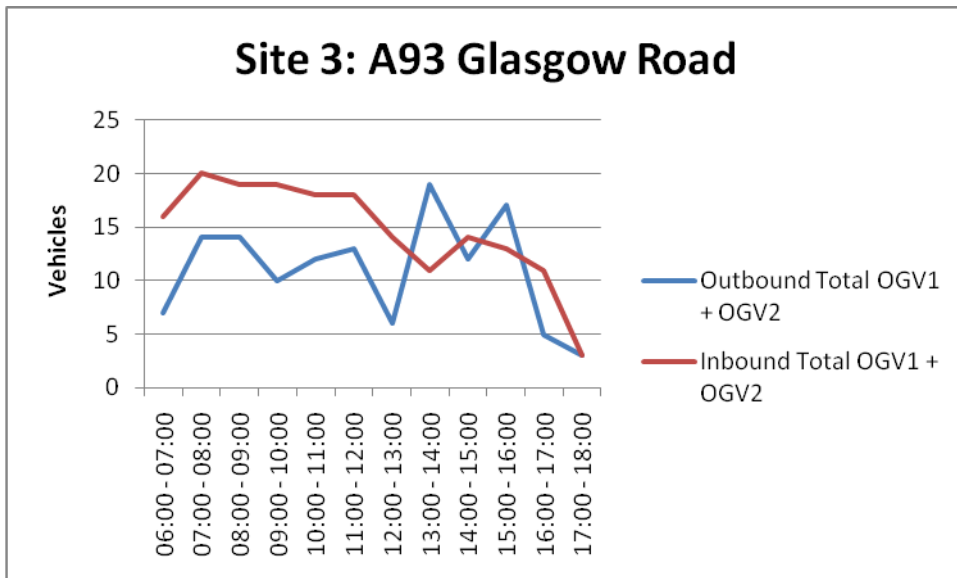


Figure 3.12 Site 4 - A912 Edinburgh Road – All movements

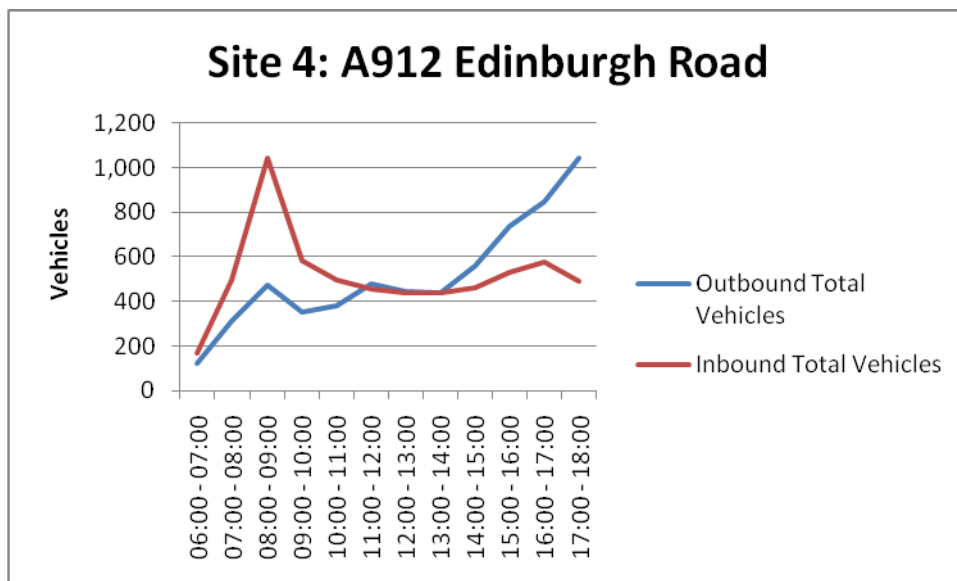


Figure 3.13 Site 4 - A912 Edinburgh Road – OGV 1 and OGV 2 combined

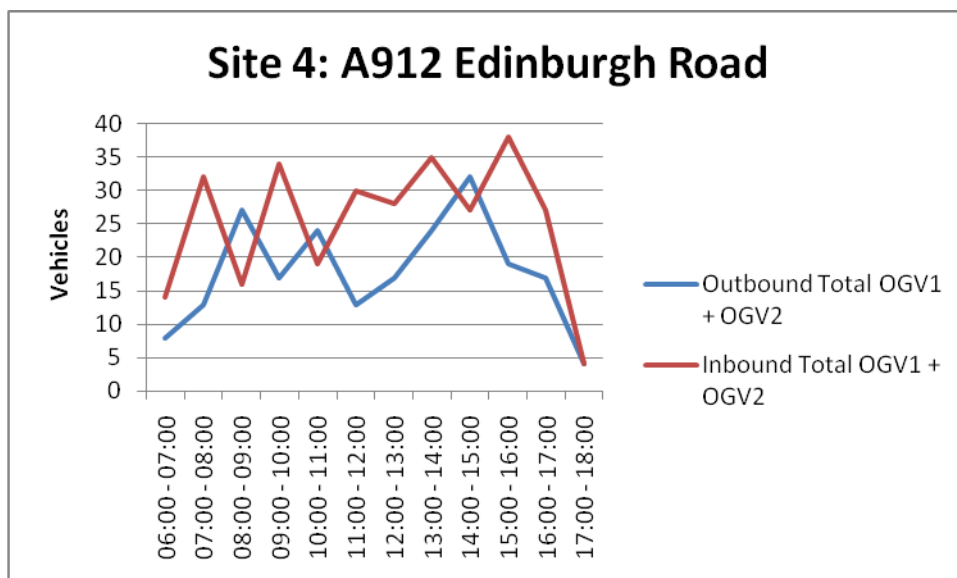


Figure 3.14 Site 5 – A85, Dundee Road – All movements

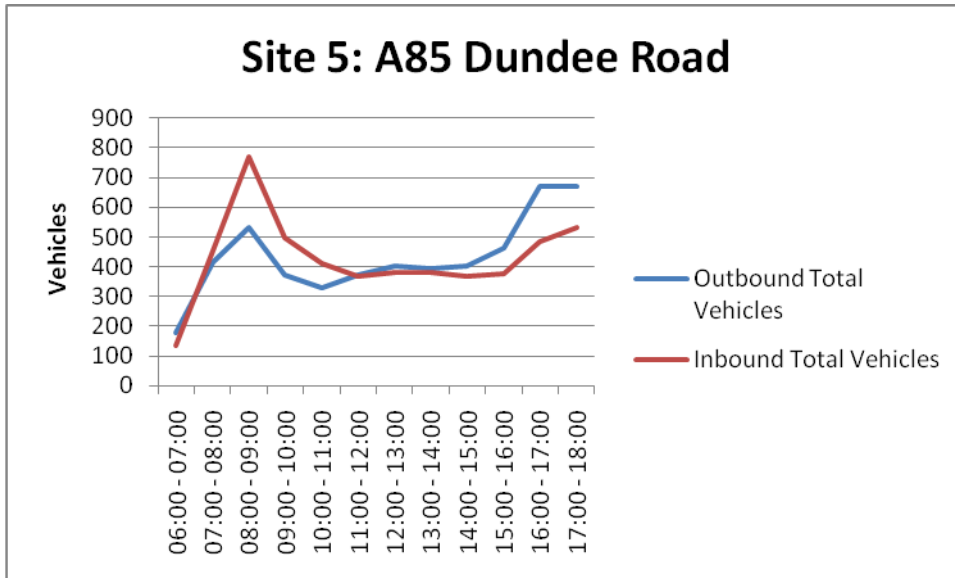


Figure 3.15 Site 5 – A85, Dundee Road – OGV 1 and OGV 2 combined

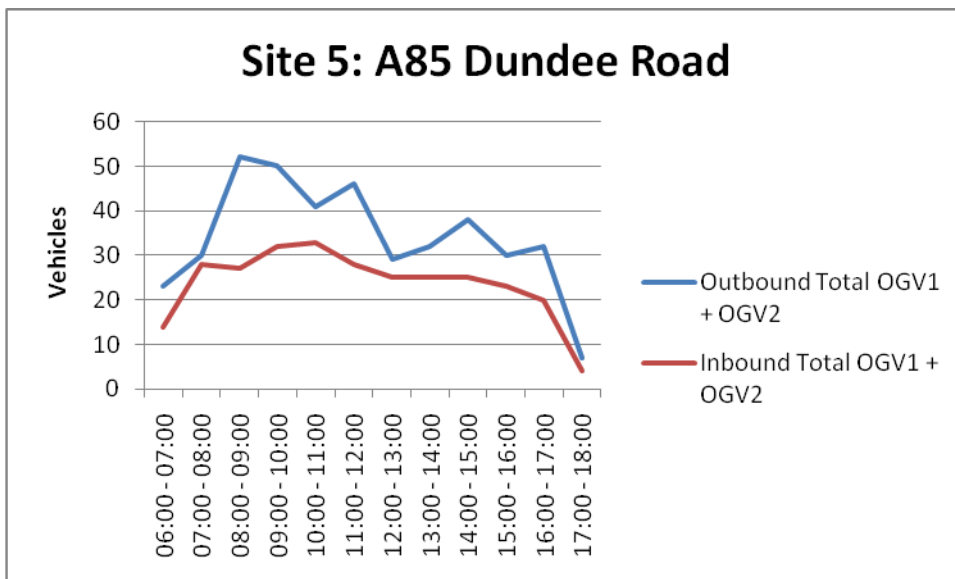


Figure 3.16 Site 6 – A94, Angus Road – All movements

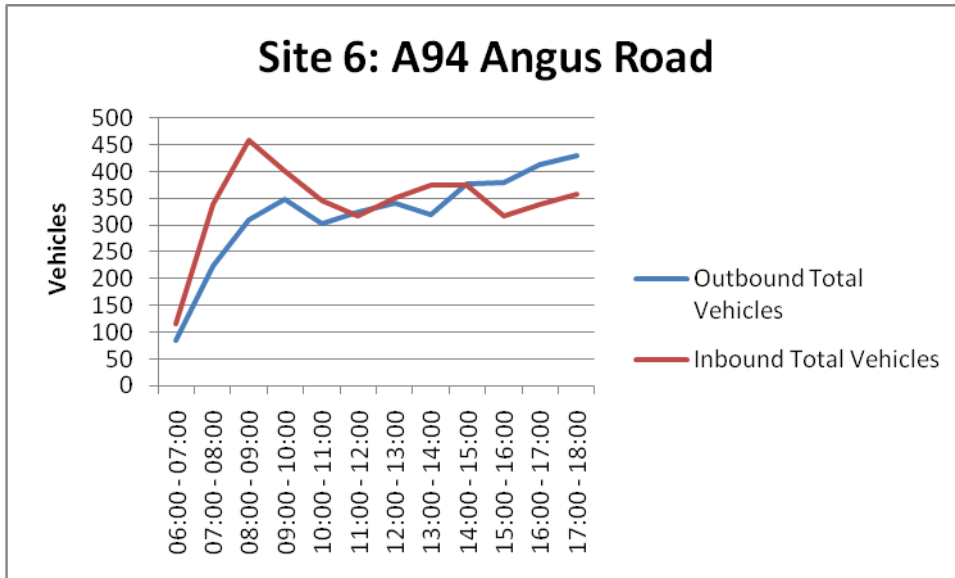


Figure 3.17 Site 6 - A94 Angus Road – OGV 1 and OGV 2 combined

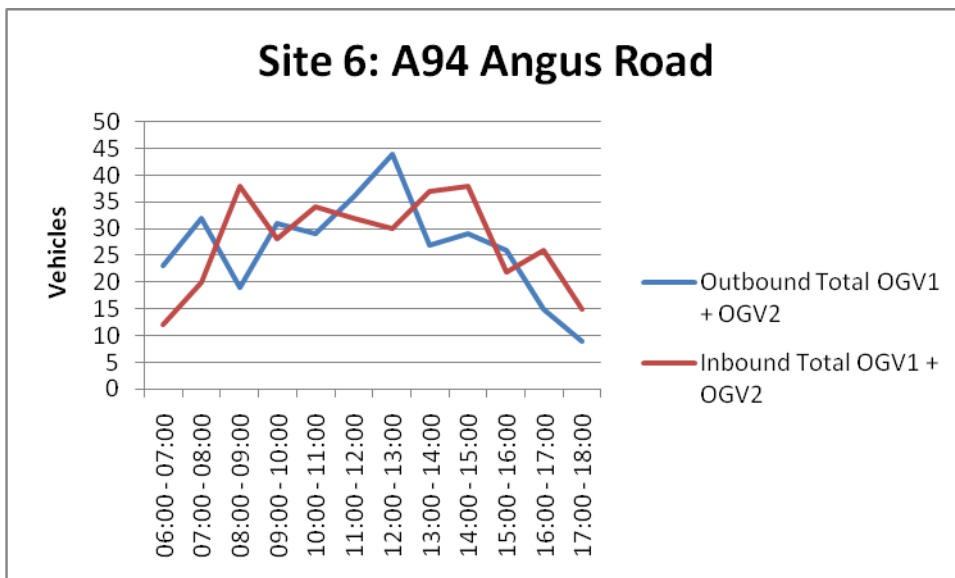


Figure 3.18 Site 7 - A93 Isla Road – All movements

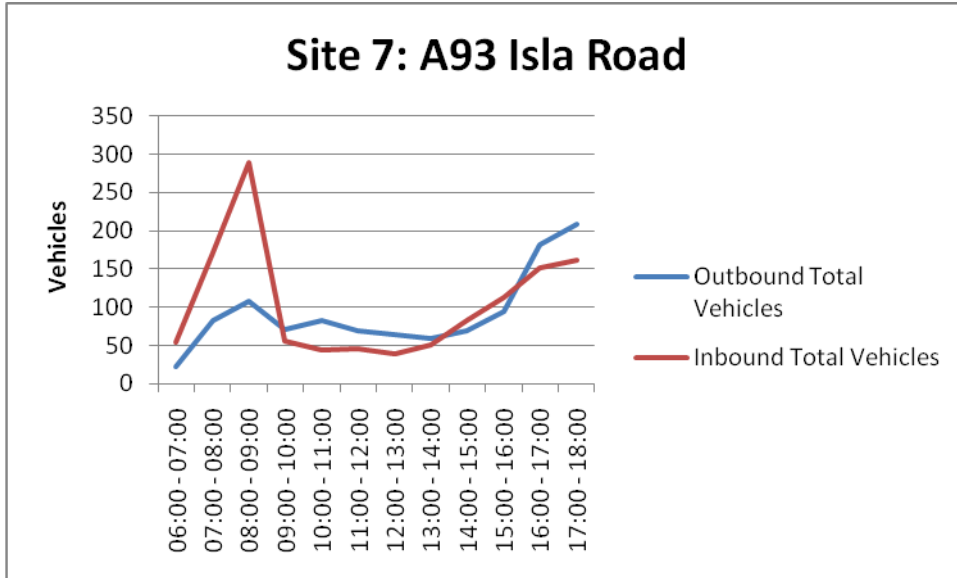


Figure 3.19 Site 7 - A93 Isla Road – OGV 1 and OGV 2 combined

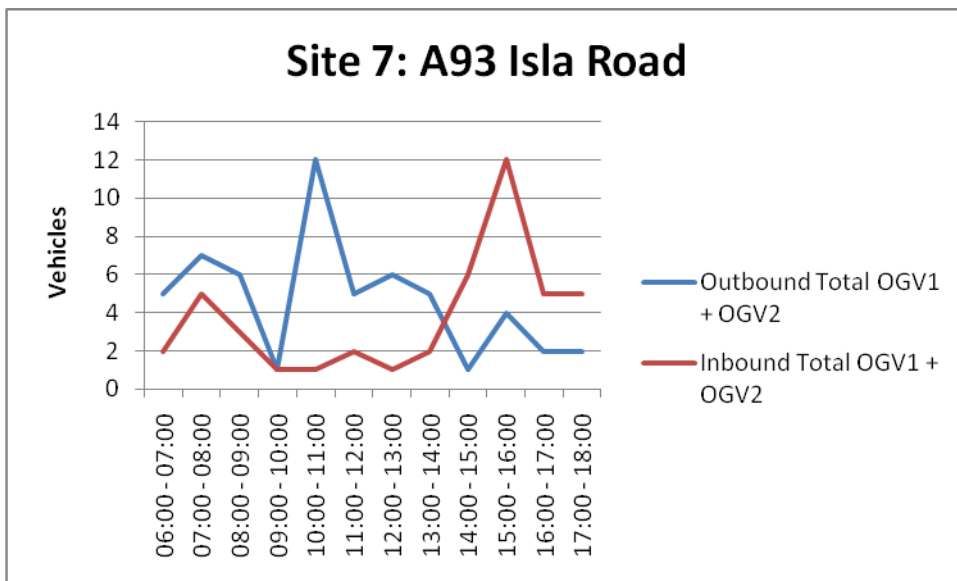


Figure 3.20 Site 8 - A85 Barrack Street – All movements

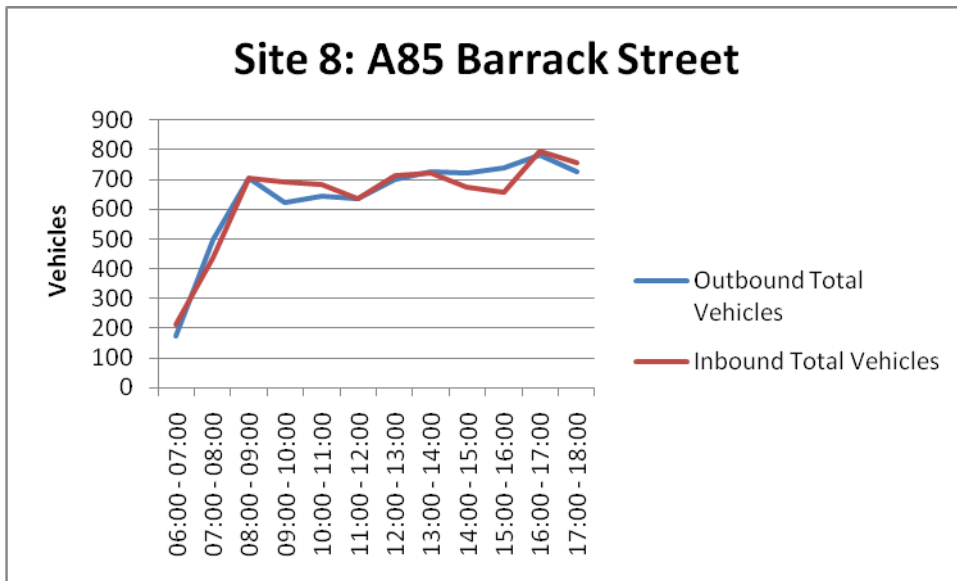


Figure 3.21 Site 8 - A85 Barrack Street – OGV 1 and OGV 2 combined

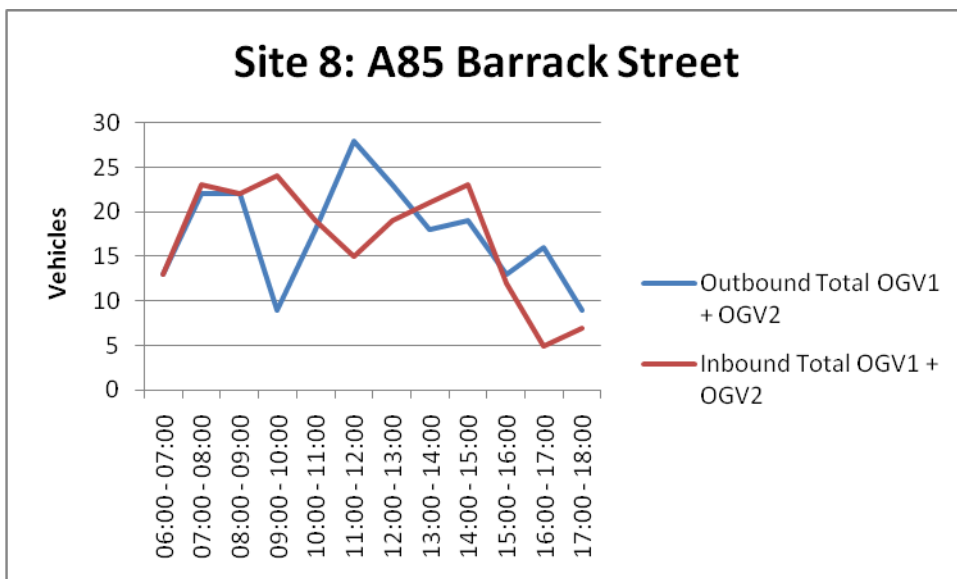


Figure 3.22 Site 9 – A93 Glasgow Road – All movements

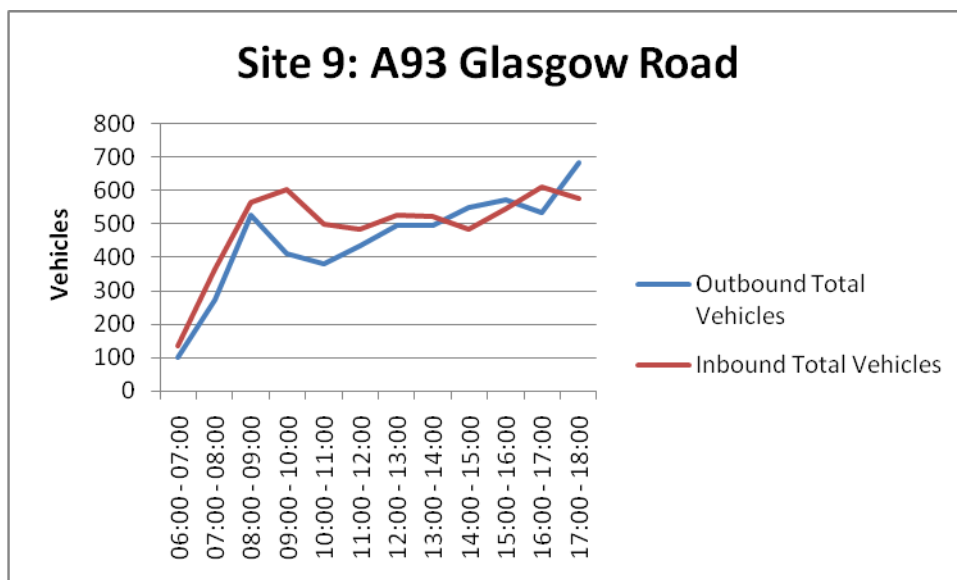


Figure 3.23 Site 9 – A93 Glasgow Road – OGV 1 and OGV 2 combined

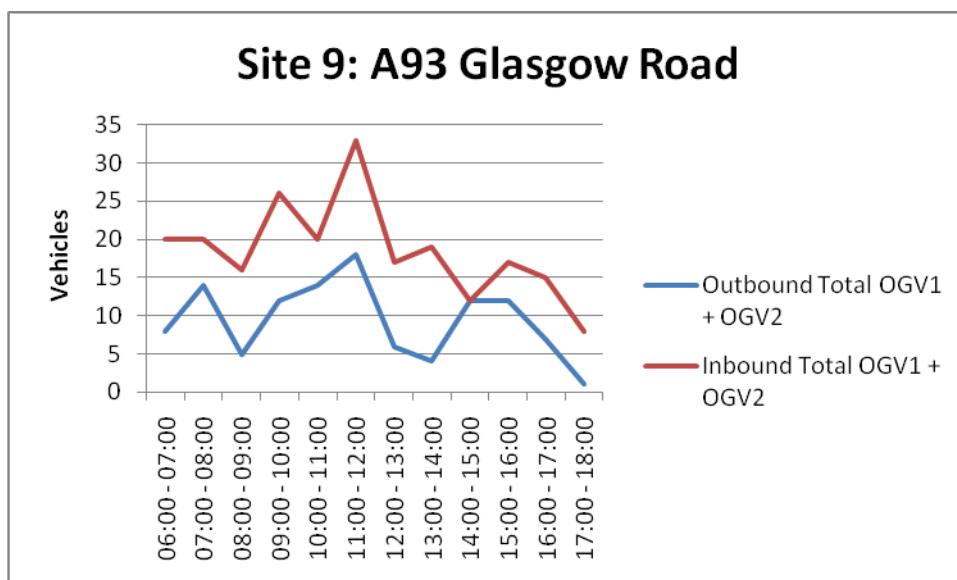




Figure 3.24 Site 10 - A912 Edinburgh Road, at South Inch – All movements

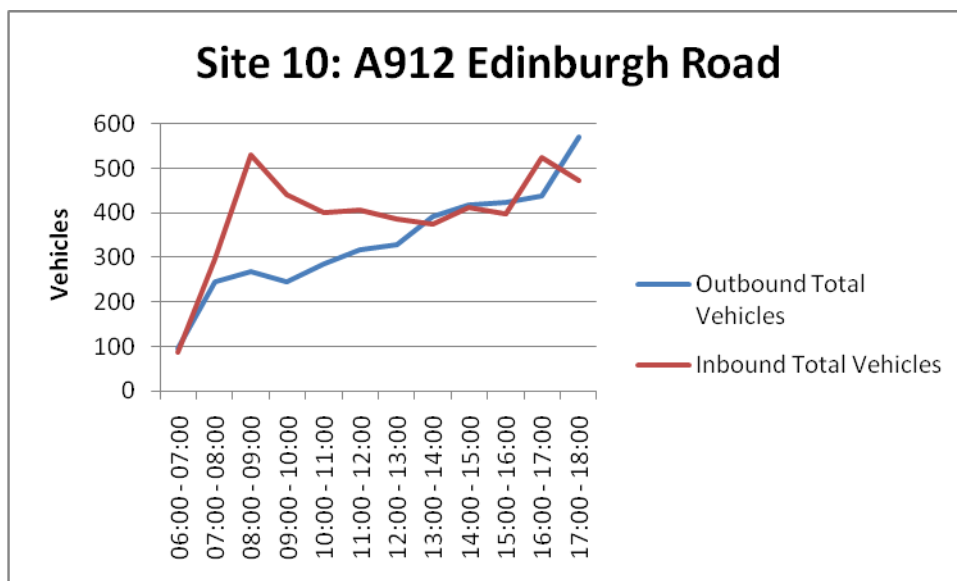


Figure 3.25 Site 10 - A912 Edinburgh Road, at South Inch – OGV 1 and OGV 2 combined

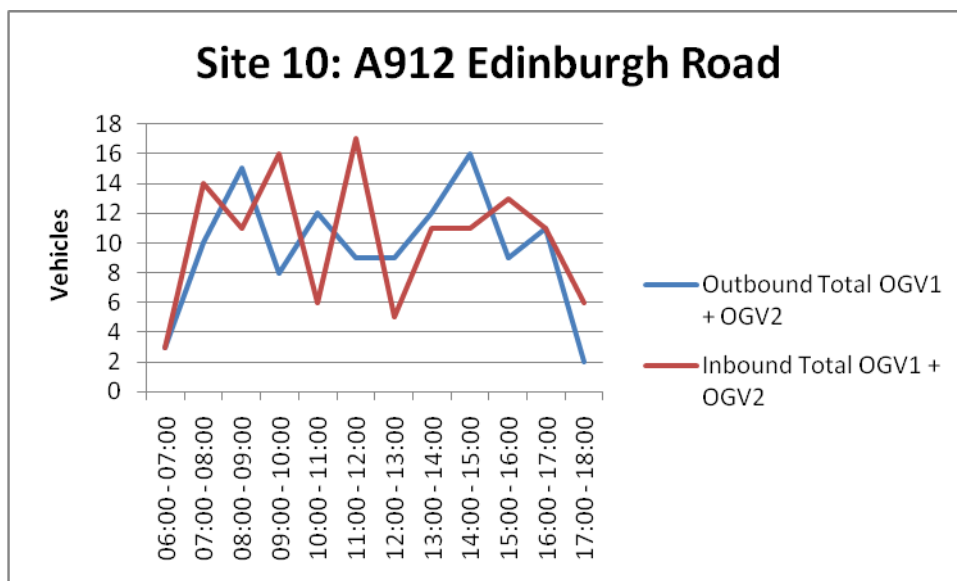


Figure 3.26 Site 11 - Shore Road, south of Marshall Place – All movements

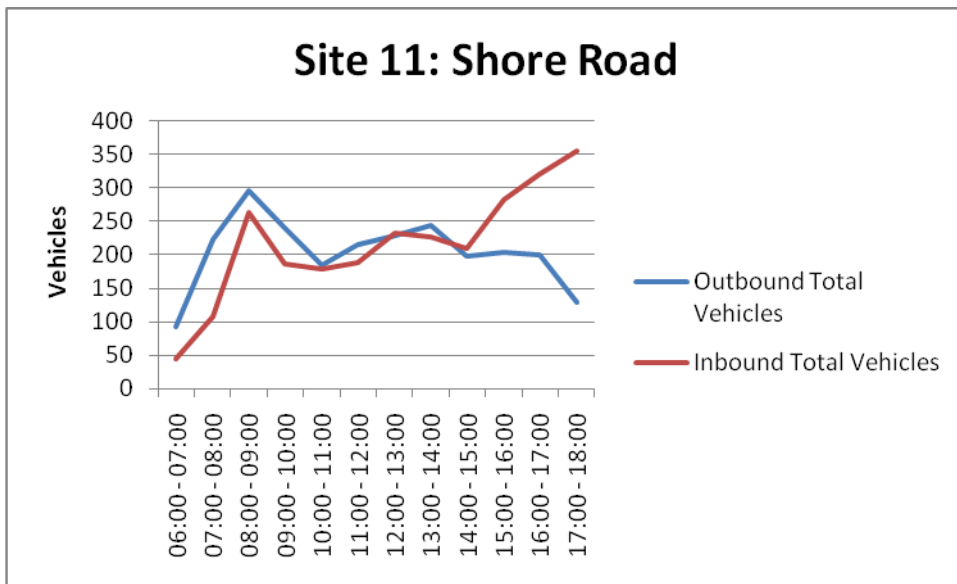


Figure 3.27 Site 11 - Shore Road, south of Marshall Place – OGV 1 and OGV 2 combined

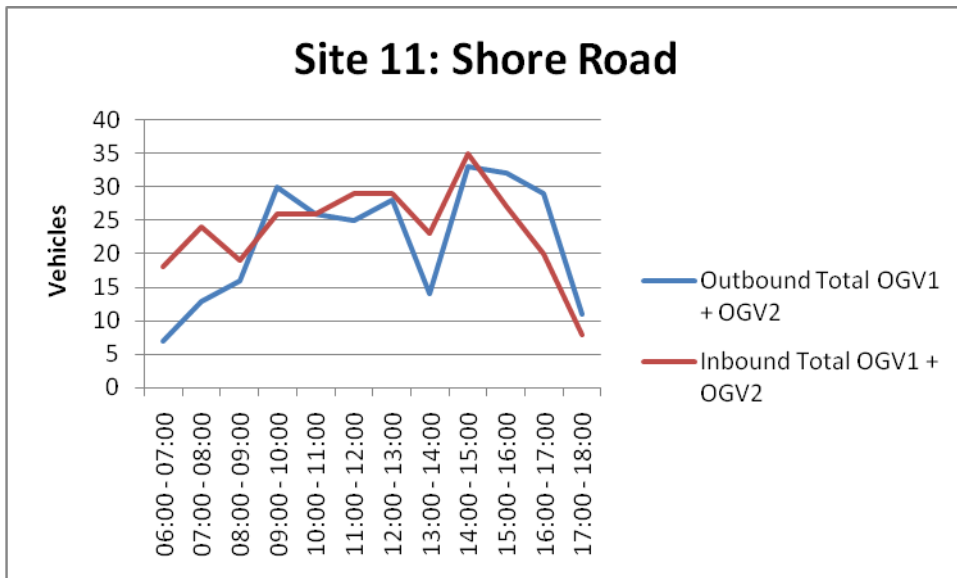


Figure 3.28 Site 12 - A85 Queen's Bridge – All movements

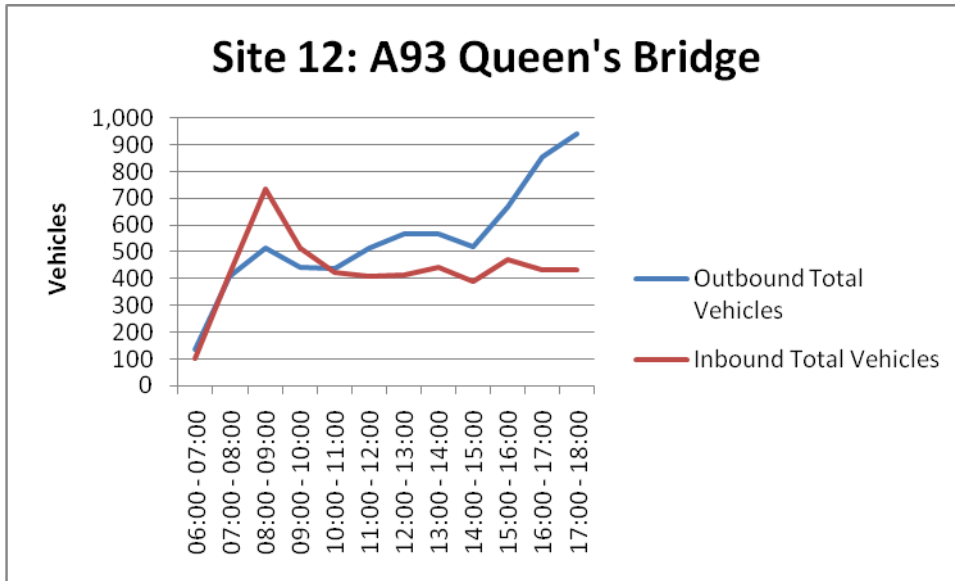


Figure 3.29 Site 12 - A85 Queen's Bridge– OGV 1 and OGV 2 combined

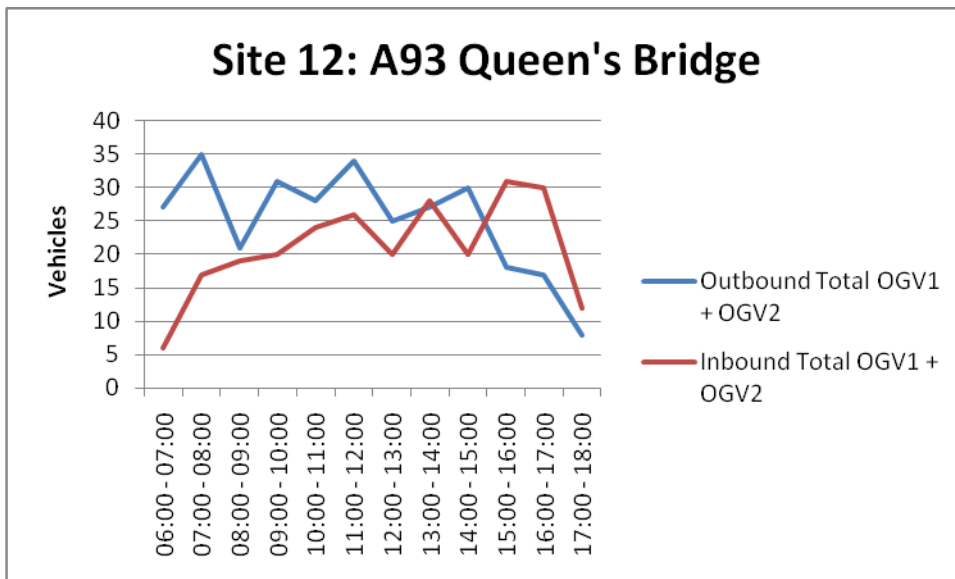


Figure 3.30 Site 13 - A93 Perth Bridge – All movements

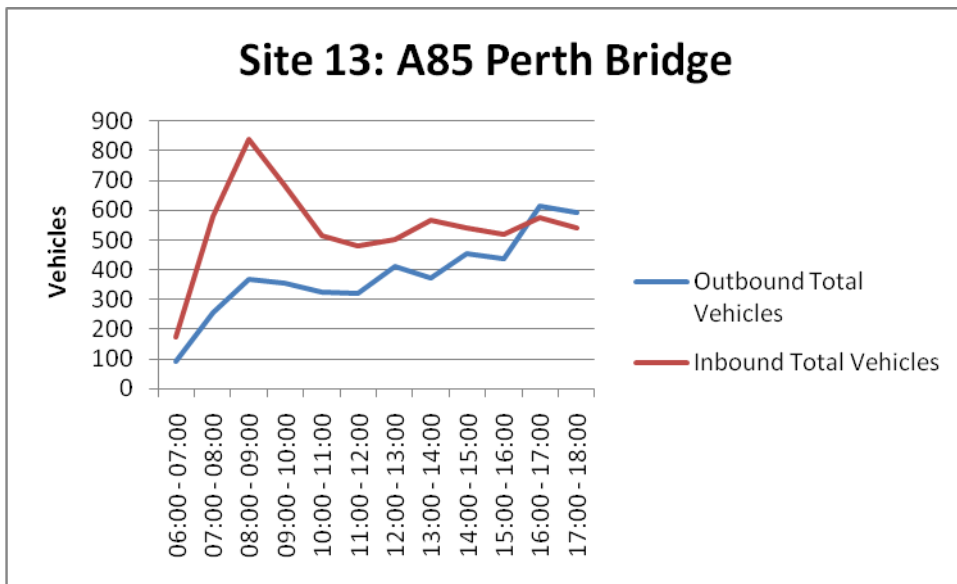
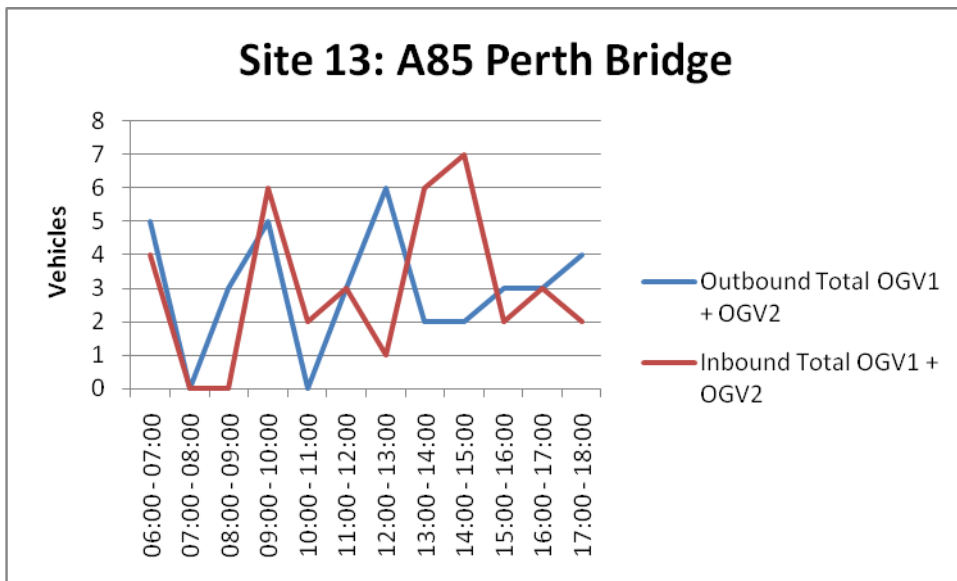


Figure 3.31 Site 13 - A93 Perth Bridge – OGV 1 and OGV 2 combined



**Weekly Comparison**

3.36 Data for Sites 1 to 7 was captured using ATC's making it possible to establish how the flows on the date of the survey (16<sup>th</sup> March) compared with the 5 day and 7 day average. This is shown in Table 3.32. below

**Table 3.32 Perth Classified Counts - Weekly Summary**

PERTH CLASSIFIED COUNTS (Weekly Summary)									
SITES 1-7									
Date: Wednesday 16th March 2011									
	Wed	Thurs	Friday	Sat	Sun	Mon	Tues	5 day	7 day ave
	16/03/2011	17/03/2011	18/03/2011	19/03/2011	20/03/2011	21/03/2011	22/03/2011	ave	ave
SITE 1: A912 Dunkeld Road	19041	18962	19765	13138	9456	18895	18829	19098	16869
SITE 2: Crieff Road	9673	9850	10283	9427	7498	9881	9816	9901	9490
SITE 3: A93 Glasgow Road	9206	9556	10362	7140	5453	8993	9632	9550	8620
SITE 4: A912 Edinburgh Road	12368	12342	13436	11328	7759	11684	11840	12334	11537
SITE 5: A85 Dundee Road	10353	10279	11193	8768	7149	10090	10109	10405	9706
SITE 6: A94 Angus Road	7943	5714	8507	5847	4426	6535	6705	7081	6525
SITE 7: A93 Isla Road	2373	2331	2562	3385	2853	3373	3335	2795	2887
<b>TOTAL</b>	<b>70957</b>	<b>69034</b>	<b>76108</b>	<b>59033</b>	<b>44594</b>	<b>69451</b>	<b>70266</b>	<b>71163</b>	<b>65635</b>

3.37 The results indicate that the survey date of the 16<sup>th</sup> March was generally comparable with the 5 day working average other than for the A94 Angus Road where it was appreciably higher perhaps due to the diversionary effects of the roadworks on the parallel A93.

**Annual Average Daily Traffic Flow (AADF)**

3.38 The AADF (Annual Average Daily Flow) is defined by the DfT as the average over a full year of the number of vehicles passing a point in the road network each day (<http://www.dft.gov.uk/matrix/>).

3.39 This can be interpreted as the average number of vehicles you could expect at a particular location on any day (including weekends and holidays) and at any time of year and for the 24 hour period.

3.40 In order to arrive at the AADF, the DfT undertakes 12 hour counts in neutral weeks and uses expansion factors to convert these one day 12 hour surveys to 24 hour average results. These expansion factors are obtained from the network of permanent traffic counting sensors located throughout the country.

3.41 As the classified counts in Perth were undertaken in a neutral period (the survey day, 16th March 2011, was in the first neutral week of the year), they should not, in theory, be too susceptible to significant peaks or troughs in traffic behaviour, and hence should be similar

to the average weekday (Monday to Friday) 12 hour flow across the year. As Sites 1-7 were collected by ATCs (which enabled a week of data to be collected), variations over the weekdays and weekend can be seen. Over the weekdays this is generally less than 1%, although the road closure north of Site 7 did impact on usual activity at Sites 6 and 7.

- 3.42 Factors Sites 1 to 7 can be obtained from the ATC dataset to convert the 12 hour count to the 24 hour count for Sites 8 - 13. The average of these factors has been used to gain the 24 hour flow for the remaining sites 8-13 for the survey day and for the 5 day weekday average and the 7 day average (AADF).
- 3.43 The factor to convert from 12 hour counts to 24 hours is 1.25. The conversion factor from a 5 day weekly average to the AADF is 0.94. These calculations have been applied to the dataset for Sites 1 to 13 which are contained in Appendix C.

### **Euro Engine Classification**

- 3.44 Data was also summarised by Euro Engine Classification for each site which is shown in figure 3.33 below for inbound and outbound movements

Table 3.33 Classified Counts by Euro Engine Classification

INBOUND TO PERTH CITY CENTRE												
Site Number	LGV						HGV					
	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	TOTAL	Euro I	Euro II	Euro III	Euro IV	Euro V	TOTAL
1. A912 Dunkeld Road, south of Inveralmond roundabout	13	26	267	801	193	1300	5	17	110	151	89	372
2. A85 Crieff Road, east of Newhouse Road	2	5	116	288	52	463	1	5	51	84	22	163
3. A93 Glasgow Road, east of Broxden Avenue	0	3	99	299	101	502	2	11	43	79	36	171
4. A912 Edinburgh Road, south of Friarton Road	6	23	112	328	76	545	1	15	92	143	57	308
5. A85 Dundee Road, south of Island View	6	11	119	348	82	566	7	14	77	157	61	316
6. A94 Angus Road, Scone, at Park and Ride roundabout	3	9	94	294	72	472	6	17	89	153	59	324
7. A93, Isla Road, south of Old Scone,	1	6	35	70	23	135	0	3	21	23	4	51
8. A85 Barrack Street, south of St Catherine's Road	2	11	179	470	101	763	1	7	76	104	46	234
9. A93 Glasgow Road, on railway bridge	3	16	106	308	80	513	4	14	60	107	36	221
10. A912 Edinburgh Road, at South Inch	4	11	101	300	90	506	2	8	53	72	26	161
11. Shore Road, south of Marshall Place	2	16	120	253	64	455	8	8	75	141	64	296
12. A93 Queen's Bridge	6	19	125	367	65	582	7	10	83	127	44	271
13. A85 Perth Bridge	9	17	154	406	98	684	0	5	26	36	12	79
<b>TOTAL</b>	<b>57</b>	<b>173</b>	<b>1627</b>	<b>4532</b>	<b>1097</b>	<b>7486</b>	<b>44</b>	<b>134</b>	<b>856</b>	<b>1377</b>	<b>556</b>	<b>2967</b>
<b>%</b>	<b>1%</b>	<b>2%</b>	<b>22%</b>	<b>61%</b>	<b>15%</b>	<b>100%</b>	<b>1%</b>	<b>5%</b>	<b>29%</b>	<b>46%</b>	<b>19%</b>	<b>100%</b>

OUTBOUND TO PERTH CITY CENTRE												
Site Number	LGV						HGV					
	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	TOTAL	Euro I	Euro II	Euro III	Euro IV	Euro V	TOTAL
1.A912 Dunkeld Road, south of Inveralmond roundabout	9	20	252	688	177	1146	4	17	124	151	79	375
2. A85 Crieff Road, east of Newhouse Road	4	4	87	288	55	438	0	5	30	56	16	107
3. A93 Glasgow Road, east of Broxden Avenue	1	7	77	239	67	391	0	5	29	55	25	114
4. A912 Edinburgh Road, south of Friarton Road	7	13	125	337	95	577	1	13	71	109	51	245
5. A85 Dundee Road, south of Island View	3	9	75	288	71	446	8	11	87	154	73	333
6. A94 Angus Road, Scone, at Park and Ride roundabout	0	7	94	288	69	458	3	7	78	159	68	315
7. A93, Isla Road, south of Old Scone,	1	1	31	75	32	140	0	7	19	30	9	65
8. A85 Barrack Street, south of St Catherine's Road	6	21	223	621	151	1022	4	18	78	108	57	265
9. A93 Glasgow Road, on railway bridge	3	10	111	301	54	479	3	8	37	79	31	158
10. A912 Edinburgh Road, at South Inch	1	9	82	232	63	387	1	6	46	61	28	142
11. Shore Road, south of Marshall Place	2	17	112	211	52	394	9	7	76	118	58	268
12. A93 Queen's Bridge	4	17	120	350	73	564	7	8	94	159	58	326
13. A85 Perth Bridge	3	13	124	352	80	572	1	3	15	31	16	66
<b>TOTAL</b>	<b>44</b>	<b>148</b>	<b>1513</b>	<b>4270</b>	<b>1039</b>	<b>7014</b>	<b>41</b>	<b>115</b>	<b>784</b>	<b>1270</b>	<b>569</b>	<b>2779</b>
<b>%</b>	<b>1%</b>	<b>2%</b>	<b>22%</b>	<b>61%</b>	<b>15%</b>	<b>100%</b>	<b>1%</b>	<b>4%</b>	<b>28%</b>	<b>46%</b>	<b>20%</b>	<b>100%</b>



- 3.45 The results indicate that the majority of LGV's on the road conform to Euro Engine 3, 4 and 5 making up around 97% of vehicles. 76% of vehicles conform to Euro 4 or 5 the latest engine classifications. HGV's exhibit a similar picture with around 94% being Euro III, IV and V and 57% being Euro IV or V. There is therefore a greater proportion of LGV's on the road which conform to the newer classifications in general which have lower levels of carbon emissions

### **Additional Pedestrian and Cycle Counts**

- 3.46 The camera images shown below depict the movements that were captured for P1 to P4 (figure 3.34 to figures 3.37). Other sites were captured manually and hence digital images are not available. The results of the assessment are shown in tabular format in Appendix D.

Figure 3.34 Pedestrian Site 1 – St Paul’s Church View East



Figure 3.35 – Site P2 Pedestrian High Street near Kinnoull Street Junction





Figure 3.36 – Site P3 Pedestrian High Street – King Edward Street



Figure 3.37 – Site P4 Pedestrian High Street – St Johns Street Junction



### Additional Classified Turning Count

3.47 The camera images shown below depict the movements that were captured for the turning counts at Atholl Street/Melville Street/North Methven Street (figure 3.38) and Atholl Street/Barossa Street/Kinnoull Street (figure 3.39)

Figure 3.38 Atholl Street / Melville Street Junction - View East





Figure 3.39 Atholl Street/Barossa Street/Kinnoull Street









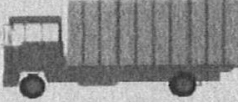

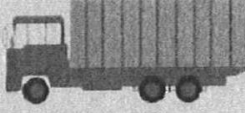



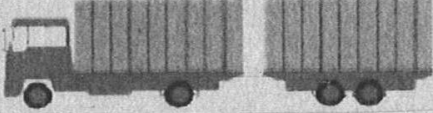
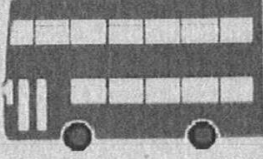

3.48 The results of the assessment are shown in tabular format in Appendix E.





# Appendix A

## Vehicle Classifications

<p><b>CAR</b></p>	 <p>SALOON</p>	 <p>ESTATE</p>  <p>CAR TOWING CARAVAN/TRAILER</p>
<p><b>LIGHT GOODS VEHICLE (LGV)</b></p>	 <p>VAN</p>	 <p>VAN</p>  <p>PICK-UP</p>
<p><b>OTHER GOODS VEHICLES (OGV 1)</b></p>	 <p>2 AXLES RIGID</p>	 <p>1 AXLES RIGID</p>  <p>3 AXLES RIGID</p>
<p><b>OTHER GOODS VEHICLES (OGV 2)</b></p>	 <p>4 AXLES RIGID</p>  <p>4 OR MORE AXLES ARTIC</p>	 <p>3 AXLES ARTIC</p>  <p>4 OR MORE AXLES DRAWBAR</p>
<p><b>BUSES &amp; COACHES (PSV)</b></p>	 <p>DOUBLE DECK BUS</p>  <p>SINGLE DECK BUS OR COACH</p>	

**Summary of Registration Plate Surveys**

# Appendix C

## Perth Full Classified Counts – Sites 1 to 13

**Pedestrian count data**

# Appendix E

## Additional Classified Counts – Atholl Street Sites Tabular Data